

AUTONOMY

(Team A)

Power Distribution System Draft Layout and BOM

16-681 MRSD Project 1

March 20, 2019
Carnegie Mellon University

Team Members

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We have made few changes from the previous submission. We decided to get rid of all the terminal blocks and instead replace them with barrel jack connectors as they are easy to plugin. The battery connector is replaced with a XT60 connector. Furthermore, all the voltage regulators were changed with similar rated ones by Pololu. This was done to keep the vendor same to avoid additional delivery costs. We ordered a rocker type switch and decided to keep the switch external to the board.

Serial No.	Component	Product Link	Vendor	Unit Price	Quantity	Price
1	Pololu 12V Step-Up/Step-Down Voltage Regulator S18V20F12	https://www.pololu.com/product/2577	Pololu	\$14.95	1	\$14.95
2	Screw Terminal Block: 2-Pin, 5 mm Pitch, Side Entry (4-Pack)	https://www.pololu.com/product/2440		\$1.50	1	\$1.50
3	DC Power Adapter Barrel Jack	https://www.pololu.com/product/1139		\$0.85	5	\$4.25
4	0.100" (2.54 mm) Female Header: 2x5-Pin, Straight	https://www.pololu.com/product/1025		\$0.69	4	\$2.76
5	3.3V, 600mA Step-Down Voltage Regulator D36V6F3	https://www.pololu.com/product/3791		\$4.95	1	\$4.95
6	Rocker Switch: 3-Pin, SPDT, 10A	https://www.pololu.com/product/1406		\$0.75	3	\$2.25
7	XT60 Connector Male-Female Pair	https://www.pololu.com/product/2175		\$1.75	2	\$3.50
8	5V, 600mA Step-Down Voltage Regulator D36V6F5	https://www.pololu.com/product/3792		\$4.95	1	\$4.95
9	Deans Connector - M/F Pair	https://www.sparkfun.com/products/11864	SparkFun	\$0.95	2	\$1.90
10	USB Female Type B Connector	https://www.sparkfun.com/products/139		\$1.25	4	\$5.00
11	Fuse 5mm 125VAC 5A	https://www.sparkfun.com/products/9772		\$0.50	4	\$2.00
12	ASI PTF-76-10 5 x 20 mm PCB Fuse Holder	https://www.amazon.com/PTF-76-10-Holder-Printed-Circuit-Spacing/dp/B074N1NMMX/ref=sr_1_8?keywords=20x5+fuse+holder&qid=1552424002&s=industrial&sr=1-8	Amazon	\$8.14	1	\$8.14
				Total Price		\$56.15

Bill of Materials				
Part Name	Value	Device	Package	Description
3V3	YEL	LED3MM	LED3MM	LED
5V	GRN	LED3MM	LED3MM	LED
12V	GRN	LED3MM	LED3MM	LED
C1	330uF	C-US025-050X050	C025-050X050	CAPACITOR, American symbol
F1	10A	FUSEBLANK_5X20MM	FUSE HOLDER_5X20MM	Fuse
F2	5A	FUSEBLANK_5X20MM	FUSE HOLDER_5X20MM	Fuse
FUSE	GRN	LED3MM	LED3MM	LED
IC1	3V3REG	PINHD-1X4	1X04	PIN HEADER
IC2	5VREG	PINHD-1X4	1X04	PIN HEADER
IC3-1	12VREG	PINHD-1X4	1X04	PIN HEADER
IC3-2	12VREG	PINHD-1X4	1X04	PIN HEADER
J1	LiPo BATTERY	XT60	XT60	XT60
J2	JETSON	POWER_JACK	POWER_JACK_PTH	Power Jack Connector
J3	ARDUINO	POWER_JACK	POWER_JACK_PTH	Power Jack Connector
J4	RESV	POWER_JACK	POWER_JACK_PTH	Power Jack Connector
J5	POWER_JACK	POWER_JACK	POWER_JACK_PTH	Power Jack Connector
J6	USB1	USB_B_PTH	USB-B-PTH	USB Type B Connector
J7	USB2	USB_B_PTH	USB-B-PTH	USB Type B Connector
JET	RED	LED3MM	LED3MM	LED
JP1	5V PORT	PINHD-2X5	2X05	PIN HEADER
JP2	3V3 PORT	PINHD-2X5	2X05	PIN HEADER
PWR	RED	LED3MM	LED3MM	LED
R1	10K	R-US_V234/12	V234/12	RESISTOR, American symbol
R2	10K	R-US_V234/12	V234/12	RESISTOR, American symbol
R3	10K	R-US_V234/12	V234/12	RESISTOR, American symbol
R4	10K	R-US_V234/12	V234/12	RESISTOR, American symbol
R5	10K	R-US_V234/12	V234/12	RESISTOR, American symbol
R6	10K	R-US_V234/12	V234/12	RESISTOR, American symbol

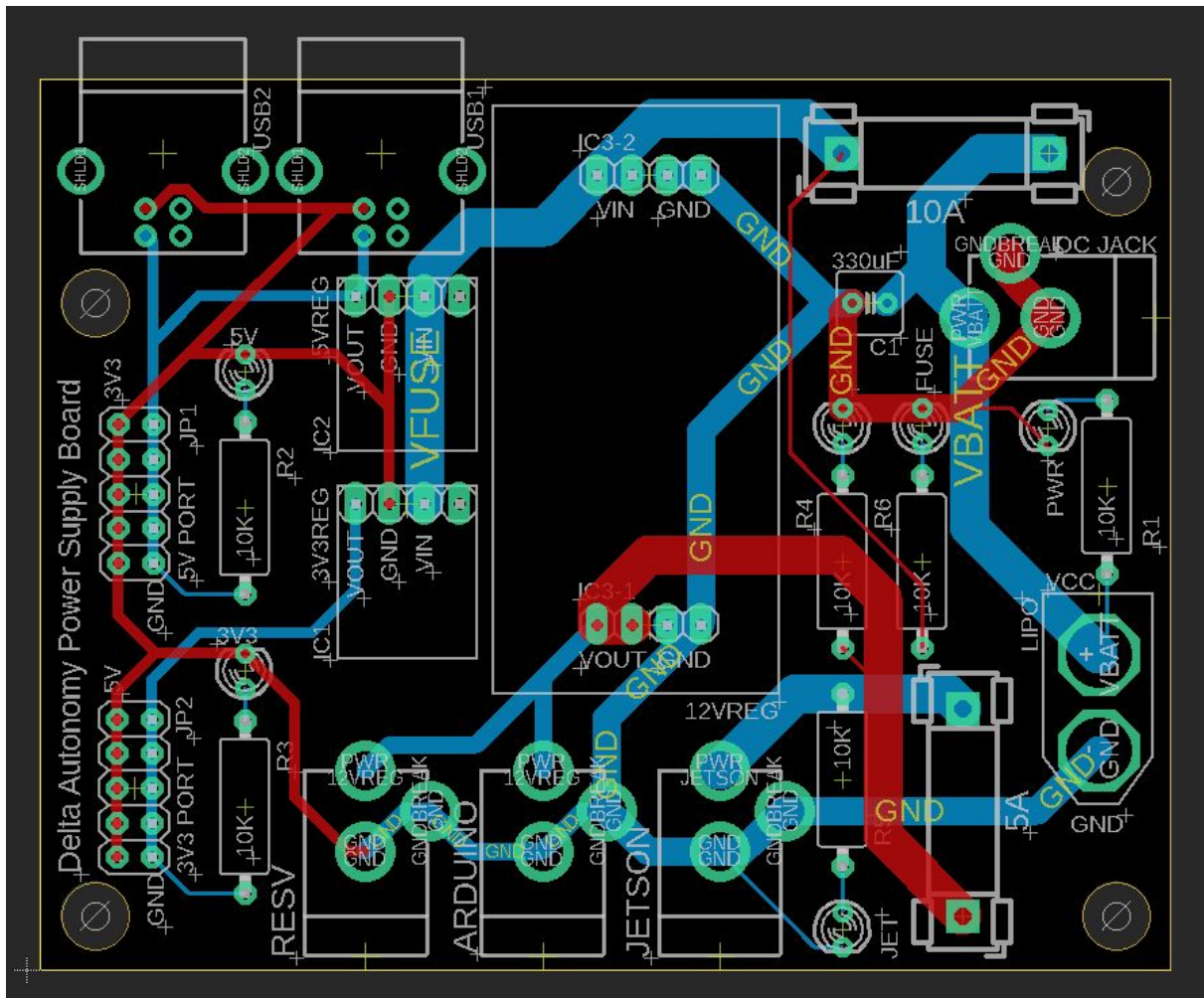
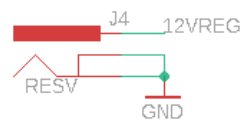
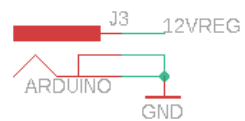
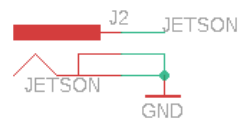
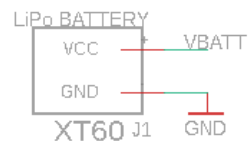


Figure 1: Draft PCB Layout

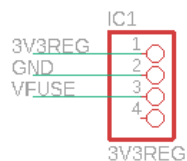
5mm holes are used to mount it on an acrylic board using 5mm spacers.



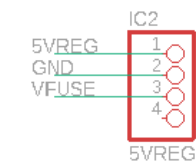
12V Terminal Blocks



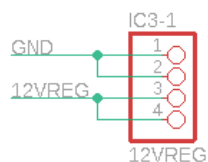
Battery Terminal Block



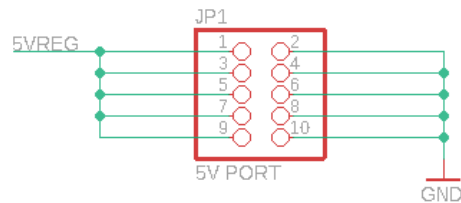
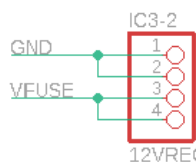
3V3 Regulator



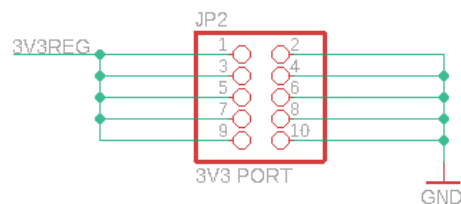
5V Regulator



12V Regulator



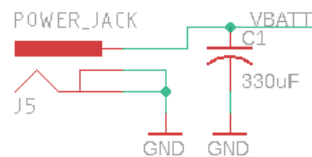
5V Supply Port



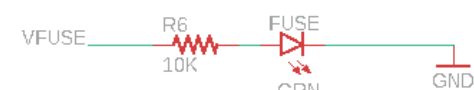
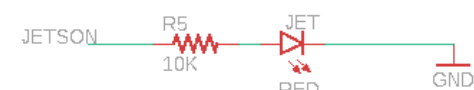
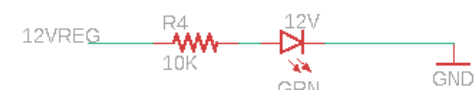
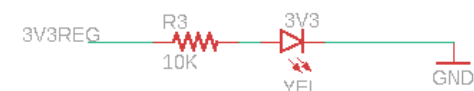
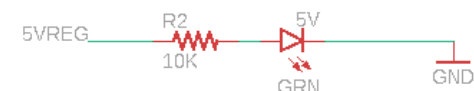
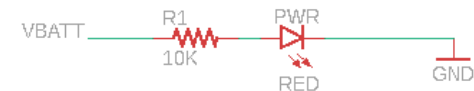
3V3 Supply Port



USB Power Supply Port



Barrel Jack Connector



LED Indicators



Fuses

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TITLE: RC Car Power Supply Board	PCB_RC_01
Design by: Heethesh Vhavle, Shubham Patil (Delta Autonomy)	REV: v02
Date: 20-Mar-19 1:26 AM	Sheet: 1/1