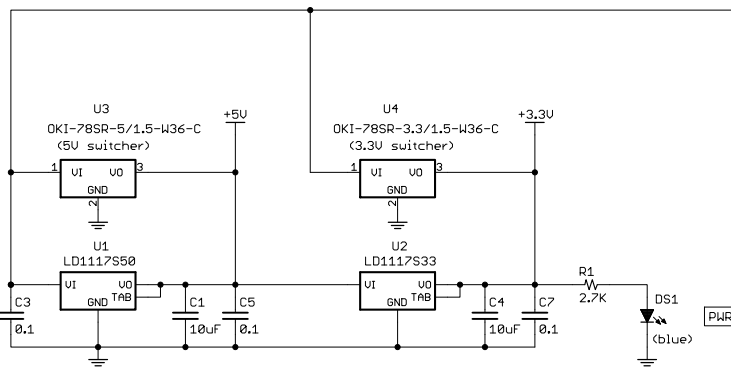
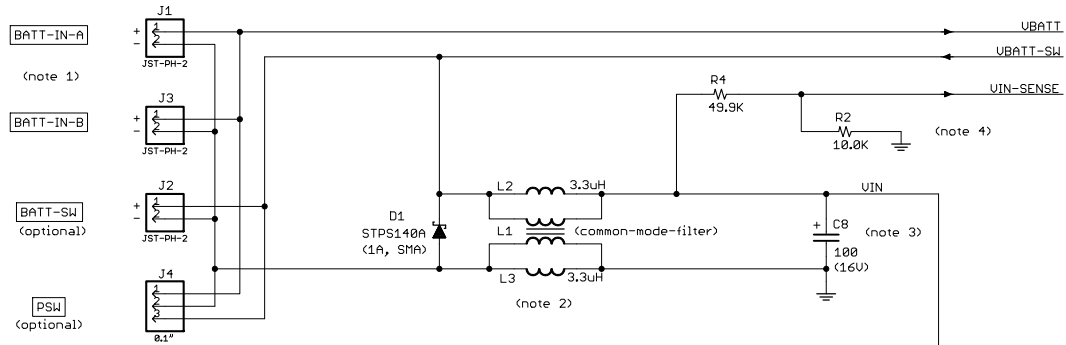
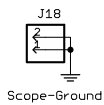
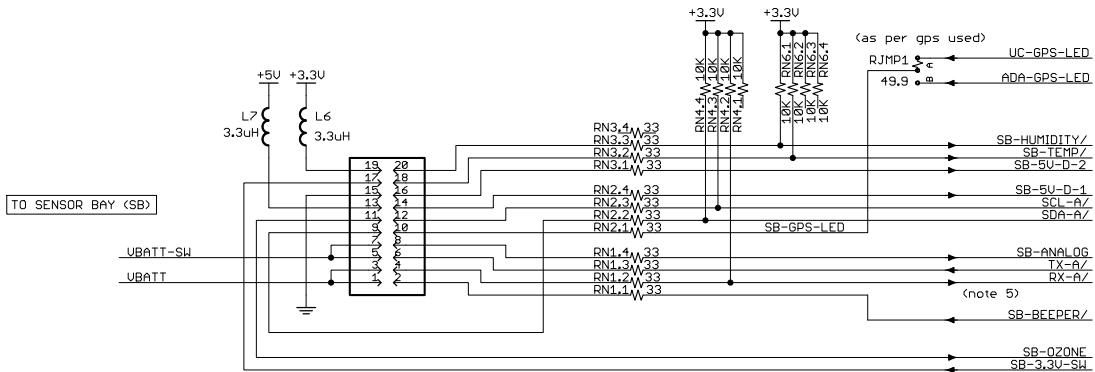


SurLEE's BALLOON SYSTEM ONE



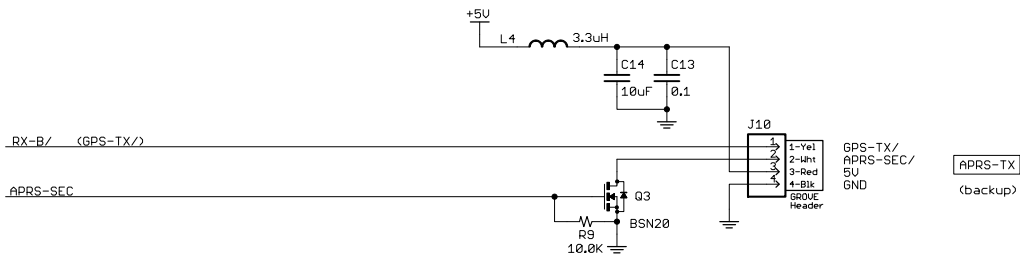
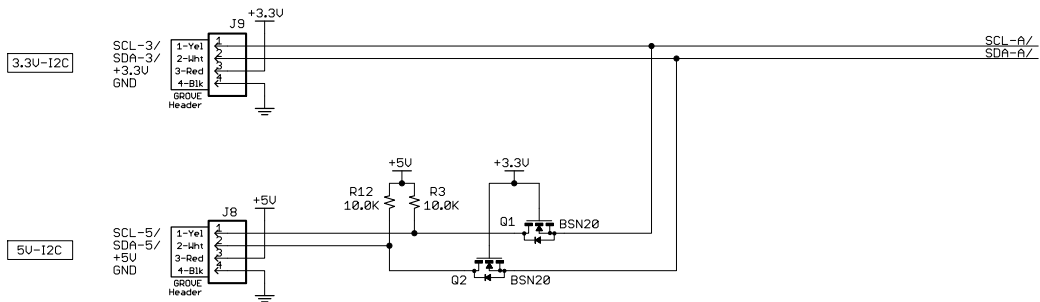
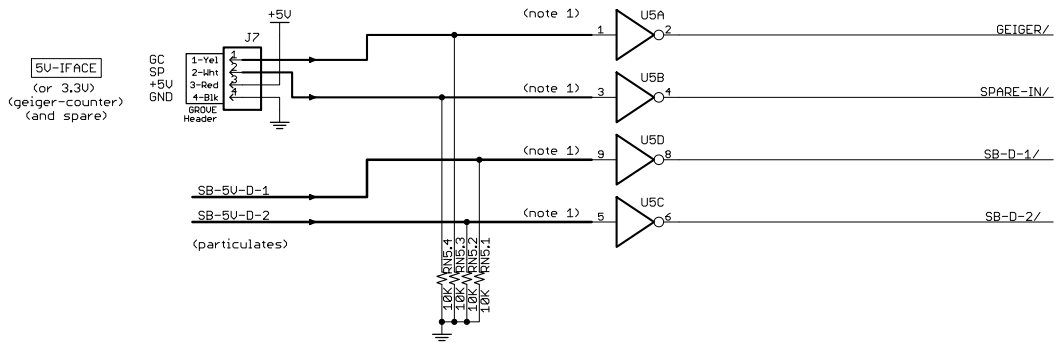
Input Power	5V Reg	3.3V Reg
Battery	Switcher (U3)	LDO (U2)
AC Adapter	LDO (U1)	LDO (U2)

(if no 5U is needed, and 3.3V draw is high, install only U4)



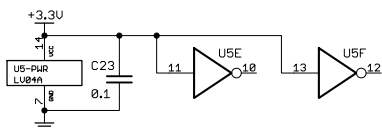
- Note 1: BATT-IN on either J1 or J2 (9 to 15VDC typical, 7.0V minimum)
- Note 2: L2/L3 are typical, common-mode filter (L1) can substitute
- Note 3: 1210 ceramic preferred, or substitute Tantalum-C (if you wish to promote third-world violence by using a conflict mineral)
- Note 4: UBATT-SENSE is 1/6 of batt voltage
- Note 5: If RF transceiver is installed, CSP serial port will override rf rx


SURLEE for surlee electrical engineers everywhere	
Title: BALLOON SYSTEM ONE	
Document: 190-0260	Rev: A
Date: 5/7/2016 12:57 AM	Sheet: 1/7

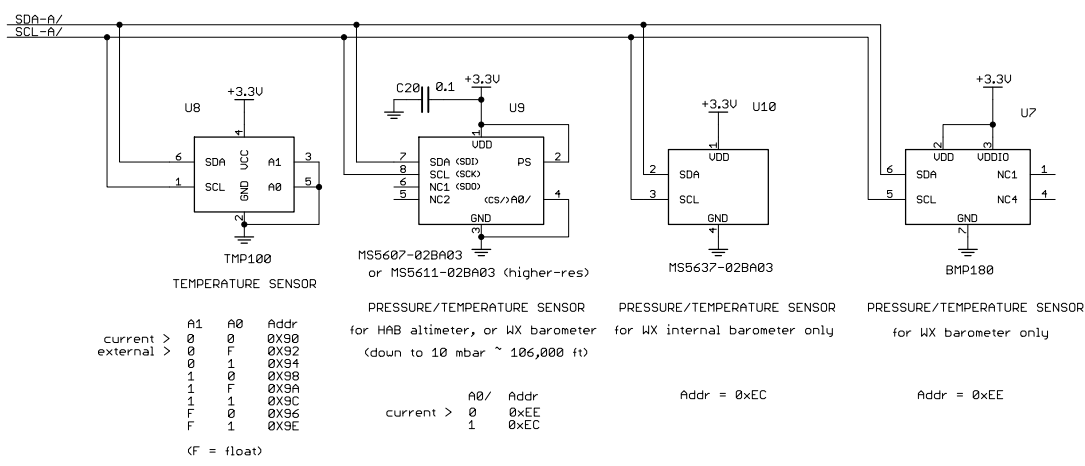
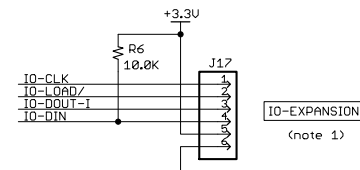
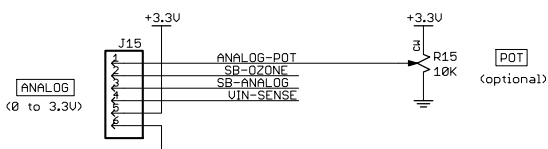
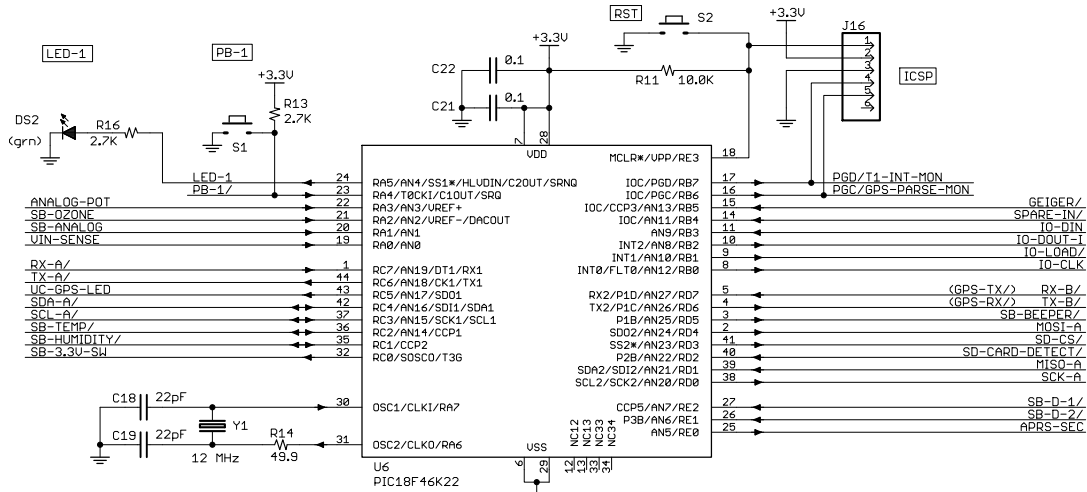


Note 1: Gate powered by 3.3U, but is 5U-tolerant for level conversion to 3.3U. Use LV-A (or LUX, or AHC), but NOT LV or HC.

Note 2: Fat nets are signals over (or potentially-over) 3.3U.



 SURLEE for surlee electrical engineers everywhere	
Title: BALLOON SYSTEM ONE	
Document: 190-0260	Rev: A
Date: 5/7/2016 12:57 AM	Sheet: 2/7



Note 1: IO-Exp is for chain of one or more series-connected 74x595 and/or 74x165. Use 74HC595 (or pricier 74L595A) for byte output. Use 74LV165A for byte input (3.3V-powered; has 5V-tolerant inputs).

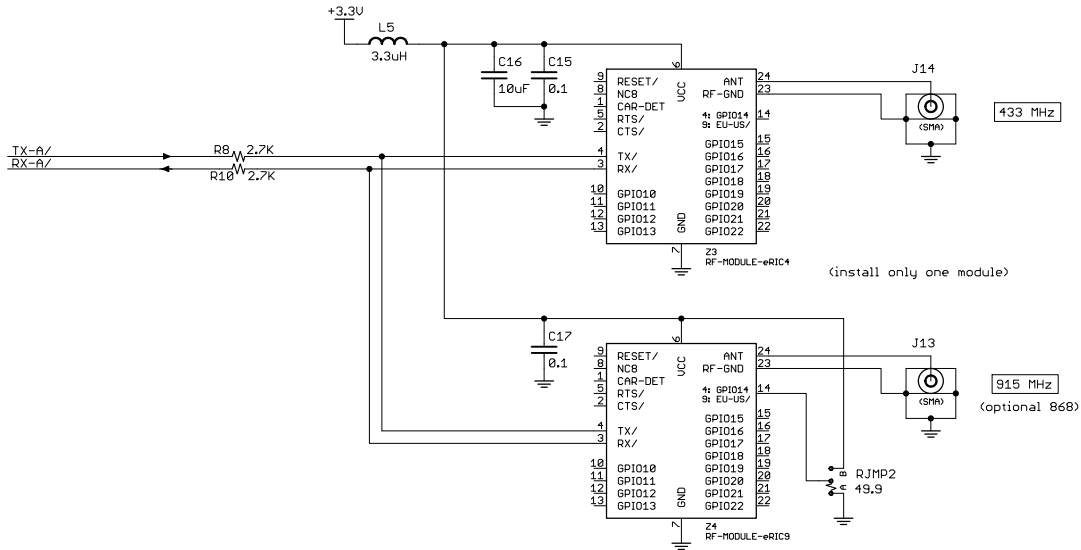
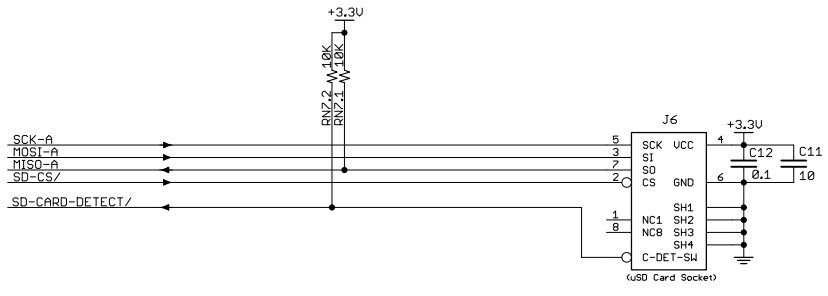
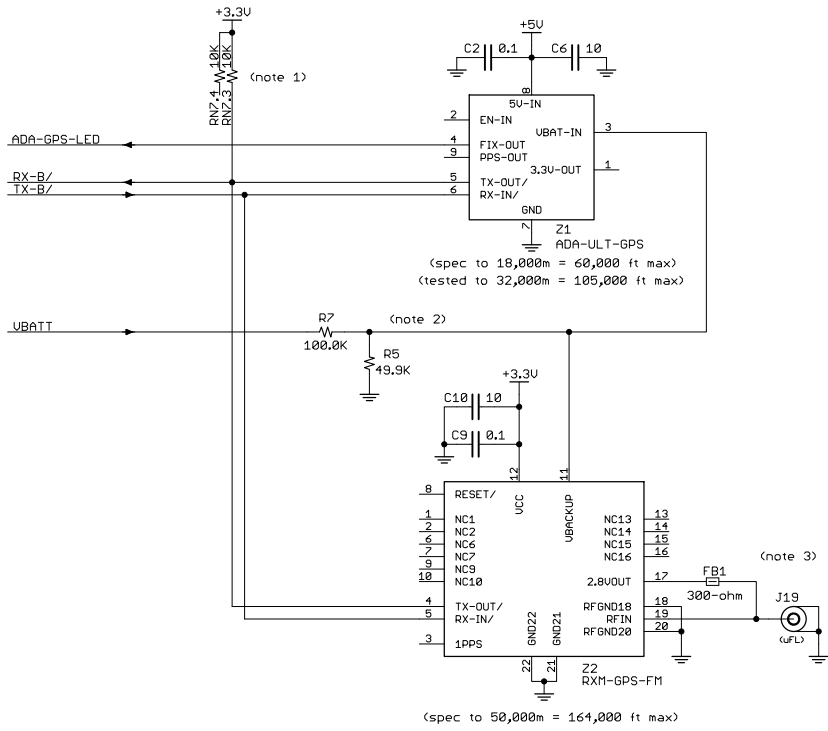
If only 74x595 in chain, IO sequence:

- Clock for 8/16... bits to shift data out
- Pulse LOAD/ low/high (strokes 74x595 on pos-edge)

If both 74x595 and 74x165 in chain, IO sequence:

- Pulse LOAD/ low/high (loads 74x165 when low)
- Clock for 8/16... bits to shift data out/in
- Pulse LOAD/ low/high (strokes 74x595 on pos-edge)

Can write magic number out/in to test loop (if loop closed)

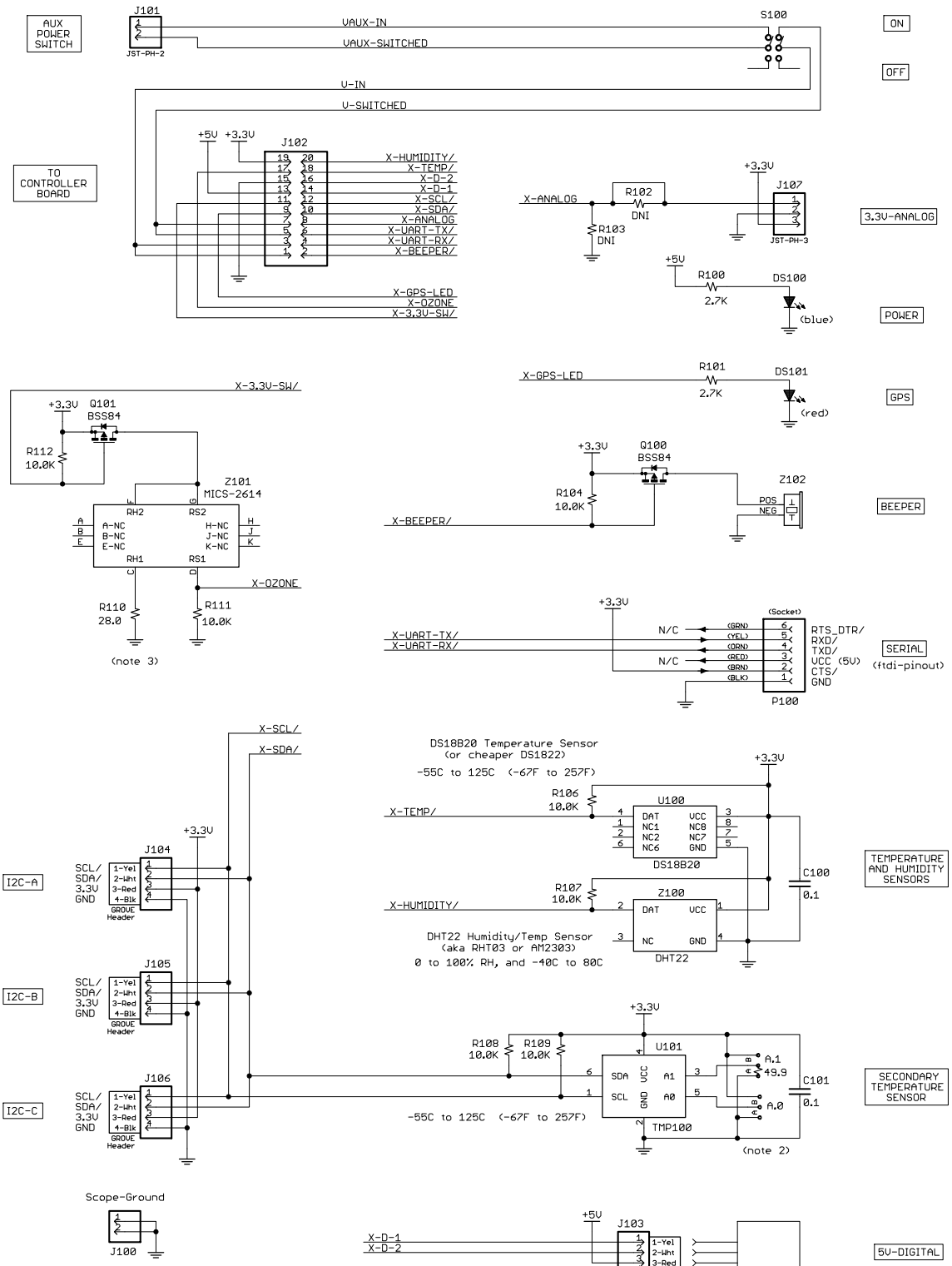


Note 1: GPS UOHmin is 2.4U, so ensure TTL in on micro, and/or use pullup

Note 2: Ubackup is 2.8 to 4.3U at about 7 uA

Note 3: Optional: for ext powered antenna, install FB1 and J8 (bypasses patch ant)
(should not be needed for HAB use)

SENSOR BAY (SB)



Note 1: Adafruit Ultimate GPS: flash every sec: acquiring, every 15 sec: tracking

Note 2: TMP100 Addressing:

A1	A0	Addr
0	0	0X90 = main board
0	F	0X92 = this board
0	1	0X94
1	0	0X98
1	F	0X9A
1	1	0X9C
1	0	0X9E
1	F	0X9E

Note 3: R110 sets heater current to ~34 mA (for 5U use 82.5 ohm, for 3.3U use 28.0 ohm) (expecting ~60ppm surface ??)

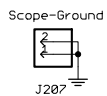
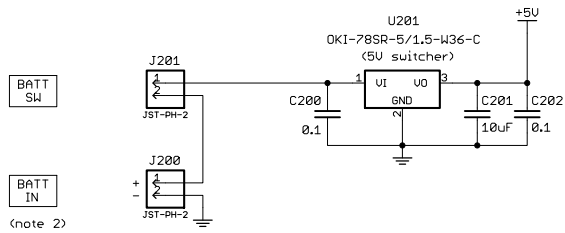
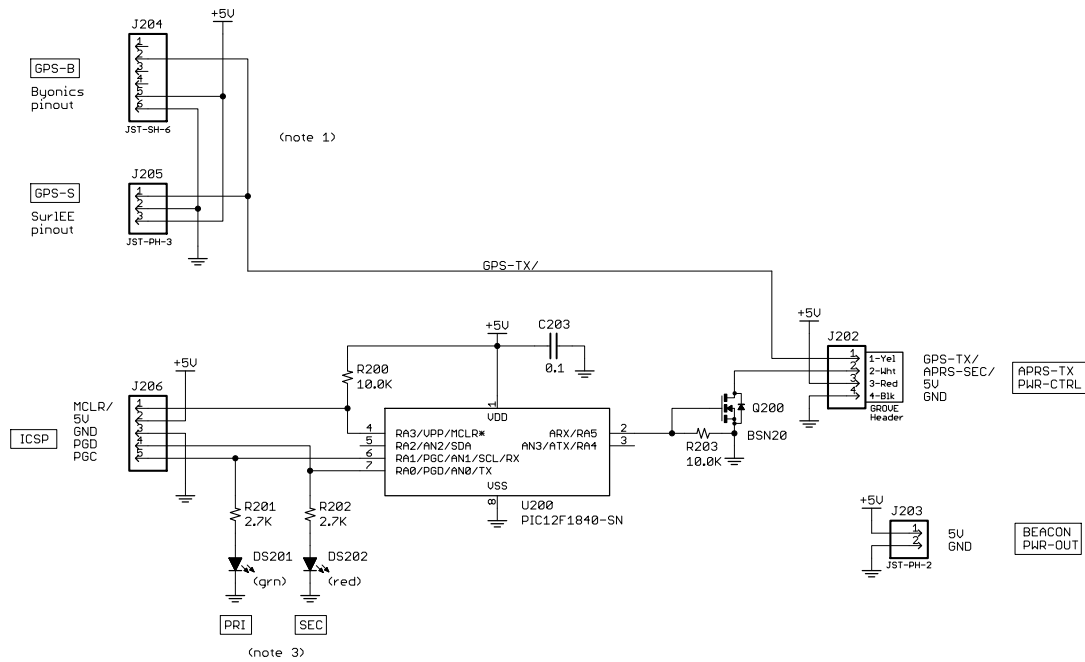
SURLEE for surlee electrical engineers everywhere

Title: **BALLOON SYSTEM ONE**


Document: **190-0260** Rev: A

Date: 5/7/2016 12:57 AM Sheet: 5/7

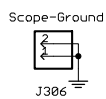
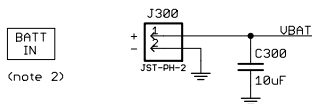
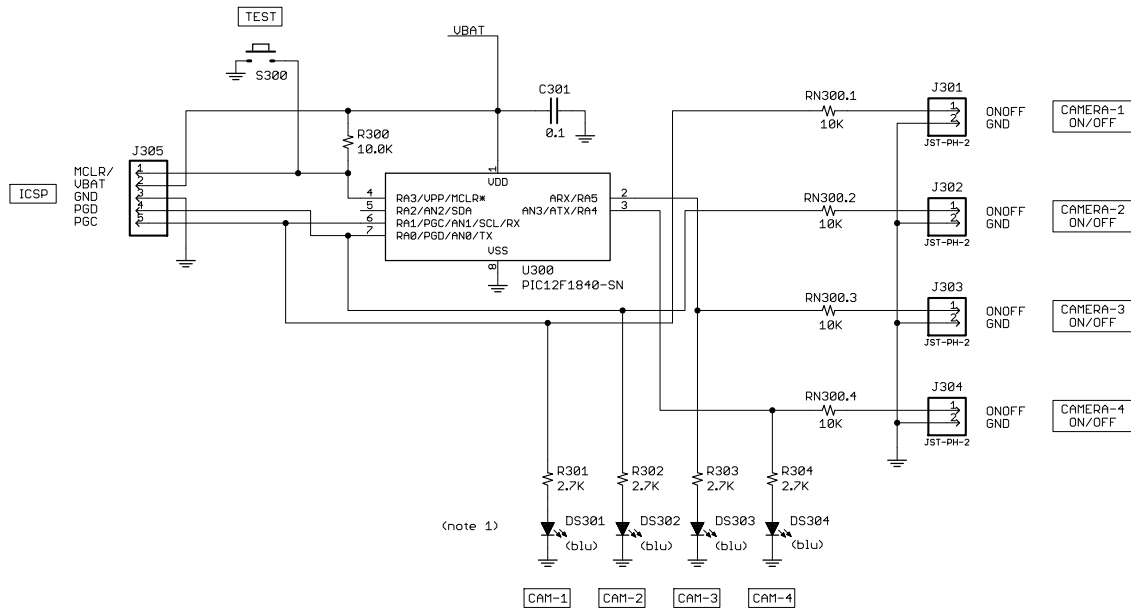
RADIO POWER/CONTROL HUB




- Note 1: GPS needed for MF-15-APRS, but not MT-1000
- Note 2: BATT-IN on J200 (9 to 15VDC typical, 7.0V minimum)
- Note 3: LEDs flash at beginning of primary or secondary period

 SURLLEE		for surlee electrical engineers everywhere
Title: BALLOON SYSTEM ONE		
Document: 190-0260	Rev: A	
Date: 5/7/2016 12:57 AM	Sheet: 6/7	

CAMERA CONTROL HUB



Note 1: Camera on/off toggle pulses are 500 msec
 Note 2: BATT-IN on J300 is 3.7V lipo

 SURLEE for surlee electrical engineers everywhere	
Title: BALLOON SYSTEM ONE	
Document: 190-0260	Rev: A
Date: 5/7/2016 12:57 AM	Sheet: 7/7