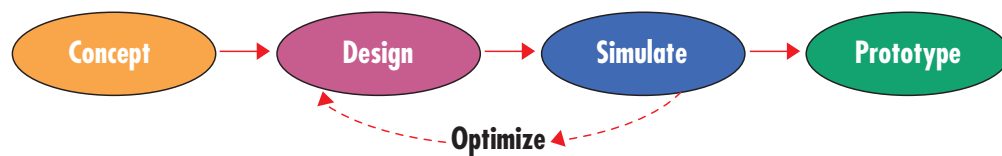


VisSim/Comm for Communication System Design & Simulation

VisSim/Comm is a Windows-based software program for modeling end-to-end communication systems at the signal or physical level. With its full complement of communication blocks and powerful, time-domain simulation engine, VisSim/Comm provides fast and accurate solutions for analog, digital, and mixed-mode communication systems. Moreover, VisSim/Comm's intuitive block diagram interface makes it easy to build, modify, and maintain even the most complex system models.

Using VisSim/Comm, engineers can freely move among the stages of model construction, simulation, optimization, and validation. This tightly integrated development platform allows engineers to simulate and view signal waveforms at any stage of the communication system chain. In addition, all modeling and simulation tasks can be completed without writing a line of code.



VisSim/Comm's unique combination of power and ease-of-use enables the rapid prototyping of communication systems.

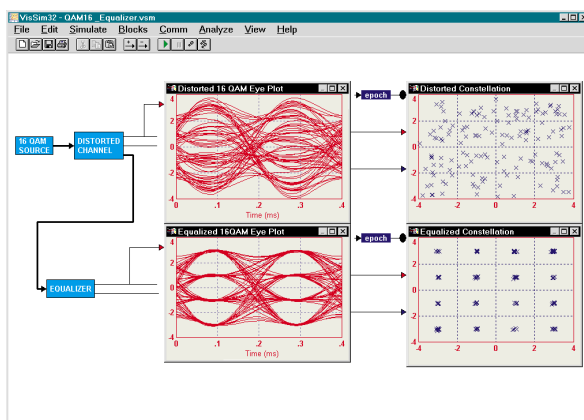
Transmitter and Receiver Models

Communication system design can be divided into two categories: transmitter design and receiver design. VisSim/Comm lets engineers build both transmitter and receiver models, from a first principles perspective, by simply selecting and connecting predefined blocks. Engineers can construct a wide range of models including analog, digital and mixed mode designs, and quickly simulate their behavior. The VisSim/Comm block set provides a variety of modulators and demodulators, including standard analog, PSK, QAM and differential formats. Full support is also provided for the design of phase locked loops, including loop filter and VCO elements.

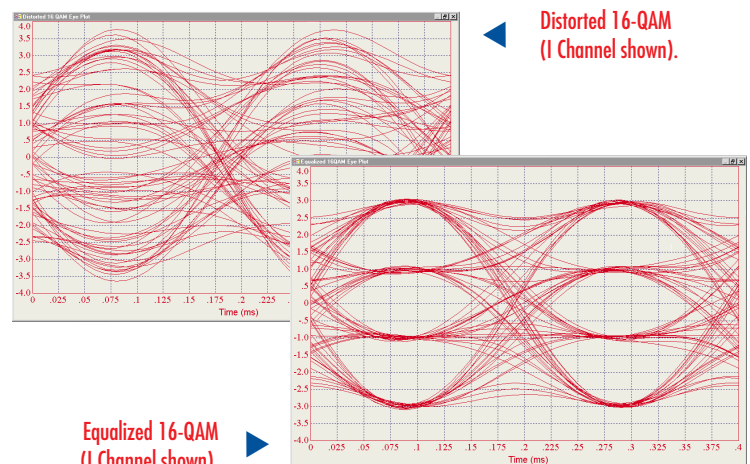
For those designs where encoding is required, VisSim/Comm supports both convolutional and trellis-based codes, such as the V.32 modem specification. In addition, for designs which require the modeling of RF components, VisSim/Comm provides models for amplifiers, mixers, splitters, attenuators, couplers and switches which include noise figure and non-linear effects.

Channel Models

VisSim/Comm includes a variety of predefined channel models supporting both fixed and mobile service scenarios. Included are fading, multipath, bandlimited, and gaussian noise models. In each case, as with all VisSim/Comm blocks, engineers can modify model parameters to suit their specific needs. Engineers can also create custom models by forming new compound blocks or developing custom C code implementations.



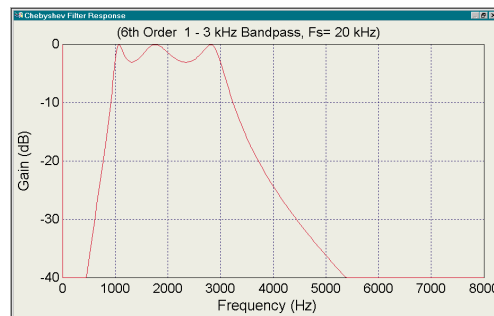
▲ Use of adaptive equalization to compensate for channel distortions in a 16-QAM communications link.



▶ Equalized 16-QAM (1 Channel shown).

Filter and Equalizer Design

VisSim/Comm supports a wide range of customizable filters, including FIR, IIR, gaussian, raised cosine and root raised cosine filters. Engineers can also specify a look-up table-based filter by providing measured gain and phase data. Additional blocks, such as the complex FFT block, make it easy to view gain and phase responses of any filter. Furthermore, for designs that require adaptive filters, fractionally-spaced LMS equalizer blocks are included.



Chebyshev bandpass filter response obtained by computing the FFT of its impulse response.

Predicting System Performance

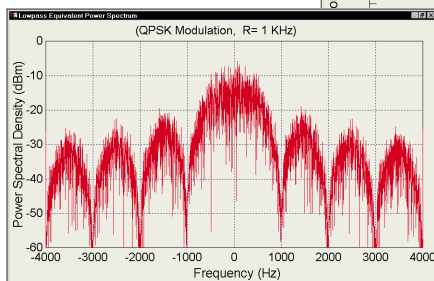
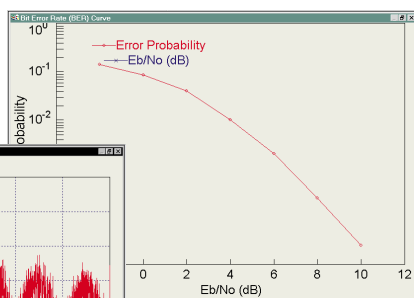
Once designed, a transmitter or receiver model can be simulated to determine its performance under a variety of operating conditions. VisSim/Comm's highly interactive interface makes it easy to perform "what if" simulations and carry out performance trade-offs. For example, a user can dynamically change one or more parameters, for example Signal to Noise Ratio (SNR), and VisSim/Comm will immediately display the corresponding changes in system behavior.

Engineers have full control over most simulation parameters, including start and end times and the simulation sampling frequency. Simulations can be set up to run in interactive, batch or single step modes, and can be paused or stopped based on simulation event conditions.

Complete end-to-end performance of a system can be determined by linking together transmitter, receiver and channel models. Simulation results can be instantly visualized in BER plots, phase scatter plots, eye diagrams, spectral plots and other visual outputs.

The models can then be refined until they accurately reflect the desired behavior. In the case of a transmitter design, this might involve compliance with a specified FCC spectral mask or operating within an output linearity specification. In the case of a receiver design, the goal might involve achievement of a target BER performance at a specified E_b/N_0 level, or verification that a carrier tracking loop can acquire the signal of interest over a specified frequency range.

VisSim generated Bit Error Rate curve.



Lowpass equivalent power spectrum of a 2 kbps QPSK modulated signal.

Additional Features

Because most modulators, channel models, and demodulators can operate in complex math notation (I & Q), VisSim/Comm supports the implementation of lowpass equivalent models, which can result in a significant reduction in simulation time compared to conventional approaches.

For large project design, VisSim/Comm offers hierarchical modeling and embedded compound blocks. Hierarchical modeling facilitates the readability and maintenance of system models, while embedded compound blocks automate the process of making global changes to the models.

VisSim/Comm includes the VisSim Viewer, a run-time view-only version of VisSim that enables users to distribute VisSim models to colleagues and clients. A selective password protection scheme is available for limiting access to proprietary information. Diagram statistics and revision history make it easy to track project development, especially across large, multi-platform groups. Finally, there is virtually no limit to model size or complexity as VisSim/Comm supports over five million blocks per diagram.

OPTIONS

Automatic C Code Generator: VisSim/C-Code generates customizable ANSI C code directly from VisSim diagrams.

Rapid Prototyping of DSP & Embedded Systems: VisSim/CommDSP is a completely integrated Windows program for the rapid prototyping of communication systems targeted for DSP (Digital Signal Processor) and embedded systems. It automatically generates C code for all or part of your VisSim diagram, compiles and downloads it to the target DSP.

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Call now for a free VisSim/Comm demo disk: **1-800-VISSIM-1**
or download it immediately from our **web site: www.vissim.com**

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