

NATIONAL RADIO ASTRONOMY OBSERVATORY
Charlottesville, Virginia

January 24, 1989

MEMORANDUM

To: VLBA Electronics Group

From: A. R. Thompson

Subj: VLBA Electronics Meeting, January 17, 1989:
Electronics Construction in 1989

Attendees: D. Bagri, L. Beale, L. Beno, W. Brundage, J. Campbell,
J. Chavez, W. Crady, R. Lacasse, P. Lilie, G. Morris,
R. Norrod, J. Oty, A. Rogers, J. Romney, E. Schlecht,
R. Simon, R. Simmons, S. Srikanth, K. Stetten, R. Treacy,
C. Walker, D. Weber, W. Wireman

The meeting was devoted mainly to a discussion of the construction plan for the VLBA Electronics Group including the Data Acquisition Racks (referred to as D-Racks or DAR's). The plan, including revisions discussed at the meeting, is shown in the table attached herewith. For the year 1988, the principal goal was to build the initial-outfitting electronics (Racks A, B, and C and Front Ends for 1.5, 4.8, and 23 GHz) for systems through serial number 7, and one Rack D. For 1989 the basic plan is to produce two further sets of electronics (serial numbers through 9), and three more units of Rack D.

Feeds - The budget does not allow for construction of feeds through system 9 in 1989, so the main consideration is to cover the initial outfitting through the first half of 1990, which includes system 7 (Brewster, April 1990). Thus feeds through serial 7 are required for 1.5, 4.8, and 23 GHz. Two more dichroic reflector systems will be obtained during 1989 to keep up with the construction of 2.3 GHz front ends. This will allow full use of available S/X front ends for geodetic measurements.

Front Ends - For greater construction efficiency it has been decided to build four 1.5 GHz front ends in 1989 rather than two each for 1.5 and 4.8 GHz. This will complete the total requirements for 1.5 GHz front ends, and four 4.8 GHz front ends will be built in 1990. Of the frequencies to be added after initial outfitting, 2.3 and 8.4 GHz have been given high priority to permit early geodetic use of the antennas. There is some question as to whether the model 22 refrigerators in the 2.3 GHz front ends are fully adequate to cool the large polarizers, so construction is being limited to a total of two or three units until this question is resolved. The first 43 GHz front end will be designed and constructed by R. Norrod in 1989.

Racks A, B, C, and Corresponding Modules - Racks A, B, and C for systems 8 and 9 will be constructed in 1989. Construction of converter modules will match that of front ends. Construction of 2-16 GHz Synthesizer modules includes units through serial number 34. These will provide 30 operating units plus 13 percent spares if the units in the test system (system 11) are counted as spares. The numbers of power supply modules in the table include units for the D-Racks.

Data Acquisition Racks - For the D-Racks and associated modules, the numbers in the first three columns of the table include the units being built at Haystack (four racks with all modules, except that two of the racks will not have the VLBA design of P105 and D122 modules). The numbers for the 5 MHz Distributor modules include one for each C-Rack in addition to those for the D-Racks. The numbers in the table also include construction of one D-Rack with 14 Baseband Converters for Green Bank (Naval Observatory contract), for which additional funds and manpower will be made available.

Monitor and Control Cards - Asterisks against the numbers of units in the final column of the table indicate that the unit concerned requires a M/C interface card. Thirty-four cards are required for the 1989 construction, 12 of which should be sent to L. Beale at Green Bank and 22 to W. Wireman at Charlottesville. Twenty cards are also required to complete the 1988 construction; 8 of these should go to L. Beale and the remainder to W. Wireman.

Other Units - Hot and cold loads are required for field calibration of front ends, in addition to the ones used in construction. One set each for 1.5 and 23 GHz is included in the 1989 build, and these should be sent to P. Lilie in Socorro when completed. Funds are also available this year for a second Navstar timing receiver.

ART/j

VLBA Electronics Construction Plan for 1989.

Unit Name	Type No.	No. Units Complete by end 1988:		No. to be Compl. by end 1989	No. to Constr. 1989
		Planned	Achieved		
330/610 MHz Feed		1	1	5	4
1.5 GHz Feed		6	5	7	2
2.3 GHz Feed		1	1	3	2
4.8 GHz Feed		5	5	7	2
8.4 GHz Feed		3	3	5	2
10.7 GHz Feed		1	1	1	0
15 GHz Feed		1	1	1	0
23 GHz Feed		6	5	8	3
43 GHz Feed		0	0	1	1
8.4/23 Dichroic		1	1	3	2
330/610 MHz F.E.		1	1	5	4
1.5 GHz F.E.		7	7	11	4
2.3 GHz F.E.		1	1	3	2
4.8 GHz F.E.		7	7	7	0
8.4 GHz F.E.		3	2	8	6
10.7 GHz F.E.		1	1	1	0
15 GHz F.E.		1	1	1	0
23 GHz F.E.		6	3	8	5
43 GHz F.E.		0	0	1	1
330 MHz Conv.	T101	1	1	5	4
610 MHz Conv.	T102	1	1	5	4
1.5 GHz Conv.	T103	7	7	11	4
2.3 GHz Conv.	T104	1	1	3	2
4.8 GHz Conv.	T105	7	7	7	0
8.4/23 GHz Conv.	T106	6	5	8	3
10.7 GHz Conv.	T107	1	1	1	0
15 GHz Conv.	T108	1	1	1	0
43 GHz Conv.	T110	0	0	1	1
F.E. Interface	F117	27	32	45	13*
330/610 Adapter	F118	7	8	9	1
Maser Interface	L101	6	6	9	3*
L.O. Transmitter	L102	7	5	9	4
Round Trip Mon.	L103	7	7	9	2*
L.O. Receiver	L105	7	5	9	4
2-16 GHz Synth.	L104	22	22	34	12*
Switch Driver	L107	7	7	9	2*
Station Timer	L108	7	7	9	2
Rack B Interface	M102	7	7	9	2*
Power Supply	P101	33	29	46	17
Power Supply	P102	21	24	27	3
Power Supply	P103	33	28	45	17
Power Supply	P104	7	7	9	2
Power Supply	P105	3	4	9	5
Model 22 Power Sup.		25	23	29	6
Model 350 Power Sup.		7	7	11	4
Rack A (F.E. Interface)		7	7	9	2

Rack B (I.F.-L.O.)	7	7	9	2
Rack C (Master L.O.)	7	7	9	2
Cryo. Compressors	14	14	19	5
I.F. Distributor T121	10	8	18	10
Baseband Conv. T122	20	16	46	30
5 MHz Distributor L121	7	12	19	7
32 MHz Synth. L122	5	6	9	3
Sampler D121	5	6	10	4
Output Rate Synth D122	3	4	9	5
Formatter	5	4	9	5
Rack D (Data Aquisition)	5	5	9	4
GPS Timing Receiver	1	1	2	1
1.5 GHz Hot/Cold Loads				1
23 GHz Hot/Cold Loads				1

* Indicates that unit requires M/C interface board.