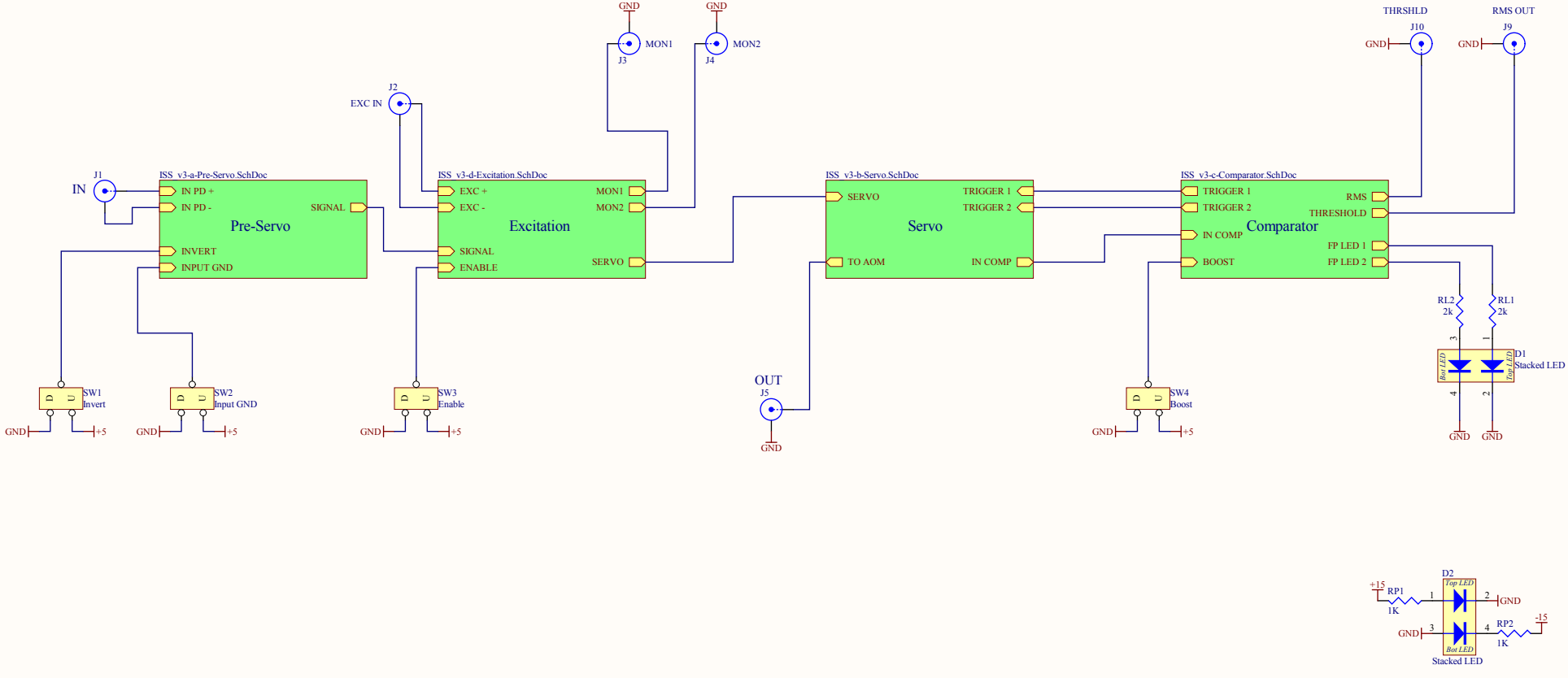
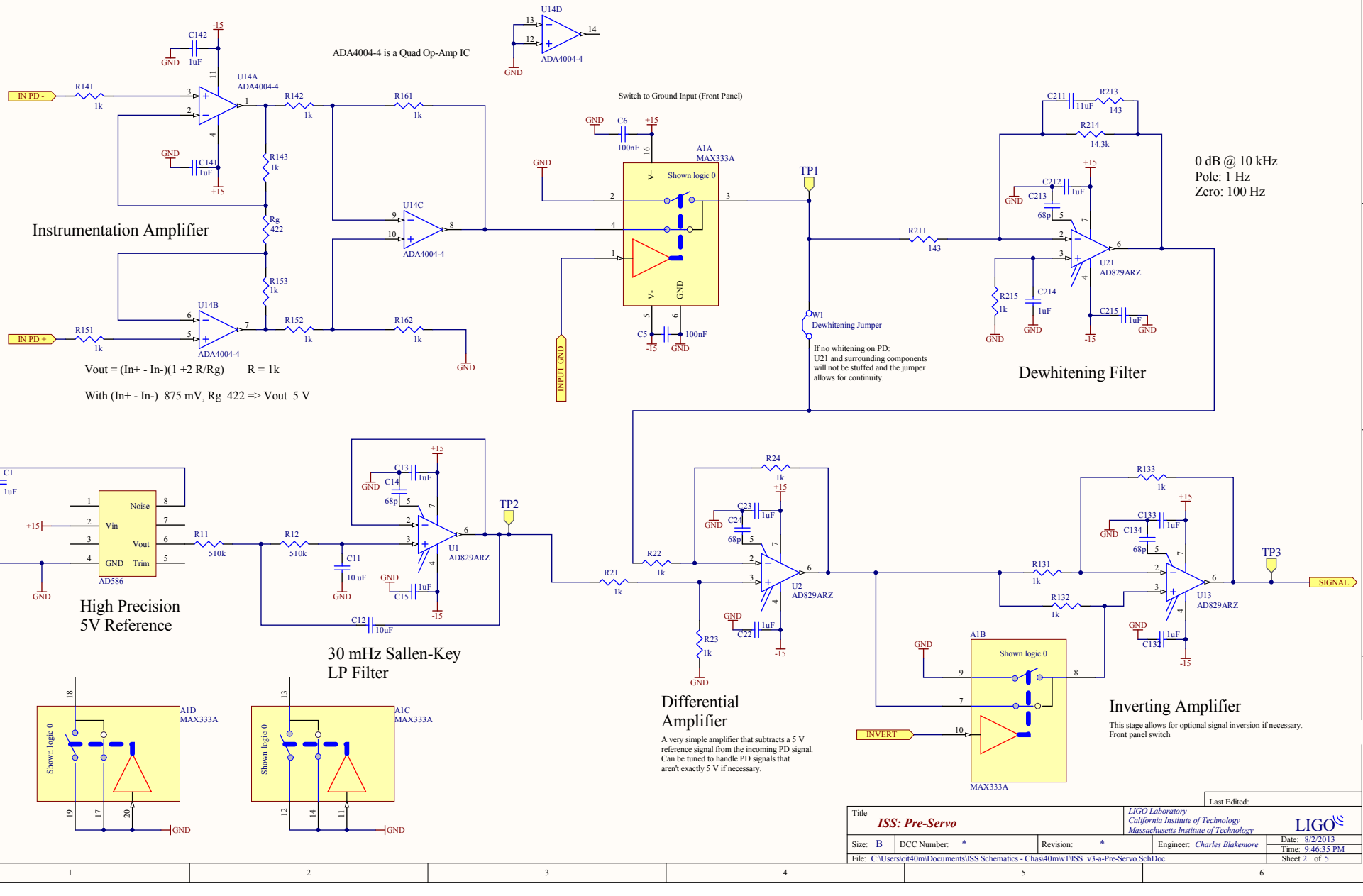


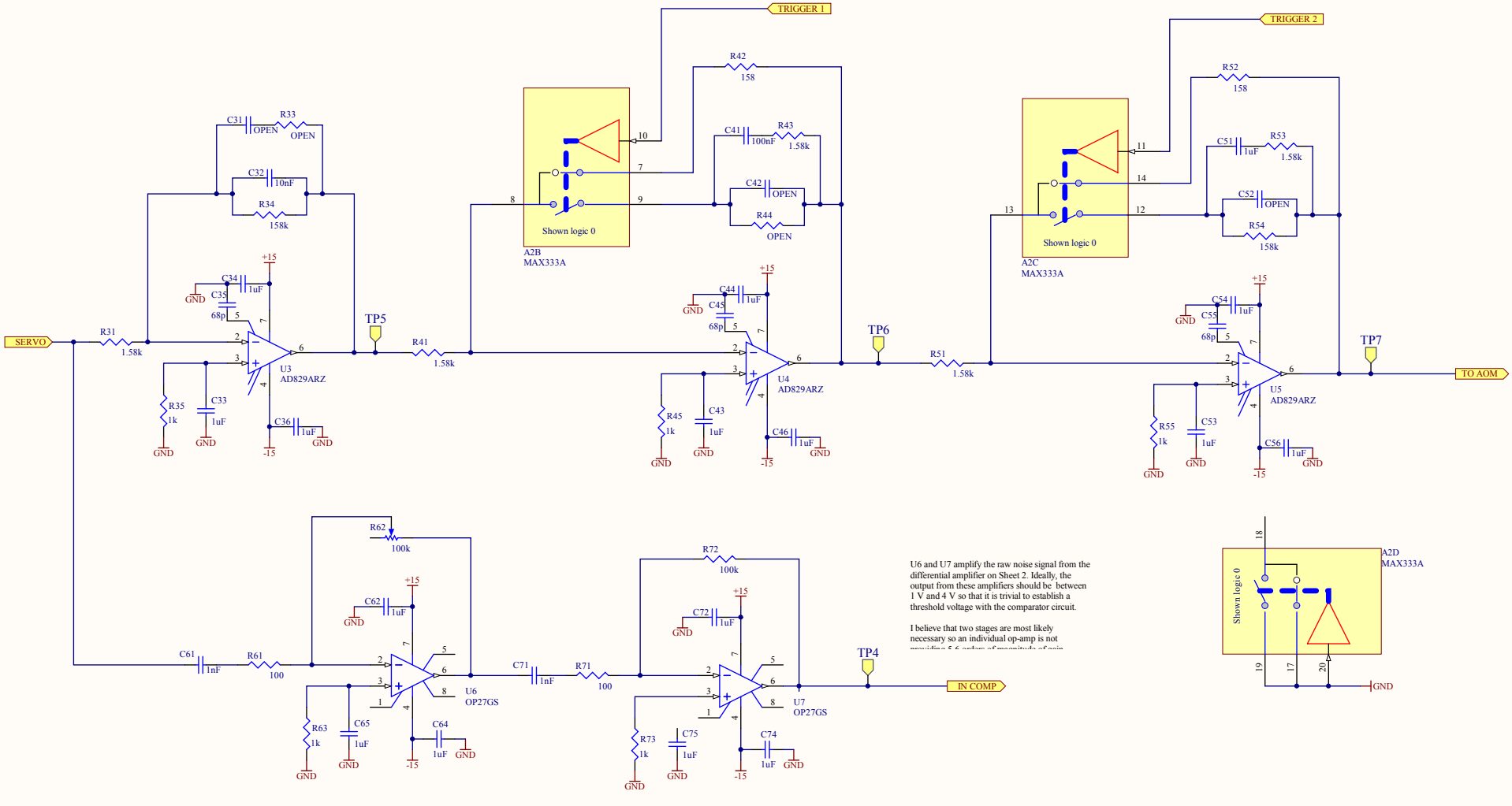
Title: *ISS: Layout + Front Panel Ports/Switches*			*LIGO Laboratory* *California Institute of Technology* *Massachusetts Institute of Technology*	LIGO
Size: B	DCC Number: *	Revision: *	Engineer: *Charles Blakemore*	Last Edited: Date: 8/2/2013 Time: 9:46:35 PM Sheet 1 of 5
File: C:\Users\cit40m\Documents\ISS Schematics - Chas\40m\v1\ISS v3.SchDoc				


ADA4004-4 is a Quad Op-Amp IC
Instrumentation Amplifier
Vout = (In+ - In-)(1 +2 R/Rg) R = 1k
With (In+ - In-) 875 mV, Rg 422 => Vout 5 V
Switch to Ground Input (Front Panel)
Shown logic 0
INPUT GND
TP1
W1
Dewhitening Jumper
If no whitening on PD:
U21 and surrounding components
will not be stuffed and the jumper
allows for continuity.
Dewhitening Filter
0 dB @ 10 kHz
Pole: 1 Hz
Zero: 100 Hz
High Precision
5V Reference
AD586
30 mHz Sallen-Key
LP Filter
TP2
Differential
Amplifier
A very simple amplifier that subtracts a 5 V
reference signal from the incoming PD signal.
Can be tuned to handle PD signals that
aren't exactly 5 V if necessary.
Inverting Amplifier
This stage allows for optional signal inversion if necessary.
Front panel switch
INVERT
TP3
SIGNAL
MAX333A
Title
ISS: Pre-Servo
LIGO Laboratory
California Institute of Technology
Massachusetts Institute of Technology
LIGO
Size: B
DCC Number: *
Revision: *
Engineer: Charles Blakemore
Last Edited:
Date: 8/2/2013
Time: 9:46:35 PM
Sheet 2 of 5
File: C:\Users\cit40m\Documents\ISS Schematics - Chas\40m\v1\ISS_v3-a-Pre-Servo.SchDoc

LP Filter
60 dB @ DC
Pole: 10 Hz

0 dB @ 100 kHz
Pole: *DC*
Zero: 10 kHz

60 dB @ DC; 0 dB @ 100 kHz
Pole: 10 Hz
Zero: 10 kHz



U6 and U7 amplify the raw noise signal from the differential amplifier on Sheet 2. Ideally, the output from these amplifiers should be between 1 V and 4 V so that it is trivial to establish a threshold voltage with the comparator circuit.

I believe that two stages are most likely necessary so an individual op-amp is not

Title: *ISS: Servo*			*LIGO Laboratory* *California Institute of Technology* *Massachusetts Institute of Technology*	LIGO
Size: B	DCC Number: *	Revision: *	Engineer: *Charles Blakemore*	Last Edited: Date: 8/2/2013 Time: 9:46:35 PM Sheet 3 of 5
File: C:\Users\cit40m\Documents\ISS Schematics - Chas\40m\v1\ISS_v3-b-Servo.SchDoc				

AD8436 RMS-to-DC Converter

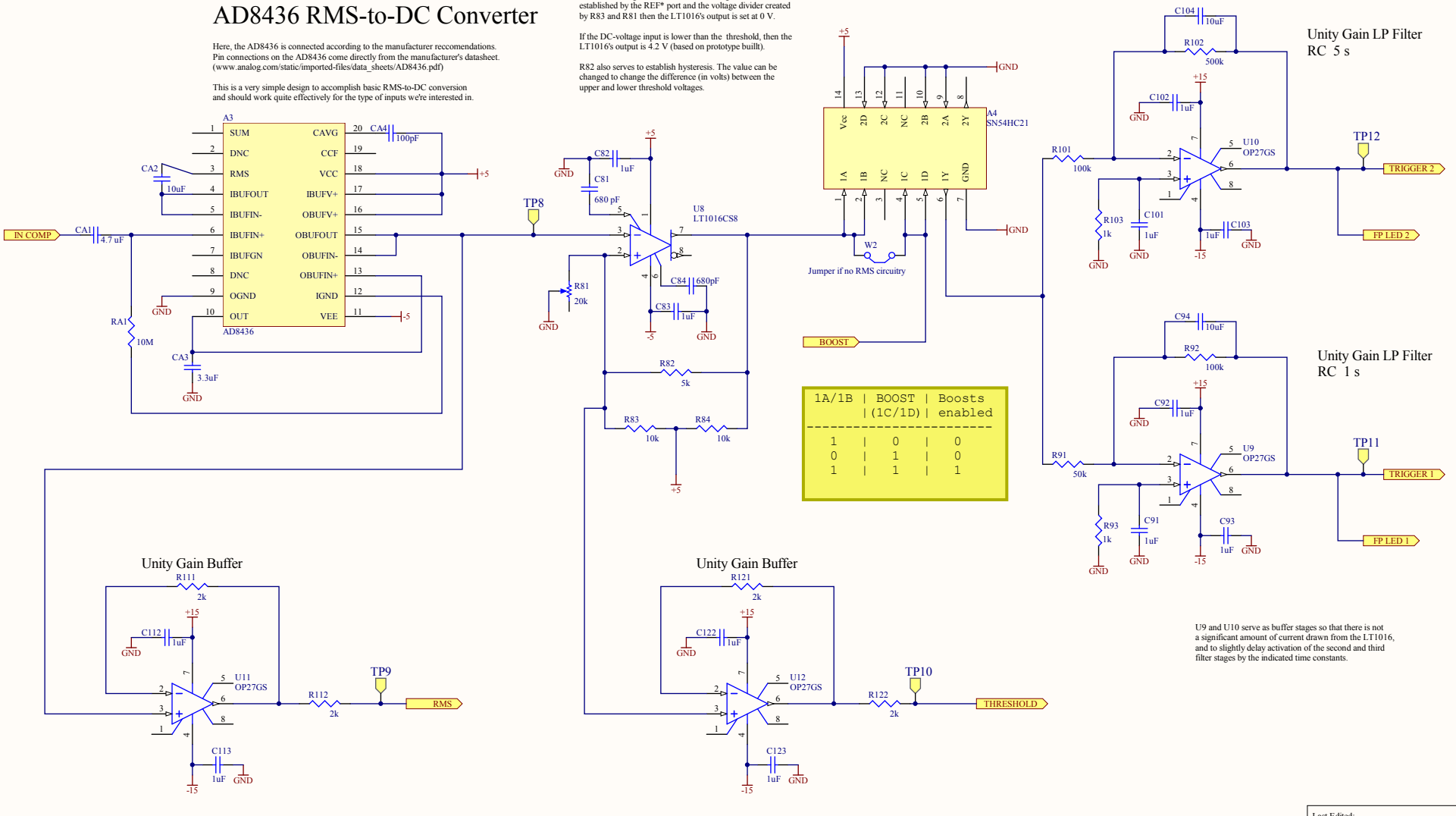
Here, the AD8436 is connected according to the manufacturer reccomendations.
Pin connections on the AD8436 come directly from the manufacturer's datasheet.
(www.analog.com/static/imported-files/data_sheets/AD8436.pdf)

This is a very simple design to accomplish basic RMS-to-DC conversion
and should work quite effectively for the type of inputs we're interested in.

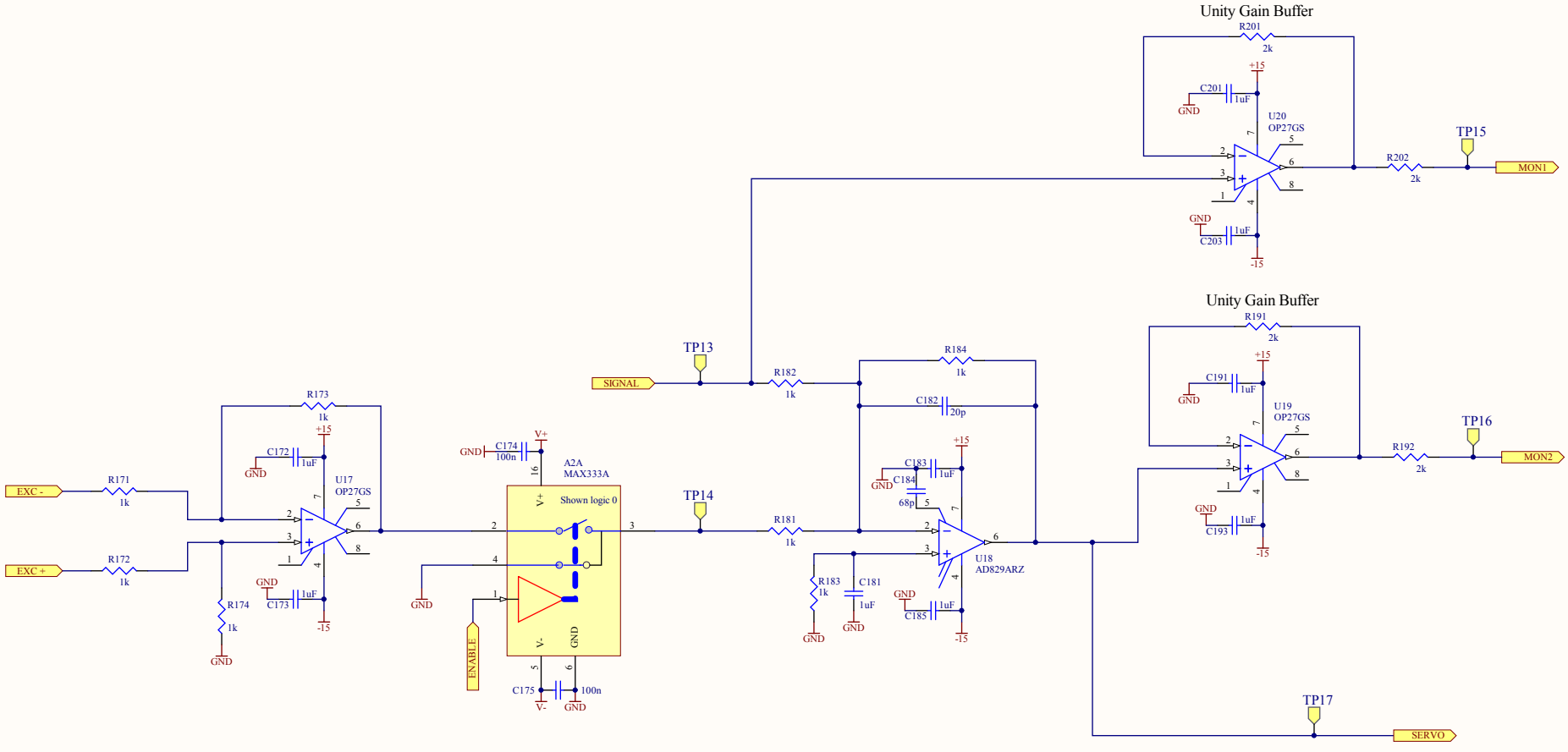
The LT1016 and accompanying circuitry has two states.
If the DC-voltage from the AD8436 is larger than the threshold
established by the REF* port and the voltage divider created
by R83 and R81 then the LT1016's output is set at 0 V.

If the DC-voltage input is lower than the threshold, then the
LT1016's output is 4.2 V (based on prototype builtt).

R82 also serves to establish hysteresis. The value can be
changed to change the difference (in volts) between the
upper and lower threshold voltages.



Title: *ISS: Comparator + Triggering*		*LIGO Laboratory, California Institute of Technology, Massachusetts Institute of Technology* LIGO	Last Edited:
Size: B	DCC Number: *	Revision: *	Engineer: *Charles Blakemore*
File: C:\Users\cit40m\Documents\ISS Schematics - Chas\40m\v1\ISS_v3-c-Comparator.SchDoc			Date: 8/2/2013 Time: 9:46:35 PM Sheet 4 of 5



Title: ISS: Excitation			LIGO Laboratory, California Institute of Technology, Massachusetts Institute of Technology	Last Edited:
Size: B	DCC Number: *	Revision: *	Engineer: Charles Blakemore	Date: 8/2/2013
File: C:\Users\cit40m\Documents\ISS Schematics - Chas\40m\v1\ISS_v3-d-Excitation.SchDoc				Time: 9:46:35 PM
				Sheet 5 of 5