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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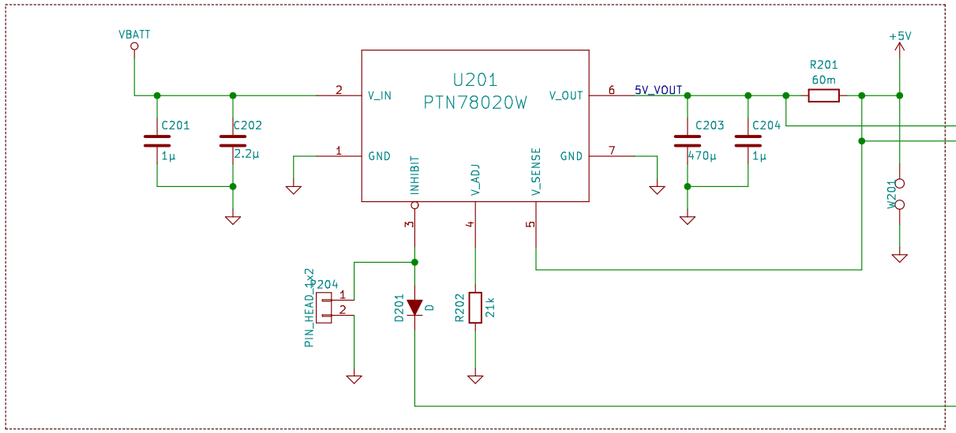
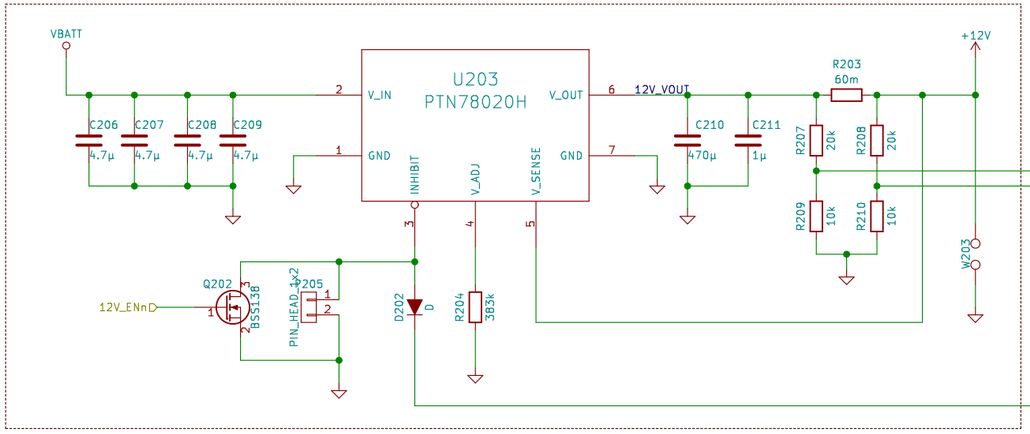
Sheet: /
File: LTC3.sch

Title: Launch Tower Computer 3 (LTC3)

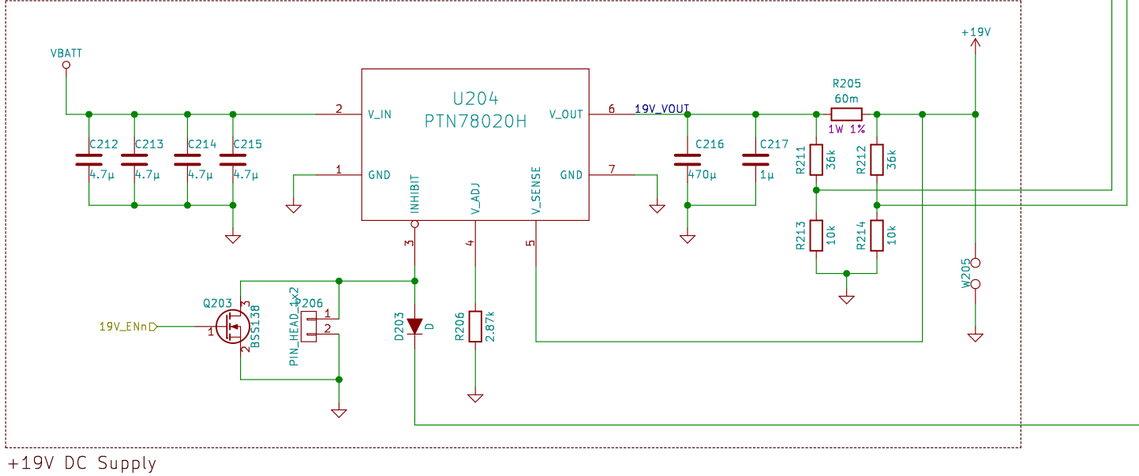
Size: B	Date: 2016-09-06	**Rev: A**
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 1/6



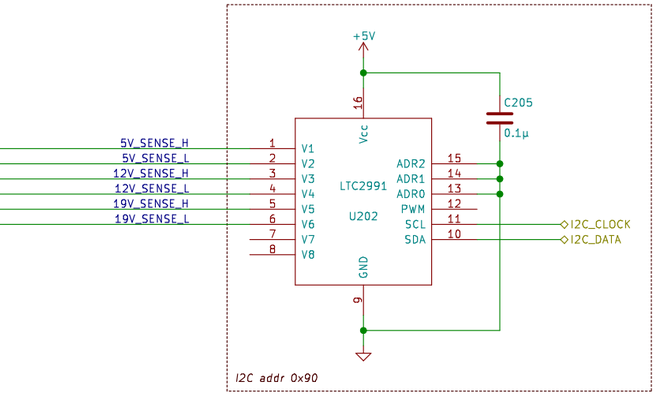
+5V DC Supply



+12V DC Supply



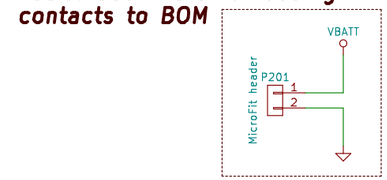
+19V DC Supply



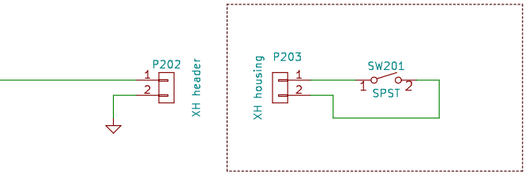
Voltage, Current, & Temp Sense

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

TODO: add MicroFit housing contacts to BOM



Power In



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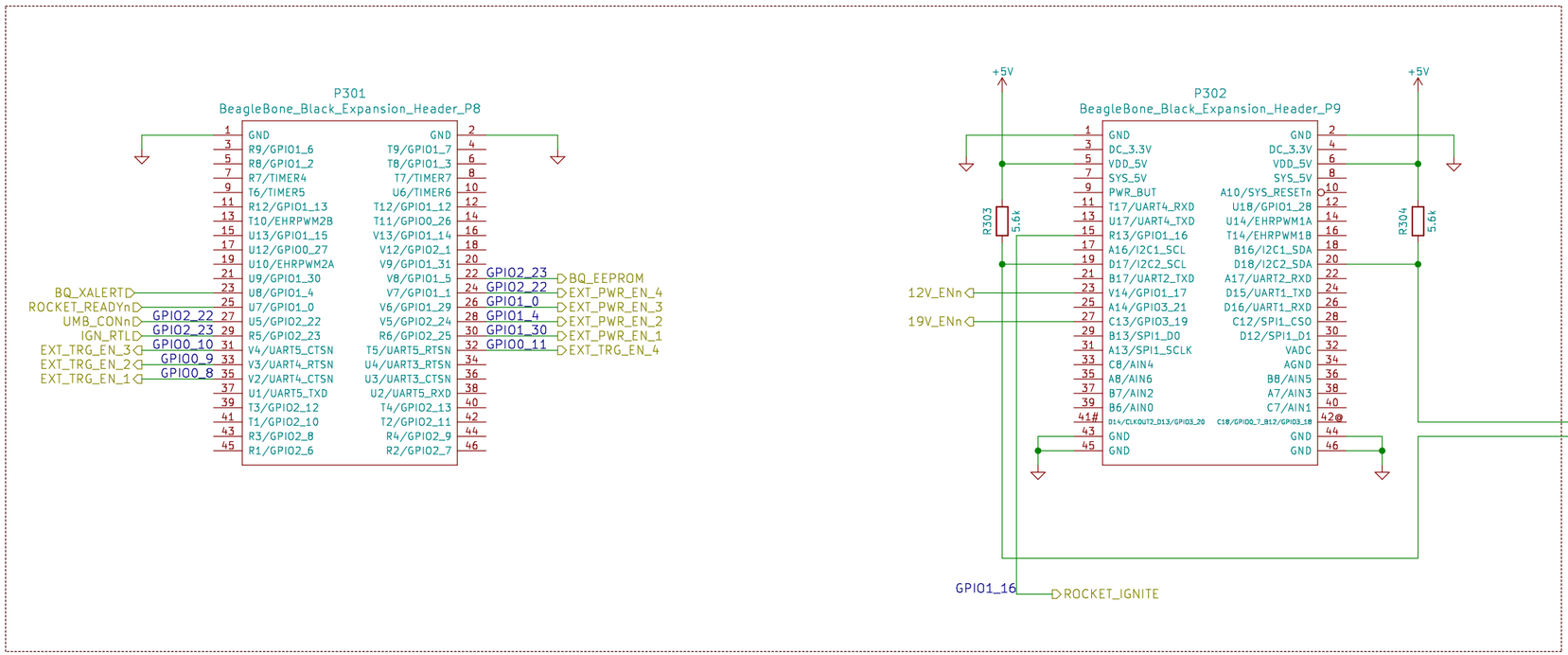
Sheet: /DC-DC Converters/
File: dcdc_converter.sch

Title: LTC3 DC-DC Converters

Size: B	Date: 2016-09-04	**Rev: A**
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 2/6



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

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.

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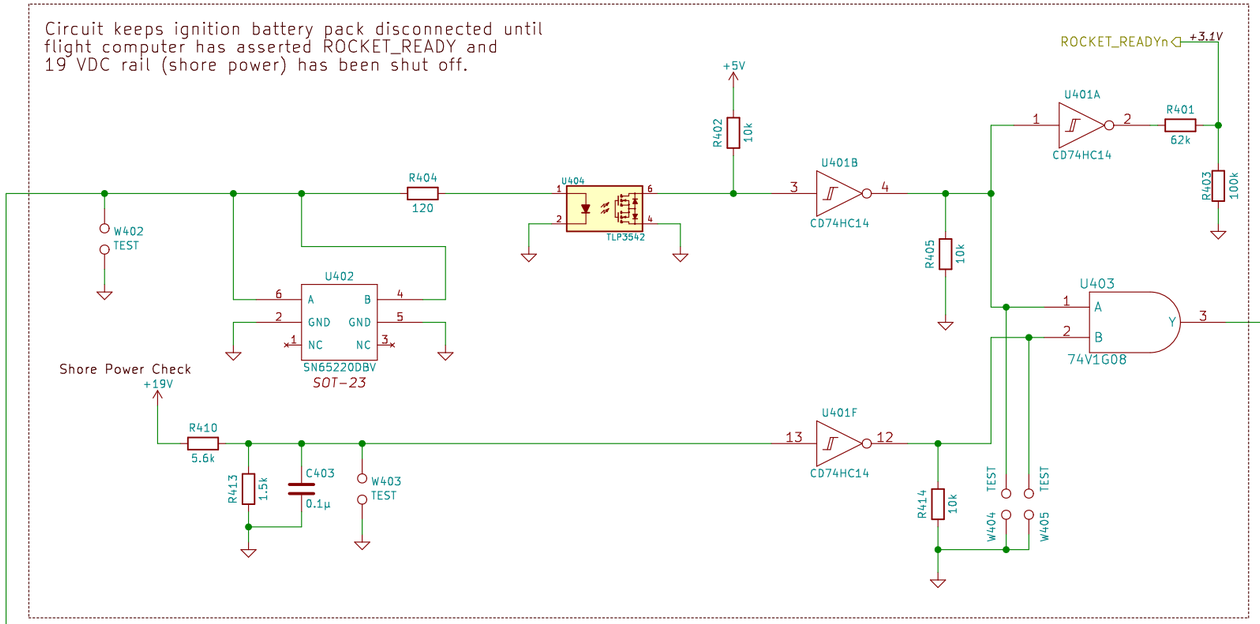
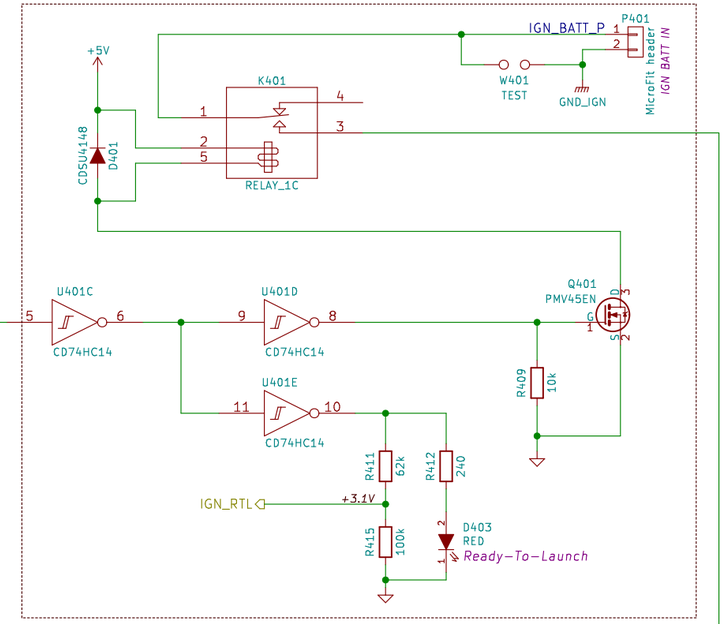
Sheet: /BeagleBone Black Cape/
File: beaglebone_cape.sch

Title: LTC3 BeagleBone Black Cape Interface

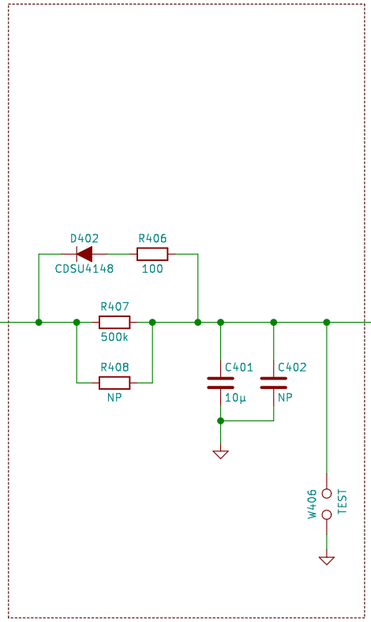
Size: B	Date: 2016-09-04	**Rev: A**
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 3/6



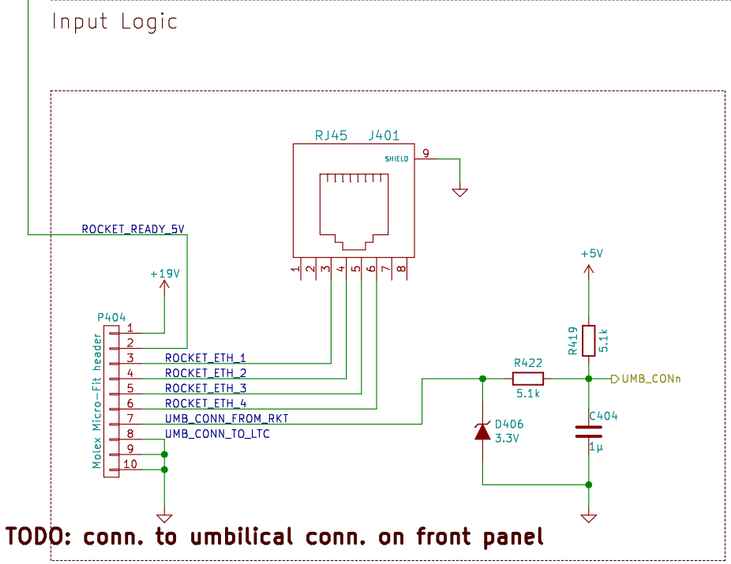
Input Logic



Ignition Battery Relay



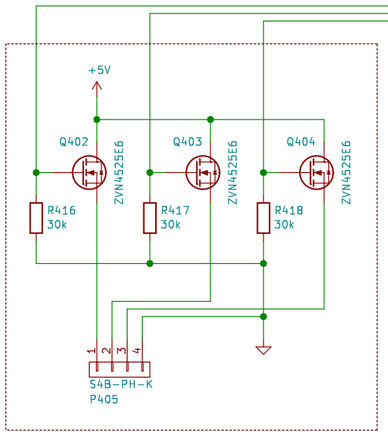
Delay (5s)

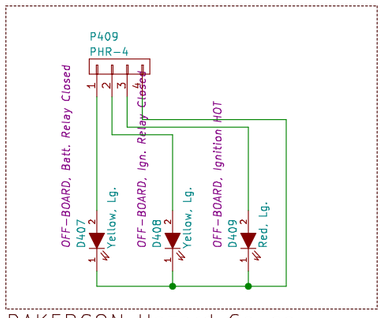


TODO: conn. to umbilical conn. on front panel

Rocket Umbilical

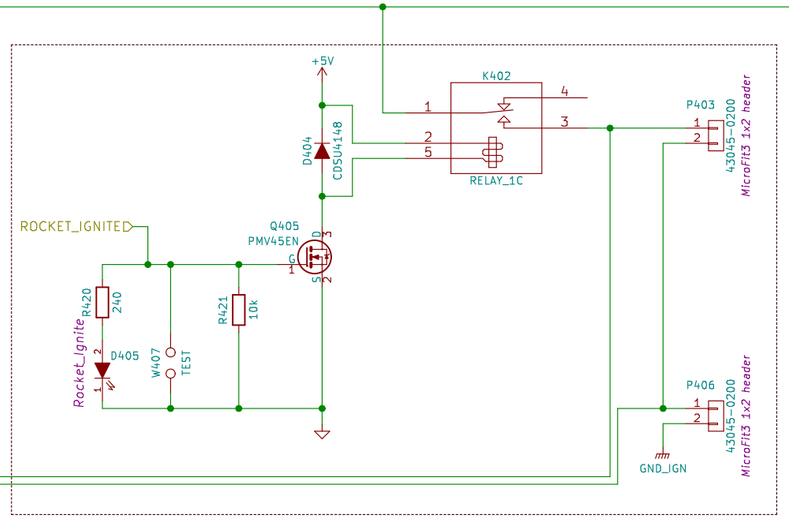
Rocket-to-BeagleBone Ethernet





BAKERCON Hazard Gauge

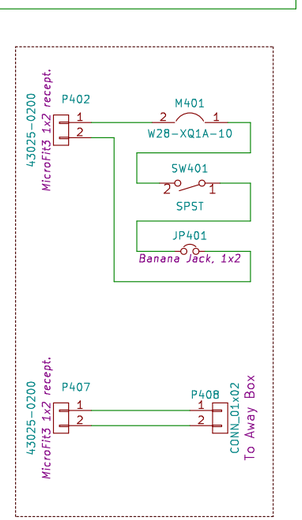
(super-bright LEDs, exterior panel)



Rocket Ignition Relay

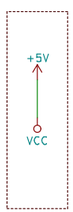
TODO: find out if Dialight 557 LED indicators require current-limiting resistor

TODO: add MicroFit housing contacts to BOM

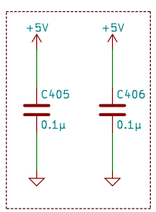


Breaker, Arm Switch, Shorting Bar, & Ignition Connector

(front panel)



VCC for CD74HC14



Bypass Capacitors (one per IC VCC)

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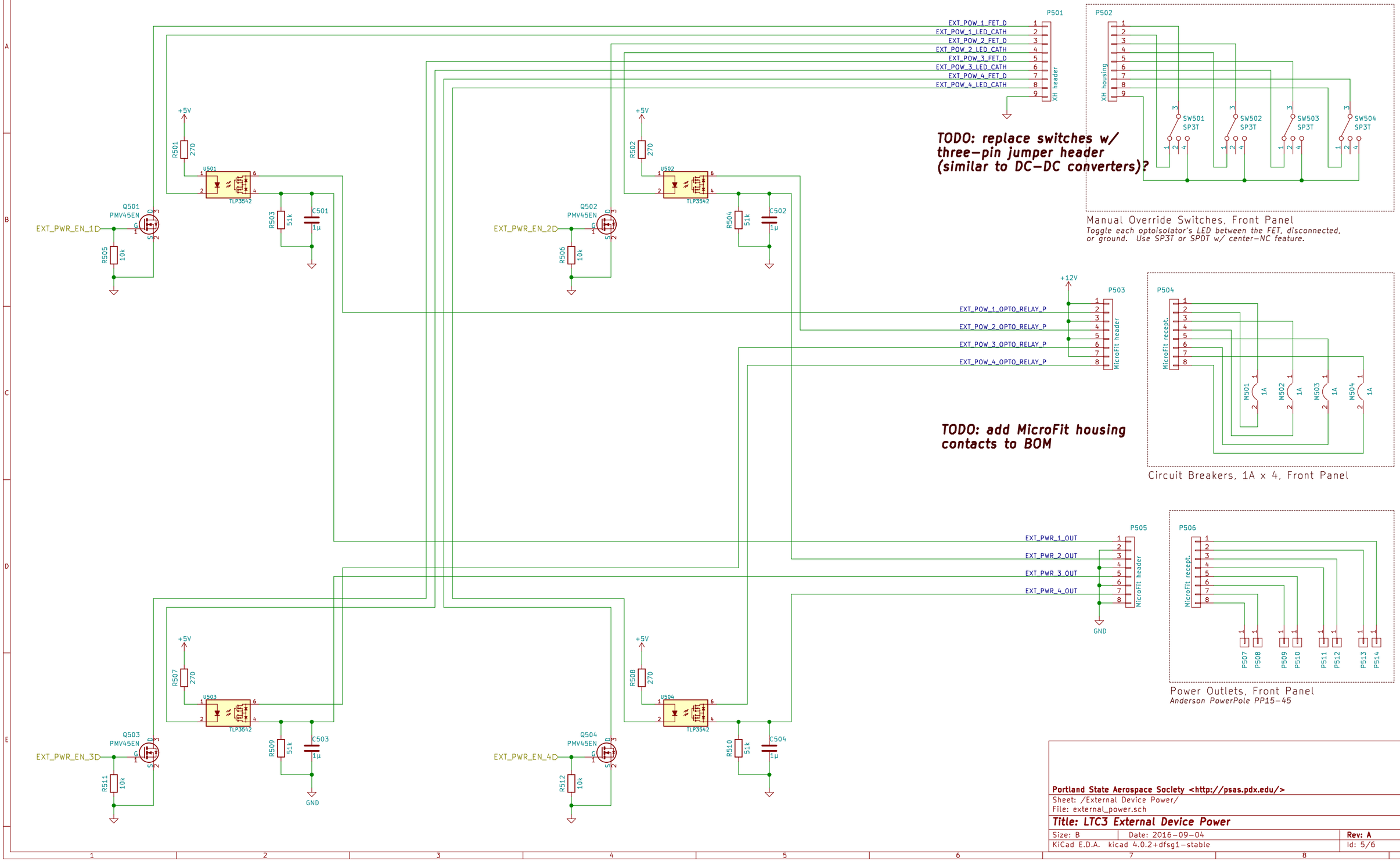
Sheet: /Rocket Umbilical & Ignition Control/

File: rocket_interface.sch

Title: LTC3 Rocket Umbilical & Ignition Control

Size: B	Date: 2016-09-04	Rev: A
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		Id: 4/6



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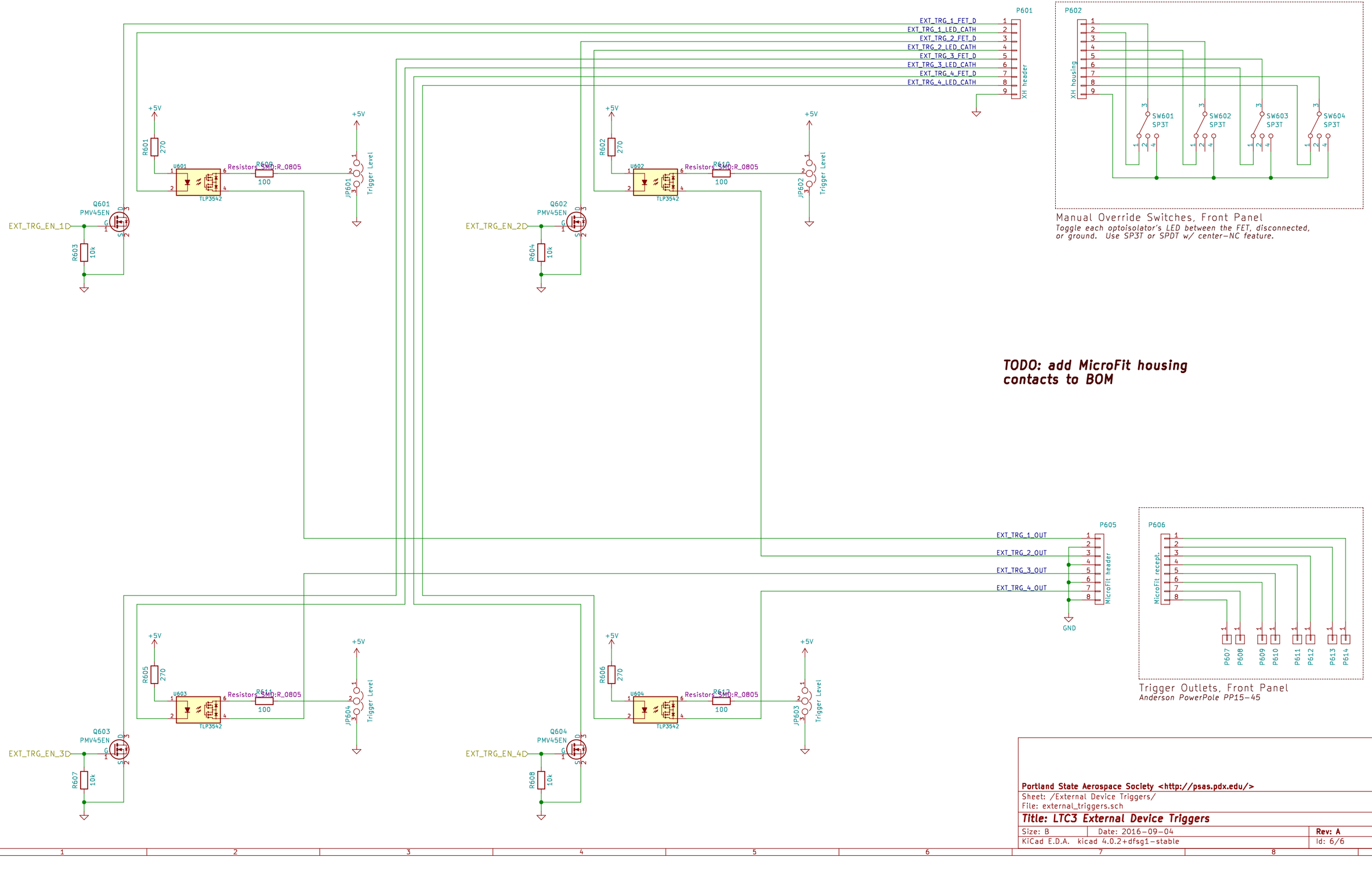
Sheet: /External Device Power/
File: external_power.sch

Title: LTC3 External Device Power

Size: B	Date: 2016-09-04	**Rev: A**
KiCad E.D.A. kicad 4.0.2+dfsg1-stable		id: 5/6


P601
EXT_TRG_1_FET_D
EXT_TRG_1_LED_CATH
EXT_TRG_2_FET_D
EXT_TRG_2_LED_CATH
EXT_TRG_3_FET_D
EXT_TRG_3_LED_CATH
EXT_TRG_4_FET_D
EXT_TRG_4_LED_CATH
XH header
+5V
R601
270
U601
TLP3542
Resistors_SMD:R_0805
R609
100
JP601
Trigger Level
Q601
PMV45EN
EXT_TRG_EN_1
R603
10k
R602
U602
R610
JP602
Q602
EXT_TRG_EN_2
R604
R605
U603
R611
JP604
Q603
EXT_TRG_EN_3
R607
R606
U604
R612
JP603
Q604
EXT_TRG_EN_4
R608
P602
XH housing
SW601
SW602
SW603
SW604
SP3T
Manual Override Switches, Front Panel
Toggle each optoisolator's LED between the FET, disconnected, or ground. Use SP3T or SPDT w/ center-NC feature.
TODO: add MicroFit housing contacts to BOM
P605
EXT_TRG_1_OUT
EXT_TRG_2_OUT
EXT_TRG_3_OUT
EXT_TRG_4_OUT
MicroFit header
GND
P606
MicroFit recept.
P607
P608
P609
P610
P611
P612
P613
P614
Trigger Outlets, Front Panel
Anderson PowerPole PP15-45
Portland State Aerospace Society <http://psas.pdx.edu/>
Sheet: /External Device Triggers/
File: external_triggers.sch
Title: LTC3 External Device Triggers
Size: B
Date: 2016-09-04
Rev: A
KiCad E.D.A. kicad 4.0.2+dfsg1-stable
Id: 6/6