Berk-Tek

X3T9.2/90-017

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 3

To Mr. John Lohmeyer	From John A. Gibson
Co. NCR Corp	Co. Berk-Tek
Dept.	Phone # 717-354-6200
Fax # 316-636-8889	Fax # 717-354-7944

132 White Oak Road
New Holland, PA 17557

717/354-6200
FAX 717/354-7944

December 20, 1989

To: ANSI X3T9.2 Cable Working Group

Fr: J. Gibson, Berk-Tek, Inc.

Subject: Proposed Near End Crosstalk Measurement Procedures

The attached procedures briefly outline two methods of determining the degree of electromagnetic coupling between two signal paths, within a cable. There may be some debate on the most appropriate method, as well as the number of "disturbing " pairs that should be energized, when measuring the crosstalk to a selected "disturbed" pair.

Method 1 has been commonly used in the cable industry. The variations of the method usually relate to the type of signal source and the means for determining the input and crosstalk power levels. This method measures the effect of a single disturber on all other pairs, which should suffice for determining the relative differences between the various cables submitted for evaluation to the systems customers such as Sun Micro, DEC, and HP.

Method 2 is similar to Method 1, except that the input signal is a fast rise time pulse, and the output on the disturbed pair is measured using a digitizing oscilloscope. Berk-Tek will be testing two products submitted, using this technique, in order to compare it to the analog signal method described in Method 1.

Both methods assume a differential input, requiring that a BALUN transformer be connected between the input cable of the power source and the output of the cable under test. This is not shown in the simplified schematics of Figures 1 and 2. Berk-Tek will be making some measurements using an unbalanced, single end connection, for comparison. Manufacturers and end users will have to agree on the most appropriate test configuration, if this test becomes a qualification or production test requirement. All interested parties should comment on the proposed methods, and attempt to perform the testing on selected products, before the working group meeting on January 8, 1990, in San Jose. Please contact me directly with comments, at 717-354-6200. Thank you.

Method 1 - Swept Fequency Analog Near End Crosstal Measurement

Equipment

* Sinusoidal Variable Frequency Signal Generator, 1 MHz - 50 MHz
  (Frequency range subject for discussion)

* Power Meter, capable of measuring output power of disturbed pair, over specified frequency range.

* Termination Resisitors - 3 required per measurement, value based on cable characteristic impedance

* Balanced to Unbalanced transformers- 2 required

Test Sample Preparation

* Sample Length - 20 ft

* Strip jacket back 1.5 inches

* Remove .5 inches of insulation from each insulated conductor

Test Measurements (See Figure 1)

* Select disturbing pair

* Attach appropriate value resistor to far end of disturbing pair

* Attach appropriate value resistor to near and far end of disturbed pair

* Measure power level of input signal into disturbing pair (Pi)

* Measure power level at near end of disturbed pair(Po)

* Express NEXT in dBs based on :

$$NEXT\ (dB) = 10 \log (Po/Pi)$$

Note: The details involved with the need to use power/signal splitters for reference signals has been ommitted, as are options such as automatic sweeping over the specified frequency range and the plotting of data. It is assumed that all interested parties conducting such testing, are aware of these requirements and options.

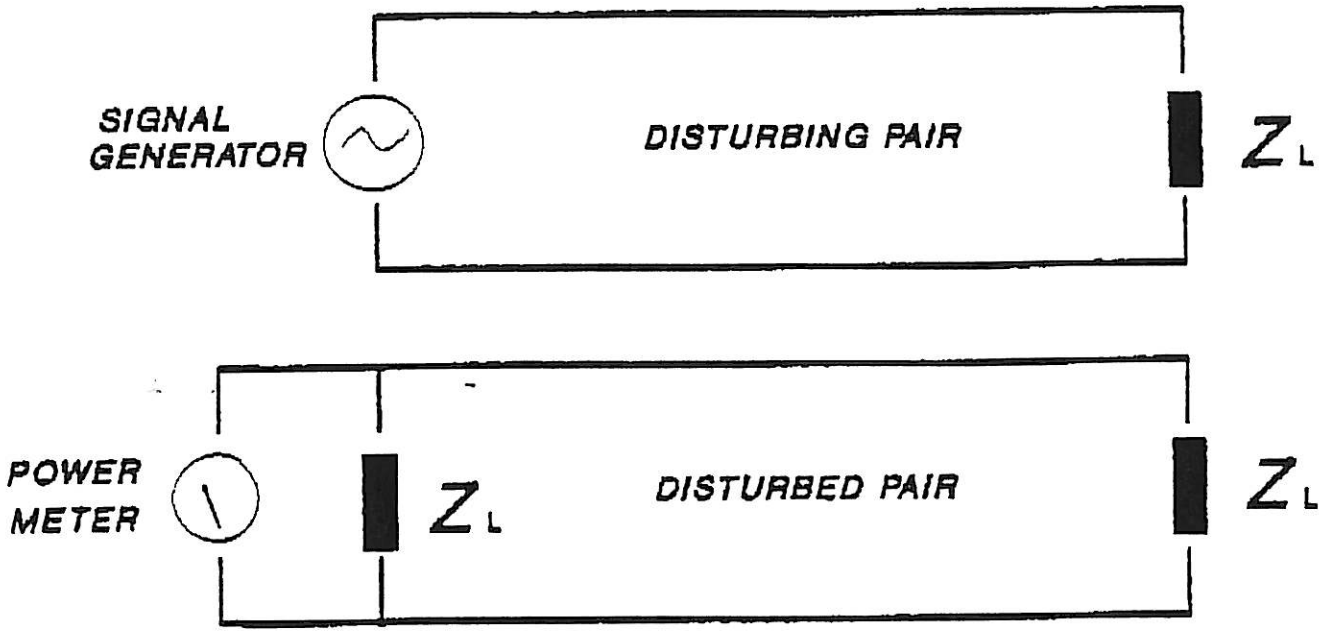

FIGURE 1 - Method 1 NEXT Circuit Schematic

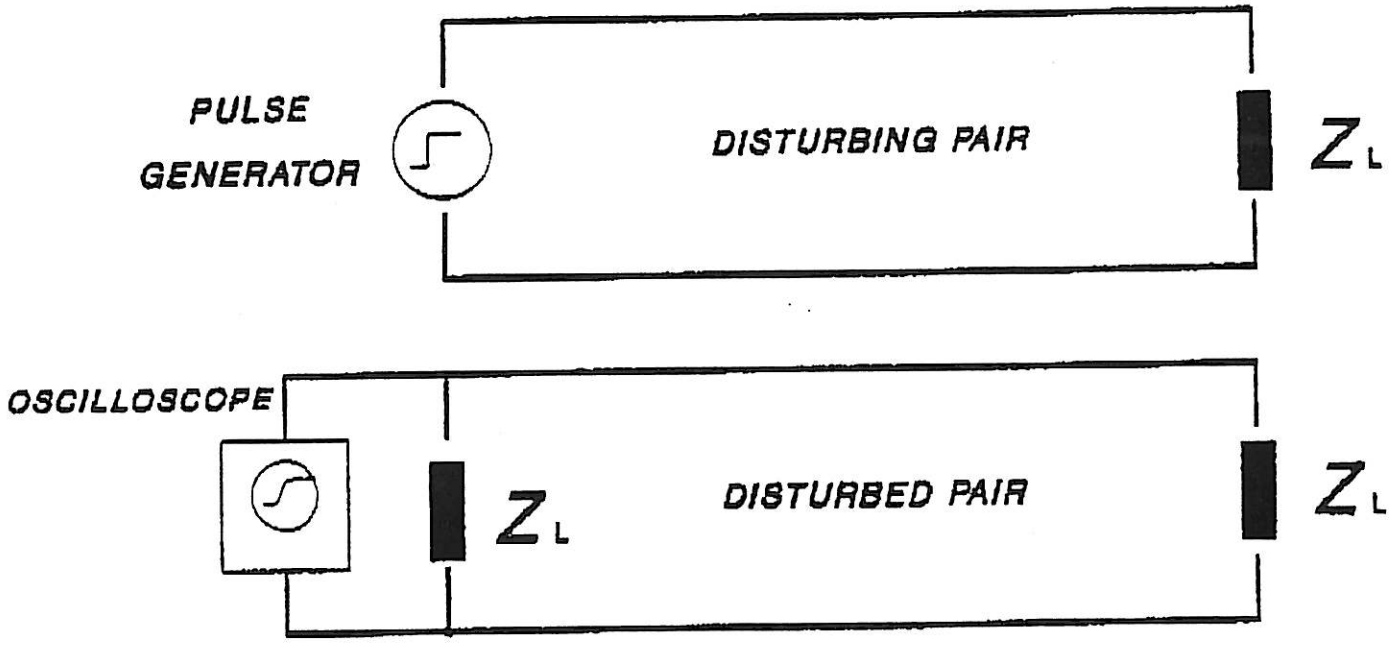

FIGURE 2 - Method 2 NEXT Circuit Schematic