

The Epic Cube

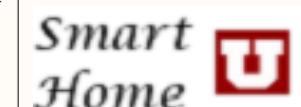
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10	Temperature Sensor Controller
11	Wireless Communication Controller
12	Microphone Mixer
13	Speaker Mixer

List of functions:

- 64 x Temperature Sensors
- Garage Door Control
- Air Conditioning and Heating Control
- 16 x Vent Damper Motor Drivers
- Wireless Communication
- 8 x Microphone Inputs for Voice Recognition
- 8 x Interrupt Buttons for Specific Microphone Use
- Baby Monitor listening
- 8 x Output Specific Speakers
- 5 x 12VDC PWM Fan Controllers
- 6 x Station Sprinkler Controller

Engineer: Levi Balling	Title <i>The Epic Cube</i>	U of U Computer Engineering 50 S. Central Campus Dr. Rm. 3280 MEB Salt Lake City, UT
Drawn By: Levi Balling		
Checked By: *	Size: B	Number: 1 Revision: 1 Project: Smart Home
Date: 9/24/2012		
Time: 11:02:41 PM	File: TheEpicCube.SchDoc	
Sheet 1 of 13		Website: www.eng.utah.edu/~lballing/SmartHome



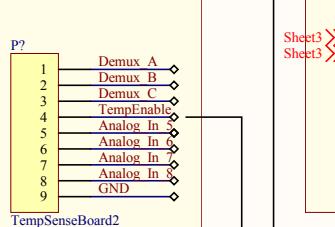
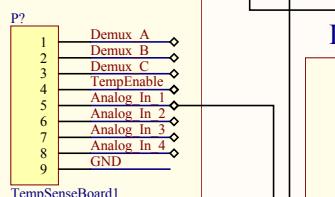
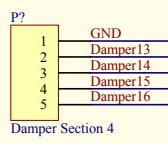
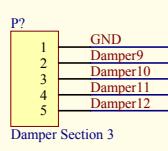
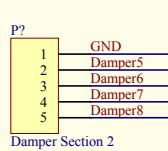
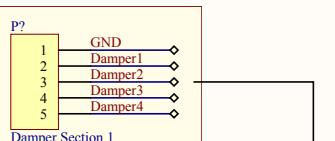
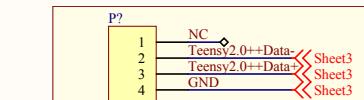


Same Sheet Connector
Off Sheet Connection

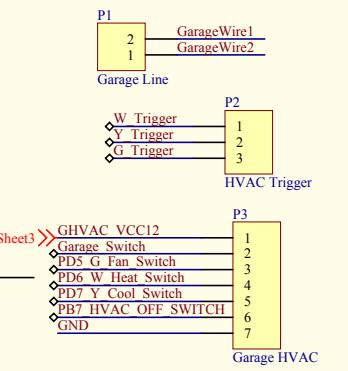
Epic Cube

This is a block diagram of how everything is going to be connected together.
This is not a board to be built, just descriptive.

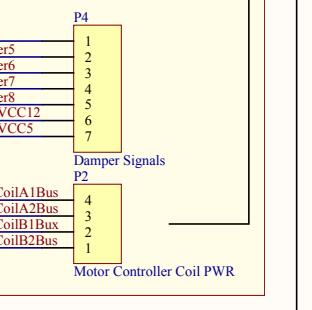
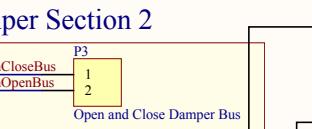
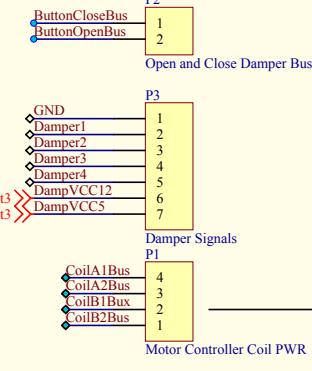
Main Controller



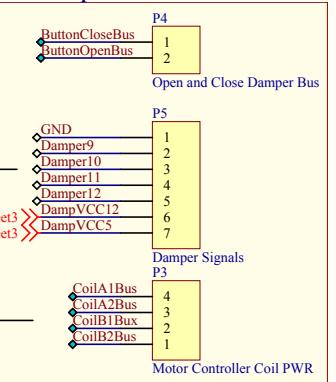
HeatingAC_Garage Board



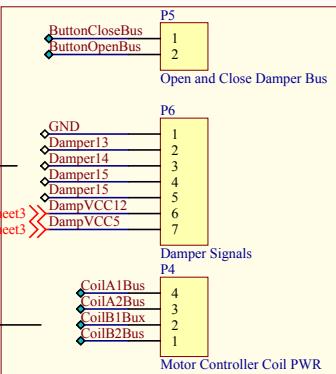
Damper Section 1



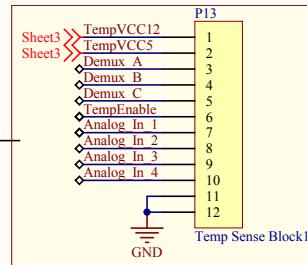
Damper Section 3



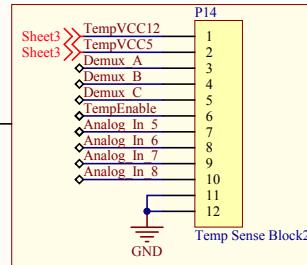
Damper Section 4



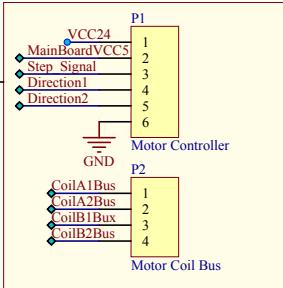
Temperature Sensor Block 1



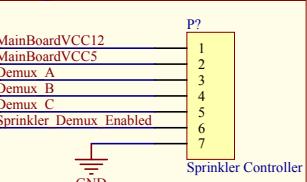
Temperature Sensor Block 2



Motor Controller



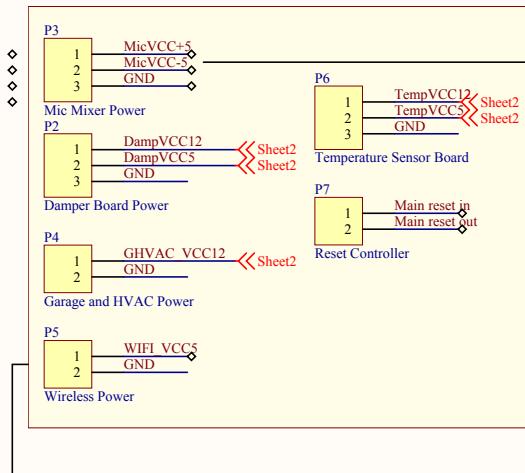
Sprinkler Controller



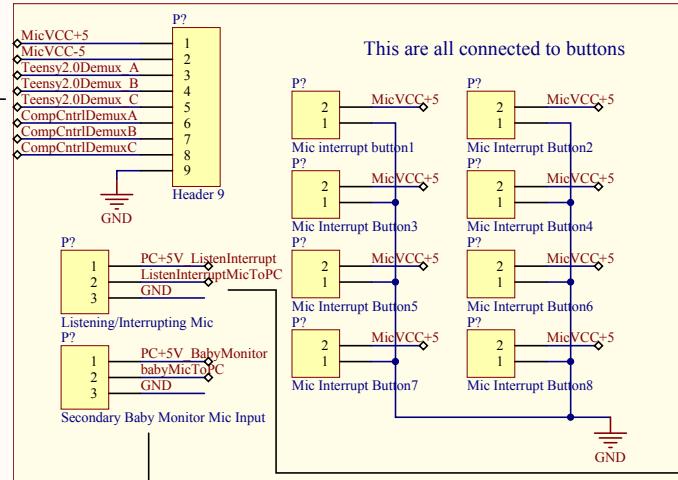
The Epic Cube Diagram 2

Power Supply Board

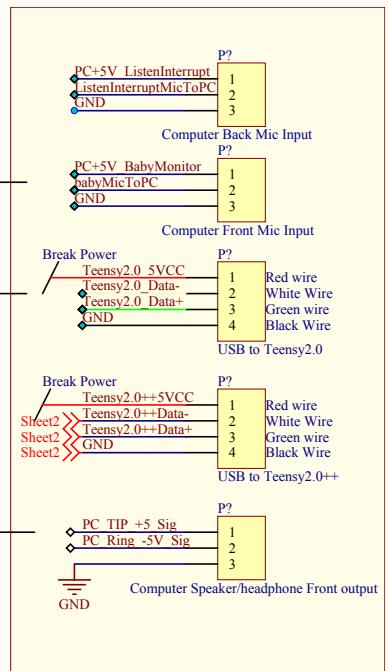
Most of the GND connections will remain unconnected



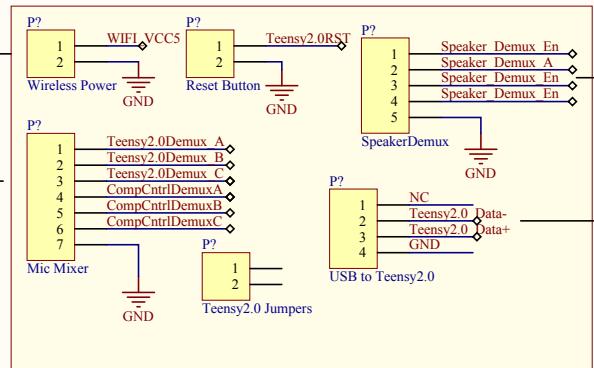
Microphone Mixer



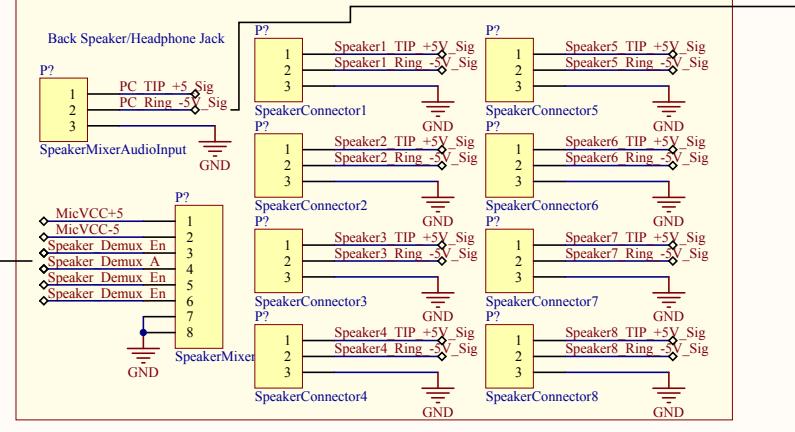
Computer I/O

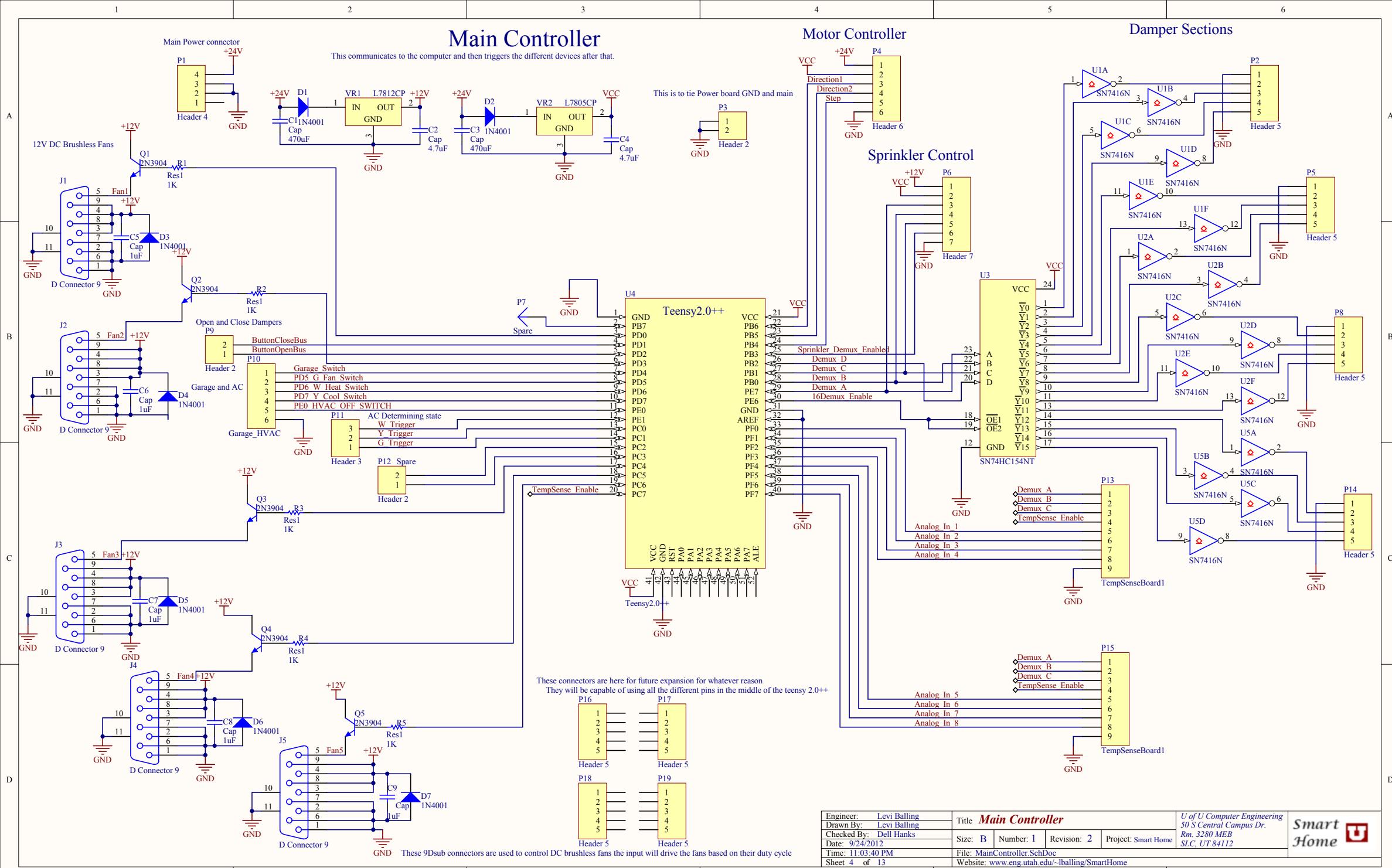


Wireless Communication



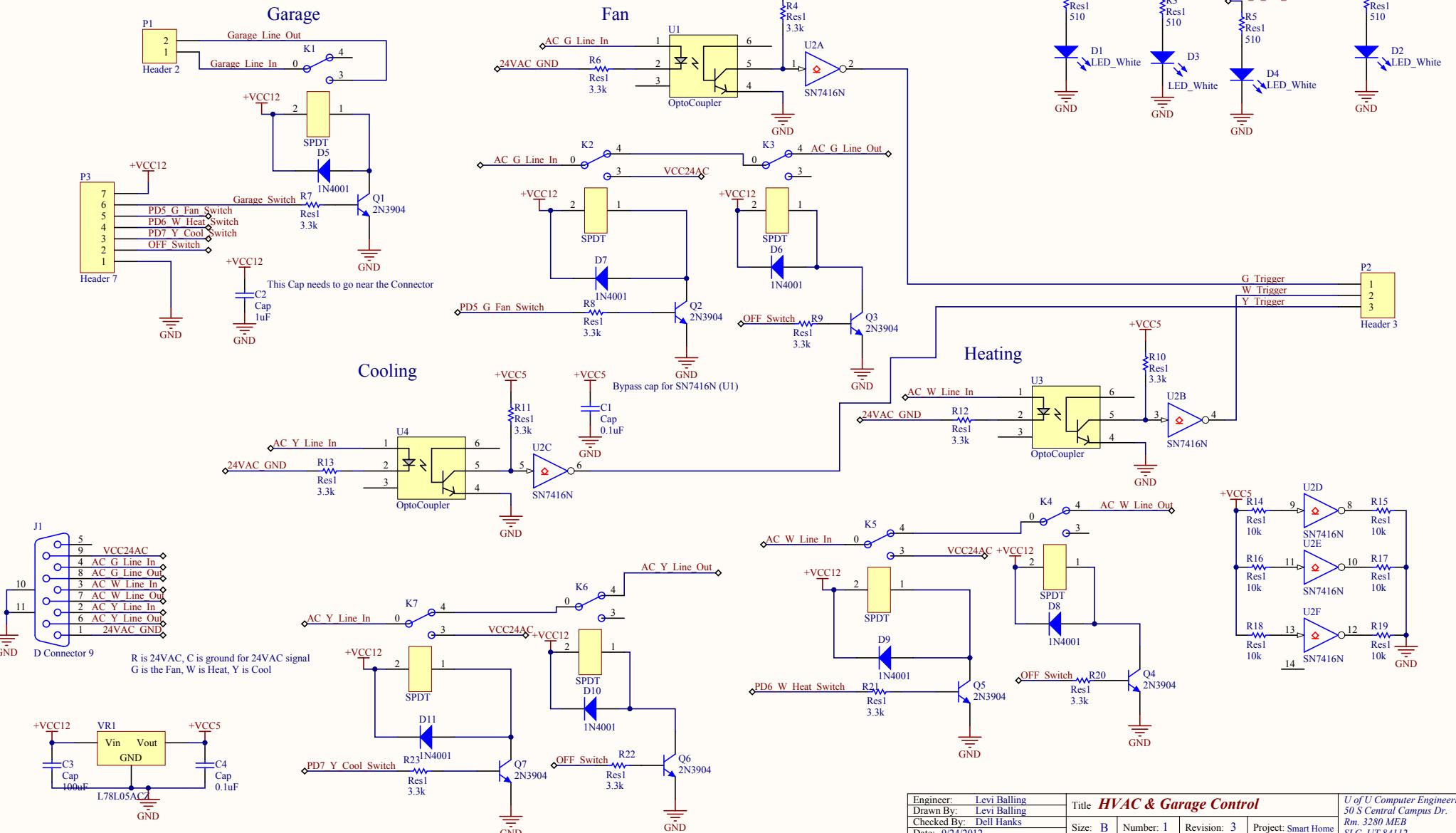
Speaker Mixer(Multiplexer)





A

A/C Heating Interface & Garage Door

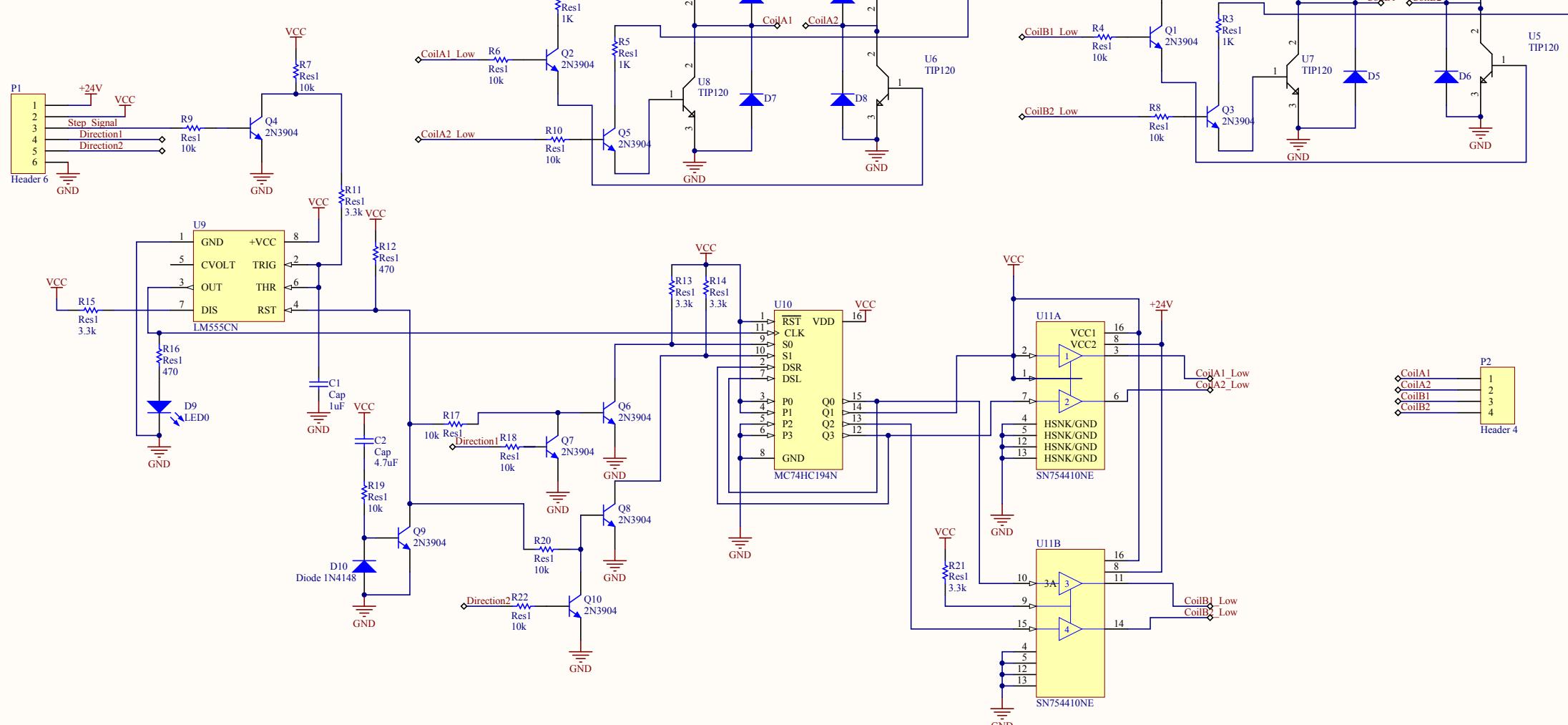


Engineer: Levi Balling	Title HVAC & Garage Control	U of U Computer Engineering
Drawn By: Levi Balling		5 S Central Campus Dr.
Checked By: Dell Hanks		Rm. 3280 MEB
Date: 9/24/2012		SLC, UT 84112
Time: 11:04:18 PM		Project: Smart Home
Sheet 6 of 13	File: HeatingAC_Garage SchDoc	Website: www.eng.utah.edu/~lballing/SmartHome

Bi-Polar Stepper Motor Driver

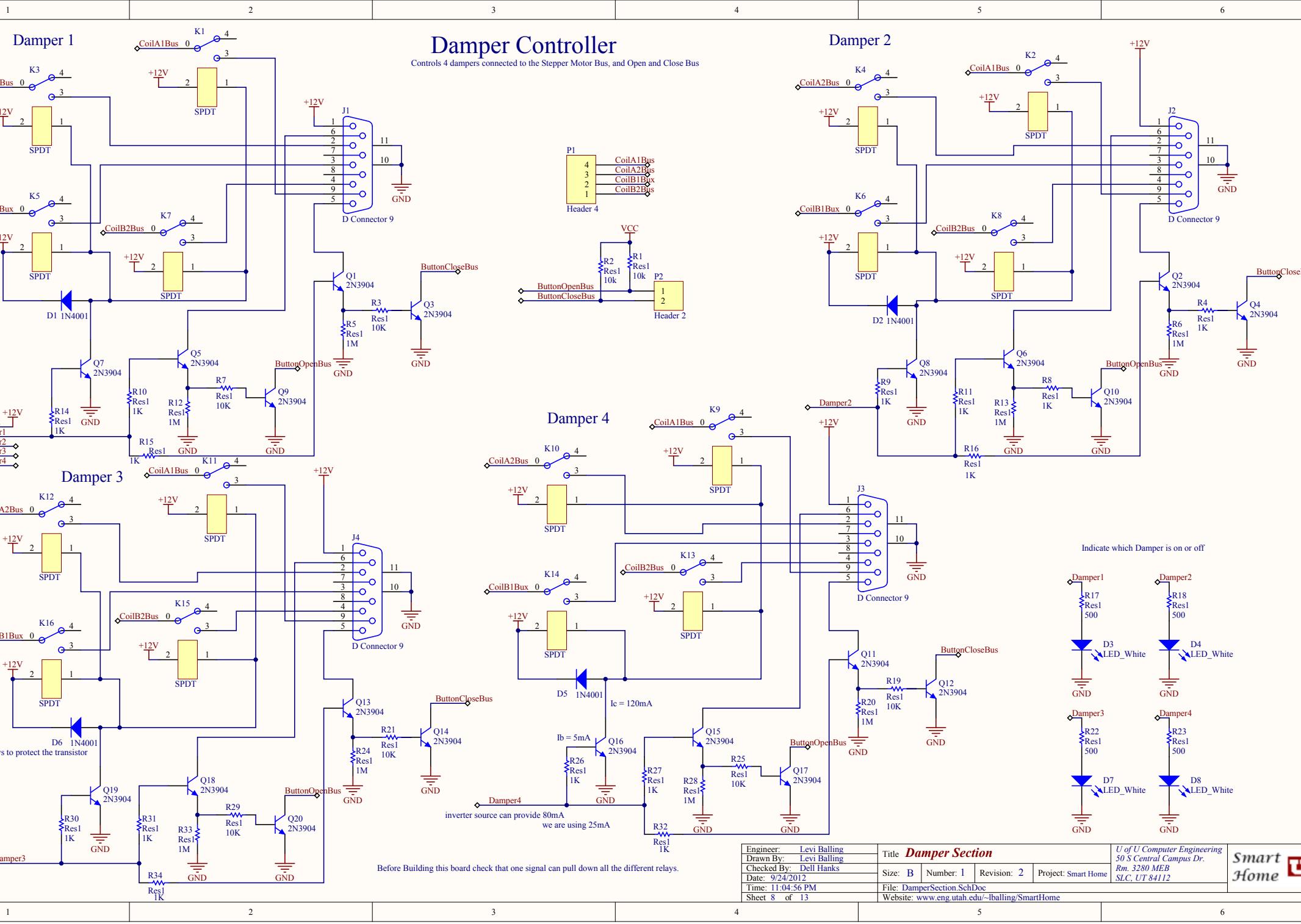
This Board will control the bi-polar stepper motor with a range of 0.5 to 5 amps (provided you put heat sinks on)

When Step is high it moves, and when Direction is High it goes in that direction
Tie other direction to ground to make sure



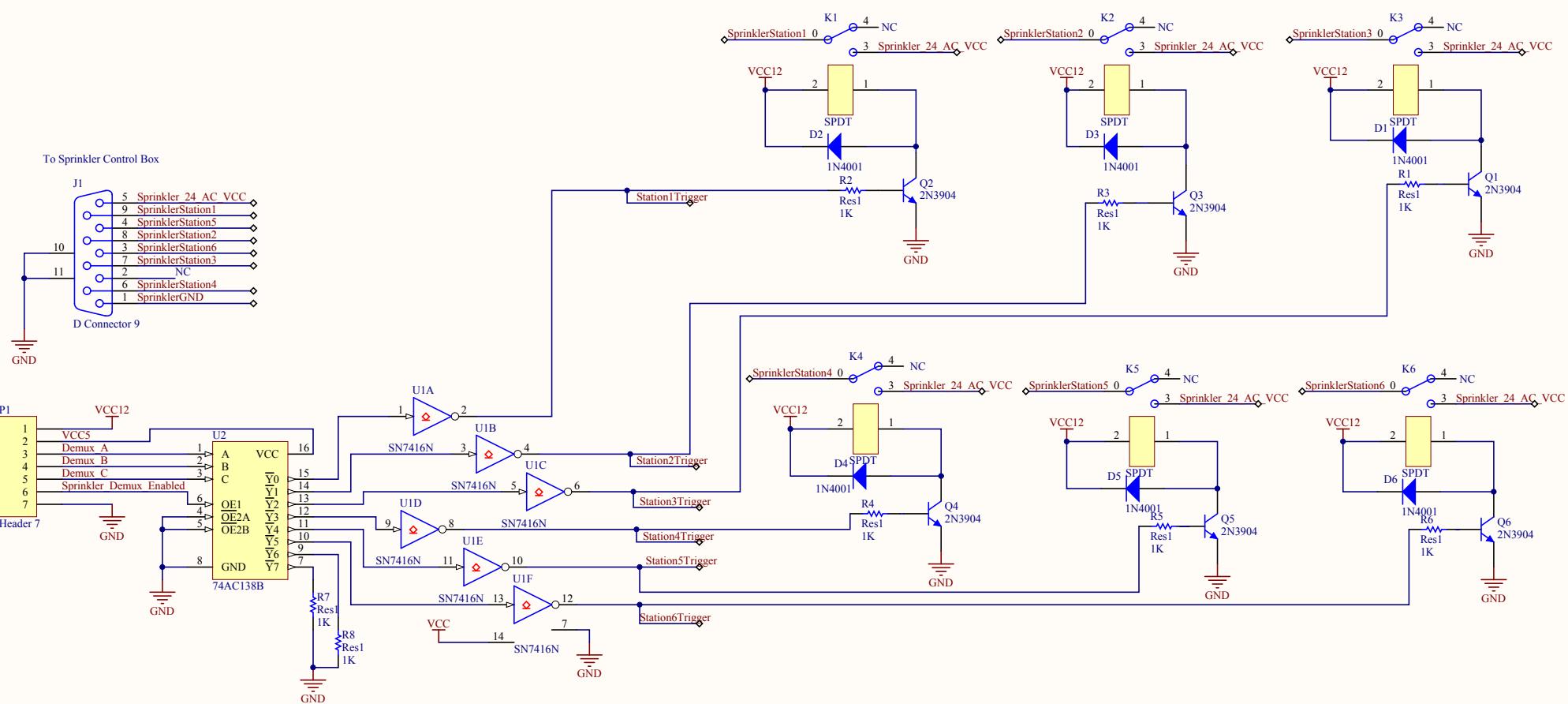
This Motor Controller was outlined heavily from <http://home.cogeco.ca/~rpaisley4/Bipolar.html>

Engineer: R. Paisley, L. Balling	Title: Bi-Polar Stepper Motor Driver	U of U Computer Engineering
Drawn By: Levi Balling		50 S Central Campus Dr.
Checked By: Dell Hanks	Size: B	Rm. 3280 MEB
Date: 9/24/2012	Number: 1	SLC, UT 84112
Time: 11:04:38 PM	Revision: 1	Project: Smart Home
Sheet 7 of 13	File: MotorController.SchDoc	Website: www.eng.utah.edu/~lballing/SmartHome

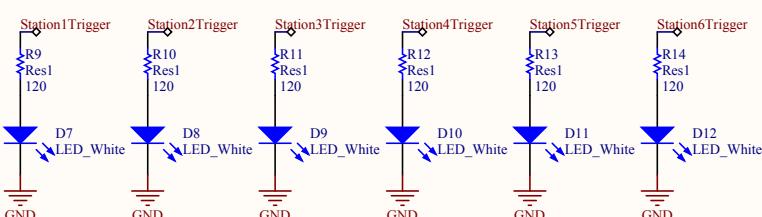


Sprinkler Controller

This board will control 6 Sprinkler Stations



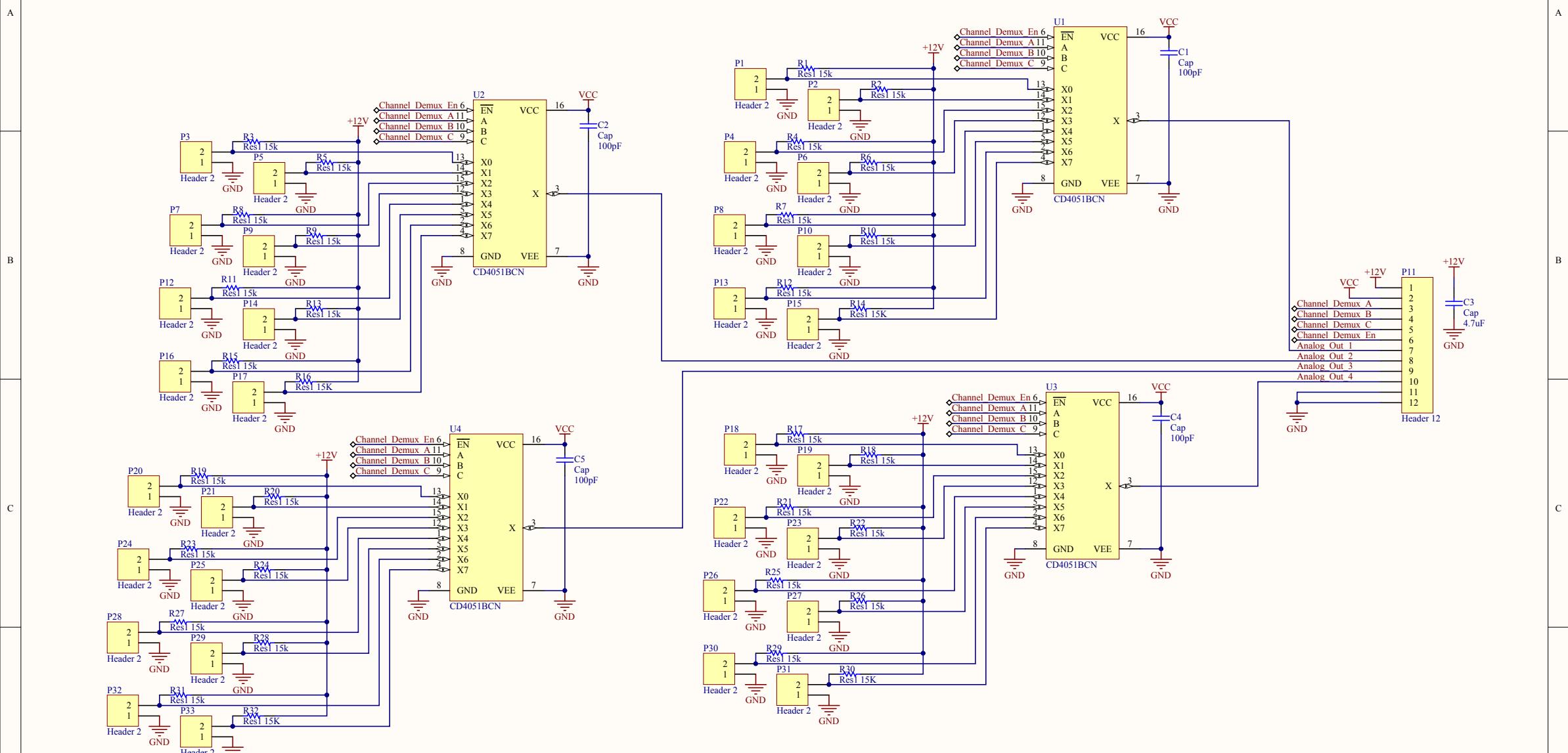
Relay Indication



Engineer:	Levi Balling	Title:	Sprinkler Controller	U of U Computer Engineering
Drawn By:	Levi Balling			50 S. Central Campus Dr.
Checked By:	*			Rm. 3280 MEB
Date:	9/24/2012	Size:	B	Salt Lake City, UT
Time:	11:05:15 PM	Number:	1	Project: Smart Home
Sheet:	9 of 13	Revision:	1	
Website:	www.eng.utah.edu/~lballing/SmartHome			

Temperature Sensor Controller

This board will Take temperature samples from 32 locations
This system uses 10k thermistors that will be measured on the teensy analog input



Engineer: Levi Balling	Title Temperature Sensor Controller	U of U Computer Engineering
Drawn By: Levi Balling		Drawn By: Levi Balling
Checked By: *		Central Campus Dr.
Date: 9/24/2012		Rm. 3280 MEB
Time: 11:05:34 PM		Salt Lake City, UT
Sheet 10 of 13	File: TemperatureSensorBlock.SchDoc	Project: Smart Home
	Website: www.eng.utah.edu/~lballing/SmartHome	

Wireless Communication Controller

This board will control a Mic Mixer system, Speaker Mixer System, and communicate wirelessly to other RF modules

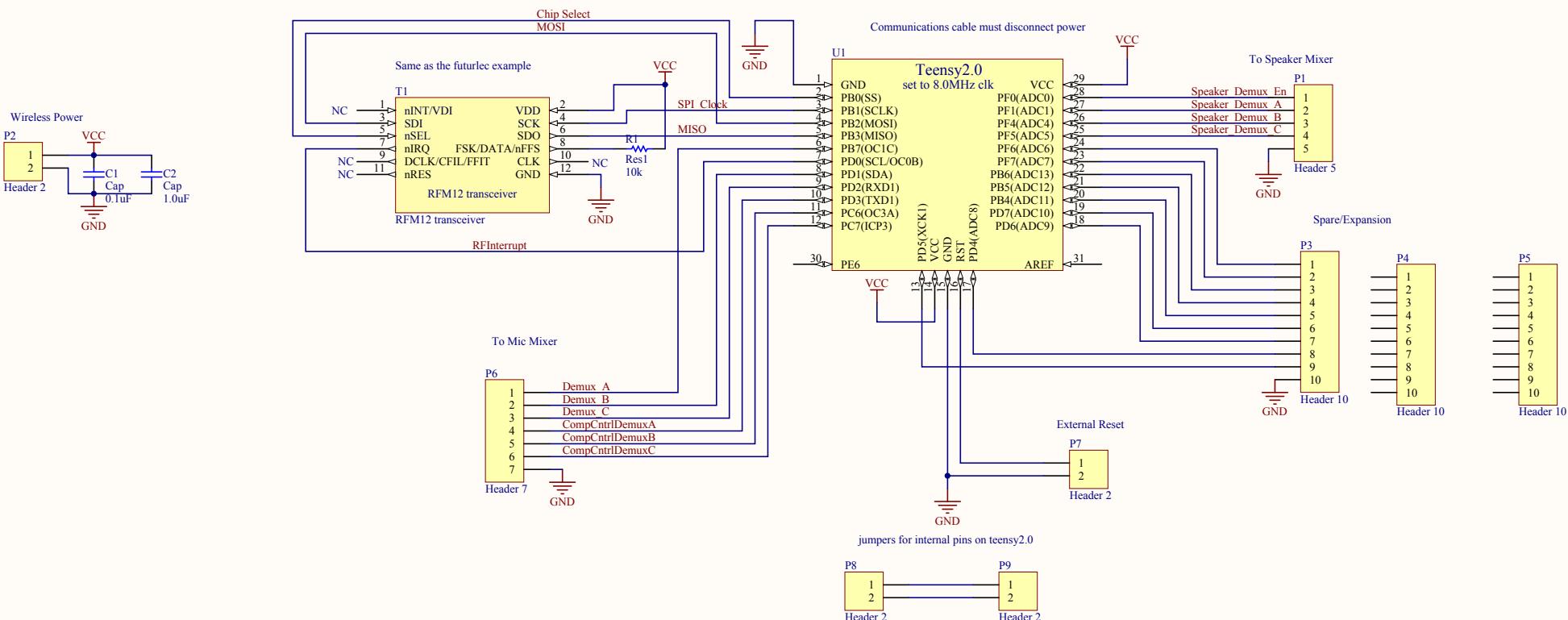
Teensy 2.0 needs to be configured to run at 8MHz, this is the min PLL frequency for the RFM12 chip
Frequencies of the RFM12(using 8Mhz)

315 MHz band, 2.5KHz step
433 MHz band, 2.5KHz step
868 MHz band, 5KHz step
915MHz band, 7.5KHz step

Frequency
248.19MHz
344.19MHz
703.61MHz
720.57MHz

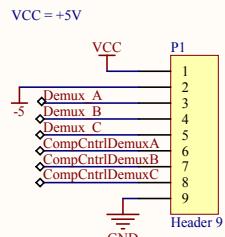
Antenna length(half/quarter)
22.6/11.3
16.31/8.158
7.98/3.99
7.79/3.89

corner to corner of PCB is 8.48 in
a whip antenna will reach 30+M indoors



Engineer: Levi Balling	Title: Wireless Communication Controller	U of U Computer Engineering
Drawn By: Levi Balling		50 S. Central Campus Dr.
Checked By: *		Rm. 3280 MEB
Date: 9/24/2012	Size: B	Revision: 1
Time: 11:05:52 PM	Project: Smart Home	Salt Lake City, UT
Sheet 11 of 13	File: WirelessCommunications.SchDoc	Website: www.eng.utah.edu/~lballing/SmartHome

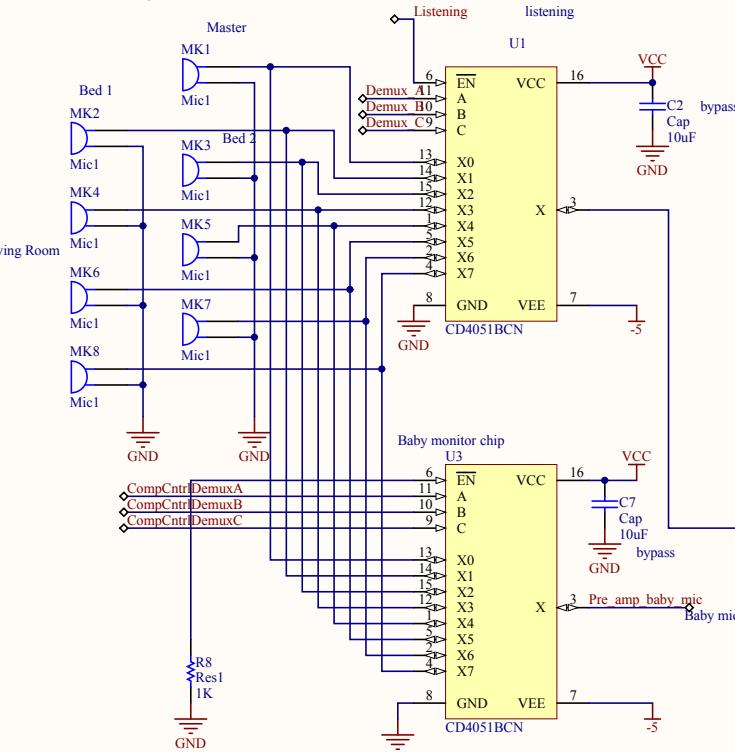
Microphone Mixer



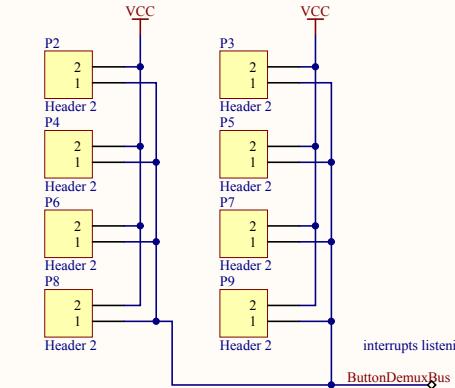
This mic mixer will be controlled using a teensy 2.0

- need to disable all other mics but the one being pressed
- need to be able to port any specific mic to the input of another mic jack

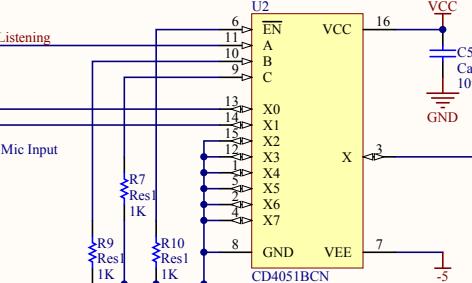
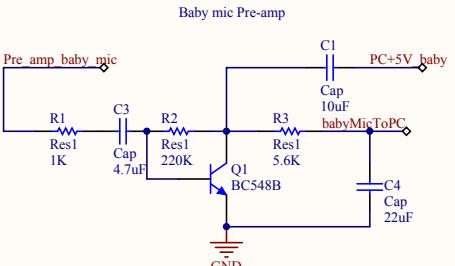
The Pre-amp was used from www.hobby-hour.com



Pull down to gnd, this chip will always be enabled.

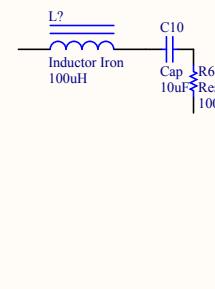
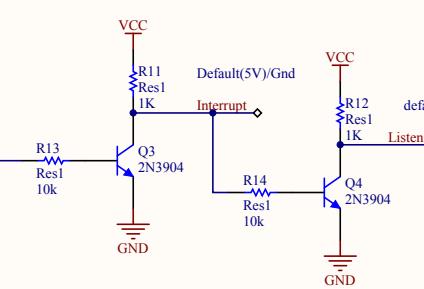
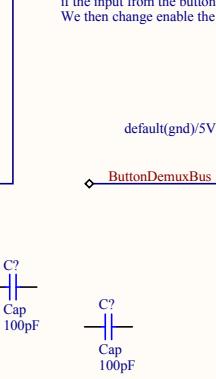
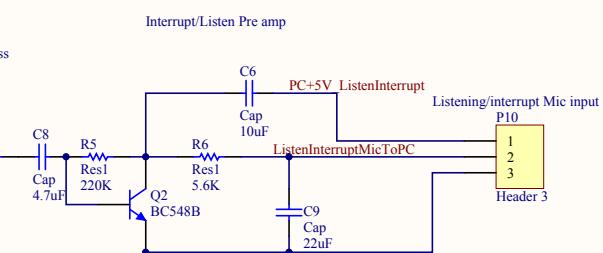


header 2
interrupts listeni
ButtonDemuxBus



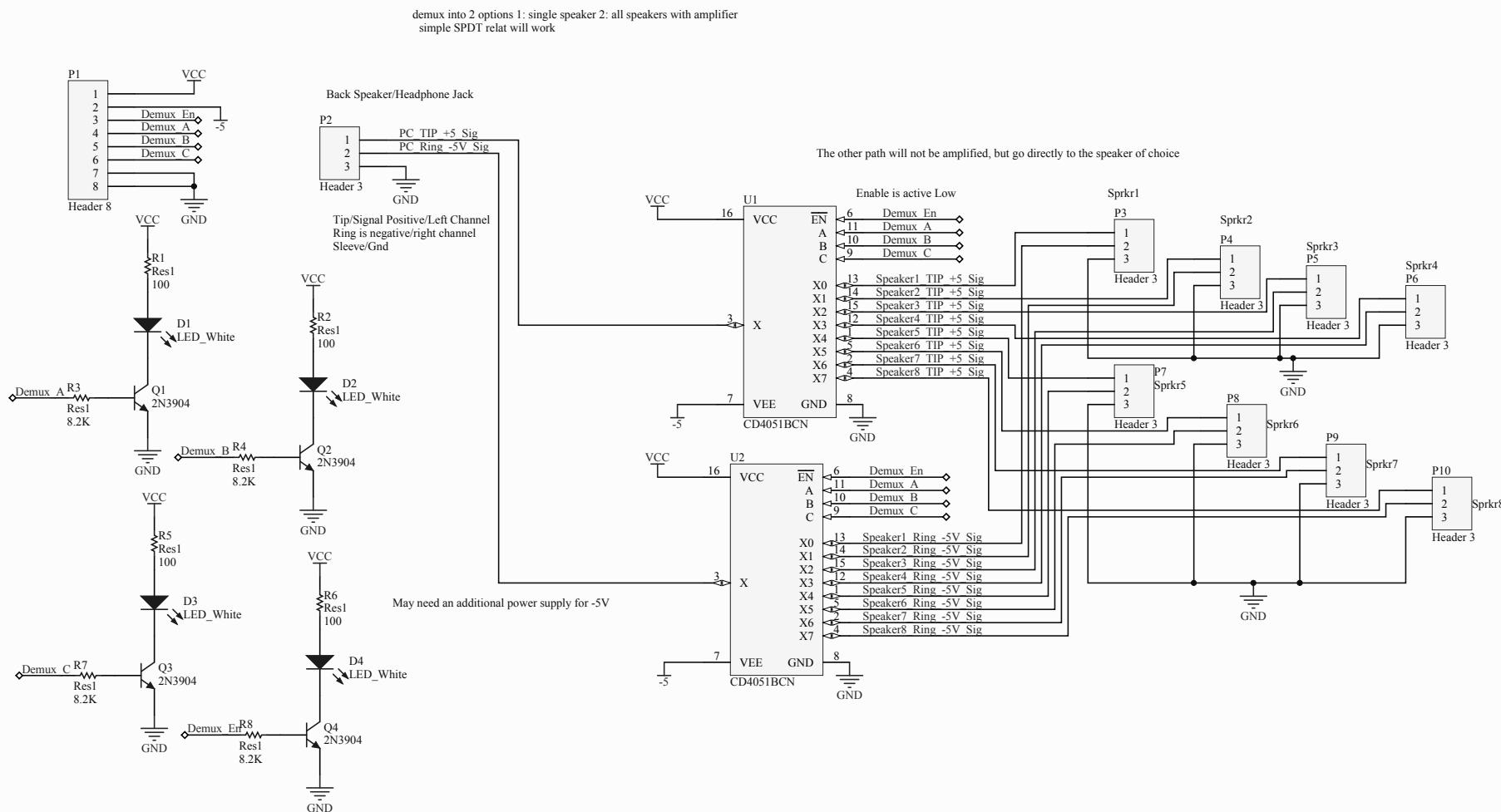
if the input from the button turns high
We then change enable the other demux

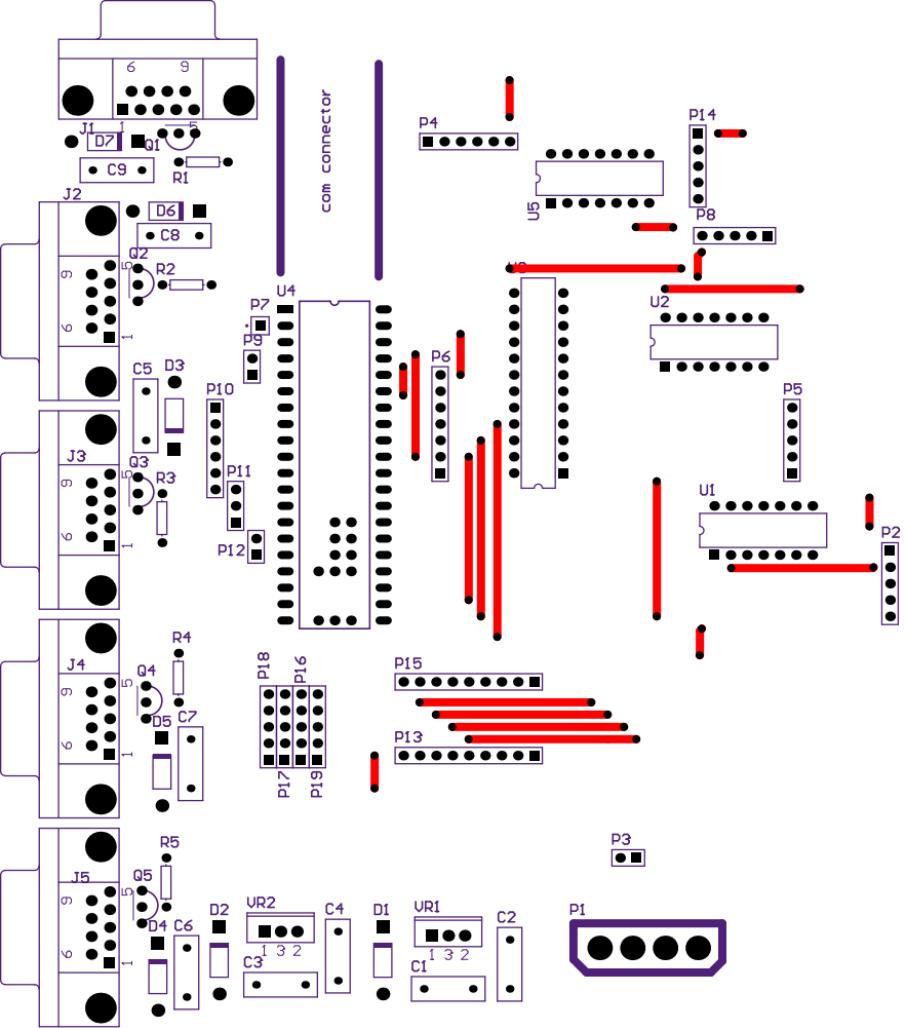
just to make sure that the signal is strong getting to the IC



Speaker Mixer

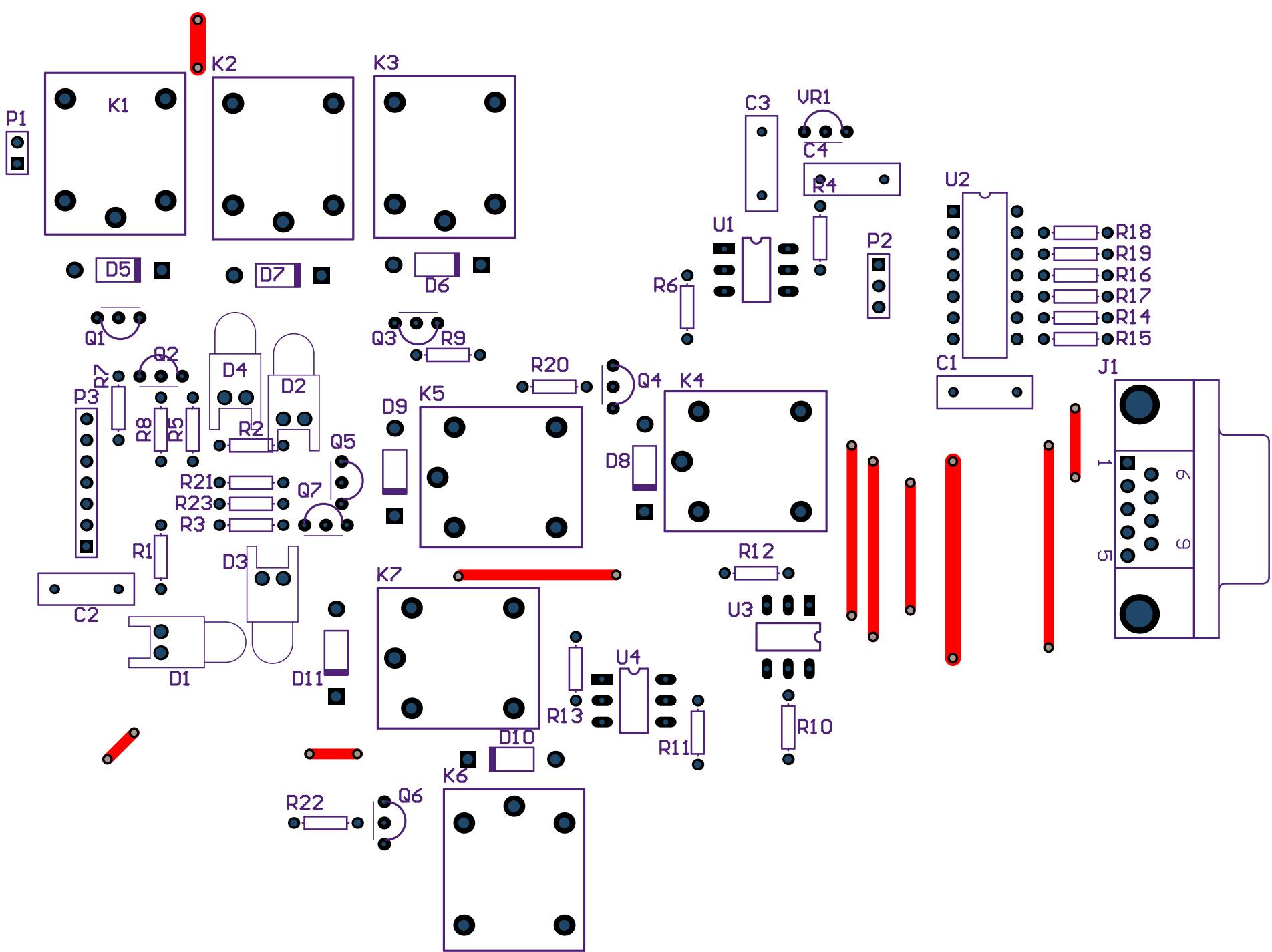
We aren't going to supply specific power to speakers. They will have their own

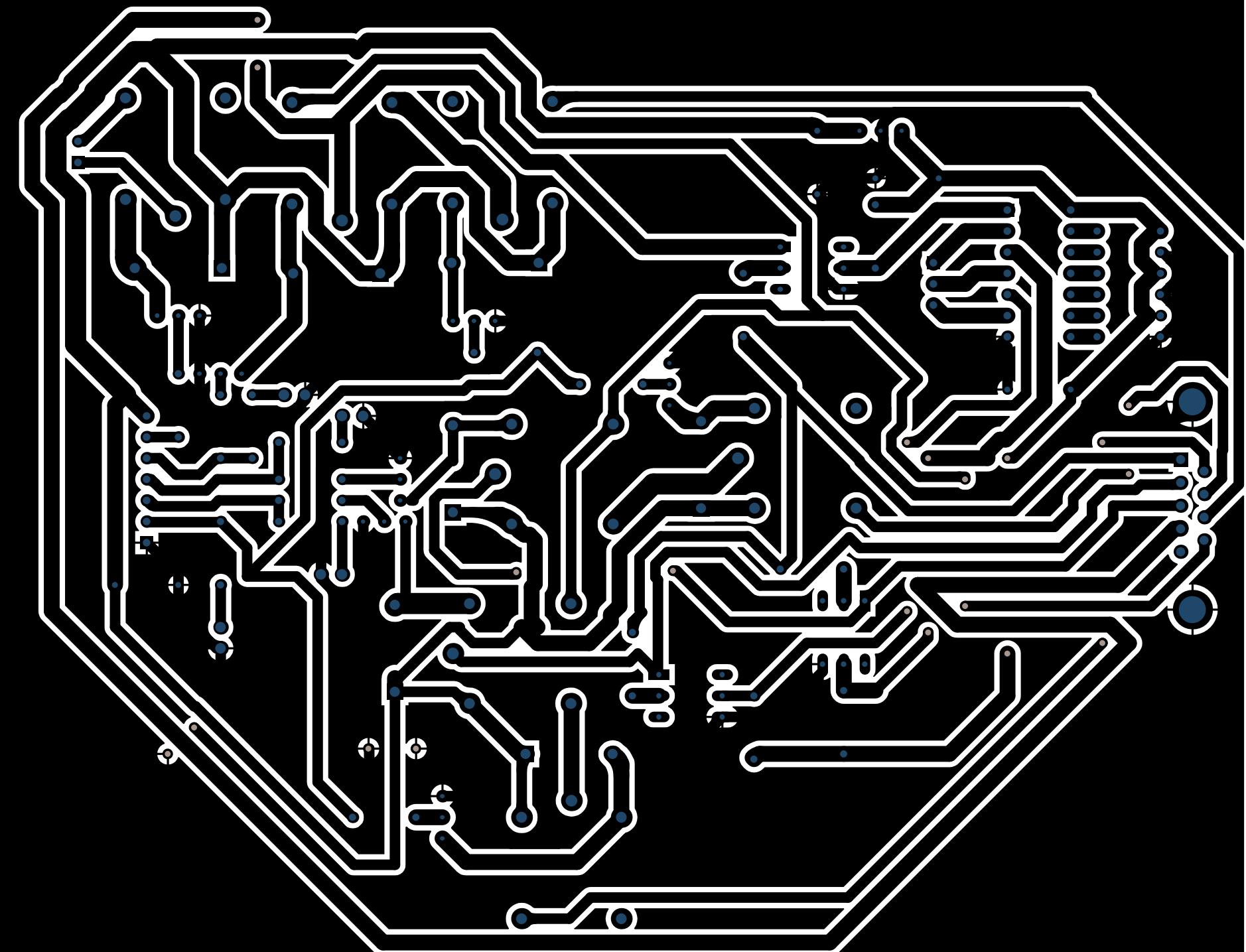




Bill of Materials

Hole	Count	38
Pin	Count	45
Header	Count	1
Resistor	Count	24
Capacitor	Count	10
IC	Count	1
Transistor	Count	1
LED	Count	1
Power Jack	Count	1
Speaker	Count	1
Pushbutton	Count	2
PCB	Count	1





ScalE: 1.00
Date Built: 04/24/2013
Via Count: 20
Hole Count: 210

Created by Team Ballistic
and Jen Ballistic

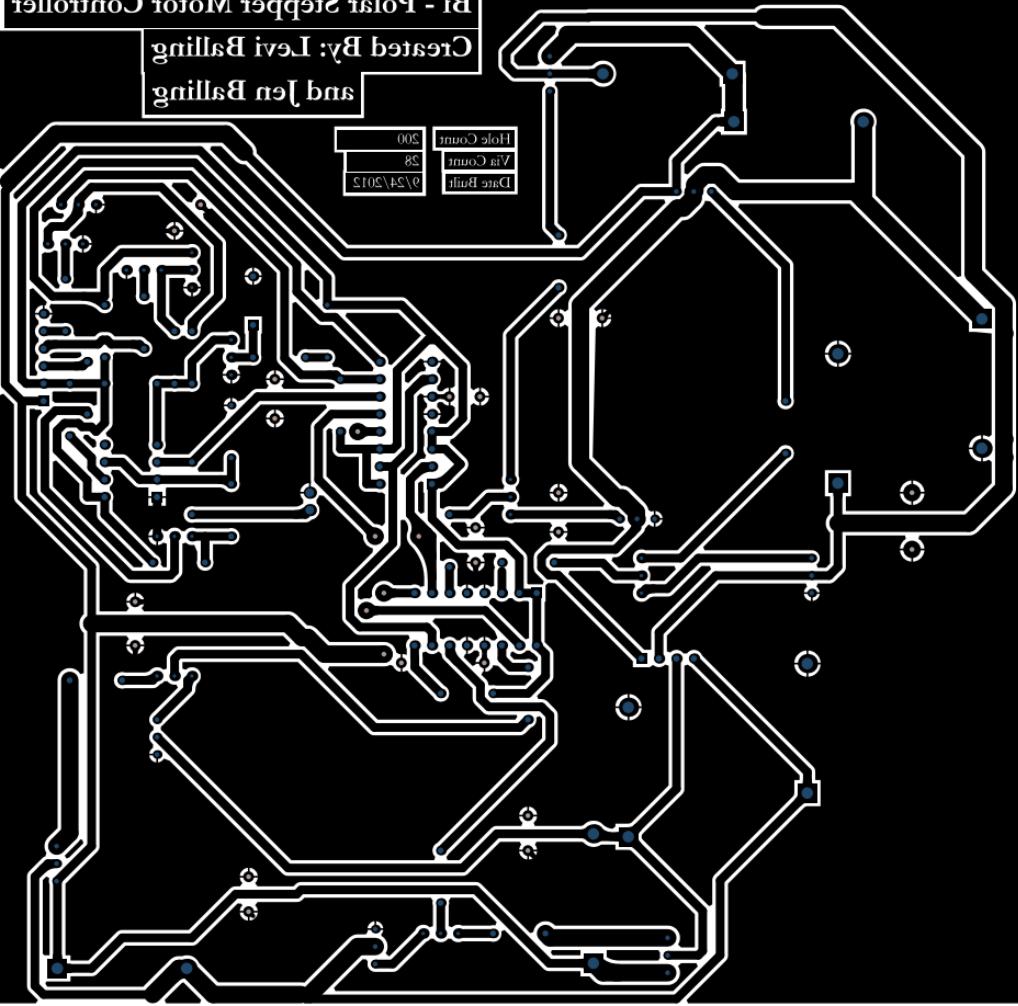
HVAC and Garbage

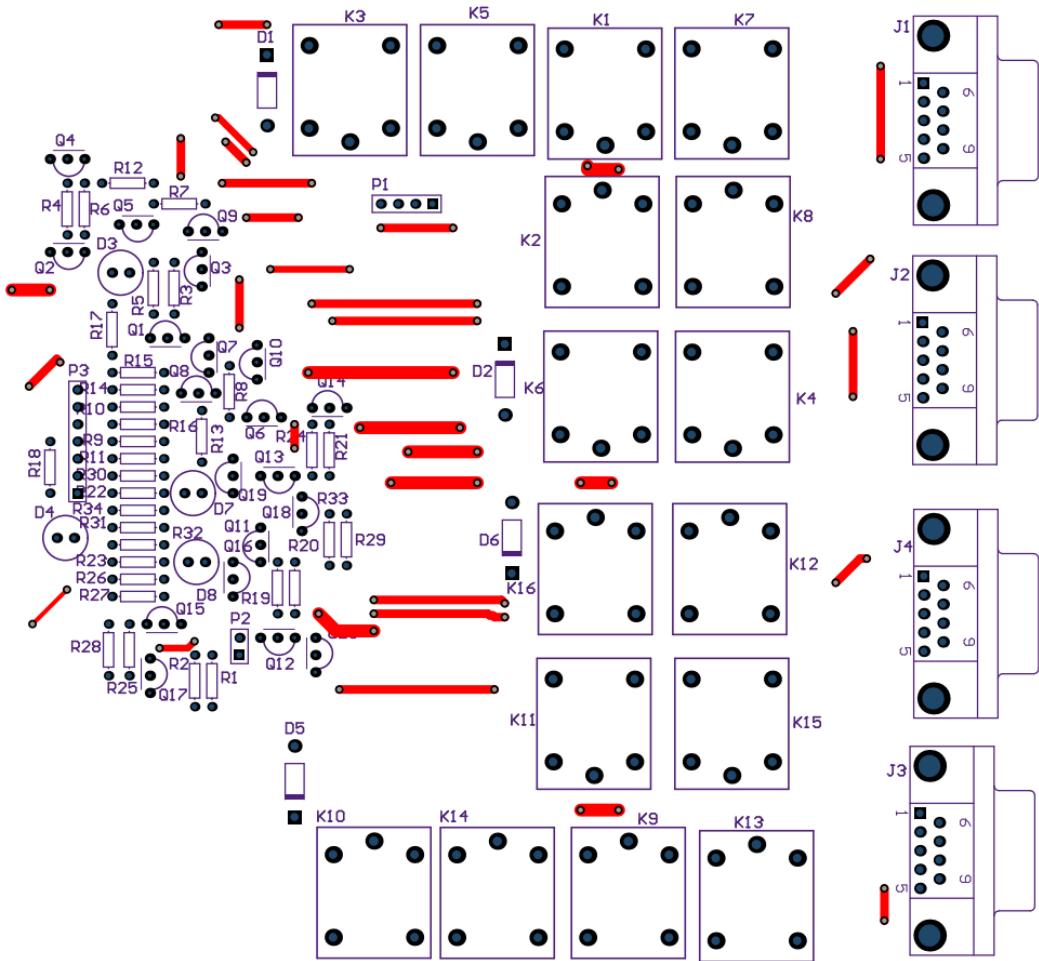


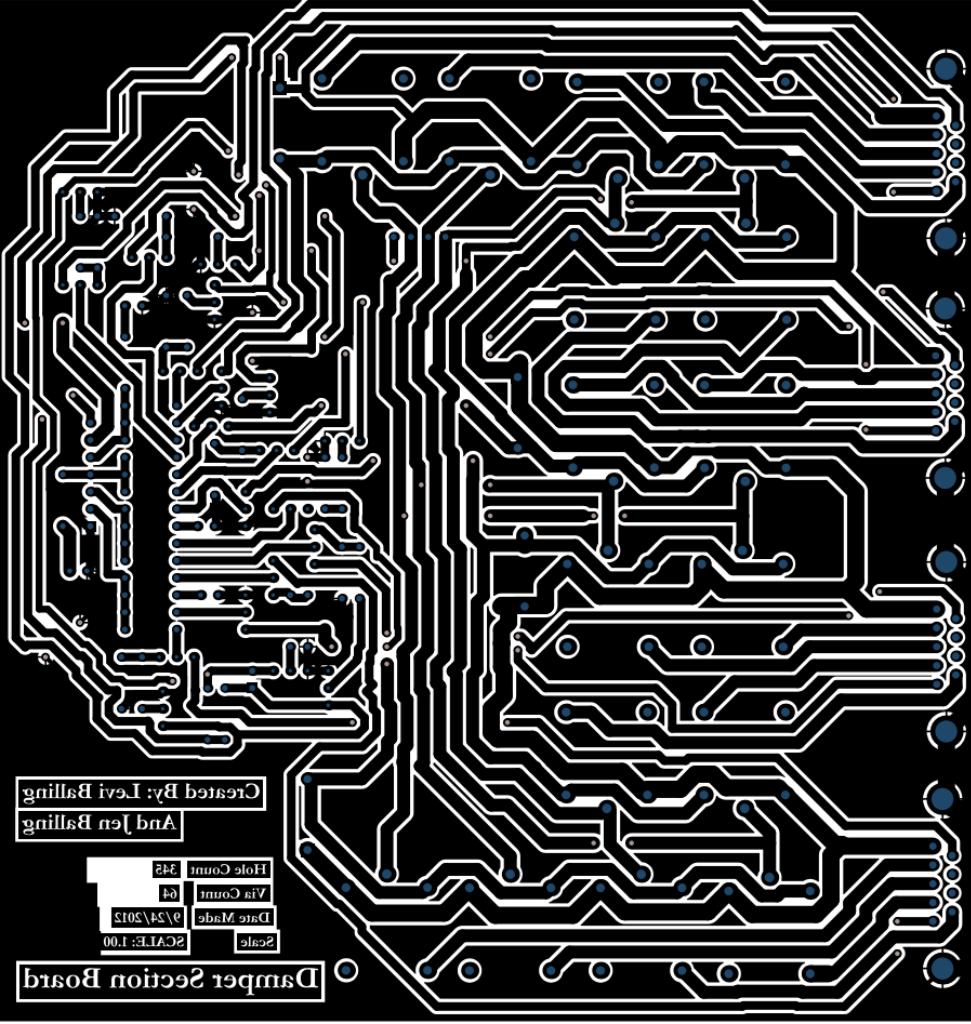
Bi - Polar Stepper Motor Controller

Create Bi: Levi Ballina
stud Jeu Ballina

Hole Count: 500
Via Count: 38
Date Built: 01/24/2015



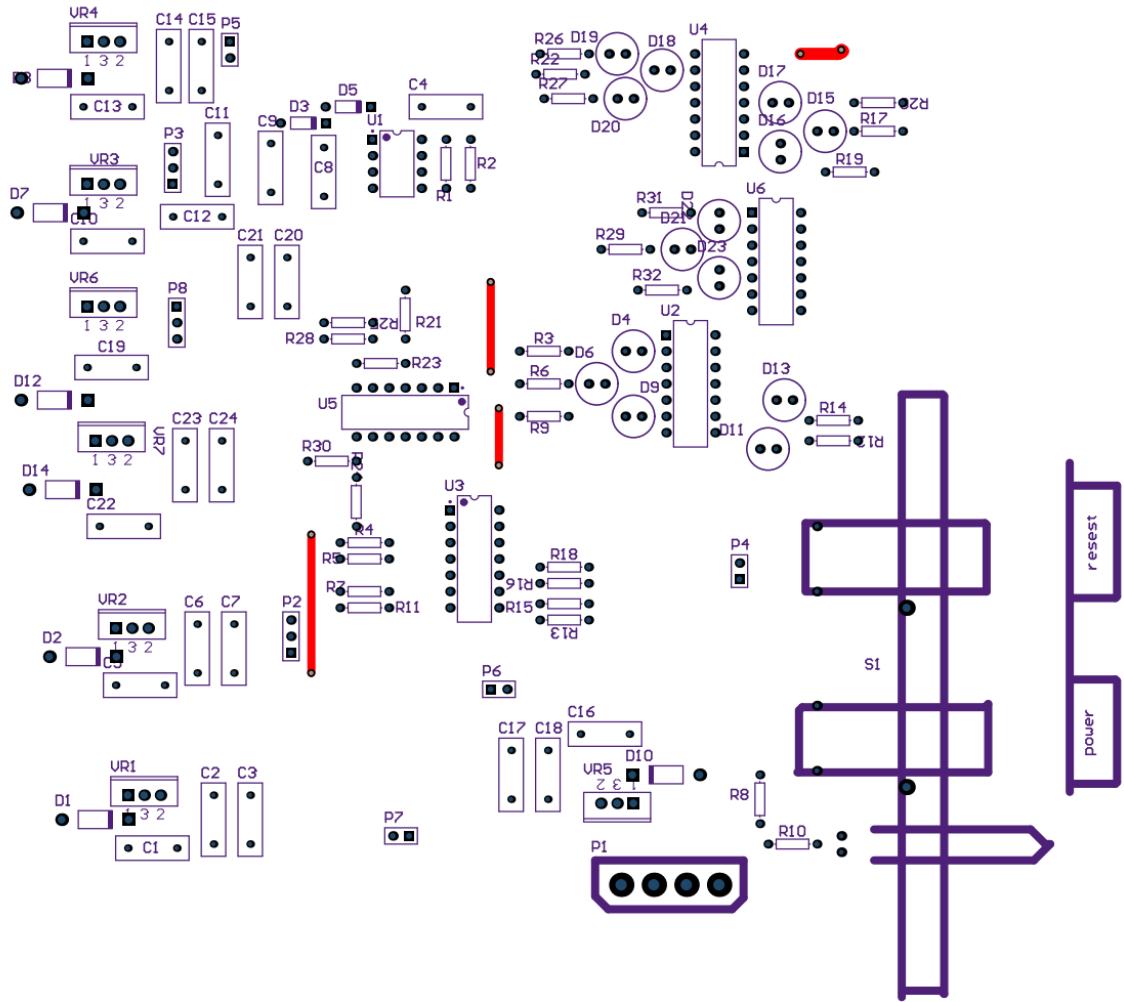




Dumbo Section Board
And Jeu Battling
Create By: Leai Ballina

SCAFFLE: 1.00
a\31\5012
Date: 04/04/2012
Page: 04
Version: 04
Hole Count: 345

Dumbo Section Board



Create by Icarus Billgine

Power Supply Board

Atmosphere

SCALTE: 1:100
Scale Unit: 3\34\3013
Date: 01/01/2013
Air Count: 8
Hole Count: 504

(+)

(-)

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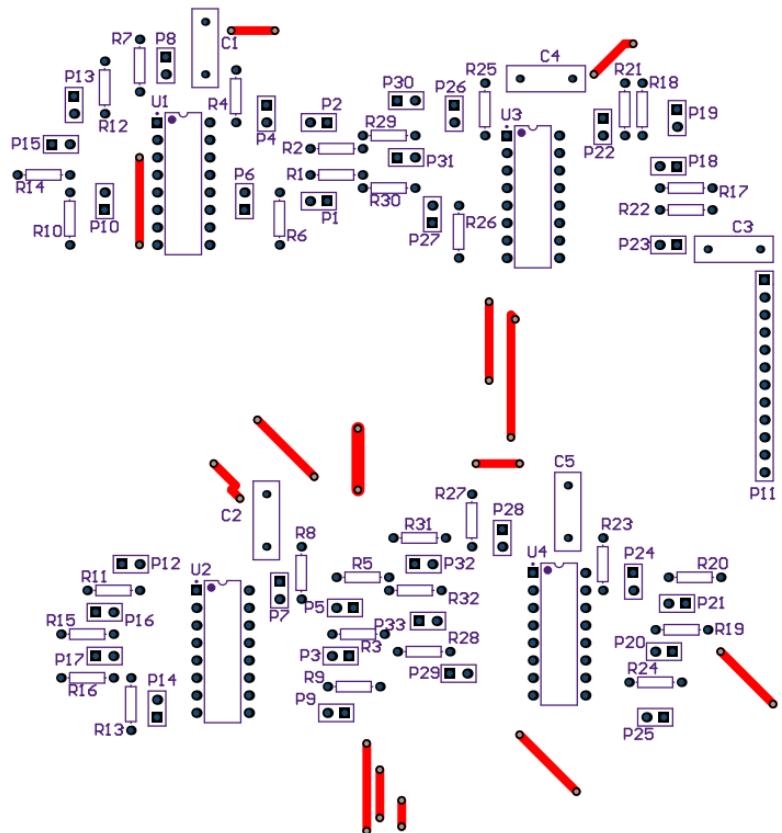
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Temperature Sensor Board

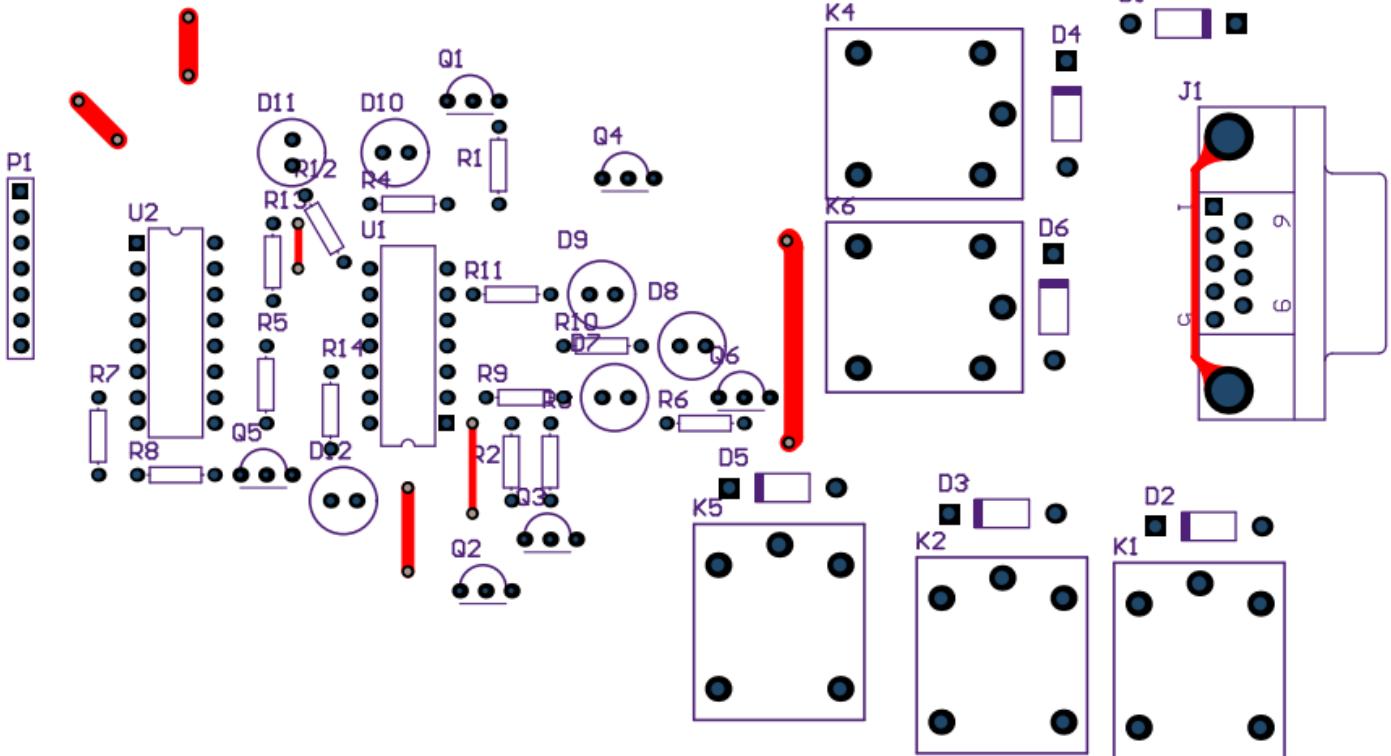
Version 2

Created by Team Bsville

SCALIE: 1.00

Ais Count
Home County

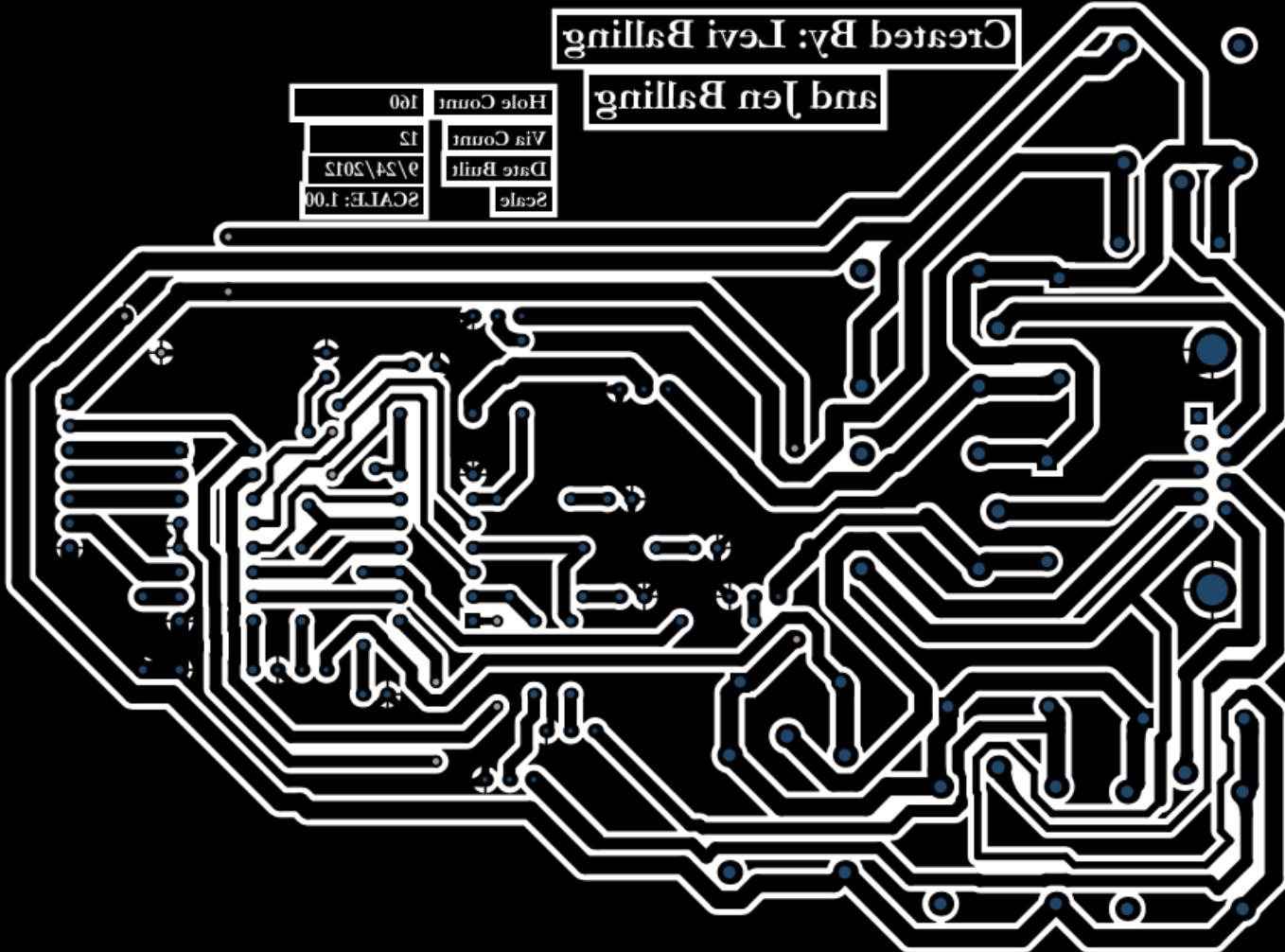
84

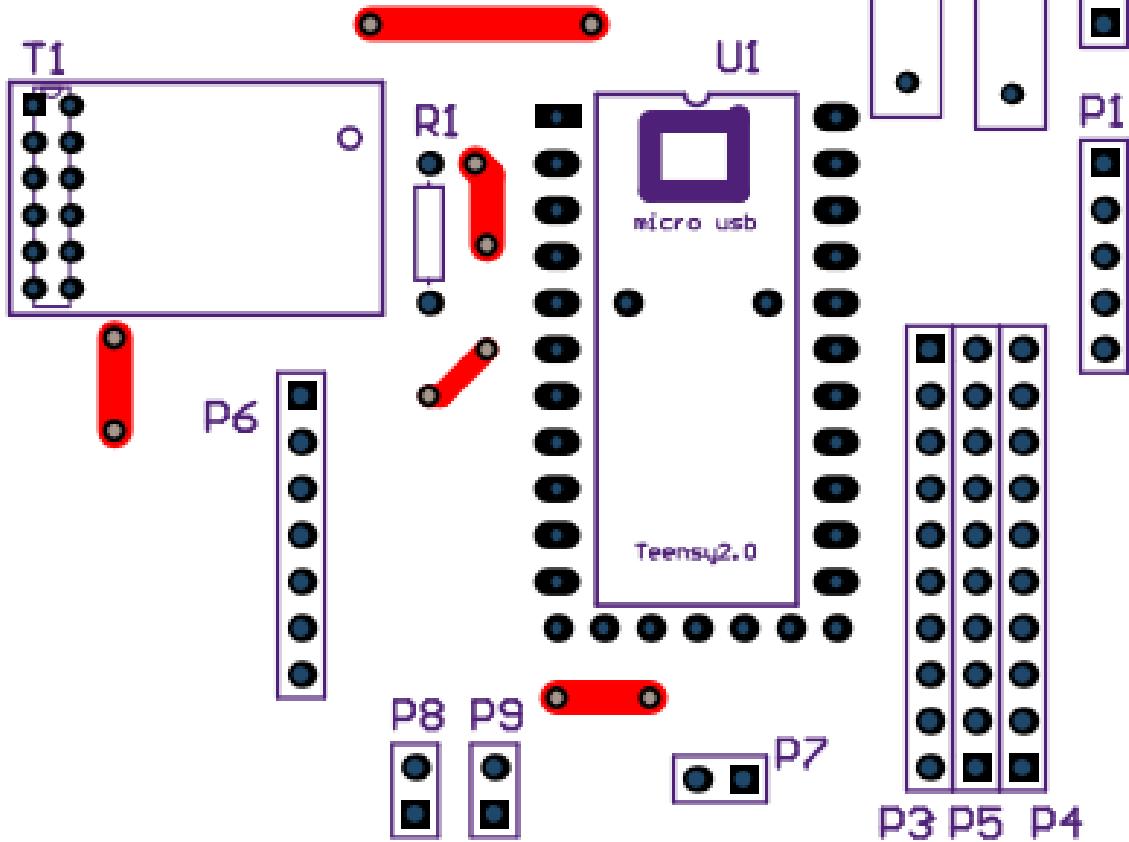


Created By: Leai Ballina

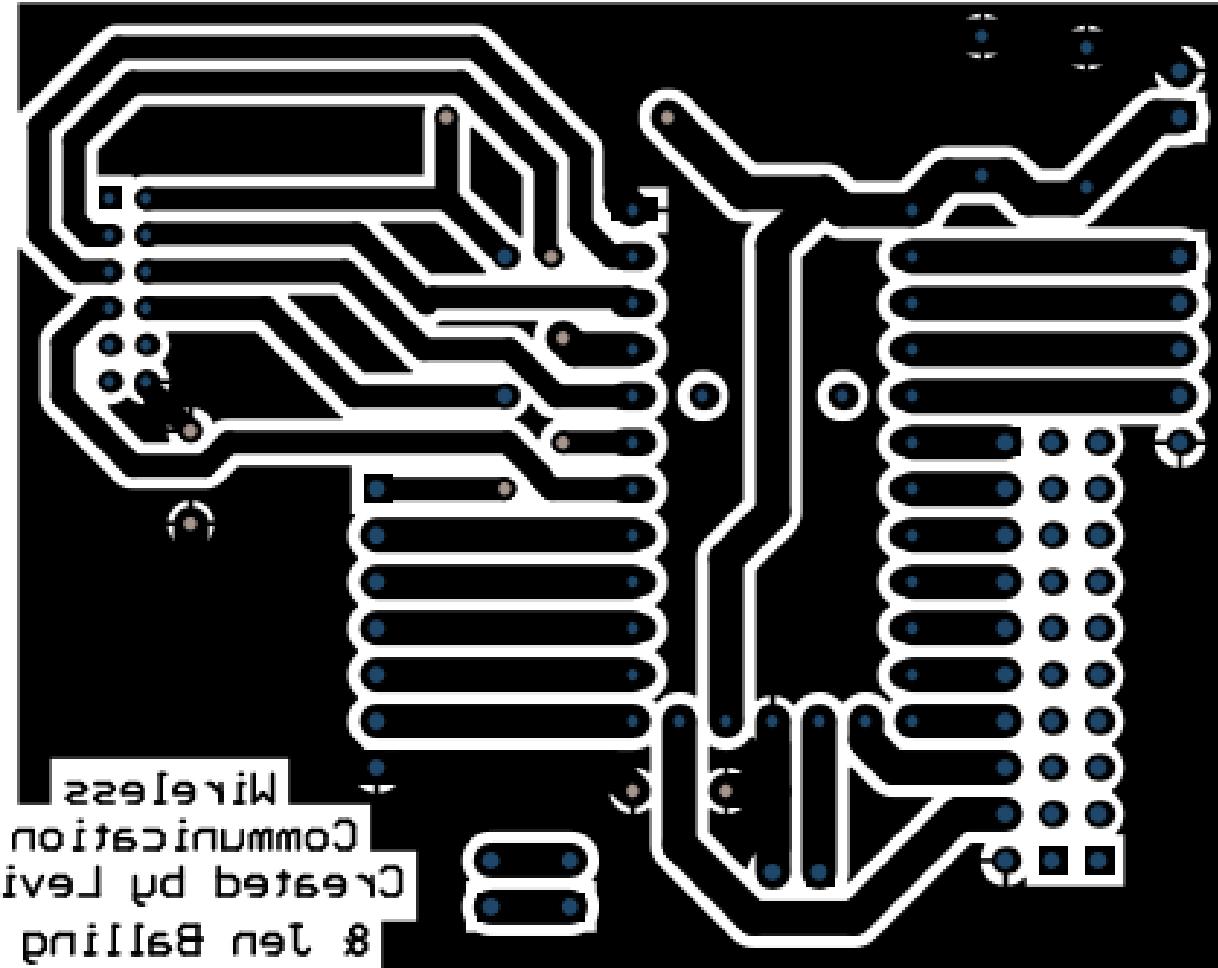
and Leai Ballina

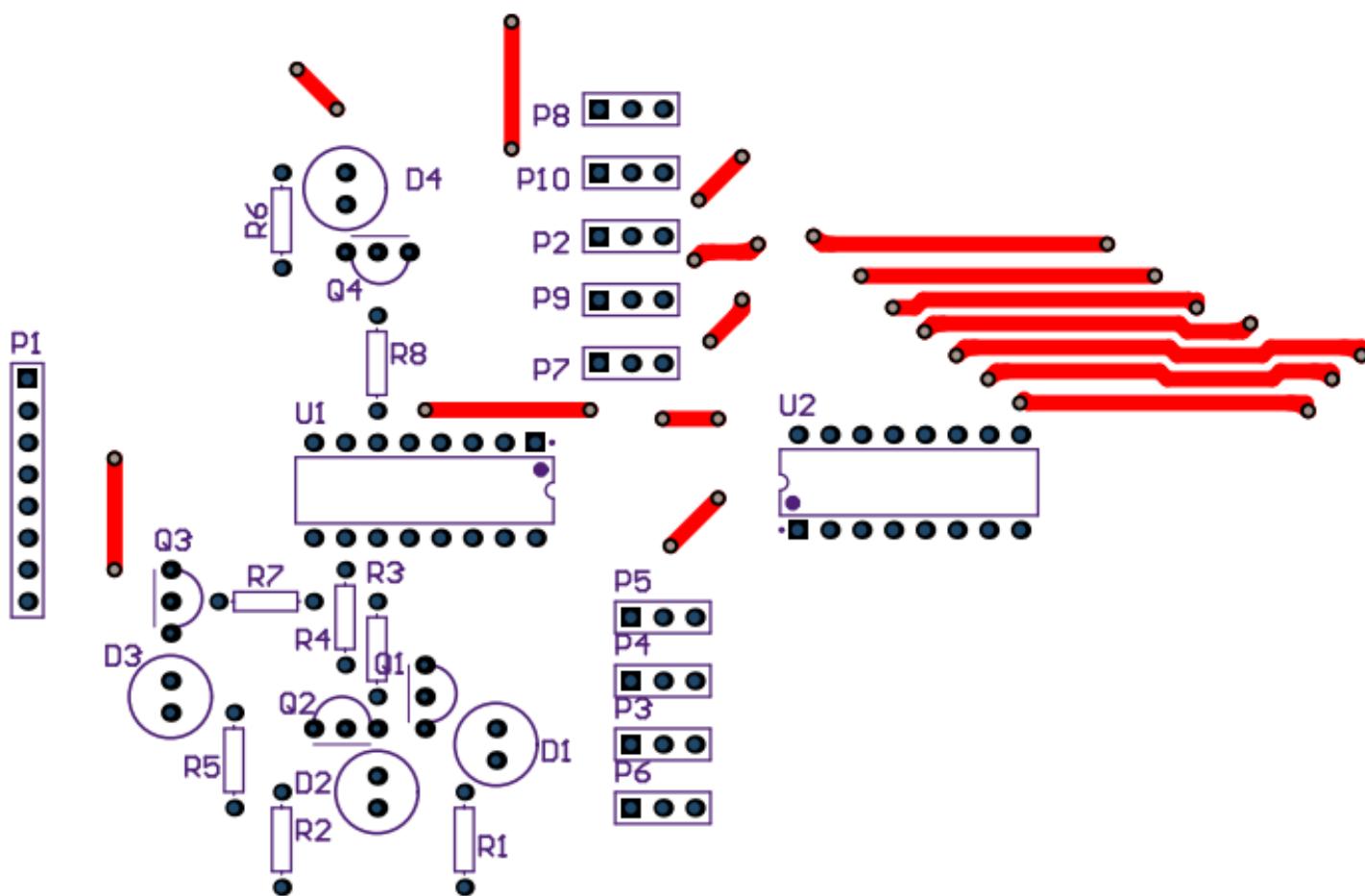
SCITE: J06	SCAGE	Dgate Buffer	AV19 Counter	Avg Counter	Home Counter	J00
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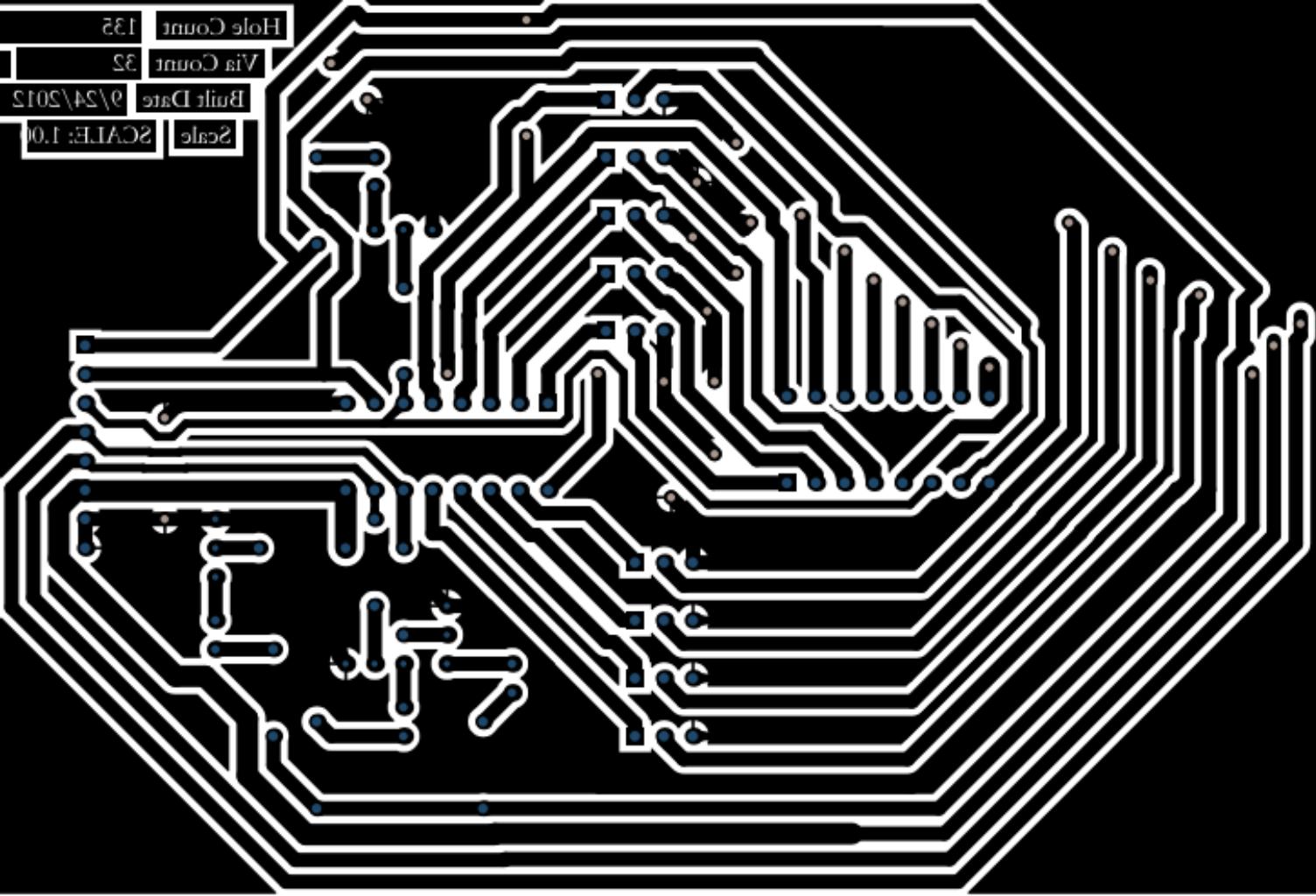
g_jeu_b9j11ud
Created by Leaf
Community cast
Mirrored





Speaker Mixer

Circuit Board Layout
Soldering Guide



Bill of Materials

Main Controller

Source Data From: MainController.SchDoc
 Project: PrintingProjectAllDocs.PpjPCB
 Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:08:35 PM
 Print Date: 24-Sep-12 11:08:49 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
RAD-0.3	Cap	Cap	C1, C2, C3, C4, C5, C6, C7, C8, C9	Capacitor	Taydaelectronics	9	0.03	\$0.27
DO-41	1N4001	1N4001, Diode 1N4001	D1, D2, D3, D4, D5, D6, D7	1.0 Ampere General Purpose Rectifier, 1 Amp General Purpose Rectifier	Taydaelectronics	7	0.01	\$0.07
DSUB1.385-2H9	D Connector 9	D Connector 9	J1, J2, J3, J4, J5	Receptacle Assembly, 9 Position, Right Angle	Taydaelectronics	5	0.48	\$2.40
MainPowerConnector	Header 4	Header 4	P1	Header, 4-Pin	Taydaelectronics	1	0.04	\$0.04
HDR1X5	Header 5	Header 5	P2, P5, P8, P14, P16, P17, P18, P19	Header, 5-Pin	Taydaelectronics	8	0.05	\$0.40
HDR1X2	Header 2	Header 2	P3, P9, P12	Header, 2-Pin	Taydaelectronics	3	0.02	\$0.06
HDR1X6	Header 6	Header 6	P4	Header, 6-Pin	Taydaelectronics	1	0.06	\$0.06
HDR1X7	Header 7	Header 7	P6	Header, 7-Pin	Taydaelectronics	1	0.07	\$0.07
PIN1	Spare	Plug	P7	Plug	Taydaelectronics	1	0.00	\$0.00
HDR1X6	Garage_HVAC	Header 6	P10	Header, 6-Pin	Taydaelectronics	1	0.06	\$0.06
HDR1X3	Header 3	Header 3	P11	Header, 3-Pin	Taydaelectronics	1	0.03	\$0.03
HDR1X9	TempSenseBoard1	Header 9	P13, P15	Header, 9-Pin	Taydaelectronics	2	0.09	\$0.18
2N3904	2N3904	2N3904	Q1, Q2, Q3, Q4, Q5	NPN General Purpose Amplifier	Taydaelectronics	5	0.01	\$0.05
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5	Resistor	Taydaelectronics	5	0.01	\$0.05
N014	SN7416N	SN7416N	U1, U2, U5	Hex Inverter Buffer / Driver with High-Voltage Outputs	Taydaelectronics	3	0.18	\$0.54
NT024D	SN74HC154NT	SN74HC154NT	U3	4-Line to 16-Line Decoder / Demultiplexer	Digi-Key	1	3.70	\$3.70
Teensy2.0++	Teensy2.0++	Teensy2.0++	U4	The teensy 2.0 from www.PJRC.com	Taydaelectronics	1	24.0	\$24.00
ISOWATT220AB	L7812CP	L7805CP	VR1	Positive Voltage Regulator	Taydaelectronics	1	0.24	\$0.24
ISOWATT220AB	L7805CP	L7805CP	VR2	Positive Voltage Regulator	Taydaelectronics	1	0.24	\$0.24
							57	\$32.46

Approved

Notes

Bill of Materials

Power Board BOM For Schematic Document [PowerAndFanBoard.SchDoc]

Source Data From: PowerAndFanBoard.SchDoc
 Project: PrintingProjectAllDocs.PrjPCB
 Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:09:06 PM

Print Date: 24-Sep-12 11:09:14 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
RAD-0.3	Cap	Cap	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24	Capacitor	Taydaelectronics	24	0.03	\$0.72
DO-41	1N4001	Diode 1N4001	D1, D2, D7, D8, D10, D12, D14	1 Amp General Purpose Rectifier	Taydaelectronics	7	0.01	\$0.07
DO-35	Diode 1N4148	Diode 1N4148	D3, D5	High Conductance Fast Diode	Taydaelectronics	2	0.01	\$0.02
LED	RED_LED	LEDO	D4, D9, D13, D15, D18, D20, D21	Typical INFRARED GaAs LED	Taydaelectronics	7	0.04	\$0.28
LED	GREEN_LED	LEDO	D6, D11, D16, D17, D19, D22, D23	Typical INFRARED GaAs LED	Taydaelectronics	7	0.04	\$0.28
MainPowerConnector	Header 4	Header 4	P1	Header, 4-Pin	Taydaelectronics	1	0.04	\$0.04
HDR1X3	Header 3	Header 3	P2, P3, P8	Header, 3-Pin	Taydaelectronics	3	0.03	\$0.09
HDR1X2	Header 2	Header 2	P4, P5, P6, P7	Header, 2-Pin	Taydaelectronics	4	0.02	\$0.08
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32	Resistor	Taydaelectronics	32	0.01	\$0.32
PCBComponent_1	nintendo_power_reset	nintendo_power_reset	S1	Timer	All Electronics	1	1.0	\$1.00
N08E	LM555CN	LM555CN	U1		Taydaelectronics	1	0.14	\$0.14
N014	SN7416N	SN7416N	U2, U4, U6	Hex Inverter Buffer / Driver with High-Voltage Outputs	Taydaelectronics	3	0.18	\$0.54
N14A	LM339N	LM339N	U3, U5	Low Power Low Offset Voltage Quad Comparator	Taydaelectronics	2	0.17	\$0.34
ISOWATT220AB	L7812CP	L7805CP	VR1, VR4, VR6	Positive Voltage Regulator	Taydaelectronics	3	0.24	\$0.72
ISOWATT220AB	L7805CP	L7805CP	VR2, VR3, VR5, VR7	Positive Voltage Regulator	Taydaelectronics	4	0.24	\$0.96
						101		\$5.60

Approved Notes

Bill of Materials

HVAC & Garage Control

Source Data From: HeatingAC_Garage.SchDoc
 Project: PrintingProjectAllDocs.PrjPCB
 Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:09:32 PM
 Print Date: 24-Sep-12 11:09:40 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
RAD-0.3	Cap	Cap	C1, C2, C3, C4	Capacitor	Taydaelectronics	4	0.03	\$0.12
LED-0	LED_White	LED0	D1, D2, D3, D4	Typical INFRARED GaAs LED	Taydaelectronics	4	0.04	\$0.16
DO-41	1N4001	1N4001	D5, D6, D7, D8, D9, D10, D11	1.0 Ampere General Purpose Rectifier	Taydaelectronics	7	0.01	\$0.07
DSUB1.385-2H9	D Connector 9	D Connector 9	J1	Receptacle Assembly, 9 Position, Right Angle	Taydaelectronics	1	0.48	\$0.48
Relay SPDT	SPDT	SPDT	K1, K2, K3, K4, K5, K6, K7		Taydaelectronics	7	0.64	\$4.48
Tayda HDR1X2	Header 2	Header 2	P1	Header, 2-Pin	Taydaelectronics	1	0.02	\$0.02
HDR1X3	Header 3	Header 3	P2	Header, 3-Pin	Taydaelectronics	1	0.03	\$0.03
HDR1X7	Header 7	Header 7	P3	Header, 7-Pin	Taydaelectronics	1	0.07	\$0.07
2N3904	2N3904	2N3904	Q1, Q2, Q3, Q4, Q5, Q6, Q7	NPN General Purpose Amplifier	Taydaelectronics	7	0.01	\$0.07
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23	Resistor	Taydaelectronics	23	0.01	\$0.23
Octocoupler	OptoCoupler	OptoCoupler	U1, U3, U4		Taydaelectronics	3	0.3	\$0.90
N014	SN7416N	SN7416N	U2	Hex Inverter Buffer / Driver with High-Voltage Outputs	Taydaelectronics	1	0.18	\$0.18
2N3904	L78L05ACZ	Volt Reg	VR1	Voltage Regulator		1	#VALUE!	#VALUE!
						61		

Approved Notes

Bill of Materials

Bi-Polar Motor driver BOM For Schematic Document [MotorController.SchDoc]

Source Data From: MotorController.SchDoc
 Project: PrintingProjectAllDocs.PrjPCB
 Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:10:00 PM
 Print Date: 24-Sep-12 11:10:09 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
RAD-0.3	Cap	Cap	C1, C2	Capacitor	Taydaelectronics	2	0.03	\$0.06
DO-201AD	Diode 1N5408	Diode 1N5408	D1, D2, D3, D4, D5, D6, D7, D8	3 Amp Medium Power Silicon Rectifier Diode	Taydaelectronics	8	0.03	\$0.24
LED-0	LED0	LED0	D9	Typical INFRARED GaAs LED	Taydaelectronics	1	0.04	\$0.04
DO-35	Diode 1N4148	Diode 1N4148	D10	High Conductance Fast Diode	Taydaelectronics	1	0.01	\$0.01
HDR1X6	Header 6	Header 6	P1	Header, 6-Pin	Taydaelectronics	1	0.06	\$0.06
HDR1X4	Header 4	Header 4	P2	Header, 4-Pin	Taydaelectronics	1	0.04	\$0.04
2N3904	2N3904	2N3904	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10	NPN General Purpose Amplifier	Taydaelectronics	10	0.01	\$0.10
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22	Resistor	Taydaelectronics	22	0.01	\$0.22
TO-220	TIP126	TIP126	U1, U2, U3, U4	TIP126 -PNP	Taydaelectronics	4	0.35	\$1.40
TO-220	TIP120	TIP120	U5, U6, U7, U8	NPN 60V -5A TO-220	Taydaelectronics	4	0.26	\$1.04
N08E	LM555CN	LM555CN	U9	Timer	Taydaelectronics	1	0.14	\$0.14
648-06	MC74HC194N	MC74HC194N	U10	4-Bit Bidirectional Universal Shift Register	Digi-Key	1	0.68	\$0.68
NE016	SN754410NE	SN754410NE	U11	Quadruple Half-H Driver	U of U	1	0.00	\$0.00
						57		\$4.03

Approved Notes

Bill of Materials

Damper Section

Source Data From: DamperSection.SchDoc
 Project: PrintingProjectAllDocs.PrjPCB
 Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:10:32 PM
 Print Date: 24-Sep-12 11:10:40 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
DO-41	1N4001	1N4001	D1, D2, D5, D6	1.0 Ampere General Purpose Rectifier	Taydaelectronics	4	0.01	\$0.04
LED	LED_White	LED0	D3, D4, D7, D8	Typical INFRARED GaAs LED	Taydaelectronics	4	0.04	\$0.16
DSUB1.385-2H9	D Connector 9	D Connector 9	J1, J2, J3, J4	Receptacle Assembly, 9 Position, Right Angle	Taydaelectronics	4	0.48	\$1.92
Relay Tayda	SPDT	SPDT	K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16		Taydaelectronics	16	0.64	\$10.24
HDR1X4	Header 4	Header 4	P1	Header, 4-Pin	Taydaelectronics	1	0.04	\$0.04
HDR1X2	Header 2	Header 2	P2	Header, 2-Pin	Taydaelectronics	1	0.02	\$0.02
HDR1X7	Header 7	Header 7	P3	Header, 7-Pin	Taydaelectronics	1	0.07	\$0.07
2N3904	2N3904	2N3904	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20	NPN General Purpose Amplifier	Taydaelectronics	20	0.01	\$0.20
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34	Resistor	Taydaelectronics	34	0.01	\$0.34
						85		\$13.03

Approved

Notes

Bill of Materials

Sprinkler Control BOM For Schematic Document [SprinklerBoard.SchDoc]

Source Data From: SprinklerBoard.SchDoc
 Project: PrintingProjectAllDocs.PrjPCB
 Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:11:05 PM
 Print Date: 24-Sep-12 11:11:14 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
DO-41	1N4001	1N4001	D1, D2, D3, D4, D5, D6	1.0 Ampere General Purpose Rectifier	Taydaelectronics	6	0.01	\$0.06
LED	LED_White	LED0	D7, D8, D9, D10, D11, D12	Typical INFRARED GaAs LED	Taydaelectronics	6	0.04	\$0.24
DSUB1.385-2H9	D Connector 9	D Connector 9	J1	Receptacle Assembly, 9 Position, Right Angle	Taydaelectronics	1	0.48	\$0.48
Relay SPDT	SPDT	SPDT	K1, K2, K3, K4, K5, K6		Taydaelectronics	6	0.64	\$3.84
Tayda HDR1X7	Header 7	Header 7	P1	Header, 7-Pin	Taydaelectronics	1	0.07	\$0.07
2N3904	2N3904	2N3904	Q1, Q2, Q3, Q4, Q5, Q6	NPN General Purpose Amplifier	Taydaelectronics	6	0.01	\$0.06
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14	Resistor	Taydaelectronics	14	0.01	\$0.14
N014	SN7416N	SN7416N	U1	Hex Inverter Buffer / Driver with High-Voltage Outputs	Taydaelectronics	1	0.18	\$0.18
DIP16	74AC138B	74AC138B	U2	3-to-8 Line Decoder Inverting	Taydaelectronics	1	0.25	\$0.25
						42		\$5.32

Approved	Notes

Bill of Materials

Temperature Sensor Control BOM For Schematic Document [TemperatureSensorB1c]

Source Data From: TemperatureSensorBlock.SchDoc
 Project: PrintingProjectAllDocs.PrjPCB
 Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:11:43 PM

Print Date: 24-Sep-12 11:11:50 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
RAD-0.3	Cap	Cap	C1, C2, C3, C4, C5	Capacitor	Taydaelectronics	5	0.03	\$0.15
HDR1X2	Header 2	Header 2	P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P12, P13, P14, P15, P16, P17, P18, P19, P20, P21, P22, P23, P24, P25, P26, P27, P28, P29, P30, P31, P32, P33	Header, 2-Pin	Taydaelectronics	32	0.02	\$0.64
HDR1X12	Header 12	Header 12	P11	Header, 12-Pin	Taydaelectronics	1	0.12	\$0.12
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32	Resistor	Taydaelectronics	32	0.01	\$0.32
N16E	CD4051BCN	CD4051BCN	U1, U2, U3, U4	8-Channel Analog Multiplexer/Demultiplexer	Taydaelectronics	4	0.23	\$0.92
						74		\$2.15

Approved Notes

Bill of Materials

Wireless Communication Controller BOM For Schematic Document [WirelessComm]

Source Data From:

WirelessCommunications.SchDoc

Project:

PrintingProjectAllDocs.PrjPCB

Organization:

U of U Computer Engineering

Creation Date: 9/24/2012 11:12:20 PM

Print Date: 24-Sep-12 11:12:29 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
RAD-0.3	Cap	Cap	C1, C2	Capacitor	Taydaelectronics	2	0.03	\$0.06
HDR1X5	Header 5	Header 5	P1	Header, 5-Pin	Taydaelectronics	1	0.05	\$0.05
HDR1X2	Header 2	Header 2	P2, P7, P8, P9	Header, 2-Pin	Taydaelectronics	4	0.02	\$0.08
HDR1X10	Header 10	Header 10	P3, P4, P5	Header, 10-Pin	Taydaelectronics	3	0.10	\$0.30
HDR1X7	Header 7	Header 7	P6	Header, 7-Pin	Taydaelectronics	1	0.07	\$0.07
AXIAL-0.3	Res1	Res1	R1	Resistor	Taydaelectronics	1	0.01	\$0.01
RFM12-transceiver	RFM12 transceiver	RFM12	T1	www.futurlec.com 433 MHZ transceiver	futurlec	1	7.90	\$7.90
Teensy2.0	Teensy	Teensy2.0	U1	The teensy 2.0 from www.PJRC.com, chang clock to 8MHz	PJRC	1	16.00	\$16.00
						14		\$24.47

Approved

Notes

Bill of Materials

Microphone Mixer

Source Data From: MicMixer.SchDoc
 Project: PrintingProjectAllDocs.PrjPCB
 Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:13:02 PM
 Print Date: 24-Sep-12 11:13:12 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
RAD-0.3	Cap	Cap	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C?	Capacitor	Taydaelectronics	13	0.03	\$0.39
AXIAL-0.9 PIN2	Inductor Iron Mic1	Inductor Iron Mic1	L?	Magnetic-Core Inductor		1		#VALUE!
			MK1, MK2, MK3, MK4, MK5, MK6, MK7, MK8, MK9, MK10, MK11, MK12, MK13, MK14, MK15, MK16	Microphone	Taydaelectronics	16	0.25	\$4.00
HDR1X9	Header 9	Header 9	P1	Header, 9-Pin	Taydaelectronics	1	0.09	\$0.09
HDR1X2	Header 2	Header 2	P2, P3, P4, P5, P6, P7, P8, P9	Header, 2-Pin	Taydaelectronics	8	0.02	\$0.16
HDR1X3	Header 3	Header 3	P10, P11	Header, 3-Pin	Taydaelectronics	2	0.03	\$0.06
2N3904	BC548B	2N3904	Q1, Q2	NPN General Purpose Amplifier	Taydaelectronics	2	0.01	\$0.02
2N3904	2N3904	2N3904	Q3, Q4	NPN General Purpose Amplifier	Taydaelectronics	2	0.01	\$0.02
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14	Resistor	Taydaelectronics	15	0.01	\$0.15
N16E	CD4051BCN	CD4051BCN	U1, U2, U3, U4	8-Channel Analog Multiplexer/Demultiplexer	Taydaelectronics	4	0.23	\$0.92
						64		#VALUE!

Approved Notes

Bill of Materials

Speaker Mixer

Source Data From: SpeakerMixer.SchDoc
Project: PrintingProjectAllDocs.PjPCB
Organization: U of U Computer Engineering

Creation Date: 9/24/2012 11:13:47 PM
Print Date: 24-Sep-12 11:13:56 PM

Footprint	Comment	LibRef	Designator	Description	Vendor	Quantity	Price	total Price
LED	LED_White	LED0	D1, D2, D3, D4	Typical INFRARED GaAs LED	Taydaelectronics	4	0.04	\$0.16
HDR1X8	Header 8	Header 8	P1	Header, 8-Pin	Taydaelectronics	1	0.08	\$0.08
HDR1X3	Header 3	Header 3	P2, P3, P4, P5, P6, P7, P8, P9, P10	Header, 3-Pin	Taydaelectronics	9	0.03	\$0.27
2N3904	2N3904	2N3904	Q1, Q2, Q3, Q4	NPN General Purpose Amplifier	Taydaelectronics	4	0.01	\$0.04
AXIAL-0.3	Res1	Res1	R1, R2, R3, R4, R5, R6, R7, R8	Resistor	Taydaelectronics	8	0.01	\$0.08
N16E	CD4051BCN	CD4051BCN	U1, U2	8-Channel Analog Multiplexer/Demultiplexer	Taydaelectronics	2	0.23	\$0.46
						28		\$1.09

Approved

Notes

Part List

Main Controller

Source Data From:

MainController.SchDoc

Project:

PrintingProjectAllDocs.PpjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:14:35 PM

Print Date: 24-Sep-12 11:14:49 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
R1, R2, R3, R4, R5	1K	Res1	Taydaelectronics	Resistor	5	0.01	\$0.05
D1, D2, D3, D4, D5, D6, D7	1N4001	1N4001	Taydaelectronics	1.0 Ampere General Purpose Rectifier, 1 Amp General Purpose Rectifier	7	0.01	\$0.07
C5, C6, C7, C8, C9	1uF	Cap	Taydaelectronics	Capacitor	5	0.03	\$0.15
Q1, Q2, Q3, Q4, Q5	2N3904	2N3904	Taydaelectronics	NPN General Purpose Amplifier	5	0.01	\$0.05
C2, C4	4.7uF	Cap	Taydaelectronics	Capacitor	2	0.03	\$0.06
C1, C3	470uF	Cap	Taydaelectronics	Capacitor	2	0.03	\$0.06
J1, J2, J3, J4, J5	D Connector 9	D Connector 9	Taydaelectronics	Receptacle Assembly, 9 Position, Right Angle	5	0.48	\$2.40
P3, P9, P12	Header 2	Header 2	Taydaelectronics	Header, 2-Pin	3	0.02	\$0.06
P11	Header 3	Header 3	Taydaelectronics	Header, 3-Pin	1	0.03	\$0.03
P1	Header 4	Header 4	Taydaelectronics	Header, 4-Pin	1	0.04	\$0.04
P2, P5, P8, P14, P16, P17, P18, P19	Header 5	Header 5	Taydaelectronics	Header, 5-Pin	8	0.05	\$0.40
P10	Header 6	Garage_HVAC	Taydaelectronics	Header, 6-Pin	1	0.06	\$0.06
P4	Header 6	Header 6	Taydaelectronics	Header, 6-Pin	1	0.06	\$0.06
P6	Header 7	Header 7	Taydaelectronics	Header, 7-Pin	1	0.07	\$0.07
P13, P15	Header 9	TempSenseBoard1	Taydaelectronics	Header, 9-Pin	2	0.09	\$0.18
VR2	L7805CP	L7805CP	Taydaelectronics	Positive Voltage Regulator	1	0.24	\$0.24
VR1	L7812CP	L7812CP	Taydaelectronics	Positive Voltage Regulator	1	0.24	\$0.24
P7	Plug	Spare	Taydaelectronics	Plug	1	0.00	\$0.00
U3	SN74HC154NT	SN74HC154NT	Digi-Key	4-Line to 16-Line Decoder / Demultiplexer	1	3.70	\$3.70
U1, U2, U5	SN7416N	SN7416N	Taydaelectronics	Hex Inverter Buffer / Driver with High-Voltage Outputs	3	0.18	\$0.54
U4	Teensy2.0++	Teensy2.0++	Taydaelectronics	The teensy 2.0 from www.PJRC.com	1	24.0	\$24.00
						Total	\$32.46

Part List

Power Board BOM 2 For Schematic Document [PowerAndFanBoard.SchDoc]

Source Data From:

[PowerAndFanBoard.SchDoc](#)

Project:

[PrintingProjectAllDocs.PrjPCB](#)

Variant:

[U of U Computer Engineering](#)

Report Date: 9/24/2012 11:15:30 PM
Print Date: 24-Sep-12 11:15:47 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
C1, C5, C10, C13, C16, C19, C22	100uF	Cap	Taydaelectronics	Capacitor	7	0.03	\$0.21
C2, C6, C9, C11, C14, C18, C20, C23	10uF	Cap	Taydaelectronics	Capacitor	8	0.03	\$0.24
C3, C7, C12, C15, C17, C21, C24	0.1uF	Cap	Taydaelectronics	Capacitor	7	0.03	\$0.21
C4	3.3nf	Cap	Taydaelectronics	Capacitor	1	0.03	\$0.03
C8	47uf	Cap	Taydaelectronics	Capacitor	1	0.03	\$0.03
D1, D2, D7, D8, D10, D12, D14	1N4001	1N4001	Taydaelectronics	1 Amp General Purpose Rectifier	7	0.01	\$0.07
D3, D5	Diode 1N4148	Diode 1N4148	Taydaelectronics	High Conductance Fast Diode	2	0.01	\$0.02
D4, D9, D13, D15, D18, D20, D21	LED0	RED_LED	Taydaelectronics	Typical INFRARED GaAs LED	7	0.04	\$0.28
D6, D11, D16, D17, D19, D22, D23	LED0	GREEN_LED	Taydaelectronics	Typical INFRARED GaAs LED	7	0.04	\$0.28
P1	Header 4	Header 4	Taydaelectronics	Header, 4-Pin	1	0.04	\$0.04
P2, P3, P8	Header 3	Header 3	Taydaelectronics	Header, 3-Pin	3	0.03	\$0.09
P4, P5, P6, P7	Header 2	Header 2	Taydaelectronics	Header, 2-Pin	4	0.02	\$0.08
R1	56k	Res1	Taydaelectronics	Resistor	1	0.01	\$0.01
R2	22k	Res1	Taydaelectronics	Resistor	1	0.01	\$0.01
R3, R6, R9, R12, R14, R17, R19, R20, R22, R26, R27, R29, R31, R32	330	Res1	Taydaelectronics	Resistor	14	0.01	\$0.14
R4, R13	30k	Res1	Taydaelectronics	Resistor	2	0.01	\$0.02
R5, R15	7.5k	Res1	Taydaelectronics	Resistor	2	0.01	\$0.02
R7, R16, R21, R24, R25	11k	Res1	Taydaelectronics	Resistor	5	0.01	\$0.05
R8, R10	470	Res1	Taydaelectronics	Resistor	2	0.01	\$0.02
R11, R18, R23, R28, R30	10k	Res1	Taydaelectronics	Resistor	5	0.01	\$0.05
S1	nintendo_power_res et	nintendo_pow er_reset	All Electronics		1	1.0	\$1.00
U1	LM555CN	LM555CN	Taydaelectronics	Timer	1	0.14	\$0.14
U2, U4, U6	SN7416N	SN7416N	Taydaelectronics	Hex Inverter Buffer / Driver with High-Voltage Outputs	3	0.18	\$0.54
U3, U5	LM339N	LM339N	Taydaelectronics	Low Power Low Offset Voltage Quad Comparator	2	0.17	\$0.34
VR1, VR4, VR6	L7812CP	L7812CP	Taydaelectronics	Positive Voltage Regulator	3	0.24	\$0.72
VR2, VR3, VR5, VR7	L7805CP	L7805CP	Taydaelectronics	Positive Voltage Regulator	4	0.24	\$0.96
						Total	\$5.60

Part List

HVAC & Garage Control

Source Data From:

HeatingAC_Garage.SchDoc

Project:

PrintingProjectAllDocs.PrjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:16:37 PM

Print Date: 24-Sep-12 11:16:51 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
C1, C4	0.1uF	Cap	Taydaelectronics	Capacitor	2	0.03	\$0.06
C2	1uF	Cap	Taydaelectronics	Capacitor	1	0.03	\$0.03
C3	100uF	Cap		Capacitor	1		#VALUE!
D1, D2, D3, D4	LED0	LED_White	Taydaelectronics	Typical INFRARED GaAs LED	4	0.04	\$0.16
D5, D6, D7, D8, D9, D10, D11	1N4001	1N4001	Taydaelectronics	1.0 Ampere General Purpose Rectifier	7	0.01	\$0.07
J1	D Connector 9	D Connector 9	Taydaelectronics	Receptacle Assembly, 9 Position, Right Angle	1	0.48	\$0.48
K1, K2, K3, K4, K5, K6, K7	SPDT	SPDT	Taydaelectronics		7	0.64	\$4.48
P1	Header 2	Header 2	Taydaelectronics	Header, 2-Pin	1	0.02	\$0.02
P2	Header 3	Header 3	Taydaelectronics	Header, 3-Pin	1	0.03	\$0.03
P3	Header 7	Header 7	Taydaelectronics	Header, 7-Pin	1	0.07	\$0.07
Q1, Q2, Q3, Q4, Q5, Q6, Q7	2N3904	2N3904	Taydaelectronics	NPN General Purpose Amplifier	7	0.01	\$0.07
R1, R2, R3, R5	510	Res1	Taydaelectronics	Resistor	4	0.01	\$0.04
R4, R6, R7, R8, R9, R10, R11, R12, R13, R20, R21, R22, R23	3.3k	Res1	Taydaelectronics	Resistor	13	0.01	\$0.13
R14, R15, R16, R17, R18, R19	10k	Res1	Taydaelectronics	Resistor	6	0.01	\$0.06
U1, U3, U4	OptoCoupler	OptoCoupler	Taydaelectronics		3	0.3	\$0.90
U2	SN7416N	SN7416N	Taydaelectronics	Hex Inverter Buffer / Driver with High-Voltage Outputs	1	0.18	\$0.18
VR1		L78L05ACZ		Voltage Regulator	1		#VALUE!
					Total		#VALUE!

Part List

Bi-Polar Motor driver BOM 2 For Schematic Document [MotorController.SchDoc]

Source Data From:

MotorController.SchDoc

Project:

PrintingProjectAllDocs.PrjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:17:47 PM
Print Date: 24-Sep-12 11:18:03 PM

Designator	Value	Comment	Vendor	Description	Quantity	Price	Total Parts Price
C1	1uF	Cap	Taydaelectronics	Capacitor	1	0.03	\$0.03
C2	4.7uF	Cap	Taydaelectronics	Capacitor	1	0.03	\$0.03
D1, D2, D3, D4, D5, D6, D7, D8	Diode 1N5408	Diode 1N5408	Taydaelectronics	3 Amp Medium Power Silicon Rectifier Diode	8	0.03	\$0.24
D9	LED0	LED0	Taydaelectronics	Typical INFRARED GaAs LED	1	0.04	\$0.04
D10	Diode 1N4148	Diode 1N4148	Taydaelectronics	High Conductance Fast Diode	1	0.01	\$0.01
P1	Header 6	Header 6	Taydaelectronics	Header, 6-Pin	1	0.06	\$0.06
P2	Header 4	Header 4	Taydaelectronics	Header, 4-Pin	1	0.04	\$0.04
Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10	2N3904	2N3904	Taydaelectronics	NPN General Purpose Amplifier	10	0.01	\$0.10
R1, R2, R3, R5	1K	Res1	Taydaelectronics	Resistor	4	0.01	\$0.04
R4, R6, R7, R8, R9, R10, R17, R18, R19, R20, R22	10k	Res1	Taydaelectronics	Resistor	11	0.01	\$0.11
R11, R13, R14, R15, R21	3.3k	Res1	Taydaelectronics	Resistor	5	0.01	\$0.05
R12, R16	470	Res1	Taydaelectronics	Resistor	2	0.01	\$0.02
U1, U2, U3, U4	TIP126	TIP126	Taydaelectronics	TIP126 -PNP	4	0.35	\$1.40
U5, U6, U7, U8	TIP120	TIP120	Taydaelectronics	NPN 60V -5A TO-220	4	0.26	\$1.04
U9	LM555CN	LM555CN	Taydaelectronics	Timer	1	0.14	\$0.14
U10	MC74HC194N	MC74HC194N	Digi-Key	4-Bit Bidirectional Universal Shift Register	1	0.68	\$0.68
U11	SN754410NE	SN754410NE	U of U	Quadruple Half-H Driver	1	0.00	\$0.00
					Total		\$4.03

Part List

Damper Section

Source Data From:

DamperSection.SchDoc

Project:

PrintingProjectAllDocs.PrjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:19:04 PM
Print Date: 24-Sep-12 11:19:18 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
D1, D2, D5, D6	1N4001	1N4001	Taydaelectronics	1.0 Ampere General Purpose Rectifier	4	0.01	\$0.04
D3, D4, D7, D8	LED0	LED_White	Taydaelectronics	Typical INFRARED GaAs LED	4	0.04	\$0.16
J1, J2, J3, J4	D Connector 9	D Connector 9	Taydaelectronics	Receptacle Assembly, 9 Position, Right Angle	4	0.48	\$1.92
K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16	SPDT	SPDT	Taydaelectronics		16	0.64	\$10.24
P1	Header 4	Header 4	Taydaelectronics	Header, 4-Pin	1	0.04	\$0.04
P2	Header 2	Header 2	Taydaelectronics	Header, 2-Pin	1	0.02	\$0.02
P3	Header 7	Header 7	Taydaelectronics	Header, 7-Pin	1	0.07	\$0.07
Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20	2N3904	2N3904	Taydaelectronics	NPN General Purpose Amplifier	20	0.01	\$0.20
R1, R2, R3, R7, R19, R21, R25, R29	10k	Res1	Taydaelectronics	Resistor	8	0.01	\$0.08
R4, R8, R9, R10, R11, R14, R15, R16, R26, R27, R30, R31, R32, R34	1K	Res1	Taydaelectronics	Resistor	14	0.01	\$0.14
R5, R6, R12, R13, R20, R24, R28, R33	1M	Res1	Taydaelectronics	Resistor	8	0.01	\$0.08
R17, R18, R22, R23	500	Res1	Taydaelectronics	Resistor	4	0.01	\$0.04
						Total	\$13.03

Part List

Sprinkler Control BOM 2 For Schematic Document [SprinklerBoard.SchDoc]

Source Data From:

SprinklerBoard.SchDoc

Project:

PrintingProjectAllDocs.PjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:20:23 PM

Print Date: 24-Sep-12 11:20:38 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
D1, D2, D3, D4, D5, D6	1N4001	1N4001	Taydaelectronics	1.0 Ampere General Purpose Rectifier	6	0.01	\$0.06
D7, D8, D9, D10, D11, D12	LED0	LED_White	Taydaelectronics	Typical INFRARED GaAs LED	6	0.04	\$0.24
J1	D Connector 9	D Connector 9	Taydaelectronics	Receptacle Assembly, 9 Position, Right Angle	1	0.48	\$0.48
K1, K2, K3, K4, K5, K6	SPDT	SPDT	Taydaelectronics		6	0.64	\$3.84
P1	Header 7	Header 7	Taydaelectronics	Header, 7-Pin	1	0.07	\$0.07
Q1, Q2, Q3, Q4, Q5, Q6	2N3904	2N3904	Taydaelectronics	NPN General Purpose Amplifier	6	0.01	\$0.06
R1, R2, R3, R4, R5, R6, R7, R8	1K	Res1	Taydaelectronics	Resistor	8	0.01	\$0.08
R9, R10, R11, R12, R13, R14	120	Res1	Taydaelectronics	Resistor	6	0.01	\$0.06
U1	SN7416N	SN7416N	Taydaelectronics	Hex Inverter Buffer / Driver with High-Voltage Outputs	1	0.18	\$0.18
U2	74AC138B	74AC138B	Taydaelectronics	3-to-8 Line Decoder Inverting	1	0.25	\$0.25
					Total		\$5.32

Part List

Temperature Sensor Control BOM 2 For Schematic Document [TemperatureSensorBlock]

Source Data From:

TemperatureSensorBlock.SchDoc

Project:

PrintingProjectAllDocs.PjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:21:46 PM

Print Date: 24-Sep-12 11:21:59 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
C1, C2, C4, C5	100pF	Cap	Taydaelectronics	Capacitor	4	0.03	\$0.12
C3	4.7uF	Cap	Taydaelectronics	Capacitor	1	0.03	\$0.03
P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P12, P13, P14, P15, P16, P17, P18, P19, P20, P21, P22, P23, P24, P25, P26, P27, P28, P29, P30, P31, P32, P33	Header 2	Header 2	Taydaelectronics	Header, 2-Pin	32	0.02	\$0.64
P11	Header 12	Header 12	Taydaelectronics	Header, 12-Pin	1	0.12	\$0.12
R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32	15k	Res1	Taydaelectronics	Resistor	32	0.01	\$0.32
U1, U2, U3, U4	CD4051BCN	CD4051BCN	Taydaelectronics	8-Channel Analog Multiplexer/Demultiplexer	4	0.23	\$0.92
						Total	\$2.15

Part List

Wireless Communication Controller BOM 2 For Schematic Document [WirelessCommur

Source Data From:

WirelessCommunications.SchDoc

Project:

PrintingProjectAllDocs.PrjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:23:10 PM

Print Date: 24-Sep-12 11:23:25 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
C1	0.1uF	Cap	Taydaelectronics	Capacitor	1	0.03	\$0.03
C2	1.0uF	Cap	Taydaelectronics	Capacitor	1	0.03	\$0.03
P1	Header 5	Header 5	Taydaelectronics	Header, 5-Pin	1	0.05	\$0.05
P2, P7, P8, P9	Header 2	Header 2	Taydaelectronics	Header, 2-Pin	4	0.02	\$0.08
P3, P4, P5	Header 10	Header 10	Taydaelectronics	Header, 10-Pin	3	0.10	\$0.30
P6	Header 7	Header 7	Taydaelectronics	Header, 7-Pin	1	0.07	\$0.07
R1	10k	Res1	Taydaelectronics	Resistor	1	0.01	\$0.01
T1	RFM12 transceiver	RFM12 transceiver	futurlec	w w w .futurlec.com 433 MHZ transceiver	1	7.90	\$7.90
U1	Teensy2.0	Teensy	PJRC	The teensy 2.0 from w w w .PJRC.com, chang clock to 8MHz	1	16.00	\$16.00
						Total	\$24.47

Part List

Microphone Mixer

Source Data From:

MicMixer.SchDoc

Project:

PrintingProjectAllDocs.PjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:24:33 PM

Print Date: 24-Sep-12 11:24:49 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
C1, C2, C3, C4, C5, C6, C7, C8, C9, C10	4.7uF, 10uF, 22uF	Cap	Taydaelectronics	Capacitor	11	0.03	\$0.33
C?	100pF	Cap		Capacitor	2		#VALUE!
L?	100uH	Inductor Iron		Magnetic-Core Inductor	1		#VALUE!
MK1, MK2, MK3, MK4, MK5, MK6, MK7, MK8, MK9, MK10, MK11, MK12, MK13, MK14, MK15, MK16	Mic1	Mic1	Taydaelectronics	Microphone	16	0.25	\$4.00
P1	Header 9	Header 9	Taydaelectronics	Header, 9-Pin	1	0.09	\$0.09
P2, P3, P4, P5, P6, P7, P8, P9	Header 2	Header 2	Taydaelectronics	Header, 2-Pin	8	0.02	\$0.16
P10, P11	Header 3	Header 3	Taydaelectronics	Header, 3-Pin	2	0.03	\$0.06
Q1, Q2	BC548B	BC548B	Taydaelectronics	NPN General Purpose Amplifier	2	0.01	\$0.02
Q3, Q4	2N3904	2N3904	Taydaelectronics	NPN General Purpose Amplifier	2	0.01	\$0.02
R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14	1K, 5.6K, 10k, 100, 220K	Res1	Taydaelectronics	Resistor	15	0.01	\$0.15
U1, U2, U3, U4	CD4051BCN	CD4051BCN	Taydaelectronics	8-Channel Analog Multiplexer/Demultiplexer	4	0.23	\$0.92
					Total		#VALUE!

Part List

Speaker Mixer

Source Data From:

SpeakerMixer.SchDoc

Project:

PrintingProjectAllDocs.PjPCB

Variant:

U of U Computer Engineering

Report Date: 9/24/2012 11:26:07 PM

Print Date: 24-Sep-12 11:26:23 PM

Designator	Value	Comment	Vendor	Description	Quant	Price	Total Parts Price
D1, D2, D3, D4	LED0	LED_White	Taydaelectronics	Typical INFRARED GaAs LED	4	0.04	\$0.16
P1	Header 8	Header 8	Taydaelectronics	Header, 8-Pin	1	0.08	\$0.08
P2, P3, P4, P5, P6, P7, P8, P9, P10	Header 3	Header 3	Taydaelectronics	Header, 3-Pin	9	0.03	\$0.27
Q1, Q2, Q3, Q4	2N3904	2N3904	Taydaelectronics	NPN General Purpose Amplifier	4	0.01	\$0.04
R1, R2, R5, R6	100	Res1	Taydaelectronics	Resistor	4	0.01	\$0.04
R3, R4, R7, R8	8.2K	Res1	Taydaelectronics	Resistor	4	0.01	\$0.04
U1, U2	CD4051BCN	CD4051BCN	Taydaelectronics	8-Channel Analog Multiplexer/Demultiplexer	2	0.23	\$0.46
					Total	\$1.09	