

NATIONAL RADIO ASTRONOMY OBSERVATORY
Charlottesville, Virginia

(860407)

April 7, 1986

To: VLBA Electronics Group
From: Dick Thompson
Subject: VLBA Electronics Meeting, April 3, 1986
Attendees: Bradley, Campbell, Dill, Greenberg, Koski, Mauzy,
Napier, Norrod, Romney, Schlecht, Thompson,
Walker, Weber, Weinreb.

The meeting opened with a brief discussion of cables and connectors in which Dick Thompson reviewed some of the recommendations discussed in more detail in VLBA Memorandum No. 543. Jim Oty will place orders for the required cables to be delivered to the VLA site. There was some feeling that the use of high stability flexible cables for the LO and IF system, which is being listed as an option pending cable tests, should be incorporated in the construction plan as a definite item.

Construction of racks and bins by an Albuquerque machine shop is proving to be satisfactory. Jack Campbell reported that inspection of early units showed some unacceptable tolerances in the bins, but this problem is being corrected. There should be no holdups resulting from delays in these items.

The spillover efficiency of the 1.5 GHz feed at the subreflector is now calculated to be 75%, resulting in a predicted antenna efficiency of 58%. These figures result from a new calculation that takes account of near-field effects, and are somewhat lower than had been hoped. They can be corrected by means of a dielectric lens at the aperture of the horn. A decision on the necessity for such a lens will await tests on the Pie Town antenna.

Three front ends for 1.5 GHz have been almost completed at Green Bank and one has been shipped to the VLA site for tests on a VLA antenna. Assembly of the 4.8 GHz front ends is about to begin as final details are completed on the 1.5 GHz ones. Components for the 15 GHz front end for Pie Town are in hand, and assembly should be completed in late May. S. Weinreb reported that the G.E. contract for HEMTS for the Voyager project has produced some very good transistors. G.E. is also developing HEMT amplifiers for frequencies as high as 94 GHz. An amplifier for the 22-25 GHz band has also been developed, using one HEMT and two FET stages. Over this band the noise temperature is $100 \pm 15K$ and the gain is 25.5 ± 1.8 dB.

Erich Schlecht reported that the frequency converters are complete except for measurements of temperature effects, which can most easily be performed if two modules are available. Procurement of converter modules parts for antennas 2 and 3 is thus being started. Temperature tests on the 330/610 MHz front end made during the past month are satisfactory, and over a range of -25 deg C to +35 deg C in the external box temperature no phase changes attributable to front end components greater than 0.5 deg were detected. The limit was largely set by the accuracy of estimation of the effects in cables running to the box within the oven.

Recommended names and type numbers for VLBA modules and units were briefly discussed and a memorandum listing these is in preparation.