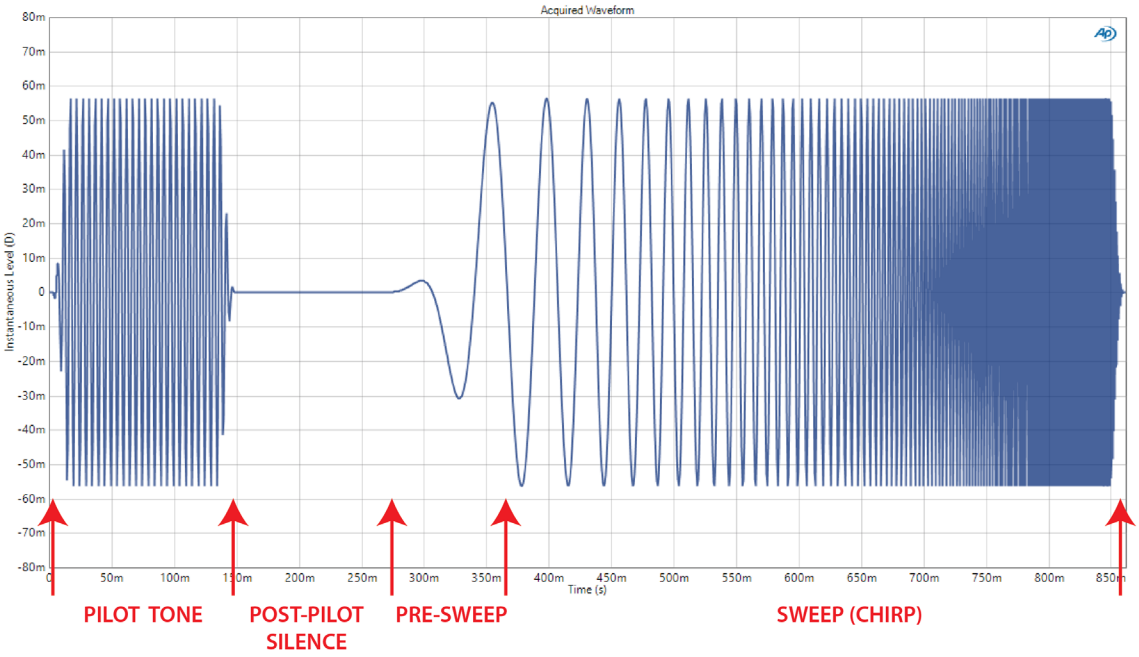

Acoustic Response chirp with pilot tone for Smart Speaker testing

What's New: APx500 version 4.6 September 2018

This document looks at the new features in the latest release of the APx500 software for all models of APx Series audio analyzers.

For more information, please contact your local Audio Precision sales partner, or visit the AP website at ap.com for datasheets, technical articles, and software downloads.

Introducing APx500 version 4.6

APx500 4.6 is a major release that supports open loop configurations for two chirp-based measurements, Continuous Sweep and Acoustic Response, enabling smart device testing across the cloud. Other enhancements include multichannel equalization for microphone array measurements and support for new file types for DTS compliance testing and verification.

New Security Requirement: the APx KeyBox

The APx KeyBox, which mounts on the rear-panel Software Options connector.

For evolving security needs, APx500 version 4.6 software requires that a new hardware module, the APx KeyBox, be attached to the Software Options connector on the analyzer rear panel. All new analyzers are shipped with an APx KeyBox attached.

The APx KeyBox is programmed with the analyzer serial number at the Audio Precision factory and cannot be used with any other APx analyzer.

Note that without a properly authenticated APx KeyBox attached, APx500 version 4.6 will only run in demo mode. If you need a KeyBox, locate your analyzer serial number and go to https://www.ap.com/get-keybox/ to complete the order form. The APx KeyBox is provided at no cost and shipped free of charge.

Analyzer serial numbers are located on the configuration label on the analyzer rear panel, and on the calibration label on the forward edge of the top panel.

Open Loop Configuration for Chirp-Based Measurements

Audio Precision's chirp-based measurement Acoustic Response is the go-to solution for testing microphones and loudspeakers. Up until now, the Acoustic Response and Continuous Sweep measurements have been limited to closed-loop applications, making smart phone and smart speaker testing with these measurements difficult or impossible.

Now Acoustic Response and Continuous Sweep have been rebuilt, using new controls and a pilot-plus-chirp stimulus to provide fast and reliable open loop testing.

The microphone array in a smart speaker, for example, can receive an audio “wake word” followed by a pilot-plus-chirp stimulus from an APx analyzer and pass the signal up to its Intelligent Virtual Assistant (IVA) in the cloud. This signal can be later downloaded as an audio file and presented to the APx for analysis of the microphones’ and input system’s performance.

Or, an APx pilot-plus-chirp stimulus audio file can be uploaded to the cloud server, and then later played through the smart speaker when requested by the operator. The speaker’s acoustic output is acquired by a measurement microphone and presented to the APx for analysis of the speaker’s performance.

Multichannel Input Equalization

APx 4.6 has expanded the **Input Equalization** feature to enable independent equalization curves to be applied to each input channel, whether analog, digital or file input. This is especially useful when an array of microphones is used for a multichannel acoustic acquisition, as in smart speaker and automotive applications.

Add a Select Input EQ Curve sequence step

You can add a step to **Signal Path Setup** for any signal path in a sequence to select an Input EQ curve for the current input. You can choose **All Channels** or one specific channel. To apply a different curve to a different channel, add another **Select Input EQ Curve** step.

Add an Import Generator EQ Curve sequence step

You can add a sequence step to **Signal Path Setup** to import a Generator EQ Curve. This step can be attached to these measurements:

- Stepped Frequency Sweep
- Bandpass Frequency Sweep
- Frequency Response
- Acoustic Response
- Continuous Sweep
- Loudspeaker Production Test

Derived Result: EQ

You can now add an EQ curve to an XY level result by creating an EQ Derived Result.

An EQ derived result can only be attached to a channel of a Level vs. Frequency, Relative Level vs. Frequency, or Gain vs. Frequency XY result. To EQ an additional channel, add an additional EQ derived result to the primary result.

Such results can be found in the following measurements:

- Bandpass Frequency Sweep
- Continuous Sweep
- Frequency Response
- Loudspeaker Production Test
- Multitone Analyzer
- Regulated Frequency Sweep
- Stepped Frequency Sweep
- Jitter Frequency Sweep

Support for DTS:X files

For customers who need to verify DTS compliance with newer technologies, APx now supports DTS:X formatted coded audio files for generator waveforms and for the **Compare Encoded Bitstream** measurement.

Bluetooth codecs

For the Bluetooth AAC audio codec, APx can now support either, or both, MPEG-2 and MPEG-4.

Acknowledgements

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