

MMA Design & Development Phase Milestones

WBS Milestone tasks, sorted by WBS and date

WBS	Milestone / Deliverable	Plan Date	Actual	Responsibility
1	<u>Administration</u>			<u>Brown</u>
1.1.1.1.1	Project Book: Version 1	7/20/98	7/20/98	Emerson
1.1.4.1.1	Deliver WBS for D&D phase	9/30/98	NA	Brown
1.1.1.3	Draft Interface Standards	10/30/98	NA	Emerson
1.1.3.9	Complete Draft of Business Procedures	10/30/98	NA	Porter
1.1.4.4	Complete prelim cost estimate	12/31/98	NA	Brown
1.1.1.6	Schedule of Reviews	1/29/99	NA	Brown
1.1.2.3	Schedule of Meetings	1/29/99	NA	Wootten
1.1.4.1.2	Deliver preliminary WBS Entire Project	1/29/99	NA	Brown
1.1.5.5	Publish Personnel, Safety & Health Procedures	1/29/99	NA	Brown
1.1.6.1	Deliver Management Plan for D&D	1/29/99	NA	Brown
1.1.3.10	Deliver Business Procedures Text	4/30/99	NA	Porter
1.1.4.5	Deliver Prelim Cost Estimate	4/30/99	NA	Brown
1.3.2.2	Bienes Nacionales Use Permission	6/30/99	NA	Hardy
1.4.4	Partnership Recommendations to NSF	6/30/99	NA	Brown
1.1.6.2	Deliver Management Plan for Construction	9/30/99	NA	Brown
1.3.1.2	CONICYT Use Permissions	9/30/99	NA	Hardy
1.1.1.4	Interface Standards	1/31/00	NA	Emerson
1.1.4.1.3	Deliver final WBS entire project	1/31/00	NA	Brown
2	<u>Site Development</u>			<u>Gordon</u>
2.1.6	Deliver Operations Plan, v.1	1/31/00	NA	Gordon
2.2.5	Deliver Civil Works Requirements	1/31/00	NA	Gordon
3	<u>Antenna</u>	<u>6/29/01</u>	<u>NA</u>	
3.2.2	PDR: Antenna	7/28/98	7/28/98	Napier
3.3.1	Vendor Information Meeting	9/22/98	9/22/98	Napier
3.2.4	CDR: Antenna	11/30/98	NA	
3.3.3	Issue Prototype Antenna RFP	1/29/99	NA	Napier
3.3.4	Receive Prototype Antenna Bid Response	4/30/99	NA	Napier
3.3.6	Sign Contract (#1+Option #2)	6/30/99	NA	Napier
3.4.6	CDR: Antenna Apex	10/29/99	NA	Napier
3.6.1.4	Deliver Transporter Requirements	3/31/00	NA	Napier
3.6.2.1	Issue Transporter RFP	6/30/00	NA	Napier
3.6.2.2	Receive Transporter Bids	9/29/00	NA	Napier

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3.4.7	Deliver Antenna Apex	1/31/01	NA	Napier
3.6.2.3	Sign Transporter Contract	1/31/01	NA	Napier
3.3.9	Delivery of Antenna #1	6/1/01	NA	
3.6.2.4	Deliver/Accept Transporter #1	6/29/01	NA	Napier
4	Receivers			Emerson
4.1.12.10	Complete Vacuum Window Development	11/2/98	NA	Webber
4.1.4.7	Complete Cryogenic IF plates for mixer testing	12/1/98	NA	Webber
4.1.8.1.10	Complete Eval. of 200-300 GHz bal. & sideband-sep. mixers	1/4/99	NA	Webber
4.1.1.2	PDR: SIS Mixer	1/29/99	NA	Webber
4.1.6.10	Complete 170-245 LO Plate, sideband source plates	2/1/99	NA	Webber
4.1.11.2.10	First MMIC IF Amplifier Tests	2/1/99	NA	Webber
4.1.18.3	Deliver Test Ant mixer: 230 GHz band	6/30/99	NA	Webber
4.1.18.5	Deliver Test Ant mixer: 86 GHz band	6/30/99	NA	Webber
4.2.7	Deliver Test Ant Amplifier: 30 GHz Band	6/30/99	NA	Webber
4.1.10.10	Complete Wafer Evaluation circuits	7/1/99	NA	Webber
4.4.2	PDR: MMA Receiver System	8/30/99	NA	Emerson
4.1.1.5	CDR: SIS Mixer	9/30/99	NA	Webber
4.4.1.9	Deliver Receiver Package Conceptual Design	9/30/99	NA	Emerson
4.1.8.2.3.9	170-245 balanced mixer tests	10/1/99	NA	Webber
4.1.9.10	Complete automated mixer testing, 2nd SIS test set	12/1/99	NA	Webber
4.1.13.10	Complete Fourier Transform Spectrometer	12/1/99	NA	Webber
4.2.8	Deliver Prototype Amplifier: 30 GHz Band	1/31/00	NA	Webber
4.1.8.3.1.9	Start 602-720 building block mixer tests	2/1/00	NA	Webber
4.1.11.2.11	Complete integrated MMIC IF development	3/1/00	NA	Webber
4.5.25	Deliver Antenna Test Receiver	4/28/00	NA	Emerson
4.1.8.2.4.9	170-245 balanced, sideband-separating mixer tests	5/1/00	NA	Webber
4.4.12	CDR: MMA Receiver System	6/30/00	NA	Emerson
4.1.8.3.2.9	Start 602-720 Balanced Mixer tests	8/1/00	NA	Webber
4.1.8.2.10	Deliver prototype 170-245 GHz	9/29/00	NA	Webber
4.4.4.5.3	Deliver Prototype Refrigerator	1/31/01	NA	Emerson
4.1.8.3.4.9	Start 602-720 Bal., sideband separating mixer tests	2/1/01	NA	Webber
4.4.3.3.3	Deliver Prototype Dewar	3/30/01	NA	Emerson
4.1.8.3.5	Deliver prototype 602-720 GHz	8/31/01	NA	Webber

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4.5.2	Deliver Prototype MMA Receiver System	12/28/01	NA	Emerson
5	<u>LO System</u>			<u>Emerson</u>
5.3.4	PDR: Multiplier Chain LO	10/30/98	NA	Webber
5.3.3.3.6	Deliver 230 GHz Doubler Demo	12/31/98	NA	Webber
5.4.1.2.6	Photonic Phase Cal Feasibility Demo	12/31/98	NA	Emerson
5.2.3	PDR: LO Reference	5/31/99	NA	Sramek
5.4.1.3.3	PDR: Photonic Phase Cal System	6/30/99	NA	Emerson
5.4.4	PDR: Photonic LO	6/30/99	NA	Emerson
5.5	PDR: LO System	6/30/99	NA	Emerson
5.3.3.5.8	Deliver 660 GHz LO Tripler demo	9/30/99	NA	Webber
5.4.5.6	Deliver 100 GHz Velocity Matched photomixer	10/29/99	NA	Emerson
5.4.1.3.5	CDR: Photonic Phase Cal System	12/31/99	NA	Emerson
5.3.3.6.3	CDR: Multiplier Chain LO	3/31/00	NA	Webber
5.4.11	CDR: Photonic LO	3/31/00	NA	Emerson
5.6	CDR: LO System	6/30/00	NA	Emerson
5.7	Decision: Multiplier Chain or Photonic LO	6/30/00	NA	Emerson
5.4.1.4.1.2	Deliver Photonic Phase Cal prototypes	12/31/00	NA	Emerson
5.2.35	Deliver LO Reference bench prototype	1/31/01	NA	Sramek
5.3.5.4	Deliver Prototype 230 GHz LO for Prototype Receiver	1/31/01	NA	Webber
6	<u>IF System</u>			<u>Sramek</u>
6.3	PDR: IF System	4/30/99	NA	Sramek
6.7	CDR: IF System	3/31/00	NA	Sramek
6.8	Deliver (Bench) Prototype IF System	9/29/00	NA	Sramek
7	<u>FO System</u>			<u>Sramek</u>
7.3	PDR: FO System	4/30/99	NA	Sramek
7.10	CDR: FO System	3/31/00	NA	Sramek
7.12	Deliver Prototype FO System	9/29/00	NA	Sramek
8	<u>Correlator</u>			<u>Webber/Escoffi</u>
8.5.3.3	Decision: FIR Filter or Analog BBC	12/31/98	NA	Webber
8.3.5	PDR: Correlator	1/29/99	NA	Webber
8.2.6	Deliver Test Correlator to VLA site	1/31/00	NA	Webber
8.5.8	CDR: Finite Impulse Response Filter	7/31/00	NA	Webber
8.10	CDR: Prototype Correlator	7/31/00	NA	Webber

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WBS	Milestone / Deliverable	Plan Date	Actual	Responsibility
8.5.16	Deliver FIR Filter for Test Interferometer	12/1/00	NA	Webber
8.12.5	Deliver Prototype Correlator to VLA site	5/30/03	NA	Webber
8.13.5	Deliver Correlator to MMA site	6/1/04	NA	Webber
9	<u>Computing</u>			<u>Glendenning</u>
9.2	PDR: Computing Requirements	4/30/99	NA	Glendenning
9.4.3	PDR: Monitor & Control	6/30/99	NA	Glendenning
9.5.2	PDR: Single Dish Antenna Test System	6/30/99	NA	Glendenning
9.7.7	Deliver Test Correlator Software	9/30/99	NA	Glendenning
9.5.4	CDR: Single Dish Antenna Test System	1/31/00	NA	Glendenning
9.4.5	CDR: Monitor & Control	6/30/00	NA	Glendenning
9.5.7	Deliver Single Dish Antenna Test System	1/31/01	NA	Glendenning
9.6.7	Deliver Holography System Software	3/30/01	NA	Emerson
10	<u>System Integration</u>			<u>Emerson</u>
10.3.1	Draft M&C Specification for Antenna	10/30/98	NA	Glendenning
10.2.4	Deliver MMA Interfaces and Standards Document	4/30/99	NA	Emerson
10.5.1	Deliver Prototype Antenna Testing Plan	6/30/99	NA	Emerson
10.5.2.6	Deliver Holography System	6/30/00	NA	Emerson
10.6.7	Test Interferometer Site Complete	4/30/01	NA	Sramek
10.5.3.3	Antenna #1 Outfitting Complete	9/28/01	NA	Emerson
11	<u>Calibration & Imaging</u>			<u>Wootten</u>
11.1.6.1	Site Char. & Monitoring Review (URSI meeting)	1/11/99	NA	Radford
11.3.2.1	Initial Radiometric Phase Cal Review	5/31/99	NA	Wootten
11.3.3.4	Initial Amplitude Cal Review	5/31/99	NA	Wootten
11.2.3	Design Review: Array Configuration	1/31/00	NA	Wootten
11.1.6.2	Mid-term Site Char. & Monitoring Review	3/31/00	NA	Radford
11.3.2.2	Mid-term Radiometric Phase Cal Review	5/31/00	NA	Wootten
11.3.3.5	Mid-term Amplitude Cal Review	5/31/00	NA	Wootten
11.1.6.3	Final Site Char. & Monitoring Review	3/30/01	NA	Radford
11.3.2.3	Final Radiometric Phase Cal Review	5/31/01	NA	Wootten
11.3.2.4	Decision: 183 or 22 GHz Phase monitor	5/31/01	NA	Wootten
11.3.3.6	Final Amplitude Cal Review	5/31/01	NA	Wootten