



LIGO HANFORD OBSERVATORY
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MEMORANDUM

DATE: March 1, 2019

TO: ISC team
FROM: Daniel Sigg
SUBJECT: Modifications to the CM board (REFL SERVO)
Refer to: LIGO-E1800338-v2

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 μ F
R72 → 15 k Ω
R74 → 15 k Ω
C119 → 1 μ F
R74 → 15 k Ω
R78 → 332 Ω

Change 2:

Add two ~15 kHz low pass and 5 times more gain to the error signal DAQ readback.

C78 → 1 nF
C79 → 3.3 nF
R56 → 665 Ω



Change 3:

Add a 500 Hz & 14kHz low pass to the slow DAQ readback.

C241 → 3.3 nF

C243 → 10 nF

Change 4:

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

C293 → 3.3 nF

C295 → 330 pF

BOM (for 3 ifo):

Qty	Item	Distributor	Description
3	81-GRM2165C1H332FA1J	Mouser	C79, 3.3 nF, 1%
6	80-C322C332F5G	Mouser	C241/293, 3.3 nF, 1%
3	581-08055A331FAT2A	Mouser	C295, 330 pF, 1%
3	81-GRM2195C1H103FA1D	Mouser	C243, 10nF, 1%
3	581-08055A102FAT2A	Mouser	C78, 1nF, 1%
6	WA2A105F	RTI	C118/C119, 1 μF
3	P15KDACT-ND	Digi-Key	R68, 15 kΩ
3	P332DACT-ND	Digi-Key	R68, 332 Ω
3	P665DACT-ND	Digi-Key	R56, 665 Ω