

LIGO HANFORD OBSERVATORY

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# MEMORANDUM

DATE: October 18, 2017

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| TO: | SQZ team |
| FROM: | Daniel Sigg, Marc Pirello |
| SUBJECT: | Modifications to the common mode boards |
| Refer to: | LIGO-E1700364-v1 |

This document lists the modifications to the 4th generation TTFSS, based on PCB D1700346-v1 and on schematics [D1700077](https://dcc.ligo.org/D1700077), [D1700076](https://dcc.ligo.org/D1700076) and [D1700078](https://dcc.ligo.org/D1700078).

**Board modifications**

Change 1:

U2 is missing the +15V rail. Add a jumper wire between the C5 pad towards U1 and the C46 pad towards U1 (D1700077, bottom).



Change 2:

Input to U26 is floating when OPT4 is selected without an option board. Add a 10 kΩ resistor between pins 8 and 18 of header JP1 (D1700077, bottom).

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**Part modifications:**

Change 3:

A couple of AD829 operational amplifiers are missing a small capacitor in the feedback path to make them stable (D1700077, top).

C66 → 4.7 pF

C52 → 27 pF

C53 → 27 pF

C101 → 10 pF

C153 → 4.7 pF

Change 4:

The output of the EOM high voltage stage needs a higher output impedance to limit the maximum current drive (D1700076, top).

R99 → 470 Ω (350V)

C63 → 100 pF (500V)

BOM (for 6 units):

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| **Qty** | **Item** | **Distributor** | **Description** |
| 10 | P10KDACT-ND | Digi-Key | Change 2; 10 kΩ |
| 20 | 478-1300-1-ND | Digi-Key | C66,153; 4.7 pF |
| 10 | 311-1099-1-ND | Digi-Key | C101; 10pF |
| 20 | 311-1104-1-ND | Digi-Key | C52,53; 27pF |
| 10 | 1135-1606-ND | Digi-Key | R99; 470 Ω |
| 10 | 80-C1206C101FBG | Mouser | C63; 100 pF |
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