

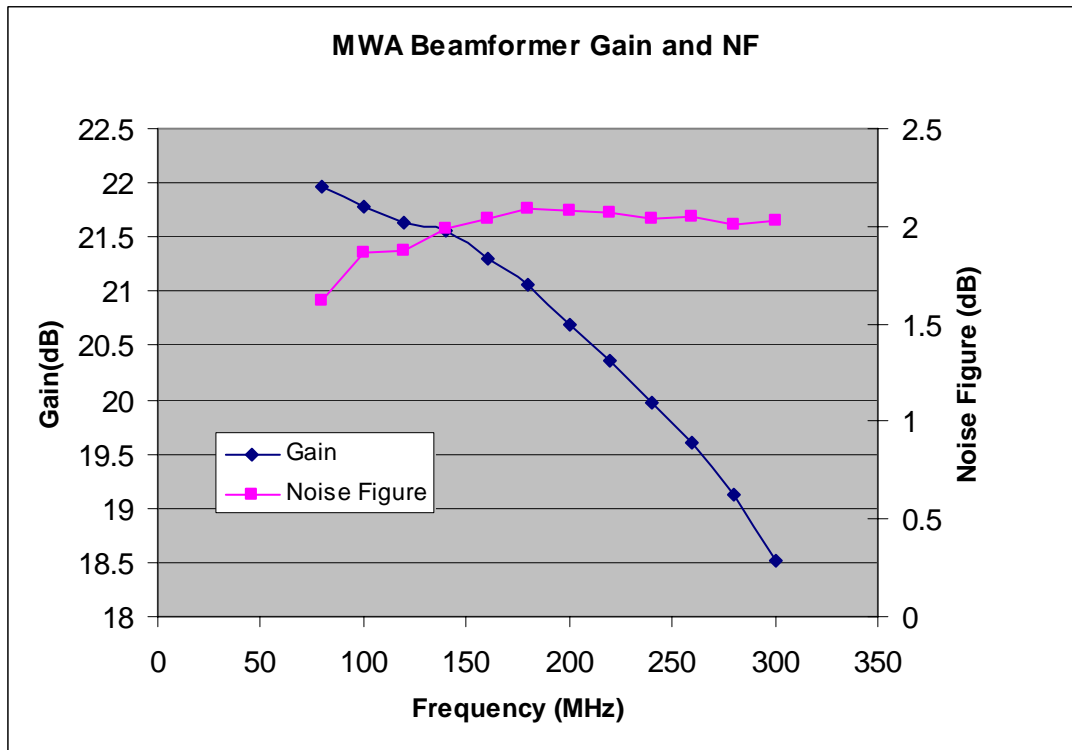
**MWA memo**  
**MWA Beamformer 2<sup>nd</sup> stage Noise**  
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**Introduction**

The second amplification stage of the MWA antenna system occurs in the first amplifier of the beamformer. Determination of the noise figure of the 2<sup>nd</sup> stage is required to verify that the noise contribution of the later stages is sufficiently small relative to the LNA.

**Results**

The Delayline test board was used to measure the gain and noise figure shown below. The test board uses the SGA-4563 as the front end amplifier to the beamformer and includes the delaylines and their associated filters. It does not include the power combiners, the later stage amplifiers, or the walsh circuitry. The HP 8970B Noise Figure Meter was used to take this measurement.



The value from the SGA-4563 data sheet used to predict the system temperature for this amplifier is 1.9dB and is consistent with these results and is estimated to contribute less than 1% of the system noise.

