

## Engineer's Waveform Work Bench (eWWoB) For IEEE Std. 802.11a

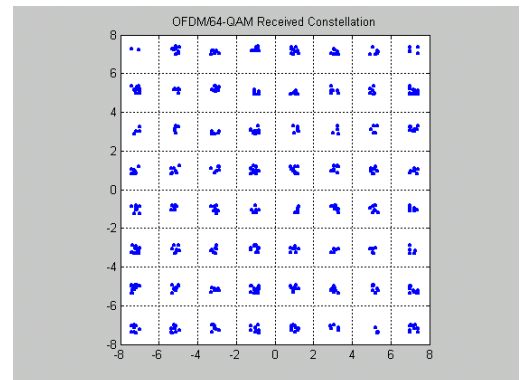
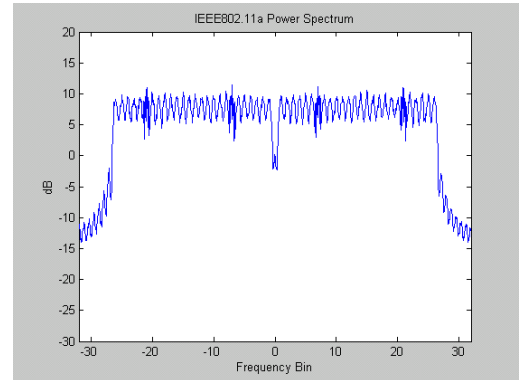
**Engineers' Waveform Work Bench (eWWoB) is a software tool set currently running on MATLAB\*. The objective is to provide the standard-based wireless communication developers with a low cost high performance platform conducting test, measurement, design, and verification, all in one. This tool set is particularly useful and valuable for the early design phase. The unique feature in this version is the Orthogonal Frequency Division Multiplexed (OFDM) waveform, also adopted by many other standards.**

### Test and Measurement

eWWoB\_11a performs OFDM waveform analysis on the imported data. eWWoB\_11a not only analyzes the waveform distortion factors but also demodulates and decodes the processed data. As a result, the outputs include both the waveform integrity report and the decoded bit stream. The latter is essential for the developers to test and verify their signal generation processes to the details of standard compliance.

### System Design and Verification

eWWoB\_11a can generate the IEEE Std. 802.11a PHY compliant waveform, and be exported to the developer's design platform to test their algorithm development and receiver design. eWWoB\_11a can also be used as a stand-alone design platform to assist the developers with their receiver design tradeoffs and iterations.



(\*) MATLAB is the flagship product of The MathWorks, Inc.

For further inquiries, please send email to [info@commaccess.com](mailto:info@commaccess.com).

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### Main Product Features

- ✓ OFDM-based waveform
- ✓ Analyze (for test and measurement) data imported from the user equipment or design source
- ✓ Generate test vectors for IEEE 802.11a PHY compliant waveform, and exportable to user design platforms
- ✓ Generate and analyze waveform with specified hardware impairments within eWVoB\_11a (for design and verification)
- ✓ User-friendly GUI

### Waveform Integrity Report

- ✓ Power spectrum
- ✓ Constellation
- ✓ EVM (Error Vector Measurement)
- ✓ EVM distribution over sub-carrier bins

### Bit Sequence Report

- ✓ Bit sequences out of OFDM demodulator, de-interleaver, Viterbi decoder, de-scrambler, etc.
- ✓ Decoded SIGNAL message
- ✓ Decoded full PSDU frame
- ✓ Bit error locations

### Typical Hardware Impairment Factors

- I/Q (amplitude and phase) imbalance
- DC offset
- Power amplifier effect (AM/AM, AM/PM)
- Group delay & I/Q time variations
- Frequency uncertainty
- Spurious
- Phase noise (post tracking statistics)

### System Models

- Random burst arrival time
- Random initial signal phase
- Initial frequency offset (up to 50 ppm)
- Initial out-of-sync clock

### Channel Models (for test vectors only)

- Multi-path channel effect
- Adjacent channel interference
- Interferences from other standards

**The collection of key building modules used in this stand-alone product is offered as a separate 3<sup>rd</sup>-party MATLAB toolbox. Please visit our website [www.commaccess.com](http://www.commaccess.com) for more information.**

**The final product features and capabilities should be defined in the official product/user manuals or data sheets.**