Minutes for AMiBA Engineering Telecon

Meeting Date: 24-Apr-2003

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

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

I. New Action Items:

AI-24Apr03-1: Ted/Philippe – Have a meeting with Bob Romeo ASAP about the platform drawing errors/inconsistencies.

II. Previous Action Items (still open):

AI-17Apr03-1: Ming-Tang – Check to see status of LNA devices. Should arrive in Hilo soon.

Keola is waiting for the package. MTC will follow up with e-mail.

AI-3Apr03-2: Bob – Estimate shipping costs for shipping CMA platform to Vertex in Germany.

No shipping costs yet but estimate for additional cost to assemble the platform twice (Germany & ML) is around $8-10k. See platform discussion below for more info.

Obtained quantity, sizes and weights of boxes. Still need to contact shipping company to obtain shipping costs to Germany. CMA will be ready to ship around middle to late June.

AI-3Apr03-5: Chao-Te – Provide revision details to Prof. Chieuh for 4-channel readout chip. Final inputs must be completed by the end of April. Next fabrication run is in June(?).

Still in process. CT sent a procedure to CJM so that he can test the new 4-lag chip at ML. Bob suggested that CT pursue testing the chip at Taipei because that is where the chip expertise is. CT is having a student working on how to lengthen the integration time.

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.

Huei asked Bob to send an e-mail to Paul Clintworth at TRW (NG) to remind him (of ?).

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

AI-17Apr03-2: Bob – Provide instructions to Dr. Ong on how to measure the secondary mirror on the 60 cm dishes.

Deferred to a discussion between Philippe, Ted, and Dr. Ong.

AI-17Apr03-3: **Ming-Tang** – Investigate output power fluctuation of Rx-2 on prototype. Resolution may require warming up receiver and tearing into it which will require a few days.

MTC checked out both receivers on Monday. The TP readout chips were offline (due to temp insertion of new version 2 readout) so he used the HP power meter. Was not able to detect any power jumps in receiver 2 or 1, only the normal slow variation. Test team was there to witness this. Recommended to continue monitoring this using both the power meter (via GPIB) and readout simultaneously.

AI-17Apr03-4: **Derek** – Install finalized version of DC amplifier module onto the Rapadas 4-lag correlator (this should eliminate the pickup, if any, between the correlator output and DC amp). A good time to do this is when MTC is working on the receiver.

Added new DC Amplifier half module to Meridian 4-lag correlator. This DC amp has been modified to have the 1uF DC blocks. Test team has installed it but are seeing lower than expected RMS at the moment. Ran a quick test of the correlator module by itself in Hilo and found no output on lag1 (lags 2-4 are OK).

IV. Miscellaneous Discussions:

MMIC: See AI-6Mar03-1 above.

Bob – Believes that Todd G. has shipped the LNA devices to Hilo. MTC has not received it yet though.

Receiver: MTC – Phase shifter + 45 degree plate (circular polarizer) appears to have unbalanced outputs. Unbalance is about 1/3 on one pol and 2/3 on the other. Uniformity (?) is OK however. Will send out a report with more details. Johnson finished preliminary tests on noise coupler.

No progress on CTI cold head. Currently have 1 in Taipei and need 1 more for the time being.

Ming-Tang – Noise coupler tests are still ongoing. Earlier tests were confusing. Currently characterizing the phase shifters (and other hardware) to properly test the noise coupler. We begin noise coupler tests within a few days.

Have not received quote for cold head.

LO/IF: MTC – Ming-Tang is planning to have a meeting with the NTU-EE department on the status. Prof Chu asked for more DC power (more current?). Physical dimension is fixed. There are no problems at the component level.

Correlator: Derek – Returned Marki 001 module last week. Ferenc tested this module and verified its high output Z and said he put the wrong diodes in this one. Derek received the replacement 002 module on Monday and measured a responsivity of 116 Vrms/W (spec is >/=80)and Z of 75kOhms (spec is </=100k), both at 10 GHz, -10 dBm. -7 and -4 dBm drives produces Z of 65k and 33kOhms respectively. Responsivity at 10 GHz is about 3x higher than of the Meridian module (measured side by side).

Mike indicated that the asymmetry in the fringe envelope implies a non-linear phase variation (not removable by varying delay) in the prototype. This undesired variation could be on the order of 30-50 degrees. He would like the phase response of the correlator to be characterized (in addition to amplitude). Derek agreed that he would try to do this.

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CTL – Distributed test results of custom power dividers. Response looks good but loss is higher than expected. Expects to go through another design iteration before production run.

Jeff P – have begun fab of terminated mixer. Informed us that this mixer will have lower responsivity because he is purposely keeping the impedances down (less voltage across the diodes). If the match looking into the mixer is good enough, then we should be able to eliminate (or reduce) the 5.5 dB pad that is presently in front of the mixer. Jeff is expecting an overall net gain. Won't know if this works until it's fab'd, packaged, and tested.

Derek - Done testing Marki SN001. Conclusion is that it's output impedance is too high for us to use. -10 dBm inputs at 10 GHz produces 2.7 MOhms. Raising the power to -5 dBm produces 810 kOhms. Performed other tests to verify functionality of the module. It is working OK, it's just that the mixers have high output Z. Marki has SN002 at his facility and claims to be seeing an output Z of 57 kOhms at -10 dBm, 10 GHz inputs. Derek will ship back SN001 for his re-evaluation. SN003 module was to have the impedance transforming power dividers. He has run into a problem with this design from a manufacturing standpoint. He had to go with 10 mil Duroid (instead of 5) to raise the characteristic impedance of the inner PDs but now can't twist his baluns because of the thickness.

Dishes: Ted – ECD (estimated completion date) of the two 60cm dishes is 1st week of may. RMS of primary is collected by hand and appears to be within spec. Bob asked to make sure the location of the 2ndary with respect to the primary is correct in the X, Y, Z, and tilt dimensions.

Dr. Ong asked for instructions on how to measure the secondary mirror. See AI above.

Platform/Mount: Bob – Had meeting with Bob Romeo. Romeo caught a few errors and inconsistencies on the platform drawings and doesn't want to proceed very far until this is resolved. See AI-24Apr03-1 above. MTC recommended that Philippe take a more active role in reviewing the drawings. ECD of platform is July. Bob is leaning toward shipping to Germany at this time because it give us a chance to assemble the platform in a controlled environment verses assembling it for the first time at ML.

Bob – Vertex has not indicated a slip in the schedule but Bob's impression is that they have slipped. Mike has not received a satisfactory explanation for the "coordinate frame" issue as of yet.

Bob – Vertex – Still having problems with polarization and nomenclature. Mike and Bob (& ?) will have a telecon with Vertex tonight. They visit their facility in a few weeks for an in person meeting.

Bob – Visited CMA and they appear to be making good progress. Will begin water jet cutting of components next week. Romeo seemed to welcome the hexapod mount change from Vertex.

DC Power Distribution: none

Site Issues/Network: none

2-Element Prototype Issues: none

Derek – Modification of DC amplifier board and software is complete. We now have a zero reference level check for the 4 TP detectors. CT will incorporate this change into his final DC Amplifier/Readout design (3U plug-in card).

Derek - Have made two 100 kOhm terminating connectors to plug into the DC amp board input, one goes before the ribbon, one after. Will test to see if there are any detected offset differences between the two cases. Right now the suspicion is that a 44 Hz signal is working it's way into the DC amplifier input.

Kyle – problem with total power output of Rx-2, IF-1 and IF2. Power output jumps abruptly. Appears to be microphonic. Isolated problem to Rx-2 by swapping IF cables with Rx-1.

Ming-Tang asked for the receiver total power output to be logged everyday after people are done working on the prototype.

Schedule: none

Enclosures: none

V. Other Inputs: none