

National Radio Astronomy Observatory
Charlottesville, Virginia

March 2, 1988

To: VLBA Electronics Group
From: Dick Thompson
Subject: VLBA Electronics Meeting, March 1, 1988

Attendees: Bagri, Balister, Beale, Brundage, Campbell, Lilie, Morris,
Napier, Norrod, Oty, Schlecht, Simon, Spaulding, Stetton,
Thompson, and Walker

Construction Status

In Charlottesville the assembly and wiring of racks A, B, and C for system 5 will be complete by the end of this week, and about 60 percent of the modules required for these racks are on hand. Rack A for system 6 is also assembled and wired.

The first 23 GHz front end has been tested, and is awaiting only an attenuator to set the noise calibration level. The noise temperature is in the range 55-65 K over most of the band (21.7-24.1 GHz), but below 22 GHz it is a little worse, and rises to about 100 K at the bottom edge of the band.

The 2.3 GHz front end is in final testing in Green Bank. The noise temperature is 10 K in the middle of the band. Because of the large polarizer, the system takes about 12 hours to cool to a usable level of performance, and a further 5 hours for the polarizer to reach a stable temperature. These figures are greater than those for higher frequency front ends, but are acceptable.

Serial 5 front end for 4.8 GHz is about to be tested at Green Bank. Serial 5 front end for 1.5 GHz is awaiting amplifiers from Charlottesville.

At Green Bank, the levellers for five of the 2-16 GHz Synthesizer Modules built last year have been received. Two synthesizers for the system 5 racks will be ready by mid-March.

Spares

It was agreed that the numbers of spares for electronics submitted to Ken Stetton in January should be reviewed. In particular, the laboratory system of racks and modules should be additional to the units required for maintenance. Also, numbers of spare modules should take account of the extent to which failure of any particular type of module will cause a major part of the receiving system be out of operation. The current numbers of spares were chosen on a 10 percent basis.

Modifications

A modification of the 2-16 GHz Synthesizer Module, which involves only changing one connection in the control circuitry, has been requested by Ron Heald. This change will allow the serial number to be read back in the same way as for the other modules. An electronics memo describing the change will be forthcoming.

J. Oty requests a modification to the circuitry used for measuring temperatures. This will involve the 330/610 MHz Adapter Module and the Rack B Interface Module, and will allow a precision of 0.1° C rather than 0.5° C. E. Schlecht has proposed the circuit design changes.

Cables

D. Bagri reported that the use of RG142B cable in place of RG214 on the azimuth cable wrap has not resulted in any significant improvement in phase stability when the antenna is turned. (RG142B is thinner and more flexible than RG214.) The next step is to consider a different mounting arrangement, if possible, to avoid twisting of cables. Durga will consult Lee King on this possibility.

Miscellaneous Points

Jack Campbell requested that the performance of front ends be measured in the lab over a wider range than the nominal bandwidth, to allow evaluation of certain special observing requests.

Bill Brundage reported that cryogenic failures on Voyager front ends are now mainly confined to problems of seal wear. Problems with bushings are no longer important now that the new bushing materials are routinely installed by the cryogenics group.

Work on documentation is continuing in Charlottesville, and a number of manuals on modules are nearing completion. Jack Campbell is setting up a file of VLBA drawings and other maintenance information at the VLA site.