

# ECHO CAT

1.0.2



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## INTRODUCTION

**Echo Cat** is a tape delay emulation audio plug-in based on the sound of the WEM Copicat. First conceived by Charlie Watkins in 1958, it was the iconic sound of The Shadows. The initial production run of the original Copycat sold out on the first day, and soon the Copycat was the sound of the sixties. The Copicat is a recording icon and continues to be used throughout the decades. Based on the Mk IV SOLID STATE Watkins Copicat. Meticulous attention to detail retains all the character of the original hardware, but the plugin offers features not originally possible.

## GETTING STARTED

### SPECIFICATIONS

- Copicat emulation.
- Tape echo with three playback heads.
- Input and output volume.
- Sustain (feedback), and mix.
- Tempo sync.
- Volume, pan and high-pass/low-pass filters for each head.
- Hiss with auto-mute.
- Wow and flutter.
- Tape age.
- Random signal loss.
- Tape loop gap effect.
- Hum with auto-mute and frequency selection.
- Varispeed with modulation.
- Ducking with M/S.
- Tone with bass-treble high-shelf filters and LP-HP filters.
- M/S output volume.
- Mono, stereo and fake stereo output modes.
- Oversampling.
- Preset system.
- Resizable GUI.
- Auto-updater.
- Formats: VST, VST3, AU, AAX (64 bit only).
- Platforms: macOS, Windows.

### SYSTEM REQUIREMENTS

Mac OSX 10.7 or superior.  
Windows 7 or superior.

## INSTALLATION

### MAC

Double-click on the PKG file downloaded from Wavesfactory.  
Follow the steps to install the plugin.

The installer will place the different plugin formats in these folders:

- **AU:** Library/Audio/Plug-Ins/Components/Echo Cat.component
- **VST:** Library/Audio/Plug-Ins/VST/Echo Cat.vst
- **VST3:** Library/Audio/Plug-Ins/VST3/Echo Cat.vst3
- **AAX:** Library/Application Support/Avid/Audio/Plug-Ins/Echo Cat.aaxplugin

The installer will also create a folder in Library/Application Support/Wavesfactory named Echo Cat that will contain all the necessary files like presets, user manual and license.

### WINDOWS

Double-click on the EXE file downloaded from Wavesfactory.  
Follow the steps to install the plugin.

The installer will place the different plugin formats in these folders:

- **VST 64 bit:** C:\Program Files\Steinberg\Vstplugins\
- **VST3 64 bit:** C:\Program Files\Common Files\VST3\
- **AAX 64 bit:** C:\Program Files\Common Files\Avid\Audio\Plug-Ins

The installer will also create a folder at C:\Users\'username'\AppData\Wavesfactory named Echo Cat that will contain all the necessary files like presets, user manual and license.

## TROUBLESHOOTING

If Echo Cat doesn't appear in your DAW plug-in list you can try following steps:

- Re-scan all plug-ins.
- If you're on Windows make sure that the plug-in is in the correct folder as the installer will place it in the default VST location and your DAW may be using a custom one.
- Make sure that your OS version is 10.7 minimum on Mac and Windows 7 minimum on Windows.

If Echo Cat crashes your DAW on start-up or while using it please delete it from the folder and reinstall it.

Make sure that you have the latest version by downloading the installer from the website:

<https://www.wavesfactory.com/audio-plugins/echo-cat>

If the crashes continue, contact support with any available crash reports, specifying your OS version, DAW version and any other valuable information that you may have.

<https://www.wavesfactory.com/support#contact>

## DEMO EVALUATION

Echo Cat will run in demo mode by default. It will output a 2-seconds volume dip every 60 seconds, parameters won't be recalled when saving the session and preset saving is disabled. All other features will be available for full evaluation with no specific time expiration.

While in demo mode the plugin will show the authorisation panel every time you open the UI, if you still want to evaluate it you have to click on "Continue evaluation" at the bottom of the pop-up.



## AUTHORISATION

When purchasing Echo Cat from Wavesfactory you'll receive an e-mail containing the username and serial number formatted like this:

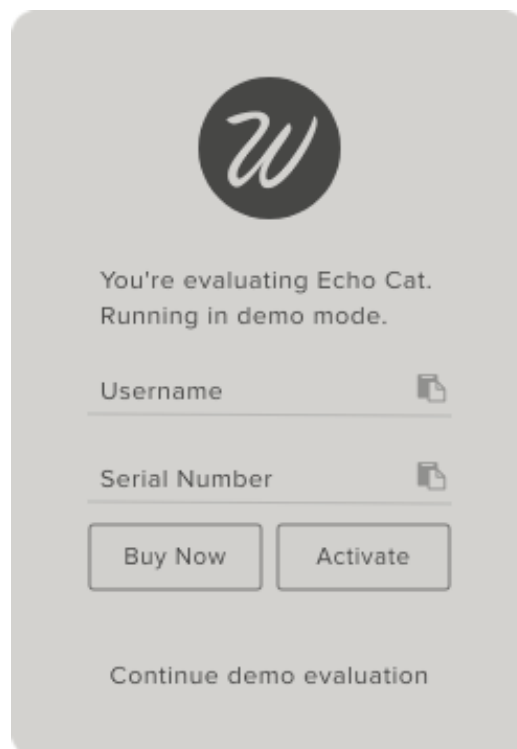
**Username:** john@doe.com  
**Serial:** 1234567890987654321

You have to copy this to the clipboard by selecting it and either:

- Right-click and select "copy".
- Press Ctrl + C on Windows or Cmd + C on Mac.

**Important:** Make sure that you copy them without empty spaces as it will result in a not valid authorisation.

Then, open the plug-in and the authorisation panel will appear. Insert your username and serial. Press the "paste" button and the contents of the clipboard will be copied accordingly. Finally, press the Activate button. If the information is correct the plug-in will save your serial number in Wavesfactory/Echo Cat/License. If the information is not correct the panel will  
In order to de-authorise you can simply delete the file inside Wavesfactory/Echo Cat/License.



## PARAMETERS

▸ **Input** - ranges from -24dB to +24dB.

This parameter sets the gain of the input signal. This way, you can drive the preamp and tape saturation. Increasing the input signal will result in more saturation, more high frequency attenuation, more compression and less noise. Decreasing the input signal will result in less saturation, more high frequency, less compression and more noise.

▸ **Sustain** - ranges from 0% to 100%

Set how much of the output signal is fed back to the input signal. Increasing its value will result in more repetitions of the delay signal. On higher values, the unit will start to self-oscillate. If you want a true replica of the original WEM Copicat, then never set this parameter to 0% as it will result in no feedback at all. On the original, the feedback signal was never 100% removed.

If you want to immediately stop the repetitions, you can click on the panic red button on the top bar.

▸ **Mix** - ranges from 0% to 100%

Mixes the dry and the wet signals. The dry signal is not processed by the plugin in any way. At 50%, both signals will be at full volume. 0% is the dry signal at full volume and no wet signal. 100% is wet signal at full volume and no dry signal.

▸ **Output** - ranges from -24dB to +24dB.

This parameters controls the volume of the output signal.

▸ **Power**

Bypass switch.

▸ **Head 1, 2 and 3**

These switches enable and disable each of the heads.

▸ **VU meters**

The VU meter shows you the volume of the input and output signals from -20dB to +3dB.

▸ **HQ**

Enables and disables oversampling.

▸ **Panic (!)**

When clicked, the tape will be erased.

▸ **Tab menu**

Heads, tape, motor and master. Clicking on these switches will take you to the desired panel.

▸ **Heads**

This page contains all of the parameters related to the playback heads. From top to bottom you can see the set of parameters to control the first, the second and the third head.

▸ **Signal volume indicator**

The red light indicates if there is signal passing through the head and its amplitude.

▸ **Time** - free or synced to tempo.

This parameter works in conjunction with the sync button. If the sync button is enabled, the Time parameter will show the time synced values that you can use to sync the head to the tempo: 1/32, 1/16T, 1/16D, 1/16, 1/8T, 1/16D, 1/8, 1/4T, 1/8D, 1/4, 1/2T, 1/4D, 1/2, 1/1T, 1/2D and 1/1.

The minimum delay time is 25 ms and the maximum is 1.2 seconds, like the original.

▸ **Sync**

Set the Time parameter to be synced to the host tempo or free.

▸ **Volume** - ranges from -100% to 100%.

Places the signal from this head in the left, right, center or anything in between.

▸ **HP** - ranges from 20Hz to 20KHz.

High-pass filter that acts only on this head.

▸ **LP**

Low-pass filter that acts only on this head.

▸ **Tape**

This page contains all of the parameters related to the sound of the tape loop.

▸ **Hiss volume** - ranges from -96dB to 0dB

Sets the volume of the hiss noise from the tape.

▸ **Auto-mute**

If enabled, the plugin will detect that there is no signal coming through and the hiss will be automatically stopped. If it's not enabled, the noise will continue even if there is no input signal.

▸ **Mono - Stereo**

If enabled, the hiss will be stereo (different noise on each channel). If not enabled, the hiss will be the same on each channel. The original Copicat is mono only.

▸ **Wow** - ranges from 0% to 100%.

This parameter controls the amount of wow. Slow pseudo-sinusoidal pitch fluctuations caused by inconsistencies in the motor speed. The wow signal is not perfectly shaped as it introduces randomness into the equation, making it sound like the original hardware, less predictable and more analog.

▸ **Flutter** - ranges from 0% to 0.01%

This parameter controls the amount of flutter. Rapid pseudo-sinusoidal pitch fluctuations with randomness.

▸ **Age** - ranges from 0% to 100%

At 0%, the parameter doesn't add anything into the sound. While gradually increasing it two things happen: the frequency response is altered, losing high frequency content and gaining low frequencies. Asperity noises is increased. Asperity noise is caused by random imperfections on the surface of the tape. It's frequency dependant and its commonly referred to as 3D effect.

▸ **Signal Loss** - ranges from 0% to 100%.

Also known as "wear", it's a parameter that controls the amount of high frequency that's randomly lost. It's driven by two random oscillators set at different frequencies and it gives a very distinctive sound to the signal.

▸ **Loop gap** - ranges from 0% to 100%.

Tape loops are just a strip of tape glued together. You can't have a perfect tape loop, there will always be a little gap from where the tape ends and starts again. This gap creates a momentary signal loss, and it's subsequently repeated by the heads. In Echo Cat you can set the amount of effect or leave it at 0% for a perfect artificial tape loop.

▸ **Motor**

This page contains all the parameters related to the motor that makes the tape spin.

- **Hum** - ranges from -96dB to 0dB.

Hum is a sound associated with alternating current which is twice the frequency of the mains electricity. The sound often has heavy harmonic content above 50-60 Hz. When analysing the sound of the Copicat, a loud hum was present. We didn't include it in the first prototype, but when comparing the sound of the original with the plugin, we missed the hum.

- **Auto Mute**

When enabled, the plugin will detect that there is no signal coming through and the hum will be automatically stopped.

- **50 - 60 Hz**

Sets the frequency of the hum noise. Depending on the frequency of the mains electricity.

- **Varispeed Amount** - ranges from -10% to 10%.

There was a version of Copicats that introduced Varispeed. You are able to change the speed of the motor so the times of the heads would vary. In Echo Cat you can change the speed of the motor to get that tape pitch effect. You can also automate it using the modulation section.

- **Varispeed Smooth** - ranges from 0.% to 100%

Controls the time it takes to the motor to achieve the desired speed. This also controls the slew effect when changing the Time parameters on the Heads section.

- **Modulation Depth** - ranges from 0% to 100%.

Sets the amplitude of the low frequency oscillator that controls the Varispeed Amount knob.

- **Modulation Hz** - ranges from 0.1 Hz to 10 Hz

Sets the speed of the LFO.

- **Waveform**

Choose between sine and triangle waves.

- **Master**

This page contains all the parameters related to the output of the plugin.

- **Ducking Amount** - ranges from 0% to 100%

Echo Cat will turn the volume of the wet signal down when the dry signal is present. Using this knob you'll set how much reduction is applied. At 0%, no reduction will be applied.

- **Ducking Speed** - ranges from 0% to 100%

Sets the attack and release ballistics of the ducking effect. At 0% the attack will be set at 10ms and release at 300ms. At 100% the attack will be set at 100ms and the release at 3000ms.

- **Ducking Target**

You can set Echo Cat to perform the reduction to the full stereo or just to the mid channel, leaving the sides untouched.

- **Bass** - ranges from -12 dB to +12 dB

Applies a low shelf filter to the output signal.

- **Treble** - ranges from -12 dB to +12 dB

Applies a high shelf filter to the output signal.

- **HP** - ranges from 20Hz to 20KHz

Applies a high pass filter to the output signal.

▸ **LP** - ranges from 20Hz to 20KHz

Applies a low pass filter to the output signal.

▸ **Mid** - ranges from -24dB to +24dB

Controls the volume of the mid channel (L+R) of the output signal.

▸ **Side** - ranges from -24dB to +24dB

Controls the volume of the side channel (L-R) of the output signal.

▸ **Mono**

Sets the output signal to be mono. If the track is already mono, it doesn't do anything.

▸ **Stereo**

Sets the output signal to be stereo. If the track is already stereo, it doesn't do anything.

▸ **Fake St.**

Applies a 5ms delay to the right channel, which results in a sensation of a wider sound.

# USER INTERFACE

## MAIN

The main window shows a representation of the tape loop with the record, erase and playback heads. With the common parameters at the bottom: input, sustain (feedback), mix and output knobs. VU meter that shows the input and output level. A power switch that will bypass the signal coming from the plugin. Finally, you can find the three switches that enable each head, tap or repetition.

In the top left you can see the Echo Cat's logo, that will display the main panel when clicked. Right after that, you can see the HQ and Panic buttons explained above. At the centre you can see the presets box with navigation arrows for easy preset surfing. More on the right you can see a burger menu icon that toggles the main menu. More on that later. On the top right there's our logo which will show you the Echo Cat's info panel when clicked.

At the bottom right corner you'll see the icon indicating that the whole GUI is resizable. Just drag to resize. The plug-in will remember it's size and it can always be reset by clicking on the main menu and selecting "Default size".





# HEADS



This page lets you control all the parameters related to the playback heads. With three rows, one for each head, that contain time, sync switch, volume, pan and high-pass and low-pass filters.

# TAPE



In the Tape panel you can find three sections: Hiss, Cat-facts (or Artifacts) and Loop gap.



# MOTOR



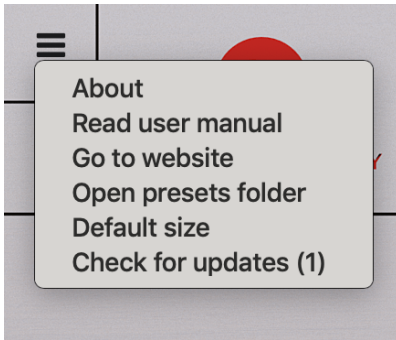
In the Motor section you can find three sections: Hum, Varispeed and Modulation which controls the Varispeed Amount knob.

# MASTER



In the Master section you can find three sections: Ducking, Global Tone and Output.

## MAIN MENU



The menu on the top right contains these elements:

- **About:** this will open a pop-up panel that shows the version number and credits.
- **Read user manual:** the folder containing the user manual will be opened.
- **Go to website:** this will launch <https://www.wavesfactory.com/audio-plugins/echo-cat> in your default browser.
- **Open presets folder:** it will open the presets folder so you can manage the preset structure.
- **Default size:** selecting this option will reset the plug-in to the default size of 850x663 pixels.

### Extra:

If an update is available the menu will also feature an option named “Check for updates (1)”. More on that in the next chapter.

## AUTO-UPDATER

In order to make the plug-in easier to use and improve the user experience we’ve included a new method for updating it. Rather than sending an e-mail for letting you know that there is an update and tell you to go to the website and download it, we’ve thought of a better method.

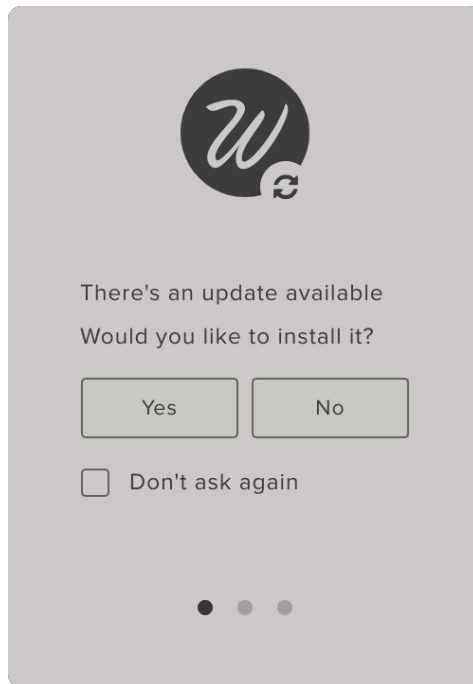
The plug-in itself will warn you that there is an update available by displaying a red icon at the top right of the main GUI.

This icon will only appear if your computer is connected to the internet and if it’s possible to perform the update.

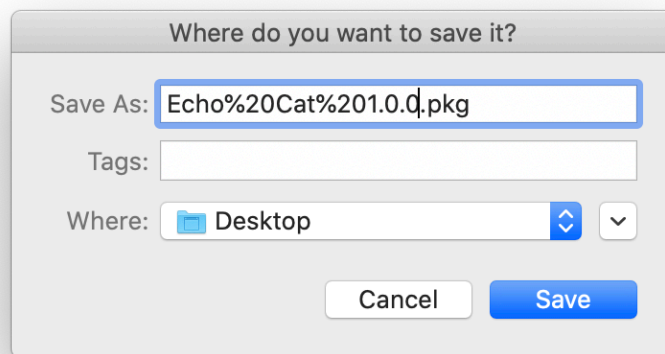




When clicking on this yellow update icon this panel will appear:

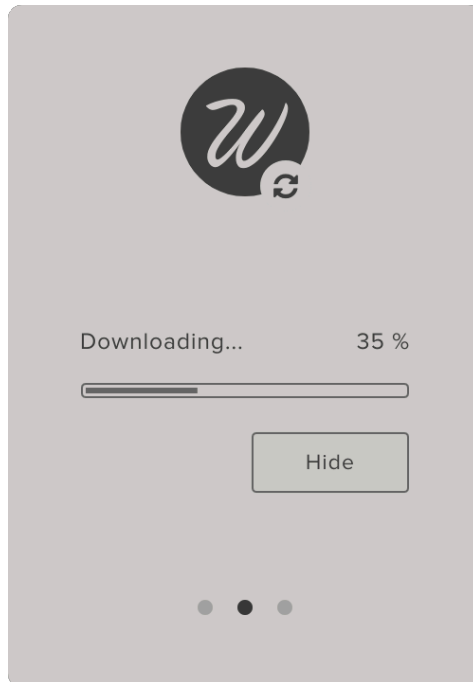


If you don't want to install the update you can postpone it by clicking "No". If you don't even want the plug-in to warn you again you can toggle the "Don't ask again" switch. Then, the icon will disappear but a new option will appear in the main menu named "Check for updates (1)". This menu option will trigger the same process as the yellow update icon. If you would like to perform the update (always recommended!) you have to click on "Yes". The plug-in will ask you where you want to download the installer in your hard drive using a native window. In this case, in a macOS system.



If you click on "Cancel" or if something goes wrong, an error message will appear indicating that there has been an error and you should try again.

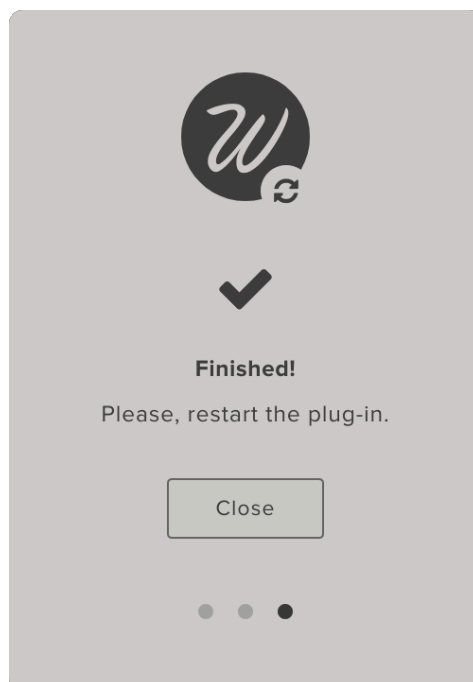
If a valid location has been set, the download will begin.



In this window you can see the download progress. Here we depend on the server speed and your own connection speed. Usually, it should be fine and the download should be ready in 1 minute (the installer's size is roughly 100MB).

You can always click on "Hide" so the plug-in downloads the installer in the background while you work in the main interface.

Once the download finishes the plug-in will launch the installer automatically, you should install the plug-in normally. Then, this message will appear.



Then, as you can read in the window, you should relaunch the plug-in and everything should be updated.

# PRESETS

## ABOUT

At the top centre of the plug-in you'll find the presets menu. It will be set to the "default" preset when you open the plug-in for the first time. It works like a regular preset manager where you have a list that it lets you pick any item and all parameters will be changed accordingly.

The presets are stored in .wfp (Wavesfactory Preset) format in:

- **Mac:** Library/Application Support/Wavesfactory/Echo Cat/Presets
- **Windows:** C:\Users\'username'\AppData\Wavesfactory/Echo Cat/Presets

You can directly manage the presets in this folder, if you create different sub-folders for drums, bass, guitars, mastering, each containing a set of presets, Echo Cat will take care of that structure and will show it accordingly using sub-menus.

To open the presets folder you can simply click on the top right menu and select "Open presets folder".

## SAVE / LOAD / DELETE

The first three elements in the presets menu are: Default, Save and Save As.

Select the default preset for going back to the initial state. This default preset can't be changed or re-saved.

In order to save a new preset you first have to tweak the parameters to your taste, then open the presets menu and select "Save As". This will open a native OS window that will let you name the preset and save it in the presets folder.

When you have a preset loaded and you tweak it, the Save label will appear with an asterisk like this: Save\*. This means that the preset has been modified and you can save it directly without going through the "Save As" dialog.

If you want to save a new preset based on a saved one you can select "Save As" and the save dialog will appear.

Deleting a preset is as easy as clicking "Delete..." or delete the file in your computer.

## SUPPORT

If you find any bug or you have any questions please get in contact with us following this link:  
<https://www.wavesfactory.com/support#contact>

## FINAL WORDS

A huge thanks to all people involved in this project. Beta testers, video makers, reviewers, artists, designers, composer friends and coding friends!

We hope you like it as much as we do and it helps you take your mixes to the next level.

Thank you very much for supporting Wavesfactory.

## CREDITS

- **Production:** Wavesfactory.
- **Design:** Jesús Ginard, Pau Obrador.
- **DSP:** Jesús Ginard, Ivan Cohen.

# EULA

## I. Grant of License:

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## II. Software Ownership:

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## **CHANGELOG**

All bug-fixes, additions and all relevant changes made to Echo Cat will be documented here.

### **# Version 1.0.2 - 22/07/2022**

- Added: Native Apple Silicon support.
- Improved: bugs fixes and optimisations.
- Removed: OpenGL is unsupported.
- HOT FIX: AU validation.

### **# Version 1.0.1 - 20/10/2020**

- Improved: CPU optimisation.
- Added: Mix and HQ parameters locked.

### **# Version 1.0.0 - 14/10/2020**

- Initial release.