

If you are reading this, most probably, you are about to build Erica Synths DIY BBD DELAY/FLANGER module. The module is 14HP wide, 45mm deep, skiff friendly, has solid mechanical construction and doesn't require wiring.

Erica Synths DIY BBD Delay /FLANGER is one of few BBD (bucket brigade delay) chips based DIY modules. The module is designed to provide variety of effects from flanger to delays with adjustable flavours and plenty of modulation possibilities. It has built in LFO with selectable shape and dedicated LFO output, delay time CV input with an attenuator, selectable feedback overdrive and feedback Send-Return connectors, so you can apply external effects on feedback signal. Maximums feedback settings put the module in self oscillation, so it can be used as an experimental sound source, as well.

The DIY kit comes in three versions:

- 1) Set of 2 PCBs + BBD ICs (V3205 and V3102),
- 2) Set of 2 PCBs + BBD ICs + mechanical parts (PCB connectors and spacer)+ panel,
- 3) Full kit.

FEATURES:

- 4092 stage BBD
- Up to 300ms delay time
- Delay time CV input with an attenuator
- Feedback Send-Return circuit for external effects
- Built in LFO with dedicated output
- Two customizable feedback overdrive flavours
- LP filter on the output with selectable cutoff
- Dedicated Wet output

SPECIFICATIONS:

•	Max Delay time	300ms
•	Audio output amplitude	10Vptp
•	CV amplitude (full span)	-5V - +5V
•	Panel width	14HP
•	Module depth	45mm
•	Power consumption	30mA @+12∖
		20mA@-12V



1 The big knob sets delay time from 0 CCW to 300ms CW.

The COLOUR switch applies the LP filter of two selectable cutoff frequencies on the output. Mid position means – no filter applied, top position is "Darker", bottom position "Dark". Use the filter with low frequency audio on the input!

- 3 Select one of two feedback signal overdrive flavours
- 4 Select the built in LFO shape

Adjust the built in LFO frequency. The LFO is internally routed to the delay time CV through the MOD LEVEL attenuator. The LED will give visual feedback on the LFO rate.

6 Adjust feedback level! In full CW setting the module will go to self oscillation

- 7 This is the Dry/Wet crossfade control
- 8 Adjust the audio input level! DDB Delays are sensitive to the audio input level, so experiment with settings to get different results!

 This is the delay time CV attenuator. It's internally patched to built in LFO, but when you patch a external modulation signal, the internal connection is replaced by the external one

This is the feedback FX Send output, meaning, you can break the feedback path and send the feedback signal to external modifiers, multimode filter, for example

This is the feedback FX return input. Patch the modified signal back here!

This is the audio signal input. Adjust the signal level for various effect flavours!

13 This is the delay time CV input

This is the LFO output. You can use the built in LFO to modulate other modules in your rack and have interesting synced effects This is the wet signal output. Here you have another audio signal to build some interesting patches

This is the output of the module. We believe, you'll enjoy results!



ASSEMBLY

Take precautions with regard to electrostatic discharge (ESD) safety. Handling components should be done in electrostatically safe environment. Use personal and workplace grounding. Any discharge (even a minor one) from body to a component may permanently damage it.

Our PCBs have silkscreened both component values and designators, but we highly recommend you to print out files with component placement before you start assembly of the module. And, please, at least take a look on this manual!

Some components are marked as NU (not used) – leave those unpopulated! Some components are market as OPTION (those are for optional modifications) – leave those unpopulated for now.

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There are two PCBs – the Control PCB with potentiometers, switches, jack and the Main PCB with components around BBDs. Solder horizontally placed resistors, diodes and ferrite beads on both PCBs! Pay attention on orientation of diodes!





Solder IC sockets, and then ceramic and film capacitors on both PCBs!







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Turn the Control board around and solder electrolytic capacitors, the PSU connector and 1x10 pin female connectors! Also fix the 11mm spacer on the board. Solder transistors, electrolytic capacitors on the Main board! Pay attention on the orientation of both! Also solder the trimpots on the main board.



Negative lug of the electrolytic capacitor is marked with a stripe!





Solder transistor, resettable fuses, potentiometers, switches and jacks on the control board! Insert the LED, but do not solder it, yet! Switches have two nuts – remove one of them and screw other on until it's fixed against the switch! Next to the FEEDBACK DRIVE switch you'll find solder pads for overdrive diodes. You can use any diodes of your taste for pairs VD4/VD5 and VD6/VD11 or VD7/VD10 which are LEDs. The kit contains two red LEDs (if you use LEDs, do not populate VD6/VD11) and 1N4148 for VD4/VD5. You may experiment here with different diodes (try germanium diodes for softer overdrive) of LEDs of various colours – it will result in different overdrive flavour. I used 33k for R71 and 100k for R72 in the overdrive configuration supplied with a kit.



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- Solder 1x10 pin male connectors on the Main board!





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Place the panel on the Controls board fix it with couple of nuts and push the LED through the hole. Solder the LED! Remove the panel, install ICs on both boards (pay close attention to the orientation of ICs!) and connect both boards together as shown on the picture! Now you can connect the module to the PSU! Set all switches in the middle position, IN LEVEL full clockwise, Dry/Wet and MOD LEVEL full CCW, other potentiometers at 12 o'clock! Check if you get some sound from the module in the DRY setting and then fade the potentiometer to the WET setting. You should hear the wet signal, as well. 6

Now it's time for initial calibration! There are two trimpots on the main board.

R8 is BBD offset adjustment. Connect the WET OUT to the oscilloscope or mixer with headphones and feed the sinewave in the audio INPUT and adjust the trimpot for the least distortion (you can do it just listening to the signal on WET output).

R7 stets maximum delay time. Adjust it to your taste. The longer is the delay, the noisier gets the signal, so find the compromise.



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Now, let's take care about feedback overdrive circuit! One side of the switch in top or bottom position connects set of overdrive diodes to the feedback circuit; other part, adjusts feedback gain, meaning, different diodes limit the signal in unique way, and you need to adjust the gain of the feedback signal, so that the module goes into self-oscillation at approximately same setting for all switch positions. R71 sets gain for VD4/VD5, R72 sets gain for LEDs. Please, note that using different diodes or LEDs than supplied with a kit may require selection of R71 and R72





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Now, you can install the front panel and knobs. Don't forget to fix the Main board to the spacer, using a M3 screw. **The module is ready to use! Enjoy!**

