

ALMA Weekly Progress Report

10th October 2003

Names: Bill Shillue (BS), Junaita Banda (JB), Sarmad Albanna (SA),
Christophe Jacques (CJ)
IPT: *Back End / Local Oscillator*

Photonic LO Reference

This summarizes the last 6 weeks:

1. LORR module(CJ):

Determination of needs and constraints with Rob Long

Initial layout of photonic LORR "cassette"

Selection of components, beginning of purchasing for said components

2. Front End Photonic Switch module (CJ,JB):

Completed deep search on all possible optical switches.

Narrowed down potential companies , and have thus far received 2 samples. One more is on the way.

Currently looking into testing/evaluation methods for these switches. Aiming to select vendor by the end of the month, and submit purchase order.

Contribution to FE-LO IC

3. CV photonics building (CJ):

Initial framework of needs and goals

Visit of the new buildings, interaction with R. Bradley

4. AOS technical building (BS,CJ):

Contribution to AOS TB/BE ICD

5. Photomixer bias assemblies (JB)

24 photomixer bias were completed and tested, as well as documented(serial numbers).All drawings, materials and design for bias box are on EDM

6. Line Length Corrector Tests (SA,BS,CJ,JB)

Extensive testing to determine cause of RF phase change due to fiber motion. Reports on this are in preparation.

7. Laser Synthesizer (BS,SA,CJ)

Successful proof-of-concept tests with DiCOS narrow linewidth DFB lasers. Report in preparation.

Statement-of-work prepares and issued as an RFQ for the Calibrated Tunable Narrow Linewidth Laser (CTNLL), available on EDM

Name: John Effland

IPT: Front End

Major Issues:

1. Cryo-3 HFETS: Marian Pospieszalski received no response from has last two e-mails to two JPL employees that were sent over the course of three weeks. He will call JPL in an attempt to expedite things. Gene Lauria has been asked to determine the development time to use some other device, although Marian thinks that would significantly delay the Band 6 schedule. If there's an unacceptable response from JPL this week, I recommend asking Marc Rafal and/or Fred Lo to accompany Marian and visit JPL.
2. Optical System: Matt Carter will measure the horn he has received from us to determine if the measured astigmatism is from manufacturing defects in the horn or from a design problem. We still haven't seen the measured data showing the astigmatism problem.

Progress:

Cartridge Construction

1. Geoff Ediss is awaiting LO waveguide and the "dummy OMT" from the shop so that we can rebuild the cartridge and commence RF testing. I'll work with our shop this coming short week to expedite things. He is writing up the finite element analysis of the mirror mounts received from Jingquan Cheng.
2. We just received from IRAM on Friday the horn and mirrors and IRAM now has our horn.

Mixer-Preamp Testing

1. Retesting of a previously tested mixer this week validated the JT-2 measurement system because the results were the same as those measured several weeks ago. Ralph will test another combination of preamps with a 2 SB mixer.
2. Gene Lauria is placing an order with an outside shop for 12 more preamps. Three completed but untested amps are due next week from the vendor ACC.

Cartridge Test Rack:

1. Dan Koller spent most of the week documenting the system. The RF vacuum window for the signal was installed. Better but still temporary IR filters are being fabricated without using the shop. Alex Grichener completed the coding to program the Lake Shore temperature monitors for DT-670 sensors but his code has not been tested. The code to retrieve the temperature monitor calibration information from the database was completed and tested.
2. The cold fingers were repaired by bending them, and chamfers have been machined into the bottom of all the cartridge cold plates. NAOJ is sending spare cooling rings.

Mixer Test Rack:

1. Internal Dewar wiring was completed and the temporary noise temperature software was partially validated. New temperature sensors were soldered to their mounts with indalloy #2 and the temperature problems have been resolved. Gene Lauria is writing a note describing the measured results from the various mounting techniques studied.
2. A photo of the internal Dewar components is available at:
<http://www.cv.nrao.edu/~jeffland/MixerTestDewar.jpg>

To be completed this week:

1. We will complete the recasting.
2. The LO waveguide and dummy OMT should be ready by the end of the week.
3. The first extensive testing of the mixer test Dewar will also occur.
4. The cartridge test Dewar will be ready to accept the cartridge for RF testing.

Name: Daniel Koller

IPT: Front End

1. Called Mike Flinko of Varian (410) 255-5049 to let him know about our bad TC gauges. He'll send us two new ones.
2. Received the cartridge top plate from the shop, and after having some holes re-drilled, I installed it.
3. I fixed the bent fingers on the 90 and 20 K stages and bent a bunch of them out to give them more clearance. Sekimoto will send us some extra sets of fingers. I returned one of the cold head thermal links in good faith.
4. Alex dropped a stepper motor controller and it won't talk to the computer. I ordered another unit while Ron and Todd try to find and fix the problem. I also helped Alex debug the newest chopper motor and get it running.
5. Gave drawings of the original Cart. Test Set filter supports to Ron to cut holes in for the filter rings. Filter holes were cut after I confirmed that the optics are properly aligned.
6. Took pictures of the Cartridge Test Set Electronics Racks and sent them along with the system block diagram to Philip Dindo and Charles Cunningham.
7. Spent a significant amount of time writing up new documentation for the test system and linking it all together. I completed and linked approximately 22 out of an estimated 31 documents needed to cover the test set. More will probably be added later.

Name: Kamaljeet Saini

IPT: Front End

(I) ALMA Work Element Sheet WBS: 4.255.1800

1. Completed measurements on the four pre-production Band-6 frequency triplers delivered by Virginia Diodes Inc (VDI). One amplifier in the warm multiplier assembly failed during the course of the tests and had to be replaced. The system was re-calibrated after the repair. Currently processing the data collected by the automated test-set to obtain performance plots for consolidation into a test report. This should help in finalizing return loss numbers in the specifications document (a TBD item) for ordering production quantities of band-6 and band-7 frequency triplers from VDI.
2. Received a revised "white paper" from VDI for a demonstration of Band-9 quintuplers with an improved efficiency at low drive power levels. This included a guarantee that the performance of the deliverables at the end of the development phase would be at least as good as that of the earlier prototypes. This increased the cost by 15K (33% of the total cost). Perhaps just ordering 3 more of the prototype frequency quintuplers and decoupling those from the developmental contract might be a better option.

(II) Other/Miscellaneous Tasks:

1. Meeting (Monday) with E. Bryerton, M. Morgan, M. Stogoski, J. Webber and S. Thacker to review the progress of the LO group. Minutes of this meeting submitted to C. Cunningham as weekly update.
2. Meeting (Friday) with E. Bryerton, M. Morgan, M. Solatka, M. Stogoski, S. Thacker to finalize the LO milestone chart for delivery of the first cartridge in April 2004.
3. Attended seminar by John Tucker (Univ. of Illinois) on Atom scale Si electronics.