# Minutes for AMiBA Engineering Telecon

Meeting Date: 10-Apr-2003

<u>Participants:</u> <u>Australia:</u> W. Wilson, M. Kesteven <u>USA:</u> P. Ho, B. Martin, M.T. Chen, D. Kubo <u>Taiwan:</u> H. Jiang, H. Wang, E. Hwang, J. Han, W. Ho, T. Huang, P. Shaw, C.T. Li, F. Patt Minutes Recorder: D. Kubo

comments from this week, previous weeks comments

#### I.<u>New Action Items:</u>

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

## II. Previous Action Items (still open):

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

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

<u>AI-3Apr03-5:</u> 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(?).

In process. Kyle just finished the data analysis of the battery test, seeing  $\sim 5$  ppm offset with 0.226sec integration time.

<u>AI-6Mar03-1:</u> 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-3Apr03-1: Ted - Find out coating material and thickness for dishes.

60cm dish coating = acrylic, 8-10um. Bob asked whether this could affect the radio signal properties. It was agreed that this coating should not be a problem.

AI-3Apr03-3: Derek - Distribute IF coaxial cable data sheet info for platform routing.

Derek distributed the data sheets of the Micro-Coax cables via e-mail. Cost impact over the existing black Andrew cable (corrugated solid outer conductor) is about a factor of 2, with approximately the same performance. 7-element system will require 14 cables between the receiver and 1<sup>st</sup> section, and 36 between the 1<sup>st</sup> section and correlator frames. After discussing this, it was agreed to stay with our existing black cables. The advantages of the solid Andrew cable is that it will be less affected by platform movement, it is cheaper, and we know it works well because this is what we are currently using on the prototype. Disadvantage is that we will have to be careful with the minimum bend radius and the number of times we bend the cable.

AI-3Apr03-4: Derek/Ted - Begin dialog for correlator mechanical frame design details.

Dialog has begun.

## Minutes for AMiBA Engineering Telecon

<u>AI-20Mar03-1:</u> 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.

Detailed drawing has been distributed to engineering team.

### IV. Miscellaneous Discussions:

MMIC: See AI-6Mar03-1 above.

Bob & Huei to discuss export issue this coming Monday, 9-10am Taipei time. Expected LNA noise temperature for chip mounted in a block is 60K. Huei ask Warwick about the testing of the SiGe mixer. Warwick said they have not gotten to it yet but plan to do so in the near future.

<u>Receiver:</u> 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.

Ming-Tang - 2 OMTs are in the Taipei lab. Johnson is conducting the measurements. Next test is to measure the noise coupler performance. Estimated completion date is next week. If coupler performance is good then ATNF will fabricate 6 more right away. Estimated installation date for the noise coupler + OMT into prototype receivers is end of May(?).

Ming-Tang asked Warwick about the phase switch signal. Warwick - Each receiver will require 2 pairs of differential TTL signals (4 wires). These signals will emanate from the correlator PC. The 19-element system will require 38 pairs of phase switch signals. There may be an interface panel somewhere between the correlator PC and receivers.

### LO/IF: none

Ming-Tang - for Professor Chu - LO/IF hardware schedule is still the same as presented in December.

<u>Correlator</u>: 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 2<sup>nd</sup> 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 500hm 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.

## Minutes for AMiBA Engineering Telecon

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.

Derek - received Marki 4-lag correlator module last Thursday. Testing is in process. So far the responsivity looks good and flatness from 3.5 GHz to 18 GHz is approx 4 dBpp. Warwick asked for output impedance measurements to done next.

Bob asked Ted to support the mechanical design of the correlator frame. This is in lieu of West being tied up with the receiver work. Ted is a logical person to do this because the correlator frame has a somewhat complex interface with the platform. Bob asked for Derek and Ted to try to work remotely to save on travel costs.

#### Dishes: none

Dr. Ong brought the 60cm dishes to Taipei last week. Bob mentioned that there is some kind of clear protective coating (polyethylene?) on the primary and asked about it's effect on the signal. Thickness ~8 to 10um. Jeff P. thought it would be a good idea to keep this coating to protect the aluminum from oxidizing.

Bob was to provide Dr. Ong with details on how to measure parameters of the dish.

<u>Platform/Mount:</u> 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).

Bob Romeo reported that he is still on schedule to deliver the platform in June. Bob pushed around the idea of having the platform shipped Vertex in Germany for integration with the mount. This alleviates Vertex from having to make a mockup load to test the mount. Vertex would have to provide the lifting fixture for the platform. Paul H. asked how much shipping costs would be (Arizona to Germany).

DC Power Distribution: none

Site Issues/Network: none

<u>2-Element Prototype Issues:</u> 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.

Warwick - Total power RMS changed by a factor of 3 with respect to time. Correlated DC offset changed with time as well. Chao-Te is presently generating a summary report for their activities here 2 weeks ago.

Schedule: none

Enclosures: none

V.Other Inputs: none