

## 12 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

### 12.1 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.

### 12.2 Project Work Breakdown Structure (WBS)

The EVLA Project is the 6<sup>th</sup> activity within NRAO's overall WBS. The work of the EVLA is subdivided into the 12 principal Level 2 tasks shown in Table 12.1.

**Table 12.1 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 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

## EVLA Project Book Chapter 12: Schedule and Budget

		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/budget/wbssumm.pdf>

### 12.3 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 and early 2003. In the third quarter (Q3) of 2003 a prototype system is being installed on a VLA antenna (the EVLA Test Antenna – VLA Ant 13). This initial prototype system will consist 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 will be the hardware for the new M/C system and enough of the new M/C software to allow the EVLA Test Antenna to be operated. The prototype system will be tested until Q1 of 2004, at which time the design will be frozen and quantity production of the new equipment will begin. The new systems will be installed on antennas at a rate of four antennas per year beginning in Q3 of 2004, with the last antenna 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 will be designed and built at the Herzberg Institute of Astrophysics 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 Q4 of 2005. 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 Q4 of 2006. First “shared risk” science using a subset of the correlator could begin in Q2 of 2007, with full correlator commissioning planned to be complete by Q1 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 the new electronics system on an antenna in Q3 of 2003, support for VLA observations using transition hardware in Q2 of 2004, tests of the prototype correlator in Q4 of 2005, tests of the final correlator in Q4 of 2006 and early science with a subset of the correlator in Q2 of 2007. 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 June 30, 2003

WBS	Task Name	Start	Finish	% Compl	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		20			
					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
0	EVLA Phase 1	5/1/01	12/26/12	31%	[Gantt bars for EVLA Phase 1]																											
1	PROJECT MGMT	5/1/01	6/1/12	29%	[Gantt bars for PROJECT MGMT]																											
1.1	Management/Subsystem Engineering	5/1/01	3/1/12	32%	[Gantt bars for Management/Subsystem Engineering]																											
1.1.20	Management Plan	5/21/01	3/1/12	30%	[Gantt bars for Management Plan]																											
1.1.40	Key Milestones	11/4/02	6/1/12	0%	[Gantt bars for Key Milestones]																											
1.6	Project Book	6/4/01	3/1/02	100%	[Gantt bars for Project Book]																											
1.10	Office Equipment & Supplies	6/4/01	5/29/08	39%	[Gantt bars for Office Equipment & Supplies]																											
1.20	Advisory Committee	10/15/01	12/26/08	19%	[Gantt bars for Advisory Committee]																											
2	SYSTEM INTEGRATION & TESTING	5/1/01	12/18/07	48%	[Gantt bars for SYSTEM INTEGRATION & TESTING]																											
2.1	Management/Subsystem Engineering	5/1/01	11/30/06	53%	[Gantt bars for Management/Subsystem Engineering]																											
2.1.50	Test Antenna Plan & Tests	10/14/02	7/12/04	25%	[Gantt bars for Test Antenna Plan & Tests]																											
2.1.50.2	Hardware Bench Integration	1/6/03	10/10/03	46%	[Gantt bars for Hardware Bench Integration]																											
2.1.50.5	1st Test Antenna Outfit	4/14/03	10/10/03	47%	[Gantt bars for 1st Test Antenna Outfit]																											
2.1.50.10	System Tests on Antenna	5/13/03	1/15/04	0%	[Gantt bars for System Tests on Antenna]																											
2.5	Test and Lab Equipment	5/1/01	5/17/07	73%	[Gantt bars for Test and Lab Equipment]																											
2.10.1	Power Supply System	9/3/02	9/2/03	62%	[Gantt bars for Power Supply System]																											
2.15	Site RFI characterization & Suppression	4/9/02	1/27/04	13%	[Gantt bars for Site RFI characterization & Suppression]																											
2.15.15.1	RF/EM Analysis of electronics & computers	7/16/02	1/27/04	8%	[Gantt bars for RF/EM Analysis of electronics & computers]																											
2.16	External RFI & Systems Immunity	4/22/02	10/6/03	90%	[Gantt bars for External RFI & Systems Immunity]																											
2.20	Scientific Support	4/9/02	11/6/02	100%	[Gantt bars for Scientific Support]																											
2.25	Modules Bins & Racks	2/1/02	12/18/07	28%	[Gantt bars for Modules Bins & Racks]																											
2.25.10	Prototype module, bin & rack assembly	6/17/02	11/4/03	60%	[Gantt bars for Prototype module, bin & rack assembly]																											
2.25.30	Production	11/4/03	12/18/07	0%	[Gantt bars for Production]																											
3	CIVIL CONSTRUCTION	6/4/01	10/1/07	56%	[Gantt bars for CIVIL CONSTRUCTION]																											
3.1	Management/Subsystem Engineering	6/4/01	4/29/05	75%	[Gantt bars for Management/Subsystem Engineering]																											
3.5	Fiber Optic Cable	1/2/02	9/30/03	93%	[Gantt bars for Fiber Optic Cable]																											
3.5.5	Trench & install FO cable (200kft)	2/14/02	5/5/04	58%	[Gantt bars for Trench & install FO cable (200kft)]																											
3.5.5.10	West Arm	10/30/02	8/4/03	94%	[Gantt bars for West Arm]																											
3.5.5.30	East Arm	4/11/03	9/22/03	73%	[Gantt bars for East Arm]																											
3.5.5.50	North Arm	4/11/03	5/5/04	9%	[Gantt bars for North Arm]																											
3.10	New Correlator Room	8/26/02	10/1/07	19%	[Gantt bars for New Correlator Room]																											
3.10.10	Remodeling	12/19/02	5/4/05	4%	[Gantt bars for Remodeling]																											
3.10.15	CB Chillers	8/25/03	7/22/05	0%	[Gantt bars for CB Chillers]																											
3.10.20	Power Distribution	1/6/03	8/9/05	37%	[Gantt bars for Power Distribution]																											
3.15	RFI Shielded Test Chamber	12/14/01	4/1/02	100%	[Gantt bars for RFI Shielded Test Chamber]																											
4	ANTENNAS	5/1/01	8/2/10	29%	[Gantt bars for ANTENNAS]																											
4.1	Management/Subsystem Engineering	6/4/01	8/12/05	51%	[Gantt bars for Management/Subsystem Engineering]																											
4.1.2	Design & Prototyping	1/23/02	6/30/03	52%	[Gantt bars for Design & Prototyping]																											
4.1.3	Laminated Feed Horn Design	1/1/02	7/14/03	76%	[Gantt bars for Laminated Feed Horn Design]																											
4.1.4	Prototype Assembly	6/3/02	8/2/04	41%	[Gantt bars for Prototype Assembly]																											
4.2	Precision Machining	1/14/02	2/13/07	11%	[Gantt bars for Precision Machining]																											
4.2.5	Mechanical fab & assembly	1/14/02	1/18/07	19%	[Gantt bars for Mechanical fab & assembly]																											
4.2.10	Front End & Feed	4/15/02	2/13/07	7%	[Gantt bars for Front End & Feed]																											
4.5	Feed Cone	10/15/01	8/4/05	56%	[Gantt bars for Feed Cone]																											
4.10	Antenna Structural Modifications	4/9/03	8/2/10	1%	[Gantt bars for Antenna Structural Modifications]																											
4.20	Pointing Improvements	5/1/01	1/9/04	51%	[Gantt bars for Pointing Improvements]																											
5	FE/FEED	6/4/01	12/26/12	8%	[Gantt bars for FE/FEED]																											

Project: evlmaster\_v3  
Date: 8/18/03

Task Critical Task Milestone Split

Baseline Progress Summary

EVLA PROJECT  
DETAIL SCHEDULE

As of June 30, 2003

WBS	Task Name	Start	Finish	% Compl	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		20			
					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
5.1	Management/Subsystem Engineering	6/4/01	12/26/12	30%																												
5.1.8	MMIC Development	4/2/02	12/12/03	84%																												
5.5	Receiver Build & Installation	7/1/02	12/26/12	5%																												
5.5.1	Receiver Card Cage prototype	9/10/02	1/20/04	43%																												
5.5.2	Prototype Receivers	9/20/02	1/4/08	5%																												
5.5.2.32	K-band Prototype Rcvr	11/4/02	6/24/04	27%																												
5.5.2.40	Q-band Prototype Rcvr	10/11/02	7/1/04	17%																												
5.5.2.15	C-band Prototype Rcvr	1/2/03	10/22/04	2%																												
5.5.2.15.4	Dewar	7/1/03	2/3/04	0%																												
5.5.2.15.5	C-band RF Path	6/11/03	6/22/04	4%																												
5.5.2.15.6	RF/IF Box	7/1/03	2/3/04	0%																												
5.5.2.15.8	Broadband H/C Load (OMT+Hybrid)	9/9/03	4/13/04	0%																												
5.5.2.25	Ku-band Prototype Rcvr	1/3/05	8/3/06	0%																												
5.5.2.25.4	Dewar	4/4/05	11/2/05	0%																												
5.5.2.25.5	Ku-band RF Path	3/3/05	9/1/05	0%																												
5.5.2.25.6	RF/IF Box	3/4/05	10/3/05	0%																												
5.5.2.25.7	Broadband H/C Load (OMT+Hybrid)	4/4/05	11/2/05	0%																												
5.5.2.5	L-band Transition Rcvr	9/20/02	11/13/03	9%																												
5.5.2.5.3	Circular w/g transition	1/2/03	9/30/03	16%																												
5.5.2.5.4	Hybrid Coupler Modifications	7/1/03	11/13/03	0%																												
5.5.2.5.8	L-band Prototype Rcvr	2/3/03	5/25/04	5%																												
5.5.2.5.12	Dewar	7/1/03	2/3/04	0%																												
5.5.2.5.13	L-band RF Path	6/30/03	3/25/04	0%																												
5.5.2.5.14	RF/IF Box	7/1/03	2/3/04	0%																												
5.5.2.5.15	Broadband H/C Load (OMT+Hybrid)	7/11/03	2/12/04	0%																												
5.5.2.20	X-band Transition Rcvr	11/4/02	8/21/03	0%																												
5.5.2.20.8	X-Band Prototype Rcvr	1/2/07	1/4/08	0%																												
5.5.2.20.12	Dewar	4/2/07	10/30/07	0%																												
5.5.2.20.13	X-band RF Path	3/1/07	8/29/07	0%																												
5.5.2.20.17	RF/IF Box	3/2/07	9/28/07	0%																												
5.5.2.20.18	Broadband H/C Load (OMT+PS ?)	4/2/07	10/30/07	0%																												
5.5.2.10	S-band Prototype Rcvr	1/3/06	1/5/07	0%																												
5.5.2.10.4	Dewar	4/3/06	11/1/06	0%																												
5.5.2.10.5	S-band RF Path	3/2/06	8/31/06	0%																												
5.5.2.10.6	RF/IF Box	3/3/06	10/2/06	0%																												
5.5.2.10.7	Broadband H/C Load (OMT+Hybrid)	4/3/06	11/1/06	0%																												
5.5.2.35	Ka-band Prototype Rcvr	2/5/03	7/6/04	9%																												
5.5.2.35.4	Dewar	7/1/03	2/3/04	0%																												
5.5.2.35.5	Ka-band RF Path	7/1/03	1/5/04	0%																												
5.5.2.35.6	RF/IF Box	7/1/03	3/4/04	0%																												
5.5.3	Current Receiver build	7/1/02	9/2/03	82%																												
5.5.0	Receiver Production	8/22/03	12/26/12	0%																												
5.10	Feed Design, Prototype & Production	10/1/01	11/5/10	11%																												
5.10.3	Design and Prototype	6/3/02	8/5/03	69%																												
5.10.5	L-Band Feed Prototype	10/1/01	1/12/04	76%																												
5.10.5o	L-Band OMT	4/4/02	1/12/04	61%																												
5.10.10	S-Band Feed Prototype	8/1/05	4/19/06	0%																												

Project: evlmaster\_v3  
Date: 8/18/03

Task Critical Task Milestone Split

Baseline Progress Summary

EVLA PROJECT  
DETAIL SCHEDULE

As of June 30, 2003

WBS	Task Name	Start	Finish	% Compl	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		20
					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
5.10.10o	S-Band OMT	8/1/05	3/17/06	0%																									
5.10.15	C-Band Feed Prototype	1/7/02	4/6/04	55%																									
5.10.15o	C-Band OMT	1/7/02	4/6/04	49%																									
5.10.20	X-Band Feed Prototype	7/1/03	4/6/05	0%																									
5.10.20p	X-Band Polarizer	8/9/04	3/23/05	0%																									
5.10.25	Ku-Band Feed Prototype	9/26/05	5/8/06	0%																									
5.10.25p	Ku-Band Polarizer	9/26/05	5/3/06	0%																									
5.10.30	K-Band Feed Modification	5/1/02	7/15/03	93%																									
5.10.35	Ka-Band Feed Prototype	1/1/03	2/3/04	38%																									
5.10.35p	Ka-Band Polarizer	1/1/03	7/30/03	78%																									
5.10.50	Feed Production	7/1/02	11/5/10	3%																									
5.30	Cryogenics	10/16/01	6/30/11	7%																									
5.30.5	Vacuum Pump & Manifolds	7/1/03	6/23/11	0%																									
5.30.10	Compressors & Helium Lines	3/4/03	6/30/11	2%																									
5.30.15	Refrigerators	5/5/03	6/30/11	1%																									
6	LO/IF	6/4/01	12/23/09	26%																									
6.1	Management/Subsystem Engineering	6/4/01	12/23/09	56%																									
6.5	Master LO System	11/12/01	8/19/04	65%																									
6.5.10	L351- 512MHz Offset Generator	6/10/02	8/19/03	92%																									
6.5.25	L350 Central Reference Generator	6/3/02	8/26/03	86%																									
6.5.30	L354 Central Reference Distributor	7/21/03	8/19/04	0%																									
6.7	Central Antenna System	7/15/02	9/17/08	18%																									
6.7.5	L352 Round Trip Phase Receiver & Monitor	7/15/02	9/17/08	18%																									
6.10	L301 12-20 GHz Synthesizer	8/27/01	12/23/09	17%																									
6.15	L302 10.8-14.8 GHz synthesizer	10/29/01	10/21/09	16%																									
6.20.1	Antenna Reference System	11/5/01	11/10/08	18%																									
6.20.5	L304 Reference Receiver	4/22/02	8/29/08	20%																									
6.20.10	L305 Reference Generator/Distributor	9/20/02	11/10/08	14%																									
8.0	Band Switches & Converters	11/19/01	11/23/09	28%																									
8.5	Band Switches	5/5/03	10/17/08	3%																									
8.10	4/P & L/S/C Converter Modules	1/28/02	3/21/03	99%																									
8.10.5	T301 4/P-band Converter	6/3/02	2/21/03	100%																									
8.10.10	T302 L/S/C-band Converter	7/29/02	3/21/03	100%																									
8.15.15	T303 U/X-band Converter	7/15/02	2/26/04	57%																									
8.20	IF Down Converters	11/19/01	11/12/08	66%																									
8.20.5	L304 Down Converters	3/4/02	8/19/03	90%																									
8.20.10	Down Converter Integrated Design	4/30/03	3/1/04	27%																									
8.20.10.30	IF Down Converter Production	4/29/05	11/12/08	0%																									
7	FIBER OPTIC	6/4/01	2/17/11	36%																									
7.1	Management/Subsystem Engineering	6/4/01	1/12/05	66%																									
7.5	IF Fiber System	3/18/02	2/17/11	20%																									
7.5.5	Formatter	3/18/02	2/17/11	12%																									
7.5.10	Deformatter	4/8/02	7/27/10	17%																									
7.5.15	Laser Transmitter Module	11/1/02	7/14/03	96%																									
7.20	LO/ Fiber Interface	6/18/02	8/11/03	75%																									
7.10	Fiber Infrastructure & Antennas	10/17/01	2/17/11	52%																									
7.10.5	Fiber Infrastructure	10/17/01	10/29/03	92%																									

Project: evlamaster\_v3  
Date: 8/18/03

Task  Critical Task  Milestone  Split   
 Baseline  Progress  Summary 



EVLA PROJECT  
DETAIL SCHEDULE

As of June 30, 2003

WBS	Task Name	Start	Finish	% Compl	2001				2002				2003				2004				2005				2006				2007				2008				2009				2010				2011				2012				20
					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	Q1							
10.20	M&C EVLA Software	5/1/01	3/4/10	17%																																																	
10.20.5	Stabilization of the VLA	5/1/01	5/10/04	69%																																																	
10.20.5.1	Modcomp to Modcomp Replacement	5/1/01	1/16/02	100%																																																	
10.20.10	Requirements (High Level, Raw)	10/5/01	3/4/10	13%																																																	
10.20.10.5	Engineering	10/5/01	3/4/10	12%																																																	
10.20.10.15	Correlator Backend	1/7/02	6/5/02	100%																																																	
10.20.10.20	Correlator M & C	2/19/02	6/26/02	100%																																																	
10.20.15	High Level Sftwre Arch & Design	1/4/02	12/2/03	21%																																																	
10.20.20	Test & Dev Support, Enhanced Ant	7/1/03	2/17/04	0%																																																	
10.20.25	Mid-Level Analysis & Design	1/8/02	9/25/03	36%																																																	
10.20.25.5	Detailed (Well-Formed) Requir	1/8/02	7/26/02	100%																																																	
10.20.25.10	e2e IF Specifications	6/27/02	7/24/03	54%																																																	
10.20.30	Test & Dev Support, Correlator	4/3/02	6/29/06	12%																																																	
10.20.30.5	Correlator Monitor & Control	9/30/02	7/13/05	9%																																																	
10.20.30.10	Correl Data Products - FFTs, F	4/8/02	8/18/05	12%																																																	
10.20.35	Detailed Design & Coding	6/4/04	3/4/10	0%																																																	
10.20.35.35	Correlator, at VLA Site	10/1/05	7/20/09	0%																																																	
10.20.10.10	Operations	10/5/01	3/22/02	100%																																																	
11	DATA MGMT/E2E	10/1/01	6/30/07	40%																																																	
11.1	e2e Project	10/1/01	6/30/07	40%																																																	
11.1.1	Management and Project Book	10/1/01	6/30/07	0%																																																	
11.1.1.1	Requirements	7/21/03	7/21/03	0%																																																	
11.1.1.1.3	EVLA milestones	12/3/01	6/30/07	0%																																																	
11.1.1.5	Phases	10/1/01	2/14/06	0%																																																	
11.1.2	Infrastructure	1/6/03	7/19/04	4%																																																	
11.1.3	Proposal submission toolkit	9/16/02	8/29/03	84%																																																	
11.1.7	Observation scheduling toolkit	3/31/03	9/15/03	20%																																																	
11.1.8	Pipeline toolkit	4/1/02	9/27/04	29%																																																	
11.1.10	Archive toolkit	10/1/01	12/8/03	80%																																																	
11.1.11	Calibration toolkit	4/1/02	3/3/03	100%																																																	
11.1.12	Master Address List	7/22/03	2/2/04	0%																																																	

Project: evlamaster\_v3  
Date: 8/18/03

Task Critical Task Milestone Split

Baseline Progress Summary

**12.4 Project Budget**

All funds are given in US\$(FY2003). The project funding will come from 4 sources. \$55.2 M from new NSF funds, \$14.8 M in manpower provided by the NRAO operations budget, approximately \$14 M funded by the Canadian Government for the correlator and \$2M from the Mexican Government. The project budget plan is given in Table 12.2.



EVLA Project Book Chapter 12: Schedule and Budget

**Table 12.2 EVLA Project Budget Plan**

All amounts are in \$k dollars (FY2004)

WBS	Task Name	Actual		Budgeted	2004	2005	2006	2007	2008	2009	2010	2011	2012	Totals
		2001	2002	2003										
6.01	Project Management	77.0	204.6	272.0	323.5	278.6	271.5	249.3	232.5	177.5	136.5	135.5	0.0	2358
6.02	System Integration & Testing	212.0	479.5	351.1	530.7	180.4	180.4	184.9	176.9	174.9	76.0	0.0	0.0	2547
6.03	Civil Construction	0.2	252.1	52.0	242.8	509.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	1086
6.04	Antennas	0.0	46.8	268.0	183.0	75.2	45.5	28.0	22.0	8.2	8.0	0.0	0.0	685
6.05	Font End Systems	385.4	124.1	868.4	2285.1	1113.0	1006.0	1185.7	1046.8	884.1	695.1	285.4	114.4	9993
6.06	Local Oscillator System	14.1	292.3	560.5	477.0	367.0	367.0	367.0	356.0	353.0	352.5	0.0	0.0	3506
6.07	Fiber Optic System	4.7	642.8	1125.0	1382.0	933.2	783.2	873.2	743.2	719.2	643.6	478.4	0.0	8328
6.08	Intermediate Frequency System	0.0	96.0	355.6	575.4	285.0	285.0	285.0	285.0	285.0	283.0	0.0	0.0	2735
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	216.8	474.9	423.4	280.0	201.3	193.2	193.5	208.9	62.0	54.0	0.0	2308
6.11	Data Management & Computing	2.8	3.0	208.0	160.0	85.5	26.0	177.0	119.0	519.0	0.0	0.0	0.0	1300
6.12	Education & Public Outreach	0.0	0.0	0.0	0.0	0.0	0.0	250.0	250.0	0.0	0.0	0.0	0.0	500
	M&S Total	845	2720	4690	7201	4144	7477	5672	3470	3347	2257	953	114	42891
	Travel	8	47	89	123	152	167	105	57	48	32	2	4	834
	NRAO Wages & Benefits	322	2667	4041	4535	4155	3867	3316	3021	2618	554	399	232	29565
	Canadian Labor	54	414	671	533	468	365	532	321	136	0	0	0	3494
	Sub Total	1229	5847	9493	12392	8918	11877	9625	6869	6149	2843	1355	350	76785
	Contingency	0	0	0	0	6	0	0	406	764	2973	1861		6010
	Redirected NRAO Effort	-195	-1549	-2317	-2186	-1985	-1872	-1703	-1475	-1325	-382	-246	-232	-15195
	Canadian Contribution	-203	-776	-826	-1151	-505	-4647	-2411	-366	-153	0	0	0	-11038
	Mexican Contribution				-1000	-1000								-2000
	EVLA Project Funds	831	3523	6349	8055	5434	5358	5511	5434	5434	5434	2970	119	54562
	Carryover to next yr	2170	3648	2621			76					119		
	Carryover from prior yr		-2170	-3648	-2621		-6	-76					-119	
	NSF Funded	3001	5000	5322	5434	5434	5428	5435	5434	5434	5434	3089	0	54562