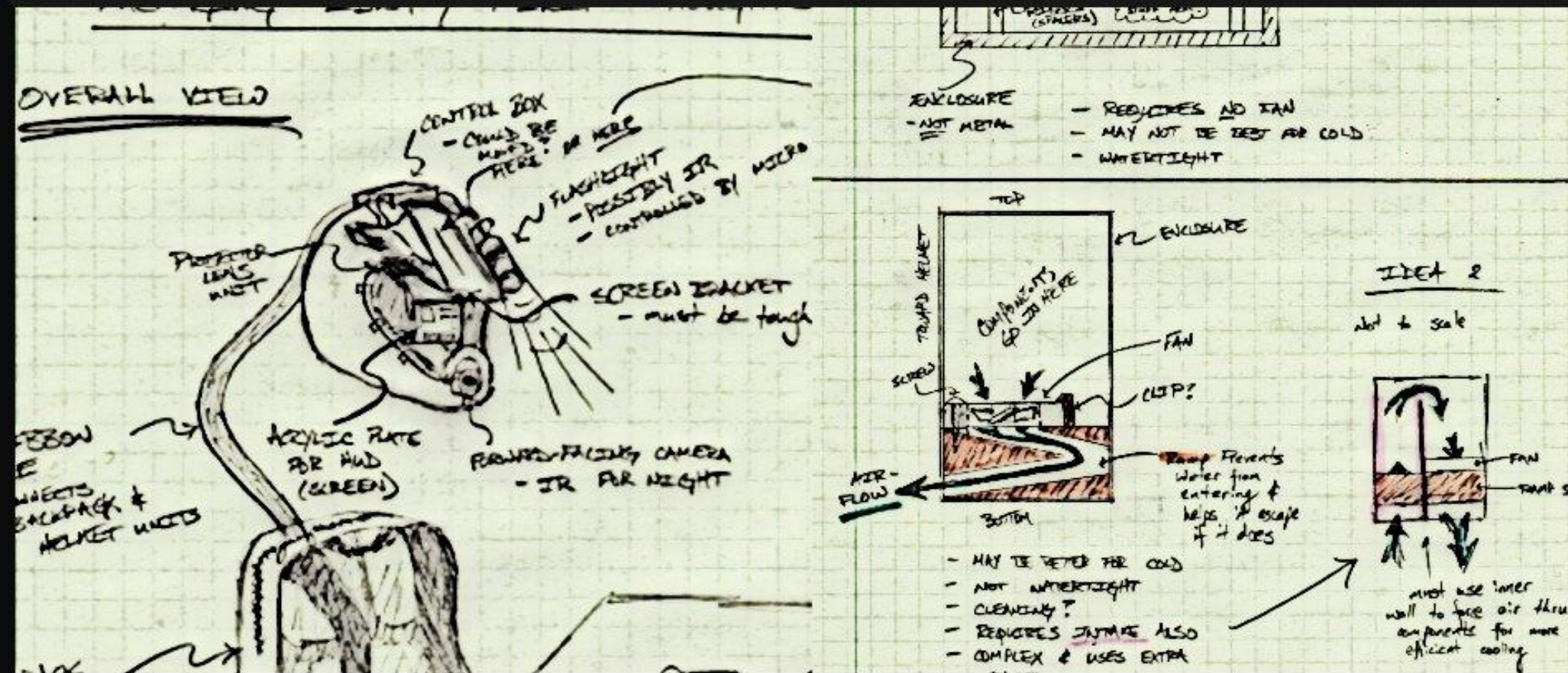
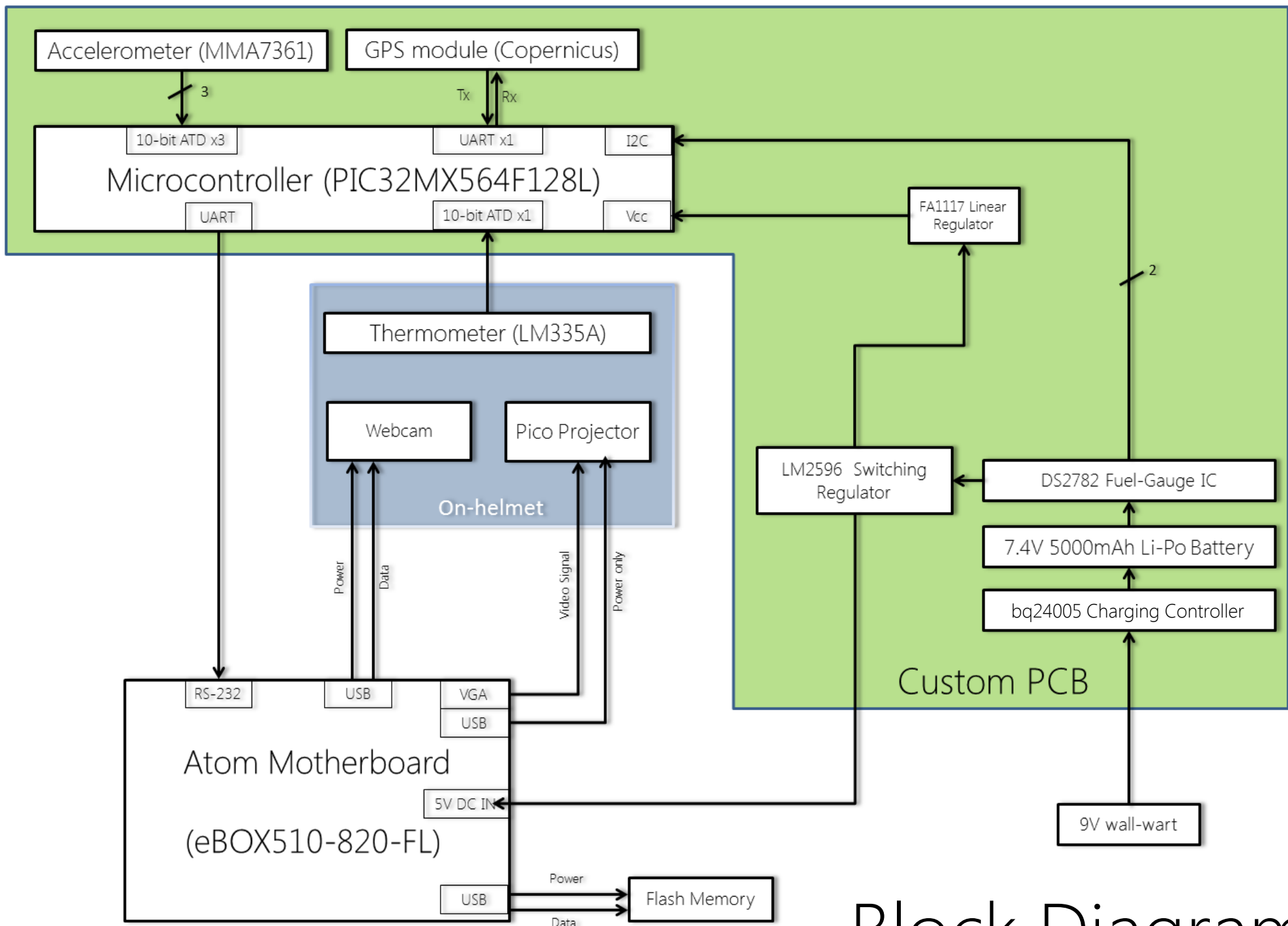


THE INCREDIBLE HUD



PSSCs

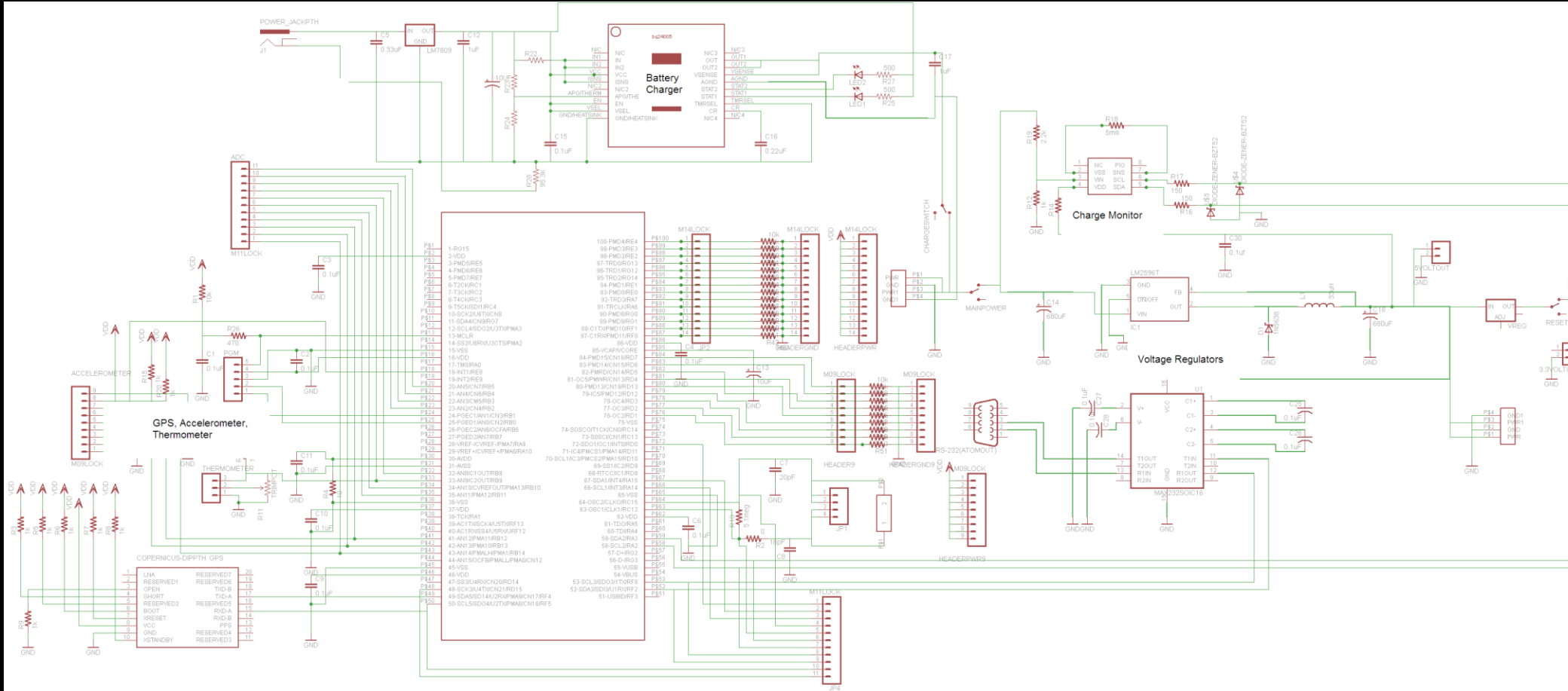
- An ability to display critical system information via a heads-up-display (HUD)
- An ability to measure telemetry information (speed, acceleration, temperature, and GPS) and store it to flash memory.
- An ability to maintain portability through the use of a rechargeable battery system .
- An ability to enable/disable important features within the display (full information, minimal, on/off).
- An ability to plot recorded GPS data on a map while overlaying telemetry information on a computer.



Block Diagram

Changes to Schematic

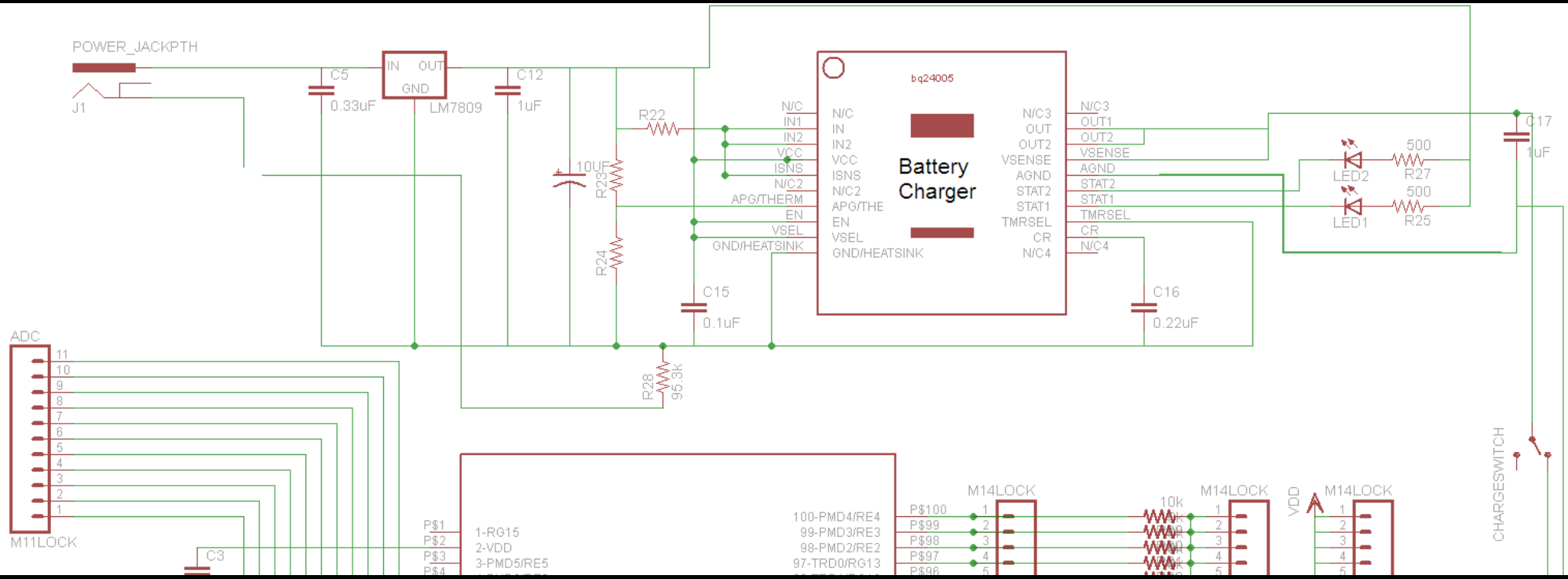
- Everything on one PCB board
 - Reduces possible communication issues
 - More compact, stable design
- Included charging circuit and charge monitoring (fuel gauge) circuit
 - TI bq24005 & Maxim DS2782

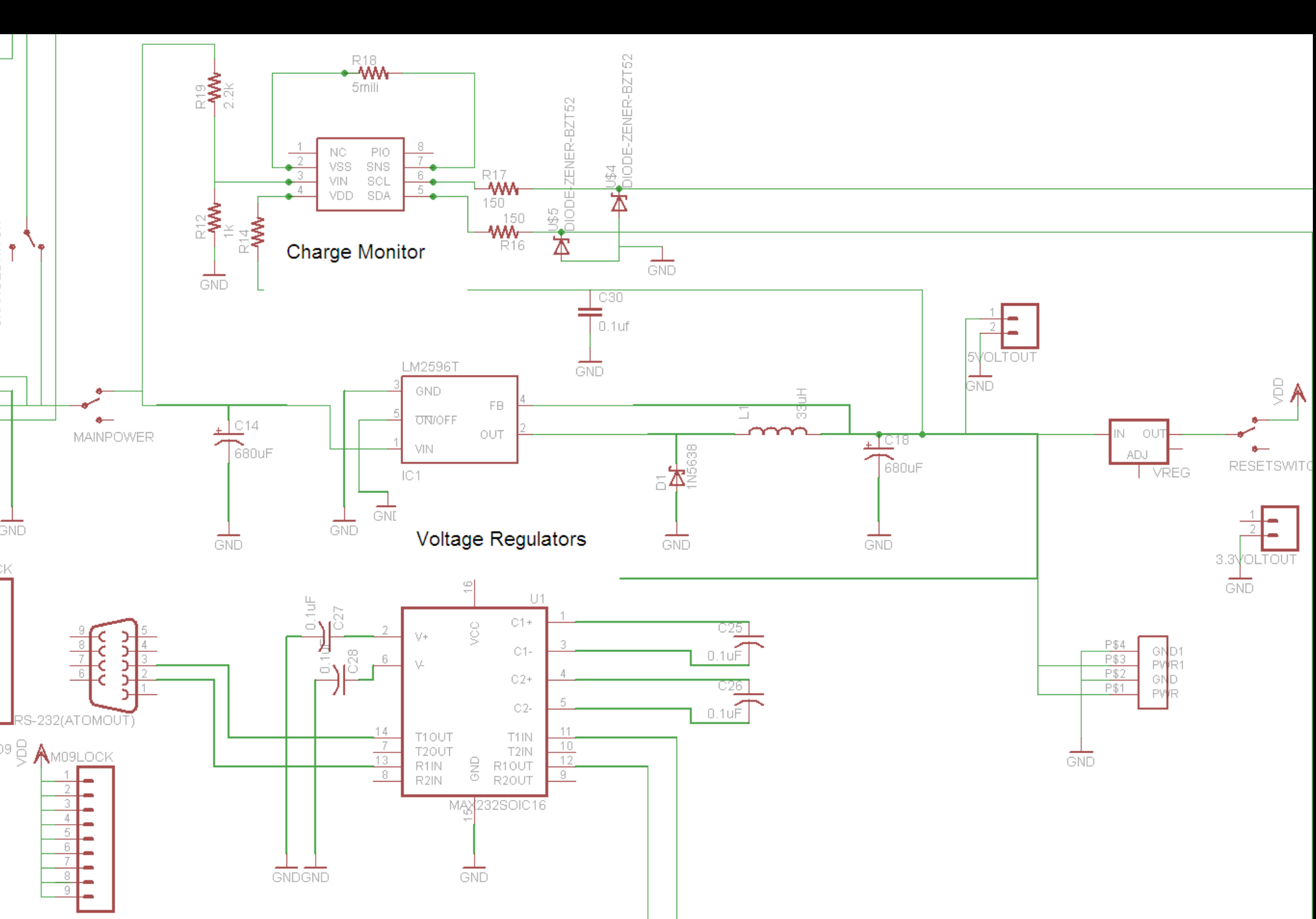


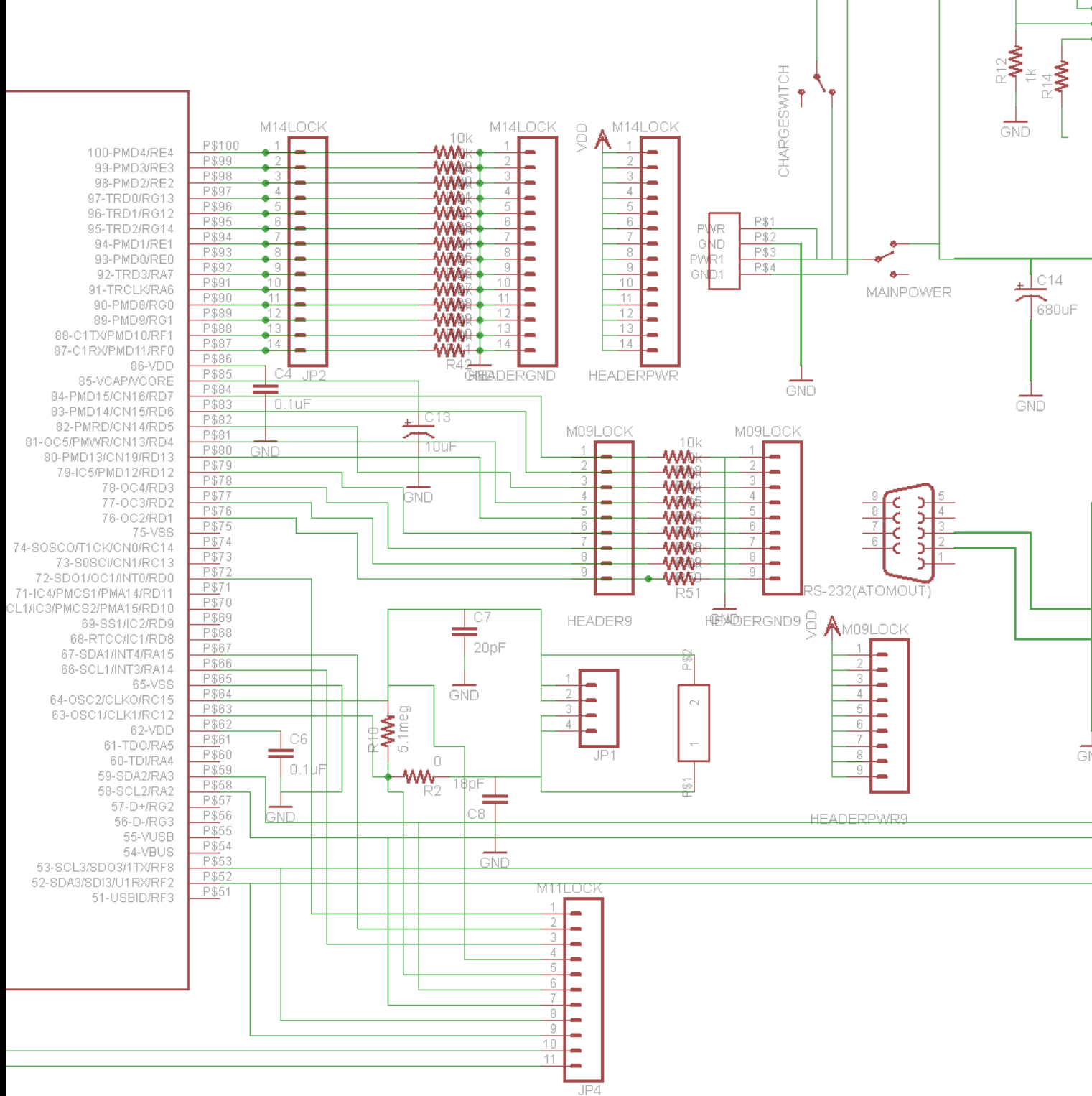
COPERNICUS-DIPPTH GPS

1	LMA	RESERVED7	20
2	RESERVED1	RESERVED6	19
3	OPEN	TOD-A	18
4	SHORT	TOD-B	17
5	RESERVED2	RESERVED5	16
6	RESERVED3	RESERVED4	15
7	ROOT	RND-A	14
8	VRESET	RND-B	13
9	VCC	PPS	12
10	GND	RESERVED4	11
	ISTANDBY	RESERVED3	10

P0	1-R015	P30	10B-PMD4RE4
P1	2-M0D	P31	99-PMD3RE2
P2	3-PMD5RE5	P32	88-PMD2RE2
P3	4-PMD6RE6	P33	97-TD0BR013
P4	5-PMD1RE7	P34	96-TD01R012
P5	6-TX0RC1	P35	95-TD02R014
P6	7-TX0RC2	P36	94-PMD1RE1
P7	8-TX0RC3	P37	93-PMD0RE3
P8	9-TX0SD1R04	P38	92-TX0LKR08
P9	10-SX0H02R08	P39	91-TX0LKR08
P10	11-SDA0CN0R07	P40	90-PMD0R08
P11	12-SCL0SD0J0T0PMA3	P41	89-PMD0R01
P12	13-NCL5	P42	88-C1T0R01M011
P13	14-SS2UR0R030TSPMA2	P43	87-C1R0PMD10R03
P14	15-VSS	P44	86-VDD
P15	16-VDD	P45	85-VCA0R0C0R0
P16	17-TM0SR0	P46	84-PMD10CN18R0D
P17	18-NT0RE5	P47	83-PMD10CN18R0D
P18	19-NT2RE5	P48	82-PMD10CN18R0D
P19	20-AND0CN0R05	P49	81-OC5P0R0CN13R0D4
P20	21-AND1N0R04	P50	80-PMD10CN18R013
P21	22-AND2N0R02	P51	79-OC5R0D1
P22	23-AND3N0R02	P52	78-OC4R0D1
P23	24-POEC1AN0CN3R0B1	P53	77-OC3R0D1
P24	25-POEC2AN0CN2R0B0	P54	76-OC2R0D1
P25	26-POEC3AN0CN0CFAR0B6	P55	75-VSS
P26	27-POEC4AN0CN0CFAR0B7	P56	74-S0B0C0T10C0H0R0C14
P27	28-REF+CV0REF+PMA0R08	P57	73-S0B0C0H0R0C13
P28	29-REF+CV0REF+PMA0R10	P58	72-S0B0C0H0R0R0B0
P29	30-VDD	P59	71-ICAF0C0T0PMA14R0D11
P30	31-VSS	P60	70-SCL0C0P0R030PMA10R010
P31	32-VDD	P61	69-S0C1R0D8
P32	33-AND0C0U0T0R0B8	P62	68-RT0C0C1R0D8
P33	34-AND1C0U0T0R0B8	P63	67-S0C1R0D15
P34	35-AND2C0U0T0R0B8	P64	66-SCL0R0T3R0A14
P35	36-AND3C0U0T0R0B11	P65	65-VSS
P36	37-VDD	P66	64-0B0C10C0H0R0C15
P37	38-T0R0A1	P67	63-0B0C10C0H0R0C12
P38	39-ACT0V0S0K48U0T0R0F13	P68	62-0B0C10C0H0R0C11
P39	40-ACT0V0S0S048U0T0R0F12	P69	61-T0R0A4
P40	41-AN13PMA11R0B12	P70	60-T0R0A4
P41	42-AN13PMA11R0B11	P71	59-S0A2R0A3
P42	43-AN13PMA11R0B10	P72	58-S0C1R0A2
P43	44-AN130C0P0M0LL0PMA0CN12	P73	57-S0C1R0A2
P44	45-VSS	P74	56-S0C1R0A2
P45	46-VDD	P75	55-VSS
P46	47-S0C1R0A0C0N0R0D14	P76	54-VBUS
P47	48-S0C1R0A0C0N0R0D15	P77	53-S0C1R0A0C0N0R0D14
P48	49-S0C1R0A0C0N0R0D16	P78	52-S0C1R0A0C0N0R0D15
P49	50-S0C1R0A0C0N0R0D17	P79	51-US0B0D0R0F3







General PCB considerations

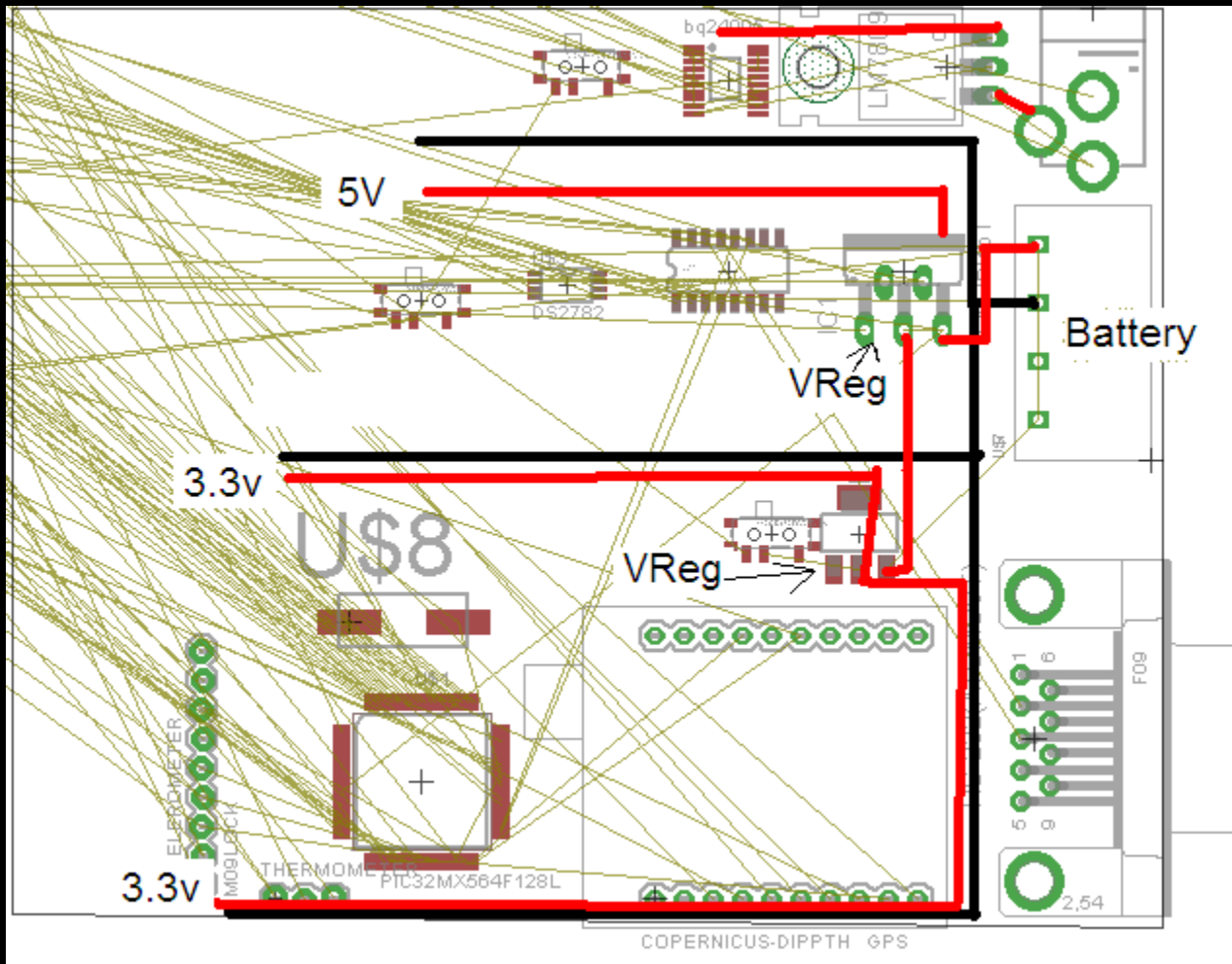
- Size – must fit with motherboard and battery pack in backpack enclosure
 - 130mm x 90mm
- Focus on internal noise reduction
- Terminals need to be placed at edges
- Separation of components by current draw

Microcontroller PCB considerations

- Headers for I/O pins to aid debugging
- External crystal oscillator
- ADC pins away from digital I/O
- Microcontroller near I2C and RS232 jack

Power Supply PCB considerations

- 5 Volt line, 3.3 Volt line, 9 volt wall wart
- Off board terminal connections for motherboard and cooling fans
- Single point ground



Questions?

- ???