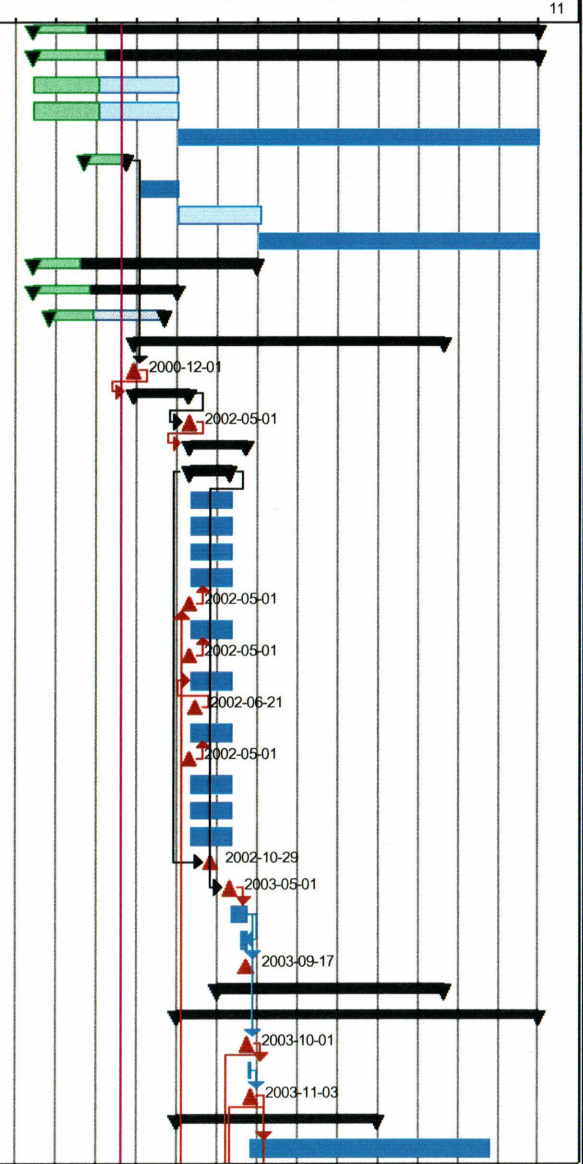


ALMA Task Scheduling
4 Front End Subsystem Tasks selected

ID	ACDS#	WBS (f)	Task	Cost	Start	Finish	Duration	Responsible
372		4	Front End Subsystem	\$84,950	1998-06-01	2010-12-31	657.4w	Payne/Wild
373		4.05	<u>Front End Management/Subsystem Engineering</u>	\$3,899	1998-06-01	2010-12-31	657.4w	
374		4.05.03	US Front End Subsystem Development Phase 1	\$0	1998-06-01	2002-01-01	187.4w	
375		4.05.04	US Front End Lab / Test Equipment Phase 1	\$0	1998-06-01	2002-01-01	187.4w	
376	25	4.05.05	Front End Subsystem Management Phase 2	\$2,964	2002-01-01	2010-12-31	470.2w	
377		4.05.10	<u>Front End Subsystem Design & Specification</u>	\$0	1999-09-01	2000-10-02	56.8w	
382		4.05.13	Evaluation Front End Engineering Support Phase 1	\$0	2001-01-30	2001-12-31	48w	
383	26	4.05.15	Evaluation Front End Engineering Support Phase 2	\$167	2002-01-01	2004-02-02	109w	
384	27	4.05.20	Production Front End Engineering Support	\$768	2004-01-01	2010-12-31	365.8w	
385		4.10	<u>SIS Mixer Development</u>	\$113	1998-06-01	2003-12-17	289.6w	
570		4.15	<u>HFET/MMIC Amplifier Development</u>	\$0	1998-06-01	2002-01-01	187.4w	
611		4.20	<u>Antenna Evaluation Front Ends</u>	\$0	1998-10-27	2001-08-28	148.2w	
628		4.25	<u>Prototype Front Ends</u>	\$0	2000-12-01	2008-09-03	405w	
629		4.25.05	PDR: Front End Subsystem	\$0	2000-12-01	2000-12-01	0d	Payne/Wild
630		4.25.10	<u>Front End Engineering Model</u>	\$0	2000-12-04	2002-04-19	72w	
647		4.25.35	CDR: Front End Subsystem	\$0	2002-05-01	2002-05-01	0d	Payne/Wild
648		4.25.40	<u>Front End Qualification Model</u>	\$0	2002-05-01	2003-09-17	72.2w	
649		4.25.40.05	<u>Front End Qualification Model fabrication</u>	\$0	2002-05-01	2003-04-29	52w	
650		4.25.40.05.05	Cryostat & Front End Chassis Qual. Model	\$0	2002-05-01	2003-04-29	52w	
651		4.25.40.05.10	Front End Common Optics Qual. Model	\$0	2002-05-01	2003-04-29	52w	
652		4.25.40.05.15	Front End Windows & IR Filters Qual. Model	\$0	2002-05-01	2003-04-29	52w	
653		4.25.40.05.20	Band 3 (89-116GHz) Front End Cartridge Qual. Model	\$0	2002-05-01	2003-04-29	52w	
654		4.25.40.05.23	(Qual. Model Band 3 (89-116 GHz) LO Del. from WBS 5)	\$0	2002-05-01	2002-05-01	0w	Webber
655		4.25.40.05.25	Band 6 (211-275 GHz) Front End Cartridge Qual. Model	\$0	2002-05-01	2003-04-29	52w	
656		4.25.40.05.28	(Qual. Model Band 6 (211-275 GHz) LO Del. from WBS 5)	\$0	2002-05-01	2002-05-01	0w	Webber
657		4.25.40.05.30	Band 9 (602-720 GHz) Front End Cartridge Qual. Model	\$0	2002-05-01	2003-04-29	52w	
658		4.25.40.05.33	(Qual. Model Band 9 (602-720 GHz) LO del. from WBS 5)	\$0	2002-06-21	2002-06-21	0w	Webber
659		4.25.40.05.35	Band 7 (275-370 GHz) Front End Cartridge Qual. Model	\$0	2002-05-01	2003-04-29	52w	
660		4.25.40.05.38	(Qual. Model Band 7 (275-370 GHz) LO del. from WBS 5)	\$0	2002-05-01	2002-05-01	0w	Webber
661		4.25.40.05.40	183 GHz WVR Qual. Model	\$0	2002-05-01	2003-04-29	52w	
662		4.25.40.05.45	Front End Control & Test Electronics Qual. Model	\$0	2002-05-01	2003-04-29	52w	
663		4.25.40.05.50	Front End Calibration Equipment Qual. Model	\$0	2002-05-01	2003-04-29	52w	
664		4.25.40.10	Front End Qual. Model Progress Review	\$0	2002-10-29	2002-10-29	0d	Payne/Wild
665		4.25.40.15	Deliver Front End Qual. Model Components	\$0	2003-05-01	2003-05-01	0d	Payne/Wild
666		4.25.40.20	Front End Qual. Model Assemble, Integrate, & Test	\$0	2003-05-01	2003-09-17	20w	
667		4.25.40.25	Final Front End Design Modification	\$0	2003-07-24	2003-09-17	8w	
668		4.25.40.30	Deliver Front End Qualification Model	\$0	2003-09-17	2003-09-17	0w	
669		4.25.50	<u>Additional Prototype Front End Cartridges</u>	\$0	2003-01-01	2008-09-03	296.6w	
730		4.30	<u>Production Front Ends</u>	\$80,938	2002-01-01	2010-12-29	469.8w	
731		4.30.15	PPR: ALMA Front End Pre-Production Review	\$0	2003-10-01	2003-10-01	0w	Payne/Wild
732	69	4.30.20	Documentation	\$133	2003-10-01	2003-10-28	4w	
733		4.30.25	Release ALMA Front End for manufacture	\$0	2003-11-03	2003-11-03	0w	Payne/Wild
734		4.30.27	<u>Production Front End fab & test equipment</u>	\$4,831	2002-01-01	2006-12-27	260.8w	
746	80	4.30.35	Production Front End Cryostat & Front End Chassis	\$17,846	2003-11-03	2009-10-07	310w	







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

8-7-00

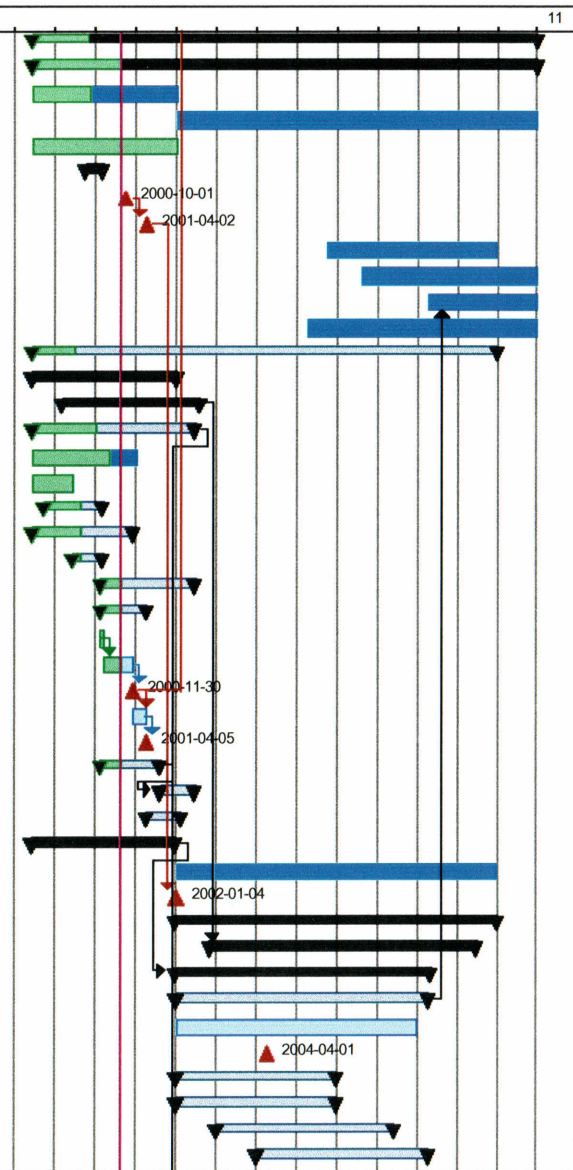
ALMA Task Scheduling 4 Front End Subsystem Tasks selected

ID	ACDS#	WBS (f)	Task	Cost	Start	Finish	Duration	Responsible	
747		<u>4.30.40</u>	<u>Production Front End Cartridges</u>	<u>\$36,802</u>	<u>2003-10-01</u>	<u>2010-12-29</u>	<u>378.6w</u>		
748		<u>4.30.40.05</u>	<u>Band 3 (89-116 GHz) Production Front End Cartridge</u>	<u>\$7,426</u>	<u>2003-10-01</u>	<u>2009-05-29</u>	<u>296w</u>		
749	81	4.30.40.05.05	Band 3 Internal optics, feed, & polarizer	\$1,326	2003-10-01	2009-05-29	296w		
750	82	4.30.40.05.10	Band 3 SIS mixer & internal IF amplifier	\$2,896	2003-10-01	2009-05-29	296w		
751	84	4.30.40.05.20	Band 3 Other components	\$3,204	2003-10-01	2009-05-29	296w		
752		<u>4.30.40.10</u>	<u>Band 6 (211-275 GHz) Production Front End Cartridge</u>	<u>\$7,426</u>	<u>2003-10-01</u>	<u>2009-05-29</u>	<u>296w</u>		
756		<u>4.30.40.15</u>	<u>Band 9 (602-720 GHz) Production Front End Cartridge</u>	<u>\$11,993</u>	<u>2003-10-01</u>	<u>2009-05-29</u>	<u>296w</u>		
761		<u>4.30.40.20</u>	<u>Band 7 (275-370 GHz) Production Front End Cartridge</u>	<u>\$9,957</u>	<u>2003-10-01</u>	<u>2009-05-29</u>	<u>296w</u>		
766		<u>4.30.40.25</u>	<u>Band 8 (385-500 GHz) Production Front End Cartridge</u>	<u>\$0</u>	<u>2007-01-01</u>	<u>2009-12-25</u>	<u>156w</u>		
771		<u>4.30.40.30</u>	<u>Band 2 (67-90 GHz) Production Front End Cartridge</u>	<u>\$0</u>	<u>2005-01-01</u>	<u>2007-12-26</u>	<u>156w</u>		
775		<u>4.30.40.35</u>	<u>Band 5 (163-211 GHz) Production Front End Cartridge</u>	<u>\$0</u>	<u>2007-01-01</u>	<u>2009-12-25</u>	<u>156w</u>		
779		<u>4.30.40.40</u>	<u>Band 4 (125-163 GHz) Production Front End Cartridge</u>	<u>\$0</u>	<u>2005-01-01</u>	<u>2007-12-26</u>	<u>156w</u>		
783		<u>4.30.40.45</u>	<u>Band 10 (787-950 GHz) Production Front End Cartridge</u>	<u>\$0</u>	<u>2008-09-04</u>	<u>2010-12-29</u>	<u>121w</u>		
788		<u>4.30.40.50</u>	<u>Band 1 (30-40 GHz) Production Front End Cartridge</u>	<u>\$0</u>	<u>2005-01-01</u>	<u>2007-12-26</u>	<u>156w</u>		
792	121	4.30.45	Production Front End Common Optics	\$3,045	2003-11-03	2009-10-07	310w		
793	122	4.30.50	Production Front End Electronics	\$5,116	2003-11-03	2009-10-07	310w		
794		<u>4.30.55</u>	<u>Production Calibration Equipment</u>	<u>\$7,099</u>	<u>2003-11-03</u>	<u>2008-10-22</u>	<u>260w</u>		
797	125	4.30.60	Front End Test Equipment/Facilities	\$1,749	2003-11-03	2004-10-29	52w		
798	126	4.30.65	Production Front End Ass'y, Integration & Test	\$4,317	2004-04-01	2009-12-29	300.2w		

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

ALMA Task Scheduling 4 Front End Subsystem Tasks selected

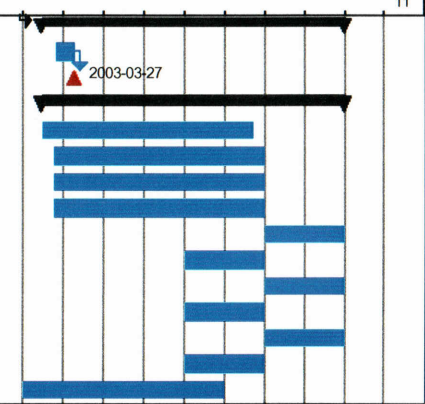
ID	ACDS#	WBS (f)	Task	Cost	Start	Finish	Duration	Responsible
799		<u>5</u>	<u>Local Oscillator Subsystem</u>	\$36,102	1998-06-01	2010-12-31	657.4w	Imerson/Wild
800		<u>5.05</u>	<u>LO Management/Subsystem Engineering</u>	\$4,971	1998-06-01	2010-12-31	657.4w	
801		5.05.03	LO Management/Subsystem Engineering Phase 1	\$0	1998-06-01	2001-12-31	187.2w	
802	127	5.05.05	LO Management/Subsystem Engineering Phase 2	\$1,619	2002-01-01	2010-12-31	470.2w	
803		5.05.10	Initial Specifications and Conceptual Design	\$0	1998-06-01	2001-12-31	187.2w	
804		<u>5.05.15</u>	<u>LO Ref system definition</u>	\$0	1999-10-01	2000-02-29	21.6w	
809		5.05.17	PDR: LO Subsystem	\$0	2000-10-01	2000-10-01	0w	Sramek
810		5.05.19	Progress Review: LO Subsystem	\$0	2001-04-02	2001-04-02	0w	
811	128	5.05.20	LO Ref Engineering Support	\$403	2005-09-22	2009-12-31	223.4w	
812	129	5.05.25	Photonic Dist Engineering Support	\$403	2006-08-01	2010-12-27	230w	
813	130	5.05.30	Millimeter LO Drivers Engineering Support	\$737	2008-04-01	2010-12-31	143.8w	
814	131	5.05.35	LO Multiplier Chains Engineering Support	\$1,809	2005-04-05	2010-12-31	300w	
815		<u>5.10</u>	<u>Prototype LO</u>	\$4,145	1998-06-01	2009-12-24	604.2w	
816		<u>5.10.03</u>	<u>LO Reference US Phase 1</u>	\$0	1998-06-01	2002-01-01	187.4w	
819	132	<u>5.10.05</u>	<u>LO Reference Prototype</u>	\$856	1999-03-01	2002-08-01	178.8w	
1075		<u>5.10.10</u>	<u>Multiplier Chain LO Prototype</u>	\$425	1998-06-01	2002-06-21	212w	Webber/Bradley
1076		5.10.10.03	US Phase 1 Multiplier Chain LO Development	\$0	1998-06-01	2001-01-01	135.2w	
1077		5.10.10.05	Specifications	\$0	1998-06-01	1999-05-28	52w	Webber
1078		<u>5.10.10.10</u>	<u>Tunable phase-locked source R&D</u>	\$0	1998-09-15	2000-02-28	76w	
1094		<u>5.10.10.15</u>	<u>Multiplier R&D</u>	\$0	1998-06-01	2000-12-01	131w	
1141		<u>5.10.10.20</u>	<u>Production for Evaluation Rcvr</u>	\$0	1999-05-31	2000-03-01	39.4w	
1144		<u>5.10.10.25</u>	<u>Multiplier Chain Production for Prototype Front Ends</u>	\$425	2000-02-01	2002-06-21	124.8w	
1145		<u>5.10.10.25.05</u>	<u>Band 3 (89-116 GHz) Front End LO</u>	\$0	2000-02-01	2001-04-05	61.6w	
1146		5.10.10.25.05.05	Determine configuration for Band 3	\$0	2000-02-01	2000-02-28	4w	
1147		5.10.10.25.05.10	Design, assemble, test source chain Band 3	\$0	2000-02-29	2000-11-30	39.6w	
1148		5.10.10.25.05.15	Deliver Eng. Model Band 3 (89-116 GHz) LO	\$0	2000-11-30	2000-11-30	0w	Webber
1149		5.10.10.25.05.20	Band 3 LO Packaging Design & Fab	\$0	2000-12-01	2001-04-05	18w	
1150		5.10.10.25.05.25	Deliver Qual. Model Band 3 (89-116 GHz) LO	\$0	2001-04-05	2001-04-05	0w	Webber
1151		<u>5.10.10.25.10</u>	<u>Band 6 (211-275 GHz) Front End LO</u>	\$0	2000-02-01	2001-08-03	78.8w	
1158	133	<u>5.10.10.25.15</u>	<u>Band 9 (602-720 GHz) Eng. Model Front End LO</u>	\$213	2001-08-06	2002-06-21	46w	
1166	134	<u>5.10.10.25.20</u>	<u>Band 7 (275-370 GHz) Prototype Front End LO</u>	\$213	2001-04-02	2002-02-01	44w	
1173		<u>5.10.15</u>	<u>Photonic LO Distribution Prototype</u>	\$189	1998-06-01	2001-12-14	185w	
1211	136	5.10.20	Photonic Phase Cal System	\$2,675	2002-01-01	2009-12-24	417w	
1212		5.10.25	CDR: LO Subsystem	\$0	2002-01-04	2002-01-04	0w	
1213		<u>5.15</u>	<u>Production LO</u>	\$26,986	2001-12-17	2009-12-28	419.6w	
1214		<u>5.15.05</u>	<u>LO Reference: Production System</u>	\$11,960	2002-11-01	2009-06-30	348w	
1230		<u>5.15.10</u>	<u>Photonic LO Distribution Production System</u>	\$3,239	2001-12-17	2008-05-07	334w	
1235		<u>5.15.15</u>	<u>Millimeter LO Drivers</u>	\$6,760	2002-01-01	2008-03-31	326.4w	
1236	153	5.15.15.05	LO Source Design and System Integration	\$95	2002-01-01	2007-12-27	313w	
1237		5.15.15.10	PPR: Millimeter LO Drivers Pre-Production Review	\$0	2004-04-01	2004-04-01	0w	
1238	154	<u>5.15.15.15</u>	<u>72-95 GHz LO Source</u>	\$2,201	2002-01-01	2005-12-23	208w	
1248	155	<u>5.15.15.20</u>	<u>100-120 GHz LO Source</u>	\$2,263	2002-01-01	2005-12-23	208w	
1258	156	<u>5.15.15.25</u>	<u>87-108 GHz LO Source</u>	\$2,201	2003-01-01	2007-05-25	230w	
1268	157	<u>5.15.15.30</u>	<u>65-85 GHz LO Source</u>	\$0	2004-01-01	2008-03-31	222w	



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

ALMA Task Scheduling
4 Front End Subsystem Tasks selected

ID	ACDS#	WBS (f)	Task	Cost	Start	Finish	Duration	Responsible	
1278		<u>5.15.20</u>	<u>LO Multiplier Chains</u>	<u>\$4,348</u>	<u>2002-06-24</u>	<u>2009-12-28</u>	<u>392.6w</u>		
1279	158	5.15.20.05	LO Multiplier Chains: Final Design & Doc	\$161	2002-11-01	2003-03-27	21w		
1280		5.15.20.10	PPR: LO Multiplier Chains Pre-Production Review	\$0	2003-03-27	2003-03-27	0w	Febber/Wild	
1281		<u>5.15.20.15</u>	<u>Millimeter LO Multiplier Chains</u>	<u>\$4,187</u>	<u>2002-06-24</u>	<u>2009-12-28</u>	<u>392.6w</u>		
1282	159	5.15.20.15.05	Band 3 (89-116 GHz) Receiver LO	\$227	2002-06-24	2007-09-05	272w		
1283	160	5.15.20.15.10	Band 6 (211-275 GHz) Receiver LO	\$936	2002-10-15	2007-12-27	272w		
1284	161	5.15.20.15.15	Band 9 (602-720 GHz) Receiver LO	\$1,549	2002-10-15	2007-12-27	272w		
1285	162	5.15.20.15.20	Band 7 (275-370 GHz) Receiver LO	\$1,476	2002-10-15	2007-12-27	272w		
1286	163	5.15.20.15.25	Band 8 (385-500 GHz) Receiver LO	\$0	2008-01-01	2009-12-28	104w		
1287	164	5.15.20.15.30	Band 2 (67-90 GHz) Receiver LO	\$0	2006-01-01	2007-12-27	104w		
1288	165	5.15.20.15.35	Band 5 (163-211 GHz) Receiver LO	\$0	2008-01-01	2009-12-28	104w		
1289	166	5.15.20.15.40	Band 4 (125-163 GHz) Receiver LO	\$0	2006-01-01	2007-12-27	104w		
1290	167	5.15.20.15.45	Band 10 (787-950 GHz) Receiver LO	\$0	2008-01-01	2009-12-28	104w		
1291	168	5.15.20.15.50	Band 1 (30-40 GHz) Receiver LO	\$0	2006-01-01	2007-12-27	104w		
1292	169	5.15.25	LO Test Equipment/Facilities	\$679	2002-01-01	2006-12-28	261w		



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

Joint Task		Summary (Joint)		Progress		Summ. Progress		Deadline	
Eur Task		Summary (Eur)		Milestone		Split			
US Task		Summary (US)		Completed Mltn		External Milestone			