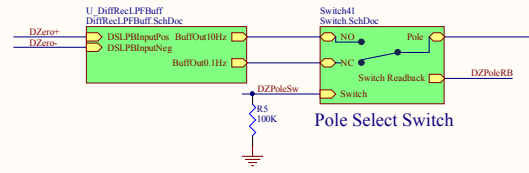
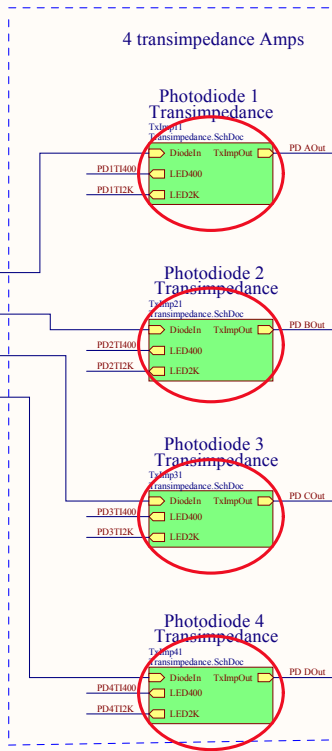


LHO As-Built 9/22/16

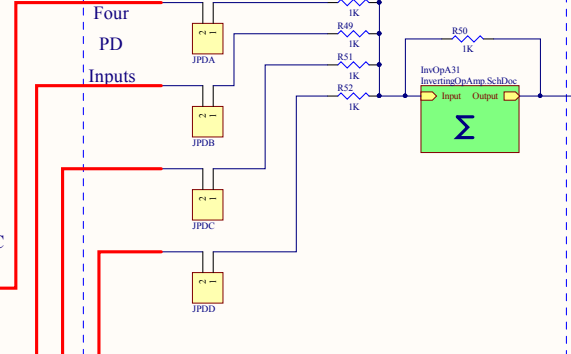
Digital Zero Input From DAC



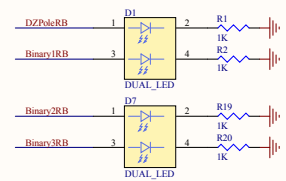
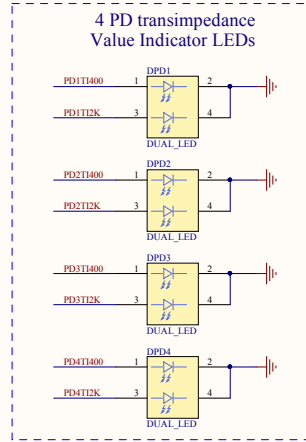
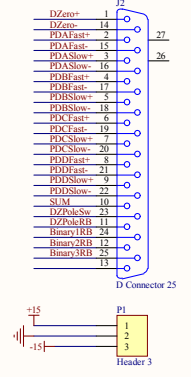
4 transimpedance Amps



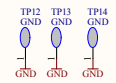
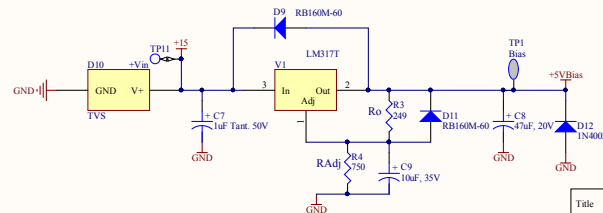
Four PD Inputs



Summing Node

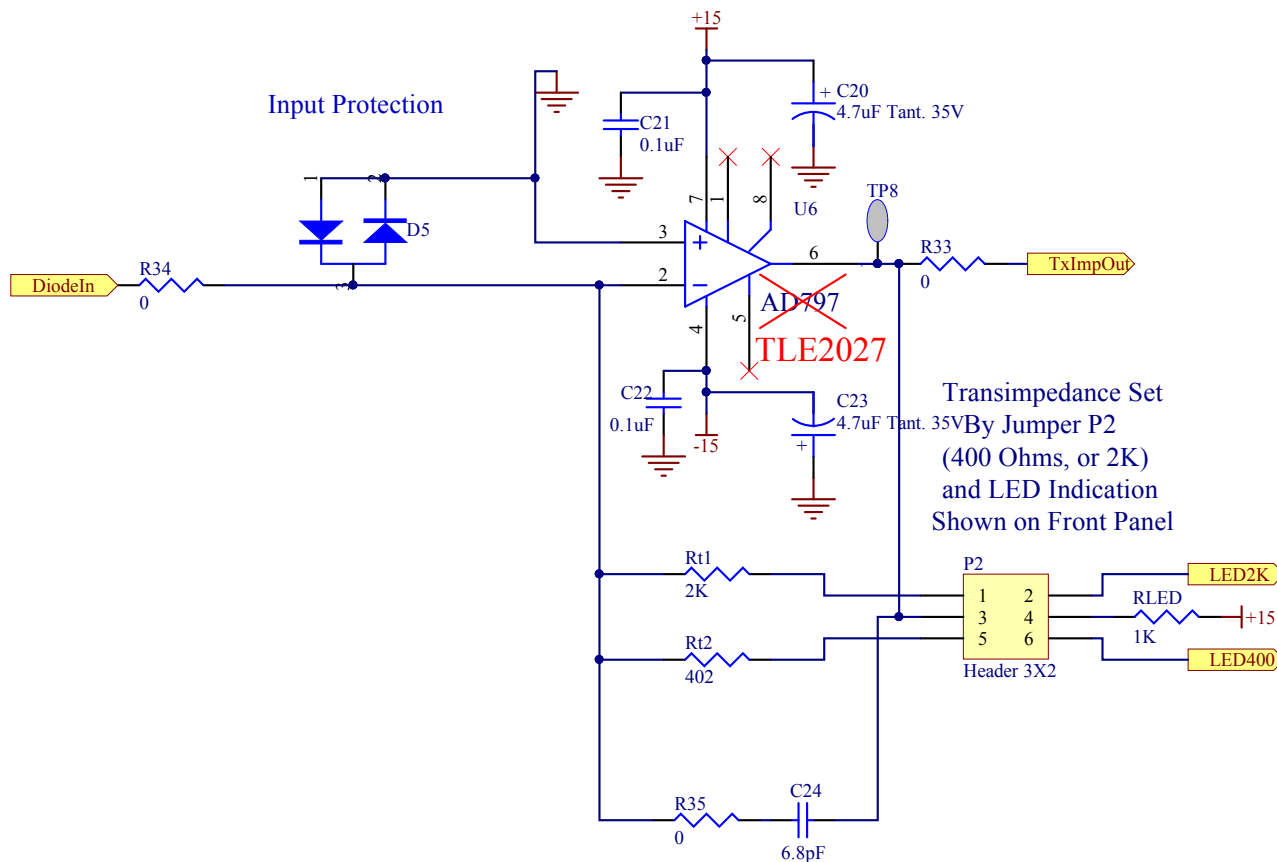


$$LM317 VOUT = 1.25 \times (1 + R_{Adj}/R_o) + (46\mu A \times R_{Adj})$$



Title		Transimpedance and Summing	
Size:	C	DCC Number:	D1600193
Drawn by:	Ben Abbott	Date:	9/22/2016
		Revision:	v2
		Ligo Project California Institute of Technology Massachusetts Institute of Technology	

LHO As-Built 9/22/16



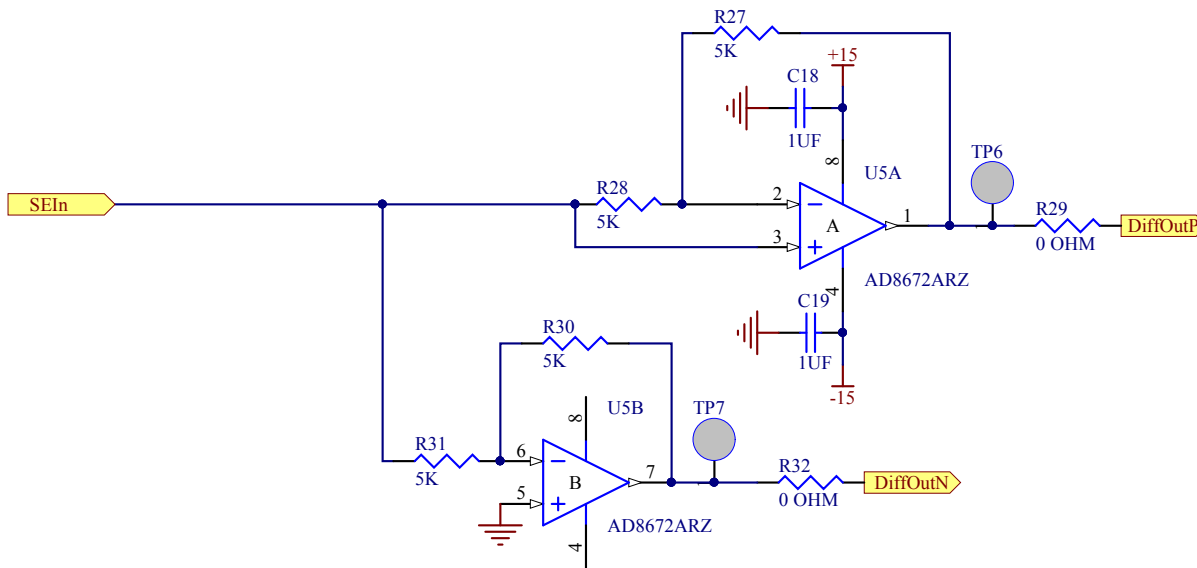
Title **Transimpedance Stage**

Size: **A** DCC Number: **D1600193**

Drawn by: **Ben Abbott** Date: **9/22/2016** Revision: **v2**

Ligo Project
California Institute of Technology
Massachusetts Institute of Technology

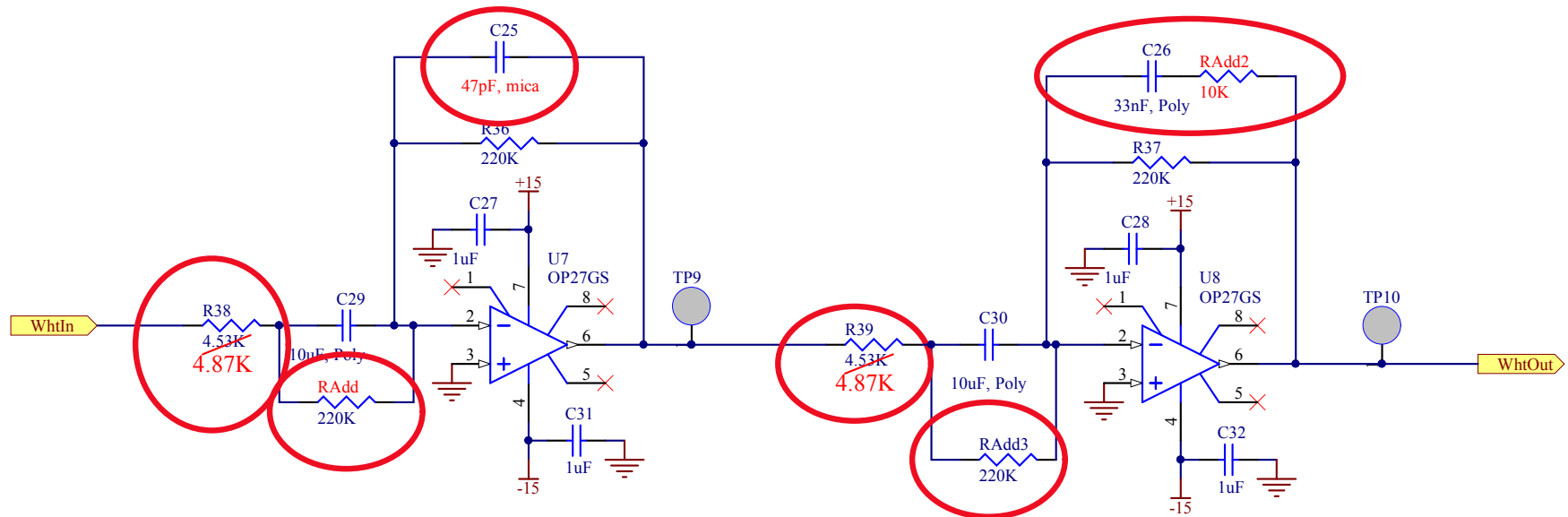
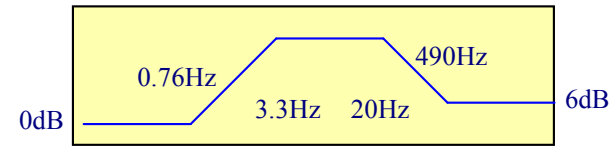
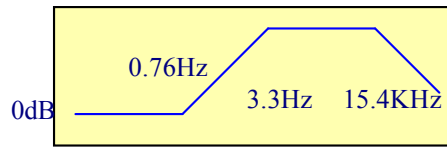




Title Single-Ended to Differential			
Size: A	DCC Number: D1600193		<i>Ligo Project</i> <i>California Institute of Technology</i> <i>Massachusetts Institute of Technology</i>
Drawn by: Ben Abbott	Date: 9/22/2016	Revision: v2	
File: C:\restored\Ben\ISS Outer Loop\TxImpedanceBoardAsBuilt\9_22_16\SimDcc\9_22_16_SimDcc.sch Sheet 3 of 7			



LHO As-Built 9/22/16



Title **Whitening**

Size: **A**

DCC Number: **D1600193**

Ligo Project
California Institute of Technology
Massachusetts Institute of Technology



Drawn by:
Ben Abbott

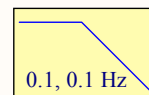
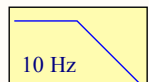
Date: **9/22/2016**

Revision: **v2**

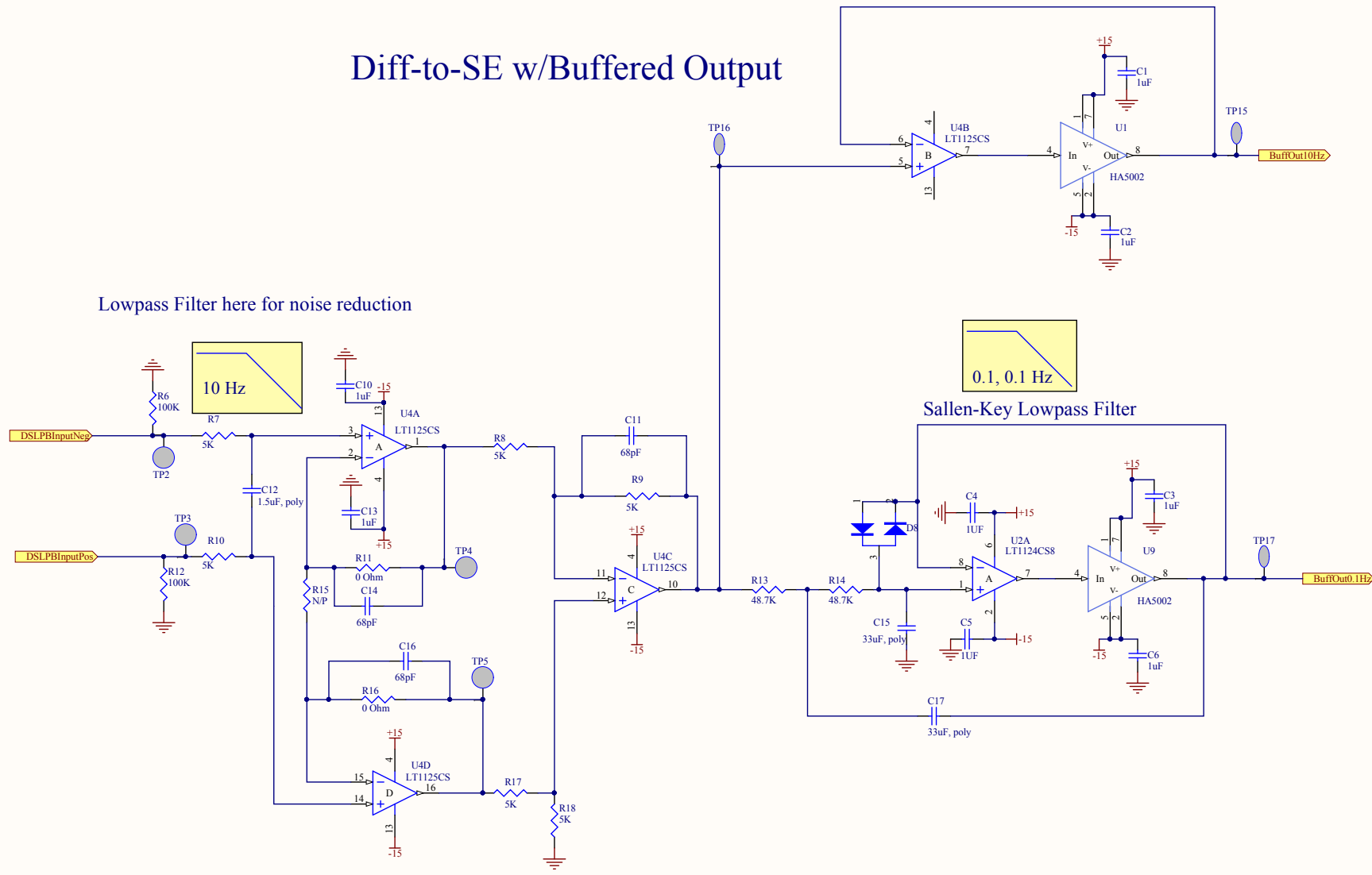
File: C:\restored\Ben\ISS Outer Loop Tx impedance Board As-Built 9 22 16\Whitening 40360.DM Sheet 4 of 7


Diff-to-SE w/Buffered Output

Lowpass Filter here for noise reduction



Sallen-Key Lowpass Filter



Title Diff. Receiver w/LPF			
Size: B	DCC Number: D1600193	Ligo Project California Institute of Technology Massachusetts Institute of Technology	
Drawn by: Ben Abbott	Date: 9/22/2016	Revision: v2	
File: C:\restored\Ben\ISS Outer Loop\TxImpedanceBoardAsBuilt\9_22_16\TxImp.cir		Sheet 15 of 7	

A

A

B

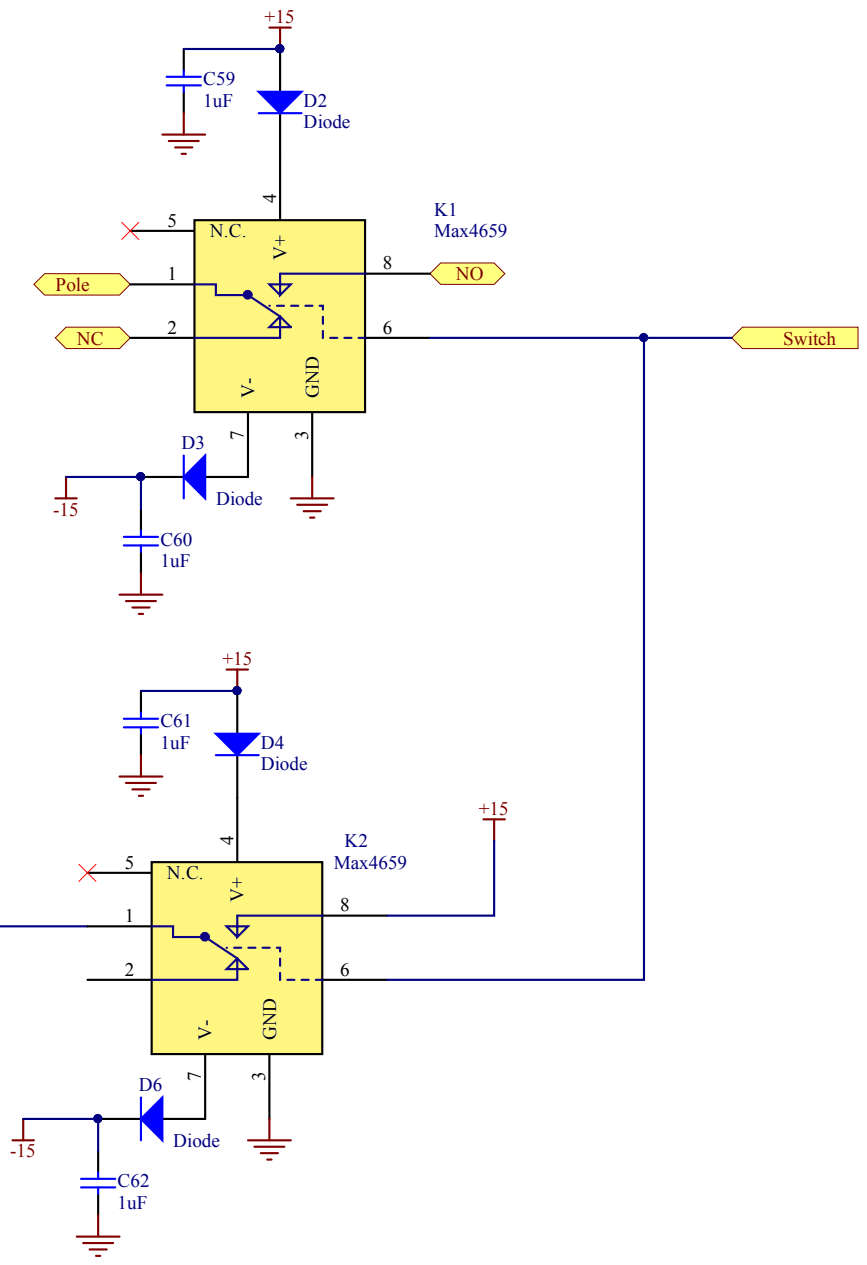
B

C

C

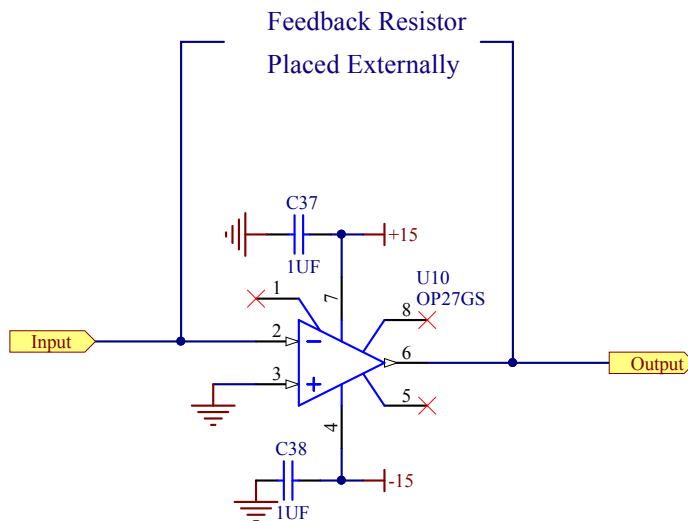
D

D



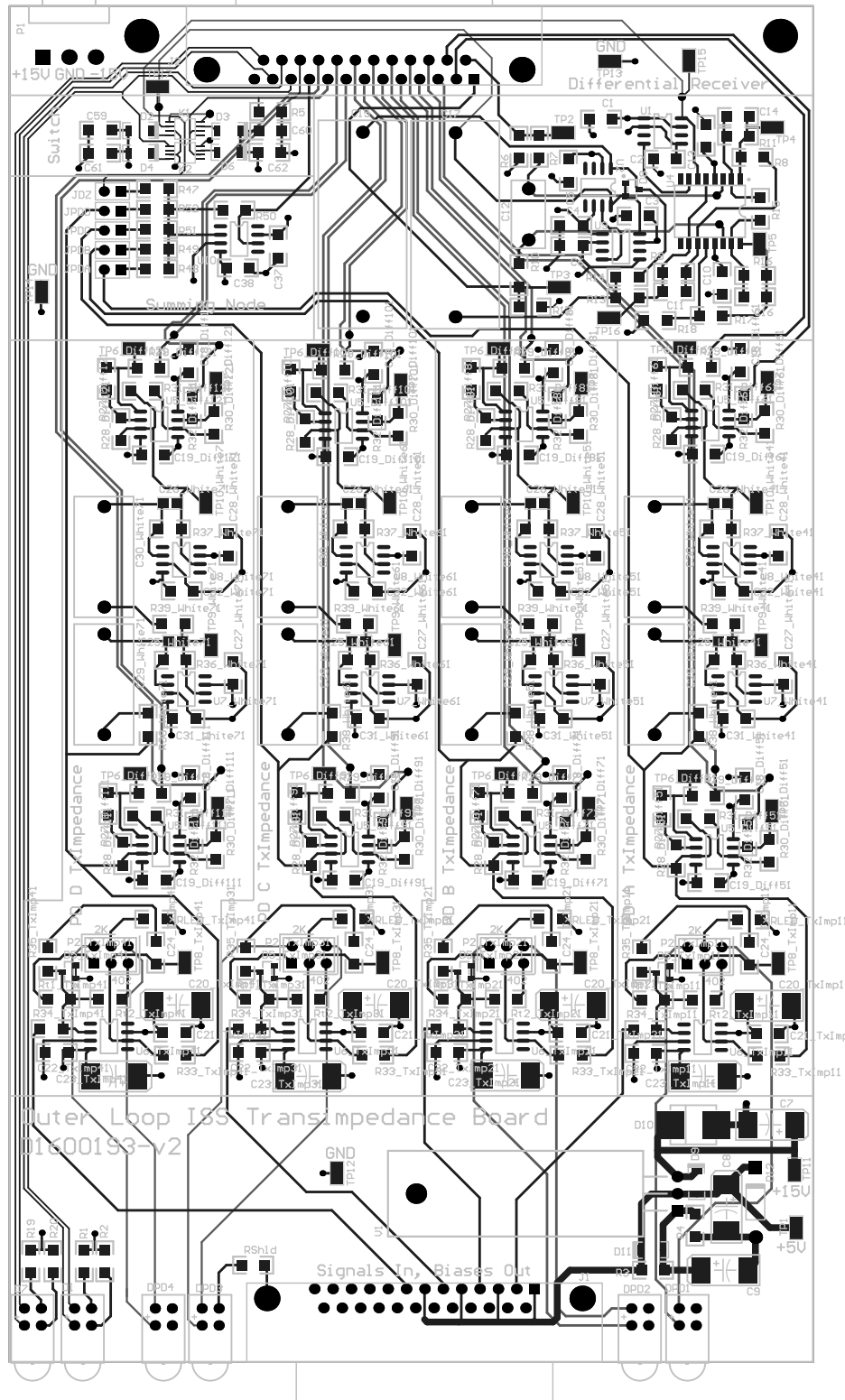
Title Switches			
Size: A	DCC Number: D1600193		<i>Ligo Project</i> <i>California Institute of Technology</i> <i>Massachusetts Institute of Technology</i>
Drawn by: Ben Abbott	Date: 9/22/2016	Revision: v2	
File: C:\restored\Ben\ISS Outer Loop\TximpedanceBoardAsBuilt\9_22_16\9_22_16_3_40_24 PM Sheet 6 of 7			





Title <i>Inverting OpAmp</i>			
Size: A	DCC Number: D1600193		<i>Ligo Project</i> <i>California Institute of Technology</i> <i>Massachusetts Institute of Technology</i>
Drawn by: Ben Abbott	Date: 9/22/2016	Revision: v2	
File: C:\restored\Ben\ISS Outer Loop\TximpedanceBoardAsBuilt9_22_16\InvertingOpAmp.Mch Sheet 7 of 7			





Outer Loop IBS Transimpedance Board
01600193-v2