High Frequency Instrumentation Coordination Meeting

Minutes, 08jul02

Attendance: Brian Mason, Nicole Radziwill, Roger Norrod, Mike Stennes, John Ford, Kim Constantikes, Dennis Egan, Richard Prestage, Phil Jewell.

- **1cm & 3mm Rx**: RN summarized the projects and indicated that he would draft a project schedule.
  - **3mm Rx** (MS)— Magic T's and directional couplers are in testing and the OMT fabrication is done. RN raised the question of balancing, which MS indicated is still an unknown quantity depending on how finely CDL can tune the HFET's, amongst other things.
  - **3mm Rx Calibration Issues** (BM) — Analysis of MS's measurements of the compression at the output of the 2nd stage amplifier indicates that even for weak sources up to 20% differential power compression can be expected. MS & BM will systematically investigate possible solutions to this problem (noise diode, semi-transparent absorbers, AGC via electronically controlled variable RF attenuators, etc.).
  - **1cm Rx** (brief summary by RN)— status similar to 3mm Rx
  - **1cm Continuum Filterbanks** (BT)— we have a final design and have placed an order with filtran; delivery will be within 2 weeks and BT expects that no additional fabrication iteration will be needed. The microstrip design (in simulations) appears to work quite well, with an estimated 7% loss in bandwidth (3% in sensitivity) compared to an ideal filter.
- **CIT Continuum Backend Status Report** — Caltech is preparing a proposal which we should receive soon. PJ emphasized that we need to hold a PDR in August so that we can commit the funding this fiscal year (by end of September). An open issue is how many units caltech builds (one, one plus engineering spare, one for each Rx, etc.). If there is just one backend in the receiver room at gregorian focus, then a remotely switchable interface to the two receivers will have to be designed and built (by CIT or NRAO). The feasibility of a single-backend arrangement may impact or depend upon the backend design.
- **Upenn Millimeter Array Receiver** — Highlights of the agenda for the upcoming (Wed 10jul) Penn Array meeting were discussed, mostly in connection with software. We should start to list the requirements for the control software interface; NR suggested that it would be helpful if this list emphasized the departures from existing interfaces (one of which will be extended & operationally restrictive tasks like cycling the He7 fridge).

DE reported that partly due to changes requested by the Penn folks, there won't be anything for them to take home with them on Wed. We should arrange a shop visit for Mark & Simon while they are here.

- **Site Characterization & Dynamic Scheduling** The site interferometer was taken out by lightning this spring, and also suffers from RFI. The tipper analysis system is also broken although probably easily fixed. We decided to get this going to help with K & Q band commissioning this fall. BM will talk to GW, JF, Simon Radford, & George Ryland (Joe McMullen & Jim Braatz for tipper) and coordinate efforts to get these online by fall. BM will find out from CB next week what K & Q-band proposals have been accepted, and pass this information along to RN & GW. This will also inform our assesment of short term Q-band requirements. RN noted that the K & Q band commissioning will affect the amount of time that MS and GW have available for new Rx development, and in particular that there is some work on the K band Rx which will have to be done before it can go up.

- **PTCS** (RP/KC) — The PTCS project currently has four main goals: a) refinement of the characterization and use of the Quadrant Detector, b) development of the Engineering Measurement System (EMS), c) development of the overall PTCS architecture, and d) upgrades to the Antenna Manager to handle multi-beam receivers. It was agreed that the EMS is not required for Q-band operation, but is necessary for other reasons. We are working on the assumption that no further work on the subreflector servo or active surface is absolutely required for Q-band. KC and Joe Brandt have discussed mechanisms which would to allow the Quadrant Detector output to feed in to the subreflector servo should this prove necessary. KC noted that there are a number of other problems affecting pointing (track splice plate motions, servoing problems and scan jerk) which may currently be limiting factors for Q-band operation. KC requested a clear specification of PTCS requirements in so far as different requirements may imply different allocation of resources. There was general consensus on the idea of iterative progress on these requirements. KC noted that Monte Carlo simulations may help clarify both the requirements and what is technically achievable.

- **Control & Analysis Software** — As noted above, we will begin to list req'mts for M&C from the Penn Array receiver; BM, RN, MS, & GW will also do the same for the 3mm & 1cm Rx's. NR requested a target date for M&C testing with the 3mm & 1cm Rx's, which RN will produce as noted above (we should also verify the timeline for the Penn Array on Wed).

  BM will begin discussions of Penn Array analysis software with Devlin this week and use these as a starting point for further progress on the array software specifications; BM will also talk with Joe McMullen while he is visiting and start to develop the requirements for the 3mm & 1cm Rx analysis software.