

*MEMORANDUM*

DATE: November 8, 2018

TO: ISC team  
FROM: Daniel Sigg  
SUBJECT: Modifications to the CM board (REFL SERVO)  
Refer to: LIGO-E1800000-v1

The common mode servo of the interferometer suffers from noise in the DAQ readbacks that are due to large high frequency signals. There is also a lack of boost filters to squash the low frequency noise below 100Hz. Capacitors need to be NP0/COG or metal film.

## Change 1:

Change the first 2 boost stages to 10/500Hz.

C118 → 1  $\mu$ F  
R72 → 15 k $\Omega$   
R77 → 332  $\Omega$   
C119 → 1  $\mu$ F  
R74 → 15 k $\Omega$   
R78 → 332  $\Omega$ 

## Change 2:

Add two ~15 kHz low pass to the error signal DAQ readback.

C78 → 1 nF  
C79 → 3.3 nF

## Change 3:

Add a 500 Hz low pass to the slow DAQ readback.

C243 → 10 nF

Change 4:

Add a 15 kHz low pass to the fast DAQ readback.

C295 → 330 pF