NRAO/VLBA VLBI Progress & Plans

Jon Romney
NRAO, Socorro

Third US VLBI Technical Coordination Meeting
Areceibio Observatory
2007 / 11 / 29
NSF Senior Review

Update by Wayne Van Citters --

“The primary recommendation of the Senior Review concerning NRAO was the reduction in support for Very Long Baseline Array (VLBA) beginning in FY 2011, with the option of closure should additional sources of support not be forthcoming. **NRAO has been very active in pursuing possible partnerships to contribute to the operations support of the VLBA and although no formal agreements have yet been made, signs are very positive that funding sufficient to keep the VLBA operating will be found.** Again, no decisions will be made until the spring of 2009 when FY 2011 budgets are established. I am optimistic that a way will be found to keep VLBA running with reduced cost to NSF.”

Wayne Van Citters, Director of NSF / AST

2007 / 9 / 20

Partnerships Being Developed

… with (primarily) other federal agencies; NRAO effort led by Jim Ulvestad. Negotiations ongoing; specific details embargoed.
VLBA Sensitivity Upgrade

Two Basic Sub-Projects

Upgrade Selected Receiver Systems
  ... through replacement of LNAs.
  K-band upgrade nearing completion.
  Status report by Craig Walker, next talk.

Upgrade Data Path Downstream from IFs
  Digital Backend / Recording System / Correlator.
4-Gbps Data Path Upgrade

Replace All Equipment Downstream from IFs

2 IFs @ 500 MHz BW @ 2 bits / Nyquist sample → 4 Gbps.

Target completion: 2011.

New goal: Use in high-priority scientific observations ~ mid- to late-2008, even though limited by available media to very low duty cycle.

Wideband Digital Backend.
Wideband Recording system.
Wideband Correlator.
Digital Backend

First US VLBI Meeting (Haystack, 06/10/25-26)
Recognized potential synergy with Haystack DBE-2 plans.
Initiated joint collaborative development.

iBOB-2 Platform
Possibly attractive option, but also possible delay.
Collaboration with UCB & KAT progressing very effectively.
Prototype boards expected next month.
Progress report by Steven Durand, after lunch.
Digital Backend [2]

FPGA Implementation

NRAO to implement DDC-based “VDBE” personality.
  Delayed by iBOB-2 development.
  Goal: prototype installed at Pie Town station by May 2008.
  Plan overview by Steven Durand, after lunch.

Haystack to implement PFB-based “DBE2” personality, AND packetization for 10G Ethernet output streams.
  Interface: corner-turner memory.
  Intermediate test output/input?
  Target dates?
Wideband Recording System

Major Gap in 4-Gbps Data Path

Urgently need a way to transmit 4-Gbps data from new digital backend to new software correlator.

Haystack/NRAO Visit to Conduant (07/2/12)

Encouraging indications that 4-Gbps recording achievable.

… using Conduant’s new “Amazon” board, and well before 2011.

“Mark 5C”

Specifications developed by Haystack/NRAO/Conduant.

Comments requested from international experts; few received.

MoA difficult due to 3-party situation.

Serious Conduant timescale needed.
Software Correlator

**Two Different Options Under Consideration...**

**Software Correlation on Cluster System**

Everyone’s favorite option – if we can afford 4-Gbps system.
‘DiFX’ software written by Adam Deller at Swinburne University.

Variety of peripheral software required to interface to VLBA, most already complete.

“VLBA-18” mini-cluster benchmark results raised confidence that 4-Gbps system is feasible.

Procurement started for more substantial intermediate cluster.
Progress report by Walter Brisken, tomorrow afternoon.
Thank you