

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY**

**HAYSTACK OBSERVATORY**

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27 March 2003

TO: Distribution  
FROM: Alan R. Whitney  
SUBJECT: 19 March 2003 e-VLBI telecon summary (updated)

Attendees:

Lee Foster, Pat Gary, Kevin Kranacs, Bill Wildes – GSFC

Tom Lehman – ISI-E

Peter Schulz – MIT Lincoln Lab

Kevin Dudevior, Hans Hinteregger, Arthur Niell, Alan Whitney – Haystack Observatory

This telecon is one of an ongoing series of telecons to prepare for gigabit/sec e-VLBI demonstrations between NASA GSFC and MIT Haystack Observatory using a combination of network facilities including all or part of GlowNet, Bossnet, ISI-E, SuperNet, Max and GSFC/HECN.

**ACTION ITEMS ARE HIGHLIGHTED IN RED.**

Project Report

- Final report is completed; awaiting final clearance from Lincoln Lab, which hopefully will come very soon. Author list has been updated as well as few other minor edits and corrections.
- Alan will distribute an e-VLBI PowerPoint presentation that he has prepared (done) and that Peter used in a presentation to Qwest. **He will also put all of the figures of the report into individual PowerPoint slides and distribute.**

GigE Switches

- Kevin reported on test he has done with the \$1600 Dell 5224 GigE switch. In a simple test connecting two workstations through two of these switches (connected back-to-back), and using jumbo frames, Kevin observed sustained throughput of ~990 Mbits/sec, near the theoretical limits of GigE. Further tests on a 24-node Beowulf cluster at Haystack are planned in a couple of weeks. One of these Dell switches has been given to Russ Roberge and Rick Larkin for further testing with more sophisticated equipment at Lincoln Lab. **Rick and Russ promised to write a report on their results.** If the tests are successful, Extreme Switches at Haystack on loan from LL will be replaced with these Dell switches.
- Pat indicated he plans to acquire and evaluate some inexpensive switches (perhaps SMC).

### Jumbo-Frame Support

- Jumbo-frame support to 9kB is now in place all the way from Haystack to Abilene (via either ISI-E or MAX).

### Glownet/Bossnet

- e-VLBI now has a dedicated GigE wavelength from Haystack to Lincoln.
- Peter reported that Bossnet has now been fixed and is now successfully operating at OC-48 in a single optical loopback LL-to-D.C.-to-LL (~2000 km without regeneration). OC-48 is ‘out-of-band’ so that it will not interfere with GigE link.

### Abilene Connections

- There are three connections to Abilene via Bossnet, one direct and two indirect:
  1. Directly via the Juniper M40 at ISI-E [G10 on diagram].
  2. Indirectly through the Juniper M40 at ISI-E [G10 on diagram] via the Juniper M160 at ISI-E [H3 on diagram] and the Juniper M160 at Eckington [H7A on diagram]
  3. Indirectly through the Juniper M40 at ISI-E [G10 on diagram] via the Juniper M160 at ISI-E [H3 on diagram], the Juniper M160 at UMCP [H7 on diagram] and the Juniper M160 at Eckington [H7A on diagram].

### Connection to GGAO

- Pat reported that connection to GGAO was restored shortly after last meeting. Subsequently, Bill Fink measured ~970-980 Mbps between ‘pluto’ at GGAO and ‘superglide’ at LL.

### 10GigE Possibilities

- Tom has couple of Nortel 8600 Passport Router Switches with 10GigE interfaces. Considering locating one at LL and one at ISI-E for 10GigE tests.
- Pat appealed that we should continue to look forward to 10GigE and keep our eyes open for new equipment and subsystems. He is looking how to get from ISI-E to GSFC at 10Gig. Possibility: LuxN has 10GigE optical channel module that has been recently demonstrated which assigns a separate wavelength for 10GigE. Must also consider what is at endpoints that can handle 10GigE; some products beginning to become available. 10GigE NIC cards: Intel and S2IO both have announced 10GigE NICs, designed to work with PCI-X.

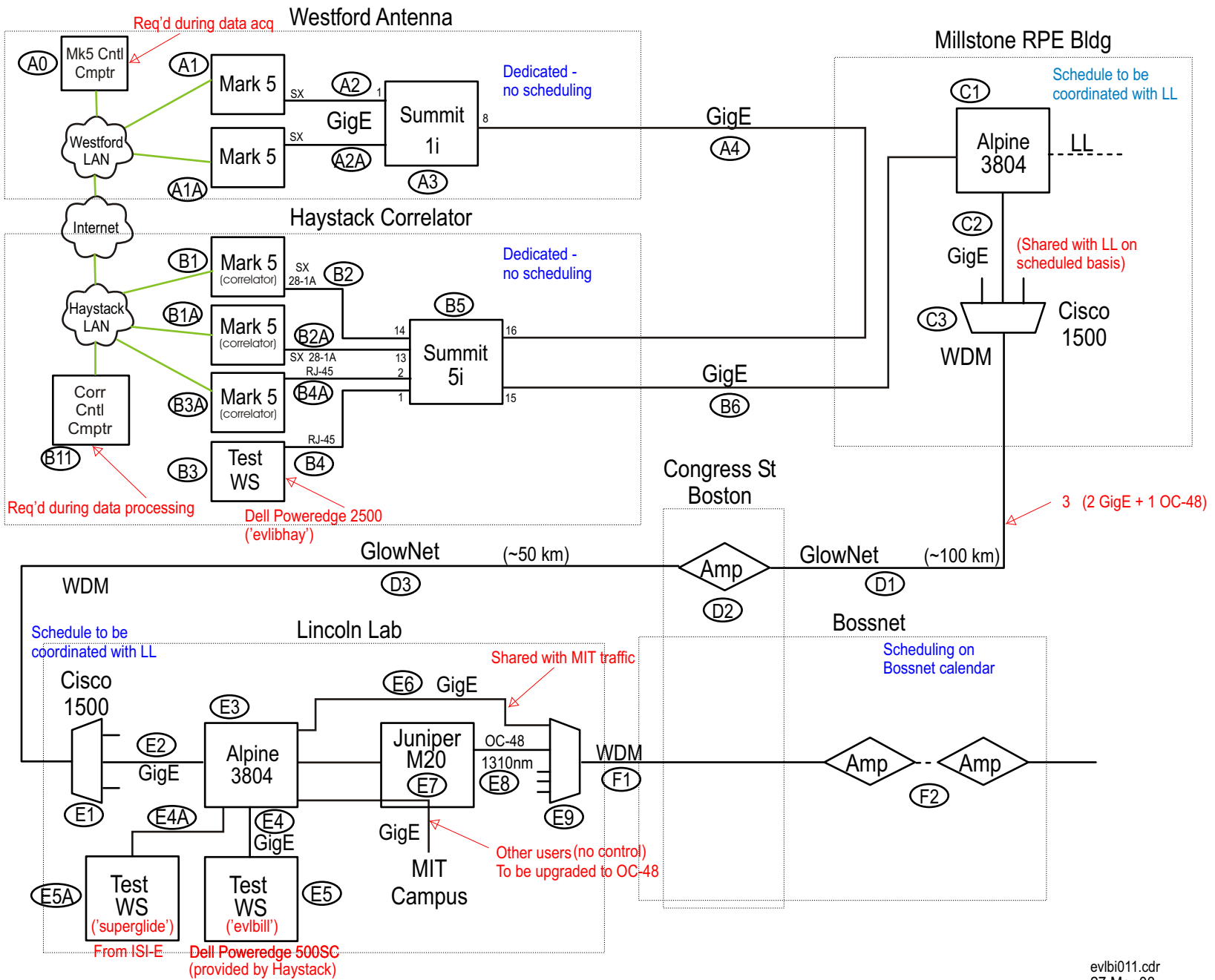
### New Haystack Hire

- Haystack has just hired Dr. David Lapsley in support of the e-VLBI network research program. David will join Haystack in early April.

### Next telecon

Next telecon is scheduled for **Mon, 14 April 2003** at 2 pm EDT.

xc: Steve Bernstein, LL  
Jim Calvin, LL  
Rick Larkin, LL  
Lorraine Prior, LL  
Peter Schulz, LL  
Leslie Weiner, LL  
Herbert Durbeck, GSFC  
Bill Fink, GSFC  
Lee Foster, GSFC  
Pat Gary, GSFC  
Chuck Kodak, GSFC  
Kevin Kranacs, GSFC  
Paul Lang, GSFC  
Aruna Muppalla, GSFC  
Bill Wildes, GSFC  
Dan Magorian, UMCP  
Tom Lehman, ISI  
Jerry Sobieski, Max  
Richard Crowley, Haystack  
Kevin Dudevoir, Haystack  
Hans Hinteregger, Haystack  
Arthur Niell, Haystack  
Joe Salah, Haystack



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Figure 1: e-VLBI Path - Haystack to ISI-E

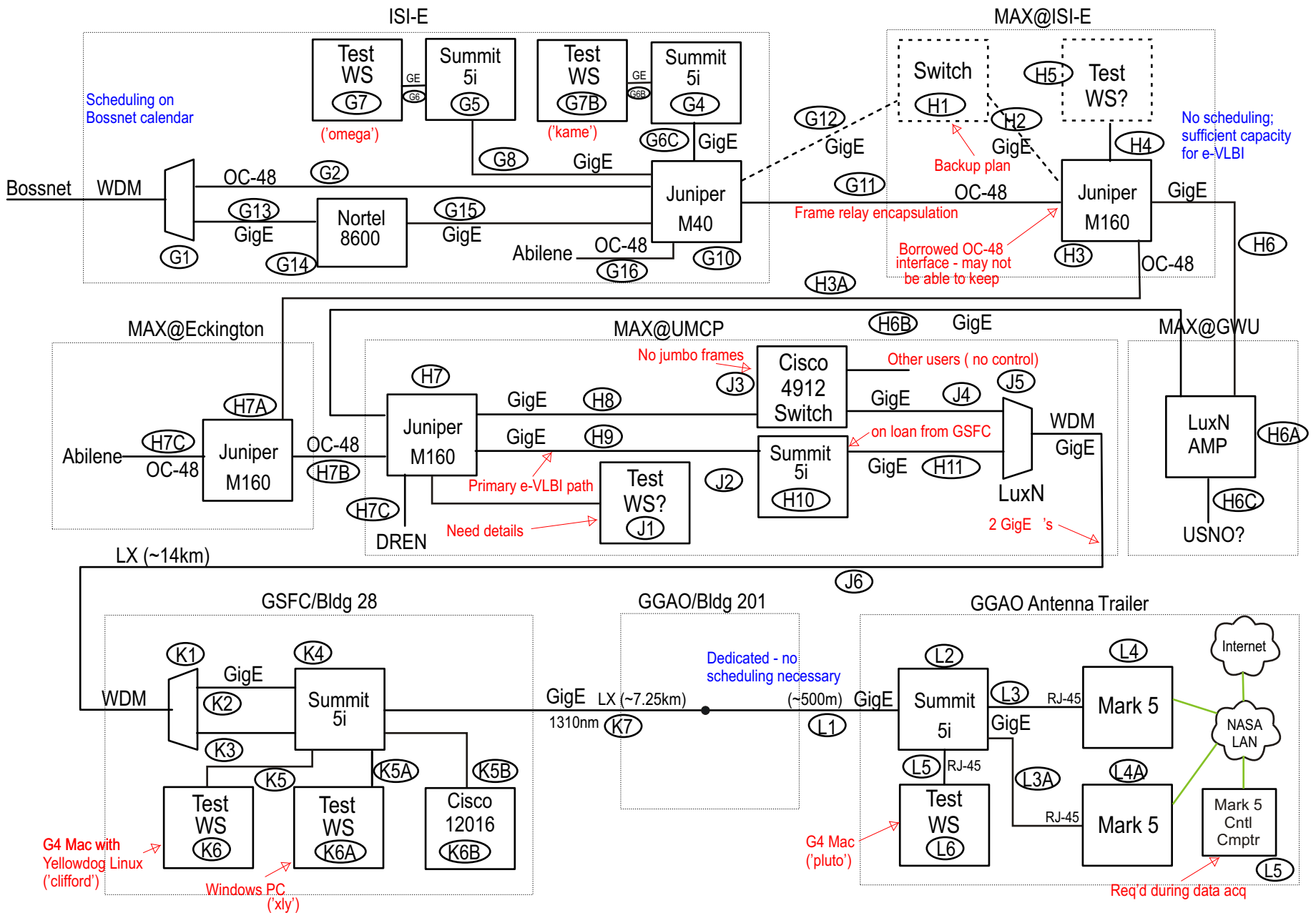


Figure 2: e-VLBI Path - ISI-E to GSFC/GGAO