This is the Revision A verion of the OOPicHub15 RoboBrick. The status of this project is work in progress.

OOPicHub15 Robobrick (Revision A)

Table of Contents

This document is also available as a PDF document.

1. Introduction

The OOPicHub15 RoboBrick is a master RoboBrick that can control up to 15 slave RoboBricks. It uses a OOPic (or OOPic II) microcontroller from Savage Innovations. It contains a battery connection, power switch, and a 5 volt linear voltage regulator with fuse.

2. Programming

There is no programming specification for the OOPICHub15 RoboBrick yet. However, the table below allows you to figure out which pins on the OOPIC II go to the connectors on the OOPICHub15.

OOPICHub15		OOPIC II		OOPICHub15 Pin
Name	**Direction**	**I/O**	**Pin**	
N1	In	1	7	1
	Out	14	8	2
N2	In	2	9	3
	Out	13	10	4
N3	In	3	11	5
	Out	12	12	6
N4	In	4	13	7
	Out	11	14	8
N5	In	5	15	9
	Out	10	16	10
N6	In	6	17	11
	Out	9	18	12
N7	In	7	19	13
	Out	8	20	14
N8	In	16	25	19

	Out	31	26	20
N9	In	17	27	21
	Out	30	28	22
N10	In	18	29	23
	Out	29	30	24
N11	In	19	31	25
	Out	28	32	26
N12	In	20	33	27
	Out	27	34	28
N13	In	21	35	29
	Out	26	36	30
N14	In	22	37	31
	Out	25	38	32
N15	In	23	39	33
	Out	24	40	34

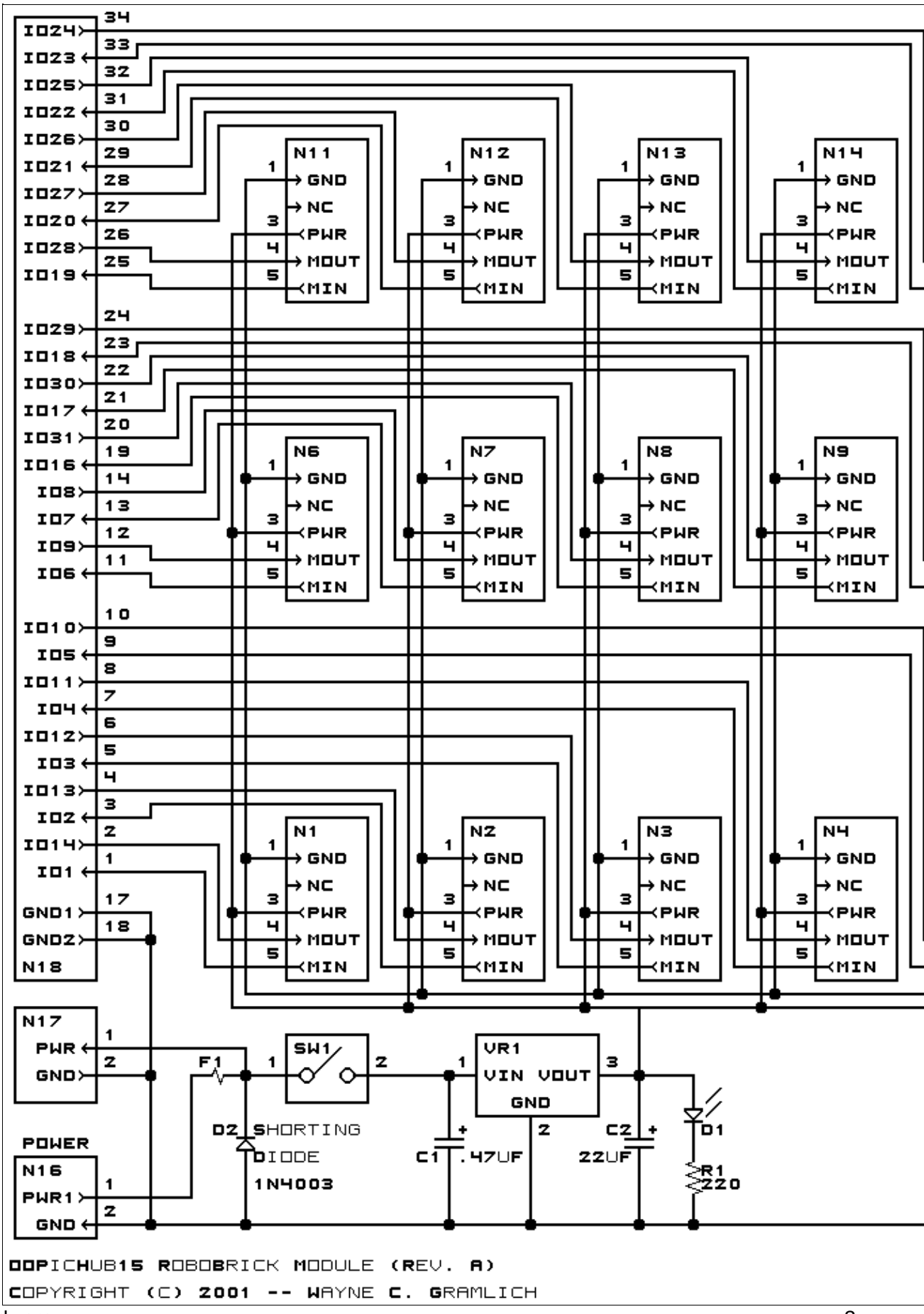
The ribbon cable that connects the OOPICHub15 to the OOPIC II has a 34 pin female (2×17) connector on one end and a 40 pin female (2×20) connector on the other. Pin 40 is connected to pin 34, thereby offsetting all of the pin numbers by 6. is a 34 conductor ribbon cable where pin 34 on hte

3. Hardware

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

3.1 Circuit Schematic

The schematic for the Oopichub15 RoboBrick is shown below:


IO24
IO23
IO25
IO22
IO26
IO21
IO27
IO20
IO28
IO19
IO29
IO18
IO30
IO17
IO31
IO16
IO8
IO7
IO9
IO6
IO10
IO5
IO11
IO4
IO12
IO3
IO13
IO2
IO14
IO1
GND1
GND2
N18
N11
N12
N13
N14
N6
N7
N8
N9
N1
N2
N3
N4
GND
NC
PWR
MOUT
MIN
N17
PWR
GND
F1
SW1
VR1
VIN VOUT
GND
D2 SHORTING
DIODE
1N4003
C1 .47UF
C2 22UF
D1
R1
220
POWER
N16
PWR1
GND
OOPICHUB15 ROBOBRICK MODULE (REV. A)
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The parts list kept in a separate file −− oopichub15.ptl.

3.2 Printed Circuit Board

The printed circuit board files are listed below:

oopichub15_back.png
: The solder side layer.

oopichub15_front.png
: The component side layer.

oopichub15_artwork.png
: The artwork layer.

oopichub15.gbl
: The RS−274X "Gerber" back (solder side) layer.

oopichub15.gtl
: The RS−274X "Gerber" top (component side) layer.

oopichub15.gal
: The RS−274X "Gerber" artwork layer.

oopichub15.drl
: The "Excellon" NC drill file.

oopichub15.tol
: The "Excellon" tool rack file.

4. Software

There is no software for this RoboBrick yet.

5. Issues

The following fabrication issues came up:

- The holes for the voltage regulator are too small.
- Regulator crowds last row in connectors.
- Switch is tight.

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A. Appendix A: Parts List

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# Parts list for OOPicHub15 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: Fuse5x20mmFront.OOPicHub15 − 5 x 20 mm Fuse Holder Clips [Jameco: 102859]
N1−15: Header1x5.RBMaster_OOPicHub15 − 1x5 Male Header [5/80 Jameco: 117196]
N16: TerminalStrip2.OOPicHub15 − 2 Junction Terminal Strip [Jameco: 189675]
N17: Header1x2.OOPicHub15 − 1x2 Male header [2/40 Jameco: 160881]
N18: Header2x17.OOPicHub15 − 2x17 Male Header [34/80 Jameco: 117196]
R1: Resistor220 − 220 Ohm 1/4 Watt Resistor [Jameco: 30470]
SW1: SwitchSPST − SPST switch [Jameco: 72160]
VR1: LM2940CG−5 − 5 Volt Low Dropout Voltage Regulator [Jameco: 107182]
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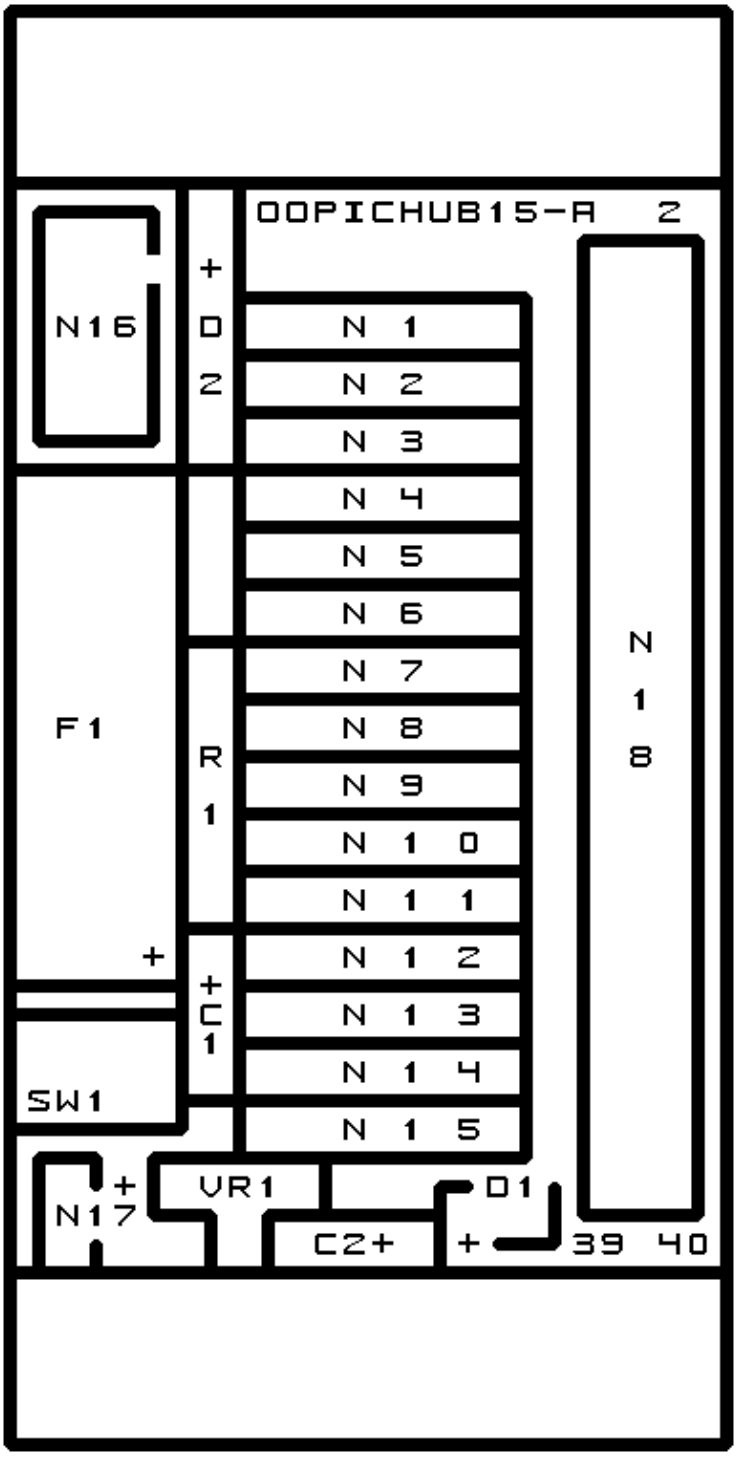
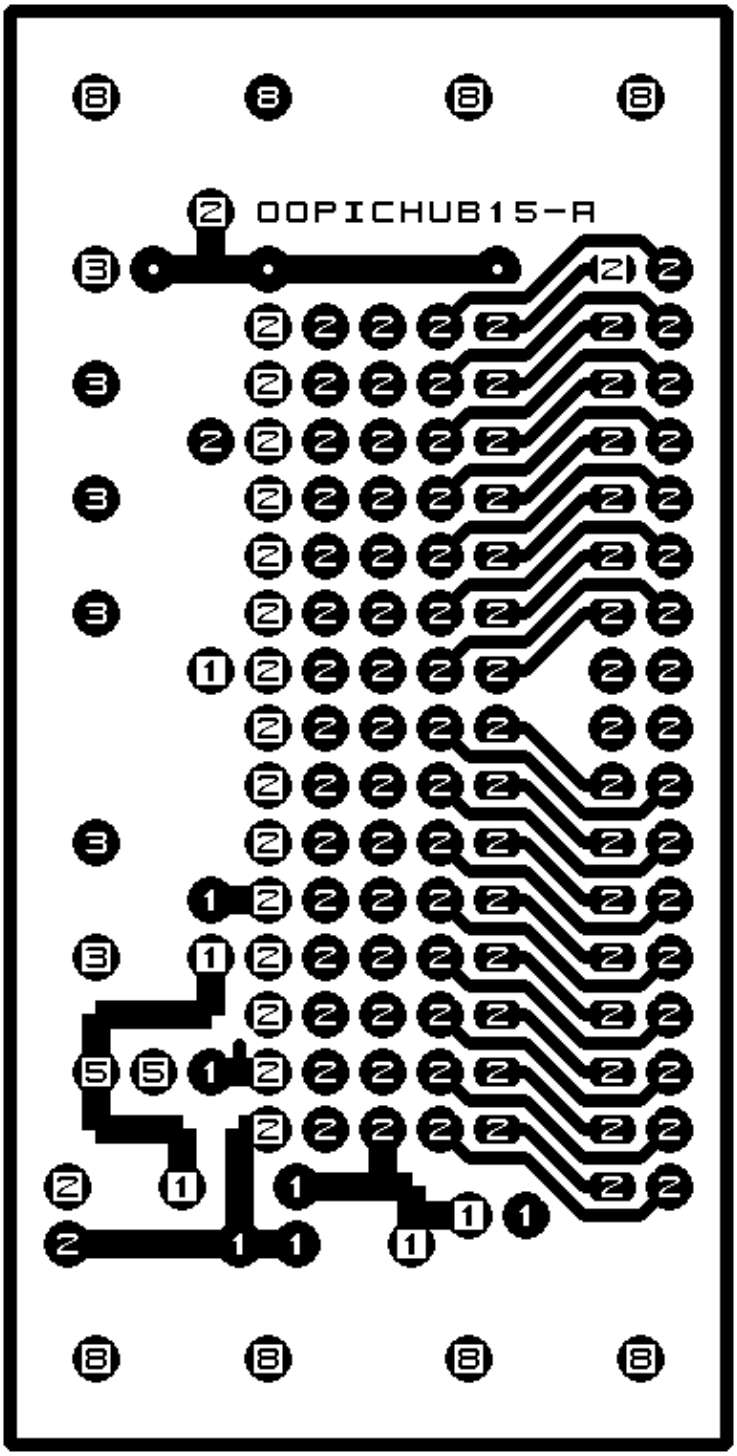
B. Appendix B: Artwork Layer



C. Appendix C: Back (Solder Side) Layer



D. Appendix D: Front (Component Side) Layer