Minutes for AMiBA Engineering Telecon

Meeting Date: 20-Mar-2003

Participants: Australia: M. Kesteven <u>USA:</u> P. Ho, B. Martin, J. Peterson, M.T. Chen, D. Kubo, T. Huang, C.J. Ma, T.H. Chiueh, C.T. Li, W. Wilson Taiwan: H. Jiang, 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-20Mar03-1: Ted/Philippe - Get together and generate a quick sketch of the planned cable (DC power, cryo, coax, and data) routing. Will have a group discussion on this matter the following week. Next platform review is scheduled for April 1.

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.

Still on going.

AI-13Mar03-3: Johnson - 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.

CTL will contact Johnson and describe the mixer and its location.

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

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.

MTC - Placed an order for 12 OMTs. 2 have been delivered to customs in Taiwan. Schedule for next few are 2 more in August, 3 more in September. Bob suggested to keep John Payne in the loop on this matter.

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

Ted distributed platform drawings. People still need to review these.

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

Done.

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

Done / past due.

<u>AI-13Mar03-4</u>: 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.

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Done / past due.

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

Done / past due.

IV.Miscellaneous Discussions:

<u>MMIC:</u> ?? - Someone mentioned that another SiGe Gilbert cell multiplier is being designed. This new design has a goal of lower 1/f noise (we haven't characterized the 1/f noise of the present ones). These chips are scheduled to be available in 3-4 months.

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?).

<u>Receiver:</u> See completed AI above for OMT discussion. MTC - Will discuss how to test the OMT with Johnson.

LO/IF: none

<u>Correlator</u>: Prof. Chieuh - Current tests at ML - Out impedance of 4-lag correlator mixers appear to be different for channels 1 & 2 vs 3 & 4. First 2 channels appear to be ~100k while the last 2 are around 50-60k Ohms. Currently seeing relatively higher RMS outputs than expected but have not tracked this down yet.

4 loose IF input SMA connectors were discovered in the correlator box. These connectors are hidden from view and can't be access unless the amplifier plate is removed. These were torque before the plate was reinstalled.

Warwick is currently reprogramming the FPGA which controls the phase switch and demodulation sequences. After this is done we should be able to phase switch faster (at $\sim 45/90$ Hz).

Assembly of SN001 for the 1st Section 3U module assy has been completed. 13 more to go.

Plan to send single packaged mixer back to Jeff Rapadas for his evaluation on why the mixer produces the non-flat responsivity vs frequency.

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 PldBc. 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 7element 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

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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 4lag 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.

DC power distribution: none

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

Dishes: none

<u>Platform/Mount:</u> Bob / Michael - Had meeting with Vertex at end of last week. Everything during the meeting appeared to go well. However, Klaus' e-mail after the meeting was a bit worrying. They are not converging on an understanding our (pol tracking?) system. Their unusual interpretation of the control algorithm may be based on their previous involvement with ALMA or the Hexapod Telescope (which were unusual?).

Ted - Clock drive motor has been installed.

<u>Site Issues/Network:</u> Bob - Design work for the ML site got hung up on payment terms. Bob hopes to sort this all out soon. Ferdinand has been investigating firms (in Hilo?) to do steel work supply cranes at ML. He's been asked to provide information about the road up to ML.

Ferdinand - GPS receiver - Having to go through another round of purchasing hoops due to the cost coming higher than originally expected.

Hilo Facilities: none

Schedule: no comments on Paul's updated schedule.

Enclosures: none

V.Other Inputs: none