This is the Revision A verion of the BS2Hub8 RoboBrick. The status of this project is that it has been replaced by the Revision B version.

BS2Hub8 Robobrick (Revision A)

Table of Contents

This document is also available as a PDF document.

1. Introduction

The BS2Hub8 RoboBrick is a master RoboBrick that can control up to 8 slave RoboBricks. It is controlled by a Basic Stamp 2® from Parallax. It has two terminals that can be connect to a battery between 6 and 9 volts. It has an on board 5 volt voltage regulator to provide power to the slave RoboBricks. The is a connector that can be connected to a DB9 connector and used to communicate with a controlling PC via RS−232 voltage levels.
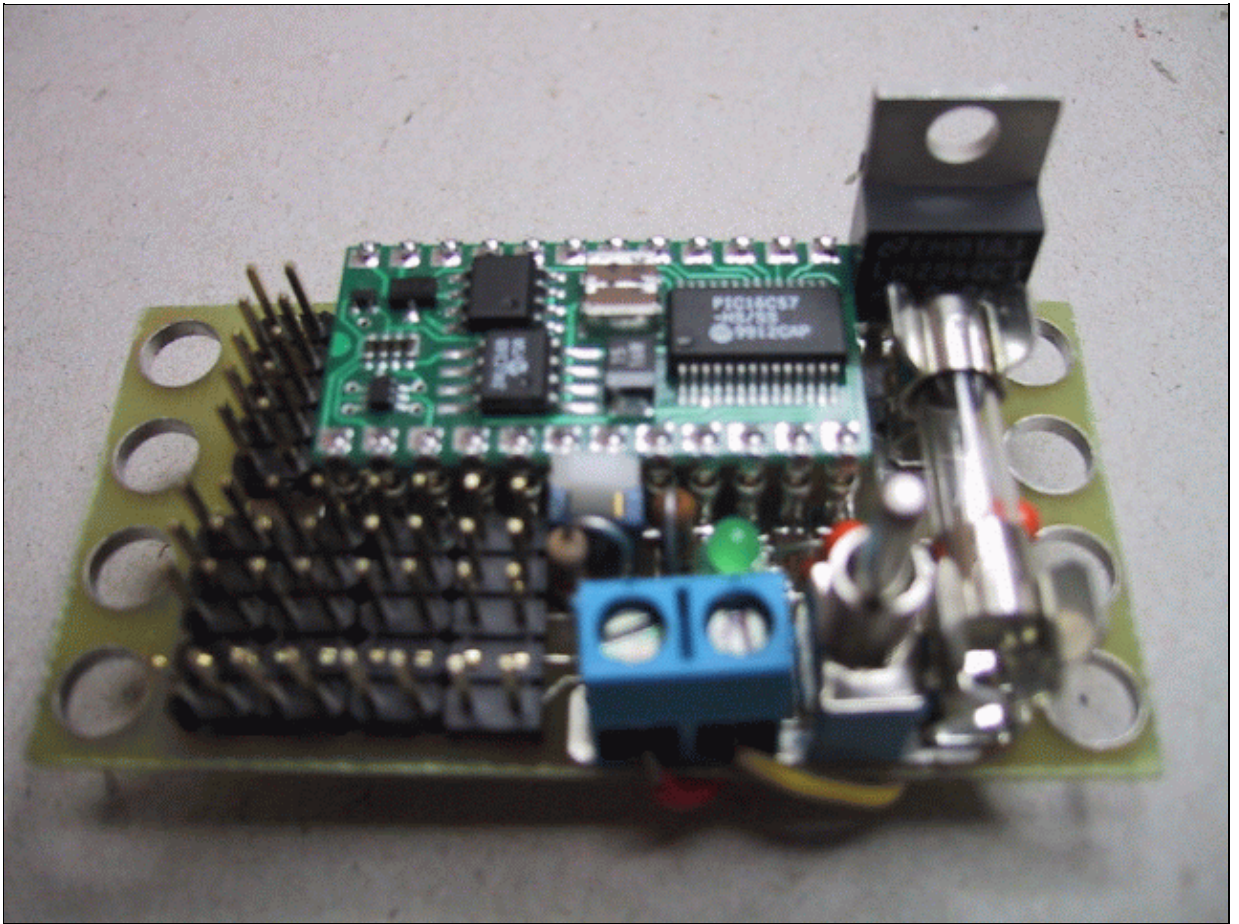
2. Programming

We may eventually put a few examples of programming the BS2Hub8 RoboBrick here. Basically, it is programmed using the Parallax Basic for the Basic Stamp 2.

```
' Even numbered pins inputs and odd number pins are outputs.
' (Remember for the BS2, 1=output and 0=input.)
dirs = $aaaa

' Set all outputs to high:
high 1
high 3
high 5
high 7
high 9
high 11
high 13
high 15

' To copy a Switch8-B (on N2) to LED10-B (on N1):
switches var byte
loop:
    ' Send command 0 (Read switches) to Switch8-B:
    serout 11, 396, [0]
    ' Receive the switch readings from Switch8-B:
    serin 10, 396, [switches]
    ' Send switch values to LED10-B:
```
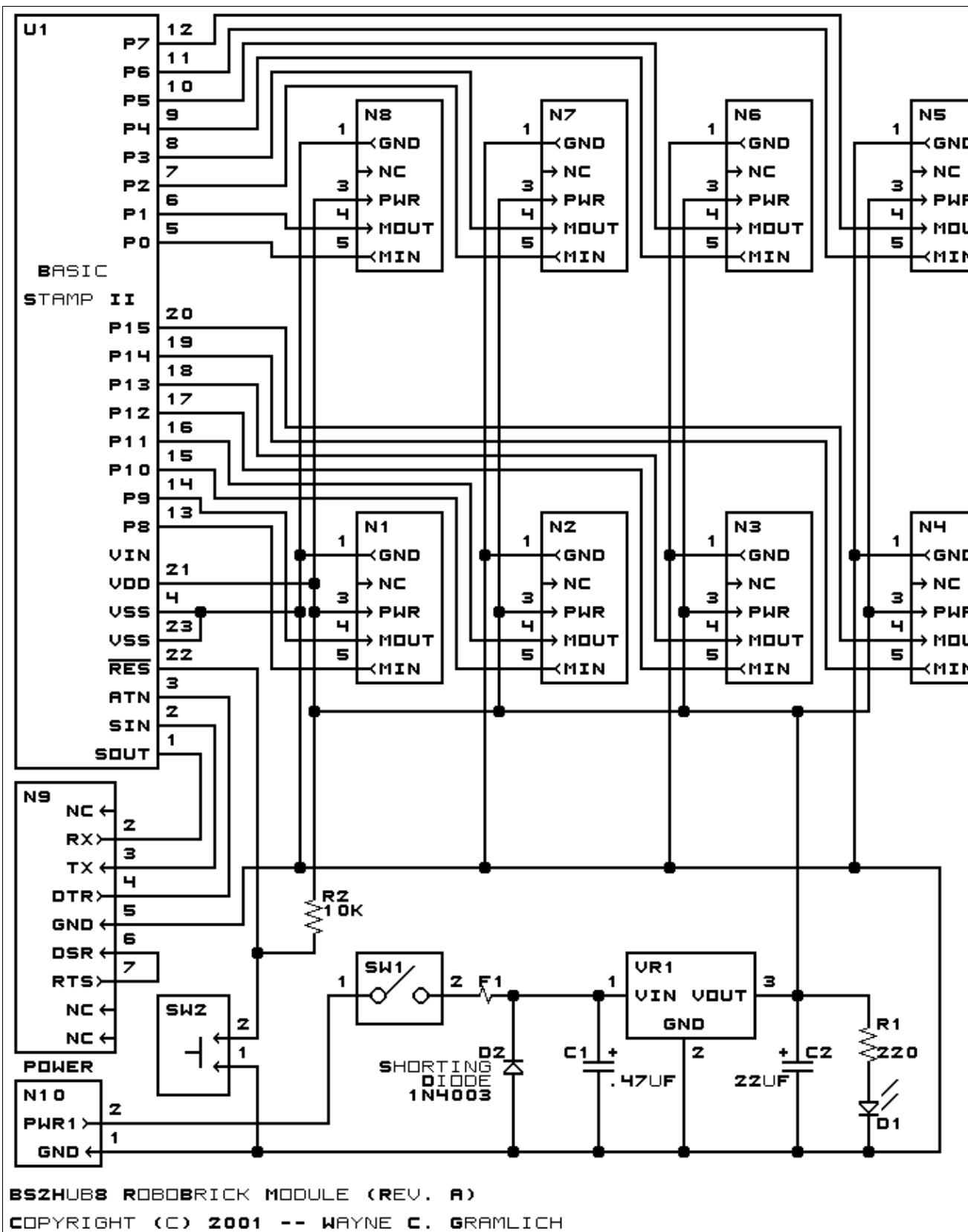
```
serout 9, 396, [switches]
goto loop
```

3. Hardware

The hardware consists of a circuit schematic and a printed circuit board.

3.1 Circuit Schematic

The schematic for the BS2Hub8 RoboBrick is shown below:

BS2HUB8 ROBOBRICK MODULE (REV. A)
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The parts list kept in a separate file –– bs2hub8.ptl.

3.2 Printed Circuit Board

The printed circuit board files are listed below:

bs2hub8_back.png
> The solder side layer.

bs2hub8_front.png
> The component side layer.

bs2hub8_artwork.png
> The artwork layer.

bs2hub8.gbl
> The RS−274X "Gerber" back (solder side) layer.

bs2hub8.gtl
> The RS−274X "Gerber" top (component side) layer.

bs2hub8.gal
> The RS−274X "Gerber" artwork layer.

bs2hub8.drl
> The "Excellon" NC drill file.

bs2hub8.tol
> The "Excellon" tool rack file.

4. Software

There is no software for the BS2Hub8 RoboBrick yet.

5. Issues

The following fabrication issues came up:

- The holes for N1−N9 are too large (size 3) and need to be made smaller
- The fuse holders are too far abart, they should be moved closer together.
- It would be nice to make the holes for the power switch SW1 (currently size 4) one size larger (size 5).
- A 1N4003 is probably the wrong diode to use for the shorting diode. Probably something with more current capacity and a lower break down voltage.
- It sure would be nice to have plus signs for both the LED and shorting diode.
- The reset button may not strictly be necessary.

A. Appendix A: Parts List

```
# Parts list for PIC876Hub10 RoboBrick (Rev. A)
#
C1: Capacitor470nF - .47uF Tantalum Capacitor [Jameco: 33531]
C2: Capacitor22uF - 22uF Tantalum Capacitor [Jameco: 94094]
D1: LEDGreen - Small Green LED [Jameco: 34606]
D2: 1N4003 - 3 Amp Silicon Diode [Jameco: 76970]
F1: Fuse5x20mmSide.BS2Hub8A - 5 x 20 mm Fuse Holder Clips [Jameco: 119280]
N1-8: Header1x5.RBMaster - 1x5 Male Header [5/40 Jameco: 160881]
N9: Header2x5.DB9 - 2x5 Male Header for DB9 [10/80 Jameco: 117196]
N10: TerminalStrip2.BS2Hub8 - 2 Junction Terminal Strip [Jameco: 189675]
R1: Resistor220.Vertical - 220 Ohm 1/4 Watt Resistor [Jameco: 30470]
R2: Resistor10K.Vertical - 10K Ohm 1/4 Watt Resistor [Jameco: 29911]
R3-4: Resistor220.Vertical - 220 Ohm 1/4 Watt Resistor [Jameco: 30470]
SW1: SwitchSPST - SPST Power Switch [Jameco: 72160]
SW2: SwitchPlunger - Small Plunger Switch [Jameco: 172700]
U1: BasicStamp2 - Basic Stamp II [Jameco: 130892]
U2: Oscillator20MHzHalf - 20MHz Crystal Oscillator [Digikey: X220-ND]
VR1: LM2940CG-5 - 5 Volt Low Dropout Voltage Regulator [Jameco: 107182]
```

B. Appendix B: Artwork Layer
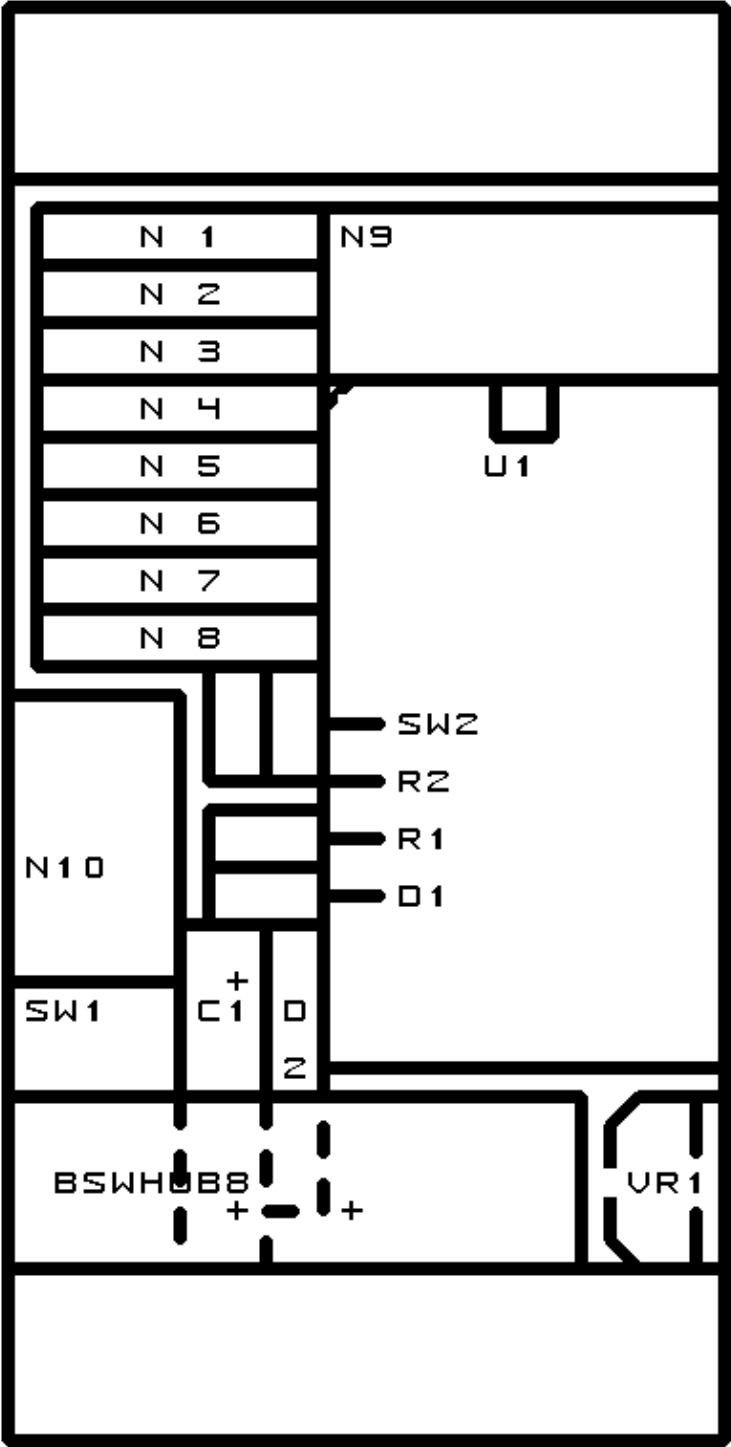
C. Appendix C: Back (Solder Side) Layer
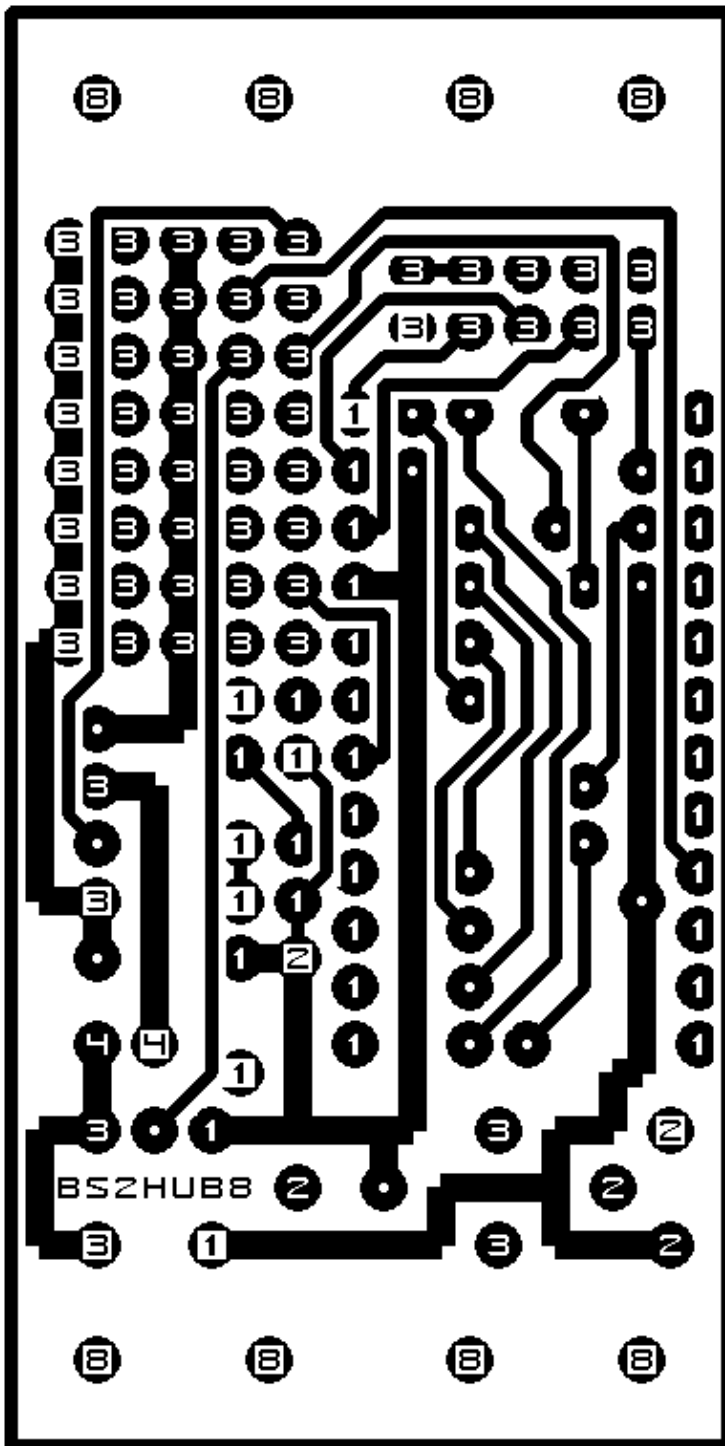
D. Appendix D: Front (Component Side) Layer