

NATIONAL RADIO ASTRONOMY OBSERVATORY  
Charlottesville, Virginia

April 23, 1985

MEMORANDUM:

TO: VLBA Electronics Group  
FROM: S. Weinreb  
SUBJECT: Front-End Monitor and Control

The following three questions, independent to a large degree, must be answered with regard to the front-end interface:

- 1) Should the interface module be mounted on the front-end or in a rack?
- 2) Should the module have a manual analog monitor mux in addition to the computer-controlled mux?
- 3) Should the module have control switches which override computer control?

I favor a rack mounted module with manual monitor and control provisions whereas VLBA Memo #41 reaches a conclusion of a front-end mounted module with manual monitor and control in a separate plug-in module. My reasons are as follows:

- 1) Space around a front-end is at a premium for fitting in as many front-ends as possible and for accessibility to each front-end. Much effort has gone into making the present front-end design as compact, light-weight, and accessible as possible (10" x 15" x 13" and < 50 pounds for 5-23 GHz units). The monitor module is estimated to occupy a volume of 12" x 8" x 2". I am sure we can now find space for the module on each front-end, but it is not necessary to use this valuable space for electronics which can be mounted elsewhere and, to my mind, is more conveniently serviced as plug-in modules in a rack.
- 2) There must be a cable and connector between the front-end and the module wherever it is located. The limitations due to connector pins or unreliability of the cable are not functions of cable length. Cross-talk and ground differentials are functions of length but a 20' length is easily accommodated by the present design. On the other hand, the RFI risk due to ten 20' digital buss cables is difficult to assess.

- 3) The monitor module will require 5V @ 1.2 amps. The return currents should not flow through the front-end frame and vertex room structure; this will necessitate a separate supply for each module (probably 9V with an on-board regulator) if the modules are mounted on each front-end. The power system is simple in a rack.
- 4) The parallel manual mux is simple, inexpensive (< \$100 per front-end), and convenient. I am all in favor of an extensive computer display and fault-detection system but just believe the manual mux is worth the small cost for help in diagnosis of some subtle problems which may arise.
- 5) The manual control is also simple and inexpensive and I do not see the wisdom of providing separate plug-in modules for this purpose. In addition to use in the early shakedown phase, I would foresee possible use during computer maintenance or control system failure (keep front-ends cold even if telescope is off-line).
- 6) If an "all in one place" test mode is desired, this can be accommodated by a plug-in test module whether the normal module is in a rack or attached to the front-end.