

## Minutes for AMiBA Engineering Telecon

Meeting Date: 2-July-2003

Participants:

Australia: W. Wilson, M. Kesteven

USA: D. Kubo, B. Martin, P. Ho, J. Peterson, C.J. Ma, K. Umetsu, M.T. Chen

Taiwan: H. Jiang, J. Han, W. Ho, T. Huang, P. Shaw, H. Wang, C.T. Li

Minutes Recorder: D. Kubo

[comments from this week](#), [previous weeks comments](#)

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### I. New Action Items:

**AI-02July03-1:** **Derek** - Determine what absorber material was used by Marki and forward to Jeff Peterson for assessment. Will this absorber dry out over time and lose effectiveness?

**AI-02July03-2:** **Ming-Tang/Chao-Te** - It may be possible to provide noise injection without worrying about the use of the polarizer(?). It was asked that the necessary W/G transitions be fabricated for the prototype telescope. These transitions are to accommodate the parts which will be installed in a different order.

**AI-02July03-3:** **Bob** - Paul Ho requested that the master schedule be reviewed and updated every 2 weeks. Pay particular attention to the items which have slipped.

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### II. Previous Action Items (still open):

**AI-26June03-1:** **Homin** - Determine necessary interface details for 4U chassis to mount backplane, DC-DC converter, various I/O. Goal is to make a firm decision on whether to go with this box by July 17. Should place final order for boxes shortly after (qty of 9 + 2 spares?).

Took pictures and will distribute to Derek and others to review. Box is not weather tight but that should be OK (because it resides under the platform). Still need to finalize backplane mounting details (and other details?).

**AI-26June03-2:** **Chao-Te** - Characterize Marki module 003 to verify latest modification (absorber hat over mixers) has not affect performance. If there is a problem we should tell Marki ASAP.

Testing with LO hardware is done so synthesizers should be available now. CT is currently working on equalizer design for XY module. Will test Marki module next week. See Correlator topic for further discussions on this matter.

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

**AI-19June03-1:** **Ming-Tang** - Check schedule for IF/LO hardware from Prof. Chu.

Student who was working on the IF/LO was studying for exams. Started working on this task last week. No problems with schedule impact.

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### IV. Miscellaneous Discussions:

**MMIC:** **Bob** - export policies have gotten more restrictive. Issues with export license are OK. Continuing to follow up loose ends with e-mails.

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Receiver: Ming-Tang - LNA spares - delivery time is a few months for 40-50 LNA modules. Todd G's process is getting better so waiting to purchase spares is probably a good thing. Began tests of JPL LNA in Hilo. See about 5 dB of falling slope over the band which is much better than the prototype. Some or all of this slope may be caused by the downconversion mixer (old version). In fact Todd believes that the LNA should exhibit higher gain with higher frequency. Homin has modified the bias board for the higher  $V_g$  of the new LNAs.

Chao-Te - Phase shifter tests - sent out waveguide designs for fabrication, Estimate to complete ~ 1 to 2 weeks.

Ming-Tang - Receiver status - Estimated delivery for cold head is 1<sup>st</sup> week of July (Taipei). Other parts are coming in as well. Began testing JPL LNA in Hilo. Have 2 versions of LNA, original one requires a gate bias of near 0V while the new versions require 1.0-1.2V. The protection circuit needs to be changed to accommodate the new gate voltage. Will talk to Todd G. to see if he can make all LNA assemblies with the same gate voltage.

Ming-Tang - 4U chassis backplane - New chassis does not have the normal ledge to mount the backplane boards. Will investigate whether can just purchase this from chassis supplier.

LO/IF: see closed AI above.

Correlator: Derek - Marki 003 module, Marki added 4 pieces of solid absorbers over each of the mixers. This seemed to eliminate the suckout at 3.5 GHz. We are awaiting CT's detailed tests to make sure this is indeed the case, and whether the responsivity (& phase) at the higher frequencies (13-18 GHz) have been compromised. See new AI above.

Derek - will provide estimated Hilo cost expenditures to Paul S. within 2 days. Just ordered 55 DC Amplifier module housings (aluminum) from Dayton Jackson in Hilo. Estimate to complete is end of July. Also submitted fabrication package for finalized DC Amplifier boards to board house. Changes include: the addition of the 4 DC blocks (1uF chip caps), buried one input trace (due to noise pickup), mechanical adjustments to line up pin interfaces to correlator module.

Bob asked about the schedule for the new Readout board, and his desire to see it tested with the prototype telescope hardware. Chao-Te and Warwick both commented that the new design will not interface with the current prototype hardware. Nevertheless, we might be able to make some kind of interface adapter to allow the old and new designs to work together. Warwick asked Chao-Te about whether we will use a Xylinx chip in the readout. The will defer this discussion offline.

Platform/Mount: Bob - Bob was at CMA this morning. Things are moving along. CMA does not report any schedule slips but looks like (to Bob) that CMA is about 1 week behind. Had a telecon with Vertex today. No new surprises, they sorted out the problems with the jack (screw?) measurements. Imbed(?) ring is estimated to arrive in Hilo on August 13.

Paul Ho asked whether any testing is being done by CMA and Vertex to verify the hardware matches the modeling (simulations). Bob said CMA is providing material samples to ASIAA for analysis. In particular, to test the strength of the inserts. Bob will ask Vertex if they can provide something similar.

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Bob - Philippe visited the mount component testing in Dresden. Tests are proceeding as per schedule. Ferdinand is checking on Vertex progress. Computer tests with drive interface has made progress. Had platform meeting with CMA 1.5 days ago. Proceeding according to schedule as well. Shipping of platform to Germany is in place, Philippe is following up (with the details).

DC Power Distribution: Homin - Performed preliminary noise tests of converter using low freq spectrum analyzer. See about -90 dBm at 130 kHz.

Enclosures: See AI-26June03-1:

Site Issues/Network: Bob - MOU has been signed by ASIAA.

Dishes: Ted - Dr Ong measured the dishes after assembly. His measurement method(?) was a little bit different than what Ted understood was to be done. Ted will talk to them. Bob asked what was asked to be measured? What was actually measured? Ted - measured data has some points out of spec near the perimeter of the dish but the RMS falls within spec. What should be done next?

Bob - RFQ for site work went out today. Process will be open for approximately 1 month. Identified independent inspector, Neil Ericsson, to inspect the site work (rebar, concrete core samples, etc.)

2-Element Prototype Issues: Derek - Generated phase switched CW tones to sum with the independent IF noise sources. Drove Meridian at about -1 dBm, Marki at -10 dBm to produce the same RMS. CW signal was reduced by about 50 dB in comparison to the noise. Overall SNR of both the Meridian and Marki modules were quite similar (keeping in mind that Meridian drive was ~9 dB higher). Offset issue with 3 levels of demod (1 software) seems to be solved. Preparing correlator box to take back up to ML tomorrow.

Cheng-Jiun and Keiichi have arrived from Taipei on Tuesday. Warwick asked for the new IP address for the correlator PC (let's make sure everyone involved knows what this is if it is changed). Derek - Cheng-Jiun and I installed version 2 readout chips (non laser cut) to replace the existing 2 chips (2 channels were dead on one, the other was the 17-ch version). We found that if we set the clock to 5.4 MHz then both chips and the old 17-ch TP detector chip locked. Verified this by monitoring the master clock output pin of the chips. Derek asked Warwick whether using an external clock into the correlator box was OK. Warwick said it was OK as long as the Data Acquisition board and the Readout boards were receiving the same clock. Cheng-Jiun is presently characterizing the setup with the new readout chips starting over again with the battery tests.

Schedule: Bob - Schedule has several slipped items (see new AI above).