

Minutes of Teleconference on ALMA ATF & OSF Holography Planning

Friday, September 22nd 2006, 15:30 UTC.

Minutes by DTE, last changed 2006-09-25

Participants: Emerson, Glendenning, Lucas, Mangum, Marson, Murowinski, Ocampo, Ramirez, Shepherd & Sramek.

All future meetings will use the same call-in details:

From USA: 866-814-1347

Outside USA: +1-517-444-3243

Participant Passcode: 3155752

(Leader Passcode: 1874599)

Minutes of our last (2006-08-10) meeting are at:

http://www.tuc.nrao.edu/~demerson/osfholo/mins2006-09-07_1a.pdf

AGENDA. 2006-09-22

I. Current Action Items

II. Schedule

III. AOB

AGENDA ITEM I. Current Action Items

See minutes of last meeting at

http://www.tuc.nrao.edu/~demerson/osfholo/mins2006-09-07_1a.pdf

1. Antonio will deliver the holography hardware, but not yet User Manuals, to be shipped on 2006-09-08. Manuals would be delivered on 2006-09-13.

The ICD update on temperature monitor points would still be provided, but on a later timescale – perhaps one month before shipment of receiver #2.

Antonio and other FE staff were unable to attend this meeting, because of a conflict with other ALMA activities. However, the holography hardware had already been received in Socorro, although the User Manuals had not yet arrived.

2. Antonio will arrange for 2 more sets of holography feeds to be made, using the old feed design. This is expected to take 2 – 3 months.

Sri will work, at a low level, on whether a new feed design is still feasible. If it turns out to be, there will be further discussion then on whether or not to proceed with its manufacture.

No-one was able to comment on what progress there had been here.

3. Site IPT will continue to investigate the tower equipment lift options and implementation.

This continues; the precise solution was not yet known, but this is not yet an urgent issue.

Additional Reports and Discussion:

Jack Meadows sent the following report just prior to the meeting:

"Due to the scheduled all day VLA power outage I won't be able to attend but here is the latest on the holography.

"The holography transmitter, power supply, RF, fiber, tower base mini-rack, and control computer have been installed at the ATF.

"On Saturday, Peter Ramirez and I will move the holography receiver and rx cabin mini-rack to the ATF from the AOC. We will install the mini-rack and remove the subreflector lightning protection in advance of the holography receiver installation on Monday morning."

Dick added the further report from Jack:

"Robert climbed the holography tower before lunch and installed the pan & tilt mechanism, the transmitter, and some of the cables.

"After lunch I climbed the tower and installed the power supply, the cabling, and then on the way down, secured the RF cable to the tower.

"We couldn't have done this job without James Sullivan's help. We had to rig up ropes and pulleys and it was all two people could do to raise the components to the top of the tower.

"Then....Robert and I connected the remaining equipment to see if we could see a response from the equipment on the computer GUI. Even though the computer says packets are being sent, Robert wants to check with CV and then do some troubleshooting.

"Robert will be at the ATF Monday morning to assist with the installation of the receiver.

"I'm going to shut down the AEC antenna and the HVAC on the Vertex antenna tonight. The VLA power is scheduled to be cut at 7:30am Friday."

In the following discussion, it was confirmed that on Monday 25th a VLA crane was being borrowed to lift the holography receiver to the Vertex antenna prime focus. (The Alcatel antenna is still inoperable, remaining at its 15-degree elevation stow position.)

Ralph Marson reported that he and Robert Ridgeway had been testing the holography system at the AOC for the last 2 weeks. Things look OK from the computing standpoint, so far as can be tested at present. Occasional monitor point responses (about 1 in 10⁵) were being lost; there is a workaround for this and the missing events can be flagged, but clearly it is desirable to resolve the issue properly. Robert has been working on the receiver tuning algorithm. The receiver LO can be made to lock, although by monitoring with a spectrum analyzer it appears that the lock monitor bit does not **always** indicate lock when the system has locked up. Also, the original lock detect algorithm was simplistic, and a more sophisticated algorithm is being implemented. There were some other small issues, but nothing serious.

AGENDA ITEM II. Schedule

The updates to the current schedule have been relatively minor. Rick has provided a corrected version, which is attached at the end of these minutes. The latest schedule will be kept on the group's web page and updated whenever there is any significant change; this update may happen daily. Rick will supply the updated schedule, based on information received from Rick and others, and Darrel will post it to the web and keep everyone informed.

[In future the latest schedule will be available via
<http://www.nrao.edu/~demerson/osfholo/schedule/>]

Events may happen relatively quickly in the coming week, but test scientists will need to remain flexible in travel plans. Darrel has developed a roster of when specific scientists are available to carry out tests; some of the testing can take place by shipping data electronically, without always requiring a physical presence at the ATF. Rick asked about detailed tests; Darrel referred to the list that had been presented at the AIV meeting in Santiago last June. This list is attached below.

NEW or CONTINUING ACTION ITEMS

1. Antonio will provide the holograph hardware user manuals, which had been expected on 2006-09-13.

The ICD update on temperature monitor points would still be provided, no later than one month before shipment of receiver #2. In addition, Marson has found some minor

items (which he will write up and distribute), which should be corrected in the next ICD issue.

2. Antonio will arrange for 2 more sets of holography feeds to be made, using the old feed design. This is expected to take 2 – 3 months.
Sri will work, at a low level, on whether a new feed design is still feasible. If it turns out to be, there will be further discussion then on whether or not to proceed with its manufacture.
3. Site IPT will continue to investigate the tower equipment lift options and implementation.
4. Rick will update the schedule, which Darrel will distribute (with these minutes) and post to the web. The schedule will be updated frequently, probably daily, during the coming weeks. [In future the latest schedule will be made available via <http://www.nrao.edu/~demerson/osfholo/schedule/>]
5. Next meeting: Because of the need to be flexible now that real testing at the ATF is about to begin, we avoided setting the date for our next meeting. Darrel will decide on the most opportune date according to how events unfold.

The following is extracted from a document presented and distributed at the AIV Review in Santiago on June 19-20 2006.

Holography Tests at the ATF

Darrel Emerson made this up 2006-06-12

Improved by Jeff Mangum 2006-06-14

Object of Tests:

The motivation is to ensure that the system will work when it's all taken to the OSF, rather than to obtain useful holography data.

Requirements:

The following capabilities are required and must be verified before attempting holography tests:

1. The telescope should be steerable.
 - a. It must be possible to point it into a chosen Az & El direction
 - b. It should be capable of performing cross-scans and OTF raster scans
 - c. It should be recording time-stamped Az-El coordinates during an OTF scan
2. The holography receiver must be mounted and in focus
3. There should be adequate transmitter-receiver sensitivity
4. The holography feed illumination should be correct
5. The receiver should be on the correct frequency
6. The received signal should be available end-to-end, from transmitter to displayable data on disk
7. The transmitter should be producing adequate power
8. The transmitter should be on the right frequency
9. The transmitter should be illuminating the antenna correctly
10. The transmitter pointing should be adjustable with sufficient precision (NB we probably won't have the positioner that will be used at the OSF)
11. Receiver & backend: does it produce adequate amplitude and phase stability?
12. Data analysis: can we display amplitude and phase as a function of time, with the antenna stationary? This is needed for the receiver stability tests
13. Can OTF data be recorded correctly, with antenna pointing data
14. Can we perform OTF holography data analysis: data gridding, FFT, near-field correction etc.?

Assuming all the above are confirmed,

15. Is the entire system sufficiently robust, capable of operating at least for hours without phase locks coming out of lock, or computer reboots? This is the ultimate holographic test.

Most of the above checks should already have been carried out in the context of engineering tests, before the holography session at the ATF. Accordingly, the bulk of the ATF holography checks will be carried out by scientists in close collaboration with hardware and software engineers.

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The following schedule is an update from Rick Murowinski.

*Updated versions of this will be made available via
<http://www.nrao.edu/~demerson/osfholo/schedule/>*

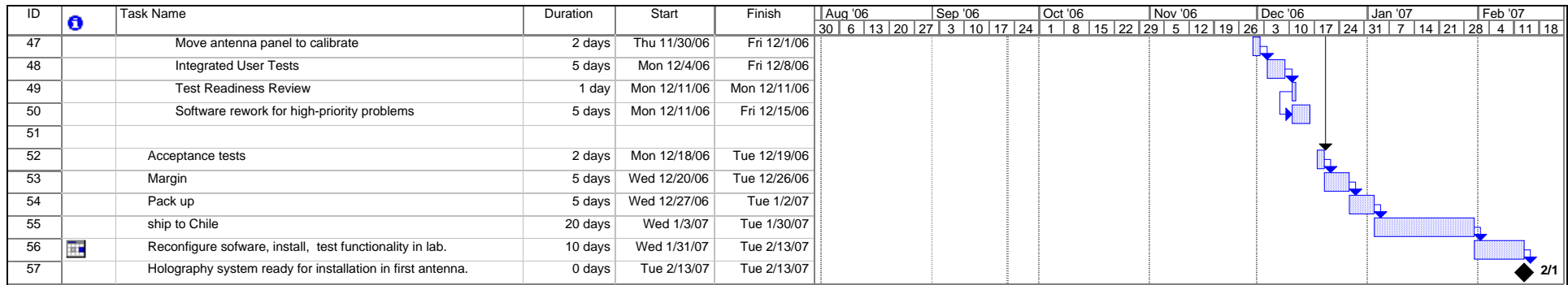
ID	Task Name	Duration	Start	Finish	Aug '06				Sep '06				Oct '06				Nov '06				Dec '06				Jan '07				Feb '07			
					30	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4
1	Holography System	332 days	Tue 11/1/05	Tue 2/13/07																												
2	Develop transmitter electronics	30 wks	Tue 11/1/05	Mon 5/29/06																												
3	Repackage holography receiver	32 wks	Tue 11/1/05	Mon 6/12/06																												
4	Develop ancillary electronics (cabling, power supply, ABM, TE an	30 wks	Tue 11/1/05	Mon 5/29/06																												
5	Develop control software	10 wks	Mon 3/13/06	Fri 5/19/06																												
6	Modify reduction software for data format	10 days	Mon 3/13/06	Fri 3/24/06																												
7	Ship Tx cables and spare minirack to AOC	5 days	Mon 8/7/06	Fri 8/11/06																												
8																																
9	NTC: Rx and Tx	57 days	Mon 6/19/06	Wed 9/6/06																												
10	Integrate/test tx, rx at CV	40 days	Mon 6/19/06	Fri 8/11/06																												
11	System test at NTC	4 days	Fri 8/25/06	Wed 8/30/06																												
12	Pack	1 day	Thu 8/31/06	Thu 8/31/06																												
13	Ship to AOC	3 days	Fri 9/1/06	Wed 9/6/06																												
14	Receive Tx and Rx at AOC	0 days	Wed 9/6/06	Wed 9/6/06																												
15																																
16	AOC and ATF preparation	31 days	Mon 8/14/06	Tue 9/26/06																												
17	Inspect Tower	1 day	Mon 8/14/06	Mon 8/14/06																												
18	Install Tx cables	7 days	Mon 8/28/06	Wed 9/6/06																												
19	Install Tx at ATF and verify control	3 days	Thu 9/7/06	Mon 9/11/06																												
20	Prepare RF cables	5 days	Mon 8/14/06	Fri 8/18/06																												
21	Control software checkout at AOC	5 days	Mon 9/11/06	Fri 9/15/06																												
22	Install RF and FO cables on tower	1 day	Mon 9/18/06	Mon 9/18/06																												
23	Upgrade software at ATF	3 days	Tue 9/19/06	Thu 9/21/06																												
24	Prepare for mounting minirack in both antennas	5 days	Mon 8/28/06	Fri 9/1/06																												
25	Antenna VA / AEC decision	0 days	Mon 9/11/06	Mon 9/11/06																												
26	prepare antenna for electronics	5 days	Mon 9/11/06	Fri 9/15/06																												
27	Install receiver	2 days	Mon 9/25/06	Tue 9/26/06																												
28																																
29	Checkout	8 days	Wed 9/27/06	Fri 10/6/06																												
30	Check M/C and 1st point of Tx	1 day	Wed 9/27/06	Wed 9/27/06																												
31	Ensure Tx and Rx on correct frequency, confirm adequate re	1 day	Thu 9/28/06	Thu 9/28/06																												
32	Peak transmitter pointing	1 day	Fri 9/29/06	Fri 9/29/06																												
33	Verify receiver complex output and stability	1 day	Mon 10/2/06	Mon 10/2/06																												
34	Margin	4 days	Tue 10/3/06	Fri 10/6/06																												
35																																
36	e2e tests of the system	29 days	Tue 10/10/06	Fri 11/17/06																												
37	Verify mount movement and synch with data	5 days	Tue 10/10/06	Mon 10/16/06																												
38	Verify writing/reading from archive	1 day	Tue 10/17/06	Tue 10/17/06																												
39	Perform 1st raster and create database	2 days	Wed 10/18/06	Thu 10/19/06																												
40	Confirm data analysis and display are working correctly	2 days	Fri 10/20/06	Mon 10/23/06																												
41	Produce first holo image	5 days	Tue 10/24/06	Mon 10/30/06																												
42	measure, adjust focus and illumination	2 days	Tue 10/31/06	Wed 11/1/06																												
43	Margin	12 days	Thu 11/2/06	Fri 11/17/06																												
44																																
45	Science Validation	18 days	Mon 11/20/06	Fri 12/15/06																												
46	a few more images	6 days	Mon 11/20/06	Wed 11/29/06																												

Project: holography at ATF
Date: Fri 9/22/06

Task Progress Summary External Tasks Deadline

Split Milestone Project Summary External Milestone

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Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			