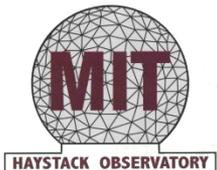


Haystack Status

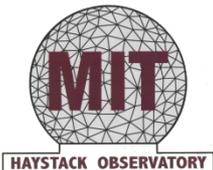
Colin Lonsdale / Chet Ruszczyk
Feb 9th 2016

MIT Haystack Observatory, Westford, MA



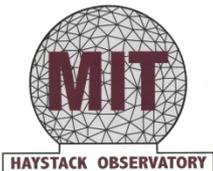
Projects

- Mark6 Status
- RDBE's
- Operations



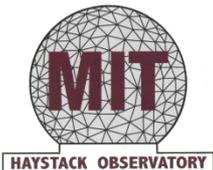
Mark6 Status

- Software Version 1.3
 - dplane (data plane - r/w to disk modules)
 - Version 1.21
 - cplane (control plane - VSI-S interface)
 - Version 1.0.24-1
 - Verified with Field System for VGOS operations
 - bug fix - ability to change a raid to a sg file system for a disk module
 - bug fix - corrected type in “runtime?”
 - python-m6utils (Mark6 utilities)
 - Version 1.0.9-1
 - On Haystack website : Mark6 Utilities
 - Description of all utilities in package



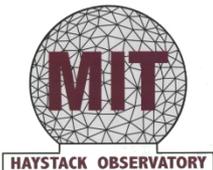
d-plane Versions

- 1.21 - released
 - A new algorithm for selecting buffer to write to disk to avoid data clumping
 - DiFX direct playback from a Mark6 Modules
 - Removes gathering step
 - Improves correlation time by factor of 4
- 1.20 - unreleased
 - Bug fix - ring buffer problem after long uptimes
- 1.19 - unreleased
 - Added the capability to accept undefined packets



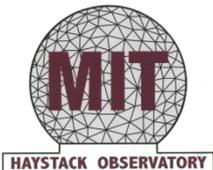
Mark6 Status

- Documentation
 - Command Set Version 1.1.2
- Self test software
 - Has been released with APP software bundle
- Conditioning software
 - hammer
 - Developed as part of APP project
 - m6-erase
 - Stand-alone module erase conditioning software.



Mark6 Status

- New Operating System under test
 - Debian Jessie 64 bit
 - c-plane has been modified and under checkout for verification
 - Some underlying utilities and method Jessie handles devices has changed and being addressed.
 - d-plane under test
 - pf_ring upgraded to newer version
 - Kernel support



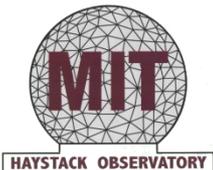
RDBE-G

- Roach Digital Backend - G
 - Deployed in VGOS Network
 - KPGO / Wf / GGAO
 - 3U form factor Version 3.0 firmware
 - Two IFs 512Mhz bandwidth
 - 16 channels - complex data
 - pricing estimated < \$18K



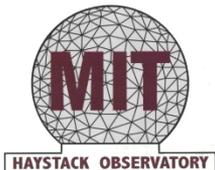
R2DBE's

- Roach2 based Digital Backend
 - Two IFs 1024 Mhz bandwidth
 - VGOS Compliant
 - Currently FPGA firmware under development
 - Leveraging SAO design for South Pole Telescope
 - Target is 2nd NASA VGOS antenna 2017
 - McDonald, Texas (MDO)
 - KPGO / GGAO will be retro-fitted.



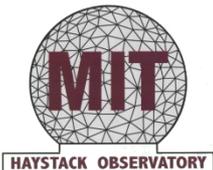
Operational Testing Status and Plans

- Correlator
 - Direct playback with DiFX
 - dplane version 1.21 allows direct playback from Mark6 modules
 - Multiple station correlation has been verified
 - Reduction in processing time by factor 4
 - Removes gather step



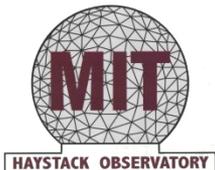
VGOS Operational Evaluation

- Broadband Westford to GGAO 12M
 - 4 RDBE-G -> Mark6 (8Gbps)
 - Bi-weekly sessions
 - 1, 6, and 24 hour sessions under evaluation
 - Work presented at IVS Tech Meeting
 - Expect more results at IVS General Meeting.
- Expect KPGO to be added
 - After acceptance by NASA (February 24th)



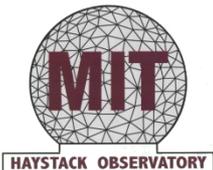
Field System Integration

- Improved consistency of sessions
- Faster setup, fewer setup errors
- Capabilities continue to evolve
 - KPGO Signal Chain Systems
 - Migration of equipment to VSI-S interface
 - Up down converters (UDC)
 - RF Distributor (RFD)
 - Frontend Monitor and Control Interface (MCI)
 - Cable Delay Measurement System (CDMS)



Astronomy Operations

- Event Horizon Telescope / BHC (32Gbps)
 - Preparing for next observing session in March
- Alma Phasing Project (64Gbps)
 - Adding features for Mark6 to ease operations
 - Preparing for 2017 observing cycle



Questions?

Please email Chet

chester@haystack.mit.edu

