



THE BELLE EPOCH

Welcome to the Catalinbread Belle Epoch Tape Echo, with tape echo sounds so authentic you'd swear there was tape inside the pedal!

Inspired by the Maestro Echoplex, EP-3 model, perhaps the most famous tape delay ever, it helped define the sound of 70's rock guitar and was used by almost everyone! Jimmy Page, Brian May, Tommy Bolin, KK Downing, Van Halen, etc, etc!

QUICK START

To get acquainted with your new Belle Epoch, let's first plug it in by itself, without your other pedals. Start off with a clean sound from your amp.

Set the Mix to noon, the Echo Sustain and Sway/Mod at minimum, and the delay time, Echo Delay, anywhere you like. Now play and try various settings on the Tone/Record Level knob. Notice when set low the repeat is very wispy and quiet and when set high it is very dense and loud with a bit of gritty distortion. You'll come to appreciate this control the more you get to know your Belle Epoch. You can set your echoes for background ambience or you can set them to be loud, punchy, and in your face. This is much more effective than a simple traditional "tone" knob and is exclusive to the Belle Epoch.

Now explore the Echo Sustain knob. In the first half of its rotation, you'll get a fixed number of repeats with a perfect decay. Then around 1:00 to 2:00 you can dial it in so that the repeats go on almost indefinitely without building up. Beyond that point and you've entered the self-oscillation zone! Now start twisting the Echo Delay knob to really start having some fun. But beware! It might get loud! Turn the Mix control down to avoid exploding your amp or to avoid getting an eviction notice!

Now dial in a bit of Sway/Mod and listen to the random tape warble on the echoes. A little dab will do ya with this control! Try setting the Mix control all the way down so you only hear the dry signal and compare the sound and touch-sensitivity with the pedal on and off. You may decide you always want it on! You can turn the Mix control all the way up to hear the echo signal only too.

This may be all you need to get up and running but do come back and read the rest of this guide to get more insight into the fabulous Belle Epoch!

WHAT WAS COOL ABOUT THE ECHOPLEX?

When we set out to develop a delay pedal that captured the essence of the mighty EP-3 we had to first understand what exactly it was that made the Echoplex special. Surely it was more than just EQing the repeats to make it sound “tape-y”.

1.) First off, the EP-3 is famous for making your guitar sound better. Even when the echo is turned off! The Echoplex was definitely not “true-bypass”. Your guitar signal went through it’s audio path whether the echo was on or not. The dry guitar signal went through a relatively simple path of discrete pre-amp and on to a passive mixer stage and then out. But guitarists loved its slight boost and subtle tone-shaping effect.

2.) The quality and decay of the repeats. The Echoplex was not necessarily “hi-fi”. As the echoes repeated, the signal got progressively degraded, losing low end and gaining a shiny, percussive top end with a bit of grit. The first repeat is strong and then it gets more and more diffused as it repeats. And in a well-tuned unit, you could dial in the repeats “Echo Sustain” so that it would float almost indefinitely, without going into self-oscillation.

3.) Self-oscillation! The Echoplex was more than just a delay box, it was an instrument unto itself. Almost all the famous Echoplex players used the delay slider and self-oscillating repeats as part of their musical vocabulary. In fact, you could play the Echoplex without even plugging in a guitar, just by turning the Echo Sustain up until it self-oscillated and then play it by manipulating the “Echo Delay” slider. This is where many other attempts at a “tape echo pedal” fall short. Not only does the unit not self-oscillate, but turning the delay time knob results in.... nothing. The sound stops till you park the delay time control. No space ships?! Fail!



4.) The sound of the tape head traveling across the tape as the Echo Delay slider was manipulated. If you have a lot of repeats going and move the Echo delay slider the echo sound “lags” a bit as the tape head settles into the new position. It’s definitely not a linear behavior like you’d hear in the delay time knobs on most pedals. But it added to the Echoplex mojo and was part of its distinct sound.

5.) Record Level. There’s a control on the EP-3 that sets how hard the tape gets hit. While this control was ostensibly used to optimize signal-to-noise ratio, set low it would give light and airy repeats and set high it would saturate the tape hard and give an awesome fat and grungy repeat tone.

6.) Wow and flutter! Almost any mechanically driven audio reproduction device is subject to these “problems” and the EP-3 was no different. Tight spots in the tape cartridge, uneven motor speed, bumpy capstan wheels, and other mechanical issues would cause the tape speed to vary resulting in random slight fluctuations in the pitch of the echoes. With shorter delay times it could create a kind of chorusy sound. With longer delay times it created an otherworldly warbling of the pitch and added thickness and dimension to the guitar tone. And the types of wow and flutter would vary from unit to unit, depending on its condition. In fact, it would vary from day to day in the same unit! We noticed that with our example of the EP-3 at the shop. One day it would be a slight warble, the next day it might be more dramatic. And it always seemed “random”. It certainly didn’t sound like a perfect sine wave LFO!

7.) Passive mixer and output stage. The EP-3 did not include any sort of output buffer after the dry and wet signals were combined through it’s simple passive mixer. This resulted in a relatively high output impedance which, while technically not “good”, resulted in the tone and response with the amp that made the Echoplex so musically dynamic.

8.) Delay time range. The Echoplex had a minimum delay time of about 80ms (it couldn't get any shorter since the playback and record heads couldn't get any closer together!) and a maximum delay time of about 800ms. This is pretty close to the perfect range to have in a guitar delay device for most applications. Plus, the famous sounds you've heard on records of EP-3 users, where the player would slide the Echo Delay slider from longest to shortest delay times and back during their spaceship sound excursions or theremin solos, to get the authentic sound you'd want to have that delay time range.

So, armed with this insight, we developed the Belle Epoch to incorporate all of these attributes into a compact pedal that delivers an amazing musical experience with none of the maintenance of the real deal!

BELLE EPOCH FEATURES

We wanted to incorporate all the attributes that made the EP-3 compelling and then some. The Echoplex is a musical instrument unto itself and we wanted the Belle Epoch to be too!

So then, here's what we did with the Belle Epoch:

- We used the same basic architecture for the audio path and mixer stages as the EP-3. The delay line is DSP-based, but we carefully tuned the repeats to sound and respond like the Echoplex.
- We developed an all-discrete preamp that gives the same benefits as the EP-3 but with even greater touch-sensitivity. Your direct guitar signal only sees this preamp. There are no buffer stages or op-amps anywhere in the direct signal path. Plus, the Belle Epoch preamp can be run from 9 to 18 volts as opposed to the fixed voltage biasing of the original, giving you more powering and tonal options.
- The delay time range of the Belle Epoch goes from 80ms to ~700ms, going from the perfect slapback all the way to Brian May.

- The Echo Delay control “lags” just like the slider on the Echoplex! When you turn it the delay time takes a moment to “catch up”. When doing self-oscillation soundscapes, this gives you a totally realistic and authentic Echoplex response! It really feels like you’re moving a tape head laterally across the tape instead of merely rotating a knob!
- We paid close attention to the sweep of the Echo Sustain (repeats) control, going from a single repeat all the way to self-oscillation madness. There is a wide sweet spot for dialing in repeats that can float without building up into self-oscillation. You’ll find the sweep of this control allows you to get the echo sustain sound you’re going for quickly.
- The Sway/Mod (mod?) control allows you to adjust the amount of random wow and flutter characteristics on the repeats.
- We reproduced the behavior of the EP-3’s Record Level control with the Tone/Record Level control. You can go from light and airy repeats all the way to thick and grungy repeats. This knob essentially gives you control over that all important first repeat - it can be thin and quiet, great for adding ambience without the echoes stepping on your dry signal or it can be big and gritty, louder and dirtier than your dry signal, great for rhythmic echo solos.
- The Mix control uses authentic EP-3 mixing circuitry to go from totally dry to totally wet. This is the same as the “Echo Volume” control on the EP-3.
- An internal trimpot allows you to preset the Belle Epoch’s gain and volume, from unity all the way to an incredible, loud, fuzzy boost. Hit your amp hard if you want for amazing saturation from the discrete preamp.

- Internal switch allows you to set for true-bypass OR "trails mode"! Put it in trails mode to always take advantage of the Belle Epoch's juicy preamp! Put it in true-bypass mode and set the gain loud for instant epic lead goodness from one pedal!
- You can run the Belle Epoch from 9 to 18 volts. Go with 18 volts for more headroom and punch!

You're gonna love what the Belle Epoch will do for your sound!

THE CONTROLS

Mix: This control replicates the functionality of the Echo Volume control on the EP-3 and uses the same basic passive mixer circuit. Set at minimum to get dry only. Set at maximum to get wet only. You'll find that you'll probably want to run the Mix control lower when running the Belle Epoch into an overdriven amp or a dirt pedal due to the fact that the signals will be compressed and therefore bringing up the level of the repeats.

Tone/Record Level: This control sets how hard the "tape" or delay line is hit. It does not affect your dry signal and only affects the initial first repeat. Turning the knob while repeats are playing will not affect them. In practice, you'll want to use this control in conjunction with the Mix control to set your balance for the delayed sound vs. your dry signal. You may find that you will end up presetting the Mix control (typically from 9:00 to noon) and controlling how present the repeats are with the Tone/Record Level knob.

With the Tone/Record Level knob set low, the initial repeat will be very quiet, thin, and airy. When set high, the initial repeat will be very loud, thick, and slightly distorted. If you like the sound with the Tone/Record Level set high but want the repeats to be quieter, just back down the Mix knob. Conversely, if you like the airy, light tone of the knob set low, but want it louder in the mix, just turn the Mix control up. Use both of these controls together to get your sound and balance! Noon is a good starting point for the Tone/Record Level and then you can adjust it up or down to get what you're looking for.

Sway/Mod: This control sets the amount of random tape wow and flutter effects in the echoes. At minimum, there is no wow and flutter. For the most realistic tape warble, set this control fairly low - 9:00 to 10:00 is a good sweet spot. Of course, you can crank it up and get some serious pitch warble going! Also, with really short delay times you may want to set this control lower for the most realistic tape sound. With longer delay times you can get away with a lot more.

Echo Sustain: This controls how much delay signal is fed back to the delay line to get multiple repeats. From minimum up to around noon you'll get a fixed number of repeats with a great decay curve. Above noon you start to get into infinite floating repeats and then into self-oscillation.

The Belle Epoch will generate self-oscillation tones by itself, without any guitar signal present at the input, when the knob is turned from around 2:00 on up. The Echoplex did this too and this was an important attribute for us to dial in!

You'll notice that up until the self-oscillation point the repeats get successively thinner as they decay. But from the self-oscillation point on up, the output from the pedal will be VERY loud. This is how the Echoplex behaved too and is part of its mojo! High settings of the Echo Sustain control are not for the faint of heart! As you get into your self-oscillation jam you can turn the Mix control down to keep things somewhat sane.

Echo Delay: This controls the delay time, from about 80ms all the way up to 800ms. It was designed to be manipulated in real-time, as you are playing, to get the same sounds as an EP-3. You'll notice, especially when the Echo Sustain is turned up a bit, that the echo sound "lags" a bit, much like how the Echoplex behaves when you move the slider back and forth. If this knob worked in a linear fashion like on a standard delay pedal, you'd miss that bit of authenticity in response!

Use this knob together with the Echo Sustain knob to play complete soundscapes without touching the strings on your guitar!

BELLE EPOCH CONTROLS



1. DC power input
2. Echo Sustain
3. Sway/Mod
4. Tone / Rec Lev
5. Mix
6. Echo Delay
7. Input Jack
8. Output Jack
9. Bypass Footswitch
10. Silkscreen Faceplate
11. Catalinbread Logo

INTERNAL CONTROLS

Gain Trimmer: This sets the gain of the preamp. It is factory set just above unity gain. At maximum gain, you'll be treated with a gloriously huge fuzzy boost that sounds amazing into a cranked amp or foundation overdrive. You'll still be able to clean up from your guitar's volume knob if you run it this way! If you choose to adjust the internal gain, do so carefully, when adjusting trim pots, it is important to recognize that you must use the correct tool for the job and do very careful work. Trimpots are much more sensitive to adjustments than the knobs on the outside of the pedal. Use a #00 Philips screwdriver, make sure the tip is seated correctly and only make 1/8 turns at a time. If the the trimpot doesn't seem to move, it is at it's full rotation. Do not attempt to force it beyond these full clockwise and counterclockwise positions or you will destroy the trimpot.

The original EP-3 did not really boost so much as color and saturate the sound slightly. The all-discrete preamp in the Belle Epoch gives you the same benefits but with added gain control and more touch-sensitivity!

Buffer / True-bypass Switch: From the factory we ship the Belle Epoch in true-bypass mode. You can use this switch to set it to "buffer" mode. (It's not really a buffer, it's a discrete preamp, but non-true bypass mode is commonly referred to as "buffered" mode.) So, in "buffer" mode, the Belle Epoch's preamp is always in the signal. Besides always having the great discrete preamp in your signal path, this mode offers another benefit - "trails", meaning when you turn off the pedal from the footswitch, the remaining repeats will keep playing but any further playing will not result in any echoes.

POWER SUPPLY REQUIREMENTS

To power the Belle Epoch use a 9-18V DC Negative Ground power supply that can deliver a minimum of 70mA. No, you can't run it on batteries! We recommend that you try it on both 9 volts and 18 volts to see which voltage you prefer. But for the best Echoplex-like response, definitely try it at 18 volts!

BELLE EPOCH PLACEMENT

The original Echoplex was typically used in front of the amp to gain the benefit of the preamp and also since guitar amps usually didn't have effects loops back then!

The Belle Epoch was designed to be run in front of your amp in the same way the Echoplex was designed to be run in front of your amp. They share almost identical input and output circuit topologies, including the passive unbuffered mixer circuit of the EP-3. However, we tuned it to have a lower output impedance than the EP-3 to not load down the output as much while still retaining the open non-buffered output interface. A buffer does just what the name implies - it isolates one circuit from the next and can create a "disconnected" feeling that is subtle but a player who relies on touch-sensitive dynamics in his rig will appreciate the difference of not having the buffer. Having said that, the Belle Epoch will perform great in almost any pedal stacking situation. But for the most authentic Echoplex-like experience, we recommend that you run it before any foundation overdrive type pedals and after fuzzes, treble boosters, and the like. For the most awesome experience, try playing it right in line before your cranked up tube amp.

At the end of the day, just experiment with the pedal order to see what YOU like the best. Here's a couple things to keep in mind though:

If you run it before an overdrive pedal or overdriven amp, you'll probably want to run the Tone(Record Level) and/or Mix controls lower since the distortion will compress the dry and echo signals together more.

If you run it after all gain pedals and into a clean amp, you can set the Mix and Tone(Record Level) controls higher to achieve the same balance between dry and echo signals.

DESIGN NOTES

The development of the Belle Epoch was a team effort at Catalinbread and we really wanted to come up with a pedal that incorporated all the key compelling attributes of the EP-3, as we noted in the introduction of this guide. We felt that a “tape echo” pedal was much more than just a standard digital delay with some “filtering” on the repeats. There are a lot of subtle and not-so-subtle traits of the Echoplex that need to be implemented in order to be authentic. The preamp, the self-oscillation character, the ability to play the pedal as an instrument unto itself, the ability to control the “record level” of the signal hitting “tape”, the wow and flutter, the way the repeats decay, the way the circuit interfaces with the amp and other pedals - all these things were important to get right.

Thanks for getting the Belle Epoch and we’re sure it will inspire many epic musical moments for you!



BELLE EPOCH TAPE ECHO

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MECHANISMS OF MUSIC