

LIGO HANFORD OBSERVATORY

PO BOX 159

RICHLAND WA 99352

TEL: 509.372.8106

FAX: 509.372.8137

# MEMORANDUM

DATE: August 26, 2015

|  |  |
| --- | --- |
| TO: | ISC team |
| FROM: | Daniel Sigg, Koji Arai |
| SUBJECT: | EOM/AOM Diver Modifications |
| Refer to: | LIGO-E1500353-v1 |

This modifications apply to [D0900761-B](https://dcc.ligo.org/LIGO-D0900761), [D0900847-B](https://dcc.ligo.org/LIGO-D0900847), [D0900848-C](https://dcc.ligo.org/LIGO-D0900848) and [D1000216-B](https://dcc.ligo.org/LIGO-D1000216) to bring them to revisions C, C, D and C, respectively.

The affected serial numbers are S1500117 to S1500128.

**Power Board** [**D0900848-C**](https://dcc.ligo.org/LIGO-D0900848)

Change 1:

Capacitors need to be added to prevent the AD829 driving the pass transistor from oscillating.

C20, C35, C36, C37, C50, C51, C52, and C63 → 1nF

C91 → add a 100pF between U6 op27 (PIN6) and VREFP (PIN7)   
 should fit between the pads of C22 and R32

W1 → remove solder jumper

Change 2:

Remove the protection diodes which are no longer needed with the use of the power sequencing relays

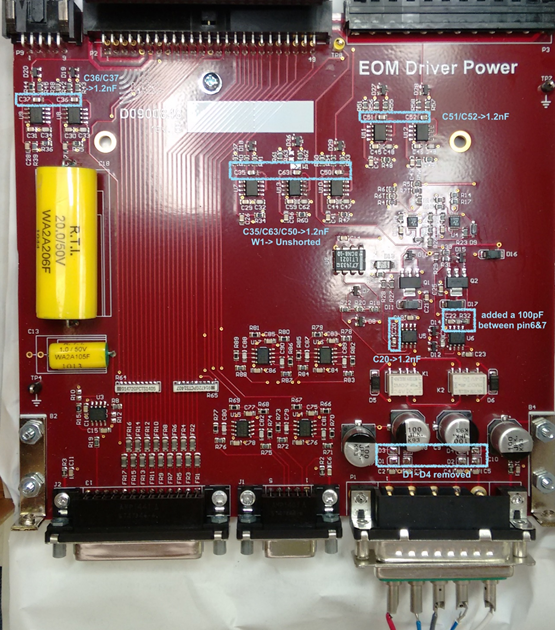
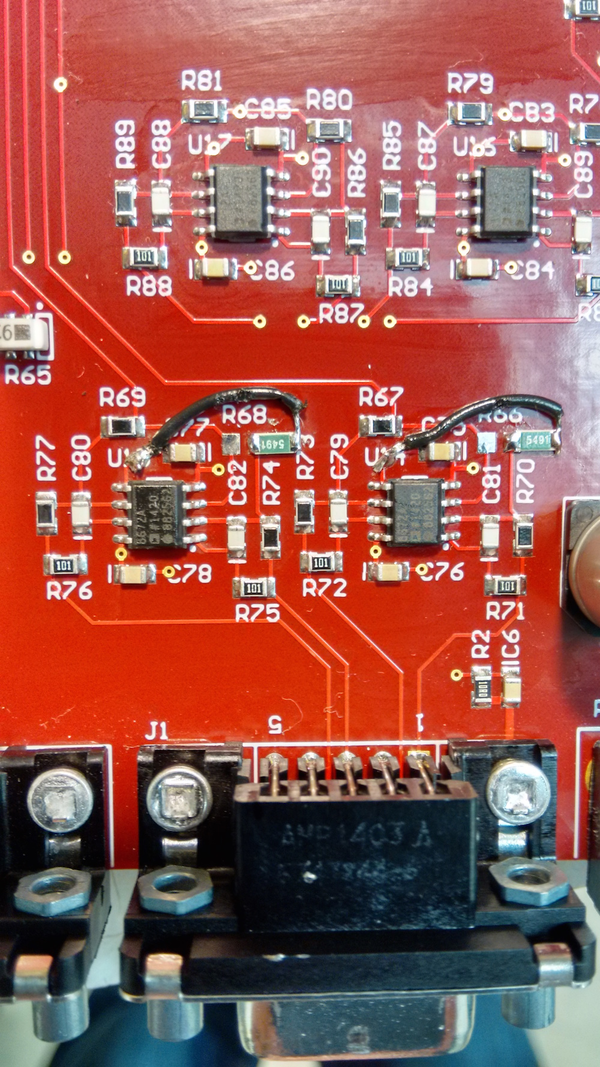
D1, D2, D3, D4 → remove

Change 3:

Fix the gain in the differential output stages.

R66, R68 → 5.49K, shift and use only the pad above R70 and R74

J1, J2 → add a jumper wire from the free end to ground (see pic)



**Servo Board** [**D0900847-B**](https://dcc.ligo.org/LIGO-D0900847)

Change 1:

Reduce the high frequency gain of the servo to allow for better phase margin.

R69 → 200

C49 → 1nF

R71 → 3.3K

R67 → 3.3K

Change 2:

Add capacitor at the output drive to ground to reduce the backfeed of RF from the attenuator board.

C58 → 1nF, add between signal and ground pin of SMA connector J5

**Attenuator Board** [**D1000216-B**](https://dcc.ligo.org/LIGO-D1000216)

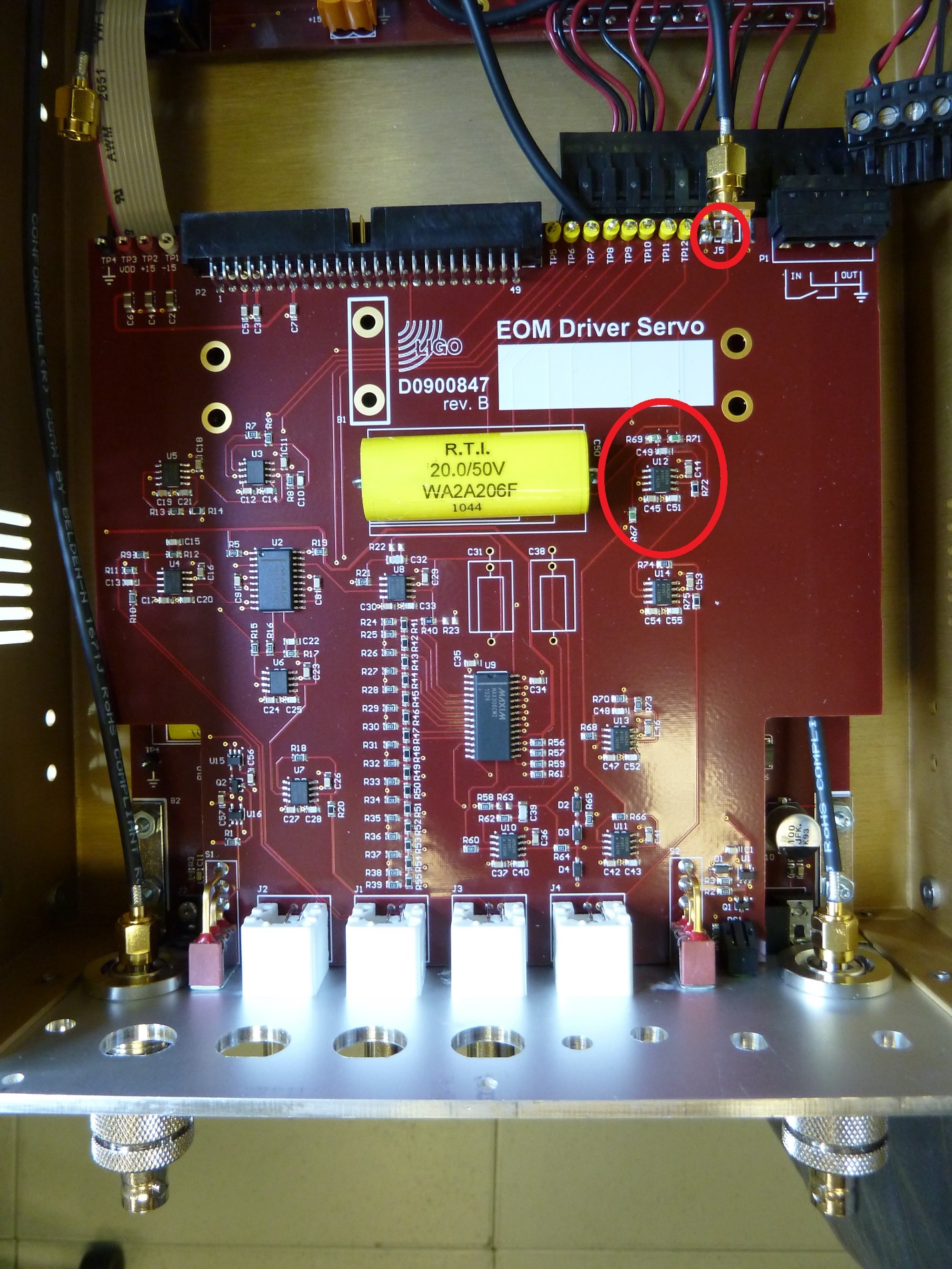
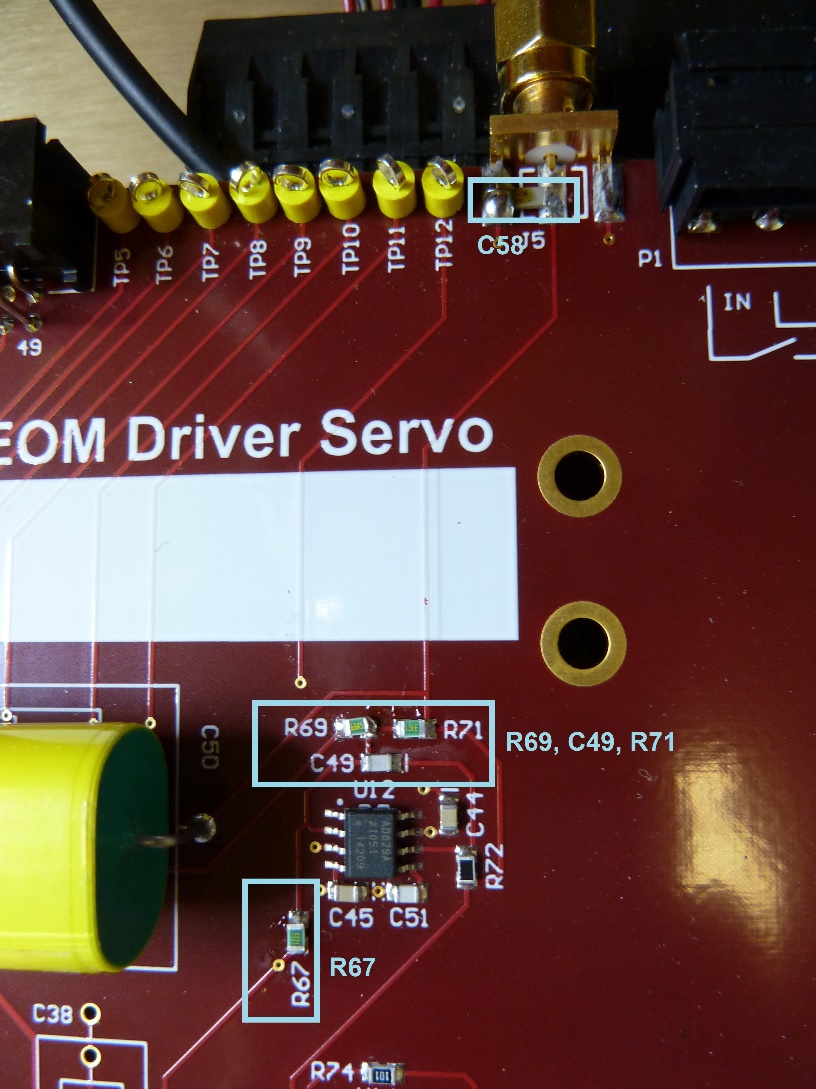
Change 1:

Add capacitor at the control input to ground to reduce the backfeed of RF to the servo board.

C2 → 1nF, add between signal and ground pin of SMA connector J3

**Controller Board** [**D0900761-B**](https://dcc.ligo.org/LIGO-D0900761)

No change.

BOM (for 12 units):

|  |  |  |  |
| --- | --- | --- | --- |
| **Qty** | **Item** | **Distributor** | **Description** |
| 108 | 311-1122-1-ND | Digi-Key | 1nF, 0805, NPO  Power board: C20, C35, C36, C37, C50, C51, C52, and C63  Servo board: C49 |
| 12 | 311-1111-1-ND | Digi-Key | 100pF, 0805, NPO  Power board: C91 |
| 24 | P5.49KDACT-ND | Digi-Key | 5.49K, 0805, 0.1%  Power board: R66, R68 |
| 12 | P200DACT-ND | Digi-Key | 200, 0805, 0.1%  Servo board: R69 |
| 24 | P3.3KDACT-ND | Digi-Key | 3.3K, 0805, 0.1%  Servo board: R67, R71 |
| 24 | 478-1492-1-ND | Digi-Key | 1nF, 1206, NPO  Servo board:C58  Attenuator board: C2 |
| 1 | 6710 BK005-ND | Digi-Key | Hook-up wire |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |