

Project Overview

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Project Manager



Outline



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- Project Goals
 - Key Events
 - Management
 - Budget
 - Schedule
 - Project Goals in FY06 and FY07
 - Action on 2004 EAC Recommendations



Project Goals



- Key goal: Improve the observational capabilities of the VLA (except for angular resolution) by a factor of ten or more. Achieve by:
 - Adding new frequency bands
 - Upgrading or replacing current receivers
 - Replacing the data transmission system
 - Replacing the correlator
- Provide a new monitor and control (M&C) system, which must also allow operation of new and old antennas in transition.
- Perform careful astronomical observations to verify that EVLA hardware and software function properly.
- Provide new data management software for better access to array data products (part of project scope, but not its budget).
- Contribute to EPO to advance public science education.



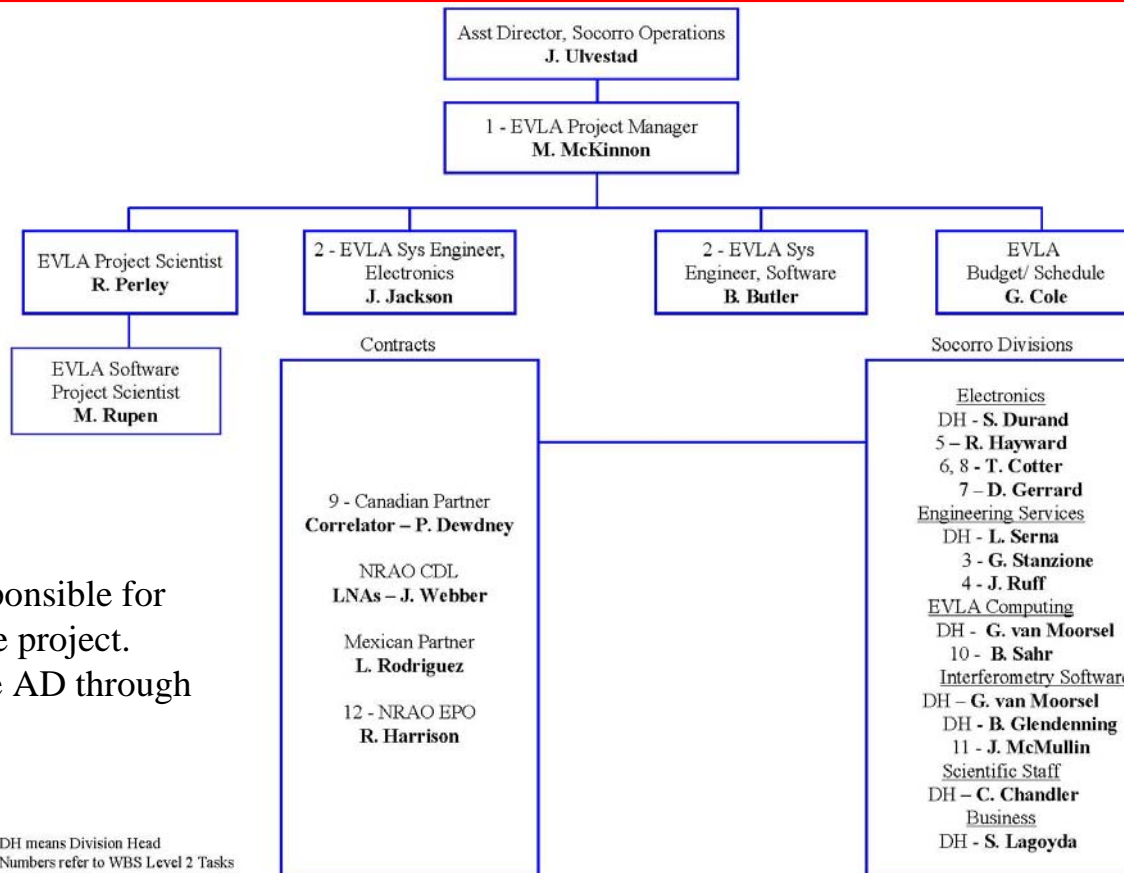
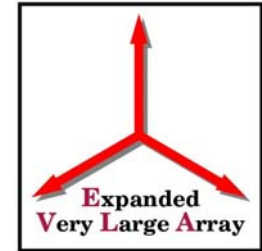
Key Events



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- Electronics reliability issues addressed and digitizer in DTS (data transmission system) module redesigned so that antenna retrofiting could proceed.
 - M&C software developed for EVLA/VLA transition mode observing.
 - Antennas 13, 14, and 16 delivered to operations for test observations.
 - Retrofits of antennas 18, 24, and 26 to EVLA design are in various stages of completion.
 - \$1.75M received from Mexican partner.
 - NRAO notified in December 2005 that NSF was unable to support request for EVLA Phase 2.
 - Front End CDR conducted on April 24-25, 2006.
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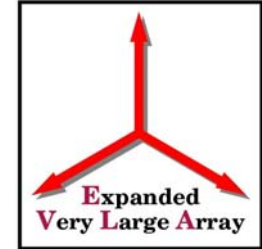
Management: Project Organization



Divisions are responsible for deliverables to the project. They report to the AD through line management.



Management: Work Breakdown Structure



WBS Element	Description	% of Total Cost
601	Project Management	4.7
602	Systems Integration	6.6
603	Civil Construction	2.7
604	Antennas	4.9
605	Front End Systems	20.7
606	LO Systems	6.0
607	Fiber Optic Systems	10.8
608	IF Systems	6.0
609	Correlator	17.5
610	Monitor & Control	12.6
611	Data Mgt. & Computing	7.5
612	Education & Outreach	0.0

162 CDS



Management: Cost & Scope Control



- Project book: defines scope (www.aoc.nrao.edu/evla/pbook.shtml)
- Semiannual updates of work breakdown structure (WBS)
- Changes to the project book or changes resulting from WBS updates (> \$50K) must be brought before the change control board (CCB) for approval. Membership:
 - Project Manager – McKinnon
 - Project Scientist – Perley
 - Hardware Systems Engineer – Jackson
 - Software Systems Engineer – Butler
 - Assistant Director for NRAO-NM Operations - Ulvestad
- Budget status summarized monthly
- High level decisions: Project Manager acts on advice of NRAO upper management, advisory committees, and review panels.



Management: Track Progress



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- Weekly milestone update (see handout)
 - Reporting
 - Quarterly reports to AUI/NSF
 - Semiannual progress reports to NSF
 - Annual Government Performance and Reporting Act (GPRA) report to NSF
 - Annual reports to AUI Visiting Committee and NRAO Users Committee
 - Bimonthly status updates to NRAO Director's Office
 - EVLA Advisory Committee



Budget

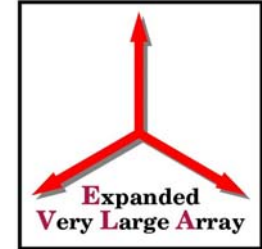


- Funding = \$93.8M (FY06)
 - NSF project funds \$58.7M
 - NRAO contributed effort \$16.3M
 - Canadian partner \$17.0M (C\$20M)
 - Mexican partner \$1.8M

See the Project Cost Summary in the Project Information Summary handout for information on expenditures in labor, travel, and M&S by WBS level 2.



NSF Funding Profile



Year	Proposed (\$K)	Approved (\$K)	Current (\$K)
2001	1,110	1,106	3,000
2002	6,883	6,900	5,000
2003	7,592	5,322	5,322
2004	8,537	5,434	9,340
2005	7,661	5,548	5,340
2006	6,178	5,665	5,440
2007	5,710	5,835	5,835
2008	4,684	6,010	6,010
2009	3,079	6,190	6,190
2010	0	6,376	6,376
2011	0	4,597	1,130
Total	51,434	58,983	58,983



Schedule: Key Milestones Completed



- Start installation of fiber optics on wye Q4 2002
- Start lab integration & test of prototype system Q1 2003
- Install prototype system on antenna Q2 2003
- Start electronics production Q2 2004
- Complete electronics CDRs Q2 2004
- Start retrofitting antennas with new system Q4 2004
- Start observing in transition mode Q1 2006

See handout for examples of primary milestones completed and remaining.



Schedule: Key Milestones Remaining



- Test prototype correlator on 4 antennas Q3 2007
- Start installing parts of final correlator Q1 2008
- Start commissioning of correlator subset at VLA Q2 2008
- Start first science with correlator subset Q1 2009
- Full correlator becomes available Q3 2009
- Retrofit last antenna to EVLA design Q3 2010
- Install last receiver Q2 2012



Project Goals FY06



-
- Retrofit 6 antennas to EVLA design and return to array for transition observations
 - Complete identification of first science observing modes and prioritize project tasks to complete them
 - Refine project schedule to insure close coupling between hardware and software deliverables where appropriate
 - Repeat contingency and risk analyses with finer level of detail
 - Finalize design of L-band orthomode transducer (OMT)
 - Provide software support for board tests of prototype correlator



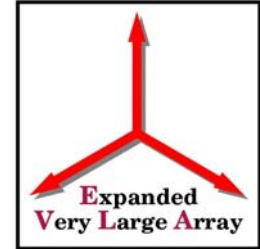
Project Goals FY07



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- Retrofit 6 more antennas to EVLA design and return to array for transition observations (for a total of 12 EVLA antennas)
 - Install prototype WIDAR correlator and begin test observations
 - Commission a science advisory committee to evaluate science priorities. Advice?
 - Initiate production of L-band OMT
 - Decommission VLA control computers (Modcomps)



Actions on 2004 EAC Recommendations - 1



- Overrun in contributed effort from the operations budget to the EVLA project
 - \$2.1M charged to the project
- Inadequate resources for EVLA e2e effort
 - 10 FTE years (\$1M) provided by the project.
 - e2e Operations Division created for entire Observatory
 - Redirection of Observatory resources to e2e
 - Additional resources from AUI under consideration
- Complete refinement of L-band OMT design
 - Ongoing. Test results presented at recent FE CDR



Actions on 2004 EAC Recommendations - 2



- Conduct a careful scientific trade-off study of descope options
 - Scientific study of descope options will be undertaken in FY07, if necessary.
- Bring younger NRAO staff into debugging and commissioning activities.
 - Additional, younger staff actively engaged.
 - Additional staff to be hired in FY07.



Actions on 2004 EAC Recommendations - 3



- For system tests, two sets of antenna electronics need to operate simultaneously in the electronics lab
 - Excellent suggestion. Can currently simulate 2 central reference sources and 2 LO fiber links in the lab.
- Scope of the M&C system, its science requirements, and interfaces are not clearly defined
 - M&C design document is nearing completion. Includes internal interface definition.
 - Software development plan completed (identifies task description, developers, and timeline).
 - Completed report characterizing information distributed in M&C system.



Actions on 2004 EAC Recommendations - 4



- No standards for M&C design and coding.
 - Biweekly code reviews.
 - CVS used for source and version control.
 - Maven for build environment. Standard nightly code builds.
- No M&C test and integration (T&I) plan
 - In transition from VLA to EVLA, EVLA antennas work must work with existing M&C system
 - Longstanding T&I procedure in place and being used
 - Will develop formal T&I plan for correlator in the final M&C system.



Actions on 2004 EAC Recommendations - 5



- Adequate design of the e2e system is lacking.
 - e2e high level design is complete
 - More resources assigned to e2e, and High Level Architecture (HLA) team has started the detailed subsystem design.
- Identify and prioritize EVLA-specific requirements for post-processing so that required resources can be identified
 - Post-processing requirements common and unique to ALMA and EVLA have been identified (e.g. wide-field imaging and calibration).