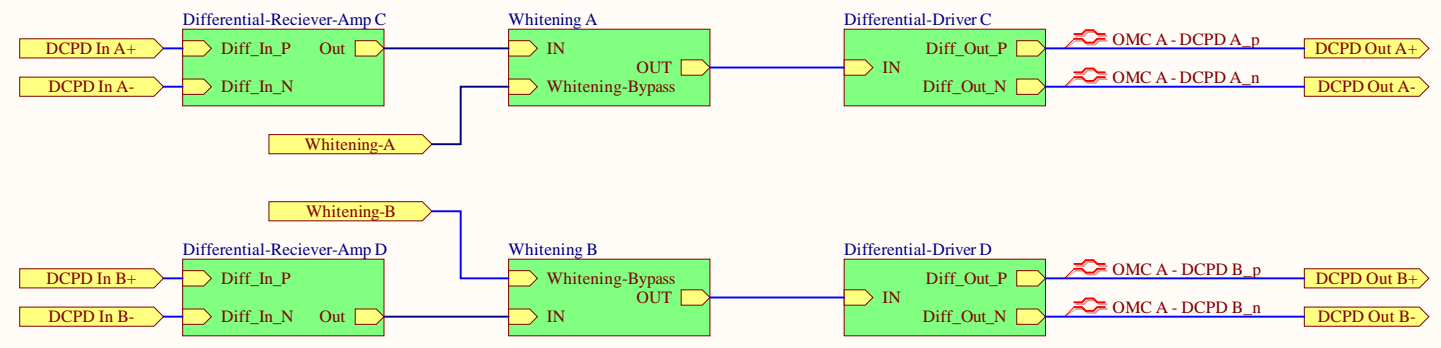
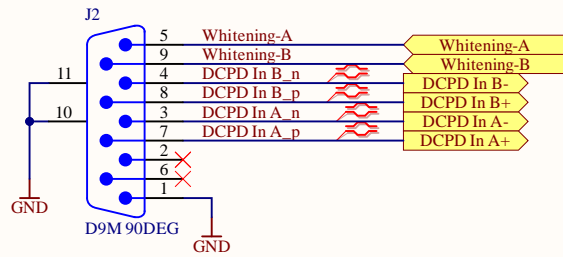
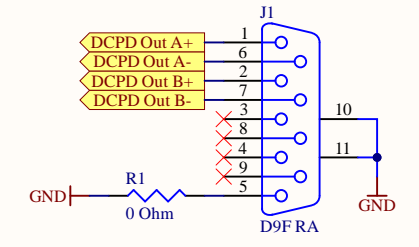


From: Front Interface PCB



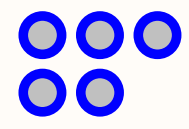
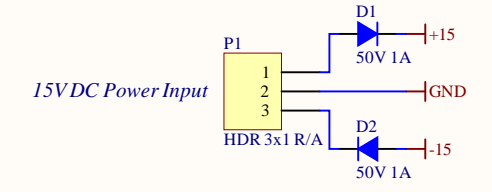
To ADC
Whitened Output

To: Rear Panel



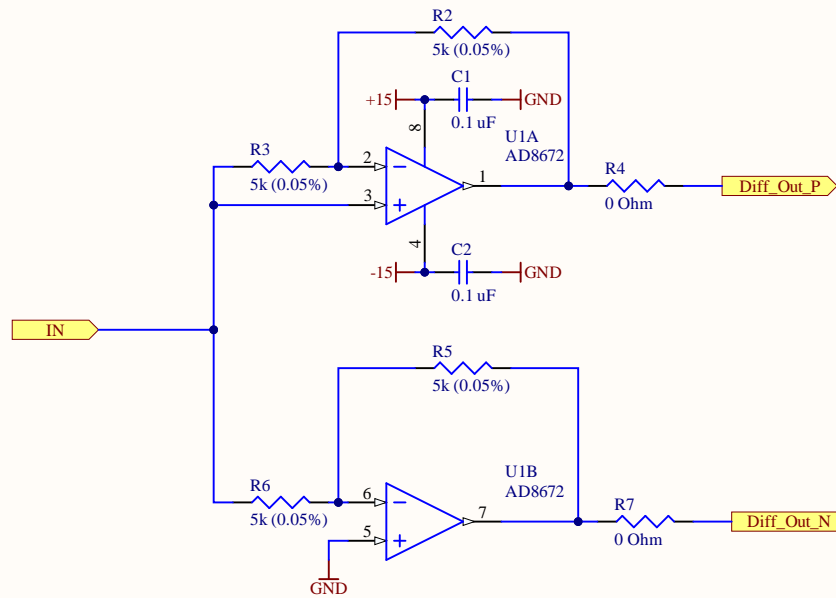
v2 removed channels C and D
v3 replaced R9, R10 with x10 less values.
C7 and C6 with x10 larger values to
reduce noise. U2 changed to OP37 for
better DC offset.

From: Power PCB



Last Edited: 2/4/2023

Title OMC DCPD Whitening		LIGO CalTech *		LIGO	
Size: B	DCC Number: D2200044	Revision: v2	Engineer: Dean Schaetl	Date: 2/3/2023	Time: 8:22:58 PM
File: C:\Dean\A+\D2200044 OMC DCPD Whitening Signal Chain\D2200044-v2 OMC DCPD Whitening.SchDoc				Sheet 1 of 4	



Last Edited: 11/11/2022

Title **Differential Driver**

LIGO
*
*

LIGO

Size: A

DCC Number: D2200044

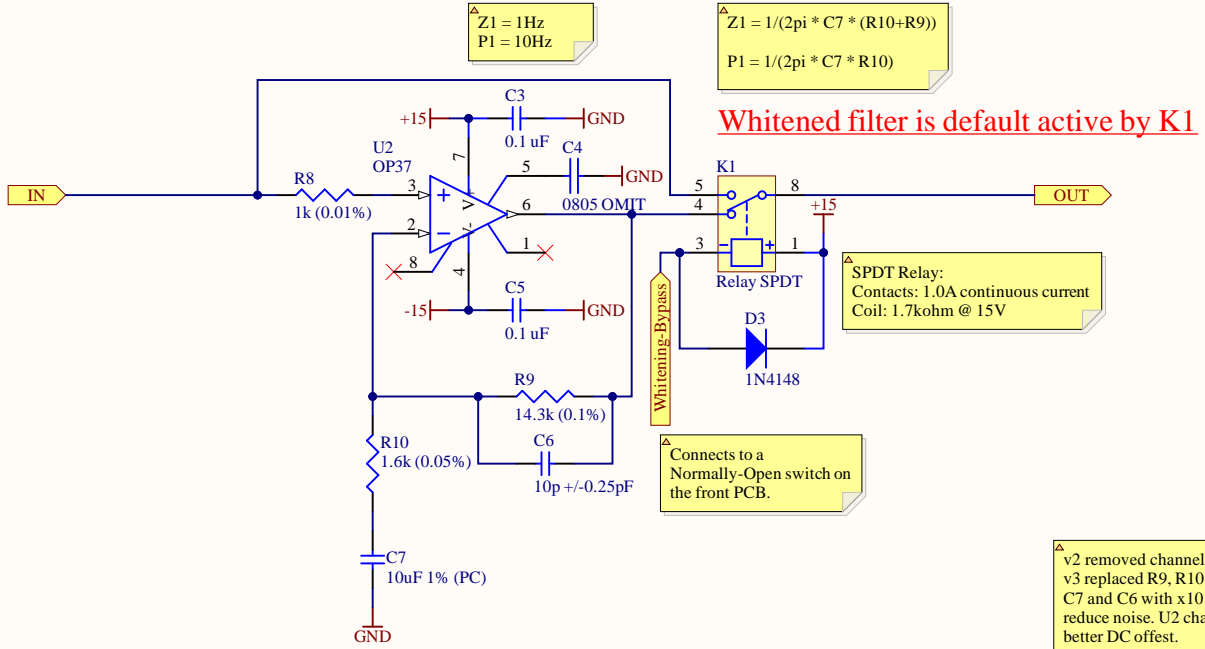
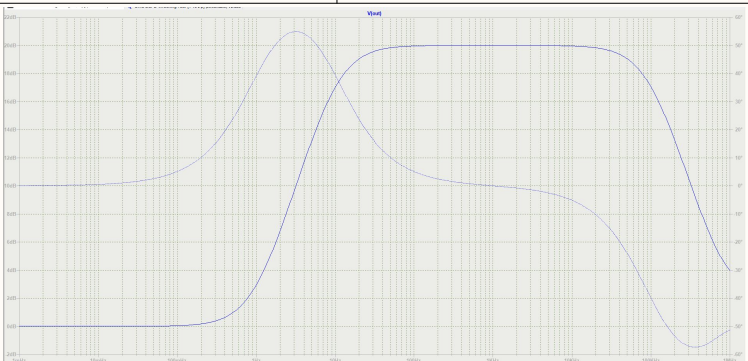
Revision: v1

Engineer: Dean Schaetzl

Date: 2/3/2023

Time: 8:22:58 PM

Sheet 2 of 4



$Z1 = 1\text{Hz}$
 $P1 = 10\text{Hz}$

$Z1 = 1/(2\pi * C7 * (R10+R9))$
 $P1 = 1/(2\pi * C7 * R10)$

SPDT Relay:
Contacts: 1.0A continuous current
Coil: 1.7kohm @ 15V

Connects to a Normally-Open switch on the front PCB.

v2 removed channels C and D
v3 replaced R9, R10 with x10 less values.
C7 and C6 with x10 larger values to reduce noise. U2 changed to OP37 for better DC offset.

OP27 Supply Current (I_q)
2.8mA (per amp) typical = 8.4mA

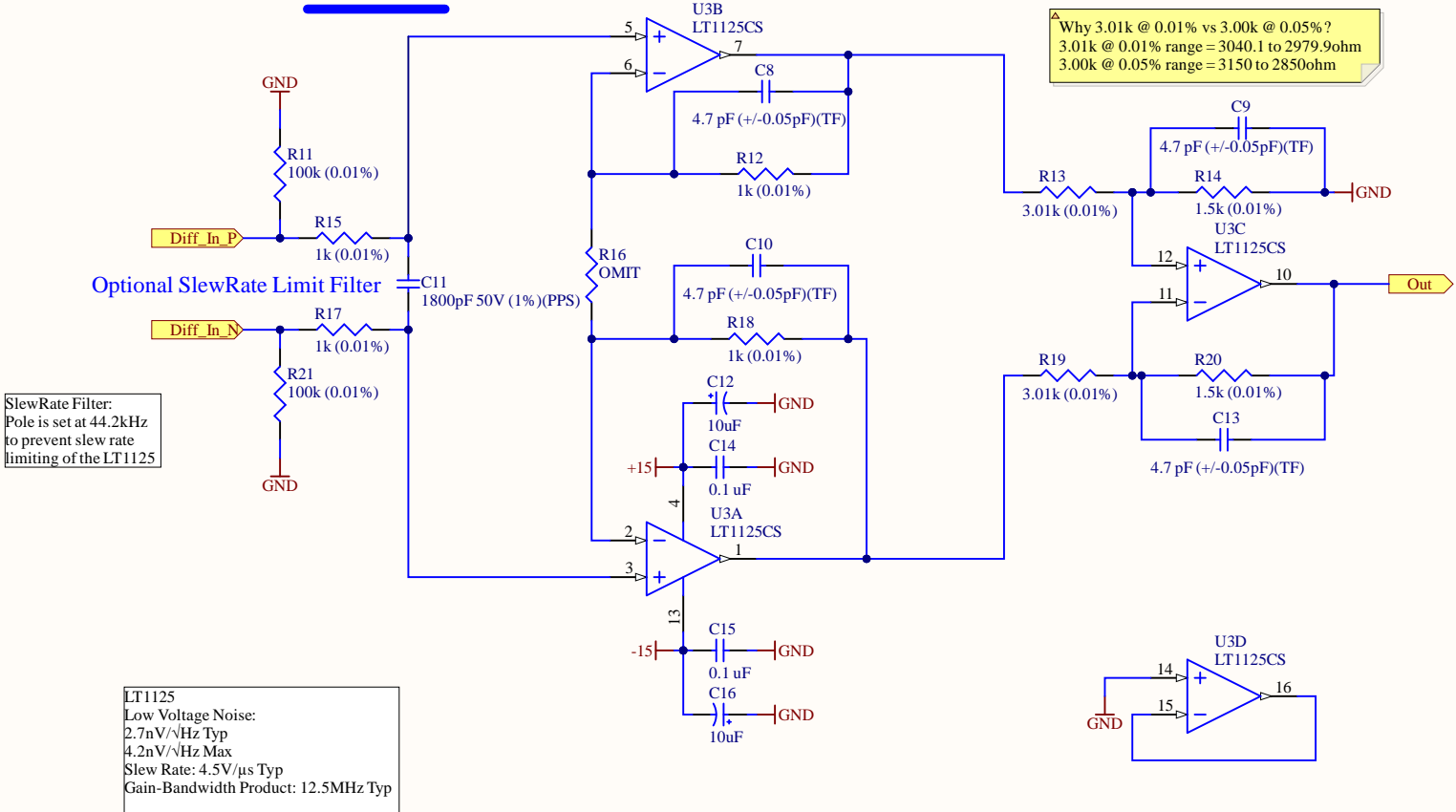


Last Edited: 2/4/2023

Title Whitening		LIGO CIT *		LIGO	
Size: A	DCC Number: D2200044	Revision: v3	Engineer: D.Schaetzl	Date: 2/3/2023	Time: 8:22:58 PM
File: C:\Dean\A+D2200044 OMC DCPD Whitening Signal Chain\Whitening-v3.SchDoc				Sheet 3 of 4	

Differential-to-Single
Gain = 1/2

Slew-Rate Limit Protection



Why 3.01k @ 0.01% vs 3.00k @ 0.05%?
 3.01k @ 0.01% range = 3040.1 to 2979.9ohm
 3.00k @ 0.05% range = 3150 to 2850ohm

SlewRate Filter:
 Pole is set at 44.2kHz
 to prevent slew rate
 limiting of the LT1125

LT1125
 Low Voltage Noise:
 2.7nV/√Hz Typ
 4.2nV/√Hz Max
 Slew Rate: 4.5V/μs Typ
 Gain-Bandwidth Product: 12.5MHz Typ

LT1125 Supply Current
 2.3mA (per amp) - 9.2mA -
 typical
 2.75mA (per amp) = 11mA -
 worst case

Title		LIGO Caltech		Last Edited: 2/3/2023	
Differential Receiver Amp				LIGO	
Size: A	DCC Number: D2200044	Revision: v1	Engineer: Dean Schaefer	Date: 2/3/2023	Time: 8:22:58 PM
File: C:\Dean\A\D2200044 OMC DCPD Whitening Signal Chain\Differential-Receiver-Amp.SchDoc				Sheet 4 of 4	