

Beyond Worst Case: Good News

Shadi AbuGhazaleh, Ph.D.

Hubbell Premise Wiring

IEEE802.3 Interim May 2003

10GBASE-T

Typical Installation Evaluation

- What does the C6 installed base look like?
 - NEXT
 - ANEXT
- Does the number of connectors matter?
- Thoughts on Insertion Loss.

Cabling Setup

Category 6 (Class E)

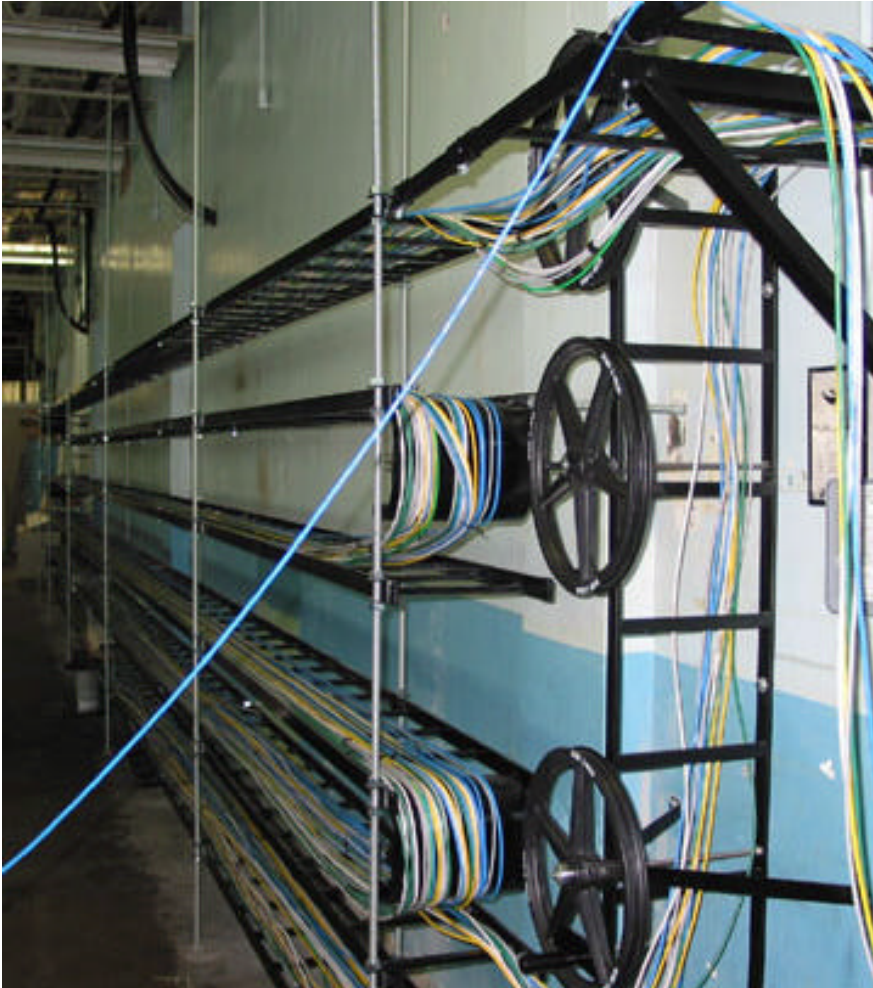
100 m long channel. (Also have 60m, 30m and 10m, data not presented here.)

Bundles of 3 cables of same type in each bundle.

Loose bundles, straps every 1 to 4 ft (depending on location).

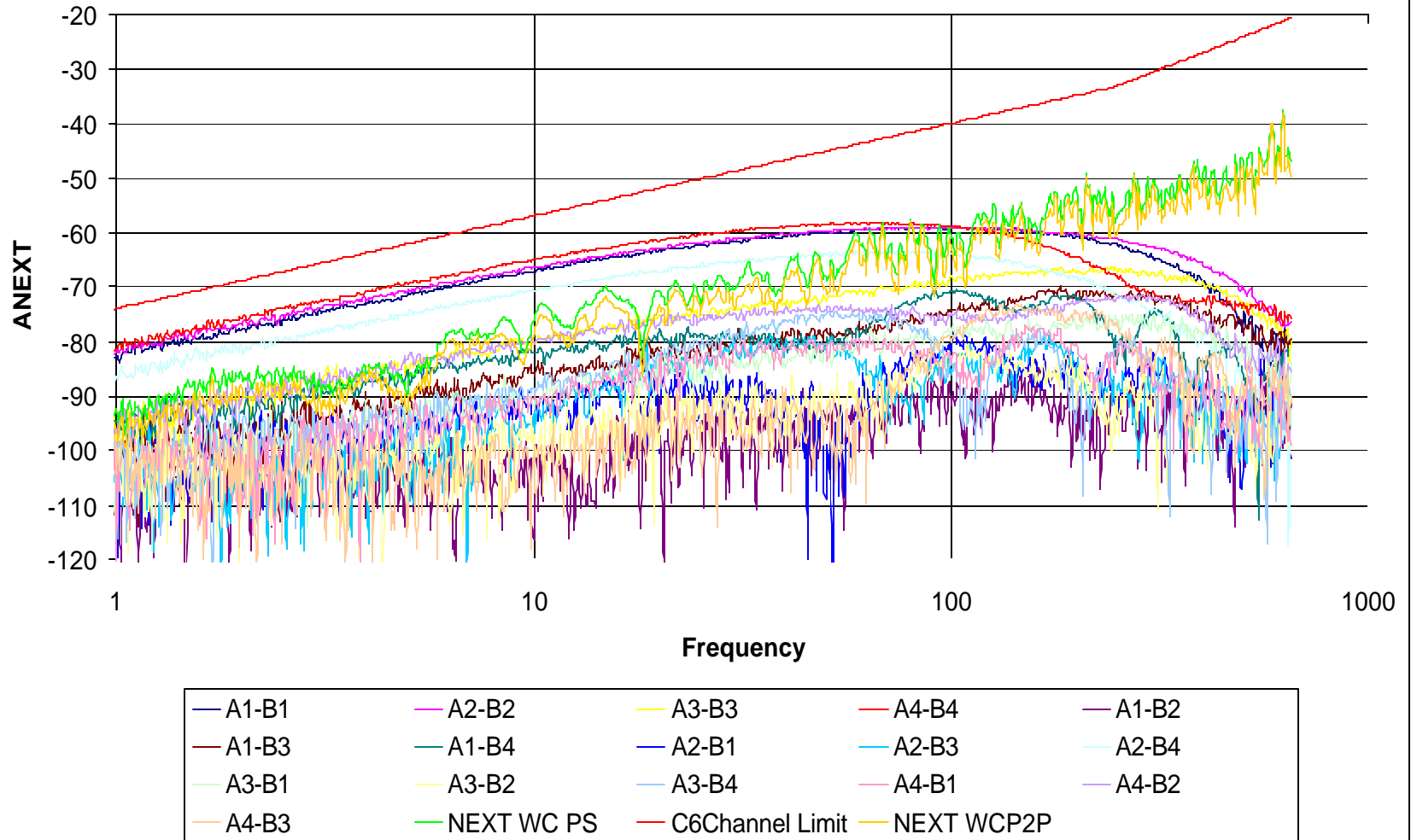
4 Connector Channels, adjacent Panel Ports.

Older Hardware of several manufacturers tested. Typical shown.



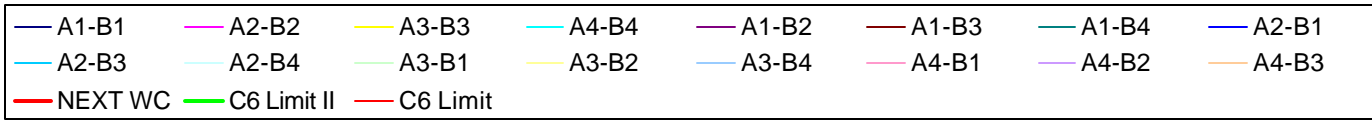
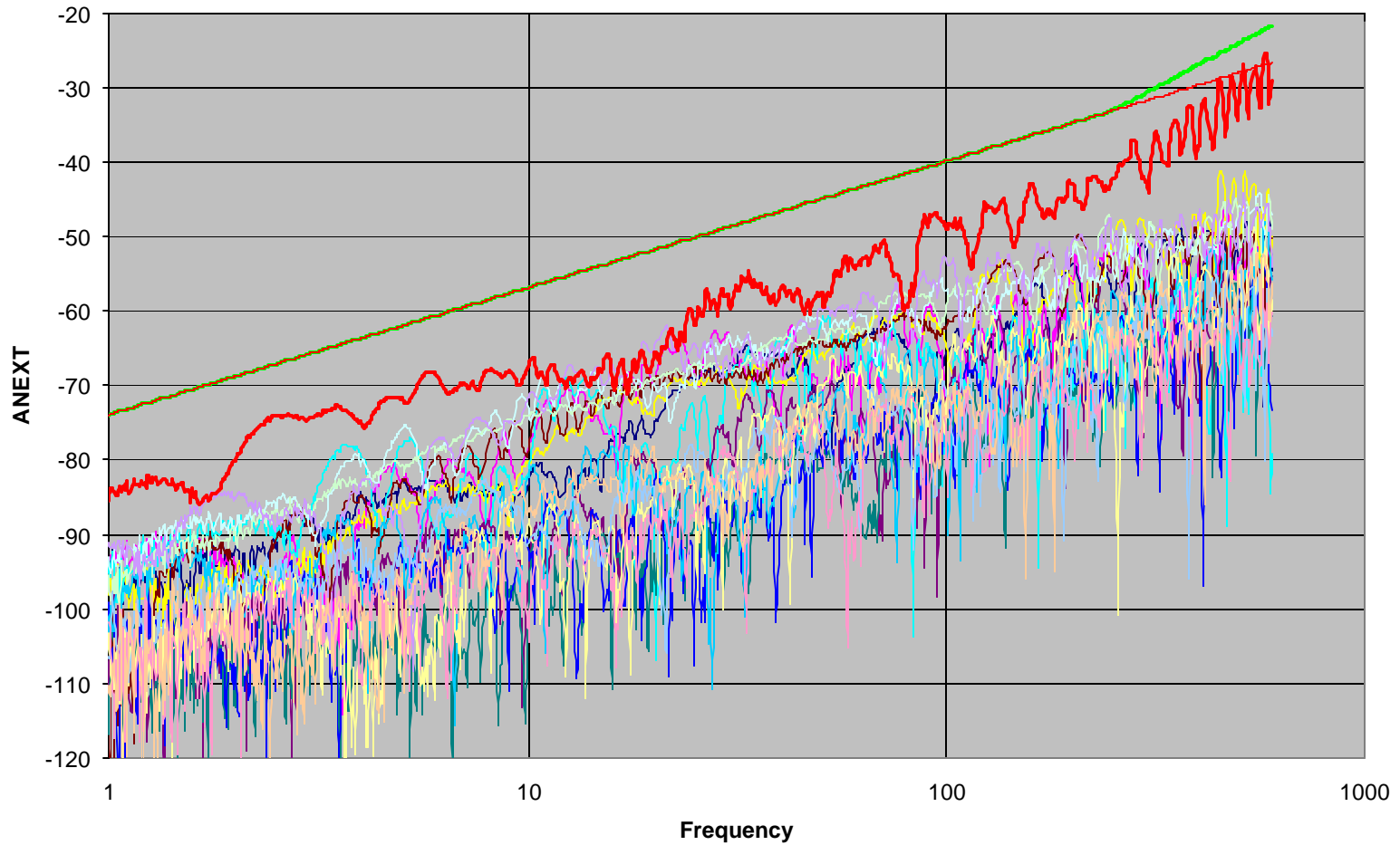
ANEXT vs. NEXT – Same Cable Type.

ANEXT vs. NEXT for cables shown against C6 Channel Limits - Loose Bundled C6 Cables



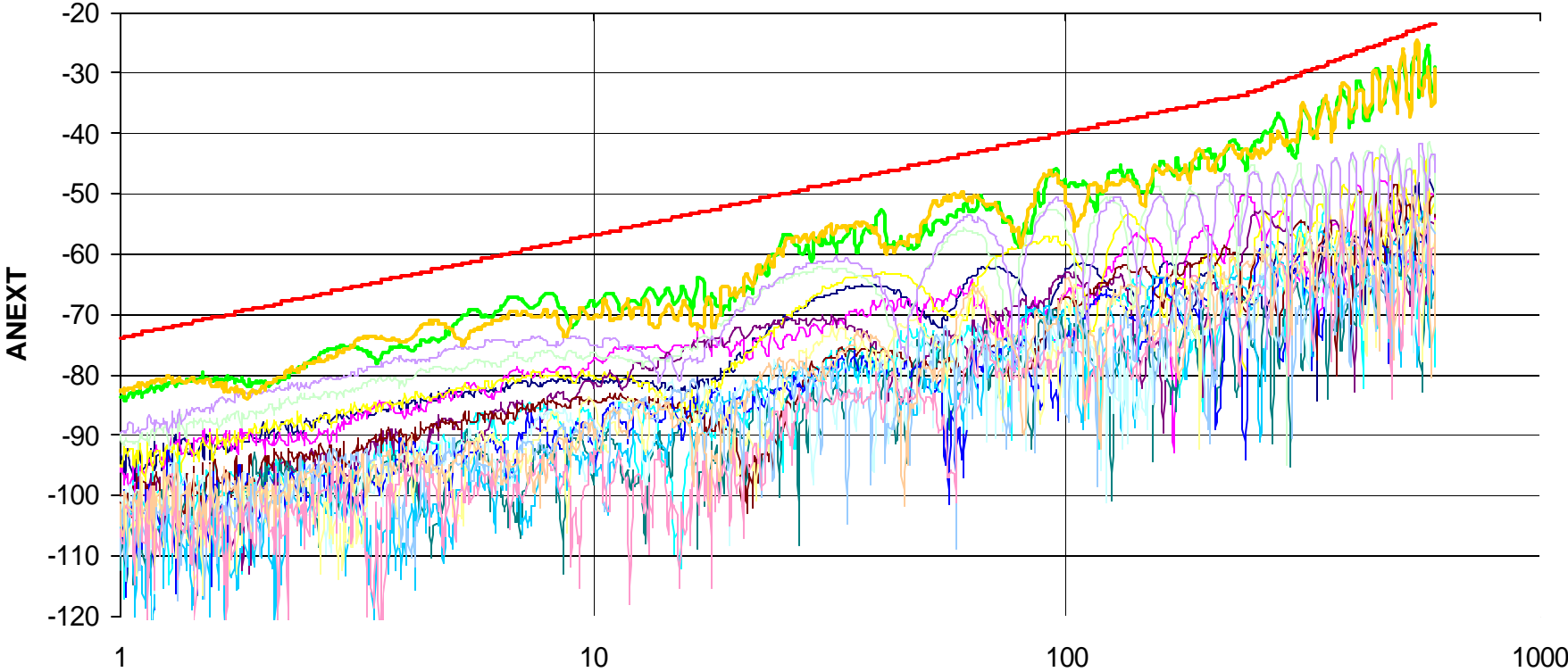
ANEXT vs. NEXT C6 Channel

ANEXT vs. NEXT - 4CC using same nominal C6 Cable in both channels



Two different C6 Cables in the two 4CCs.

ANEXT - two different C6 Cables

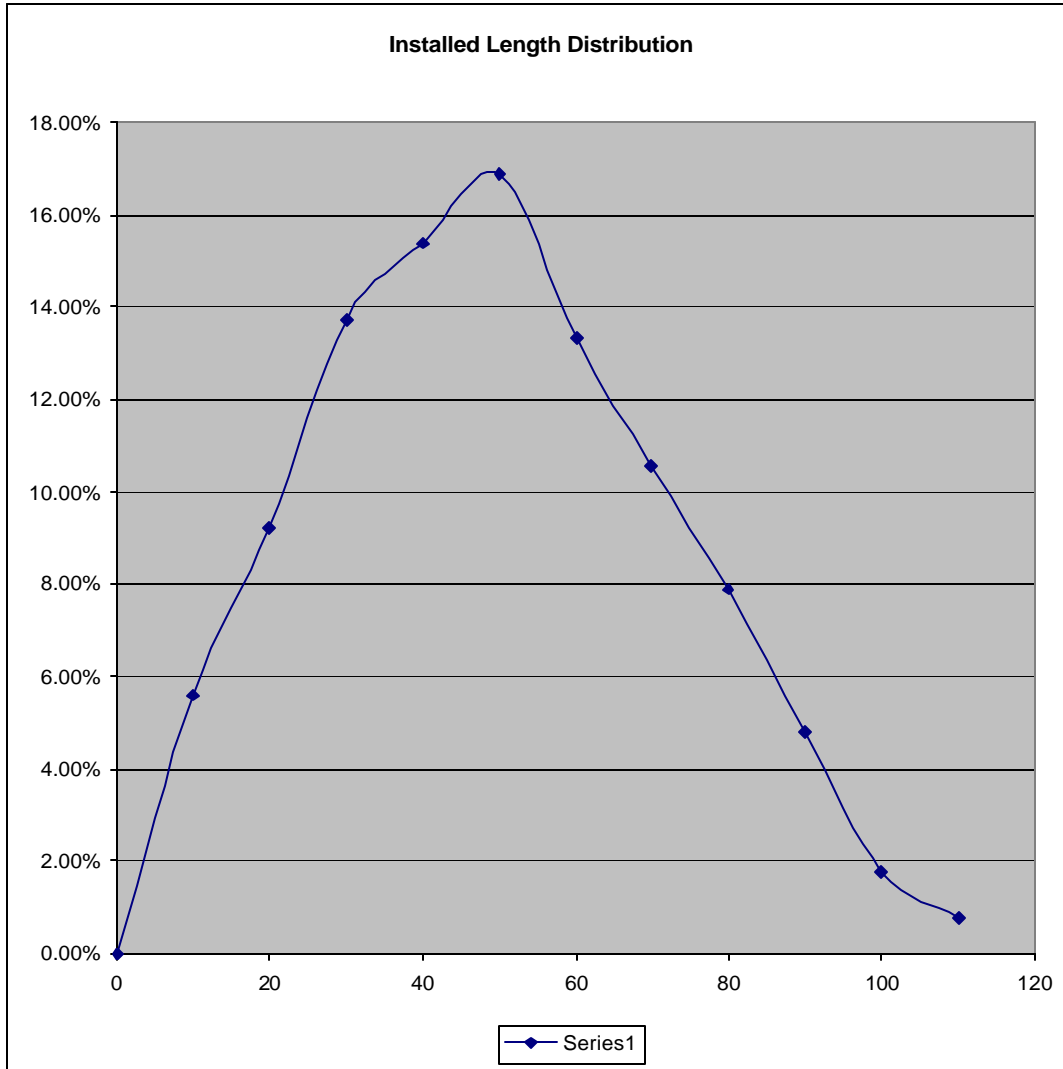


— A1-B1	— A2-B2	— A3-B3	— A4-B4	— A1-B2
— A1-B3	— A1-B4	— A2-B1	— A2-B3	— A2-B4
— A3-B1	— A3-B2	— A3-B4	— A4-B1	— A4-B2
— A4-B3	— NEXT WC System 1	— C6 Limit	— NEXT WC System 2	

Conclusions: What do installed channels look like.

- NEXT is worse than extended C6 limit.
- ANEXT is better than “Worst Case” being shown in Capacity Calculations.
- Return Loss is better than C6 Limits Extended.
- Number of connectors matters only close to measurement end.
- How About IL?

Insertion Loss



Insertion loss depends on:

- Cable performance
- Channel length

Think About It

Expected W.C. IL = P(W.C. margin) x P(length)