Minutes for AMiBA Engineering Telecon

Meeting Date: 13-Mar-2003

Participants:
Australia: W. Wilson, M. Kesteven
USA: P. Ho, B. Martin, J. Peterson, M.T. Chen, D. Kubo, T. Huang, C.J. Ma, T.H. Chiueh, C.T. Li
Taiwan: P. Shaw, H. Jiang, H. Wang, E. Hwang. J. Han, W. Ho, K.Y. Lin, Benson Lin

Minutes Recorder: D. Kubo
comments from this week, previous weeks comments

I. New Action Items:

AI-13Mar03-1: Paul S./Ming-Tang – Lookup how many OMTs were actually ordered from NRAO (West G.). Then find out the delivery schedule for these OMTs. If they are not planning to supply all of our future OMTs then we need to know this soon.

AI-13Mar03-2: Ted – Generate and distribute platform mounting hole patterns by next Wednesday. Next CMA meeting is next Friday.

AI-13Mar03-3: Paul S. – Locate single packaged mixer from Jeff Rapadas (non biased one) and send back to Rapadas for investigation as to how to flatten responsivity vs. frequency.

AI-13Mar03-4: Ming-Tang – Prepare liquid N for hot/cold tests at ML next week.

AI-13Mar03-5: General – Review Homin's design and cost inputs before next Wednesday. Info available at:

http://www.asiaa.sinica.edu.tw/amiba/ProjectBook/workplan/image/2003/DCPowerWorkPlan2003.pdf

AI-13Mar03-5: General – Review Paul S. updated project schedule before next Wednesday. Info available at:

http://www.asiaa.sinica.edu.tw/amiba/Administration/image/AMiBA%20schedule%20for%207%20element.pdf

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II. Previous Action Items (still open):

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.

Fred has been contacted on this matter but so far he offered no help. Fred asked about the equipment and time necessary to test the MMICs. This issue still needs to be solved so NRAO is a worthwhile path to pursue.

AI-13Mar03-4: 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.

Please send your inputs in by this Friday.

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

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

Distributed cost updates via e-mail. June 2002 estimates were 336k, 746k, 1400k, for 7, 13, & 19-element. New costs are 374 (+11%), 836 (+12%), 1449 (+3.5%). All costs in USD.

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.

2 OMTs have been sent out of Tucson today and due to arrive in Taipei. Next step is to test it. Future OMTs – see AI above. Backup plan: a) reproduce OMTs with current supplier (not as easy as it sounds); b) use ATNF OMT.

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.

Complete. Drawings will be distributed before next Wednesday.

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.

Complete. Drawings will be distributed before next Wednesday.

IV. Miscellaneous Discussions:

MMIC: Huei – TRW asked about the 2nd fabrication run of MMICs. Haven't been able to contact Todd G. Still need to solve this issue of testing the MMICs. If they are good then testing will take a few days, if they are bad then this could take several weeks. Possible options: a) send people to TRW; b) obtain MMICs (and test elsewhere?).

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: See above for OMT discussion.

Ming-Tang – OMT issue, see AI above. Need OMT to test noise injection coupler. Can't proceed to make more OMTs unit 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?).

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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.

LO/IF: none

Correlator: Chao-Te – Brought new 4-lag correlator and plan to install into prototype today and tomorrow. New module exhibits good phase response but has a notch (suck out) at ~4.5 GHz and non-flat responsivity vs frequency. Lag 2 is flakey in that it is more temperature dependent than the other lags.

Jeff P. – Feels that the variation of responsivity vs. frequency is largely in the mixer. Chao-Te agreed because both the single mixer and the 4-lag exhibit the same general shape. Jeff suggested to send the single packaged mixer back to Rapadas (see AI above) for investigation. Jeff has suggested in the mean time that he try the terminated mixer approach (suggested by Paden paper). He will send Bob a brief proposal on this matter.

Derek – 2 improvements are necessary for the 4-lag: a) flatter responsivity vs frequency (for higher equiv noise BW); b) higher overall responsivity. We might be able to live with a lower than desired responsivity if we can drive harder without getting to far into the P1dBc. Warwick mentioned that we might have to drive the module at -7 dBm to get above the "self noise" but this may be difficult with the 7-element design. Derek – we can get -7 dBm into the module but there might be a VSWR ripple effect from dropping the pad values. Derek – how about removing the 5.5 dB pad within the correlator module since it looks like the mixer appears to be the primary cause? Warwick – be careful about doing this because we are getting fairly good phase where as the 16-lag had a phase problem without these pads.

Chao-Te - Will remove dishes and install noise table for characterization of the new 4-lag in conjunction with the receivers. Will characterize SNR and hope to be able to perform spectrum recovery with this new module. Plans for next week when Warwick arrives: a) install new readout chip; b) update phase switch.

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 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.

DC power distribution: Homin - Posted the design and cost of the DC-to-DC converter board on the web. See AI above.

Dishes: none

Platform/Mount: Ted - Clock drive motor has been installed.

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.

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.

Hilo Facilities: none

Schedule: See AI above.

Enclosures: none

V. Other Inputs: none