LIGO HANFORD OBSERVATORY

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# MEMORANDUM

DATE: April 4, 2019

|  |  |
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| TO: | ISC team |
| FROM: | Daniel Sigg |
| SUBJECT: | Modifications to the common mode boards (DAQ readbacks) |
| Refer to: | LIGO-E1900103-v1 |

Version 6 of the AA board, [D070081](https://dcc.ligo.org/LIGO-D070081), has AD8622 operational amplifiers at both the input and output which are too slow and exceed their slew rate limit. These OpAmps need to be changed into faster ones for the DAQ channels of the common mode boards.

The common mode servo boards, [D040180](https://dcc.ligo.org/LIGO-D040180), suffer from noise in the DAQ readback channels that is due to large high frequency signals and slew rate limitations in the AA boards that follow.

These changes are already done for CM and MC variants, see [E1800338](https://dcc.ligo.org/LIGO-E1800338).

Capacitors need to be NP0/COG or metal film.

Change 1:

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

C78 → 1 nF

C79 → 3.3 nF

Change 2:

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

C241 → 3.3 nF
C243 → 10 nF

Change 3:

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

C293 → 3.3 nF
C295 → 330 pF

Change 4 (AA board D070081 and channels associated with CM & MC readbacks):

Use faster OpAmps for the differential receiver and drivers.

U2 → ADA4075-2
U3 → ADA4075-2

BOM (for 1 board):

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| **Qty** | **Item** | **Distributor** | **Description** |
| 1 | 81-GRM2165C1H332FA1J | Mouser | C79, 3.3 nF, 1% |
| 2 | 80-C322C332F5G | Mouser | C241/C293, 3.3 nF, 1% |
| 1 | 581-08055A331FAT2A | Mouser | C295, 330 pF, 1% |
| 1 | 81-GRM2195C1H103FA1D | Mouser | C243, 10nF, 1% |
| 1 | 581-08055A102FAT2A | Mouser | C78, 1nF, 1% |
| 6 | ADA4075-2ARZ | Digi-Key | U2/U3 |
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