

MEMORANDUM

DATE: December 13, 2013

TO: ISC team
FROM: Daniel Sigg, Rich Abbott
SUBJECT: RF Splitter/Filters for LSC-AS_B and LSC_POP_B
Refer to: LIGO-E1300899-v2

The ASAIR_B and POPAIR_B LSC chains look at the $2f$ -signals of the main and secondary modulation frequency at $2f$ and $10f$. These are strong signals which don't require rejection of close-in lines. However, the demodulation of the $2f$ -signal will also demodulate the $10f$ -signal with an efficiency which might be as high as 20%.

As a consequence we implement internal filters for the associated demodulators. The $2f$ -signal demodulator will be equipped with a 20 MHz low pass filter, whereas the $10f$ -signal will be equipped with a high pass filter.

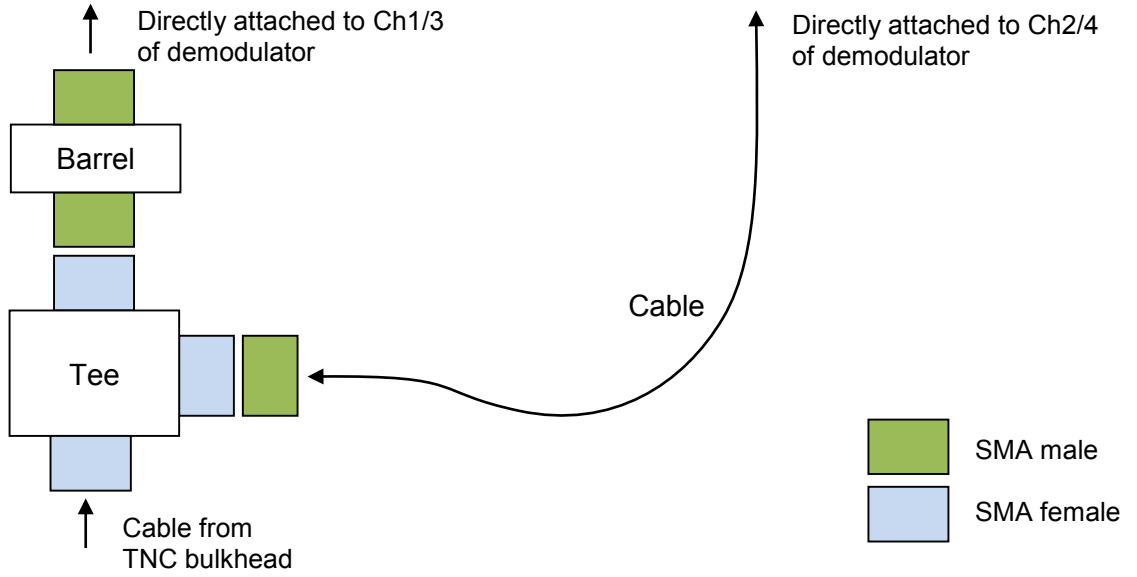
The demodulator patch panels, D1100956, in rack R2 for POPAIR_B and REFLAIR_B, and in rack R3 for ASAIR_B are equipped with TNC bulkhead feedthroughs (Ch 1, Ch 3 and Ch 3, respectively). Two insulating bushings are used per bulkhead. Remove the unneeded TNC to SMA cables from the patch panel.

The sketch below indicates how the SMA adapters and cables are connected to the demodulators for POPAIR_B and ASAIR_B. It is important that the tee is mounted at the demodulator channel with the lower frequency. A custom TNC-SMA cable connects from the patch panel to the demodulator side.

BOM (for 3 ifo):

Qty	Item	Distributor	Description
6	PLP-21.4+	Mini-Circuits	Low pass filter for $2f$ -signal
6	PHP-100+	Mini-Circuits	High pass filter for $10f$ -signal
6	501-1254-ND	Digi-Key	SMA tee adapter female-female-female
6	ACX1240-ND	Digi-Key	SMA barrel, male-male
6	J4106-ND	Digi-Key	SMA cable, 6", straight-straight
9	ACX2020-ND	Digi-Key	TNC bulkhead feedthrough
18	A24479-ND	Digi-Key	Insulating bushing

Mounting:



2f-signal demodulator

10f-signal demodulator