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## **Equalizers for 2.5Gb/s over copper HSSG - Copper Ad Hoc**

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## Copper ad hoc IEEE 802.3 HSSG

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- Objective: Demonstrate Technical Feasibility of 100m over copper: objective b., 2.5Gb/s over 100m
- Existence Proof
  - GD16510 2.5Gb/s Adaptive Cable Equalizer
- Background
  - An existing market employs 75 ohm cable at 100m to 150m lengths.
  - Technology developed for the Digital Video market (1.485Gb/s) has been adapted to the SONET market (2.488Gb/s)
  - Adaptive equalization technology should adapt to differing cable transfer functions

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## GD16510 2.5Gb/s Cable Equalizer Background

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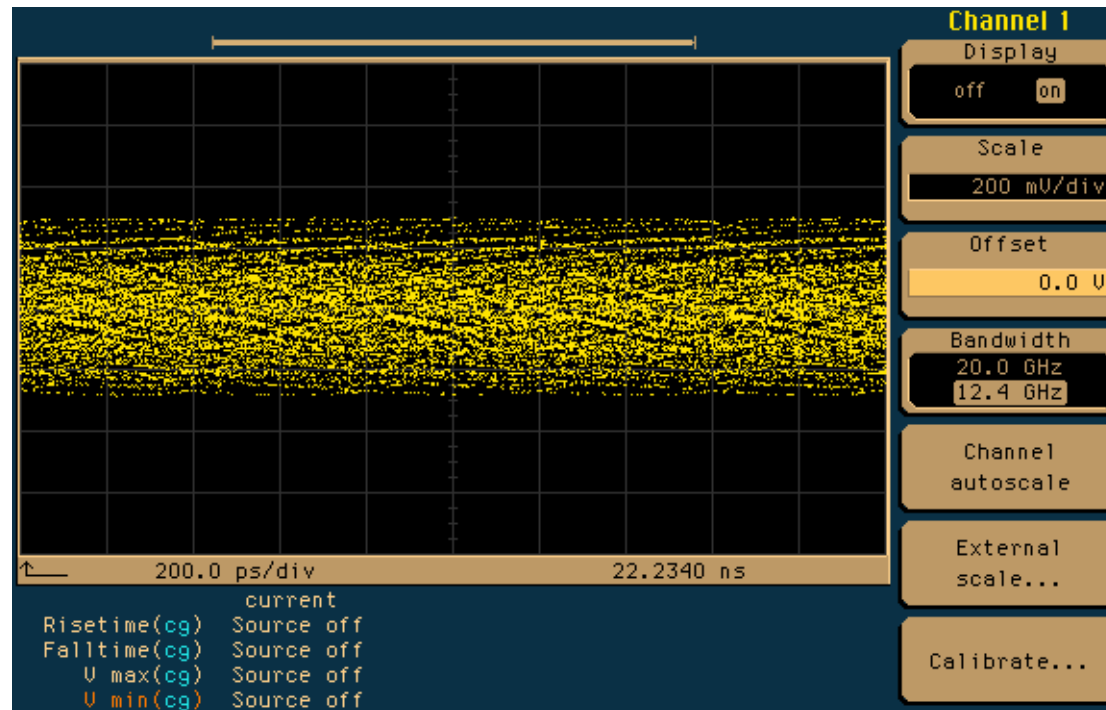
- Nominal target cable: Belden 8281 cable
  - Typical cable conforming to SMPTE292M
  - From 8.2.2 of SMPTE292M: “It is necessary for the frequency response of the coax loss, in decibels, to be approximately proportional to  $1/\sqrt{f}$  from 1MHz to the clock frequency of the signal being transmitted...”
- GD16510 compensates for more than 20dB loss at 1250MHz
- Follow on device scheduled for 4Q99 Sampling
  - Provides 35db of gain
  - Up to 150m of cable
  - 16 pin SOIC package
- Equalization for 10Gb/s not indicated
  - Cables no longer have  $1/\sqrt{f}$  behavior
  - High gain at high frequencies becomes more difficult

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## Unequalized output after 70m

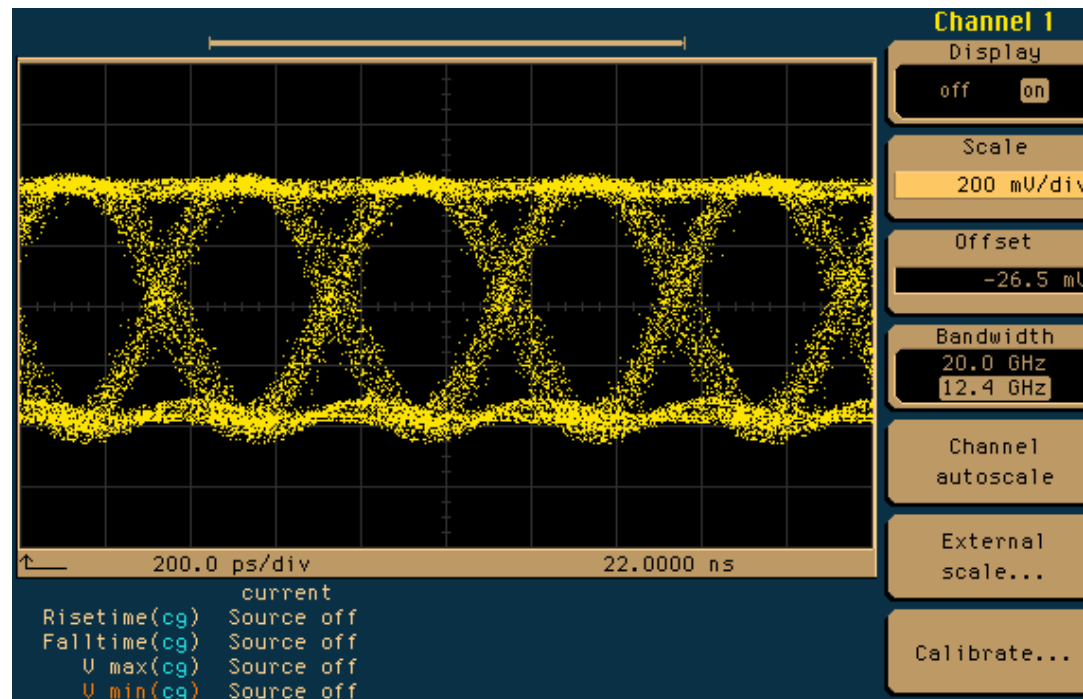


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## Output of equalizer with 70m of cable



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## Equalizer Applicability

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- Technology existence proof provided for Coax
- Existence proof must be put into place for Cat6, or other cable candidates
- Next Steps
  - Simulate Cat6 transfer function (Can anyone provide models?)
  - Bench test with Cat6 cable
    - GiGA will provide test platform
    - Can network / UTP savvy house perform the testing?
- Data sheets and test reports will be provided upon request.  
Email me a [woodruff@giga-na.com](mailto:woodruff@giga-na.com)

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