

14 SCHEDULE AND BUDGET

Revision History

2001-Nov-08: Initial release, Budget and Schedule from EVLA Management Plan, September 2001
 2002-May-31: Updated budget section to be current as of Q2 2002
 2003-Aug-16: Updated budget and schedule to be current as of Q3 2003
 2004-Dec-04: Updated budget and schedule to be current as of Q4 2004

14.1 Introduction

In this chapter a brief summary of the schedule and budget information for the project is provided. This information will change as the project progresses, so readers should understand that the information provided is current as of the date identified in the Revision History above. If required, a more up-to-date or more detailed version of this information can be requested from EVLA Project Management.

14.2 Project Work Breakdown Structure (WBS)

The EVLA Project is the 6th activity within NRAO's overall WBS. The work of the EVLA is subdivided into the 12 principal Level 2 tasks shown in Table 14.1.

Table 14.1 EVLA Project WBS Level 2 tasks

WBS No.	Task Name	Task Description
6.01	Project Management	Project management including work definition, budget and schedule control. Advisory committee, design review and oversight activities.
6.02	System Integration and Testing	All system engineering activities during the design, integration, installation and test phases of the project. Management of the technical aspects of both the hardware and software systems. Provision of shared systems such as modules, racks and power supplies.
6.03	Civil Construction	Burial of the long-distance fiber optics cables along the arms of the array. Construction of a new shielded room to house the new EVLA correlator.
6.04	Antennas	Structural modifications to the VLA feed support structure on the antennas to allow installation of the new feed and receiver systems. Modifications to the vertex rooms on the antennas to allow installation of the new electronic systems.
6.05	Front End Systems	Design, construction and installation of all feeds and receivers for the eight EVLA receiver bands. Includes conversion to first IF at 8-12 GHz. Modifications to the cryogenics systems on the antennas for compatibility with the new receivers.
6.06	Local Oscillator System	Provision of a central reference oscillator system and an antenna remote local oscillator (LO) system. Provision of a "round-trip-phase" monitoring system to measure the phase of the LO at each antenna.
6.07	Fiber Optic System	Provision of all fiber optics systems including the fiber, the optical transmitters and the optical receivers for LO distribution, IF transmission and M/C.
6.08	Intermediate Frequency System	Provision of all frequency converters required to convert the signal

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		from the 8-12 GHz band at the output of each receiver to the 2-4 GHz baseband input to the digitizers. Provision of the wide band and narrow band digitizers. Provision of switching equipment required to direct the desired IF into each of the digitizers.
6.09	Correlator	Construction and installation of the EVLA correlator, supplied by Canada, and NRAO interfaces.
6.10	Monitor and Control System	Provision of hardware and software for array monitor and control. Includes both the central computer system and the electronics system located in each module for interface to the M/C system.
6.11	Data Management and Computing	Provision of software and hardware for observation preparation and scheduling and for post-correlation data processing. Includes a pipeline system for rapid image formation.
6.12	Education and Public Outreach	EVLA contribution to NRAO's EPO program.

A listing of the detailed Level 3 and Level 4 tasks in the WBS is available at <http://www.nrao.edu/evla/admin/wbs/wbssumm.pdf>

14.3 Project Schedule

The overall plan for the EVLA project is as follows.

The new EVLA equipment required for the antennas was designed and prototyped during 2002, 2003 and 2004. This prototype system began to be installed on the EVLA Test Antenna (VLA Ant 13) in Q3 of 2003, with more equipment being added over the following months as designs were completed or modified. This initial prototype system consists of the new LO, IF and fiber optics systems, the new feed cone and some of the new feed/receiver designs. Old feeds and receivers will continue to be used where necessary to provide frequency coverage. Also included is the hardware for the new Monitor and Control (M/C) system and the new M/C software to allow the EVLA Test Antenna to be operated with the rest of the VLA. Using this prototype equipment first light was achieved on the Test Antenna in October 2003 and first interferometric fringes were obtained in March, 2004. An improved prototype system was installed on the second EVLA antenna (VLA Ant 14) in late 2004 and first fringes were obtained between this antenna and the rest of the VLA (including Ant 13) in December 2004. A "production-like" electronics system, in which most of the problems found in prototyping have been fixed, will be installed on Antenna 14 in January 2005 with the goal of returning the antenna to routine observing with the rest of the VLA during the first quarter of 2005. The third EVLA antenna is currently undergoing its EVLA structural modifications and will be equipped with EVLA electronics at the end of the first quarter of 2005. The project plan is to have 5 antennas equipped with EVLA electronics by the end of FY 2005 (Sept 2005) (including the retrofit of Antenna 13) and antennas will then be outfitted at a rate of approximately 5 antennas/year. The last antenna is scheduled for retrofit by Q3 of 2010. The new receivers will be installed at a slower rate than this, with the last receiver planned for installation in the second quarter of 2012.

The correlator is being designed and built at the Herzberg Institute of Astrophysics in Canada and will be installed in a new correlator room in the VLA control building. A small 3 or 4 antenna prototype of a subset of the correlator will be tested using astronomical observations at the VLA in Q1 of 2006. Equipment will begin to be installed in the new correlator room at the VLA in Q2 of 2006 and first testing of the first subset of the final correlator will begin in Q2 of 2007. First "shared risk" science using a subset of the correlator could begin in Q1 of 2008, with full correlator commissioning planned to be complete by Q2 of 2009.

The software for the new monitor and control system will be scheduled so as to provide the level of support required for the various phases of hardware delivery described above. This will include support for VLA observations using transition hardware in Q1 of 2005, tests of the prototype correlator in Q1 of 2006, tests of

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the final correlator beginning in Q2 of 2007 and early science with a subset of the correlator in Q1 of 2008. Similarly, new data management software will be available as required to handle the data from the new correlator.

The summary project schedule for all parts of the project, required to support the schedule goals listed above, is presented below.

EVLA PROJECT
DETAIL SCHEDULE

As of September 30, 2004

WBS	Task Name	Start	Finish	% Compl	2001				2002				2003				2004				2005				2006				2007				2008				2009				2010				2011				2012			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
6	EVLA PROJECT	5/1/01	6/29/12	53%	[Gantt bar]																																															
6.1	PROJECT MGMT	5/1/01	6/1/12	58%	[Gantt bar]																																															
1.1	Management/Subsystem Engineering	5/1/01	7/6/09	62%	[Gantt bar]																																															
1.1.20	Management Plan	5/21/01	8/9/02	100%	[Gantt bar]																																															
1.1.21	Project Management & Tracking	10/5/01	7/6/09	31%	[Gantt bar]																																															
1.1.40	Key Milestones	11/4/02	6/1/12	0%	[Gantt bar]																																															
1.6	Project Book	6/4/01	3/1/02	100%	[Gantt bar]																																															
1.10	Office Equipment & Supplies	6/4/01	1/26/06	83%	[Gantt bar]																																															
1.20	Advisory Committee	10/15/01	9/11/08	46%	[Gantt bar]																																															
6.2	SYTEM INTEGRATION	5/1/01	4/23/08	60%	[Gantt bar]																																															
2.1	Management/Subsystem Engineering	5/1/01	3/8/07	59%	[Gantt bar]																																															
2.1.30	System CDRs & analysis	5/19/04	3/21/05	6%	[Gantt bar]																																															
2.1.50	Test Antenna Plan	10/14/02	3/7/05	39%	[Gantt bar]																																															
2.1.50.2	Hardware Bench Integration	1/6/03	1/10/05	10%	[Gantt bar]																																															
2.1.50.5	1st Test Antenna Outfit	4/14/03	1/10/05	61%	[Gantt bar]																																															
2.1.50.10	System Tests on Antenna	5/13/03	1/6/05	86%	[Gantt bar]																																															
2.5	Test and Lab Equipment	5/1/01	4/13/07	68%	[Gantt bar]																																															
2.10.1	Power Supply System	9/3/02	1/6/05	90%	[Gantt bar]																																															
2.15	Site RFI characterization & Suppression	4/9/02	10/15/04	98%	[Gantt bar]																																															
2.15.15.1	RF/EM Analysis of electronics & computer	7/16/02	10/15/04	98%	[Gantt bar]																																															
2.16	External RFI & Systems Immunity	4/22/02	10/27/06	99%	[Gantt bar]																																															
2.16.10	EVLA antenna sidelobe gain patterns 2-120	10/1/04	10/27/06	0%	[Gantt bar]																																															
2.20	Scientific Support	4/9/02	11/6/02	100%	[Gantt bar]																																															
2.25	Modules Bins & Racks	2/1/02	4/23/08	50%	[Gantt bar]																																															
2.25.10	Prototype module, bin & rack assembly	6/17/02	10/26/04	96%	[Gantt bar]																																															
2.25.30	Production	2/9/04	4/23/08	8%	[Gantt bar]																																															
2.30	Transition Planning	12/19/03	3/15/06	8%	[Gantt bar]																																															
6.3	CIVIL CONSTRUCTION	6/4/01	6/5/06	82%	[Gantt bar]																																															
3.1	Management/Subsystem Engineering	6/4/01	6/5/06	93%	[Gantt bar]																																															
3.5	Fiber Optic Cable	1/2/02	2/6/04	99%	[Gantt bar]																																															
3.5.5	Trench & install FO cable (200kft)	2/14/02	2/13/04	100%	[Gantt bar]																																															
3.5.5.10	West Arm	10/30/02	5/1/03	100%	[Gantt bar]																																															
3.5.5.30	East Arm	4/11/03	9/9/03	100%	[Gantt bar]																																															
3.5.5.50	North Arm	4/11/03	1/30/04	100%	[Gantt bar]																																															
3.10	New Correlator Room	12/14/01	6/5/06	30%	[Gantt bar]																																															
3.10.5	Shielded Room	3/1/05	6/5/06	0%	[Gantt bar]																																															
3.10.10	Remodeling	12/19/02	5/18/05	51%	[Gantt bar]																																															
3.10.15	RFI Shielded Test Chamber	12/14/01	4/1/02	100%	[Gantt bar]																																															
3.15	CB HVAC	8/25/03	12/1/04	78%	[Gantt bar]																																															
3.20	Power Distribution	1/6/03	1/16/06	90%	[Gantt bar]																																															
6.4	ANTENNAS	5/1/01	4/16/10	44%	[Gantt bar]																																															
4.1	Management/Subsystem Engineering	6/4/01	8/2/05	89%	[Gantt bar]																																															
4.1.2	Design & Prototyping	1/23/02	12/7/04	93%	[Gantt bar]																																															
4.1.3	Laminated Feed Horn Design	11/1/02	12/1/03	100%	[Gantt bar]																																															
4.1.4	Prototype Assembly	6/3/02	8/2/05	73%	[Gantt bar]																																															
4.2	Precision Machining	1/14/02	12/28/06	42%	[Gantt bar]																																															
4.2.5	Mechanical fab & assembly	1/14/02	12/28/06	60%	[Gantt bar]																																															
4.2.10	Front End & Feed	4/15/02	10/6/05	16%	[Gantt bar]																																															
4.2.10.12	L-band horn production	12/7/04	8/17/07	0%	[Gantt bar]																																															

Project: evlamaster_v4 Date: 12/6/04	Task		Baseline		Milestone		Summary	
	Progress		Critical		Baseline Milestone		Split	

EVLA PROJECT
DETAIL SCHEDULE

As of September 30, 2004

WBS	Task Name	Start	Finish	% Compl	2001		2002			2003			2004			2005			2006			2007			2008			2009			2010			2011			2012		
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
4.2.10.14	C-band horn production	10/4/04	2/13/08	0%																																			
4.2.10.16	S-band horn production	8/2/05	2/13/08	0%																																			
4.5	Feed Cone Prototye	10/15/01	12/5/03	100%																																			
4.5.50	Feed Cone production	5/14/04	8/6/04	99%																																			
4.10	Antenna Structural Modifications	4/9/03	4/16/10	9%																																			
4.15	Antenna Electrical & HVAC	7/7/03	11/17/04	54%																																			
4.20	Pointing Improvements	5/1/01	4/28/06	75%																																			
6.5	FRONT END SYSTEMS	6/4/01	6/29/12	27%																																			
5.1	Management/Subsystem Engineering	6/4/01	6/12/12	43%																																			
5.1.7	MMIC Development	4/2/02	5/11/05	54%																																			
5.2	Receiver Build & Installation	1/7/02	6/29/12	23%																																			
5.2.1	Front-end Subsystems Engineering	11/18/02	7/27/06	22%																																			
5.2.2	Prototype Receivers	1/7/02	1/4/08	38%																																			
5.2.3	Current Receiver build	7/1/02	9/2/03	100%																																			
5.2.4	Receiver Production	8/4/03	6/29/12	1%																																			
5.3	Feed Design, Prototype & Production	5/1/02	10/31/11	37%																																			
5.3.1	Design and Prototype	6/3/02	3/28/05	88%																																			
5.3.2	L-Band Feed Prototype	7/31/02	1/6/05	99%																																			
5.3.3	S-Band Feed Prototype	8/1/05	4/19/06	0%																																			
5.3.4	C-Band Feed Prototype	6/10/02	12/3/04	99%																																			
5.3.5	X-Band Feed Prototype	6/11/03	3/10/05	57%																																			
5.3.6	Ku-Band Feed Prototype	10/4/04	9/21/06	0%																																			
5.3.7	K-Band Feed Modification	5/1/02	6/25/03	100%																																			
5.3.8	Ka-Band Feed Prototype	6/11/03	11/2/04	88%																																			
5.3.9	Feed Production	7/1/02	10/31/11	10%																																			
5.4	Cryogenics	10/16/01	9/9/09	26%																																			
5.4.5	Vacuum Pump & Manifolds	6/11/03	7/15/09	24%																																			
5.4.6	Compressors & Helium Lines	3/4/03	5/22/09	10%																																			
5.4.7	Refrigerators	5/5/03	9/9/09	23%																																			
6.6	LO/IF SYSTEMS	6/4/01	12/1/09	53%																																			
6.1	Management/Subsystem Engineering	6/4/01	5/2/08	98%																																			
6.5	Master LO System	11/12/01	3/15/05	80%																																			
6.5.10	L351- 512MHz Offset Generator	6/10/02	11/5/04	94%																																			
6.5.25	L350 Central Reference Generator	6/3/02	12/14/04	84%																																			
6.5.30	L354 Central Reference Distributor	12/15/03	2/11/05	19%																																			
6.7	Central Antenna System	7/15/02	11/19/07	27%																																			
6.7.5	L352 RTP Measurement	7/15/02	11/19/07	27%																																			
6.10	L301 12-20 GHz Synthesizer	8/27/01	4/17/07	39%																																			
6.10.20	L301 Synthesizer Hardware Production	8/25/04	4/17/07	0%																																			
6.15	L302 10.8-14.8 GHz synthesizer	10/29/01	4/17/07	46%																																			
6.15.20	L302 Synthesizer Hardware Production	8/25/04	4/17/07	0%																																			
6.20.1	Antenna Reference System	11/5/01	12/28/07	29%																																			
6.20.5	L304 Reference Receiver	4/22/02	1/16/07	30%																																			
6.20.10	L305 Reference Generator/Distributor	9/20/02	12/28/07	27%																																			
6.25	Antenna Outfitting	8/12/03	12/1/09	68%																																			
8.0	Band Switches & Converters	11/19/01	5/2/08	78%																																			
8.5	Band Switches	5/5/03	3/1/07	62%																																			
8.10	4/P & L/S/C Converter Modules	1/28/02	2/21/05	77%																																			
8.15.15	T303 U/X-band Converter	7/15/02	2/11/05	84%																																			







Project: evlmaster_v4
Date: 12/6/04

Task		Baseline		Milestone		Summary	
Progress		Critical		Baseline Milestone		Split	

EVLA PROJECT
DETAIL SCHEDULE

As of September 30, 2004

WBS	Task Name	Start	Finish	% Compl	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
10.32	Converter Interface - M301	6/2/03	11/19/04	80%																										
8.15.20	T301, 302 & 303 Converter Production	2/11/05	9/28/07	0%																										
8.20	IF Down Converters	11/19/01	5/2/08	79%																										
6.7	FIBER OPTIC SYSTEM	6/4/01	4/1/10	74%																										
7.1	Management/Subsystem Engineering	6/4/01	4/1/10	96%																										
7.5	IF Fiber System	3/18/02	6/30/09	86%																										
7.5.5	Formatter	3/18/02	12/3/04	82%																										
7.5.10	Deformatter	4/8/02	10/29/04	99%																										
7.5.15	Laser Transmitter	11/1/02	11/1/04	99%																										
7.5.20	IF Interface	6/18/02	6/30/09	99%																										
7.5.25	IF System Production	4/12/04	9/4/07	0%																										
7.10	Fiber Infrastructure & Antennas	10/17/01	4/1/10	49%																										
7.10.5	Fiber Infrastructure	10/17/01	6/1/07	58%																										
7.10.10	Antenna Fiber	9/30/02	4/1/10	39%																										
7.15	Samplers & MCB	3/1/02	2/16/06	84%																										
7.15.5	Monitor & Control	3/1/02	3/5/04	100%																										
7.15.10	2-4 GHz Sampler 3-Bit	4/19/02	2/16/06	0%																										
7.15.15	1 GHz Sampler 8-Bit	3/4/02	8/12/04	100%																										
7.20.10	LO Transmitter Module - L353	1/21/02	8/31/07	82%																										
6.9	CORRELATOR	7/1/99	5/8/09	48%																										
1	Pre-Project Activities	7/1/99	6/28/02	100%																										
2	Hardware	6/1/01	8/11/08	52%																										
2.1	Hardware Design	6/30/01	6/16/08	71%																										
2.2	Prototype Building & Testing	6/1/01	10/4/06	29%																										
2.3	Production	11/5/01	8/11/08	0%																										
3	Software	11/5/01	7/14/08	34%																										
3.1	Software Architecture	11/5/01	2/13/04	100%																										
3.2	Software Standards & Development Enviro	11/18/03	4/15/04	78%																										
3.3	Sub-Systems Software	1/1/02	7/14/08	28%																										
3.4	In-House Test Software	5/14/04	2/22/06	0%																										
3.5	Software Development Test Software	7/31/06	4/30/07	0%																										
3.6	Manufacturing Test Software	1/20/05	5/3/06	0%																										
4	System Integration & Testing (@Penticton)	6/22/06	1/3/08	0%																										
5	Installation & Testing (@VLA Site)	10/2/06	9/24/08	0%																										
5.7	System Rack & Cable Installation	11/1/06	12/27/06	0%																										
5.8	Limited Board Installation & Testing	1/31/08	5/5/08	0%																										
5.9	Full Board Installation & Testing	5/5/08	9/24/08	0%																										
6	Commissioning	9/24/08	5/8/09	0%																										
7	Procurement	7/1/99	10/4/06	47%																										
7.1	Project Operations Procurement	7/1/99	11/18/04	81%																										
7.2	Prototype Misc. & Test Equipment Procure	7/1/99	9/20/04	0%																										
7.3	Prototype Board/Parts Procurement	7/1/99	1/6/05	48%																										
7.4	Production Board/Parts Procurement	7/1/99	7/1/99	0%																										
7.5	Production Misc. Equipment Procurement	7/1/99	10/4/06	0%																										
8	Management	7/1/99	11/29/06	83%																										
8.1	External Projects	7/26/04	11/30/04	100%																										
8.2	ASIC Contracting	9/8/03	1/27/06	58%																										
8.4	Hiring	7/1/99	8/2/04	100%																										
6.10	MONITOR & CONTROL	5/1/01	3/4/10	46%																										







Project: evlamaster_v4 Date: 12/6/04	Task		Baseline		Milestone	Summary	
	Progress		Critical		Baseline Milestone	Split	

EVLA PROJECT
DETAIL SCHEDULE

As of September 30, 2004

WBS	Task Name	Start	Finish	% Compl	2001				2002				2003				2004				2005				2006				2007				2008				2009				2010				2011				2012			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4								
10.1	Management/Subsystem Engineering	6/5/01	12/22/04	79%	[Gantt bar]																																															
10.5	M&C Electronic Hardware	1/14/02	10/26/09	43%	[Gantt bar]																																															
10.5.5	Physical Interface	1/14/02	12/15/04	74%	[Gantt bar]																																															
10.5.10	Utility Module - M302	11/24/03	5/19/05	7%	[Gantt bar]																																															
10.5.15	Front End Interface Module - F317	8/1/03	1/18/05	38%	[Gantt bar]																																															
10.30	Transition Module - F320	1/2/03	1/10/05	47%	[Gantt bar]																																															
10.32	MIB Slot Identification	1/27/04	7/16/04	100%	[Gantt bar]																																															
10.35	Production of M&C hardware modules	9/24/04	10/26/09	0%	[Gantt bar]																																															
10.10	M&C Network Hardware/ Software	12/3/01	4/30/07	94%	[Gantt bar]																																															
10.15	M&C Computing Systems, Hardware & Software	5/1/01	3/28/05	94%	[Gantt bar]																																															
10.15.20	MIB prototype board, design & dev	5/1/01	9/18/03	100%	[Gantt bar]																																															
10.20	M&C EVLA Software	5/1/01	3/4/10	32%	[Gantt bar]																																															
10.20.5	Stabilization of the VLA	5/1/01	6/10/04	100%	[Gantt bar]																																															
10.20.10	Requirements (High Level, Raw)	10/5/01	3/4/10	28%	[Gantt bar]																																															
6.11	DATA MGMT/e2e	10/1/01	8/27/10	47%	[Gantt bar]																																															
11.1	e2e Project	10/1/01	8/27/10	47%	[Gantt bar]																																															
11.1.1	Management and Project Book	12/3/01	6/9/04	100%	[Gantt bar]																																															
11.1.2	Infrastructure	1/6/03	7/20/05	23%	[Gantt bar]																																															
11.1.3	Proposal submission toolkit	9/16/02	11/11/04	84%	[Gantt bar]																																															
11.1.7	Observation scheduling toolkit	3/31/03	11/26/04	20%	[Gantt bar]																																															
11.1.8	Pipeline toolkit	4/1/02	12/9/05	29%	[Gantt bar]																																															
11.1.10	Archive toolkit	10/1/01	12/24/04	88%	[Gantt bar]																																															
11.1.11	Calibration toolkit	4/1/02	3/3/03	100%	[Gantt bar]																																															
11.1.12	Master Address List	10/4/04	4/15/05	0%	[Gantt bar]																																															
11.1.13	Transition Plan	9/16/04	8/27/10	0%	[Gantt bar]																																															

Project: evlamaster_v4
Date: 12/6/04

Task		Baseline		Milestone	
Progress		Critical		Baseline Milestone	

14.4 Project Budget

The current project budget plan is given in Table 14.2. All funds are given in US\$(FY2004). The project funding will come from 4 sources. \$54.6.2 M from new NSF funds, \$17.3 M in manpower provided by the NRAO operations budget, approximately \$14 M funded by the Canadian Government for the correlator and \$1.7M from the Mexican Government.

The amount of manpower in this plan provided by the NRAO operations budget is approximately \$4M over the original baseline plan established at the beginning of the project. It is not clear how much, if any, of this overrun will be available from the operations budget. If all of this overrun is charged to the EVLA construction budget it may be necessary to descope the project, probably with respect to the number of receivers provided on each antenna.

EVLA Project Book Chapter 14: Schedule and Budget

Table 14.2 EVLA Project Budget Plan

All amounts are in \$k dollars (FY2004)

As of 11/12/2004

WBS	Task Name	Actuals 2001	Actuals 2002	Actuals 2003	Actuals 2004	Budget 2005	2006	2007	2008	2009	2010	2011	2012	Totals
6.01	Project Management	77.0	203.7	124.9	279.7	261.4	320.7	279.2	267.7	277.4	221.7	140.4	0.0	2454
6.02	System Integration & Testing	212.0	478.0	236.4	746.1	1040.4	139.4	122.4	92.2	22.9	0.0	0.0	0.0	3090
6.03	Civil Construction	0.2	252.0	40.1	229.1	573.4	47.3	0.0	0.0	0.0	0.0	0.0	0.0	1142
6.04	Antennas	0.0	46.7	98.5	497.2	134.8	94.5	61.4	38.0	14.2	8.0	0.0	0.0	993
6.05	Front End Systems	385.0	114.5	596.5	1315.4	2374.2	1770.7	1477.8	900.1	597.0	451.1	204.6	139.3	10326
6.06	Local Oscillator System	14.1	292.4	253.0	1188.4	504.3	548.7	506.3	225.6	52.0	0.0	0.0	0.0	3585
6.07	Fiber Optic System	4.7	603.8	735.5	1175.6	744.9	1507.8	937.9	675.3	388.6	51.5	0.0	0.0	6826
6.08	Intermediate Frequency System	0.0	105.5	327.5	205.4	726.9	418.2	382.2	333.0	78.9	68.0	0.0	0.0	2646
6.09	Correlator	149.0	362.0	155.0	618.0	37.0	4281.5	1879.0	45.0	17.0	0.0	0.0	0.0	7544
6.10	Monitor & Control System	0.0	209.2	255.8	367.0	561.9	629.1	488.0	415.5	241.7	66.6	8.0	0.0	3243
6.11	Data Management & Computing	2.8	0.2	219.0	194.9	64.0	8.0	202.0	102.0	500.0	0.0	0.0	0.0	1293
6.12	Education & Public Outreach	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	M&S Total	845	2668	3042	6817	7023	9766	6336	3094	2190	867	353	139	43140
	Travel	8	65	67	67	78	69	64	55	48	32	0	0	554
	Direct Labor	126	1115	1689	2297	2667	2310	1911	1905	1504	200	181	0	15903
8889	NRAO Indirect Labor	195	1549	2317	2186	2642	2218	2057	1737	1598	393	211	198	17302
	NRAO Wages & Benefits	321	2664	4006	4483	5309	4528	3968	3641	3101	593	392	198	33205
	Canadian Labor	54	414	671	533	523	438	499	321	136	0	0	0	3589
	Sub Total	1227	5810	7787	11900	12934	14802	10867	7111	5475	1492	745	337	80488
	Contingency	0	0	0	0	0	0	0	606	1534	2043	105		4288
	Redirected NRAO Effort	-195	-1549	-2317	-2186	-2642	-2218	-2057	-1737	-1598	-393	-211	-198	-17302
	Canadian Contribution	-203	-776	-826	-1151	-560	-4720	-2378	-366	-153	0	0	0	-11133
	Mexican Contribution						-1700							-1700
	EVLA Project Funds	829	3486	4643	8563	9732	6164	6432	5615	5259	3142	639	139	54642
	Carryover to next yr	2170	3685	4363	5140	748						47		
	Carryover from prior yr		-2170	-3685	-4363	-5140	-748						-47	
	NSF Funded	3000	5000	5322	9340	5340	5415	6432	5615	5259	3142	686	92	54642
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Totals

EVLA antenna available
Receivers available

	3	7	12	17	21	25	28						
3	13	43	73	105	140	174	208	231	240				