VLB ARRAY MEMO No. 501

VLBA Electronics Memo No. 52

NATIONAL RADIO ASTRONOMY OBSERVATORY
Charlottesville, Virginia

October 7, 1985

To: VLBA Electronics Group

From: Dick Thompson

Subject: Electronics Meeting, October 3, 1985

Attendees: Balister, Beale, Bradley, Clark, D'Addario, Dill, Hvatum, Koski, Mauzy, Moffet, Napier, Norrod, Rogers, Schlecht, Walker, Weber.

Almost all of the meeting was devoted to a discussion of bin and module interconnections, and the distribution and interconnection of the monitor and control bus. Most of the basic information was supplied by D. Weber: see VLBA Electronics Memo No. 53. The bus will be distributed on twin-ax cable for short lengths: the cabling for longer runs has not yet been decided. It was generally agreed that the shielding of the bus should be preserved through the Amp connector blocks in the bin and module interconnection, although it is not clear that the radiation from using unshielded pins would be a problem. Since there is more than three orders of magnitude in frequency between the bit rate on the bus and the lowest (future) VLBA frequency of 75 MHz, it should be possible to filter the digital signals. However, this may not be a practical solution because of the large number of drivers connected to the bus. Dave Weber stated that the Amp types of coaxial connectors in the subminiature size have not proved to be reliable. Thus there are two principal candidates for the bus transmission through the Amp connector blocks. There are the twin standard coaxicon connectors which Dave favors, and the miniature coaxicon connectors which are currently in use on some VLA modules.

The twin standard connectors would require the use of the Amp mixed 16-position, M-Series connector which has not been previously used on the bin and module systems. It accommodates four shielded twin connectors and 12 signal/power pins of the regular size. Two of the twin connectors would be required for the bus.

The miniature coaxicon connectors could be used with the existing standard bin and module connector, the Amp 42-position mixed connector. Four such connectors would be needed to carry the bus. This connector has 36 of the regular power/signal pins, and is thus less restrictive in many applications than the 16-position connector.

Much of the problem of using either connector for the bus is related to branching of the bus lines along the back of the bins to produce short lengths of coaxial or shielded twin cable to carry the bus signals to the connectors. Dave's material included two drawings suggesting designs for distribution boxes.

Alan Rogers wishes to use a connector that accommodates 20 of the miniature coaxicon connectors for the baseband modules. These would carry the required bus and IF signals. There is much to be said for allowing a small number of different possibilities to be used, since this allows flexibility in accommodating all of the other signal connections that may be required for a module. Limitation of the bus connection to a single Amp type would have the effect of requiring two connectors on many modules that would otherwise require only one, thus complicating the alignment tolerances of the modules and bin panels. Note that all of the connectors mentioned above have blocks of either one of two sizes, which correspond to the standard 38-pin and 50-pin block sizes. Study of connector types for recommended standards is continuing.