

NATIONAL RADIO ASTRONOMY OBSERVATORY
Charlottesville, Virginia

June 30, 1986

MEMORANDUM:

TO: Distribution

FROM: S. Weinreb *S. Weinreb*

SUBJECT: Hybrid Spectrometer Plan

I. Telescope Test Results

The results of recent tests at the 12-meter telescope are attached. In summary, the results were good. The spectrometer has small imperfections (images, pedestals, residuals), but there is good prognosis for improvement in the final system, post processing could remove the imperfections if they remain, and the system is our only alternative for achieving a versatile, wide-bandwidth (37.5 MHz to 2400 MHz) spectrometer with a large number of channels (1536).

II. Plan

The following tasks were discussed and responsibilities assigned during recent meetings in Tucson:

- 1) Coordinate project - (Weinreb; final hardware and PC software complete by July 1987, assuming \$45k additional funds available January 1987)
- 2) Digital hardware - (Escoffier, Brown; assembled by February 1987, tested by May 1987)
- 3) Analog filters - (Freund, Dowd; assembled by April 1987, tested by June 1987). Hold expenditures to \$8k in 1986, improve and finalize one unit in 1986, order long-term delivery items by November 1986.
- 4) I.F. processors - (Freund, Perfetto; prototype by January 1987, eight units by July 1987). Hold expenditures to \$5k in 1986. Achieve maximum I.F. input frequency range while holding cost to < \$4k per unit.
- 5) PC software - (Dowd by May 1987; \$8k available in 1986). Improve reliability, friendliness, and documentation of existing software and incorporate array processor and mode options for final system. Scope of PC software will remain as present. The PC provides: (i) Fourier transform and corrections to give filter-bank equivalent data, (ii) monitor operation of system during observations, and (iii) stand-alone processing needed for maintenance or testing.
- 6) Telescope software - (Hogg, Stobie by June 1988). Provide PDP/ 1144 and VAX programs to handle the new spectrometer.

- 7) Further prototype system tests - (Dowd). Perform tests to characterize the residual baselines for long integrations and pedestals around strong signals. Keep a log book showing system hardware and software changes and test results; publish a brief (< five pages), bi-monthly (first by September 1, 1986) report summarizing the results.

III. HYSPEC Memo Series

To keep track of the documentation of the project, Cathy Burgess will control a memo series. I will selectively distribute future memos in the series and will send everyone receiving this memo an updated list when appropriate. Please call Cathy if you want a copy of any of the existing memos listed below:

<u>HYSPEC Memo #</u>	<u>Title</u>	<u>Author</u>
1	Hybrid Correlator (Summary) 11/13/85	Escoffier
2	"Analog-Filter, Digital-Correlator Hybrid Spectrometer" (published in <u>IEEE Trans. on Instrum. and Measurement</u> , vol. IM-34, no. 4, Dec. 1985)	Weinreb
3	Test Procedure for Filter Module of Hybrid Spectrometer 1/10/86	Weinreb
4	Hybrid Spectrometer (Specification) 3/3/86	Hogg
5	Correlation Function to Power Spectrum Transformations (Technical Note #136) 3/4/86	Weinreb
6	Theoretical RMS for Hybrid Correlator 4/23/86; corrected 6/30/86	Weinreb
7	Hybrid Spectrometer Plan 6/30/86	Weinreb
8	Telescope Tests of Hybrid Spectrometer 6/30/86	Weinreb/ Escoffier/ Dowd

Attachment

Distribution:

M. Balister	R. Hill	B. Stobie
R. Brown	D. Hogg	B. Turner
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A. Dowd	H. Liszt	A. Wootten
R. Escoffier	J. Payne	
R. Freund	A. Perfetto	