Project Planning for the Tripartite ALMA:
Issues Needing Resolution to Build the Work Breakdown Structure

15 January 2001

WBS 2: Site Development

Project Milestone: Install first antenna on-site. December 2004

- What are the special needs of a third party participation? (e.g. More people on site? Added connectivity costs?);
- Does Japanese cash-flow for site development in the period 2002-2004 allow the development to be done at once? Is that desirable?

WBS 3: Antennas

Project Milestone: Initiate (sign) the contract for the production antennas. August 2003. Initial delivery, 12 months.

- What is the design process for the Japanese 12m antenna? [Schedule and cost]
- Will there be a prototype 12m antenna? If so, what is the schedule for that prototype? If not, how is the antenna performance to be validated?

WBS 4: Front End Subsystem

Project Milestone: Release ALMA front end for manufacture. November 2003.

Process: Evaluation Front End
Engineering Model Front End
Qualification Model Front End
Production Front End

- What is the plan for front end design work in Japan? WBS elements? Cost and schedule? At what stage in the front end design process will Japan become involved?
- Laboratory setup plans in Japan: cost and schedule (including SIS fabrication, test and integration)?
- Is there to be an ALMA front end assembly center in Japan? If so, what is its task? What is the cost and schedule for that center?

WBS 5: Local Oscillator Subsystem

The LO Subsystem is a deliverable to the front end cartridge builders

Project Milestone: CDR LO Subsystem. June 2002
Project Milestone: LO Subsystem Pre-production Review. March 2003.

- Will Japan contribute to development of the baseline LO system? If so, what are the tasks cost and schedule for that work?
- Will Japan contribute to development of the full photonic LO system? If so, what are the tasks, cost and schedule for that work?

WBS 6: Backend Subsystem

Project Milestone: Pre-production design review. March 2003
Project Milestone: Backend system on-site in Chile for integration and test. October 2004.

Process: (FO Tx/Rx, digitizer, IF system etc)
-Bench Prototypes
-Field Prototypes
-Production Units

- Will Japan contribute to the development of the baseline backend system? If so, what are the tasks, cost and schedule for that work?
- Will Japan pursue parallel development of the digitizer or other system components? If so, what are the tasks, cost and schedule for that work?

WBS 7: Correlator

Project Milestone: Correlator (or quadrant thereof) on site in Chile. October 2004.

Process: -Test Correlator (complete)
-Prototype correlator (deliver to VLA November 2002)
-Production correlator operational in Chile (2/2004; 5/2005; 8/2006; 11/2007)

- Will Japan contribute to the development of the baseline correlator (e.g. production FIR filter)? If so, what are the tasks, cost and schedule?
- Will Japan contribute to the development of the future correlator? If so, what are the tasks, costs and schedule?

WBS 8: Computing Subsystem

An effort being pursued by an integrated team of workers; it is manpower limited.

Project Milestones: Many and often.

- Japan involvement welcome. Soon! [Tasks and costs to be negotiated by ALMA-J computing lead]

WBS 9: System Engineering and Integration

Integrated team of workers; it is manpower limited.

Project Milestone: Test Interferometer. November 2001
Project Milestone: On-Site facilities in Chile. October 2004.

- Japan involvement welcome. Soon! [Tasks and costs to be negotiated by ALMA-J System Engineering and Integration Lead]

WBS 10: Science

Integrated team of workers; it is manpower limited.

Project Milestone: Configuration design review. February 2001.
Project Milestone: Calibration design review. June 2001.

- Japan involvement welcome. Soon! [Tasks and costs to be negotiated by ALMA-J Science Lead].

WBS XX: Beyond the Baseline

- Operations tasking, especially interim operations;
- ACA?
- ASTE?
- Other?