

European Antenna Prototype

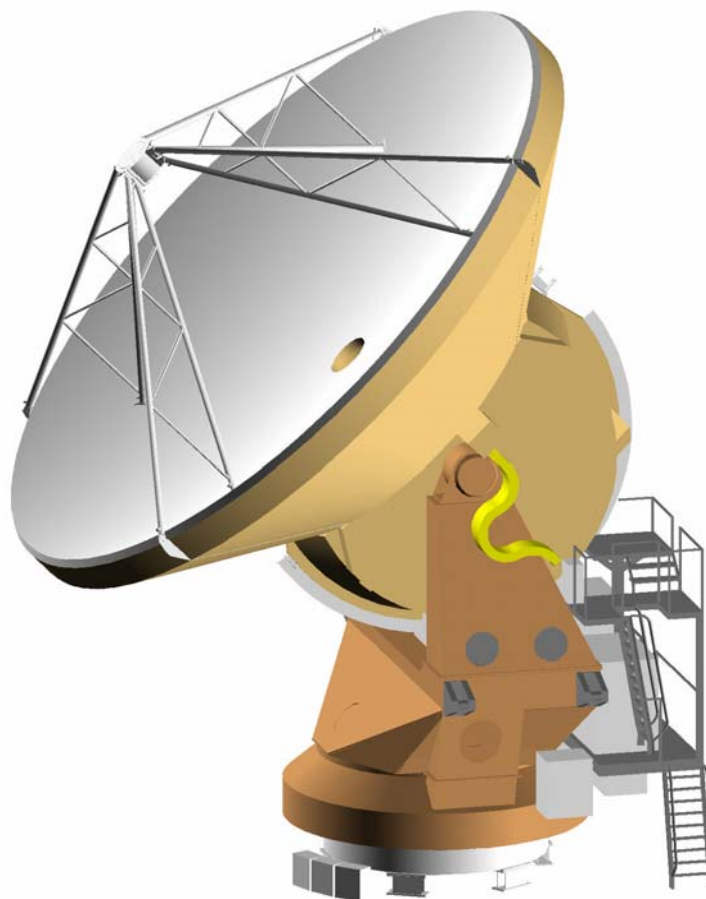
Update Status

May 2003

**Atacama
Large
Millimeter
Array**

European ALMA Board
Garching, May 12, 2003

Doc. Nr.: EAB 09-03
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ALMA Project

Contractual Status

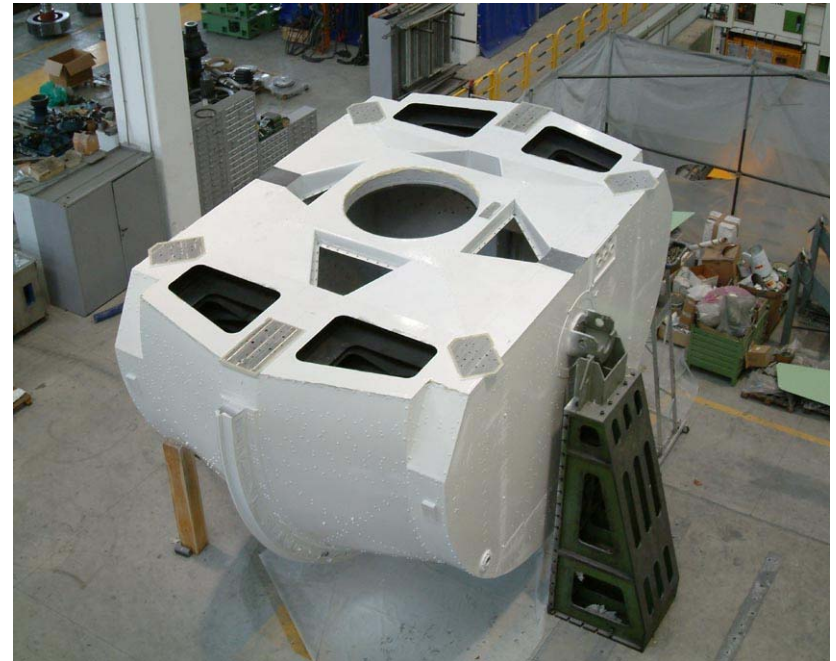
- No change since February 2003:
- Amendment #4 is in force foreseeing:
 - Contractual delivery Preliminary Acceptance 18.04.03
 - Contractual delivery Provisional Acceptance 17.06.03
- Amendment # 5 in preparation:
 - Change of Project Manager (Mrs. B. Gardes of Alcatel)
 - Modification of ESO/AUI undertaking on VLA site
 - Two minor change requests (Optical Pointing Telescope, quadripod cladding)
- Metrology system price still pending (ceiling foreseen in the Contract)

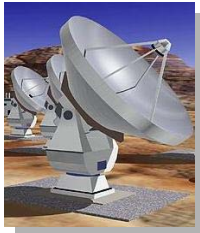


ALMA Project

Manufacturing Status: CFRP Receiver Cabin (Plyform, Galbiati)

- Cabin completed, although completion took sensibly longer than planned (finishing, riveting, shielding, painting, etc...)
- Instrument room coated with Aluminium for EMC shielding (by flame spray process). External surfaces white painted.
- Cabin floor, HVAC system pre-fitted inside cabin room, door installed.



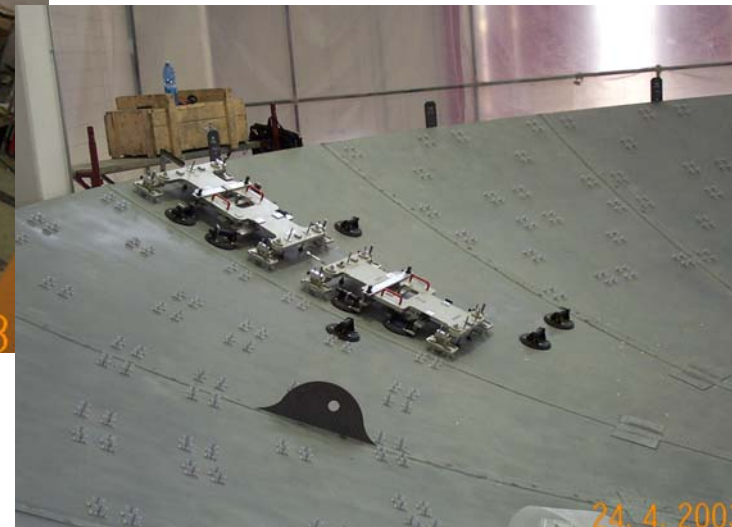


ALMA Project

Manufacturing Status: BUS Pre-assembly



- BUS closed on 18.03.03 under dimensional control (laser tracker).
- Afterwards flanges to the cabin were positioned and interfaces to panel adjusters glued.





ALMA Project

Manufacturing (cont.d)

Subreflector & Mechanism

- Subreflector undergoing final testing (internal acceptance 27.05.03)
- Subreflector mechanism tested and ready for integration in the apex structure





ALMA Project

Manufacturing (cont.d)

Altitude assemblies (at Galbiati)

Dimensional control of altitude motor support and roller guides (9.05.03)



Pre-assembled elevation axis boxes (9.05.03)





ALMA Project

Manufacturing (cont.d)

CFRP Apex and Quadripod Legs

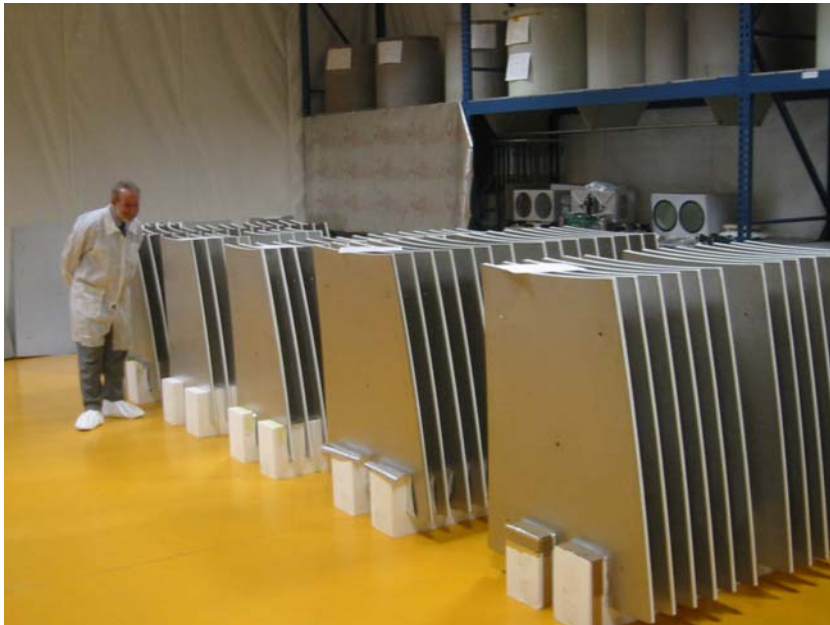




ALMA Project

Replicated Rhodium Coated Panels

- All panel manufactured, Rhodium coated, dimensionally controlled and being packed for transport.





ALMA Project

Cabin & BUS Transport at Galbiati

- Air transport foreseen since Dec. 01 (amendment #3) due to schedule. Last minute drop of Antonov 124 due to zero size margin, in favour of Airbus Industries “A300 Beluga.
- Special transport and loading jigs developed by Airbus together with AEC. Loading operation under responsibilities of Airbus.



Positioning of cabin on Transport Jig on 9.05.03



ALMA Project

Cabin & BUS Transport

- BUS separated in two halves on 11.05.03 and now positioned on the two Airbus jigs.
- Transport to Malpensa on 14.05.03 (cabin in the morning, BUS in the night). Storage in closed hangar, until 17.05.03
- Loading and departure on 17.05.03. Delivery to site 22.05.03.





ALMA Project

Site Logistics

- Deceiving start of AEC site activities:.
 - Storage containers, equipment and tools and office trailer delivered during February 03, after arrival of mount structure on site
 - ALCATEL logistics failed to procure the temporary assembly shelter in the US. Project team decided to procure in Italy (through EIE) a removable building and to air ship to site. (March, April 03)
 - Key personnel very busy with Cabin and BUS in Italy until very recently. Mounting activities started mid-April 03 (Yoke pre-mounted for AMAC meeting)





ALMA Project

Site assembly

- Foundation measured and mount installed. Various subsystems integrated (Az. cable wrap, motors and brakes, az stow pin.....)
- Ladders and platforms assembled
- Electronic cabinets and power supplies mounted. Cabling and hydraulics starting





ALMA Project

Next Milestones

- **Transport:**
 - BUS and cabin on site 22.04.03 (+ 1 month w.r.t last EAB)
 - Transport of other parts Upon availability !
- **Antenna erection ATF site**
 - Cabin mounted on Structure 12.06.03 (+ 6 weeks w.r.t last EAB)
 - Antenna fully assembled (w/o metrology) 20.07.03 (TBC) (+ 7 weeks w.r.t last EAB)
- **Expected delivery**
 - Preliminary acceptance (ESO/AUI access) August 03, TBC (18.04.03 contractual)
 - Provisional Acceptance 28.08.03 Official date from Consortium,
ESO estimate Sept. 03, (18.06.03 contractual)
 - Manufacturing File In progress, completion TBD, Contractually due 18/04.03

Big progress since last EAB report, but also sensible delay!



ALMA Project

Next Milestones: Issues

- Europe
 - Schedule dependent on timely delivery of sub-critical parts (example Elevation drive motors.....)
 - Schedule also likely to suffer from missing bits and pieces, designed as needed
 - Flawless organisation of air transport
 - Timely delivery of documentation to site (integration, drawings, procedures)
 - Socorro ATF site:
 - Integration team needs complete integration files, some of them being produced (example cabling). ALCATEL culture of integration different from that of EIE in some cases.
 - Missing bits and pieces.
 - Necessity of integrated ALCATEL / EIE team to ensure smooth commissioning of the antenna
 - Strong dependence on key supplier (Phase, ADS, Microgate): hence necessity of frozen schedule
 - Little time for metrology calibration & testing, after antenna functional.
- Generally:**
- Success oriented schedule likely to suffer from minor problems (transport, minor correction to HW.....)
 - Heavy load on documentation ahead (drawings, plans & procedures, manuals.....)
 - Necessity of close interaction AEC / (ESO) to speed up the commissioning phase and achieve pointing accuracy .



ALMA Project

Issues for Serial Production

- SCHEDULE OF ANTENNA DELIVERY
 - Unfortunate situation with lack of consolidated schedule, needs to be tackled immediately. ESO has repeatedly followed the issue and pressured the Consortium with moderate success.
 - The Consortium has been repeatedly informed in writing by ESO about the importance of the schedule for the inclusion of the AEC antenna in the serial production phase.
- DOCUMENTATION
 - Status of the documentation clarified with Consortium in dedicated meeting. Content and actions agreed.
 - The Consortium has obvious difficulty in producing the large amount of documentation still pending:
 - linked to the final assembly, testing and acceptance
 - Linked to the completion of the design & manufacturing file

BOTH ISSUES OBJECT OF STRONG EFFORT BY ESO TEAM!



ALMA Project

Antenna IPT: Major tasks

- Supporting Acceptance of NA Antenna by NRAO (review of punch list...)
- Harmonise foundation and issue ICD / Antenna foundation (completed)
- Prepare final ICD's (Front End, transporter, Power etc...)
- Provide to the JAO Call for Tender documents (Updated Spec. & ICD's, SOW, drawing sets...) for the Antenna production
- Finalise studies and specification on Antenna Transporter, submit it to a CDR review and prepare interface to site (central cluster, roads etc.).
- Support enquiries from the project (example site / logistics....).
- Participate into the Antenna Tendering process as demanded by the project.