Minutes for AMiBA Engineering Telecon

Meeting Date: 17-Apr-2003

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

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

I. New Action Items:

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

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

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.

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.

II. Previous Action Items (still open):

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

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.

Not sure we are going to ship platform to Vertex at this time. Will pursue shipping cost when this becomes a real option.

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.

Kyle just finished the data analysis of the battery test, seeing ~5 ppm offset with 0.226sec 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.

Still on going. Paul H. suggested to go through the same person at TRW (NG) as NRAO did in the past.

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

AI-10Apr03-01: **Derek –** Return Ted's Pro-E network card ASAP!

Done.

IV. **Miscellaneous Discussions:**

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

Receiver: 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.

OMT tests in Taipei have been completed and the results look good. Tests on the polarizer will be performed next. Eugene could not see the dielectric coating on the polarizer waveguide wall and thought it might be missing. Someone mentioned that the coating is only 100um thick so it may not be obvious by eye.

MTC – Plan to purchase 7 CTI cold heads and cryo lines soon. Starting machining of metal work for the receivers.

LO/IF: none

Correlator: 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.

Derek has been continuing tests with the Marki 4-lag module. Output impedance from mixers appears extremely high at 2.71MOhms with -10dBm input power. This is in contrast to around 100kOhms for the Rapadas 4-lag module. Ferenc has a 2nd module at his facility (different mixers) and is measuring a much lower impedance on the order of 80kOhms for the same test. Dialog with Ferenc is ongoing, he has suggested a number of other tests to verify the operation of the module Derek has in hand. Both modules (001/002) have straight 50Ohm power dividers through out. 003 has been designed by not built yet, this one will have the power dividers as impedance transformers. Ferenc has mentioned that the microstip lines are extremely narrow for this design and he might run into difficulties in fabricating the board.

Derek spoke to Jeff Rapadas about the mixer which was shipped back from Taipei for rework. Asked that the mixer be modified to provide the following: a) higher responsivity, b) flatter amplitude response. Rapadas believes that Jeff Peterson has already proceeded to construct the new mixer with an internal terminating resistor.

Ferdinand – Peter's availability to support Derek has been delayed again to support SMA activities.

Derek – Planning to update the TP detector DC amplifier board to provide an automated zero level check tomorrow. Warwick thought this was a good idea and said he would update the

software remotely to control this feature through the event generator. He will send detailed instructions on how to activate this feature.

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

Platform/Mount: 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.

Mike – No feedback from Vertex on polarization issue. Philippe to contact them and prime them for this discussion. Next meeting is 17-April (Taipei time).

DC Power Distribution: none

Site Issues/Network: none

2-Element Prototype Issues: 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.

Motor is electrically slipping? T.P. detector DC amplifiers are being modified to provide automated zeroing of the detectors. Tests on the readout chip are being continued.

Schedule: none

Enclosures: none

V. Other Inputs: none