ECSV Discussion
23 October 2012, 10am in room 317

Attendees:

Sanjay Bhatnagar, Barry Clark, Vivek Dhawan, Dale Frail, Feng Gao, Miller Goss, Eric Greisen, Huib Intema, Christene Lynch, Ann Mao, Minni Mao, Drew Medlin, Heidi Medlin, Emmanuel Momjian, Robert Mutel, Steve Myers, Susan Neff, Kristina Nyland, Juergen Ott, Frazer Owen, Urvashi Rau, Dave Roberts, Michael Rupen, Deb Shepherd, Lorant Sjouwerman, Ken Sowinski, Ravi Subrahmanyan, Gustaaf Van Moorsel, Hsi-Wei Yen

Minutes:

News:
- We need to start thinking about preparing for the next CfP (out ~1jan13 that means the PST will start to be used on 1jan13), e.g., getting the documentation ready, doing last minute testing, developing best practice reduction heuristics (esp. 3-bit).   I'll be doing something similar to last time, asking everyone to help with updating specific sections.   So if you helped with a section of the OSS or script last time, you can expect to be contacted again this time.
- This is Ann Mao's last week (see her report on her work with instrumental polarization later in the meeting).

Correlator and general system health (Ken, Vivek, Michael)
- 3-bit sampler status:
    - New Correlator Back End (CBE) software was installed last night.   We ran 7 or 8 3-bit scripts in a row (before the CBE would fail after one 3-bit script ran and this was the biggest major blocker to doing 3-bit science)!
    - We are still missing some BDFs (binary data files) occasionally – Martin is trying to track down the issues.   It appears the CBE is not always 'getting organized' properly for the missing scans (a process startup problem).   This is now the biggest blocker to doing 3-bit science (we can get science but some of the data is missing).
    - The CBE crashed last night at around 2:30am.   This does not appear to be caused by the CBE upgrade but rather it appears to have been caused by the spawning of a process on node 5.   This is being troubleshooted.
    - All the 3-bit samplers were given a careful evaluation.   Out of about 50 poorly performing samplers, we are now down to about a dozen poorly performing 3-bit samplers.   We are getting there.

- o Vivek & Hsi-Wei have been evaluating the absolute gain calibration to estimate the accuracy of flux calibration transfer at different elevations and between the 3 and 8-bit systems.   So far, a couple of tests have been done at Q and Ku bands:
    - Initial results: if an observation stays above 30 deg elevation and below 70 deg, we can transfer flux calibration within 3%.
    - Between 3 and 8-bit flux transfer, the maximum difference on any single sampler is about 5%, but generally it is good to 3%.
    - Tests were done under extremely good conditions.   We need to repeat this under moderate and poor conditions.   There are also other issues that need to be tracked down.   One thing at a time.
- We re-booted the correlator to get new correlator module interface board (CMIB) software installed.   Narrow sub-bands should now work but this needs to be tested.   This should also fix a few of the baseline boards that were not configuring properly but this also needs to be verified.
- Sub-arrays are still a problem.
- Tests of the VLA maser laser are planned. Details are:
    - o On 24oct12 the reference standard at the VLA will be switched from the existing Maser to the Rubidium standard between 8 and 9 am. This is a test to see what happens when the switch is made. If the switch goes as planned, then the robustness of the system will be tested by switching back and forth a few times.   If this test works properly, then a second test will happen sometime in the near future to actually observe a science target using the rubidium standard.
- Further upgrades are planned for the CBE software to get ready for the new hardware.   The software upgrade may be happening in a few weeks but the new hardware will probably not be installed until early December.
- We have 4 internal 3-bit sampler science programs:
    - o PIs are: Mark, Claire, Hsi-Wei and Lorant.
    - o Deb also has a 3-bit continuum observation for testing.
        - Hsi-Wei has started with a submitted test block.   We need to get test blocks in for the other programs.   Please create a test SB to verify your SB setup and let Michael (and me) know when it is ready.   Michael or I will then run it through model2script and then submit the test for observations.
    - o For all 3-bit tests, please remember to use the WebTEST OPT followed by M2S.
- 8-bit: Steve & Ann have a polarization test to run to check 2 GHz bandwidth polarization properties.

Phased array test status
- Our end2end phased array + VLBA test block made in late September, TY020, didn't fringe (this was a DDC problem).   We think we know what the

problem is and as soon as we hear that that the DDC is working, we will schedule another phased array+VLBA test.

- Vivek and others have been looking at the VLA+VLBA calibration scheme. He finds that the phased VLA data are good to within about 20% with no special effort.   VLBA stability is also an issue: the gain loop running on the DDC has a random 10% error that needs to be addressed.

Software status:
- OPT
  - Working on user interface and m2s to support holography
  - Michael reported that the next version of the OPT is expected to be ready for testing in early December.   This is a problem because all testing and document preparation would then need to be compressed into a few weeks just before Christmas.   This is a problem.
- PHT
  - TAC support.
- PST
  - Started GOST Wideband integration

Pipeline:
- SSS group created a program for Drew that can send signals to pipeline given a list of exec blocks.   Drew hasn't tested this yet but expects to soon.

CASA (Steve, Juergen):
- The next release is CASA 4.0 and it should be out next week.
- The latest CASA 4.1 priorities for both ALMA and EVLA have been defined. The list is available at: http://www.aoc.nrao.edu/~smyers/casa/docs/CASA_4.1_DeliveryTargets-modified.pdf.   Highlights include:
  - A big refactoring of CLEAN
  - Weights: handling and proper calculation is included
  - Plotms: lots of nice improvements
  - There will be monthly stables and the status of the development (in the link above) will be kept up on a monthly basis.   This is the first time we are trying to track monthly, incremental progress and some iterations will be needed before we get it correct..
- Note: Frazer will give Steve a Linear polarization P-band dataset so he can calibrate the data in CASA and see if this works and we can start to create a regression script and then a 'casa-guide' for our users on how to do this.

Low-band – 4-band image (Frazer):
- Frazer presented Tracy Clarke's new 4-band image of Cyg A made with data from the last campaign.   The image, reduced in AIPS, looks reasonable.
- Ravi got MIRIAD to work with the 4-band data from the box-dipole test.

- The next low-band data campaign will have dipoles put up on 13 Nov (Tuesday). The dipoles will remain up until the Monday after Thanksgiving.
  - We should have 17 receivers up by then (although not all will likely be functional as issues are being resolved with the new receivers).
  - Contact Huib and Frazer if you want to help put up dipoles.

RSRO report from Ann Mao:
- Ann has been working with Steve and George to monitor the instrumental polarization of the VLA. In the past, on a scale of a few days, the polarization varied on a scale of about 0.1% and over a few months, it varied on a scale of about 0.5%.
- She has been using Steve's polcal runs at all bands to evaluate the same thing with the Jansky VLA.
- Ann presented plots of instrumental polarization on a single antenna (EA12) in C, X and Ku bands over the course of a year. The leakage amplitude is within about 3% and the variation of the leakage looks nicely stable.
- George is making modifications to the CASA calibration heuristics to support this calibration process and Ann hopes to get this analysis completed this week before she leaves.
- This is promising because eventually we would like to use the D-terms derived from one run and apply it to another run.
  - The implementation of how to do this during standard operations will be tricky. We will need to track changes to the array and schedule new D-term calibration runs when there are changes. We will need to be able to handle the retrieval of the solutions and application to datasets in a seamless way. Lots of fiddly-bits to work through.
- Ann is also looking at the Q and U calculations across a wide band. At L and S bands especially, if you don't do anything, you are injecting an artificial rotation measure across the band and into the dataset. Ann has created a script that corrects for this artificial RM as a function of frequency and then you calibrate the data with appropriate Q and U values. After proper calibration, you would then reverse the correction and restore the data to its original form.