

## Minutes for AMiBA Engineering Telecon

Meeting Date: 1-May-2003

Participants:

Australia: W. Wilson

USA: D. Kubo, C.J. Ma, K. Umetsu, P. Ho

Taiwan: H. Jiang, J. Han, W. Ho, T. Huang, P. Shaw, C.T. Li, M.T. Chen, E. Hwang

Minutes Recorder: D. Kubo

[comments from this week](#), [previous weeks comments](#)

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### I. New Action Items:

AI-1May03-1: **Warwick** - Provide comment on Ming-Tang's phase shifter and noise coupler reports.

AI-1May03-2: **Derek** - Complete phase measurement of Marki 002 module.

AI-1May03-3: **Derek** - Talk to Paul S. about potential cost upper of correlator module.

AI-1May03-4: **Derek** - Determine next step for Meridian 4-lag SN002 module. Need to give Rapadas instructions for design changes on the next module.

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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.

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

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

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

Ted and Philippe had a meeting with CMA on Monday. Ted is currently modifying the drawings.

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

MTC - Received e-mail from Todd G. saying package not shipped yet. Expecting package from JPL.

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.

Dropped.

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.

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(?).

CTL generated summary report and recommended changes to readout chip. This has been reviewed and approved.

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### IV. Miscellaneous Discussions:

MMIC: MTC - Still waiting for LNAs to be delivered from JPL to Hilo.

Receiver: MTC - Tested phase shifter and noise coupler and sent out preliminary reports. Phase shifter appears to be about 73 degrees (instead of 90) and there is a power imbalance of around 3 dB (between polarizations). Warwick was not surprised about the phase imbalance (dependent on dielectric thickness) but was surprised about the 3 dB power imbalance. He will look at the report and provide comment (see AI at top).

MTC - Combined test with phase shifter + noise coupler was not good as expected. Jeff P. commented that the devices will be used at 10K (?) but has been tested at 300K. He also thought that S11 tests could be useful for diagnosis.

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.

LO/IF: MTC - Prof. Chu is ahead of schedule. Prof. Chu making enough LO/IF assemblies for the 7-element system but will be delivering only 2 by this summer. Homin commented that the assembly will require the same voltages as before but more current.

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: Jeff P. - Duroid board for terminated mixer is in fab. Will install diode ring then package the mixer into a housing. Estimate to complete is 2 to 3 weeks.

Derek - Currently testing the Marki 002 module. Responsivity verses frequency averages around 125 Vrms/W with a variation of 4 dBpp over 2-18 GHz. Most of the variation is caused by the response below 5 GHz (5-18 GHz is fairly flat). Input 1 dB compression point is about -5 dBm for all 4 lags. Next things to do are: a) phase measurement; b) add DC amp module and re-test; c) install on prototype and characterize SNR.

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  $\geq 80$ ) and Z of 75kOhms (spec is  $\leq 100k$ ), 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.

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.

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Dishes: Ted - Dr. Ong will provide exact delivery date within the next few days. Current plan is to have all components fabricated in the middle of May, followed by measurements of the primary and secondary mirrors.

Ted - ECD (estimated completion date) of the two 60cm dishes is 1<sup>st</sup> 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.

Platform/Mount: none

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 gives us a chance to assemble the platform in a controlled environment versus 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.

DC Power Distribution: Homin - Next version of DC-to-DC converter board is ready(?) for testing. Waiting for Ferdinand's spectrum analyzer to characterize.

Site Issues/Network: Derek (for Ferdinand) - Just performed more surveying tasks at ML. Planned locations for platform and container will not interfere with existing MLO tests.

2-Element Prototype Issues: none

Schedule: none

Enclosures: none