

Minutes for AMiBA Engineering Telecon

Meeting Date: 6-Mar-2003

Participants:

Australia: W. Wilson, M. Kesteven

USA: P. Ho, B. Martin, J. Peterson, M.T. Chen, D. Kubo, F. Patt, C.J. Ma, T. Huang, J. Rapadas

Taiwan: P. Shaw, H. Jiang, C.T. Li, H. Wang, E. Hwang, J. Han, W. Ho, K.Y. Lin

Minutes Recorder: D. Kubo

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

I. New Action Items:

AI-6Mar03-1: Bob - Ask Fred L. if he can help AMiBA with the TRW InP MMIC testing problem. Can't export to Taipei for testing. Also contact Todd Gaier in regard to telling him our MMIC delivery needs.

AI-6Mar03-2: Ming-Tang - Contact West G. in regard to the delivery of the delivery of the OMTs. This part was supposed to be on its way to Taiwan on 21-Feb. Also, find out about the delivery of future OMTs.

AI-6Mar03-3: Derek - Revisit the expansion costs for 7 to 13 and 19 element system. Current expansion cost estimates appear low.

AI-6Mar03-4: General - Generating a last minute booklet for MOE visit at the end of the month. Please send any pertinent information to Paul S. before the 15th of this month.

II. Previous Action Items (still open):

AI-20Feb03-1: Ted, Derek - Need to provide hole pattern in platform for mounting the Correlator Frames. Forward this info to Ferdinand who is serving as the focus for the physical interfaces to the platform.

[Awaiting for final mounting hole drawings.](#)

AI-13Feb03-1: Ferdinand Patt - Gather/determine hole patterns for all boxes on the platform. Will serve as focus on this issue and will have to work with others to gather info.

[Awaiting for final mounting hole drawings.](#)

AI-6Feb03-3: Michael - What is our spec for group delay variations from one IF path to another? I.e., how well should they be matched? Is non-flat group delay is OK as long as they are all the same?

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

AI-26Feb03-1: Derek, Bob - Review mounting method of correlator frame to platform. We want to make sure correlator frame expansion/contraction does not deform the platform.

[Derek - reviewed Ted's current mounting scheme for the correlator frames. Consists of 2 carbon fiber mounting brackets, one on each side of the frame. 2 slide rails will attach to each mounting bracket.](#)

AI-26Feb03-2: Bob - describe planned location of dishes/receivers in relation to boxes on platform for 7, 13, and 19 elements.

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Bob e-mailed Ted/Derek with dish/receiver locations. Ted is in the process of drawing this up for distribution.

AI-6Feb03-3: **Michael** - What is our spec for group delay variations from one IF path to another? I.e., how well should they be matched? Is non-flat group delay is OK as long as they are all the same?

Michael sent this answer out via e-mail (although few have actually seen this). Please resend to wider distribution.

IV. Miscellaneous Discussions:

MMIC: Huei - Suggested an idea of testing the InP HEMT in Taiwan. Bob - thought this route would be difficult. Another suggestion was to involve NRAO - see AI above. Paul H. - Will this issue affect our final delivery schedule (of the receivers)? Bob/Ming-Tang - No.

Receiver: Ming-Tang - OMT issue, see AI above. Need OMT to test noise injection coupler. Can't proceed to make more OMTs until 1st one is tested.

West Ho is still in the process of updating the mechanical drawing for the receiver.

Warwick asked what modifications will be made on the prototype receivers in March. Ming-Tang - none, tasks have been delayed (until April?).

Ming-Tang - Stability and TP vs. declination tests were run on the prototype yesterday. He will go up tomorrow and repeat these tests.

Ferdinand - Noise source tests on prototype using super luminous LED will be delayed until April.

Ming-Tang - Completed CTI cold head test. Results are good, have made the decision to go with this for the final design. Receiver drawing updates are still in process. Also working on details of how to distribute and route the helium lines on the platform.

Paul S. asked whether only 5 new receivers will be built and 2 refurbished, or 7 new receivers. Ming-Tang = 7 new receivers will be built.

Bob - OMT - West G. was supposed to have the OMTs measured and sent to Taipei last week. This apparently didn't happen. There was a change made from hard to soft gold plating which should result in less loss. Ming-Tang was concerned about the state of West G's business climate and was worried whether we will get the entire run of OMTs for our 7-element system. Warwick mentioned that AT has developed a 3mm OMT and will forward the information to Ming-Tang.

Bob relayed a message from John Payne - has asked about doing trial tests of his noise generation scheme with the prototype in March. Bob - this will probably not be a good time as we will have many activities going on during March.

LO/IF: none

Correlator: Chao-Te ran tests on the signal mixer and sent out results a few days ago. The mixer appeared to compress at around -30 dBm but this may have been an artifact of something else in the test setup compressing first (lock-in amplifier?). Mixer responsivity peaks at 1800 Vrms/W @ 5.5 GHz and dips down to 900 Vrms/W @ 7 GHz and a

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few other spots. Chao-Te also began testing the 4-lag module 001 yesterday (Jeremy brought him the missing BMA to SMA adapter from Hilo). He sent out initial amplitude and phase measurements via e-mail. Module responsivity vs. frequency has similar features of the single mixer itself. Amplitude response appears noisy (why?) but phase looks fairly smooth. More thorough tests to come in the next few days.

Jeff R. - Waiting for information from AMiBA on what to do with SN002. Derek asked for 2 things: a) higher module responsivity, b) flatter amplitude response. Derek will respond formally after talking this over with Chao-Te and Warwick. Jeff asked if the measurements could tell him whether he got the delay lines correct. Warwick said he would look at this and let him know.

Derek - Received Jonathon slides for the correlator frame and showed Ted. We decided that this is indeed what we want. Derek will place the order for 4 more slides. Also placed the final order for the remaining 18 GHz (-3 dB @ 18.75 GHz) K&L LPFs and Inmet 13 dB slope equalizers. Derek asked Warwick whether we should lengthen the correlator lags to accommodate our 18 GHz top end instead of 20 GHz.

Chao-Te - Will be in Hilo next week. Asked Warwick what he would like him to do on the prototype before Warwick arrives in Hilo. Warwick will respond via e-mail.

Warwick - Asked whether we can configure the prototype to accept the translatable noise source for calibrating the new correlator module. Ming-Tang said that the dishes will have to be removed. Re-alignment will be necessary after they are reinstalled but this should not be a problem.

Derek - Assy of 1st Section IF Distribution module nearly complete with Peter Oshiro's help. Will send out photos. Need to make a total of 16. Peter is working on the layout of the large 2nd Section plate and will probably begin assembly in 3 weeks.

Derek - The Meridian correlator appears to have a responsivity of around 800 to 900 V/W (peaks at 1000 at lower end). The original 16-lag had a responsivity closer to 2000 V/W (albeit with large variations vs frequency). One possible explanation for this is additional passive losses before the mixer. If this is the case then driving the unit harder would overcome this without running the mixer into compression.

Chao-Te - He is having difficulty interfacing with the 4-lag module (SN001) because the pins are recessed into the module. He will send an e-mail out with pictures of the interface to describe his problem. Warwick thought that he may have the necessary hardware if in fact the interface is the same as for the previous 16-lag.

Bob asked what the plans were for the prototype. Chao-Te will come here to 1) upgrade the Readout chip, 2) install the 4-lag correlator module (replace one of the 16-lag modules).

DC power distribution: none

Dishes: none

60cm - Ted responded to some questions from Dr. Ong. Paul S. stated that the contract specifies that measurements be included as part of their service (I.e., we are paying for it). Bob would like this measurement to be conducted on the finalized assembly. Paul S. asked whether measurement of the dish can damage the mirror surface. Bob - probably not because the contact pressure is very low at 7-12gm force. Paul S. - current schedule has the delivery of the 2 dishes at the end of March.

Paul H. asked about the status of the 1.2m dishes. Bob - no progress. Paul S. asked Bob to summarize what needs to be done and the costs estimates.

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Platform/Mount: Bob - One open issue with Vertex is the polarization drive(?).

Michael has been communicating with Klaus on this matter. Next meeting (with Vertex) is 14-Mar. Had a meeting with CMA this past Monday. Still on schedule.

Ferdinand - Asked Vertex on the cost of a anchor ring - \$45k USD each. Sounds too high.

Ted - waiting for hole patterns for small electrical boxes.

Vertex - April/May - fitting of U-joints and jack screws; June - integration. Michael is involved with the programming (pointing?) interface. Next meetings: March 3 with CMA, March 21 with Vertex.

Site Issues/Network: Bob - checked on cost of a roll-out enclosure to cover the platform. Estimated cost is \$20k USD, close to what was projected earlier.

Bob - was at Boulder CO last week. Discovered that there was previous soil test done on the area we are interested in. Don't have to do this anymore (saved \$10k USD). Solid lava approximately 10 feet down, will design foundation to tie to this. The electrical design aspect was looked at separately by the ML group. Plan to tap off 208VAC 3-phase power from one of their existing transformers. AMiBA will pay for the extension of the power line from the transformer to our facility (underground conduits). There will be 2 subcontractors involved, one for the excavation/concrete and the other for the electrical. Rough schedule: May - bid, June - construction, August - done. The mount will ship from Germany early August and will probably arrive in Hawaii early September.

Bob - Electrical usage at ML has increased by about \$800/month since we powered up the receivers. Also, Bob asked that we take fewer cars up to the summit to reduce road wear (I.e., more people per car). ML pays for the road maintenance and estimates the cost per 1 car*trip to be \$300.

Hilo Facilities: none

Schedule: none

Enclosures: none

V.Other Inputs: none