



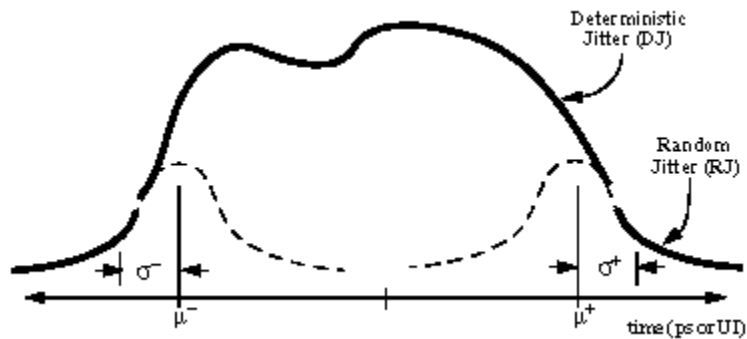
Product Description — Random Data Application Program

In addition to the standard WAVECREST *Virtual Instruments Signal Integrity*[™] software, the CDROM contains a special Random Data Application Program. This Random Data Application is intended for use on dataCOM systems where neither a bit-clock nor pattern marker are available. In addition, it has the ability to measure Deterministic Jitter (DJ) and Random Jitter (RJ) even on purely random data.

Note: When using this window, it is imperative that an accurate Bit Rate is specified.

The DJ is obtained by taking a series of measurements across various pattern spans. The DJ is then calculated based on the difference between the largest average deviation from expected edge position and the smallest average deviation from expected edge position.

The RJ is obtained by performing a series of tail-fits across various pattern spans. The tail-fit method is based on Appendix D of the ANSI T11.2 Fibre Channel - Methodologies for Jitter Specification. This technique operates under the basic assumption that the tails of the jitter distribution are truly Gaussian and that all other sources are bounded and deterministic.



First, the tail region of the histogram of measurements for a given pattern span is isolated. Then, an optimization routine is used to determine the best-fit coefficients from which the 1-sigma value is obtained. This operation is performed on three or more pattern spans to ensure reasonable frequency coverage from the corner frequency to Nyquist. The number of pattern spans selected will affect the acquisition time and can be adjusted using the *Tail-fit* option.

Once this process is complete, a Bit Error Rate (or Bathtub) Plot is calculated by convoluting the deterministic and random Probability Density Functions (PDF's). The total jitter is then extracted from the Bathtub Curve based on the user-specified *Bit Error Rate*.

Installation

The Random Data Application can be installed by inserting the CD into the CDROM drive and running the **Random.exe** program. This program will guide you through the selection of an installation directory and the creation of a shortcut with which to launch the application. After installation, the GPIB settings for your environment can be configured by selecting *Tools/Configuration* from the main menu.

Note: This program is only available on Microsoft[®] Windows[™] operating systems at this time.

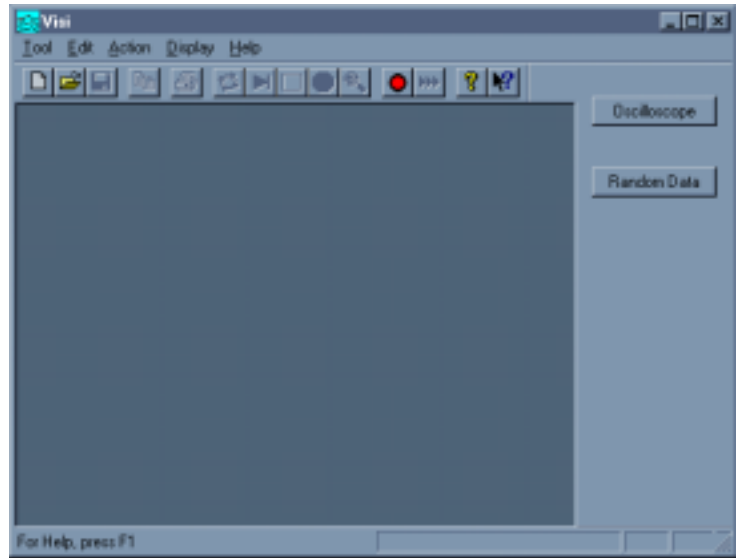


Performing a Measurement

Start the Random Data Application

The Random Data window is opened by clicking on the **Random Data** button or selecting **Tool; New;** and then choosing **Random Data**.

Note that there is also an **Oscilloscope** window available in this application. Context sensitive help is available to explain the configuration options.



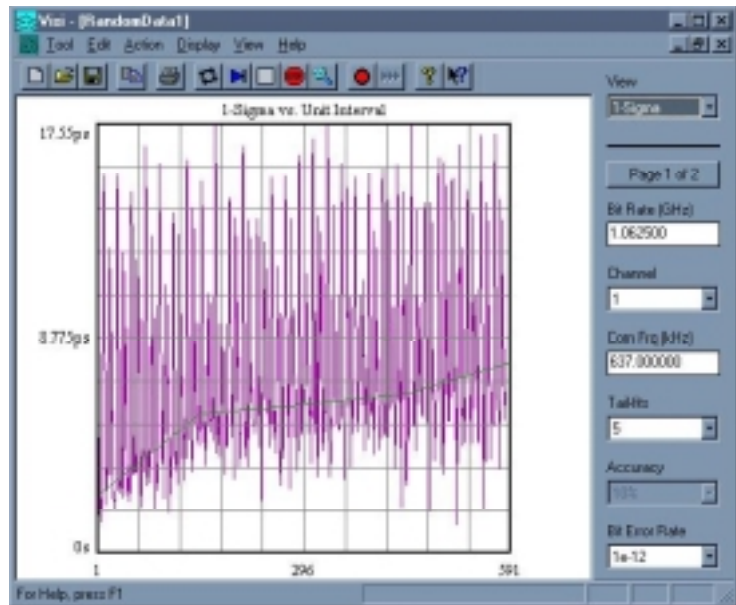
A measurement is taken by selecting the **Acquire** button on the toolbar.



NOTE: Due to the amount of data required, a typical measurement may take as long as five minutes.

A “BUSY” indicator will appear in the status area in the bottom right of the window

When changing views, the data is not re-acquired. Each of the five views shows information from the most recent Acquire.





Random Data Specific Configuration Options

View

Selects the view to be shown in the current window. A new view can be selected without acquiring a new measurement.

Bit Rate

The average Data Rate of the signal, entered in gigabits per second. An accurate Bit Rate is crucial because it is used in the calculation of the various jitter components. The default is 1.0625 Gbit/s, which is the standard Fibre Channel speed.

Channel

Selects either 1 or 2 for single channel functions. In some windows, BOTH is also an option. The default is Channel 1.

Corner Frequency

The Corner Frequency is used to determine the maximum measurement interval to be used in sampling and is entered in kHz. A lower corner frequency extends the time required to acquire the measurement set. Below the corner frequency, a natural roll-off of about 20dB per decade is observed. The default value is 637kHz, which is the Fibre Channel standard.

Tail-fits

Determines the number of pattern spans to be measured for calculating random jitter. The default mode will automatically determine the number of tail-fits that are necessary to ensure no frequency bias exists. When using this mode, three tail-fits are initially performed and an RMS jitter is calculated. Additional tail-fits are then performed between the initial tail-fits. If the resulting RMS jitter is not within the percentage specified, the process is repeated. The percentage can be specified using the **Accuracy** option. Optionally, the number of tail-fits to perform can be explicitly set.

Accuracy

Determines the percentage within which consecutive tail-fits must comply in order to ensure that no frequency bias exists. The default setting is 10%.

Bit Error Rate

Determines the Bit Error Rate to be used when extracting total jitter from the Bathtub Curve. The default value is 1e-12.