

SCHEDULE AND TIMELINE

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Revision History:

2000-Feb-22: Initial version created (R. Simon)

Introduction

This chapter outlines the schedule and project planning for the Atacama Large Millimeter Array Project. There are two key aspects of planning for the ALMA:

- Tasks and milestones which must be accomplished
- Associated target dates.

The logical structure for the project is built around the concept of a "Work Breakdown Structure", or WBS. The WBS is simply an outline plan of all the work to be accomplished, and provides a framework for scheduling, costing, and tracking progress. Once a baseline WBS has been created, the inevitable changes and unexpected developments any real world project experiences may be incorporated into the WBS, and the impact of problems or unexpected difficulties can be allowed for.

The basic outline of the Joint WBS for the ALMA project has been drafted, but some details remain uncertain at this writing. This chapter presents the following:

- The Project WBS, expanded to level 2, presented in the form of a Gantt chart

After agreement has been reached on specific milestones in the project, they will be summarized in a separate table.

Note: For practical reasons, the HTML version of this chapter does not include detailed table listed below, other than as a link to the relevant PDF file. Readers are *strongly* encouraged to access the [PDF version](#) of this chapter.

Table 1: [ALMA Task Scheduling](#)

This Table presents a timeline for the project in the form of a Gantt chart, listing all tasks from level 1 or level 2 in the WBS.

Substantially more detailed views of the WBS are maintained at the following locations in PDF format:

The ALMA WBS *(last updated 2000-Feb-11)*

- [Summary to Level 3](http://www.cv.nrao.edu/almaplan/costing/almaplan2000feb11level3.pdf) (http://www.cv.nrao.edu/almaplan/costing/almaplan2000feb11level3.pdf) (All tasks, Phase 1 and Phase 2, level 3 and higher, 17 pages)
- [Complete ALMA WBS](http://www.cv.nrao.edu/almaplan/costing/almaplan2000feb11full.pdf) (http://www.cv.nrao.edu/almaplan/costing/almaplan2000feb11full.pdf) (All ~1,900 tasks; 76 pages)

Large
Millimeter
Array

All Tasks selected

File: almaplan2000feb22.mpp
View: Clean Gantt View
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WBS (f)	Task	Start	Finish	Duration	%Done	Eur	US	1998	1999	2000	2001	2002	2003
									I			I	H2
1	Management/Administration	1998-06-01	2009-12-31	605w	13%	Yes	Yes						
1.05	Phase 1 Management	1998-06-01	2002-01-01	187.4w	33%	Yes	Yes						
1.10	Phase 2 Planning	1999-01-01	2002-01-01	156.6w	17%	Yes	Yes						
1.15	Facilities	1998-06-01	2003-12-31	291.6w	21%	Yes	Yes						
1.20	Agreements in Chile	1998-06-01	2009-12-31	605w	20%	Yes	Yes						
1.25	Partnerships and Agreements	1999-01-11	2002-01-01	155.4w	27%	Yes	Yes						
1.30	Phase 2 Management	2001-01-01	2009-12-30	469.8w	0%	Yes	Yes						
2	Site Development	1998-06-01	2009-12-31	605w	1%	Yes	Yes						
2.05	Site Development Management	1998-06-01	2006-01-20	399.2w	19%	Yes	Yes						
2.10	Development Plans	1998-06-01	2000-08-21	116.1w	91%	Yes	Yes						
2.15	Site Legal Issues	2000-08-21	2009-12-31	488.9w	0%	Yes	Yes						
2.20	Array Site	2002-01-01	2006-01-20	212w	0%	Yes	Yes						
2.25	Operations Support Facility (OSF)	2001-06-01	2005-03-24	199w	0%	Yes	Yes						
2.30	Array/OSF/World Links	2001-06-04	2005-06-20	211.2w	0%	Yes	Yes						
2.35	Chilean Phase 2 Facilities	2002-01-01	2004-12-31	156.8w	0%	Yes	Yes						
2.40	Dedicate ALMA Site Facilities in Chile	2006-01-20	2006-01-20	0w	0%	Yes	Yes						
3	Antenna Subsystem	1998-06-01	2009-12-31	605w	6%	Yes	Yes						
3.05	Antenna Management/Subsystem Engineering	1998-06-01	2009-12-31	605w	14%	Yes	Yes						
3.10	Prototype Antennas	1998-09-22	2003-04-01	236.2w	1%	Yes	Yes						
3.15	Production Antennas	2001-06-01	2009-06-30	421.8w	0%	Yes	Yes						
3.20	Antenna Transporters	1999-10-01	2006-08-14	358.6w	0%	Yes	No						
3.25	Antenna Foundations	2002-10-02	2003-05-28	34.2w	0%	Yes	Yes						
4	Receiver Subsystem	1998-06-01	2009-12-31	605w	5%	Yes	Yes						

Milestones: bold type Summary Tasks: <u>underline</u>	Joint Task	Summary (Eur)	Completed Mlstr
	Eur Task	Summary (US)	Summ. Progress
	US Task	Progress	Split
	Summary (Joint)	Milestone	

ALMA Task Scheduling

All Tasks selected

WBS (f)	Task	Start	Finish	Duration	%Done	Eur	US	1998	1999	2000	2001	2002	2003
													H2
4.05	<u>Receiver Management/Subsystem Engineering</u>	1998-06-01	2009-12-31	605w	8%	Yes	Yes						
4.10	<u>SIS Mixer Development</u>	1998-06-01	2004-01-02	292w	1%	Yes	Yes						
4.15	<u>HFET/MMIC Amplifier Development</u>	1998-06-01	2002-01-01	187.4w	0%	Yes	Yes						
4.20	<u>Antenna Evaluation Receivers</u>	1998-10-27	2001-10-01	153w	32%	No	Yes						
4.25	<u>Prototype Receivers</u>	1998-06-01	2002-12-30	239.2w	0%	Yes	Yes						
4.30	<u>Production Receivers</u>	2002-12-31	2009-12-30	365.6w	0%	Yes	Yes						
5	Local Oscillator Subsystem	1998-06-01	2011-06-09	680w	5%	Yes	Yes						
5.05	<u>LO Management/Subsystem Engineering</u>	1998-06-01	2011-06-09	680w	7%	Yes	Yes						
5.10	<u>Prototype LO</u>	1998-06-01	2003-12-30	291.4w	0%	No	Yes						
5.15	<u>Production LO</u>	2002-01-01	2009-07-28	395.4w	0%	Yes	Yes						
6	Backend Subsystem	1998-11-02	2009-12-31	583w	11%	Yes	Yes						
6.05	<u>Backend Management/Subsystem Engineering</u>	1998-11-02	2009-12-31	583w	8%	Yes	Yes						
6.10	<u>Prototype Backend Subsystem</u>	1999-02-22	2003-04-01	214.4w	39%	No	Yes						
6.15	<u>Production Backend</u>	2002-11-04	2005-09-30	152w	0%	Yes	Yes						
7	Correlator	1998-06-01	2009-12-31	605w	1%	Yes	Yes						
7.05	<u>Correlator Management/Subsystem Engineering</u>	1998-06-01	2009-12-31	605w	11%	Yes	Yes						
7.10	<u>Test Correlator</u>	1998-07-20	2000-03-31	89w	99%	No	Yes						
7.15	<u>Baseline Correlator</u>	1998-07-03	2006-06-02	413.4w	23%	No	Yes						
7.20	Correlator Test Equipment/Facilities	2002-01-01	2007-12-31	313.2w	0%	Yes	Yes						
7.25	<u>Future Correlator</u>	1999-09-01	2009-12-31	539.6w	0%	Yes	No						
8	Computing Subsystem	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.05	Management	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.10	Science Software Requirements	1998-06-01	2009-12-31	605w	0%	Yes	Yes						

Milestones: bold type Summary Tasks: <u>underline</u>	Joint Task	Summary (Eur)	Completed Mlstr
	Eur Task	Summary (US)	Summ. Progress
	US Task	Progress	Split
	Summary (Joint)	Milestone	

ALMA Task Scheduling

All Tasks selected

WBS (f)	Task	Start	Finish	Duration	%Done	Eur	US	1998	1999	2000	2001	2002	2003
													H2
8.15	High Level Analysis & Design	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.20	Software Engineering	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.25	Common Software	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
<u>8.30</u>	<u>Control Software</u>	<u>1998-06-01</u>	<u>2009-12-31</u>	<u>605w</u>	<u>0%</u>	<u>Yes</u>	<u>Yes</u>						
<u>8.35</u>	<u>Correlator Software</u>	<u>1998-06-01</u>	<u>2009-12-31</u>	<u>605w</u>	<u>0%</u>	<u>Yes</u>	<u>Yes</u>						
8.40	Pipeline Software	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.45	Archiving	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.50	Scheduling	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.55	Observing Preparation & Support	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.60	Off-line Data Processing/Analysis	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.65	Telescope Calibration	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
8.70	Integration and Support	1998-06-01	2009-12-31	605w	0%	Yes	Yes						
<u>9</u>	System Engineering and Integration	<u>1998-06-01</u>	<u>2009-12-31</u>	<u>605w</u>	<u>7%</u>	<u>Yes</u>	<u>Yes</u>						
9.05	SE&I Management	1998-06-01	2009-12-31	605w	15%	Yes	Yes						
<u>9.10</u>	<u>System Engineering</u>	<u>1998-06-01</u>	<u>2003-05-20</u>	<u>259.4w</u>	<u>6%</u>	<u>Yes</u>	<u>Yes</u>						
<u>9.15</u>	<u>Prototype Antenna Integration and Testing</u>	<u>1998-06-01</u>	<u>2002-04-01</u>	<u>200w</u>	<u>50%</u>	<u>Yes</u>	<u>Yes</u>						
<u>9.20</u>	<u>Test Interferometer</u>	<u>1998-09-01</u>	<u>2003-07-25</u>	<u>255.8w</u>	<u>6%</u>	<u>Yes</u>	<u>Yes</u>						
9.25	Phase Monitoring Device	1999-09-01	2001-12-31	609d	0%	Yes	Yes						
<u>9.30</u>	<u>Array</u>	<u>2004-01-05</u>	<u>2009-12-31</u>	<u>313w</u>	<u>0%</u>	<u>Yes</u>	<u>Yes</u>						
<u>10</u>	Science	<u>1998-06-01</u>	<u>2009-12-31</u>	<u>605w</u>	<u>32%</u>	<u>Yes</u>	<u>Yes</u>						
10.05	Scientific Requirements	1998-06-01	2001-12-31	187.2w	45%	Yes	Yes						
10.10	Site Monitoring and Characterization	1998-06-01	2001-12-31	187.2w	45%	Yes	Yes						
10.15	Array Design and Operation	1998-06-01	2001-12-31	187.2w	45%	Yes	Yes						

Milestones: bold type Summary Tasks: <u>underline</u>	Joint Task	Summary (Eur)	Completed Mlstr
	Eur Task	Summary (US)	Summ. Progress
	US Task	Progress	Split
	Summary (Joint)	Milestone	

ALMA Task Scheduling

All Tasks selected

WBS (f)	Task	Start	Finish	Duration	%Done	Eur	US	1998	1999	2000	2001	2002	2003
													H2
10.20	Calibration	1998-06-01	2001-12-31	187.2w	45%	Yes	Yes						
<u>10.25</u>	<u>Imaging</u>	<u>1998-06-01</u>	<u>2001-12-31</u>	<u>187.2w</u>	<u>45%</u>	<u>Yes</u>	<u>Yes</u>						
10.30	Phase 2 Science Support	2001-01-01	2009-12-31	470w	0%	Yes	Yes						
11	<u>Operations and Maintenance</u>	<u>2003-01-01</u>	<u>2009-12-31</u>	<u>365.6w</u>	<u>0%</u>	<u>Yes</u>	<u>Yes</u>						
<u>11.05</u>	<u>Administration of Chilean Operations</u>	<u>2003-01-01</u>	<u>2009-12-31</u>	<u>365.6w</u>	<u>0%</u>	<u>Yes</u>	<u>Yes</u>						
<u>11.10</u>	<u>Site Operations</u>	<u>2003-07-01</u>	<u>2009-12-31</u>	<u>339.8w</u>	<u>0%</u>	<u>Yes</u>	<u>Yes</u>						

Milestones: **bold type**
Summary Tasks: underline

Joint Task	Summary (Eur)	Completed Mlstr
Eur Task	Summary (US)	Summ. Progress
US Task	Progress	Split
Summary (Joint)	Milestone	