

# Advanced LIGO Engineering Change Request (ECR)

**ECR Title: Add independent absolute time marker to frame files**

**DCC No: E1500355-v1**

**Date: 8/21/2015**

**Requester: Zsuzsa Marka  
Daniel Sigg**

**Impacted Subsystem(s): CDS**

**Description of Proposed Change(s):** We propose to add the IRIG-B channel back to the science frame, derived from an independent GPS clock. The independent GPS clocks are CNS II units installed in the end stations. The IRIG-B channel is connected to the PEM chassis, the 1PPS is connected to the timing comparator, and the serial port is read through and available RS232 channel of the EtherCAT system.

**Reason for Change(s):** In initial LIGO we had an absolute and independent time marker in the frame files. It was an IRIG-B signal digitized in one of the end stations. We lost this feature as part of the timing upgrades in Advanced LIGO.

**Estimated Cost:** \$2600/GPS clock, 4 total; and costs for cabling.

**Schedule Impact Estimate:** can go on in parallel.

**Nature of Change (check all that apply):**

- Safety
- Correct Hardware
- Correct Documentation

- Improve Hardware
- Improve/Clarify Documentation
- Change Interface
- Change Requirement

**Importance:**

- Desirable for ease of use, maintenance, safety
- Desirable for improved performance, reliability
- Essential for performance, reliability
- Essential for function
- Essential for safety

**Urgency:**

- No urgency
- Desirable by date/event: \_\_\_\_\_
- Essential by date/event: 01
- Immediately (ASAP)

**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.):  
CDS rack drawings, timing docs, EtherCAT system drawing, GPS library doc.

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## 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.

## Concurrence by Project Management:

Acknowledgement/acceptance/approval of the disposition is to be indicated by the electronic “signature” feature in the DCC entry for this ECR, by one the following personnel:

- Systems Scientist
- Systems Engineer
- Deputy Systems Engineer