POWER SUPPLY BOARD

This Board is to supply ample power to the rest of the circuit
Main controller board is taken care off with the other connector
Mic preamp is also taken care of because it needs its own power.

This is the connector for +24V

P1 Header 4 — VCC24IN — GND

This section is to indicate wheather the voltages are good or bad.
if the voltage is to low then the LED will go red
else the led will be green if good. we will use MicVCC+5 for circuitry

we will do voltage Dividers to distiguish which voltage is greater
we won't test the -5V due to comparing

Damper Board Power +5V and +12V

VCC24 — D1 Diode 1N4001 — VR1 L7812CP (IN, OUT, GND) — C1 Cap 100uF, C2 Cap 10uF, C3 Cap 0.1uF — DampVCC12

VCC24 — D2 Diode 1N4001 — VR2 L7805CP (IN, OUT, GND) — C5 Cap 100uF, C6 Cap 10uF, C7 Cap 0.1uF — DampVCC5

P2 Header 3

12V test is if the voltage is greater than 11.42V
5V test is if the voltage is greater than 4.8V

Test Damper

VCC24 — R4 Res1 30k — MicVCC+5 — R5 Res1 7.5k — DampVCC5 — U3A LM339N — GND

U2A SN7416N — D4 RED_LED — R3 Res1 330 — GND

U2B SN7416N — D8 GREEN_LED — R6 Res1 330 — GND

Garage and HVAC power

VCC24 — D7 Diode 1N4001 — VR4 L7812CP (IN, OUT, GND) — C12 Cap 100uF, C13 Cap 10uF, C14 Cap 0.1uF — GHVAC_VCC12

P4 Header 2

WIRELESS

We need 5V for the Wireless communications portion
Whether we use the teensy or just a simple avr chip we will still need it.

VCC24 — D10 Diode 1N4001 — VR5 L7805CP (IN, OUT, GND) — C16 Cap 100uF, C17 Cap 0.1uF, C18 Cap 10uF — WIFI_VCC5

P5 Header 2

VCC24 — R8 Res1 470 — ResetIn — R10 Res1 470

S1 Super Nintendo Power/Reset Button
VCC24IN — Power_In — Power_out — VCC24
Reset_IN — Reset_out — ResetOut
LED IN — LED_out
GND GND
nintendo_power_reset

ResetIn / ResetOut — P7 Header 2

tie main and power — P8 Header 2

Test WIFI 5V power

VCC24 — R13 Res1 30k — MicVCC+5 — R17 Res1 7.5k — WIFI_VCC5 — U3C LM339N — U2E SN7416N — D14 RED_LED — R15 Res1 330 — GND

U4A SN7416N — D16 GREEN_LED — R20 Res1 330 — GND

VCC24 — R14 Res1 11k — R18 Res1 10k — TempVCC12 — MicVCC+5 — U3D LM339N — U2F SN7416N — D15 RED_LED — R16 Res1 330 — GND

U4B SN7416N — D17 GREEN_LED — R21 Res1 330 — GND

Test Garage and HVAC 12V

VCC24 — R24 Res1 11k — R29 Res1 10k — GHVAC_VCC12 — MicVCC+5 — U5C LM339N — U4E SN7416N — D20 RED_LED — R27 Res1 330 — GND

U6A SN7416N — D22 GREEN_LED — R31 Res1 330 — GND

VCC24 — R25 Res1 11k — R30 Res1 10k — TempVCC5 — MicVCC+5 — U5B LM339N — U4F SN7416N — D21 RED_LED — R28 Res1 330 — GND

U6B SN7416N — D23 GREEN_LED — R32 Res1 330 — GND

Power Supply for the analog channels
Positive and negative 5V

MicVCC+5 — Stephen Hobley had the design for using a 555 timer chip in astable to convert +5V to +/-5 V estimated amount of current 10ma. enough for mic signals.

our -5v device uses 1uA at MAX, we we should be able to power several

R1 Res1 56k — R2 Res1 22k — C4 Cap 3.3nf — GND

U1 LM555CN (GND, +VCC, CVOLT, TRIG, OUT, THR, DIS, RST) — MicVCC+5

To go to Mic board

MicVCC+5 — P3 Header 3 — VCC-5 — GND

VCC-5 — D3 Diode 1N4148 — C8 Cap 47uf — GND

C9 Cap 10uf — D5 Diode 1N4148 — GND

VCC24 — D6 Diode 1N4001 — VR3 L7805CP (IN, OUT, GND) — C10 Cap 100uF, C11 Cap 10uF, C15 Cap 0.1uF — MicVCC+5 — GND

Power supply for the temperature Sensors
This requires +5V and gnd, it uses analog chips, but we will always be in the positive range so we just need positive

To go to the Temperature Sensor Board

VCC24 — D11 Diode 1N4001 — VR6 L7812CP (IN, OUT, GND) — C19 Cap 100uF, C20 Cap 10uF, C21 Cap 0.1uF — TempVCC12

P6 Header 3 — TempVCC5

VCC24 — D13 Diode 1N4001 — VR7 L7805CP (IN, OUT, GND) — C22 Cap 100uF, C23 Cap 10uF, C24 Cap 0.1uF — GND

VCC24 — R19 Res1 11k — R23 Res1 10k — MicVCC+5 — U5A LM339N — U4C SN7416N — D18 RED_LED — R22 Res1 330 — GND

U4D SN7416N — D19 GREEN_LED — R26 Res1 330 — GND

Engineer: Levi Balling	Title: *Epic Cube Power Supply*				*U of U Computer Engineering*
Drawn By: Levi Balling					*50 S. Central Campus Dr.*
Checked By: *	Size: B	Number: 1	Revision: 1	Project: Smart Home	*Rm. 3280 MEB*
Date: 8/17/2012					*Salt Lake City, UT*
Time: 11:36:20 PM	File: PowerAndFanBoard.SchDoc				Smart Home
Sheet 5 of 13	Website: www.eng.utah.edu/~lballing/SmartHome				

Bill of Materials

Epic Cube Power Supply

Source Data From: PowerBoard.PrjPcb
Project: PowerBoard.PrjPcb
Variant: None

Creation Date: 8/17/2012 11:36:28 PM
Print Date: 17-Aug-12 11:36:32 PM

Footprint	Comment	LibRef	Designator	Description	Quantity
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	24
DO-41	Diode 1N4001	Diode 1N4001	D1, D2, D6, D7, D10, D11, D13	1 Amp General Purpose Rectifier	7
DO-35	Diode 1N4148	Diode 1N4148	D3, D5	High Conductance Fast Diode	2
LED	RED_LED	LED0	D4, D9, D14, D15, D18, D20, D21	Typical INFRARED GaAs LED	7
LED	GREEN_LED	LED0	D8, D12, D16, D17, D19, D22, D23	Typical INFRARED GaAs LED	7
MainPowerConnector	Header 4	Header 4	P1	Header, 4-Pin	1
HDR1X3	Header 3	Header 3	P2, P3, P6	Header, 3-Pin	3
HDR1X2	Header 2	Header 2	P4, P5, P7, P8	Header, 2-Pin	4
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	32
PCBComponent_1	nintendo_power_reset	nintendo_power_reset	S1		1
N08E	LM555CN	LM555CN	U1	Timer	1
N014	SN7416N	SN7416N	U2, U4, U6	Hex Inverter Buffer / Driver with High-Voltage Outputs	3
N14A	LM339N	LM339N	U3, U5	Low Power Low Offset Voltage Quad Comparator	2
ISOWATT220AB	L7812CP	L7805CP	VR1, VR4, VR6	Positive Voltage Regulator	3
ISOWATT220AB	L7805CP	L7805CP	VR2, VR3, VR5, VR7	Positive Voltage Regulator	4
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Approved	Notes	