Sheet: External Device Power

GPIO_EXT_PWR_1
GPIO_EXT_PWR_2
GPIO_EXT_PWR_3
GPIO_EXT_PWR_4
EXT_PWR_EN_1
EXT_PWR_EN_2
EXT_PWR_EN_3
EXT_PWR_EN_4

File: external_power.sch

Sheet: External Device Triggers

EXT_TRG_EN_1
EXT_TRG_EN_2
EXT_TRG_EN_3
EXT_TRG_EN_4

File: external_triggers.sch

Sheet: BeagleBone Black Cape

I2C_CLOCK
I2C_DATA
BQ_XALERT
EXT_PWR_EN_1
EXT_PWR_EN_2
EXT_PWR_EN_3
EXT_PWR_EN_4
EXT_TRG_EN_1
EXT_TRG_EN_2
EXT_TRG_EN_3
EXT_TRG_EN_4
12V_ENn
19V_ENn
UMB_CONn
ROCKET_READYn
IGN_RTL
ROCKET_IGNITE

File: beaglebone_cape.sch

TODO: make use of BQ_XALERT?

Sheet: DC-DC Converters

I2C_CLOCK
I2C_DATA
12V_ENn
19V_ENn

File: dcdc_converter.sch

Sheet: Rocket Umbilical & Ignition Control

ROCKET_IGNITE
UMB_CONn
ROCKET_READYn
IGN_RTL

File: rocket_interface.sch

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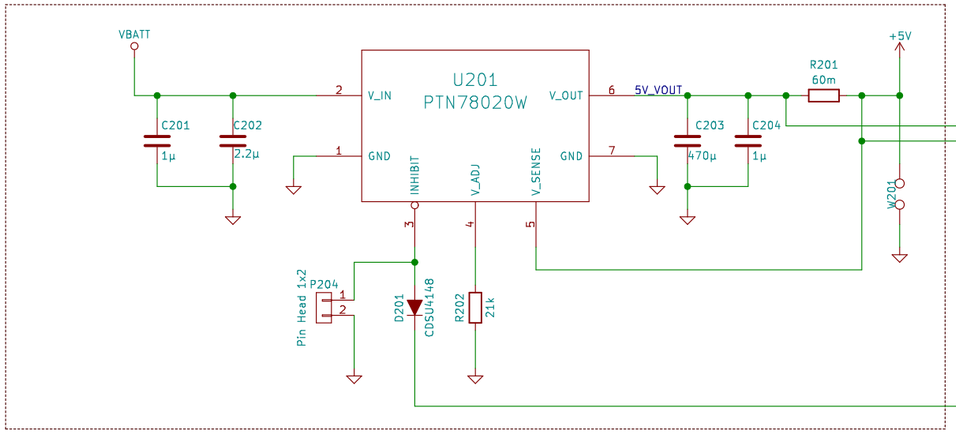
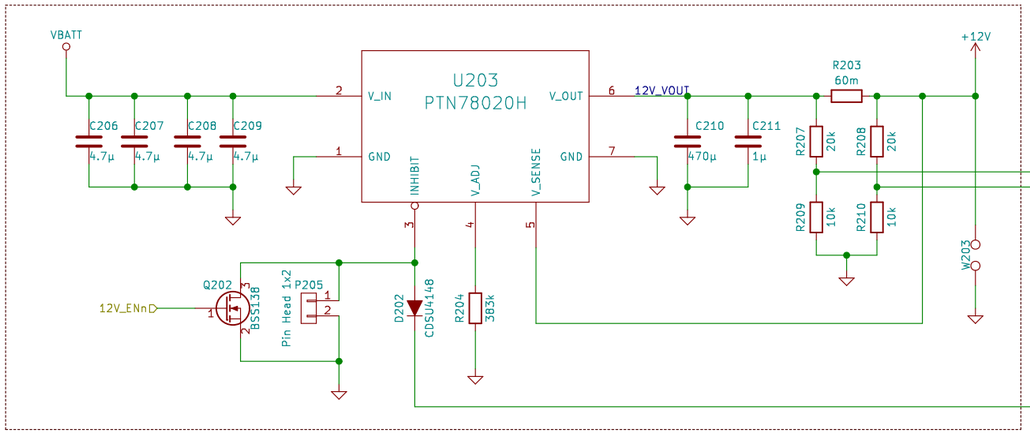
Sheet: /
File: LTC3.sch

Title: Launch Tower Computer 3 (LTC3)

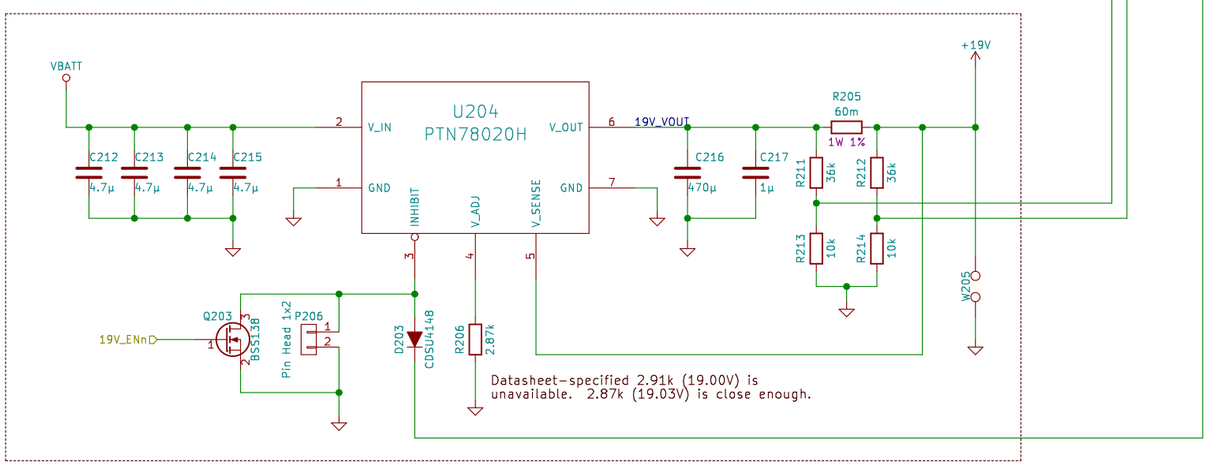
Size: B	Date: 2016-09-13	**Rev: A**
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 1/6



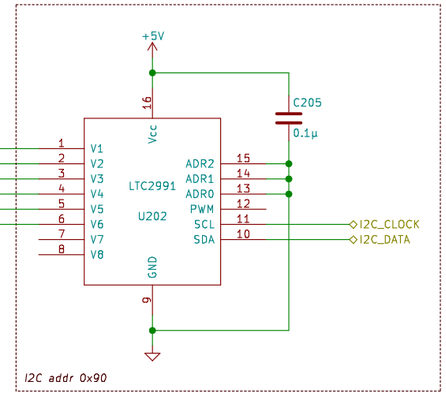
+5V DC Supply



+12V DC Supply

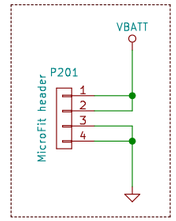


+19V DC Supply



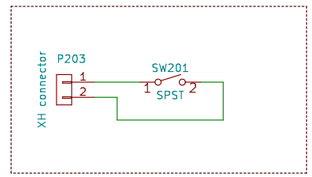
Voltage, Current, & Temp Sense

Current Sense Resistors
full-scale voltage = 0.300 V
R_sense_max = 0.300/Imax
5 A = 60mΩ

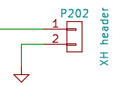


Power In

TODO: add MicroFit housing contacts to BOM



Main Power Switch, Front Panel



NOTES
1. V_sense should connect as close as possible to the largest load on the given power rail.
2. Place Rset resistors as close to package pins as possible.
3. Ceramic (Cin) capacitors should be located within 0.5 in of the input pins.
4. We may need heat sinks on the converters. The datasheet indicates a range of 2W to 5W of power dissipation given our specs.
5. Pay attention to the datasheet's recommendations regarding capacitor selection.

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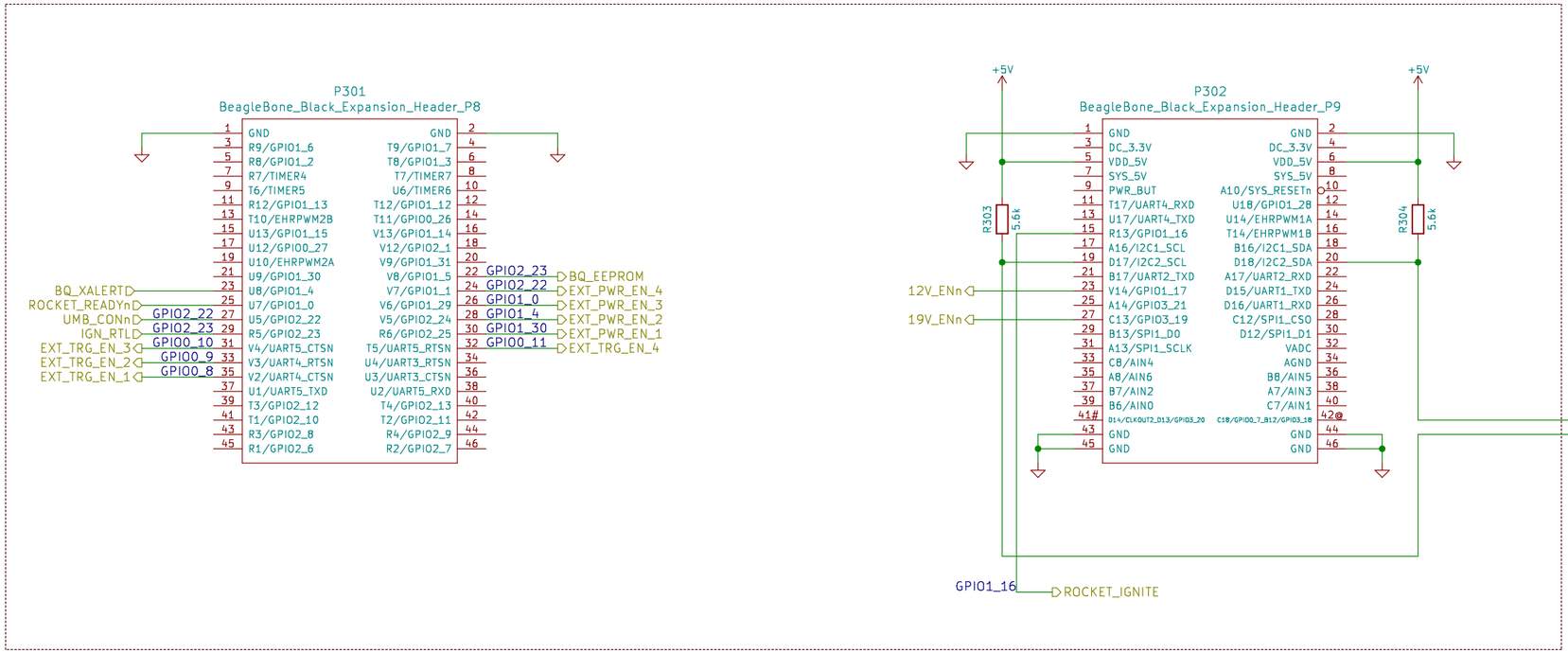
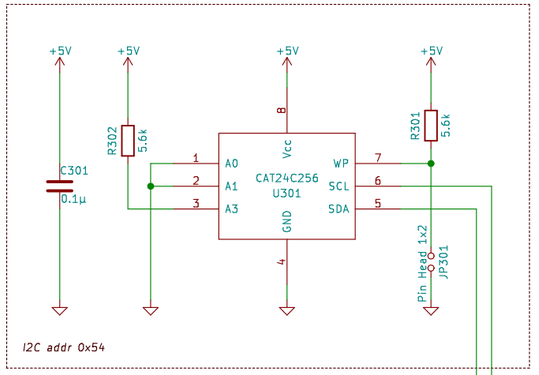
Sheet: /DC-DC Converters/
File: dcdc_converter.sch

Title: LTC3 DC-DC Converters

Size: B	Date: 2016-09-13	**Rev: A**
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 2/6



BeagleBone Expansion Headers



Cape EEPROM

TODO: add off-board JST XH connectors

NOTES:
* Do NOT change ROCKET_IGNITE, pin default reset state is High-Z w/ pulldown resistor. Other pins can be configured in EEPROM at boot time.
* All I2C devices on LTC3 are slaves. The BBB is the only master so the LTC will not need arbitration.

I2C Devices

ADDR	Part	Type	Location
0x10	U203	BQ77PL900	B/PM
0x54	U501	EEPROM	BBB
0x90	U402	LTC2991	DC-DC
0x98	U203	LTC2990	Power In
0x9A	U301	LTC2990	B/PM

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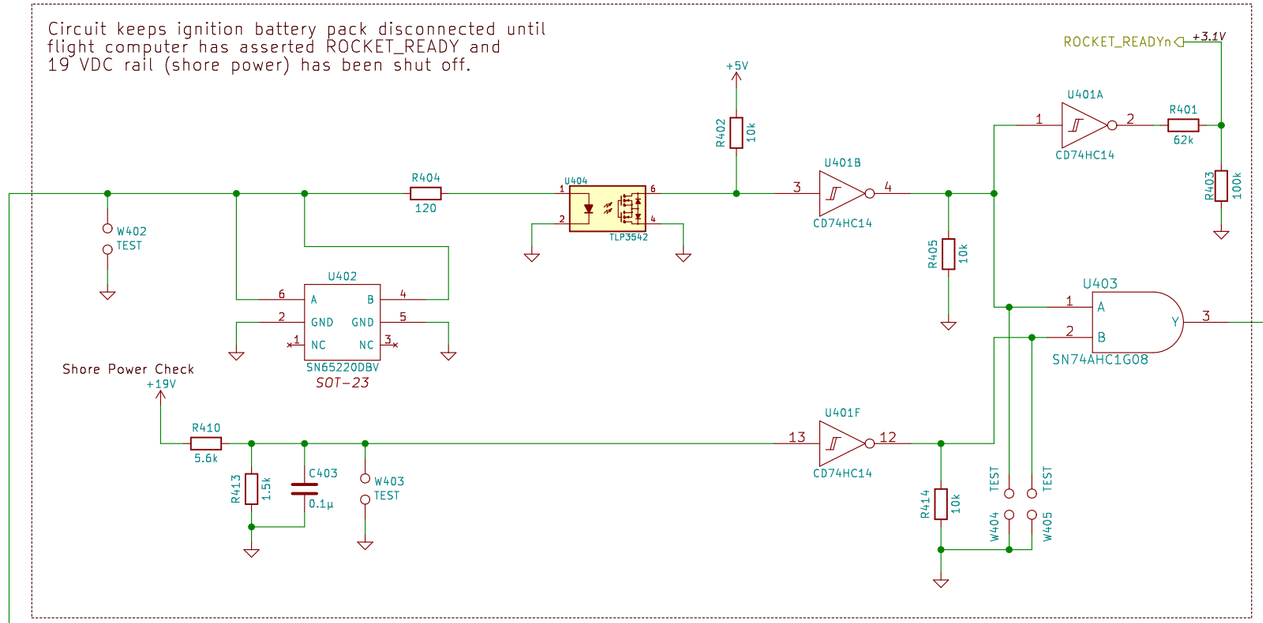
Sheet: /BeagleBone Black Cape/
File: beaglebone_cape.sch

Title: LTC3 BeagleBone Black Cape Interface

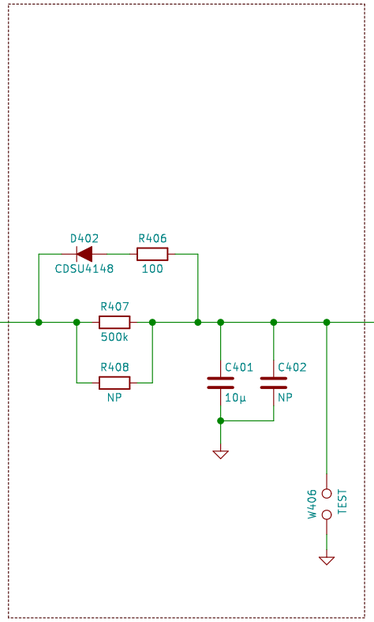
Size: B	Date: 2016-09-13	**Rev: A**
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 3/6

Circuit keeps ignition battery pack disconnected until
flight computer has asserted ROCKET_READY and
19 VDC rail (shore power) has been shut off.

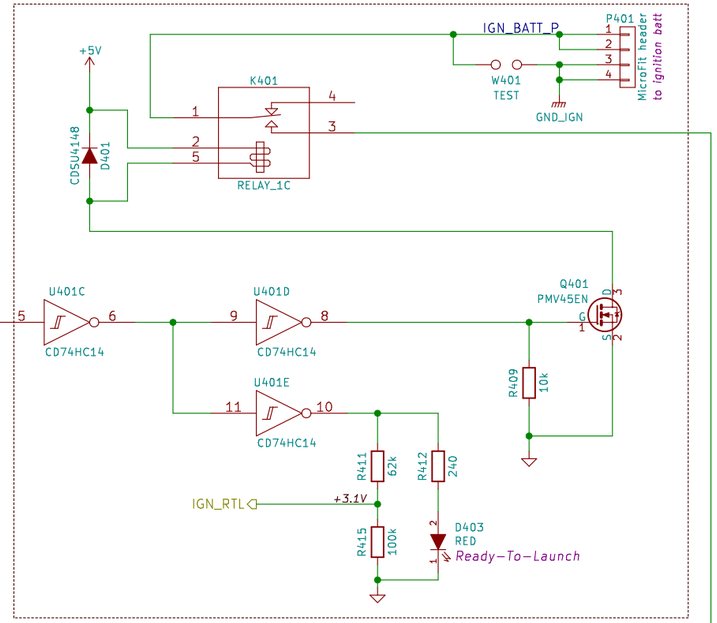
Input Logic



Delay (5s)

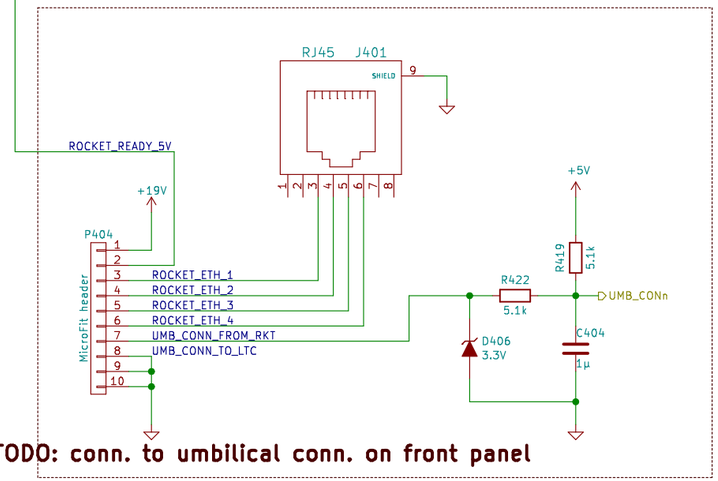


Ignition Battery Relay

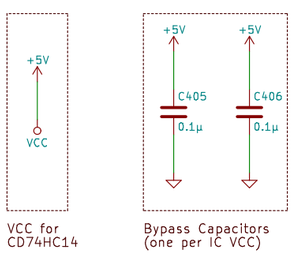


Rocket Umbilical

Rocket-to-BeagleBone Ethernet

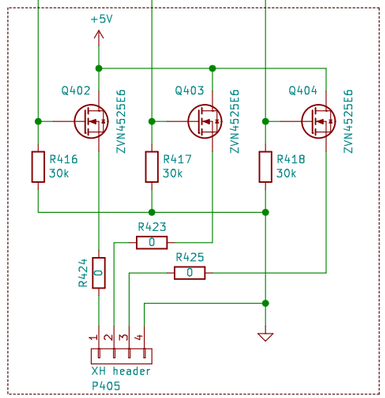


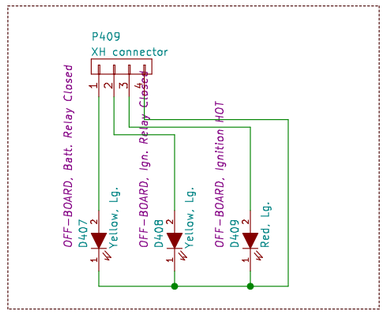
TODO: conn. to umbilical conn. on front panel



VCC for
CD74HC14

Bypass Capacitors
(one per IC VCC)

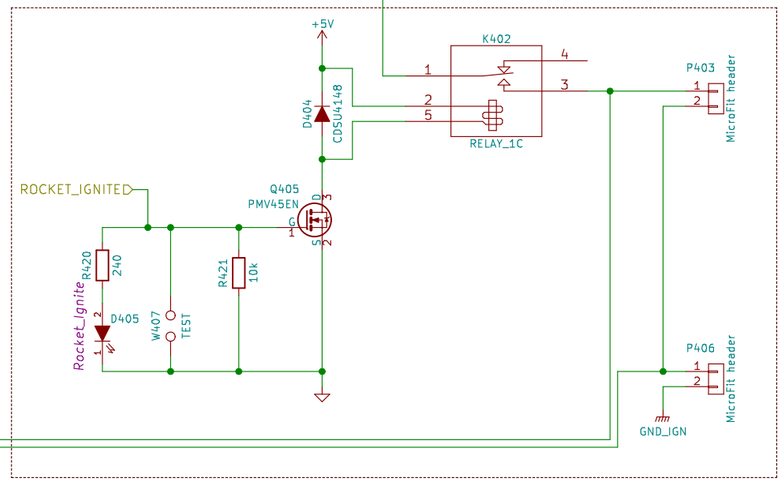




BAKERCON Hazard Gauge

(super-bright LEDs, exterior panel)

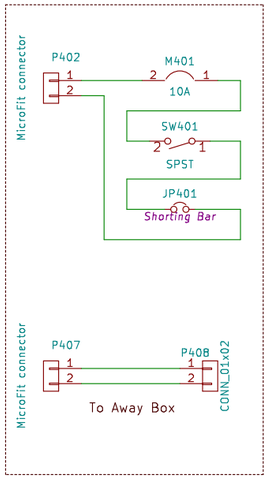
Rocket Ignition Relay



TODO: add MicroFit housing contacts to BOM

Breaker, Arm Switch, Shorting Bar, & Ignition Connector

(front panel)



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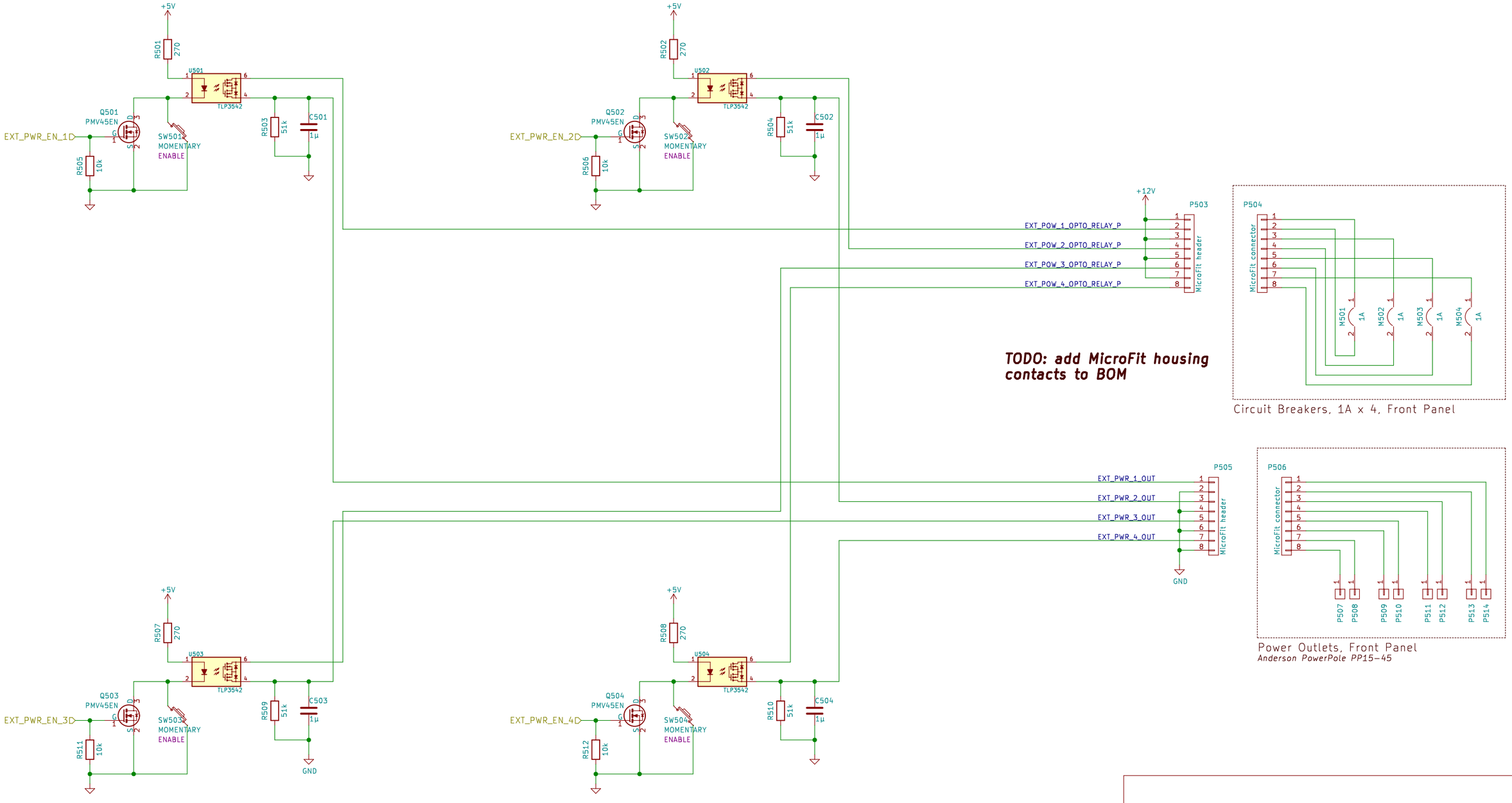
Sheet: /Rocket Umbilical & Ignition Control/
File: rocket_interface.sch

Title: LTC3 Rocket Umbilical & Ignition Control

Size: B	Date: 2016-09-13	Rev: A
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 4/6



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Sheet: /External Device Power/
File: external_power.sch

Title: LTC3 External Device Power

Size: B	Date: 2016-09-13	**Rev: A**
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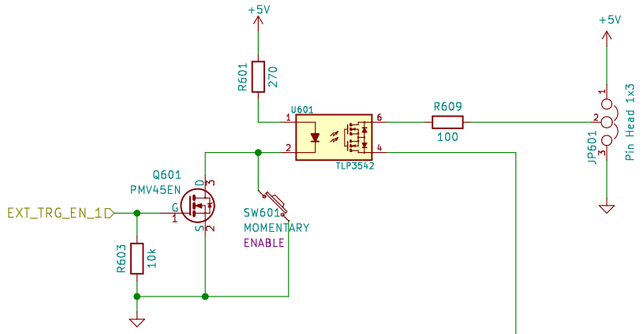

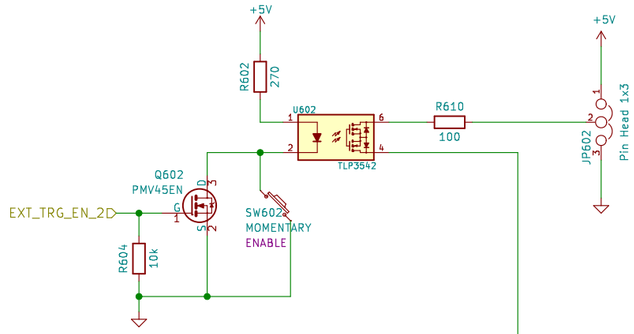

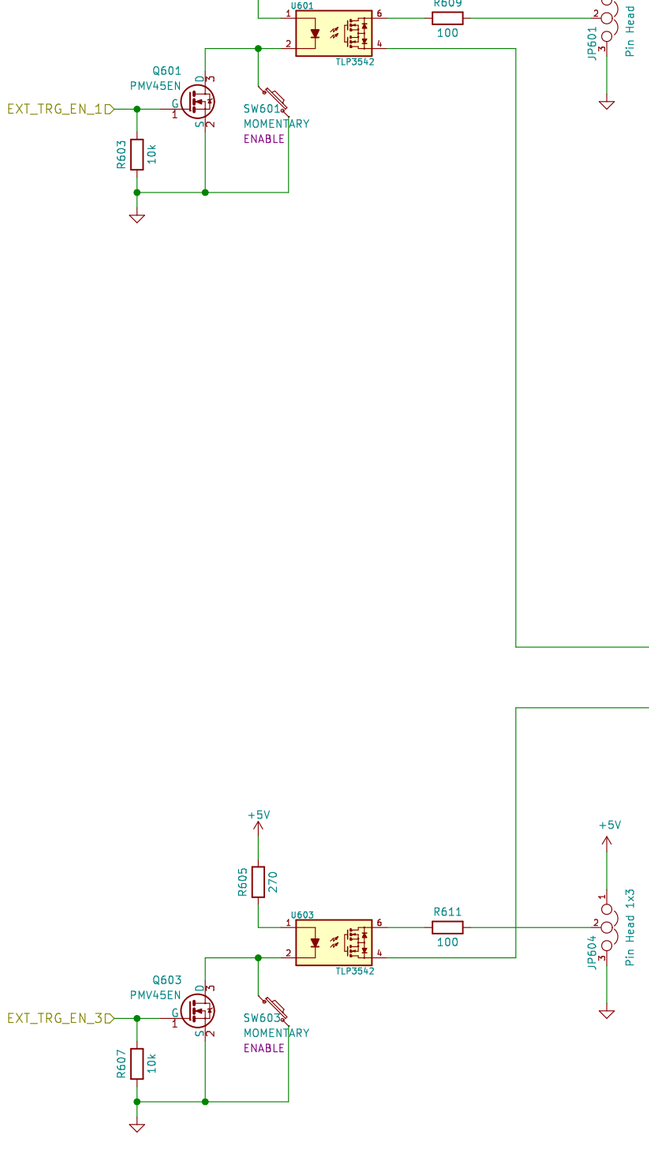

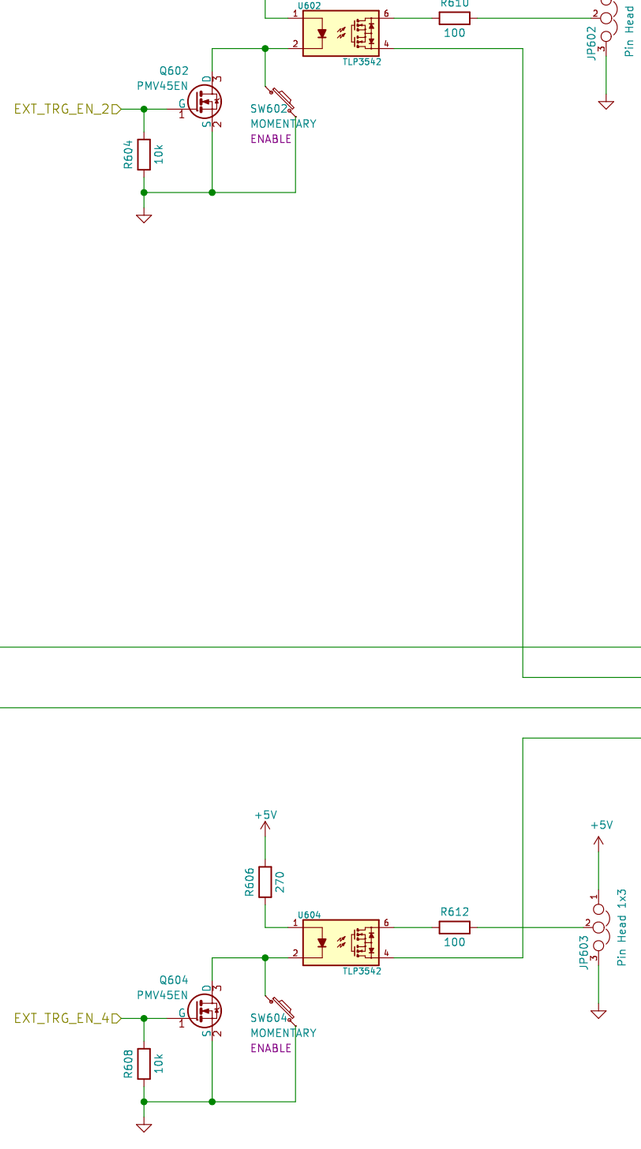

Trigger Outlets, Front Panel
Anderson PowerPole PP15-45

TODO: add MicroFit housing contacts to BOM

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Sheet: /External Device Triggers/
File: external_triggers.sch

Title: LTC3 External Device Triggers

Size: B	Date: 2016-09-13	**Rev: A**
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 6/6