Minutes for AMiBA Engineering Telecon

Meeting Date: 21-Aug-2003

Participants:
Australia: W. Wilson, M. Kesteven, C.T. Li
USA: J. Peterson, M.T. Chen
Taiwan: H. Wang, H. Jiang, J. Han, W. Ho, T. Huang, P. Shaw, P. Ho

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Minutes Recorder: C.T. Li
previous weeks comments

I. New Action Items:

AI-21Aug03-1: Summary of open issues/design questions - Need to settle on the site, on the cost, as well as the new location. Is there any impact on the project? For testing, to come up with a plan next week to check whether we have missed anything, e.g. trying the observing program, testing the dishes, etc.
Discuss the calibration system, also the very tight specs on the phase switches,

AI-21Aug03-2: Homin - After putting DC converter together with receiver, it came out more noisy than before. The reason is that the DC converter is too close to the back plane. Cable is picking up radiation from the DC converter. One of the solutions is to make an Aluminum shielding to cover the DC converter. Will re-locate the bias connector in the next batch run of back plane. If all the schemes fail, suggest using a deeper box (need some discussions with Bob).

II. Previous Action Items (still open):

AI-14Aug03-1: Warwick - Become directly involved with offset issue (assigned by Paul H.)

Warwick - From the recent test results, which show quite large RMS (~ 400), it seems correlators have been driven very hard, that might cause the non-linearity in the correlator. Suggest testing the offsets with different IF power.

Kyle - Offsets also changed as swapping two IF inputs with the same IF power.

AI-14Aug03-2: Bob - Ask Conrad of Vertex to send pictures of the mount to both Pauls for the proposal. Ditto for the platform and cone and jackscrews.

AI-14Aug03-3: Ted - Obtain and distribute test results of platform material test coupons from Dr. Ong.

AI-24July03-1: Bob/Ferdinand: Resolve site bidding issue.

Ferdinand sent out an updated site layout plan via e-mail and asked for people to review and comment. Paul Ho asked what the impact of these changes could be (beside lower excavation and cost). New position is 6m lower.

III. Closed Action Items (as of this meeting):

IV. Miscellaneous Discussions:

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MMIC:

Huei - Waiting for the approval of export license. Haven't got reply about dicing. Will send another email to inquire. There should be enough amplifiers for 13-elements after 2nd iteration.

Receiver:

Ming-Tang – Will cool down receivers using prototype window (still waiting for the final windows to come in a week).
Looking for machine shops or companies in Taiwan to manufacture the noise coupler.

Ming-Tang – Ran into problem with LO cable order. Cables were made wrong and will have to be remade (at no cost). Also discovered a problem with the 2 JPL MMIC amps, the bias connector fell apart. Will contact Todd G. about this problem.

LO/IF:

Kyle – After testing the relation between offsets and LO power modulation, the preliminary specs for difference in IF power between two phases is less than 0.01dB

Ming-Tang - Prof. Chu has finished the 1st set, they're writing the documentation for it. 2nd assembly is being worked on.

Correlator:

Chao-Te – Will work on the data acquisition board design with Warwick within these two weeks in AT. The long lead time item for now is the processing of power divider board. Will check with vendor about the delivery. Will work with Ted on the 3rd section frame and enclosure design after returning from the trip.

Derek – Have 30 Marki modules in Hilo, + 1 engineering model (+1 EM in Taipei). Mockup frame is done and will be sent to Ted tomorrow. Shipment will include 4 front and 4 rear dummy power dividers. We will also send Ted 15 correlator modules + empty DC amp modules for fitting in a separate box. Sending Jonathan slides too.

Problem with DC amp boards, fab house made an error and will refab 100 more for free. New boards should be ready for shipment tomorrow and plan to go into assembly next week. Peter is designing cover plate for DC amp module and will have 55 fab'd at Dayton Jackson.

Peter has begun assembly of our 3U+1U chassis. DC-DC board is now installed. Plan to integrate this box with the prototype but don't know where to put it.

1st Section Celeritek amp is running uncomfortably hot. We might try to redesign the heatsink to see if this helps.

Still waiting for some parts to complete the 2nd section.

Chao-Te – Received sample 3rd section housings. Plan to begin layout of readout board soon. Going to ATNF and will work with Warwick to verify designs.

Platform/Mount:

Ted – Worked with Phillippe and Bob Romeo about the platform modifications

Mike – Not concerned at the first level that Vertex can provide an antenna, which can be driven, and give reliable feedback of where it is. A little puzzled about their approach to the pointing problem. The suspicion is we have set pretty tight specs. Don't think they fully appreciate the subtlety that they will try to follow. Have spoken to them on number of occasions, recommended the alternative, they turned to go their part. When they get things assembled, and first start trying, then to get the pointing model to work, at that stage we should be involved. For the table of correction, they will use 10-degree square patch on the sky, that would be sort of correction to get the pointing right. However, to create the table, to check, and to maintain it, would be very difficult. They will quickly discover that they can't measure it. At that point, we will probably recommend using Venix? Modeling. Just generate a polynomial model of the platform. That will describe and in fact create that table.

It is always being a part of our plan is that we have the optical telescope, which will provide us the reference point model. Provided they give us within the point of view of the optical telescope, presumably we should be able to make a local correction.

Ted - Working on new stiffener design to replace Bob Romeo's design.

DC Power/ Distribution:

Enclosures: none

Site Issues/Network: See open AI above.

Dishes:

Ming-Tang - 60cm dishes have arrived in Hilo. What should we do with it next? Ferdinand has plans to install the photonics noise diode into the secondary as a test. These dishes can be installed on the prototype but the optical telescope will have to be lowered. There still should be enough unblocked aperiture to permit pointing on bright stars. Ming-Tang would like to see a schedule and plans for these 2 dishes.

2-Element Prototype Issues:

Kyle – Testing stop until 1st of Sept. Will take these two weeks to think about what to do next, and circulate the plan between Mike and other people.

Ming-Tang/Mike/Jeff – Suggest testing 60-cm dishes, maybe just a simple drift scan, using a signal source instead of astronomical objects. Not in the far field may not be much a problem. Won't have a perfectly deep null on the 1st side lobe, still can get a good sense how far the side lobes are.

Mike – Suggest trying the observing program, to check the link with correlator and other parts of the system (like a dummy antenna).

Kyle – Ran into a problem where the LO power of one of the phase switches differed by ~2.7 dB between the 2 phase states. This resulted in a large AMing of the associated IF which was related to the very large offset of ~1000. The LO power disparity was improved by changing pads and the offset also was reduced. This issue will be discuss further in the science meeting.

Jeff suggested that we be able to tune the LO power for the 2 phase states to achieve perfect balance. The new 42GHz phase switch will have a mylar tuning sheet (set once) which may suffice.

Schedule:

Paul Shaw /Paul Ho – May need more than two years to complete the 19 elements. According to Derek's estimation, we will need 342,000 more USD to finish 19 elements. Need to figure out what causes the change. For the calibration system, the cost isn't forecast before. According to Ferdinand, it may cost us 74,000 USD to build up the 7 units, 31,000 (USD) for expansion to 13.
According to the latest estimation, it looks like we're short eventually, e.g. we don't know how much we are going to spend on site. However, that does not affect the expansion.

Paul S. - Expansion goal is to complete the 13-elements by the end of 2004, and 19-elements by the end of 2005. One problem is that the NSC funding might not be available until April 2004.