

JUNE 1980

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NATIONAL RADIO ASTRONOMY OBSERVATORY
JUNE PROGRESS REPORT
VLA PROGRAM
July 18, 1980

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NATIONAL RADIO ASTRONOMY OBSERVATORY

MONTHLY PROGRESS REPORT

VLA PROGRAM

JUNE 1980

SYSTEMS INTEGRATION DIVISION

The array was scheduled for 64 percent of the time; 50 percent went to astronomical programs and the remaining 14 percent went to tests. The average downtime for the month was approximately 16.1 percent.

The maximum number of antennas used for an astronomical observing program during the month of June was 24. Antennas 1 and 2 are currently unavailable for observation. Antenna 26 is in the shakedown stage. The test array consists of antennas 3, 5 and 11.

The furthest station on each arm occupied by operating antennas are currently located at a distance of 6.9, 10.5 and 17.2 km from the array center along the north, southeast and southwest arms respectively. Our longest astronomically usable baseline is approximately 24 km.

ELECTRONICS DIVISION

In the Front End Area the Front End for Antenna 27 was completed and is expected to be installed the first half of next month. The Automatic test system for the Front End racks is continuing and the design of an Automatic test set for Paramps, upconverters K & Ku mixers, and FET Amplifiers has started. AIL delivered 1 Paramp and this unit was accepted. No upconverters were received during the month of June.

In the local oscillator area, the assembly of the back-up master LO system is continuing and is 65% complete.

In the Monitor and Control Area, the new F/R modules were installed in Antenna 27 and alignment and subsystem testing well underway.

In the Delay and Multiplier area, the B & D channel system integration and preliminary testing is continuing.

In the Waveguide Area, installation of Waveguide to the last station on each arm is in process. Measurements on the cathodic protection system are proceeding with potential, resistivity and current requirement complete for the North Arm.

COMPUTER DIVISION

The ModComp 7810 for the synchronous system has been made part of the standard operating configuration. Work is now in progress to take advantage of the CPU time and memory that now are available in MONTY.

In the PDP-11/70 (MAPPER) system, the transpose algorithm has been re-written. This causes the Fourier Transform stage of the map-making process to run substantially faster for large maps.

The self-calibration procedure has been made to work successfully on MAPPER. At the moment this is only available in a test version, but work is proceeding to make it easily available to the user.

A new Massbus controller for the Century disks was successfully installed on the PDP-11/70 (SORTER). The current plan is to transfer it to MAPPER, giving more disk space for the mapping tasks, and to transfer the RP06 disk from MAPPER to the DEC-10, where there is currently a disk space shortage.

ANTENNA DIVISION

Antenna Moves

Two antennas were moved during the month.

Outfitting

Antenna No. 28 was completed on 6/24/80 and marks the end of this phase.

Major Overhaul

Antenna No. 2 was moved to the Master Pad on 6/24/80 and servo tests were completed 6/29/80. Painting was started 6/30/80. The antenna overhaul schedule is changed in sequence as follows; 1, 2, 6, 4, 5, 3, 7 and on.

Transporter No. 2

Modifications and outfitting were completed on 6/30/80, in time for the July "C" array configuration.

Misc.

All antenna mechanics are now located in the AAB and the new shops within the building were completed 6/30/80.

SITE AND WYE DIVISION

Waveguide Installation

Installed approximately 3,094 feet of waveguide. 920 feet on East arm and 2,230 feet on West arm and trenched approximately 920 feet on East arm and 2,230 feet on West arm.

Phase IV

Overall completion 100%. With only administrative details remaining before closeout.

Phase V

Overall completion of the total contract is 94%. Track rough layed to AW 9 and ballast is 75% complete. All ballast is in place on the north arm and antenna spur tracks. 100% of track materials have been layed out to A9 on the East arm. Maintenance vehicle spur track is 95% complete. Electrical work is 99% complete.

P.O. S 11480 - Casco Fire Protection Systems

Installation of the sprinkler system for the Tech., Service Bldg., Shop, Warehouse, Library Bldg. and VSQ 1 & 2 continued during the month and is 95% complete. The P.O. was amended to add VSQ #3 and Library Bldg. addition sprinkler installation work has commenced on this installation and is 90% complete.

P.O. S 12394 - Total Service Co., Inc.

VSQ #3 and the Office Building addition were delivered to the Site during the month and placed on their foundations which were constructed during the month. The VAX Room concrete floor was poured. Finish work is progressing and the total order is 95% complete.

PROJECT MANAGEMENT

General

Informal advice from the Department of Justice indicates that the Gross Receipts Tax case will not be heard by the U.S. Tenth District Court of Appeals until late September or early October.

A hearing before the New Mexico Public Service Commission concerning an electric utility rate increase for the Socorro Electric Cooperative was held in Sante Fe on June 17th. None of the testimony was directed toward the very favorable rate proposed for the VLA and 56 other large commercial users.

Personnel

The personnel changes as of June 30, 1980 are as follows:

Division	Budgeted 6/30/80 Level	5/31/80 Level	Additions	Reductions	6/30/80 Level
Site & Wye	10	10	0	0	10
Antenna Division	16	16	0	0	16
Electronics	52	49	0	1	48*
Site Management	6	5	0	0	5
Computer Division	18	16	1	0	17
Operations Div.	13	10	0	0	10
Project Mgmt.	26	23	1	0	24*
TOTAL	141	129	2	1	131

*Does not include two part-time employees

6/30/80

VLA PROGRAM
MAJOR SUBCONTRACTS AND PURCHASE ORDERS PLACED

NUMBER P.O. SUBCONTRACT	VENDOR	ITEM DESCRIPTION	DATE PLACED	DOLLAR AMOUNT	DELIVERY DATE	CURRENT STATUS - ALL FIRM FIXED PRICE CONTRACTS EXCEPT WHERE NOTED
VLA-345 Amendment	G. C. Dean	Labor Hour (Waveguide Installation)	3/19/79	335,000	Two years completing 2/28/81	
VLA-346	Wm. A. Smith Contract- ing Co., Inc.	Phase V Construction	4/26/79	2,820,000	July, 1980	Work progressing satisfactorily.
P.O. S-09849	BWH/CVA Joint Ventures	A/E Service Phase V	5/16/79	39,000	July, 1980	
P.O. S-11638	DEC	Computer Maintenance	2/13/80	90,024	CY '80	Monthly expenditure rate estimated at \$7,500.
VLA-354 P.O. S-11480	CASCO Fire Protec- tion Systems	Fire Protection System for VLA Site Buildings	2/20/80	57,840	9/15/80	
P.O. S-11481	Century Data Systems	Disk Drives	2/15/80	64,078	8/15/80	
P.O. S-11478	Digital Equipment Corp.	Computer Systems	2/27/80	74,635	9/2/80	

6/30/80

VLA PROGRAM

MAJOR SUBCONTRACT AND PURCHASE ORDERS PLACED

NUMBER P.O. SUBCONTRACT	VENDOR	ITEM DESCRIPTION	DATE PLACED	DOLLAR AMOUNT	DELIVERY DATE	CURRENT STATUS - ALL FIRM FIXED PRICE CONTRACTS EXCEPT WHERE NOTED
VLA-6 Amend. #21	E-Systems, Inc.	28 Radio Telescopes	10/18/73	\$ 18,156,054	Complete	
VLA-256	New Mexico State University	Archaeological Exca- vation	9/20/77	\$ 107,000	Complete	\$91,245 invoice thru 2/29/80. Final reports expected in Aug. 1980..
P.O. S-07990	AIL Division Cutler- Hammer	Parametric Amplifiers	9/21/78	\$ 212,800	Complete by 1/21/80	12 sets received. 16½ sets remain for completion of order.
P.O. S-08085	AIL Division Cutler- Hammer	Parametric Upconverters	10/23/78	\$ 102,525	4/13/79 thru 8/13/79	12 units received. 12 units are at AIL for repair. 3 will ship in July to complete order.
P.O. S-08329	Contact Systems, Inc.	Various Wiring Modules	10/31/78 1/19/79	\$ 30,486		On schedule. NRAO owes them additional components for assembly.
VLA-323	Logemann Bros.	Transporter	1/17/79	\$ 788,758		Work complete - final paper work pending.
S-12394 VLA-355	Total Systems	Motel/Office	5/1/80	\$ 123,500	Complete	Work complete. Final paper work pending.

NATIONAL RADIO ASTRONOMY OBSERVATORY

VERY LARGE ARRAY
STATUS AS OF JUNE 30, 1980

TOTAL PROGRAM

PROJECT NUMBER	DESCRIPTION	ALLOCATION	EXPENDED MONTHLY	TOTAL EXPENDED	TRANSFER TO FIXED ASSETS	BALANCE CONSTRUCT. IN PROGRESS	TOTAL COMMITTED	TOTAL EXPENDED & COMMITTED	NET BALANCE
11000	SITE AND WYE	26,637,172	294,531	25,585,734	11,518,782	14,066,952	699,281	26,285,015	352,157
12000	ANTENNA	22,721,203	14,941	22,136,475	17,940,920	4,195,555	507,296	22,643,771	77,432
13000	ELECTRONICS	17,982,546	95,108	17,133,576	7,913,761	9,219,815	197,777	17,331,353	651,193
14000	COMPUTER	6,111,066	33,288	4,759,644	2,874,739	1,884,905	300,055	5,059,699	1,051,367
16000	SYSTEMS INTEGRATION	201,022	---	201,022	200,965	57	---	201,022	---
17000	PROGRAM MANAGEMENT	2,098,809	9,351	1,941,593	1,782,795	158,798	530	1,942,123	156,686
18000	COMMON COST	2,100,371	28,043	1,873,810	1,699,307	174,503	9,851	1,883,661	216,710
19000	CONTINGENCY/RESERVE	400,000	---	---	---	---	---	---	400,00
	SUB TOTAL	78,252,189	475,262	73,631,854	43,931,269	29,700,585	1,714,790	75,346,644	2,905,545
30000	RETIREMENTS	(67,979)	---	(67,979)	(67,979)	---	---	(67,979)	---
	TOTAL PROGRAM	78,184,210	475,262	73,563,875	43,863,290	29,700,585	1,714,790	75,278,665	2,905,545

Note: Project allocation excludes \$325,811 withheld and paid directly to other agencies by the NSF in prior years.
Project allocation includes \$4,500,000 for CY-1980 Funding.

NATIONAL RADIO ASTRONOMY OBSERVATORY

VERY LARGE ARRAY

STATUS AS OF JUNE 30, 1980

CY - 80

<u>PROJECT NUMBER</u>	<u>DESCRIPTION</u>	<u>ALLOCATION</u>	<u>EXPENDED MONTHLY</u>	<u>TOTAL EXPENDED</u>	<u>TRANSFER TO FIXED ASSETS</u>	<u>BALANCE CONSTRUCT. - IN PROGRESS</u>	<u>TOTAL COMMITTED</u>	<u>TOTAL EXPENDED & COMMITTED</u>	<u>NET BALANCE</u>
11000	SITE/WYE	1,998,942	211,659	1,106,240	1,305	1,104,935	565,469	1,671,709	327,233
12000	ANTENNA	160,000	12,277	67,820	---	67,820	16,683	84,503	75,497
13000	ELECTRONICS	1,153,000	69,154	417,307	---	417,307	92,046	509,353	643,647
14000	COMPUTER	1,291,000	25,512	143,155	---	143,155	137,445	280,600	1,010,400
17000	PROGRAM MANAGEMENT	207,000	9,351	49,784	---	49,784	531	50,315	156,685
18000	COMMON COSTS	401,063	28,043	174,502	---	174,502	9,851	184,353	216,710
19000	CONTINGENCY	400,000	---	---	---	---	---	---	400,000
	TOTAL PROGRAM	5,611,005	355,996	1,958,808	1,305	1,957,503	822,025	2,780,833	2,830,172

Note: Project allocation for CY-80 consists of \$4,500,000 in new funding plus \$1,111,005 in prior year funds re-allocated in February, 1980.

NATIONAL RADIO ASTRONOMY OBSERVATORY
VLA PROGRAM

FINANCIAL STATUS REPORT
(in thousands)

As of: June 30, 1980

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Item	Program Ceiling	(A) Allocation to Date (C)			Un-Allocated Balance	Outlook (B)			Not
		Allocated	Expended and Committed	Allocated Balance		Estimate to Complete	Estimate Total	(Over) Under Ceiling	
Site and Wye	27,860	26,930	26,578	352	930	352	26,930	930	
Antennas	20,400	22,721	22,644	77	(2,321)	77	22,721	(2,321)	
Electronics	17,000	17,999	17,347	652	(999)	652	17,999	(999)	
Computer	4,850	6,111	5,060	1051	(1,261)	1051	6,111	(1,261)	
Systems Integration	400	201	201	---	199	---	201	199	
Program Management	2,650	2,116	1,958	158	534	158	2,116	534	
Common Cost	-	2,100	1,884	216	(2,100)	216	2,100	(2,100)	
Subtotal	73,160	78,178	75,672	2,506	(5,018)	2,506	78,178	(5,018)	
Contingency	2,840	400	---	400	2,440	400	400	2,440	
TOTAL	76,000	78,578	75,672	2,906	(2,578)	2,906	78,578	(2,578)	

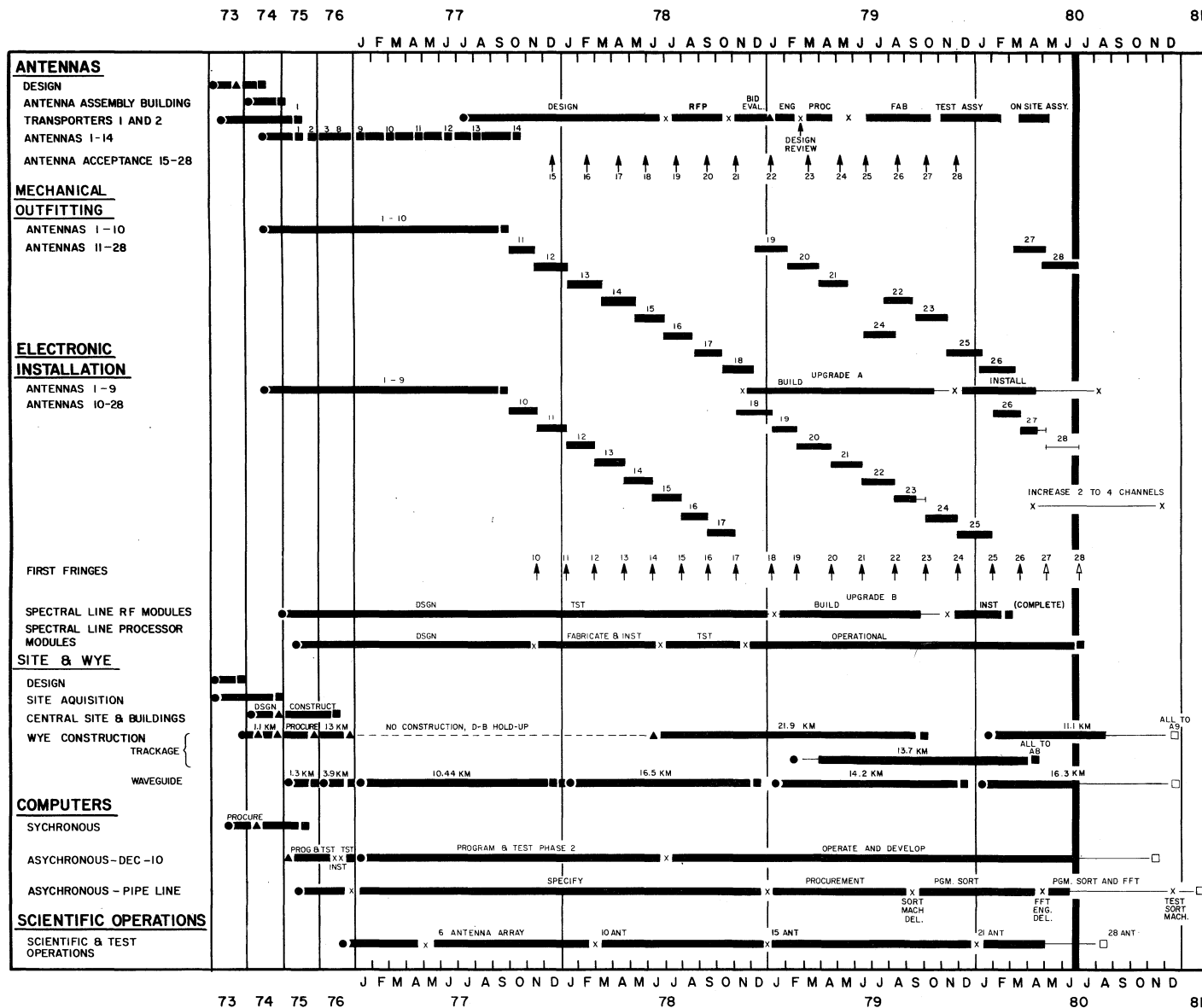
NOTES: (A) Includes \$293K for site acquisition, \$15.7K for ECAC Study, and \$17.1K for NSF Ad Hoc Advisory Panel. Allocated and Expended includes \$68K in assets which were retired in prior years.

(B) Estimate to complete is as of March 14, 1980.

(C) Includes \$4,500K in CY-80 Funding.

NATIONAL RADIO ASTRONOMY OBSERVATORY VLA ACTIVITY SCHEDULE

UPDATE DATE: 07/01/80



TASKS	
UPGRADE A	RECEIVER FRONT-END FILTERS, MODULES F4, F7, F8. INSTALL 5 ANT/MO. (25 MODULES)
UPGRADE B	SPECTRAL LINE IF MODULES T3, T4, T5, T6. INSTALL 4 SYSTEMS (24 MODULES) PER MONTH. (COMPLETED 03/03/80)
INCREASE 2 TO 4 CHANNELS	ADDITIONAL MODULES OF ABOVE TYPES. TOTAL 224. INSTALL 36 PER MONTH.

ABBREVIATIONS	
DSGN - DESIGN	TST - TEST
LAB - LABORATORY	PRELM - PRELIMINARY
INST - INSTALL	OPNS - OPERATIONS
ANT - ANTENNA(S)	PGM. - PROGRAM
	DEL. - DELIVERY

SYMBOLS	
O START OF A PHASE	△ CONTRACT AWARD
X END OF AN ACTIVITY	□ END OF A PHASE
↑ SCHEDULED	↑ COMPLETED

REV. NO.	REV DATE	DESCRIPTION
1	12/1/78	UPDATE PROGRAM PLAN '79
2	11/1/79	UPDATE PROGRAM PLAN '80
3	2/1/80	MISC. PLAN CHANGES.