

National Radio Astronomy Observatory  
Tucson, Arizona

October 8, 1986

MEMORANDUM

To: J. Payne, S. Weinreb, R. Escoffier, D. Hogg, D. Emerson

From: A. Dowd and R. Freund

Subject: Status of the Hybrid Spectrometer

On Friday, October 3, 1986, a meeting was held here to discuss the present status of the Hybrid Spectrometer. In particular, the focus was on Tucson's part in the construction of the final Correlator. Everyone here was brought up to date on the present status and some decisions on future efforts were made. The meeting's participants were: John Payne, Robert Freund, Antonio Perfetto, and Andy Dowd.

The following is a brief summary of the information presented in the meeting.

I. FILTER MODULES:

- A. Test Module - The initial plan called for Tucson to build an additional filter module. This is still planned but will be shoved back until changes in the individual units have been finalized.
- B. Filter Board - By the first of November, Robert Freund will place an order for 72 filters to fulfill the needs for the system plus necessary spares. He is investigating the possibility of changing the mounting of the filters from conductive epoxy to a mounting which will allow the filters to be more easily removed. The coupling to the ground plane would change to solder tabs.
- C. Mixer Board - Some work has started on increasing the image rejection. The first area that is being examined is the 90 degree phase shifter. In particular, several transformers have been ordered as possible replacements. When they all arrive, tests will be made of the transformer characteristics. Robert and Andy will work on this problem and come up with a revised design. The primary effort will be to evaluate individual components.

D. Gated ALC Board - Starting Nov. 1st, Ralph Becker will start laying out the final version of this card. Necessary changes will be made to correct the known problems with digital driver levels, analog multiplexer feedback, integration counter overflow, and temperature monitor full scale range.

II. DATABASE: The various components necessary for a filter module will be set into a Data Base on Lotus 123. This will be done to facilitate ordering. Andrew Dowd will set this up by Nov. 1st.

III. SOFTWARE DEVELOPMENT: Several additions have been made to observation software. For example, the software can now present data in the bar graph form. Also, the IEEE-488 driver is being modified to handle the addition of the control computer on to the Bus. Finally, "C" is being evaluated as a possible replacement for the Fortran software. "C" offers several positive features including a good source level debugger and extensive libraries of routines.

IV. SYSTEM TESTING: System testing is ongoing between the various power outages and A/C repairs. The results to date will be copied and sent to Charlottesville by Oct. 10, 1986. The only conclusive result is an unstable output from the third total power V/F converter. This problem is seen only for the first few hours after power up.

Andrew Dowd  
Oct 3, 1986

V. IF PROCESSOR:

A. An initial system level design of the IF pre-processor will be completed by Nov. 1, 1986. A description of the technical capabilities will be generated for review. - RWF

B. After the system level design is completed, the construction of a prototype unit will proceed. Orders for some long lead-time components from the signal path will be placed. - RWF/AAP

C. A detailed design of the LO synthesizer will follow. An order for the YIG oscillator and sampling mixer will be placed. Until the acquisition of the desired YIG oscillator, a substitute suitable for initial experiments might be a 4GHz to 8GHz YIG oscillator already in Tucson. - RWF

D. A short investigation into the availability of microstrip components for the high frequency IF portion of the pre-processor and the difficulty of interconnecting these components with microstrip

will be made. A decision will be made no later the Dec 31, 1986 whether to use microstrip or standard coax construction techniques.  
- AAP

- E. Expenditures for the IF pre-processor design and prototype will be kept to less than \$5k in 1986. (HYSPEC memo #7)
- F. All remaining components for the main signal path and the LO synthesizer section of the prototype will be ordered. - RWF/AAP

Robert W. Freund  
Oct 8, 1986

c: ✓ Cathy Burgess, HYSPEC MEMO SERIES