Meeting Date: 20-Oct-2005

<u>Participants:</u> <u>Australia:</u> <u>USA:</u> M.T., Hiroaki, Paul H. <u>Taiwan:</u> Homin, C.T., Kyle, Po-I, Edwin, Ted, Chia-Hao, Patrick, Johnson, Paul S., Eugene USA Dial-in = 1-800-653-5390, 6668081# Outside USA Dial-in = 1 847 330 4361 Minutes Recorder: Kyle

## I. New Action Items:

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

(13/Oct/05)
Philippe/Ted - Photogrametry analysis. (See <u>Platform</u>)
(29/Sep/05)
Ted - Routing cable from ground up to platform. (See <u>Site</u>)
(08/Sep/05)
Po-I/Ted - Design a sturdy optical telescope mount (including fixure of the
CCD). (See <u>Mount</u>)
(07/Jul/05)
Pierre - Top priority to improve the shelter. (See Shelter)

### <u>III.</u> <u>Closed Action Items (as of this meeting):</u>

#### IV. Miscellaneous Discussions:

Platform:

MT - Philippe has done some analysis of the whole platform and is communicating with the photogrametry company. He will focus on the analysis of the inner part of the platform and hopefully will send out a report next week.
MT - Philippe will also send out a list of spare parts generated in 2003.

(29/Sep/05)

C.T. - Can we modify the receiver hole covers to be able to hook the harness? Philippe - I will spend some time to look into the safety issues of operation. C.T. - I would like to ask the science team to finalize the configuration of 7-element receiver locations. (22/Sep/05) Ted - The cables will be mounted under the platform. I have some weight information and Joshua can order standard cable trays directly. (11/Aug/05) Paul - Kyle, organize a separate meeting in Taipei with some engineers to sort out the issues with laser measurement system.

#### Shelter:

MT - Pierre is on leave. He is having some trouble with buying the load sensors. Jackie and I will help him on this. (13/0ct/05)Pierre - One year ago we asked Manfred to add a few relays and software in PLC to indicate mount is in parking position. We need to test its function whether the relay is closed when the mount is parked when next time I am in Hilo. Pierre - I am working on improving the shelter. I plan to go to Hilo in November. M.T. - A contract with ARL is being worked out now. We'll try to get them to come to Hilo in early Nov. They will stay for quite a some time. Pierre - I have sent a mail to ASFI for calculations and detailed drawings. (06/Oct/05) Pierre - About hiring a civil engineer to inspect our shelter, we lack the drawings and documents. Will ask ASFI for them. The cost for the engineer to come and check is around 10k. (29/Sep/05) **Pierre** - Fabric is becoming more and more a problem. Ted - New lift cable is not installed yet because the pulley and tower need to be modified. It will take 1 to 2 weeks.

<u>Mount:</u>

Homin - Po-I will regenerate the drawing for optical telescope mount after
modification as you requested. He will send the design to be made in Hilo.
MT - Many parts of the optel mount is over-specified. When the design is sent to
Dayton-Jackson, I will ask Kevin to talk to them and see if we can further
reduce the cost.

**Hiroaki** - I could not reproduce all the problems Patrick reported using the program track function.

- 1. Az and el seems to follow a straight line but obspol changes slope during a linear program track. Michael thinks it is related to interpolation end-point problem. We will ask Vertex to verify.
- 2. When we asked the mount to move across az=0, it does not work if the el is lower than certain number. When at higher el, it moved past az=0 but with strange motion.
- 3. When we slowed down the trajectory file interal, the result seems smooth. However, Michael thinks the number of points is too small in the trajectory file. We will increase the number and test again.
- 4. We have received a new flash card for PTC, but we still can not get PTC to read our own pointing correction file for interpolation. I will check our format again.

**Patrick** - The program track looks for two points in the file after the current position and interpolate. So when the trajectory file reaches the end (or one point before the end), it does not find enough point to interpolate and speed up to reach final position without interpolation. Vertex has no intention to change this part. We will just have to add two more points in the trajectory file if we want the trajectory to be smooth to certain position.

 $\mathbf{MT}$  - I am confused about why commanding from az=355 to az=5 results in R-crash, but only after it moved to az=358.

Patrick - I think there is a discrepancy between actual position and commanded
position. In the first few degree, the difference is within the R limit, but the
difference grows linearly with time, so when it reaches 50mm, R-crash happened.
MT - We should do some more tests about this while waiting for a new version of
software to arrive.

(13/Oct/05)

**MT** - Michael has some communication with VA about network between ACU and TCS. I will forward the email to people who are interested in.

Hiroaki - Michael has incorporated my subroutine into a boss for automatic pointing schedule generation. There was some error messages and Michael said he would look into it but may require some time.

Hiroaki - I will also do some analysis on the current pointing data.

(25/Aug/05)

 $\ensuremath{\textbf{Patrick}}$  – Some temperature sensors have loose wires that need to be soldered. Someone onsite or in Hilo can do it.

<u>Site:</u>

**Ted** - I wrote an email to people in NASA who also uses hexapod for flight simulator. They run cables through the center of the hexapod. Since we are on a much larger scale than theirs, we need some fixures and clamps to support cables.

**Ted** - On the top we plan to use the central hole and probably a few neighboring holes. On the bottom, we will need some kind of funnel shape structure to catch cables when platform is lowered.

MT - I am looking for a 2nd container on site. Whether it should be for sleeping or for office, we should make a decision soon. MT - As for a new car, we seem to have reach a consensus. We also need emergency generator and lightning protection. Pierre - I will talk to a electrician in Hilo about emergency generator when I am in Hilo. (06/Oct/05) M.T. - We need more engineering mind to help solve the cabling problem.

(11/Aug/05)

M.T. - Open issues in general on site: (1) spare parts for the mount. Philippe will be in charge of it. (2) helium lines and cables routing to the platform (3) lightning protection (4) emergency generator (5) how do people access the platform. Cherry-picker, ladder? (6) accomodation on site -> 2nd container for sleeping? Or visitor building for sleeping and 2nd container for office? (7) a new car Receiver: Johnson - Chia-Hao has started assemling Rx8. Some cold head power cables can be sent to Hilo with the six dishes now. Su-wei started to test the VGA in IF/LO module with computer digital signal to control the gain. We will circulate the results in a few days. About the phaseshifter, I wonder what should we do next. (discussed later) (06/Oct/05) Pierre - 1-to-4 cold head power distribution box is finished in the lab. Need to more receivers to be connected and tested if it really works to cool down four Rx. If it work, then we can ship it up to ML. (15/Sep/05) Eugene - The Tsys were measured with noise coupler installed and seems to be higher than the earliest measurements done on Rx1 without a noise coupler. We need to repeat the test on Rx1 with noise coupler to see whether it increased the temperature or not. (04/Aug/05) M.T. - Todd Gier is working on our LAN. We will have complete 28 LNAs some time. For spare LAN, as Prof. Huei Wang suggested, we may consider sending the chips to Wisewave for packaging. (07/Jul/05) Johnson - We expect to ship Rx5 and Rx6 in mid Aug after IF/LO is finished. (09/Jun/2005) Pierre - Two quick fixes to the LNA power supply card. 1. Reverse the protection diode instead of removing it should provide a protection at 3V. 2. The polarized capacitor at output is reversed and I suspect it is dead. They should be replaced. LO/IF: (08/Sep/05)

**Eugene** - Johnson reported the modules in Hilo need two hours after switch on to reach stable performance. I think it indicated thermal isolation and the device need time to heat up and establish equilibrium. I think the thermal link should be improved to protect the devices.

## <u>Correlator:</u>

CT - Chia-Hao and I are looking into correlator error messages. Basically we are looking into Warwick's program to see where the error comes from. I am also looking for spec on the polarizer for our application. (06/Oct/05) C.T. - I want to test one baseline with eletronically-tuned attenuator for LO to balance

the power between phase states. One concern is if the control has some delay (like we found in prototype testing with a PIN attenuator in 21GHz LO), then the scheme would not work.

 $\ensuremath{\textbf{C.T.}}$  - I will increase the phase switch speed to 2kHz or 4kHz to beat the 1/f noise in our system.

C.T. - We inspected the correlator enclosure and will ship it to Hilo soon. Po-I needs to go to Hilo in about two weeks to make preparations for installation. (29/Sep/05)

C.T. - We got three comments from the workshop:

- 1. automatic gain control (AGC) of IF power
- 2. LO power balance in phase switch
- 3. thermal stablize the correlator and IF

Homin - Software to control VGA is ready. Once we have the total power detector reading, we can close the loop. M.T. - Our problem is that VGA has different gain and phase response under different control voltage. Can we really use it to do AGC? C.T. - Derek suggested to put some temperature sensors in the correlator box. We will discuss about it in more detail.

### Calibration System:

Kyle - I sent out a note summarizing some thoughts on the need for a circular polarizer. Basically we will not do polarization as a science goal. What is of concern now is how to couple the calibration signal into both channels in the OMT. Original design requires a circular polarizer. The greatest concern of inserting a polarizer is the insertion loss would increase the system temperature. If we modify the design by rotate the noise coupler 45deg, then we do not need a polarizer to solve this problem. MT - Indeed this method looks practical. In fact, we may be able to assemble a modified waveguide path to test it now. There is also a concern on loss of 45deg plate. On the other hand, we have already asked NRAO to design a polarizer for us. The spec they claimed is <0.1dB loss and 5deg phase error in 85-105GHz. It will come back around April next year. We'll see. We need to find a person in charge for this modification. It is not a top priority issue right now. Homin - Without modification, the noise coupler has leakage to the other polarization. Is it possible to increase the calibration signal strength to calibrate the other channel? That is, to calibrate one channel at a time? Kyle - The coupling loss difference is at least 20dB lower in the other polarization and I don't have enough power to increase in the calibration system. (13/Oct/05) Kyle - I will put together a schedule when the calibration should be online and when we should really push to finish the system. (29/Sep/05) Kyle - I will circulate the test results presented in the workshop for more comments. And we also need to discuss the next step of the calibration system.

(18/Aug/05)

Kyle - Pierre found a quote for the motion controller and the PC/104.

M.T. - We should discuss it offline. There should be another person to work on this part since Pierre will be working on the shelter part. There may be some changes to the design and so we should hold on the ordering.

#### <u>1.2m dish:</u>

(29/Sep/05)

Philippe - Paul S. Said he will organize a telecon with Along this week or next week. Ted - We probably want to add some cover on the dish, so we need to ask Along to leave this possibility of the baffle. Philippe - We can discuss it with Along in the telecon, but we need to specify more clearly what we need.

#### <u>Misc:</u>

MT - Next month, Nov, we'll try to put two receivers on the platform, so we'll be very busy. In about two weeks, the vice president of AS will come to us. Some people will be here and we'll show him around. Paul H. - I need to update AS key projects. Please send me your new figures and results.