VLBA Operational Manpower and Building Space Requirements

September 20, 1985

The manpower requirements for operating the VLBA and the VLA from a control center located in Socorro have been reassessed in order to reestablish the total space requirements for the Array Operating Center (AOC). The manpower and space requirements are summarized in the attached tables and include estimates with and without consideration of the supercomputer (inclusion of the supercomputer assumes that it will be located with the AOC).

Some Assumptions

There were many basic assumptions made for the plans of the AOC building. Some of these include:

(A) All of the antenna and grounds personnel, all of the cryogenics and some of the receiver and LO personnel are located at the VLA.

(B) Much of the standard warehousing is located at the site.

(C) A large volume of tape archiving will be at the VLA site.

(D) No extensive scientific drafting and very little photographic services at all are built into the operation. It is assumed (??) that these services can be obtained from NMIMT.

(E) There is only a part time librarian.

(F) It is explicitly assumed that the total amount of unusable space in the form of hallways, stairways, etc amounts to 20 percent of the building. This may be significantly low in which case the total space requirements must be increased appropriately.

Space Crunch

The total amount of space requirements for the building may be too large to build financially in which case cut backs will have to be considered. Some possibilities (certainly not the only ones or the ones that would be implemented) are:

(A) Combine the two conference rooms and auditorium into one room and reduce the floor area from 2100 to 1000 sq. ft. Occasional needs for a larger conference room or multiple rooms may be satisfied through rental from NMIMT.

(B)   Reduce library space from 1500 to 750 sq. ft.

(C)   Reduce the office size or number of offices by some
        percentage. A 20 percent reduction would gain about 2920
        sq.ft.

(D)   Reduce services (which ones?).

(E)   Other possibilities could also be considered.

VLA AND VLBA OPERATIONAL MANPOWER LEVEL
==

Division	Position	VLA Current Level	VLA AND VLBA Personnel		VLA+VLBA+SUPERCOMP Personnel		Notes
			Socorro	Site	Socorro	Site	
Electronic	Head	1	1	0	1	0	
	System Technician	0	1	0	1	0	
	Systems Engineer	1	1	0	1	0	
	Visiting Engineer	1	1	0	1	0	
	Cryogenic Grp Ldr	1	0	1	0	1	
	Cryogenic Tech	2	0	5	0	5	E
	Low Noise Rcv Grp Ldr	1	1	0	1	0	
	Low Noise Rcvr Engr	1	2	0	2	0	
	Low Noise Rcvr Tech	6	7	1	7	1	E
	IF/LO Grp Ldr	1	1	0	1	0	
	IF/LO Engr	0	1	0	1	0	
	Maser Engr	0	1	0	1	0	
	IF/LO Tech	4	5	1	5	1	
	Digital Grp Ldr	1	1	0	1	0	
	Digital Engr	0	1	0	1	0	
	Digital Tech	3	5	0	5	0	
	Correlator Engr	1	2	0	2	0	
	Correlator Tech	1	2	0	2	0	
	Recorder Engr	0	1	0	1	0	
	Recorder Tech	0	3	0	3	0	
	Communications Tech	0	1	0	1	0	
	Field Grp Ldr	0	1	0	1	0	
	Field Tech(at sites)	0	20	0	20	0	
	Waveguide Grp Ldr	1	0	1	0	1	
	Waveguide Tech	1	0	1	0	1	
	Draftsman	1	2	0	2	0	
	Total	28	61	10	61	10	

VLA AND VLBA OPERATIONAL MANPOWER LEVEL
===

Division	Position	VLA Current Level	VLA AND VLBA Personnel Socorro	Site	VLA+VLBA+SUPERCOMP Personnel Socorro	Site	Notes
E&S/Antennas	Head	1	0	1	0	1	C
	Vehicle Mechanic	1	0	1	0	1	
	Site Electrician	1	0	1	0	1	
	Aircondition,Plumbng	1	0	1	0	1	
	Carpenter	1	0	1	0	1	
	Antenna Mechanic	9	0	10	0	10	
	Antenna Servo Tech	4	0	6	0	6	
	Engineer/Supervisors	2	0	3	0	3	
	Machinist	2	0	3	0	3	
	Draftsman	1	0	3	0	3	
	Labourer	2	0	3	0	3	
	Total	25	0	33	0	33	
Array	Head	1	1	0	1	0	
	Chief Array Oper.	1	2	0	2	0	
	Array Oper.	7	10	1	10	1	
	Main. Coord.	1	1	0	1	0	
	Chief Corr. Oper.	0	1	0	1	0	
	Corr. Oper.	0	5	0	5	0	
	Data Analysts	3	5	0	5	0	
	Total	13	25	1	25	1	
Business	Head	1	1	0	1	0	
	Sr. Adm. Ass.	1	1	0	1	0	
	Admin. Aide-personnel	1	1	0	1	0	
	Secr. Pool	3	4	1	6	1	
	Recep./Oper.	1	1	0	1	0	
	Ship Clerk	0	1	0	1	0	
	Librarian	0	1	0	1	0	B
	Guard/Janitor	4	0	4	0	4	
	Janitor	1	2	0	2	0	
	Warehouse/Bus	1	0	1	0	1	
	Receiving	1	1	0	1	0	
	Leadman/Shuttle Dr.	1	1	0	1	0	
	Shuttle Driver	0	1	0	1	0	
	Sr. Buyer	1	2	0	2	0	A
	Buyer	1	1	0	1	0	A
	Purch. Secr.	2	3	0	3	0	A
	Head Cook	1	0	1	0	1	
	Cook/Housekeeper	3	0	1	0	1	
	Total	23	21	8	23	8	

VLA AND VLBA OPERATIONAL MANPOWER LEVEL
===

Division	Position	VLA Current Level	VLA AND VLBA Personnel Socorro	Site	VLA+VLBA+SUPERCOMP Personnel Socorro	Site	Notes
Fiscal	Head	1	1	0	1	0	B
	Accountant	1	1	0	1	0	
	Bookeeper	0	2	0	2	0	
	Fiscal Clerks	3	3	0	3	0	
	Total	5	7	0	7	0	
Computer	Head	1	1	0	1	0	
	Ass. Div. Hd/Op. Man.	1	2	0	4	0	
	Systems Prog./Analysts	1	2	0	8	0	
	Senior Programmers	6	8	0	9	0	
	Programmers	2	5	0	13	0	
	Engineer	1	1	0	1	0	
	Technician	2	5	0	6	0	D
	Oper. Support (Libr.)	2	3	0	8	0	
	Computer Operators	1	1	0	9	0	
	Total	17	28	0	59	0	
Scientific Services/ Management	Director	1	1	0	1	0	
	Deputy Director	1	2	0	2	0	
	Scientists	6	8	0	10	0	
	Systems Scientists	5	9	0	9	0	
	Mathematical Analysts	0	0	0	3	0	
	Post Docs	2	4	0	6	0	
	Resident Cust./Sup.	0	0	1	0	1	
	Photographer	0	1	0	1	0	B
	Technical Illustrator	0	1	0	1	0	B
	Secretaries	2	1	0	1	0	
	Total	17	27	1	34	1	
Grand total 18-Sep-85		128	169	53	209	53	

Notes:
A. Number of buyers and purchasing secretaries assume the use
   of a computer for inventory and purchasing.
B. Exact number of personel may depend on any particular
   redistribution of manpower within NRAO in the future.
C. Assumes grounds work and much of caretaking is contracted
   through NMIMT.
D. Assumes all equipment maintained by contract.
E. Assumes no support for 86MHz system.

ARRAY OPERATIONS BUILDING SPACE REQUIREMENTS
===

Division	Purpose	Unit Area (sq. ft.)	VLA + VLBA #	VLA + VLBA Area(sq ft)	VLA + VLBA + SUPER COMPUTER #	VLA + VLBA + SUPER COMPUTER Area(sq ft)	Notes
Scientific	Library /study area	1500	1.0	1500	1.0	1500	
Services	Secretary Office	150	2.0	300	2.0	300	
	Directors Office	300	1.0	300	1.0	300	
	Deputy Dir. Off.	150	2.0	300	2.0	300	
	Scientific Offices	150	26.0	3900	35.0	5250	A,D
	Visitors Offices	75	26.0	1950	38.0	2850	B
	Auditorium	1500	1.0	1500	1.0	1500	
	Journal/Coffee area	500	1.0	500	1.0	500	
	Visitor's kitchen	200	1.0	200	1.0	200	
	Conference room	400	1.0	400	1.0	400	
		200	1.0	200	1.0	200	
	Canteen	200	1.0	200	1.0	200	
	Measur. Eng./Prt Rm	300	1.0	300	1.0	300	
	Photographic Lab	400	1.0	400	1.0	400	C
	Total			11,950		14,200	
Array	Array Control Room	600	2.0	1200	2.0	1200	
Operations	Correl. Control Rm	200	1.0	200	1.0	200	
	Tape Staging Area	500	1.0	500	1.0	500	
	Offices / Supervisor	150	6.0	900	6.0	900	
	Offices / others	75	8.0	600	8.0	600	
	Total			3,400		3,400	
Proc. Tape Storage	Storage for 30 days at AOC	300	1.0	300	1.0	300	E
Computer	Offices	150	20.0	3000	40.0	6000	
	Supercomputer	1000			1.0	1000	
	SC Front Ends	2000			2.0	4000	F
	Common File Storage	1000			1.0	1000	
	Off-line comp. (VLA)	2000	1.0	2000		0	
	On-line comp.	600	3.0	1800	3.0		
	Correlator Room						
	Racks(+con. comp)	20	46.0	920	46.0	920	
	Expan rack space	20	15.0	300	15.0	300	
	Comp. rm (Vaxes)	300	6.0	1800	2.0	600	
	User Displays (AIPS)	150	6.0	900	10.0	1500	
	Gen. tape archiving	750	1.0	750	1.0	750	
	Maintenance lab	300	2.0	600	5.0	1500	
	Comm equip/supp.	150	3.0	450	5.0	750	
	Special AC room	300	2.0	600	2.0	600	
	Total			13,120		18,920	

ARRAY OPERATIONS BUILDING SPACE REQUIREMENTS

==

Division	Purpose	Unit Area (sq. ft.)	VLA + VLBA		VLA + VLBA + SUPER COMPUTER		Notes
			#	Area(sq ft)	#	Area(sq ft)	
Business	Offices	150	7.0	1050	7.0	1050	
		100	11.0	1100	11.0	1100	
	Ship./Rec.	300	1.0	300	1.0	300	
	Receptionist Area	250	1.0	250	1.0	250	
	Files + Supplies	100	4.0	400	4.0	400	
	Warehouse, Equip. rm	500	1.0	500	1.0	500	
	Mach. (copiers, etc)	250	1.0	250	1.0	250	
	Mail room	200	1.0	200	1.0	200	
	Computer room	150	1.0	150	1.0	150	
	Total			4,200		4,200	
Fiscal	Offices	150	2.0	300	2.0	300	
		100	5.0	500	5.0	500	
	Files + Supplies	100	2.5	250	2.5	250	
	Computer	150	1.0	150	1.0	150	
	Total			1,200		1,200	
Electronics and Field	Front End Lab	864	2.0	1728	2.0	1728	
	Local Osc. & IF Lab	648	2.5	1620	2.5	1620	
	Digital Lab	432	3.0	1296	3.0	1296	
	Recorder Lab	432	1.0	432	1.0	432	
	Maser Lab	324	1.0	324	1.0	324	
	Test System Lab	162	2.5	405	2.5	405	
	Diagnos. & Mon. Area	288	2.0	576	2.0	576	
	Rec. Keep/File Area	144	2.0	288	2.0	288	
	Offices	150	21.0	3150	21.0	3150	
	Module Ship. Area	192	1.0	192	1.0	192	
	Stock Area	288	1.0	288	1.0	288	
	Broken Modules Area	50	2.0	100	2.0	100	
	Repaired Mod. Area	50	2.0	100	2.0	100	
	Drafting area	360	1.0	360	1.0	360	
	Screened room	130	1.0	130	1.0	130	
	Mech Area (compresso	200	1.0	200	1.0	200	
	Total			11,189		11,189	
Antennas	Office	150	1.0	150	1.0	150	
Overhead (hallways, washrms, etc 20%)				9,102		10,712	
Total				54,611		64,271	

23-Sep-85

ARRAY OPERATIONS BUILDING SPACE REQUIREMENTS
==

Division	Purpose	Unit Area (sq. ft.)	VLA + VLBA		VLA + VLBA + SUPER COMPUTER		Notes
			#	Area(sq ft)	#	Area(sq ft)	

Notes:
  A. The number of scientific offices accounts for scientists, system scientists, post docs and 5 long term visitors offices. With the supercomputer the number of offices have been increased 6 more.
  B. The number of short term visitor offices is based on current VLA experience and accommodates both observers, short term visitors and students. This number has been increased by 12 units to allow allow for additional requirements of a supercomputer.
  C. The present allotment for a photographic lab space is about a factor of 4 too small for serious and extensive photographic work.
  D. These estimates do not include about 5000 sq. ft. for any NMIMT astronomers.
  E. This assumes that antennas have a 30 day supply.
  F. The large amount of space allows for peripherals and expansion.

SPECIAL REQUIREMENTS
FOR THE
VLBA OPERATIONS CENTER

(A)   Each room will have terminal or Ether-Net outlets installed
in addition to telephone jacks.

(B)   The building will have moveable walls so that the interior
can be redesigned when the VLBA needs change with time.
Also a modern approach to office grouping within large rooms
should be considered.

(C)   The array control room will have a special arrangement
with respect to the computer rooms such that access to
necessary tape drives is made easy. The same will hold
true for the correlator control room.

(D)   It may be necessary to to screen some rooms with a Faraday
cage.

(E)   The Air conditioning, heating and humidity requirements
will be controlled closely for the computers and special
hardware.

(F)   There should be an easy access cable trough system instal-
led.

(G)   The tape storage areas should have temperature, humidity
and clean air controls.

(F)   Special safety requirements.

(G)   The building should be designed such that it can be expanded
easily to accommodate (a) the combined VLA/VLBA operations
and (b) possible inclusion of the mm array operations in
the future.

(H)   Space will also be required for any MG sets.

15-Aug-85