

ADDITIONAL BASELINE TO INTERFEROMETER
MEMO No. 185

NATIONAL RADIO ASTRONOMY OBSERVATORY

MEMORANDUM

February 15, 1983

To: R. Fisher
From: J. Coe
Subj: Point Mountain to Green Bank Microwave Link

The microwave link path losses were measured February 9 and 10. Measurements were made by transmitting a signal from Point Mountain through the 10-ft antenna, the double reflector on Back Mountain, and the single reflector on site receiving the signal with a test horn on top of the control building. The signal level received at the control building was -66 dBm and the transmitter power was +37 dBm, indicating a path loss of 103 dB. This signal level was obtained without adjusting the single or double reflectors, which is indicative of the precision of the initial installation.

The signal level of -58 dBm was also measured at the single reflector site resulting in a path loss of 95 dB.

The computed path losses were determined by adding algebraically the antenna gains and losses as shown below:

<u>Point Mountain to Control Building</u>		<u>Point Mountain to Single Reflector Site</u>
17' Waveguide Loss	-1.5 dB	} = -78.1 dB
10' Antenna Gain	52.3 dB	
14.5 mile Path Loss	-144.7 dB	
Double Reflector Gain ...	115.0 dB	
5.3 mile Path Loss	136.0 dB	
Atmospheric Atten.	-3.2 dB	
Test Horn Gain	25.0 dB	
Amplifier Gain	15.0 dB	
0.7 mile Path Loss	-118.4 dB	
Single Reflector Gain ...	115.8 dB	
	<u>-80.7 dB</u>	

Summary

<u>Point Mountain to Control Building</u>		<u>Point Mountain to Single Reflector Site</u>
80.7 dB	 Computed Path Loss	78.1 dB
103.0 dB	 Measured Path Loss	95.0 dB
22.3 dB	 Difference	16.9 dB

At the time the measurements were made it was evident that the path loss from Monterville to the single reflector site was higher than the computed loss. However, the measured path loss to the control building seemed equal to the computed path loss.

When I checked my calculations I found an error in the single reflector gain value which caused the computed path loss figure to be too high.

When the 10-ft antenna is installed at the Interferometer Control Building we should plan on adjusting the reflectors to minimize the path loss. We expect the difference between the computed and measured path losses to be reduced substantially.

JRC/cjd