Advanced LIGO Engineering Change Request (ECR)

ECR: Squeezer Modifications to the ISC racks

DCC No: E1700219-v1

Date: 6/23/2017

Requester: Daniel Sigg   **Impacted Subsystem(s):**   ISC

Description of Proposed Change(s): The RF generation and distribution for the squeezer is located in the corresponding ISC racks.

RF Distribution, E1100591-v11 to v12:
- 13 RF signals belonging to the squeezer
- 4 patch panels for squeezer (32 to 35)
- 5 Heliax cable runs between ISC-C4 and ISC-R3
- 12 Heliax cable runs between ISC-C3 and SQZ-R1
- 13 baluns

ISC-C2/C4: D1001427-v17 to v18:
- Rack C2: Added 384 BIO to 35-36
- Rack C2: Moved serial concentrator to 38
- Rack C3: Added 2 RF patch panels to 33-34 and 35-36
- Rack C3: Added RF Amp concentrator 4 to 13
- Rack C3: Added 200 MHz Muliply-by-5 to 9
- Rack C3: Add 200 MHz dist amp to 8
- Rack C3: Added 6.25 MHz Divide-by-32 to 7
- Rack C3: Add 6.25 MHz dist amp to 6
- Rack C3: Added 3.125 MHz Divide-by-2 to 5
- Rack C3: Add 3.125 MHz dist amp to 4
- Rack C3: Added 42.375 MHz RF Synthesizer to 2-3
- Rack C3: Add 42.375 MHz dist amp to 1
- Rack C4: Removed 79.4 MHz source in 7-8 (no longer needed)
- Rack C4: Removed 79.4 MHz dist amp in 6

ISC-R3: D1001426-v10 to v11:
- Removed patch panels, demodulators and whitening chassis associated with LSC ASAIR path.
- Changed WFS triplexer into quadplexer (D1600002).
- Added SQZ WFS electronics here (U2, U5, U5 and U7).

ISC-R5: D1200196-v9 to v10:
- Added a SUS Sat Amp (D1002818) for SQZ tip-tilt mirrors.
- Repurposed the LSC RFPD Interface (was used for ASAIR, now SQZ).
- Add OMC DCPD diplexer (TBD?).

Reason for Change(s): Squeezer upgrade. The RF generation for the squeezer is located in the ISC racks

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Estimated Cost: No additional costs, included in the squeezer budget.

Schedule Impact Estimate: approximate 2 days (after O2).

Nature of Change (check all that apply):
- ☐ Hardware Safety
- ☐ Correct Hardware
- ☐ Correct Documentation
- ☒ Improve Hardware
- ☐ Improve/Clarify Documentation
- ☐ Change Interface
- ☐ Change Requirement

Importance:
- ☐ Desirable for ease of use, diagnostics
- ☐ Desirable for improved performance, reliability
- ☒ Essential for performance, reliability
- ☐ Essential for function
- ☐ Essential for hardware safety

Urgency:
- ☐ No urgency
- ☒ Desirable by date/event: After O2
- ☐ Essential by date/event: _____
- ☐ Immediately

Impacted Hardware (select all that apply):
- ☐ Repair/Modify. List part & SNs: _____
- ☐ Scrap & Replace. List part & SNs:_____
- ☐ Installed units? List IFO, part & SNs: _____
- ☐ Future units to be built

Impacted Documentation (list all dwgs, design reports, test reports, specifications, etc.):

E1100591, D1001427, D1001426, D1200196

Disposition of the proposed change(s):

The disposition of this proposed engineering change request is to be completed by Systems Engineering and indicated in the "Notes and Changes" metadata field in the DCC entry for this ECR. The typical dispositions are as follows:

- **Additional Information Required**: in which case the additional information requested is defined. The ECR requester then re-submits the ECR with the new information using the same DCC number for the ECR but with the next version number.
- **Rejected**: in which case the reason(s) for the rejection are to be given
- **Approved**
- **Approved with Caveat(s)**: in which case the caveat(s) are listed
- **TRB**: the ECR is referred to an ad-hoc Technical Review Board for further evaluation and recommendation. It is the System Engineer's (or designee's) responsibility to organize the TRB. The System Engineer (or designee) then makes a technical decision based on the TRB's recommendation. Links to the TRB's documentation (charge, memos, final report, etc.) are to be added to the "Related Documents" field for this ECR.
- **CCB**: a change request for approval of additional funds or schedule impact is to be submitted to the Configuration Control Board. Links to the CCB's documentation (CR, etc.) are to be added to the "Related Documents" field for this ECR.