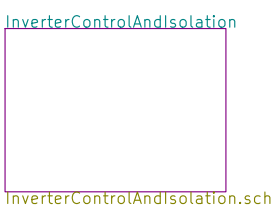

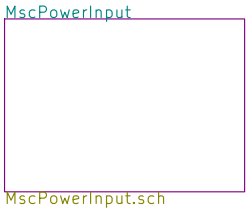

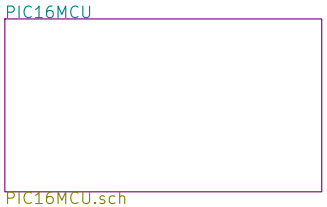

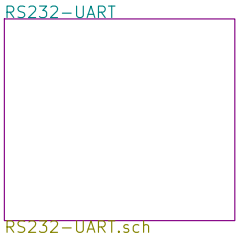

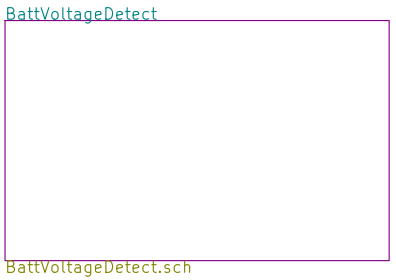

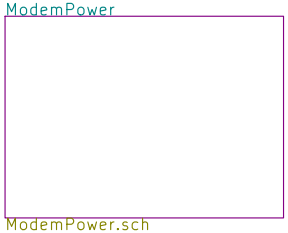

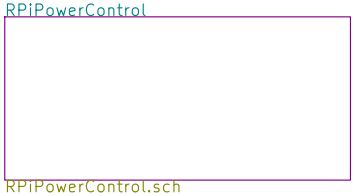

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Sheet: /
File: SiteControl.sch

Title: Telescope Base Station Control Board

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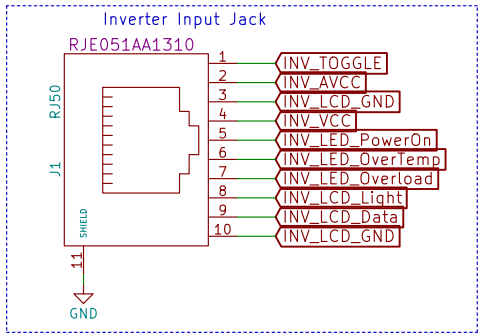

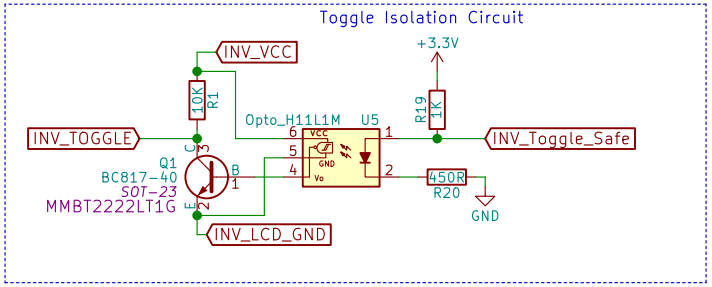

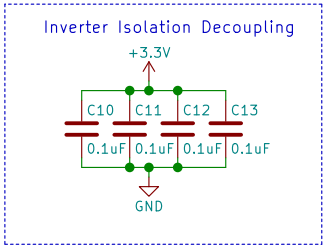

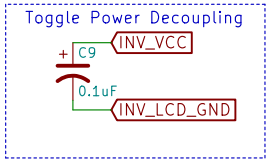

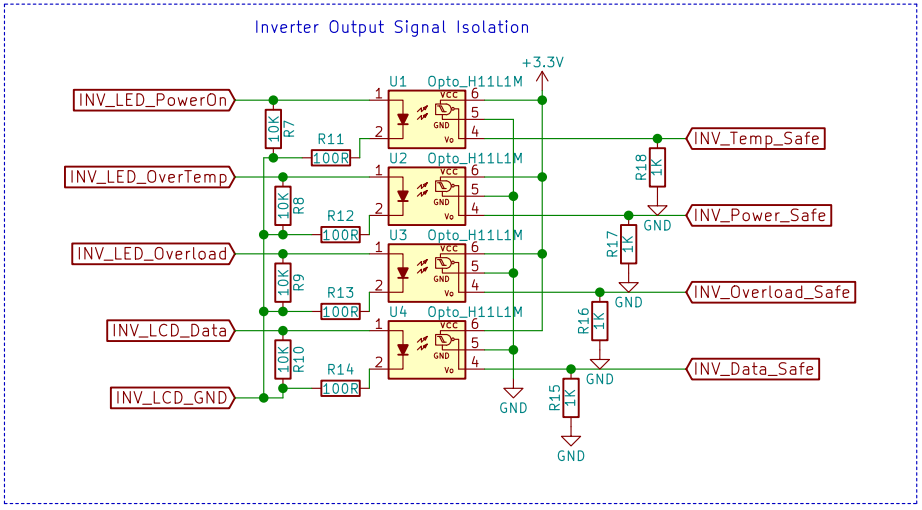

NOTES: The Samlex PST2000-12 inverter contains an RJ50 jack for interfacing with the RC-200 remote control. The engineers at Samlex have kindly provided application circuits for the basic circuitry within the RC-200 which will allow us to improvise our own controller which can be directly connected to the PIC 16 and thus the Raspberry Pi and RF Modem. This will allow us to remotely (from a distance of several km) activate and de-activate the inverter, as well as monitor information such as voltage, temperature, and power consumption.

Since the inverter RJ50 jack contains inverter main board level voltages (supposedly VBATT), the circuit will be isolated from the rest of the control board via opto-isolators. The metal case of the RJ50 jack will, however, be grounded to the chassis ground.

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Sheet: /InverterControlAndIsolation/
File: InverterControlAndIsolation.sch

Title: Telescope Base Station Control Board

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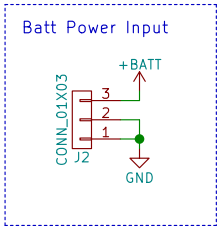

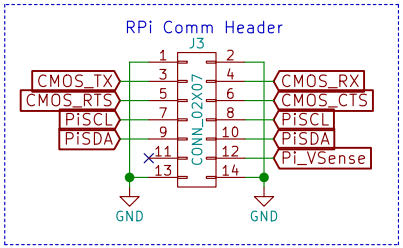

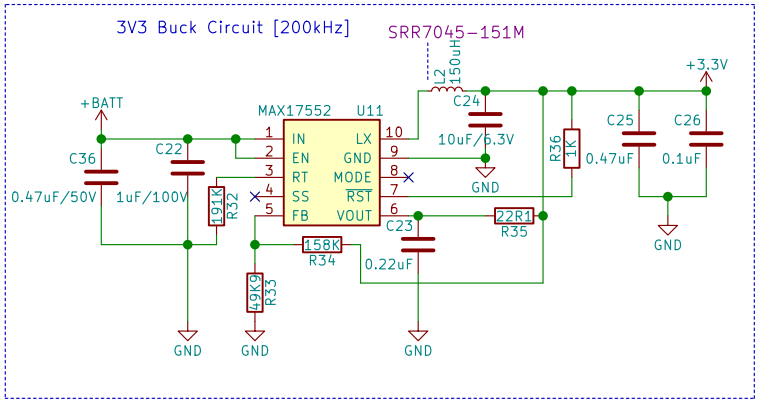

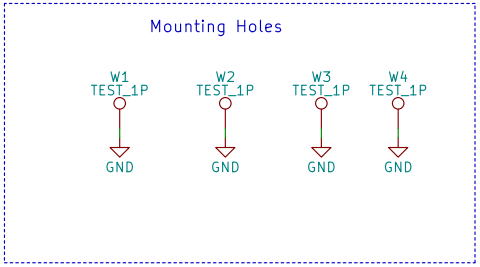

NOTES: The main power input terminal contains a second ground to allow for electrical connection with the enclosure. Since the board should be attached to a metal case (for shielding) via standoffs, and the mounting holes are grounded, this electrical connection should already be accomplished.

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Sheet: /MscPowerInput/
File: MscPowerInput.sch

Title: Telescope Base Station Control Board

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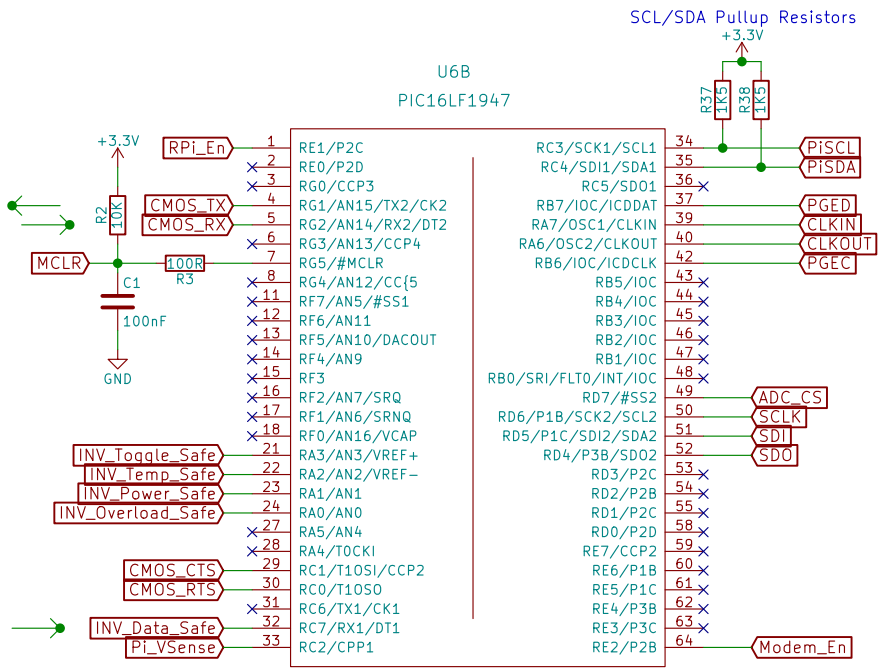

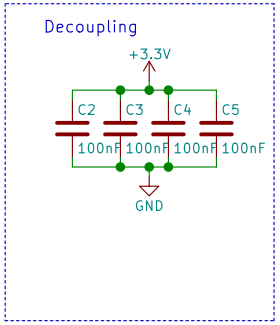

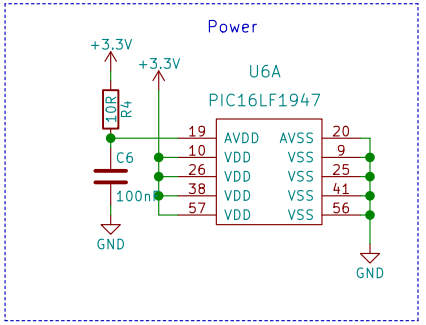

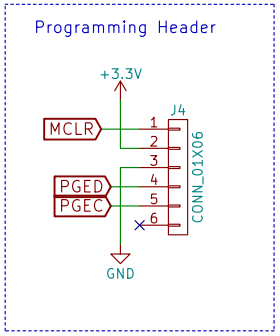

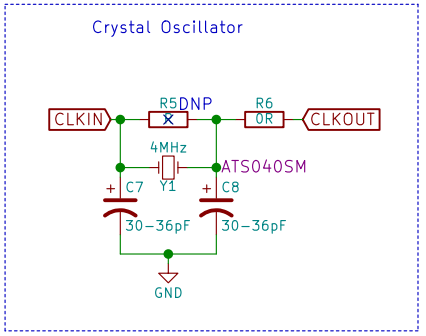

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Sheet: /PIC16MCU/
File: PIC16MCU.sch

Title: Telescope Base Station Control Board

Size: A4 | Date: August 11, 2016 | **Rev:**
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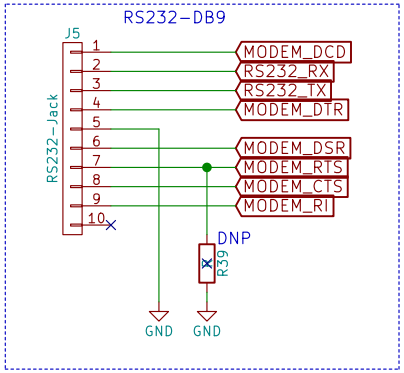

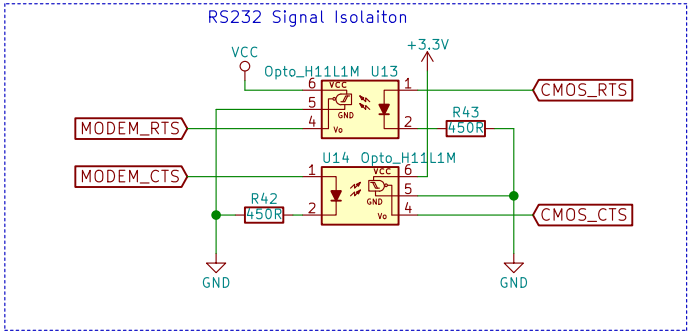

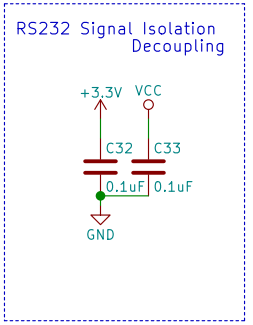

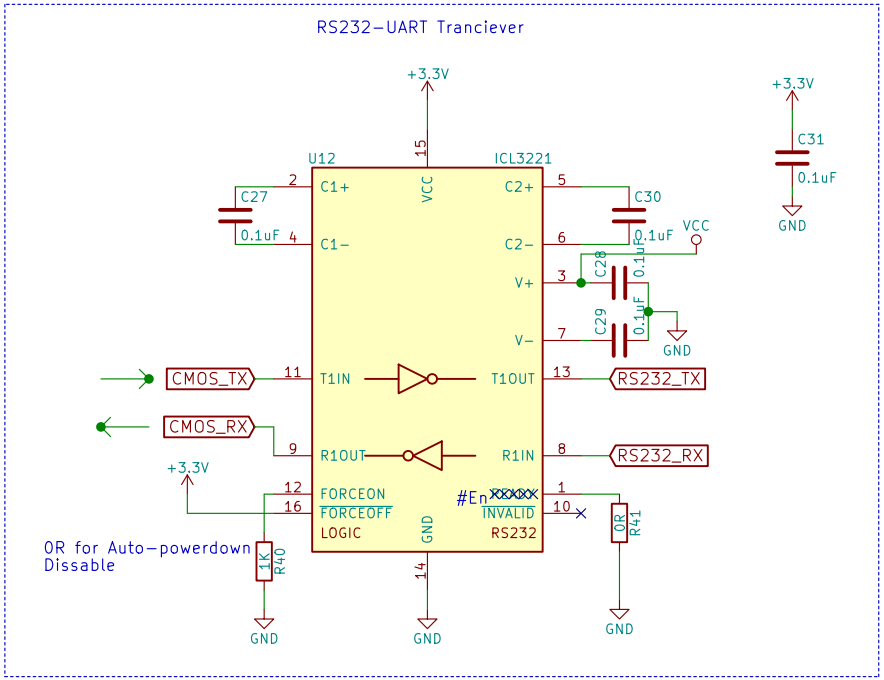

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Sheet: /RS232-UART/
File: RS232-UART.sch

Title: Telescope Base Station Control Board

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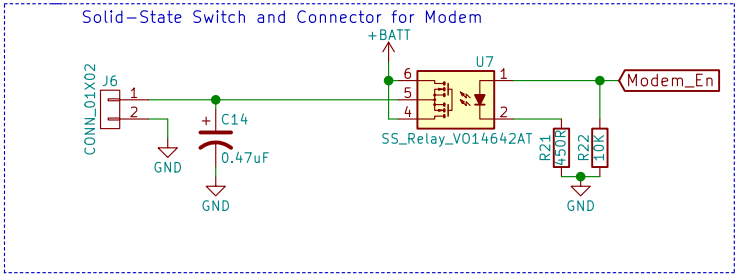

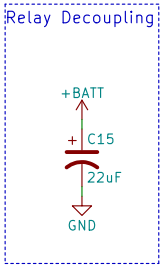

NOTES: The modem can be powered by anything between 9 VDC and 16 VDC indicating an internal power supply / regulator. This means that we can simply pipe battery power directly to the modem (after a switch / relay allowing for hard reset / power consumption)

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Sheet: /ModemPower/
File: ModemPower.sch

Title: Telescope Base Station Control Board

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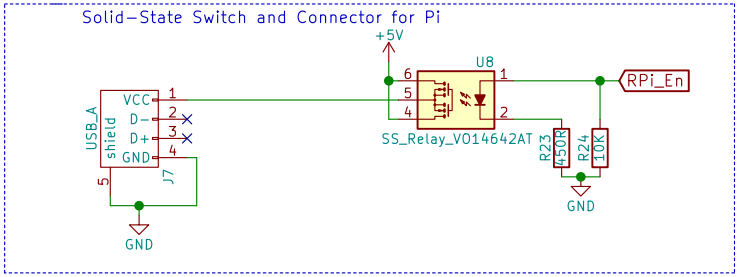

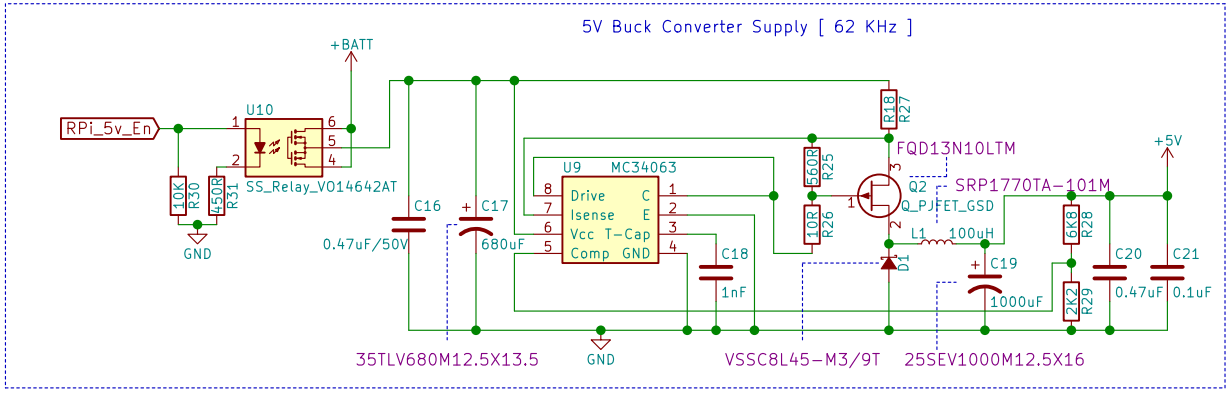

NOTES: This power supply should supply up to 1.8 A @ 5 VDC. The Raspberry Pi B+ only consumes 350 mA under heavy load, however, the Raspberry Pi 3 consumes 1.2 A under heavy load. Allowing for up to 1.8 A supply allows for a future move to a Raspberry Pi 3 without replacing this circuit.

The buck converter circuit was taken from
http://forum.allaboutcircuits.com/threads/12v-to-5v-dc-high-efficiency-smps-buck-converter-using-34063-ic.78805/

There are two relay switches placed in this circuit, one controls the activation of the buck converter (it will still dissipate power even under no load), and one for the Pi itself. The former can be used to conserve battery power, and allow for the buck converter to equalize a stable voltage before connecting the Pi. The latter allows for the Pi to be turned off when not needed, and to be hard power cycled.

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Sheet: /RPiPowerControl/
File: RPiPowerControl.sch

Title: Telescope Base Station Control Board

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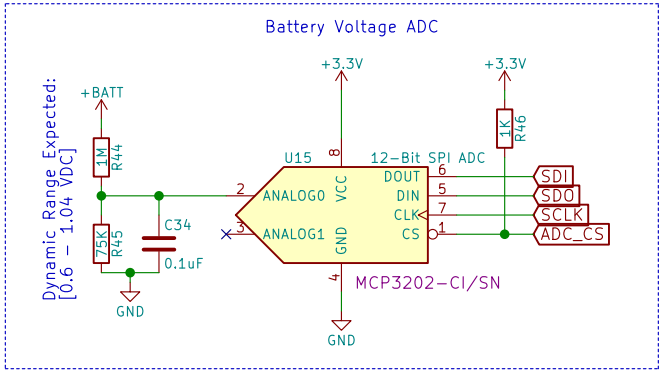

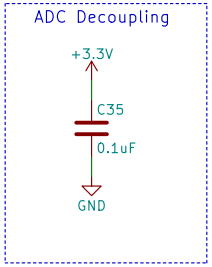

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Sheet: /BattVoltageDetect/
File: BattVoltageDetect.sch

Title: Telescope Base Station Control Board

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