

## NATIONAL RADIO ASTRONOMY OBSERVATORY

Charlottesville, Virginia

1987 September 1

To: VLBA Electronics Group

From: R. B. Sebring and A. R. Thompson

Subject: Notes from VLBA Electronics Meeting, 1987 September 1

Present: Thompson (moderator), Napier, Bagri, Stetten, Norrod, Beale, Schlecht, Wireman, Spaulding, Morris, Simon, Brundage, Sebring

Charlottesville

System 3 Electronics to be shipped Sep 4 or 8 or 9. Has been well tested in CV, but will be hooked up to M/C computer at VLA before being sent on to Kitt Peak. No essential changes from earlier systems, but this is first system with 8.4- and 23-GHz converter. On 23 GHz there is a spurious response resulting from the second harmonic of the local oscillator. This is not strong enough to preclude early operation, but may require some design change to eliminate. The LO Transmitter and LO Receiver modules are essentially the same as in the Pie Town system, except for an improved phase-lock circuit.

The A-rack for System 4 is done save for Power Supplies, and the B-rack is nearly complete also.

Current plan is to ship System 4 directly to Site 3 (Los Alamos). Napier asked whether all are comfortable with this idea, or whether the system should go first to the VLA, as earlier ones have. There seemed no objection to proceeding as planned.

System 4 is the first one with what has been heretofore called the "General Interface Module", which contains a number of relay drivers for operating transfer switches, including those for interchanging IF signals for diagnostic purposes. This module appears sufficiently specialized to Rack B to henceforth be known as the Rack B Interface module (M102).

Green Bank

Norrod reports #4 1.5GHz system 80% complete. Napier pointed out that a 1.5-GHz system is needed at KP mid-November, and that it would be well if such a unit could be shipped to the VLA when the System 3 racks go.

The 2.3-GHz unit is also 80% done, though tech time is needed to complete the amplifier.

The 2-16 GHz synthesizers are progressing, with all through serial #6 operational. Beale is awaiting output-leveling attenuators for some of these.

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Napier said that a US VLBI Network (NUG) run at 327 MHz is scheduled for mid-November, and that a goal has been set to have Pie Town participate. To achieve this, we should attempt by the end of September to get fringes in a PT-VLA pilot operation. A Mk II formatter will be needed for this. The one now at CV for VCR testing may have to be borrowed. The first masers should be available by mid-September, but a crystal is good enough to prove fringes at this low frequency.

Thompson said that in our discussion of plans for building Data Recording equipment in-house the matter of spares came up. He feels that two spare units each of the initial outfitting front ends, and one each for the later frequencies should suffice. It was mentioned that the Model 22 refrigerators are now looking good, with no failures reported for over a month. Napier said we must begin to prepare a written spares plan for the entire Project, and that Thompson should contribute the list and procurement/fabrication schedule for Electronics spares.

Thompson mentioned that \$15k per site is budgeted for test equipment destined to reside at the site, and that none of this has yet been committed. Schlecht has obtained a spectrum analyzer (Anritsu) for about \$7.5k that might be good to have. Bagri suggested a remote readout instrument that would permit engineers at the AOC to direct servicing operations remotely. This would permit observations of RFI problems as well. Napier felt this is inconsistent with the VLBA philosophy of servicing by module replacement, based on what can be learned from monitoring observations. Thompson recommends getting one more unit like the one Schlecht has and seeing how useful it is in the field. He is also looking into a digital scope that could be useful.

Ken Stetten suggested that a slow-scan video operating over the data circuit could be useful in permitting AOC personnel to observe problems at the site that are not covered well by the M/C system. It could be tried at Pie Town at modest cost.

Thompson said proposals for Navstar receivers are being evaluated. Although some scientists have pushed for an expensive (\$60k) two-frequency system for calibrating the ionosphere, we need to go ahead now with a cheaper model for the next station.