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RLF Notch Filter Test Procedure

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LIGO Scientific Collaboration

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of the LIGO Laboratory.

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|  |  |  |
| --- | --- | --- |
| **Date** | **Engineer** | **Chassis Serial** |
|  |  |  |

# Overview

# Power Board

## DC Power Supply

Total chassis power and individual voltages are recorded in Table 1. Use caution in believing the digital readouts of laboratory triple output power supplies. Their meters are not highly accurate. When in doubt, use a multimeter on the appropriate scale in series with the supply to be measured.

Table 1, Record of DC Test Data

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Typical Value** | **Allowable Range** | **Measured Value** |
| Front & Rear Panel LEDs | All eight on | N/A |  |
| +24V current | 0.02A | ±50mA |  |
| -24V current | 0.02A | ±50mA |  |
| +17V current | 0.14A | ±50mA |  |
| -17V current | 0.43A | ±50mA |  |
| +15V (TP11 on power board) | +15V | ±0.1V |  |
| -15V (TP6 on power board) | -15V | ±0.1V |  |
| +VREF (TP12 on power board) | +10V | ±0.1V |  |
| -NREF (TP13 on power board) | -10V | ±0.1V |  |
| +5V (TP5 on power board) | +5V | ±0.25V |  |
| OK (TP14 on power board) | 3.5V | 3V to 5V |  |

## DC Power Supply Noise

For the noise measurements use a SR785 and measure the rms power spectrum.

Table 2, Record of DC Test Data

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Typical Value** | **Allowable Range** | **Measured Value** |
| +15V (TP11 on power board) | 10nV/√Hz @ 140Hz | <20nV/√Hz |  |
| -15V (TP6 on power board) | 12nV/√Hz @ 140Hz | <20nV/√Hz |  |
| +VREF (TP12 on power board) | 5nV/√Hz @ 140Hz | <20nV/√Hz |  |
| -VREF (TP13 on power board) | 7nV/√Hz @ 140Hz | <20nV/√Hz |  |

# Notches

## Measurement Setup

Set up an RF network analyzer to send an excitation to one of the filter inputs and tee off to the first input of the analyzer. Use the filter output to drive the A-B inputs of a SR560. Then use its 50 Ohm output to drive the second input of the analyzer.

## Notch Frequency Tuning

While running transfer functions continuously tune the variable capacitor to the correct notch frequency. If the notch frequency is out-of-range adjust the capacitors in positions C1-4 and C11-C14, respectively, to get the notch frequency in range.

Table 3, Channel 1/2 Notch Frequency Tuning

|  |  |  |  |
| --- | --- | --- | --- |
| **Notch** | **Nominal (Hz)** | **Allowable Range** | **Measured Frequency (Hz)** |
| **Channel 1** | **Channel 2** |
| 1 | 105 kHz | ±1 kHz |  |  |
| 2 | 210 kHz | ±1 kHz |  |  |

Table 4, Channel 1 Notch Frequency Depth

|  |  |  |  |
| --- | --- | --- | --- |
| **Notch** | **Nominal (dB)** | **Allowable Range** | **Measured Depth (dB)** |
| **Channel 1** | **Channel 2** |
| 1 | 40 dB | <30 dB |  |  |
| 2 | 40 dB | <30 dB |  |  |

## Notch Enable

The notch filters can be enabled for each channel using a DIP switch SW1A and SW1B. Enable or disable each channel depending on need. If the channel is disabled, check that the resulting transfer function is flat.

Table 5, Enable Notch Filters

|  |  |  |
| --- | --- | --- |
| **Required** | **Set** | **Transfer Function Flat** |
| **Channel 1** | **Channel 2** |
|  |  |  |  |

## Pictures

