



# Memorandum

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**To:** File

**From:** John Effland  
Dave Schmitt

**Date:** 2005-10-06

**Revisions:** 2005-10-05     jee     Initial  
2005-10-06     jee     Better data annotation, comment on 50  $\mu$ A noise

**Subject:** GaAs LO Power Amplifier Measurements in Band 6 Cartridge

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Drain voltages required to achieve the operating SIS mixer current of 50  $\mu$ A were measured using the just-completed Warm Cartridge Assembly employing GaAs power amplifiers for the LO. Drain voltages yielding 50  $\mu$ A mixer currents are shown in Figure 1 for the GaAs power amplifiers and Figure 2 for the InP power amplifiers. The GaAs amplifier provides the necessary power to achieve the required operating mixer current for all frequencies measured.

Figure 3 shows the measured mixer currents for the InP power amplifiers and Figure 4 is mixer currents measured using the GaAs power amplifiers. For each polarization, the software servoed the negative mixer current to the desired 50  $\mu$ A value and the system simply reads the current in the other component mixer, as shown in the positive mixer current plots.

The larger variation on the commanded mixer currents for the GaAs case results from excessively large step sizes selected for the D/A converter that maps bits to bias volts. The D/A converter range will be changed in the next revision of the Band 6 GaAs power amplifiers to correct this.

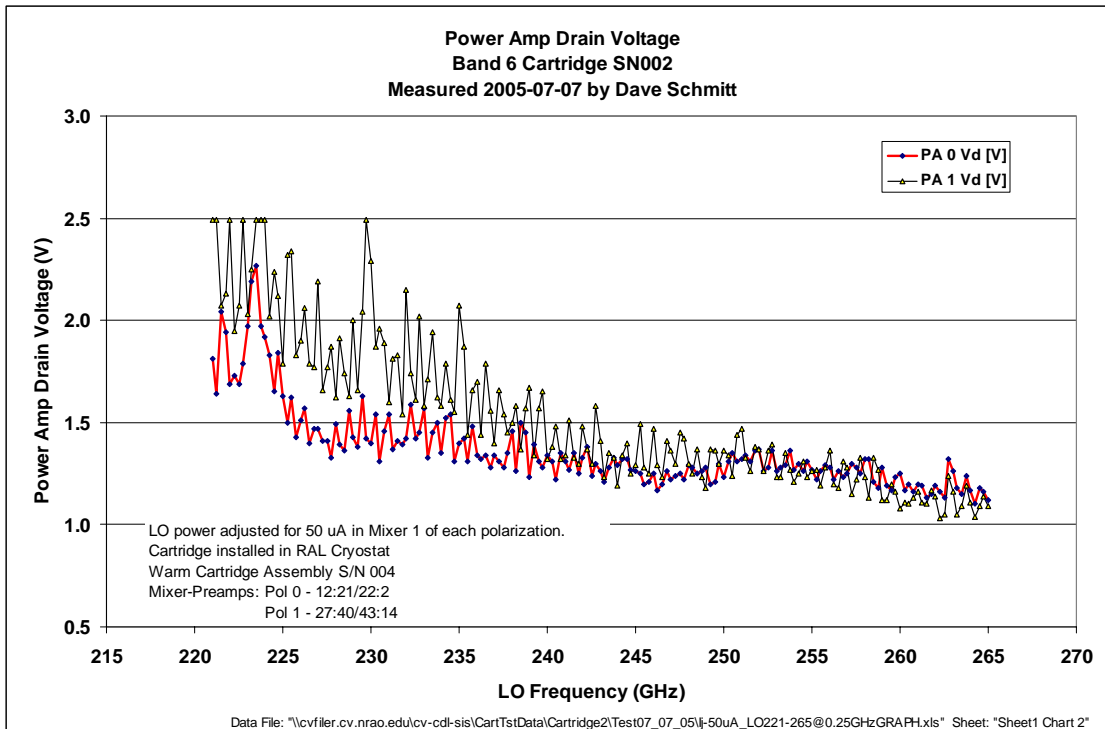


Figure 1: Drain Voltage using InP Power Amp

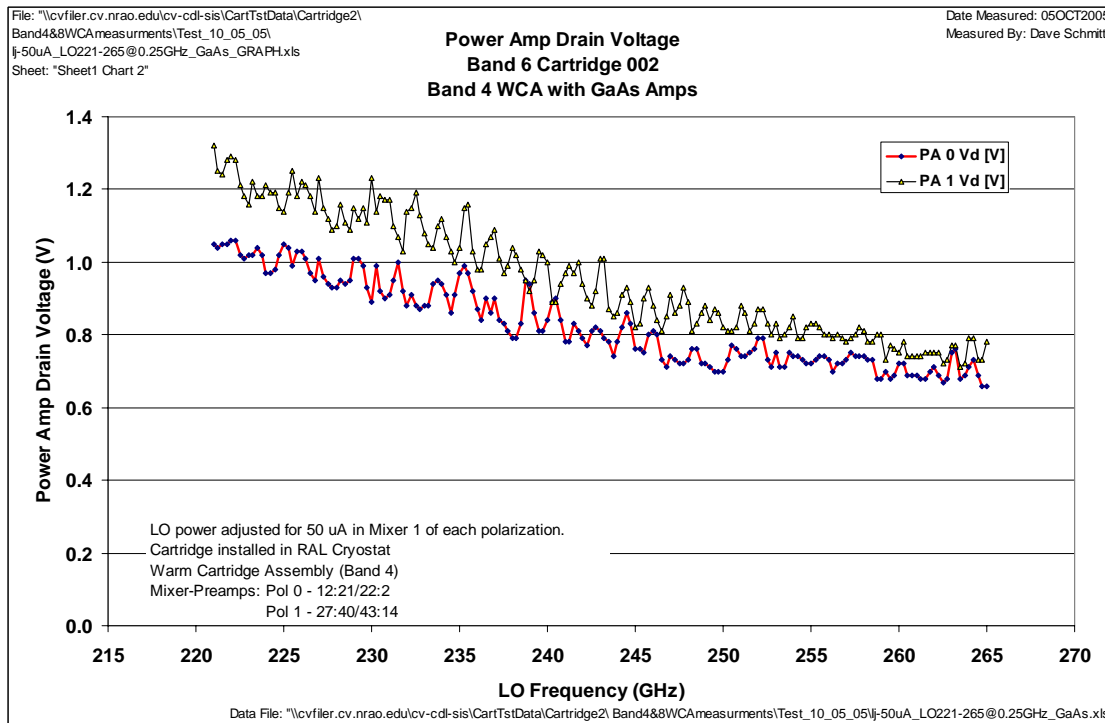


Figure 2: Drain Voltage using GaAs Power Amp

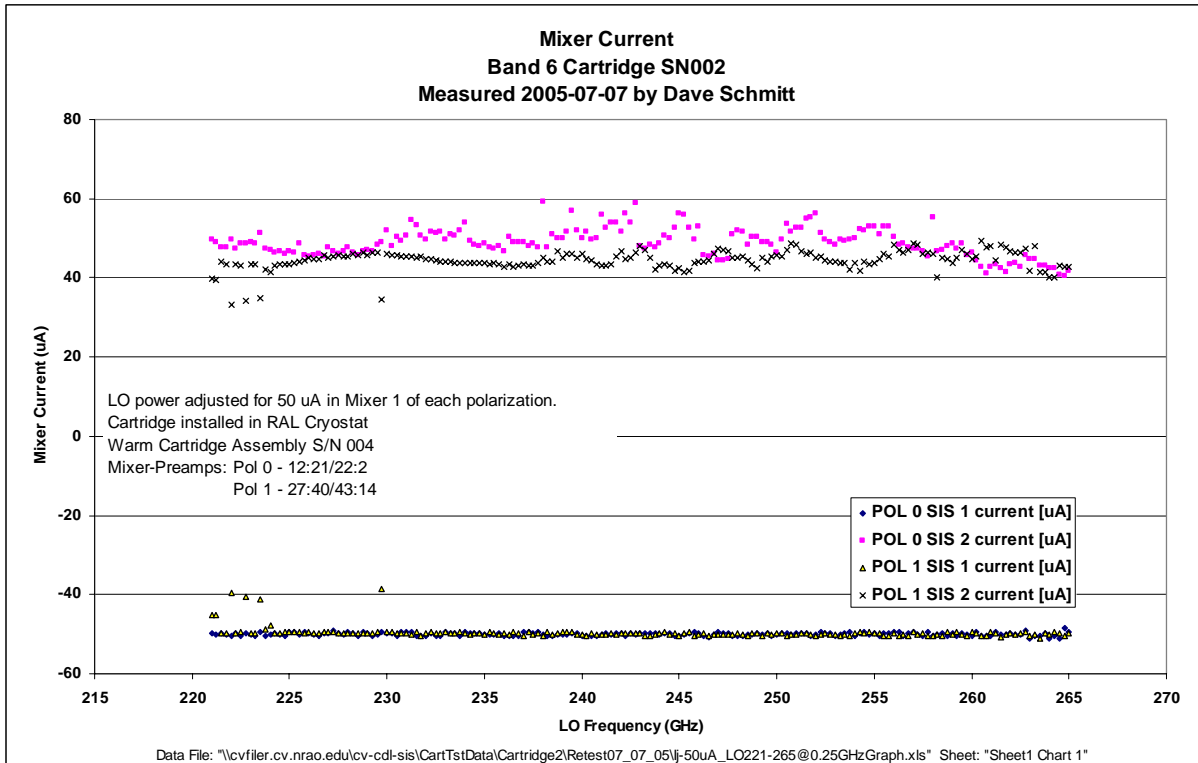


Figure 3: Mixer Current using InP Power Amp

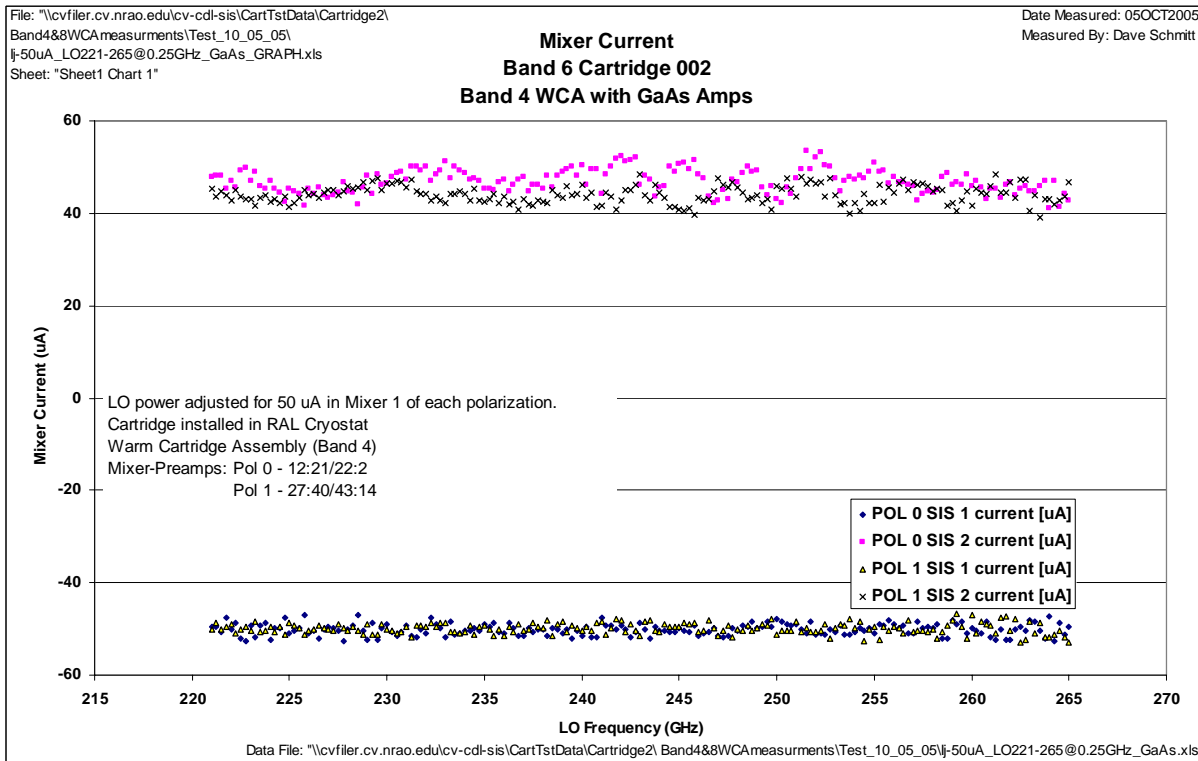


Figure 4: Mixer Current using GaAs Power Amp