auGEN X

Expressive Audio Generator AUv3

User Guide

Version 1.2

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Introduction

Thank you for purchasing auGEN X, auDSPr's first audio app! On first glance, auGEN X appears to be just a simple oscillator and noise generator — which, in essence, it is. (I actually first started working on the app because I needed something for testing plug-ins and couldn't find anything that did exactly what I wanted.) But as you begin to use auGEN X, you soon realize that it behaves more like a musical instrument. The controls are fast and intuitive — and precise. You'll find that you can quickly and easily explore the vast array of sounds that are possible from a mere oscillator and noise generator. You can design sounds and be all kinds of creative! And because auGEN X is an AUv3 Audio Unit Extension, you can run multiple instances in your favorite Audio Unit Host (such as GarageBand, Cubasis, AUM, apeMatrix, or BeatMaker 3) to automate it and record your cool sounds. And starting with iOS 11, auGEN X can receive MIDI in and BPM sync from the AU Host for even more control and fun!

auGEN X is precise enough to be used for serious audio engineering while being expressive enough to be used creatively. Our goal is for auGEN X to be one of your Essentials in your audio toolbox. We hope you enjoy it and we're excited to see and hear the cool things that you do with auGEN X!

Oscillator

auGEN X has a full-featured audio Oscillator for making test tones as well as a variety of interesting and useful sounds. The Oscillator is designed using state of the art digital signal processing (DSP) algorithms for virtually alias-free performance at musical fundamental frequencies while efficiently remaining lightweight on CPU load. In other words, you can set the

Oscillator to a sawtooth at the frequency of the highest note on a piano (Hi-C = 4186.01 Hz) and you won't hear any aliasing and your battery won't drain away quickly.

 Oscillator Wave Shape

You can set the Oscillator to one of the 4 classical Wave Shapes: Sine, Triangle, Rectangle, or Saw. The options are presented in order of increasing harmonic content.
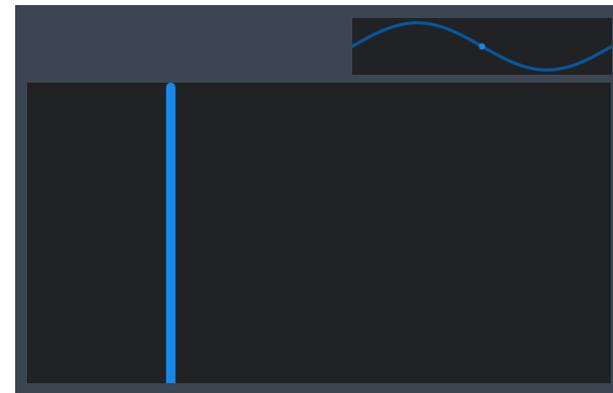
On the left, Sine Waves have just the fundamental frequency with no harmonics.

Oscillator

Next come Triangle Waves which add odd harmonics falling steeply at 12 dB per octave.
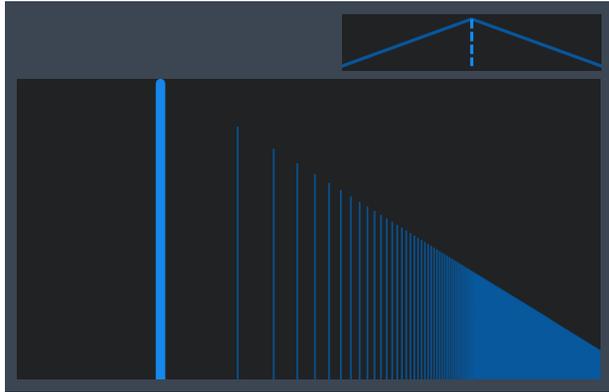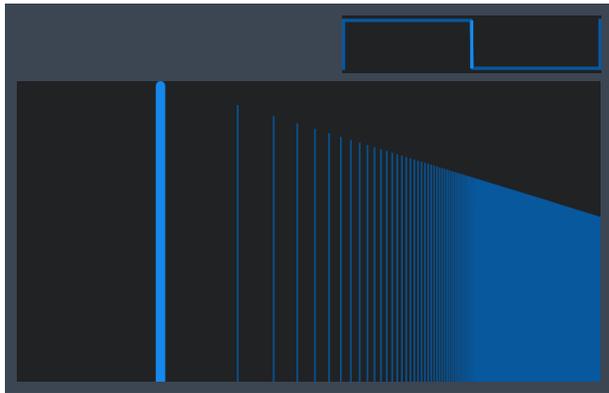

Similar to Triangles, Rectangular Waves also have odd harmonics, except they fall more gradually at 6 dB/octave.
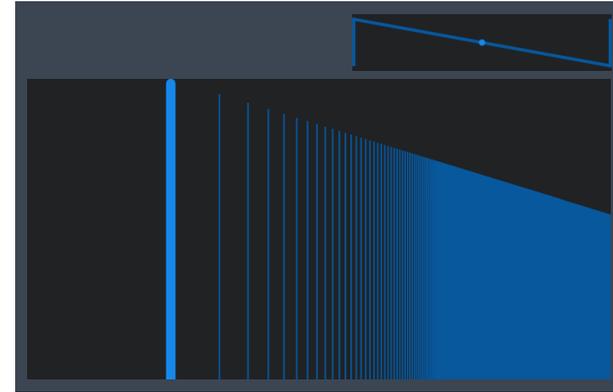
Finally, we have Saw Waves which have both odd and even harmonics falling at 6 dB/oct. Saw Waves are popular for making fat analog synthesizer sounds because they are so harmonically rich.

The Triangle and Rectangle Shapes have an additional Duty Cycle Control which goes from 1.0% to 99.0%.

New in Version 1.1.0 Now the Sine and Saw Wave Shapes also can go asymmetrical. So warp away!
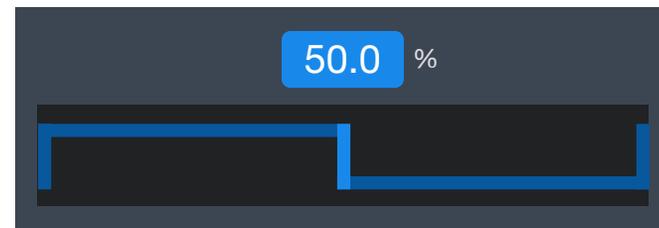
Setting the Rectangle to 50.0% Duty Cycle gives you the classical Square Wave. Setting the Triangle Duty Cycle to the low extreme (1.0%) approximates a falling Sawtooth while the high extreme (99.0%) gets close to a rising Sawtooth (sometimes called a Ramp).

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Top Tip: If you've changed the Duty Cycle and want to get back to 50.0% quickly, simply double-tap on Duty Cycle control thumb (the bright blue part).

 Oscillator Mode

The Oscillator can operate in one of 3 Modes: Fixed, Frequency Sweep, or Level Sweep.

 Fixed: In Fixed Oscillator Mode, you set the Oscillator's Frequency and Level and they stay at your settings.

 Frequency Sweep: In Frequency Sweep Mode, you set the minimum and maximum for a range of frequencies as well as the time it will take for the Oscillator to sweep through this frequency range. You can specify exactly how the range is swept (discussed below). In Frequency Sweep Mode, the Level stays at your setting.

 Level Sweep: In Level Sweep Mode, you set the minimum and maximum for a range of levels as well as the time it will take for the Oscillator to sweep through this level range. As with the Frequency Sweep, you can specify exactly how the range is swept (discussed below). In Level Sweep Mode, the Frequency stays at your setting.

When you change Oscillator Mode, the appropriate controls will appear and unused controls will disappear to minimize screen clutter while maximizing usage of precious screen real estate.

Fixed Oscillator Mode

In Fixed Oscillator Mode, you simply have two controls for the Oscillator: Frequency and Level.

The Oscillator Frequency can go from 10 Hz to 20,480 Hz spanning the entire audio range. We extended the low frequency limit from the traditional 20 Hz down an extra octave to 10 Hz. This is great for testing subwoofers!

The Frequency control shows the harmonic structure based on the Wave Shape. In the picture above, the Wave Shape is set to Sine so the Frequency control is only showing the fundamental frequency (bright blue) and no harmonics since a pure sine has no overtones. When the Wave Shape is set to Triangle, in addition to the fundamental the control will also show odd harmonics falling off at a steep slope of -12 dB per octave as you go up in frequency. Similarly, Square waves have odd harmonics falling off at a more gradual slope of -6 dB per octave. Of the classical Wave Shapes, the Sawtooth (or Saw, for short) has the richest harmonic structure with both odd and

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even overtones falling off at the shallow slope of -6 dB per octave.

The Oscillator Level ranges from 0 dBFS (the highest level that can be produced without digital clipping) all the way down to -∞ dBFS (no signal at all).

Audio Unit Host MIDI Input   New in iOS 11

If you are running auGEN X in an Audio Unit Host that sends MIDI to its AUv3's (such as AUM or apeMatrix), then you can control auGEN X from MIDI sources such as MIDI keyboards, MIDI sequencers, or AUv3 MIDI apps! Press an A on a MIDI keyboard and auGEN X's Frequency jumps to the right pitch. auGEN X is crossing over from engineering utility to musical instrument.

Frequency Sweep Mode

Compared to Fixed Oscillator Mode, Frequency Sweep Mode expands the controls available to you. Instead of a simple Frequency control for setting the Oscillator to a single static frequency, you now have a Frequency Range control. This allows you to set the minimum frequency and the maximum frequency for your Frequency Sweep.
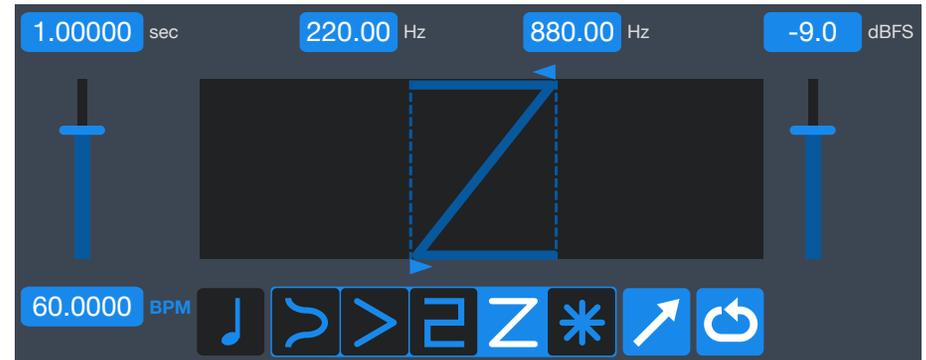
Next, you'll find an additional control for setting the Sweep Period in seconds. This is the amount of time it will take for the frequency to change from its minimum setting to its maximum setting or vice versa. Since the Sweep Period is mathematically the inverse of the Sweep Rate (that is, Sweep Period = 1 / Sweep Rate), we have given an additional control so you can directly set the Sweep Rate in Hertz or Beats per Minute (BPM). This might seem redundant, but it is really for convenience. Sometimes it's easier to think in terms of seconds, and other times it makes sense to think in Hz.

Top Tip: To switch back and forth between Hz and BPM, simply tap the blue Hz or BPM units indicator. auGEN X will convert the value for you.

The Sweep Period control has wide range (20 octaves!) so you can set the period as short as 1/10,000th of a second to as long as 100 seconds. Alternatively, thinking in terms of Sweep Rate the range is from 10000 Hz down to 0.01 Hz. With such a wide range, on one end of the range you are modulating the frequency LFO-style while on the other end you are in FM synthesis territory!

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Frequency Sweep Controls

In Frequency Sweep Mode, you have control over exactly how the frequencies are swept. You do this by setting the Host BPM Sync Mode, selecting the Sweep Type, setting the Sweep Direction, and choosing Repeat or 1-Shot. These three controls work together to determine the sweep behavior.

Host BPM Sync Mode **New in iOS 11**

If you are running auGEN X in an Audio Unit Host that supports BPM Sync (such as AUM or apeMatrix), you can synchronize auGEN X's Sweep Rate to the Host's Tempo in Beats per Minute (BPM). If the Host Tempo changes, auGEN X will follow in perfect time.

Note that if you are running auGEN X as a stand-alone app, then the BPM Sync button will be hidden since there is no Host.

♩ or ♩ or ♪ or ³♪ or ♪ Tapping here will cycle through the Host BPM Sync Modes:

♩ **Off**: When Host BPM Sync Mode is Off, you simply set the Sweep Rate manually using the slider or the number keypads.

♩ **Quarter Note (1x) Sync**: At this setting, the Sweep Rate will match the Host Tempo note for note at a 1-to-1 rate.

♪ **Eighth Note (2x) Sync**: In this mode the Sweep Rate will run at double the Host BPM.

³♪ **Eighth Note Triplet (3x) Sync**: Here, the Sweep Rate will run at three times the Host BPM.

♪ **Sixteenth Note (4x) Sync**: You guessed it. Now the Sweep Rate quadruples the Host Tempo.

Sweep Type

⊃ > ⼝ Z ✳ In beautiful mathematical symmetry to the Oscillator Wave Shape, our Oscillator has 4 Frequency Sweep Types (Cosine, 2-Way Ramp, Step, and 1-Way Ramp) plus a bonus 5th Sweep Type (Sample & Hold).

New in Version 1.1 Now all five Sweep Types have a "Duty Cycle" control. (In previous versions, only the 2-Way Ramp and Step had this control.) So now you can warp each shape into asymmetrical forms. Ironically, this change makes the app itself more symmetrical.

⊃ or ⊂ **Cosine**: Depending on the Sweep Direction, the Cosine will either smoothly ramp the Oscillator Frequency up then down or ramp down then up.

> or < **2-Way Ramp**: Depending on the Sweep Direction, the 2-Way Ramp will either ramp the Oscillator Frequency up then down or ramp down then up. Similar to the Duty Cycle on the Triangle Wave Shape, the 2-Way Ramp also has a control for controlling the asymmetry between the rising and falling phases.

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2 or 5 Step: Depending on the Sweep Direction, the Step will either start the Oscillator Frequency at the minimum then immediately step to maximum or start high then go low. Similar to the Duty Cycle on the Rectangular Wave Shape, the 2-Way Ramp also has a control for controlling the asymmetry between the high and low phases.

Z or ⧄ 1-Way Ramp: Depending on the Sweep Direction, the 1-Way Ramp will either ramp the Oscillator Frequency up or ramp it down.

✳ Sample & Hold: Its icon is the asterisk — commonly used as the "wildcard" character. Sample & Hold takes a random number as a "sample" value within our chosen Frequency Range, and "holds" at this Frequency for the first phase of a Sweep Period. At the start of the second phase (set by the Warp control), a new random value is chosen and held until the end of the period. Then at the start of the next period, it takes a new random value and holds at this value. And so on and so forth…
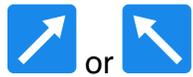
↗ or ↖ Tap to toggle the Sweep Direction.

↺ or → Tap to toggle between Repeat Mode and 1-Shot Mode. In Repeat Mode, when the sweep finishes its trajectory it simply loops around and starts another sweep, repeating endlessly until you manually stop the Oscillator. In 1-Shot Mode, the sweep plays through its full range once and then automatically stops the Oscillator.

Level Sweep Mode

Compared to Fixed Oscillator Mode, Level Sweep Mode expands the controls available to you. Instead of a simple Level control for setting the Oscillator to a single static level, you now have a Level Range control. This allows you to set the minimum level and the maximum level for your Level Sweep.
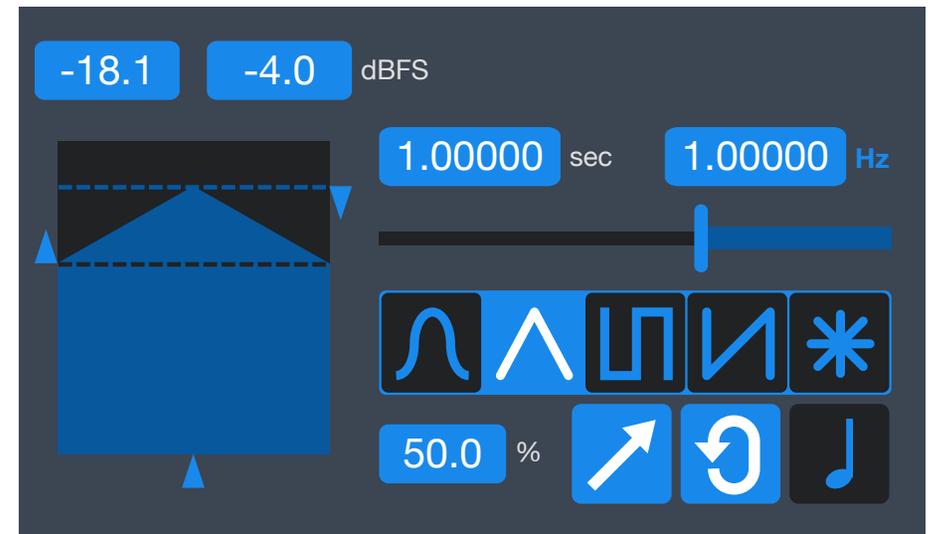
Similar to Frequency Sweep Mode, we have a control for setting the Sweep Period in seconds. This is how long it will take for the level to change from its minimum setting to its maximum setting or vice versa. Alternatively, you can set the Sweep Rate in Hertz.

Top Tip: To switch back and forth between Hz and BPM, simply tap the blue Hz or BPM units indicator. auGEN X will convert the value for you.

The Sweep Period control has wide range (20 octaves!) so you can set the period as short as 1/10,000th of a second to as long

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as 100 seconds. Alternatively, thinking in terms of Sweep Rate the range is from 10000 Hz down to 0.01 Hz. With such a wide range, on one end of the range you are modulating the level LFO-style while on the other end you are in AM synthesis territory!

Level Sweep Controls

Analogous to Frequency Sweep Mode, in Level Sweep Mode you have a similar set of controls for setting exactly how the level is swept. You do this by selecting the Sweep Type, setting the Sweep Direction, and choosing Repeat or 1-Shot. These three controls work in conjunction to determine the sweep behavior.

Host BPM Sync Mode **New in iOS 11**

Host BPM Sync Mode for the Oscillator Level Sweep works the same as for the Frequency Sweep.

Sweep Type

  In beautiful mathematical symmetry to both the Wave Shape and Frequency Sweep Type, our Oscillator has 4 Level Sweep Types (Cosine, 2-Way Ramp, Step, and 1-Way Ramp) plus a bonus 5th Sweep Type (Sample & Hold).

New in Version 1.1 As with the Frequency Sweep, now all five Level Sweep Types have a "Duty Cycle" control for warping each shape into asymmetrical forms.

 or **Cosine**: Depending on the Sweep Direction, the Cosine will either smoothly ramp the Oscillator Level up then down or ramp down then up.

 or **2-Way Ramp**: Depending on the Sweep Direction, the 2-Way Ramp will either ramp the Oscillator Level up then down or ramp down then up. Similar to the Duty Cycle on the Triangle Wave Shape, the 2-Way Ramp also has a control for controlling the asymmetry between the rising and falling phases.

 or **Step**: Depending on the Sweep Direction, the Step will either start the Oscillator Level at the minimum then immediately step to maximum or start high then go low. Similar to the Duty Cycle on the Rectangular Wave Shape, the 2-Way Ramp also has a control for controlling the asymmetry between the high and low phases.

 or **1-Way Ramp**: Depending on the Sweep Direction, the 1-Way Ramp will either ramp the Oscillator Level up or ramp it down.

 Sample & Hold: Similar to its Frequency Sweep counterpart, Sample & Hold takes a random number as a "sample" value within our chosen Level Range, and "holds" at the Level for an entire Sweep Period. Then at the start of the next period, it takes a new random value and holds at this value. And so on and so forth…

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▱ or ◳ Tap to toggle the Sweep Direction between rising and falling.

◲ or ◱ Tap to toggle between Repeat Mode and 1-Shot Mode. In Repeat Mode, when the sweep finishes its trajectory it simply loops around and starts another sweep, repeating endlessly until you manually stop the Oscillator. In 1-Shot Mode, the sweep plays through its full range once and then automatically stops the Oscillator.

Noise Generator

auGEN X has a Noise Generator for creating as much high quality noise as you require.

Noise Color

You can select either White or Pink Noise.

Note that the pink noise generated by this app conforms to SMPTE Standard 2095-1:2015 so it's good enough to calibrate your local movie theater if you want.

 Noise Generator Mode

The Noise Generator can operate in one of 2 Modes: Fixed or Level Sweep.

 Fixed: In Fixed Noise Mode, you simply set the Noise Generator's Level and it stays right where you left it.

 Level Sweep: In Level Sweep Mode, you set the minimum and maximum for a range of levels as well as the time it will take for the Generator to sweep through this level range. You can specify exactly how the range is swept (discussed below).

When you change Noise Generator Mode, the appropriate controls will appear and unused controls will disappear to minimize screen clutter while maximizing usage of precious screen real estate.

Level Sweep Controls

In Level Sweep Mode, you have control over exactly how the Level is swept. You do this by selecting the Sweep Type, setting the Sweep Direction, and choosing Repeat or 1-Shot. These three controls work in conjunction to determine the sweep behavior.

Host BPM Sync Mode **New in iOS 11**

Host BPM Sync Mode for the Noise Level Sweep works just like the Oscillator Frequency Sweep. Refer back to that section for more information.

Sweep Type

 Just like the Oscillator, our Noise Generator has 5 Level Sweep Types: Cosine, 2-Way Ramp, Step, 1-Way Ramp, and Sample & Hold.

 or **Cosine**: Depending on the Sweep Direction, the Cosine will either smoothly ramp the Noise Level up then down or ramp down then up.

 or **2-Way Ramp**: Depending on the Sweep Direction, the 2-Way Ramp will either ramp the Level up then down or ramp down then up. Similar to the Duty Cycle on the Oscillator's Triangle Wave Shape, the 2-Way Ramp also has a control for controlling the asymmetry between the rising and falling phases.

 or **Step**: Depending on the Sweep Direction, the Step will either start the Level at the minimum then immediately

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step to maximum or start high then go low. Similar to the Duty Cycle on the Oscillator's Rectangular Wave Shape, the 2-Way Ramp also has a control for controlling the asymmetry between the high and low phases.

◩ or ◪ **1-Way Ramp**: Depending on the Sweep Direction, the 1-Way Ramp will either ramp the Level up or ramp it down.

✳ **Sample & Hold**: Sample & Hold takes a random number as a "sample" value within our chosen Level Range, and "holds" at the Level for an entire Sweep Period. Then at the start of the next period, it takes a new random value and holds at this value. And so on and so forth…

↗ or ↘ Tap to toggle the Sweep Direction between rising and falling.

↺ or ↑⁰ Tap to toggle between Repeat Mode and 1-Shot Mode. In Repeat Mode, when the sweep finishes its trajectory it simply loops around and starts another sweep, repeating endlessly until you manually stop the Noise Generator. In 1-Shot Mode, the sweep plays through its full range once and then automatically stops the Noise Generator.

Impulse Generator

auGEN X features a handy Impulse Generator. An impulse is a short, sharp signal like the sound of a balloon popping or a starter pistol firing. Impulses are useful for testing the response of audio components and algorithms. They are particularly useful for checking the impulse response of reverberators. Lighting up a reverb with an impulse is kind of an acid test. The impulse shows every detail of a reverb's early reflections and tail. (Fun Fact: I've spent a significant portion of my career designing reverb algorithms and products. When I worked at Alesis, I was on the design team for the cult classic Wedge Master Reverb which had an Impulse Audition feature.)

To fire off an impulse, tap . Bang!

In the Settings Page, you will find a control for setting the Impulse Width anywhere from a single sample to 960 samples. You'll also find controls for setting the Impulse's Level and Pan.

Channel Tests

New in Version 1.1 The Channel Tests now work when auGEN X is running either as a stand-alone app or in an Audio Unit Host.

When auGEN X is running as a stand-alone app (that is, not when it is running in an Audio Unit Host), two additional buttons appear — the Channel Test Buttons. Tapping either of these buttons plays a sound which identifies the audio channel. This is very handy for channel testing when you are setting up a new system such as a home stereo or car stereo.

Preset Manager

auGEN X sports auDSPr's full-featured Preset Manager for storing all of your settings as a patch, or Preset. Presets can then be recalled at a later time so you can quickly get back to a particular sound. Presets are stored in long term memory so they are available from one app run to the next and they are available across Audio Unit Hosts. For example, Presets you create in AUM are available in Cubasis and BeatMaker 3.

Tap ◀ or ▶ to step from one Preset to another. Or tap the Preset name to show your Preset List. When the Preset List is showing, you can tap a Preset name to select it.

Presets are grouped into a few Banks: User Presets, Factory Presets, and Artist Presets.

New in Version 1.1.0 The auDSPr Preset Manager now supports Dynamic Type. This allows you to make the Preset text larger for easier readability or smaller to fit more on the screen. You can set your device's Text Size with the Settings App under Accessibility, Display & Text Size, Larger Text.

👤 User Presets   Bank 0

You can make your own Presets and save them in the User Preset Bank. The number of User Presets that you can have is only limited by the amount of free storage on your device, and since each Preset takes hardly any space, you probably will not run into any practical limit (other than your own imagination, of course). You can delete User Presets by swiping left on a

Preset name in the Preset List. Tap ☰ to change their order.

Why change the User Preset order? Because auDSPr's Preset Manager responds to MIDI Program Change and Bank Select Messages. This makes it convenient to browse Presets using a MIDI controller. For live gigging, re-ordering the User Presets lets you match your Preset order to your set list.

🏭 Factory Presets   Bank 1

Factory Presets are provided by auDSPr and are meant to showcase auGEN X's wide range of capabilities. They give you a taste of what is possible and can be used as starting points for you own creations. As such, Factory Presets cannot be deleted.

Artist Presets   Banks 2+

While Factory Presets were created in-house by auDSPr, Artist Presets were created by independent sound designers. These artists were kind enough to share their Presets with us and we felt these Presets were cool and unique enough to deserve their own Banks. Just like Factory Presets, Artist Presets cannot be deleted.

🅰️🅱️ A/B Comparing your settings

auDSPr's Preset Manager has a handy feature for A/B'ing your settings. Audio engineers often like to have two versions of a sound — an "A" version and a "B" version. This way you can make changes to one version and then quickly switch back and forth between versions to compare which one you like better. This way you always know you're moving in the right direction with your changes.

Here's how it works: When you first select a Preset, the AB Button is disabled because initially both A and B versions are the same. Then, when you change a parameter (for example, Oscillator Level), the B version now becomes "edited" and the B

version is currently selected. You know this because the AB Button is now enabled and the 'B' is showing larger than the 'A'. In addition, the name of the Preset is dimmed as a second indicator that the original has been edited. If you now tap the AB Button, auGEN X switches to the original A version. You'll notice now that the 'A' is larger than the 'B' to show that you're currently on the A version. The Preset name is bright because at this point you have not yet edited the A version. So now you can switch back and forth as often as you like to compare — that is, A/B — between your versions. Then, when you've settled on the greatest version of all time, save your wonderful Preset. Trust me, once you get used to this, you'll wish all your apps had this feature.

⬇️ Save your Preset

Tap the Save Button to save your Preset. You can name your Preset. If you were editing a Factory or Artist Preset, you can save your version as a new User Preset. Or if you have been editing an existing User Preset, you can either save a new copy or overwrite the existing one.

📤 📥 Preset Sharing   New in Version 1.1

The auDSPr Preset Manager lets you share your Presets so the world can know just how awesome you are. Tap 📤 to export your Preset as a file that you can share just like any other file.

Tap 📥 to import Presets into your User Bank.

Unlock the Power of Audio Unit Parameter Control

The AUv3 Audio Unit format has a super power that allows Audio Unit Hosts to communicate extremely accurately to Audio Unit Extensions (Plugins) - **Audio Unit Parameters**, or AUParameters. Each AUv3 Plugin can expose Parameters, or an entire Parameter Tree, to the Host to allow the Host, and whatever else is connected to the Host, to control it in real time. You can record and automate these parameter changes to create dynamic, lively compositions. auDSPr audio apps go over the top to expose full Parameter Trees to Hosts. This gives you very fine-grained control over many, many aspects of your sound for full creative freedom.

A Word about AUParameter Control vs. MIDI Control:

By far, the most common form of parameter control is MIDI. The MIDI Standard has been around for decades and millions of MIDI devices exist that are being used to create music that we all have been able to enjoy. The downside is that because of its age, the MIDI 1.0 Standard that a lot of the older devices use is typically only 7-bit Fixed Point for parameter control messages. Sometimes "double precision" MIDI is available which increases this to 14-bits, but not everything supports this. So if you've ever experienced zippering when moving a MIDI control, it is due to this relatively low bit precision without any kind of parameter smoothing. In contrast, to my knowledge AUParameters have always been 32-bit Floating Point to yield smooth parameter moves.

Newer MIDI devices may have corrected this smoothing issue, and some Plugins may do things to correct it on their end, and the new MIDI 2.0 Standard addresses this, so depending on your specific setup, you may or may not encounter this zippering. But with AUParameters, you should not *ever* have this issue.

So auDSPr's advice is: Given the choice between AUParameter or MIDI control, prefer AUParameter control. Sometimes you don't have a choice - for example, when your favorite hardware controller might only output MIDI control messages.

Settings Page

Tap ⚙ to display the Settings Page. This is where we've put controls for "set and forget" options that you might only change once in a while.

First, you'll find a section for controls which affect the sound, but you might not need to change very often. For the controls in this particular section, you have the option of saving and recalling them on a "per Preset" basis, or simply using the values you see here as Global settings regardless of what values are saved in a Preset.

In this section, you'll find controls for fine-tuning the **Impulse Generator**.

Pan Law

Lastly, you'll find the app global setting for the Pan Law. The Oscillator, Noise Generator, and Impulse Generator each are monophonic sources, meaning that they only produce one channel of audio signal. Each thus requires a Pan control for panoramically positioning its mono sound in the stereo field between the left and right speakers. The Pan Law determines how each Pan control adjusts the level of the mono source between the left and right channels. If a source is panned hard left (i.e., 100% left), then its left level will be full up while its right level will be zero. The opposite happens when the source is panned hard right — the right level is full up while the left is zero. As you move the Pan control between the left and right settings, the levels in the left and right channels are smoothly cross-faded to set the sound's position in stereo space. In the center "C" position, the left and right levels are equal to each other and both are set somewhere between full up and zero.

The question is exactly where between full up and zero? This is where the Pan Law setting comes in. A Pan Law is simply a pair of mirror image curves for cross-fading between left and right levels. The left channel fades out just as the right channel fades in and vice versa.

The simplest Pan Law is a straight line Linear crossfade which puts both channels 6 dB down (i.e., -6 dB) at the center position. This tends to have a "hole-in-the-middle" effect where the sound is softer in the center than at either side position.

Constant Power Panning improves upon -6 dB Linear Panning by adjusting the cross-fade curves to yield a constant audio power at every pan position. This puts each individual channel down 3 dB at center. Constant Power Panning might be preferred if the speakers are far apart in a large room with multiple listeners at different positions in the room. Movie theaters tend to use Constant Power Panning.

-4.5 dB Compromise Panning splits the difference between -3 dB Constant Power Panning and -6 dB Linear Panning. -4.5 dB Compromise Panning might be preferred if one or a few listeners are in the sweet spot right between the speakers. This is the default setting.

auGEN X offers a fourth Pan Law option, 0 dB Linear Panning, whose cross-fade curve keeps both channels at 0 dB (unity gain) at center. This is useful for system testing because there is no attenuation at center.

⊞ Output Polarity

The Output Polarity buttons allow you to invert the polarity of the signals sent out by either the Left or the Right channel. This can be very handy when you are checking your audio setup to see if a speaker is wired up backwards. If one of your speakers is out of phase, your stereo image will be wonky. If both of your speakers are out of phase, then the stereo imaging will be cloudy. So get it right, get it tight!

On the Settings Page you'll find the current **Sample Rate** at which the current instance is running. When running as a stand-alone app, auGEN X defaults to 44100 Hz (which is standard on most iOS devices) or 48000 Hz (supported by some newer devices like the iPad Pro). When running in an Audio Unit Host like AUM, auGEN X uses the sample rate set by the host. All auDSPr audio apps support the following sample rates: 44.1 kHz, 48 kHz, 88.2 kHz, and 96 kHz. Our audio algorithms are designed to be "sample rate agile" which means they scale themselves to run natively at the current sample rate. This way you get the best sound available for the current sample rate. To use the higher 88.2 and 96 kHz sample rates, your iPad, iPhone, or iPod touch will need to be connected to an iOS-compatible USB audio interface via the Lightning jack (or USB-C jack on some newer devices).

You'll also find here the maximum **Frame Rate** supported by your device's screen. Most devices support 60 fps (frames per second), but some Pro models support 120 fps.

MIDI Input Channel New in Version 1.1

Use the MIDI Input Channel controls to select which MIDI Channel this particular auGEN X instance will use. It simply will ignore incoming MIDI messages that are *not* on this MIDI Channel. If OMNI is selected, auGEN X will respond to messages arriving on *all* MIDI Channels.

When auGEN X is running as a stand-alone app (that is, not when it is running in an Audio Unit Host), some additional settings are available.

MIDI Input Sources New in Version 1.2

In Stand Alone Mode, Settings shows a list of available MIDI Input Ports that are currently configured and recognized by the operating system. auGEN X listens and responds to MIDI messages received from any port whose name is highlighted. Tap a port name to toggle it. You can have more than one port active at the same time.

Preferred Sample Rate New in Version 1.2

In Stand Alone Mode, Settings shows a list of Sample Rates so you can specify your preferred rate. auGEN X will attempt to set the hardware to this rate. If another app is already using the audio hardware or if your setup does not support this rate, you might not get your preferred rate, so you might have to check the current Sample Rate.

Preferred Buffer Size New in Version 1.2

In Stand Alone Mode, Settings shows a list of Buffer Sizes so you can specify which one you prefer. Using a larger buffer size is more CPU efficient so your battery lasts longer, but latency will be higher. Smaller buffers use more CPU, but latency is shorter so the app will perform better - animations in particular will feel snappier. If your device cannot handle the smaller sizes, your audio might glitch or click and pop. If this happens try larger sizes until the glitches go away. auGEN X shows the current size.

**Background Audio**   **Stand Alone Mode only**

When Background Audio is enabled (the button will be bright blue), auGEN X will continue to generate audio even it is running in the background (for example, when the screen is off). If Background Audio is not enabled, auGEN X will pause audio to conserve battery when it goes into the background.

Keep Screen On   **Stand Alone Mode only**

When Keep Screen On is enabled, auGEN X will prevent the screen from going to sleep — useful if you need to keep the controls available and visible for long periods (for example, during a live gig). Obviously disabling this option will allow the screen to sleep which saves battery life.

Block Diagram

auGEN X Block Diagram
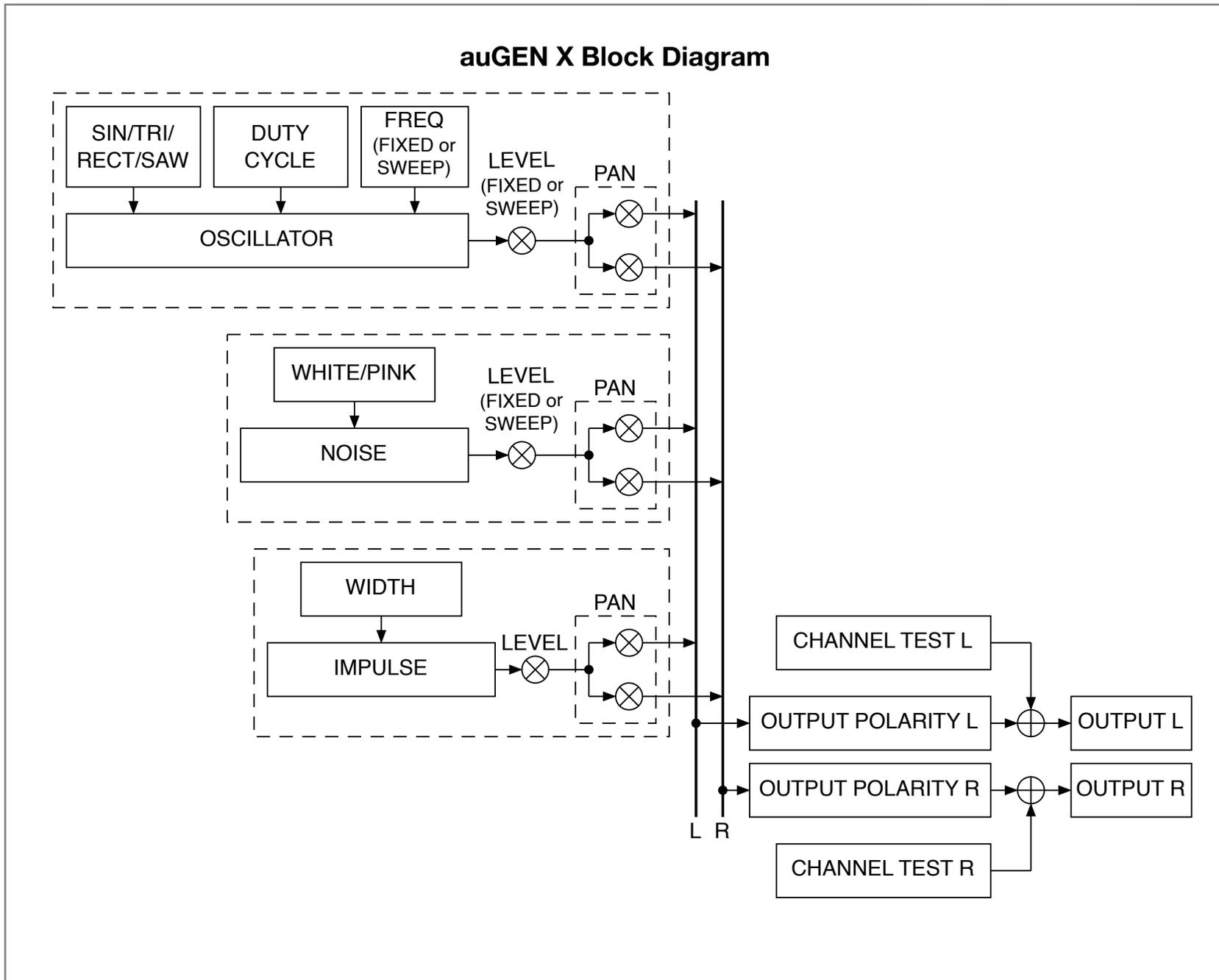
Become an auDSPr Power User in Minutes

Yes, auGEN X is just auDSPr's first audio app. We plan to release several more, and all will share common user interface features, so learn to be a power user *now* and you'll be a power user for all auDSPr audio apps!

First, each app consistently uses a specific key color to indicate interactive elements. This color is chosen to be eye-catching — a graphic designer might say that it "pops". So when you see this color, the control is saying "See me! Touch me! Hear what I do!" Hint: The "pop" color is the color of the App icon.

Getting the best performance

For optimum performance, when you are running any auDSPr audio app, you might want to consider first disabling Wi-Fi or activating Airplane Mode. Doing so will prevent any network activity or notifications from interrupting your session and competing for CPU and battery.

If you are running off battery, keep your charge above 50%. Otherwise the operating system might reduce CPU performance which can result in audio glitches or a sluggish user interface.

Sliders

All auDSPr Sliders, in addition behaving just like typical sliders, have several added features designed so you can get to your desired setting quickly and accurately:

- Tapping a slider anywhere above or below the "thumb" (which you now know the thumb will be our "pop" color) will nudge the value in fine steps. (Obviously "above or below" is for vertical sliders — substitute "left or right" for horizontal sliders.) We have thoughtfully chosen step sizes for each parameter type. This allows you quickly to close in on your setting by first sliding to it, and then tapping up or down to fine tune accurately. (On other apps, I can't tell you how many times I've painstakingly made a setting only to have it nudge away as I lift my finger. Arrrgh! Our "Tap Slider Track To Step Value" Feature corrects this once and for all.) Furthermore, if you tap and hold, the value will keep stepping, just like key repeat on a computer.
- Double-tapping the slider thumb resets the value to a default setting which has been judiciously chosen.

Range Sliders

- For sliders which control a range (for example, Frequency Range or Level Range), dragging from the middle of the range will move the entire range as a unit. The lower and upper values will move in lock step with each other so the range width stays the same. Tapping outside the range will nudge the entire range in fine steps.
- Sliding from either of the triangle-shaped controls at the lower left or upper right will change just the lower or upper value (depending on which one you touch, obviously). As with the simpler sliders, tapping will nudge the value in fine steps.
- Sliding from one of the dashed lines will change the width of the range.
- Double-tapping in the middle of the range resets both the lower and upper values to their default settings.

Number Keypads
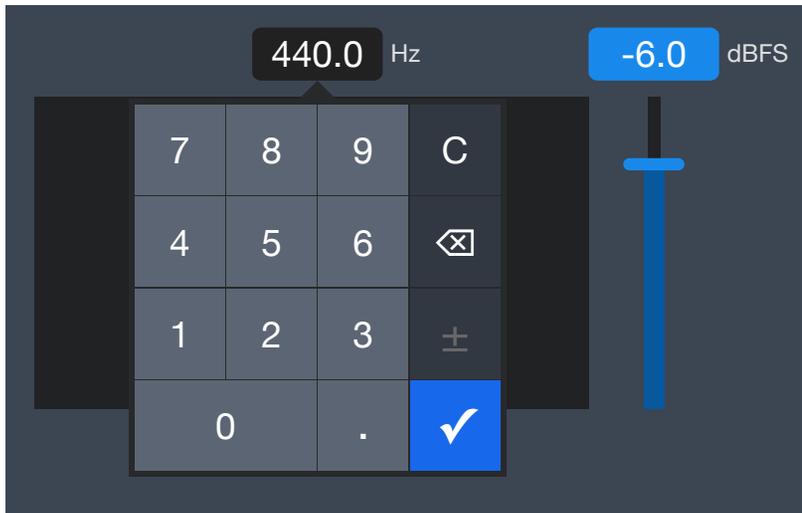
Lastly, all of the numeric parameter readouts are actually buttons. Tapping on one will bring up a convenient number keypad so you can directly enter in an *exact* value. And for parameters which are always negative (for example, Level), the minus sign is automatically entered for you, so you don't have to do it every time. (If you haven't figured it out already, I'm a control freak and efficiency freak. I'm hoping other control freaks like myself will appreciate these details and love auDSPr audio apps.)

New in Version 1.2 Number Keypads now support Hardware Keyboards (iPad) If you have a hardware keyboard connected to your iPad, you can use it to type in values quickly when a Number Keypad is showing.

Product Info Page

Tap to bring up the auGEN X product information page. Here you'll find convenient buttons for visiting the auGEN X product page on our website, for viewing this informative User Guide, and for contacting us with a friendly e-mail. You'll also find the app version number.

auDSPr Company Info Page

Tap to bring up our company information page. Here, you'll find convenient buttons which link out to our website and to our social media. Earn brownie points by supporting us in public - we'll be your best friend!

In the future, the auDSPr Company Info Page is where you'll find information about our other sweet audio apps.

Knowing all this, you shouldn't ever need to crack another auDSPr manual, except to enjoy my quirky writing style.

Now go make something sound cool!

Dave Simpao
auDSPr

P.S. If you enjoy our audio apps, **please write a favorable review on the App Store**. At the very least, give us a 5 Star rating. It really helps a lot. Thanks in advance!

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More sweet audio apps from auDSPr

auSCOPE X
Smart Audio Oscilloscope AUv3

volumeCTRL
Precise Volume Control