

# VLBA ACQUISITION MEMO #297

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To: VLBA Data Acquisition Group  
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Subject: Tests of phase calibration pulse generator from 22-43 GHz

VLBA Acquisition #284 summarized tests made on the pulse generator up to 22 GHz. Now I have repeated the 22 GHz measurement and extended measurements up to 43 GHz on the first of the units now being produced for the VLBA. The 22 GHz measurement made previously of  $-110 \pm 3$  dBm was in error because I failed to peak the YIG preselector on the HP8566B analyzer. With the preselector peaked the output is  $-102 \pm 3$  dBm.

Measurements were extended to 35 and 43 GHz using a SpaceKom doubler/mixer and K-band sweeper in front of the HP8566B analyzer. The output was calibrated using a sweeper and power meter. The pulse generator without microwave gating switch (NARDA S213) extends quite well to 43 GHz in a manner consistent with a risetime of about 20 ps. However, the S213 switch becomes extremely lossy above 35 GHz - see attached figure. With the S213 switch the pulse generator is not useable above 35 GHz and I am not optimistic that a suitable switch can be found to cover the entire 2-43 GHz range. I suggest two options for VLBA phase calibration at 43 GHz as follows:

- 1] Use separate pulse generators for the 2-25 GHz and 43 GHz bands. The 43 GHz pulse generator would use a millimeter PIN switch like the S217 (not tested - but should work fine).
- 2] Use only I.F. phase calibration at 43 GHz.

Atch: (1) Figure

