



**Atacama
Large
Millimeter /
submillimeter
Array**

ALMA Phasing Project (APP)

Acceptance Review for the Recorders, Optical Fiber Link System, Correlator Upgrades and the Phasing Interface Card Assembly - Plan

ALMA-05.11.00.52-0001-A-PLA

2014-12-05

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Change Record

Version	Date	Affected Section(s)	Reason/Initiation/Remarks
A.1	2014-11-18	All	Initial draft
A.2	2014-12-04	All	Documentation package provided by the APP Team incorporated.
A.3	2014-12-05	All 5.1	Fix broken links. Updated RID status.

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1. Introduction

1.1. Purpose

This document contains the meeting plan for the acceptance review of the ALMA Phasing Project (APP) Recorders, the Optical Fiber Link System, related Baseline Correlator Upgrades and the Phasing Interface Card Assembly that have been integrated at ALMA during the year 2014.

1.2. Scope

This review aims to look at the technical requirements of the above mentioned items only, so ALMA system-level technical requirements are not covered (though are general PA-, Environmental- and Safety requirements).

1.3. Applicable Documents

The following documents are part of this document to the extent specified herein. If not explicitly stated otherwise, the latest issue of the document is valid.

Ref	Document Title	ALMA Doc. Number
[AD01]	ICD Between ALMA Phasing Project And ALMA Site	ALMA-05.11.10.00-20.00.00.00-A-ICD
[AD02]	ICD Between ALMA Phasing Project And ALMA Backend	ALMA-05.11.10.00-50.00.00.00-A-ICD
[AD03]	ICD Between ALMA Phasing Project And ALMA Computing	ALMA-05.11.00.00-70.35.25.00-A-ICD
[AD04]	ICD Between ALMA Phasing Project And ALMA Correlator	ALMA-05.11.10.00-60.00.00.00-A-ICD
[AD05]	ICD between C167 Microprocessor And ROACH2 FPGA (APP Internal)	ALMA-05.11.10.49-0005-A-ICD

1.4. Reference Documents

The following documents contain additional information and are referenced in this document.

Ref	Document Title	ALMA Doc. Number
[RD01]	ALMA Phasing Project (APP) Critical Design Review Final Report	ALMA-05-11.10.03-0004-A-REP
[RD02]	ALMA Phasing Project Reliability and Maintainability Report	ALMA-05.11.10.03-0002-A-REP
[RD03]	ALMA Phasing Project Product Assurance Plan (APP Internal)	
[RD04]	ALMA Phasing Project Failure Modes and Effects (APP Internal)	ALMA-05.11.10.00-0001-A-GEN
[RD05]	ALMA Product Assurance Requirements	ALMA-80.11.00.00-001-D-GEN
[RD06]	ALMA Safety Manual	ALMA-10.08.00.00-011-D-MAN

2. Acceptance Meeting Participants

2.1. JAO Acceptance Team


Member	Role
Nick Whyborn	Array Lead Engineer
Norikazu Mizuno/David Rabanus	Array Maintenance Group Manager
Ivan Lopez	Safety Manager
Anthony Remijan	EOC Lead
Ruben Soto/Tzu Shen	JAO Software Group Managers
Bernhard Lopez	System Integration & PA/QA (Chair)

2.2. Observers

Member	Role
Pierre Cox	ALMA Director
Stuartt Corder	ALMA Deputy Director
Serge Guniat	ALMA Head of Engineering
Phil Jewell	Head of NAASC
Wolfgang Wild	Head of EASC
Satoru Iguchi	Head of EAASC
Lars-Ake Nyman	ALMA Head of DSO
Jorge Ibsen	ALMA Head of ADC
Jorge Castillo	JAO ESG Technical Lead – BE and Photonics
Alejandro Saez	JAO ESG Technical Lead – Correlator & DTS

2.3. APP Team / Presenters

Member	Role
Shep Doleman	APP Principal Investigator
Michael Hecht	APP Project Manager
Christophe Jacques	NRAO Photonics Group Lead
Geoff Crew	APP Software Lead
Rich Lacasse	APP Correlator Lead
Bob Tracy	APP PA
Joe Greenberg	APP PIC

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3. Agenda

1. Review of action items from applicable action items from the CDR
2. Review of pending action items from the in-house acceptance (if any)
3. Review of the compliance matrix, test results and - if applicable - related NCRs/CREs/RFWs
4. Review of workmanship inspection report
5. Review of safety compliance
6. Review Acceptance Review RIDs (if any)
7. Summary of action items
8. Recommendation for acceptance

4. Logistics

4.1. Date, Time and Conference Details

This meeting has been scheduled for **Thursday December 11 13:30-15:00 UTC (10:30-12:00 Chile)**.

Meeting rooms are SCO: Socaire and OSF: ADS

Ready-Access dial-in numbers:

- Chile: 800 835 321
- US: [800 504 8071](tel:8005048071)
- Germany: 08001014529
- Japan: 00531001557
- Access code: 4676169#

4.2. Review Item Discrepancies (RIDs)

In case of specific requests for clarification and/or detected discrepancies please file a JIRA APPRID ticket with the "Delivery" item "Acceptance Review" at <http://jira.alma.cl/browse/APPRID>. Alternatively, you can also send an email to blopez@alma.cl.

5. Acceptance Related Documentation & Information


5.1. Summary of open RIDs from the Critical Design Review (CDR)

According to the action items listed in the Final CDR Report [RD01] the following RIDs that are related to the H-Maser appear still as unresolved:

Key	Summary	Assignee	Notes
APPRID-67	Finalize H-Maser rack labeling and ethernet cable routing (see workmanship report)	Christophe Jacques	Pending
APPRID-66	Measure the grounding connection of the Maser rack	Jorge Castillo	Pending
APPRID-65	Prepare and submit RFWs for not verifying requirements ENVI-00050-00 / R, ENVI-00121-00 / R and ENVI-00122-00 / R	Roberto Price	Pending
APPRID-64	ICD Between ALMA Phasing Project And ALMA Computing ALMA-05.11.00.00-70.35.25.00-A-ICD is not approved by both parties to the interface	Michael Hecht	Undergoing CCB review
APPRID-63	ICD Between ALMA Phasing Project And ALMA Backend ALMA-05.11.10.00-50.00.00.00-A-ICD is not approved by both parties to the interface	Michael Hecht	Undergoing CCB review
APPRID-62	ICD Between ALMA Phasing Project And ALMA Site ALMA-05.11.10.00-20.00.00.00-A-ICD is not approved by both parties to the interface	Michael Hecht	Undergoing CCB review
APPRID-61	Maser ACRV - rack stiffness confirmation	Christophe Jacques	Ongoing
APPRID-60	H-Maser and level of HW self-protection	Michael Hecht	Pending
APPRID-47	Define fall back position in CSV plan	Lynn Matthews	Ongoing
APPRID-43	All hardware delivered to JAO must be accompanied with a detailed and costed maintenance plan	Michael Hecht	Pending for recorders, FO link system and PIC Assembly.

5.2. Summary of open action items from the PAS

- Mark6 Maintenance Manual
- Mark6 S/W release 1.2
- Cables (l,j) on quadrant 4 polarization Y Maser – GPS cable swap to distributor

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5.3. APP Documentation Package (ALMA Documents on EDM)

5.3.1. System-level Documentation


N	Document Title	ALMA Doc. Number
1.	ALMA Phasing Project – Recorders, Optical Fiber Link System, Correlator Upgrades and Phasing Interface Card Assembly – Verification Plan and Matrix	ALMA-05.11.00.52-0002-A-PRO
2.	ALMA Phasing Project – Recorders, Optical Fiber Link System, Correlator Upgrades and Phasing Interface Card Assembly – Compliance Matrix	ALMA-05.11.00.52-0004-A-LIS
3.	ALMA Phasing Project – Recorders, Optical Fiber Link System, Correlator Upgrades and Phasing Interface Card Assembly – Configuration Item List	ALMA-05.11.00.52-0003-A-LIS
4.	ALMA Phasing Project – Maintenance Manual	ALMA-05.11.10.05-0001-A-MAN (DRAFT)
5.	ALMA Phasing Project - Hazard Analysis and Safety Compliance Plan	ALMA-05.11.10.01-0003-A-PLA
6.	ALMA Phasing Project - System Level Bill Of Material (BOM)	ALMA-05.11.10.12-0001-A-BOM
7.	ALMA Phasing Project - Certificate of Compliance	ALMA-05.11.00.06-0001-A-GEN
8.	Recorders and Fiber Optical Link System Installation - Workmanship Inspection Report	ALMA-05.11.10.90-0001-A-REP

5.3.2. Design Descriptions/Bill of Material

N	Document Title	ALMA Doc. Number
9.	ALMA Phasing Project - Optical Fiber Link system design	ALMA-05.11.40.01-0001-A-DSN
10.	ALMA Phasing Project - Update to Corr/Control Design	ALMA-05.11.61.01-0001-A-DSN
11.	APP Correlator Upgrade - Upgrade plan to add PIC and 1-PPS distributor to 64-stn correlator	CORL-05.11.00.01-0001-A-PLA
12.	PIC Assembly Block Diagram	ALMA-05.11.31.11-0001-A-DWG
13.	PIC Assembly Bill of Materials	ALMA-05.11.31.12-0001-A-BOM
14.	PIC Assembly - PIC Bill of Materials	ALMA-05.11.31.12-0002-A-BOM
15.	PIC Assembly - ZDOK to QXH Adapter BOM and Assembly	ALMA-05.11.31.12-0003-A-BOM
16.	TTL to LVDS Converter Card (TLC) BOM	ALMA-05.11.35.12-0001-A-BOM
17.	ATX power supply & bracket BOM	ALMA-05.11.34.12-0001-A-BOM

5.3.3. Verification Test Plans/Procedures and Reports

N	Document Title	ALMA Doc. Number
18.	ALMA Phasing Project - Mark6 Recorder/OFLS PAI Test Report	ALMA-05.11.40.03-0001-A-REP
19.	ALMA Phasing Project - Mark6 Recorder Test Procedures	ALMA-05.11.50.02-0001-A-PRO
20.	ALMA Phasing Project - Mark6 Recorder Module Test Report	ALMA-05.11.53.03-0001-A-REP
21.	ALMA Phasing Project - Optical Fiber Link system prototype test report	ALMA-05.11.40.03-0002-A-REP
22.	ALMA Phasing Project - Optical Fiber Link Installation and Test report	ALMA-05.11.40.03-0003-A-REP
23.	ALMA Phasing Project - Correlator Upgrades Acceptance Report	ALMA-05.11.30.03-0001-A-REP
24.	ALMA Phasing Project - Tests on Absolute Timing	ALMA-05.11.61.03-0001-A-REP

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5.3.4. Manuals

N	Document Title	ALMA Doc. Number
25.	Mark6 Users Guide	Release 1.0 (Draft) – pending on EDM
26.	ALMA Phasing Project - Optical Fiber Link operation manual	ALMA-05.11.40.05-0001-A-MAN
27.	ALMA Phasing Project - Optical Fiber Link maintenance manual	ALMA-05.11.40.05-0002-A-MAN
28.	ALMA Phasing Project - Phasing Interface Card Assembly Maintenance Manual	(Under development)

5.4. APP – Additional Documents

The following documents are accessible at the APP wiki page:

https://deki.mpifr-bonn.mpg.de/ALMA_Phasing_Project/Reviews/App_Acceptance_Review

N	Document Title	Revision
1.	APP Integration and Test Plan	2.2 16Apr14
2.	Mark6 Recorder command set	Release1.1 (Draft)
3.	Mark6 Reliability and Power Requirements Study	
4.	Getting Started with your Mark6	(Draft)
5.	Mark6 Usage Examples	Release 1.0 (Draft)
6.	APP Correlator Modification Description	Release 1.0
7.	APP Correlator Upgrade - Incoming Inspection Report for Symmetricon XL-GPS SN1331C00739	ALMA-05.11.35.91-0001-A-REP
8.	Symmetricon GPS Manual	
9.	APP Correlator Upgrade - Sum Data LVDS Cable List	ALMA-05.11.30.03-0004-A-REP
10.	APP Correlator Upgrade - Miscellaneous Cables List	ALMA-05.11.30.03-0005-A-REP
11.	Report on Detection and Correction of Radiation Induced Events in Integrated Circuits of the ALMA Correlator High Site (updated)	Updated November 2014
12.	PIC Assembly Misc Cables	ALMA-05.11.31.11-0004-A-DWG
13.	PIC Assembly Check-out Logs	ALMA-05.11.31.03-0001-A-REP
14.	PIC Schematic	ALMA-05.11.31.11-0002-A-DWG
15.	PIC PCB Files	ALMA-05.11.31.11-0005-B-DWG
16.	ROACH FPGA Requirements and Specifications	ALMA-05.11.31.15-0002-A-SPE
17.	PIC Assembly ZDOK to QXH Adapter Schematic	ALMA-05.11.31.11-0003-A-DWG
18.	PIC Assembly ZDOK to QXH Adapter PCB Files	ALMA-05.11.31.11-0006-A-DWG
19.	Incoming Inspection Reports for PIC Assembly SN001-SN006	ALMA-05.11.31.91-0001-B-REP ALMA-05.11.31.91-0002-A-REP ALMA-05.11.31.91-0003-A-REP ALMA-05.11.31.91-0004-A-REP ALMA-05.11.31.91-0005-A-REP ALMA-05.11.31.91-0006-A-REP
20.	Incoming Inspection Reports for Roach2 SN00102903 and SN00102908 and SFP+SN245	ALMA-05.11.31.91-0007-A-REP ALMA-05.11.31.91-0008-A-REP
21.	TLC PCB Files and Spec for Fab	ALMA-05.11.35.11-0002-A-DWG
22.	TLC Schematic	ALMA-05.11.35.11-0001-A-DWG
23.	Mechanical - ATX Brackets	ALMA-05.11.34.11-0002-A-DWG
24.	Mechanical - ATX PSU Panel	ALMA-05.11.34.11-0003-A-DWG
25.	Mechanical - TLC Panel	ALMA-05.11.34.11-0005-A-DWG
26.	Mechanical - Bin Fiber Support	ALMA-05.11.34.11-0004-A-DWG

5.5. APP System Operations & Maintenance Training for JAO Staff

Arrangements to be discussed during the meeting.

5.6. Proposed Requests for Waivers (RFWs)

RFW ID	Requirement ID	Requirement Description	RFW Description
RFW05	ENVI-00121-00 / R	[AOS operating and non-operating compatibility with] Maximum expected Gamma ray dose rates are 3.14 mSv/year	See ALMA Memo 462. All FPGAs are subject to gamma rays. FPGA personality changes due radiation from gamma rays or neutrons were detected at the rate of one every few hours in tests of the ALMA Correlator for the ~10,000 FPGAs in the Correlator TFB boards. ALMA currently ignores this. The additional disruption caused by an additional 8 FPGAs in the PICs will be too minor to be noticed.
RFW06	ENVI-00311-00 / R	[OSF Operating and non-operating compatibility with] maximum expected Gamma ray dose rates of 1.70 mSv/year.	This applies to the recorders. As stated above for ENVI-00121, FPGA disruptions occur statistically. At the OSF, given the lower elevation and smaller number and smaller physical size of FPGAs, the probability of a disruption is miniscule and can be dealt with in the same way as ALMA deals with this issue in other computers, by rebooting periodically.
RFW07	PA-00920-00/	All commercially purchased test and measurement equipment used in the execution of formal acceptance testing shall satisfy the requirements for metrology and calibration specified in Table 4.	We used ALMA test equipment for all tests.