

tone dexter® II



User Guide

Software 2.0

User Guide Version 2.11



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ToneDexter II User Guide

What is ToneDexter II?

ToneDexter II is an innovative professional grade preamp that improves the sound of an acoustic instrument pickup.

It learns the difference between how an instrument sounds through a microphone and how it sounds through its pickup.

Using proprietary WaveMap® technology, it corrects the pickup so that it sounds like the mic.

It stores up to 32 WaveMaps at a time, which can be used for different sound variations of the same instrument, or different instruments, or even different configurations for inputs and outputs.



ToneDexter II Connectivity

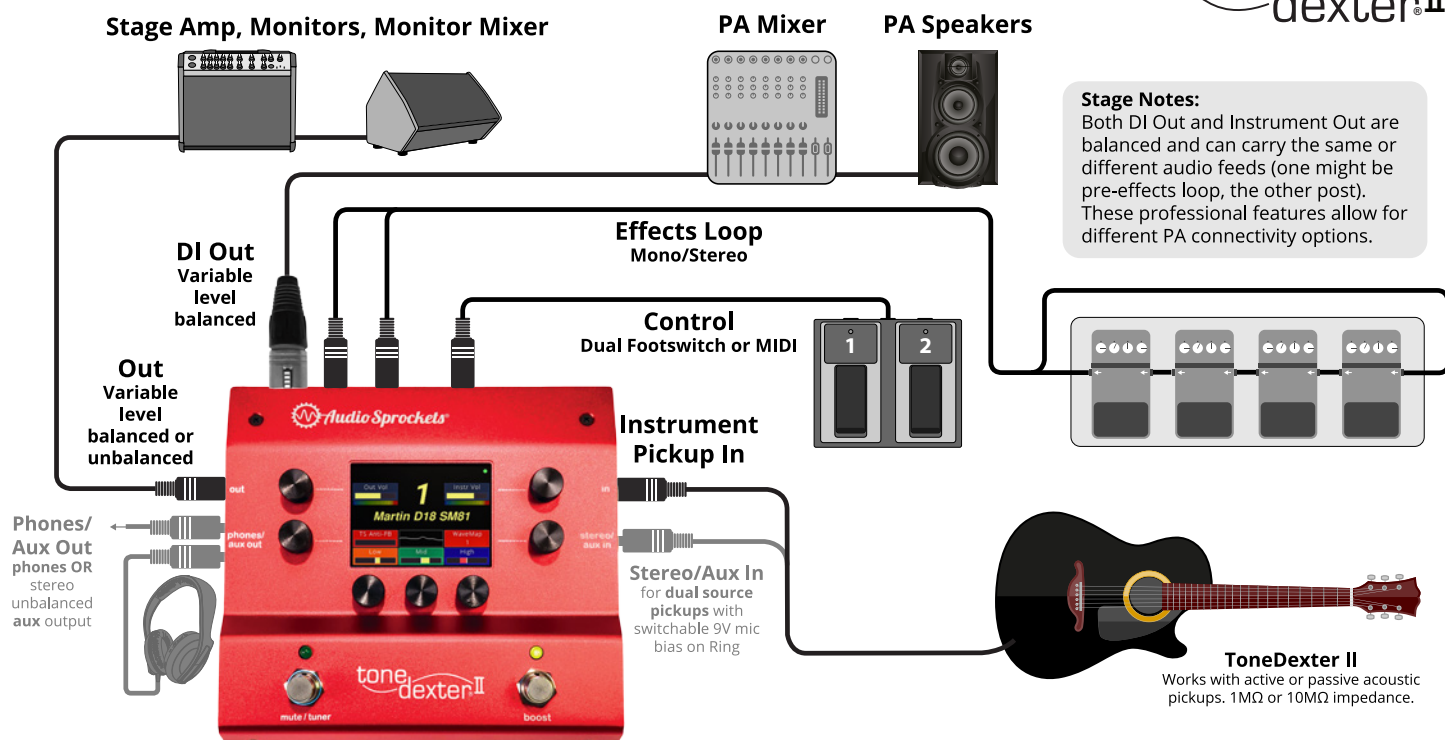
Training

tone dexter II



Live

tone dexter II



Front and Side Features



Output Controls

Adjust output level. Tap to set all output levels and routing.

Instrument Output

1/4" balanced or unbalanced mono. Source configurable.

Stereo Phones/Aux Out

1/4" balanced TRS. Drives headphones, or can be used as a stereo Auxiliary line output. Source configurable.

Tone Shaping

Anti-Feedback, Spaciousness, and Notch Filter Controls

EQ Controls

Adjust EQ gain from main page. Tap to adjust other parameters like frequency, width and shape.

USB 2.0 Port

For software downloads and WaveMap management.

Mute/Tune/Scroll

Tap to Mute and Tune. Can also be used to select WaveMaps in Footscroll mode.

Color Display

Uncluttered and color-coded to show only the most needed info.

Input Controls

Adjusts input gain. Tap to set all input levels and sources.

Instrument Input

1/4" mono phone jack. 1MΩ or 10MΩ impedance.

Stereo/Aux Input

1/4" TRS jack. Stereo input mode supports dual source pickups with switchable 9V mic bias on RING.

WaveMap Select and Edit

Select from 32 slots. Tap to name, copy, move, save, bake in and delete WaveMaps.

Boost/Train/Scroll

Tap to give a 2-8dB adjustable gain boost. Also used to initiate training and select WaveMaps in Footscroll mode.

System Configuration

In Tune mode, tap the System Config control to access global and advanced options.

Rear Features



Boot button

Tap to reboot, (press-hold initiates the alternate software update procedure – see [Updating Software](#)).

Mic In

XLR Female, with switchable 48V phantom power.

Control Select switch and Control Jack

Set to **Pedal** for external dual footswitch control.

Set to **Midi** for a standard TRS MIDI connection to select WaveMaps with Program Change commands.

DC In

Accepts 9V to 15V DC power, either polarity. **Requires 8W minimum for startup, 7W continuous.**

Effects (FX) Send and Return

1/4" TRS jacks. Supports mono, stereo, and dual channel configurations.

DI Out

Balance XLR, source configurable.

Introduction

How To Use This Guide

Once you have a sense of what the controls do, go to [Quick Start Basics](#) to jump right in and create a custom WaveMap for your instrument.

Next, look over the [Nuts and Bolts](#) section to learn about all the options for operating modes, signal routing, EQ, and Tone Shaping, managing your WaveMaps and updating the software as new features are added.

For even more depth, the [Advanced Features](#) section will allow you to squeeze every last ounce of functionality out of your ToneDexter II.

See [Additional Info](#) for troubleshooting and other details.

Definition of Terms

- **WaveMap** - a transformation filter that ToneDexter II creates, stores, and uses. It is a multi-dimensional impulse response (IR) filter which maps the sound of your pickup to the sound of your mic.
- **Slot** – one of 32 WaveMap storage locations.
- **Tap** – a quick press and release to one of the footswitches or controls.
- **Press-Hold** – pressing and holding a footswitch or control for at least one second until the display changes or the action takes effect.
- **Mute** – the left footswitch.
- **Boost** – the right footswitch.
- **Control** – a digital encoder knob for selecting values or options either by rotating or by a Tap or a Press-Hold action.
- **TRS connector** – a jack or mating plug that has 3 connections: TIP, RING, and SLEEVE (ground). Sometimes known as a stereo connector.
- **TIP** – the main conductor in a TRS connector. This is the same as in a mono connector.
- **RING** – the second conductor in a TRS connector, used to carry a signal for a second pickup, for example.
- **Frequency Response Plot** – dB magnitude (loudness) is shown on the vertical axis as a function of the frequency on the horizontal axis.
- **Impulse Response Plot** – linear magnitude is shown on the vertical axis linearly as a function of time on the horizontal axis.

Experiment Without Worry

Don't be afraid to tap buttons and turn controls to see what they do. You can always easily undo changes and go back to where you were.

If you get into a situation that would make a permanent change, such as deleting or overwriting a WaveMap, you will be warned and asked to confirm your choice.

ToneDexter II is designed to be fun and easy to use, so take a little time to play around with it without worry. In no time, you'll be an expert user!

A Word About Power Supplies

ToneDexter II ships with a 12V power supply rated either 700mA (8.4W) in the US or Canada, or 1A (12W) for Europe. The one for Europe comes with adaptor blades for a variety of countries. Both have universal input and can work with mains voltage of 100V-240V, 50-60Hz.

ToneDexter II It requires 7W continuous to run, and about 8W power during power up. Power supplies are rated differently, some conservatively, some optimistically. The recommended power supply ratings are shown in the table below.

Output Voltage	Minimum Current Rating	Power
9V	900mA	8.1 W
12v	675mA	8.1 W
15v	540mA	8.1 W

Most pedal board supplies do not put out enough power on a single output to sufficiently power a ToneDexter II.

If you are experiencing issues like the screen going white, the unit continuously resetting at startup, or working some of the time but not at other times, it is most likely because the power supply you are using is underpowered.

The good news is that most pedal board power supplies have multiple floating outputs, and you can usually get enough power by using a current doubling (parallel) daisy-chain cable connecting two outputs (with the same rating) together to feed ToneDexter II.

Quick Start Basics

Training

While ToneDexter II works as a great preamp right out of the box, to get the best sound it's necessary to create at least one WaveMap for your instrument by training ToneDexter II with a microphone.

Once that's done, the mic is no longer needed. Up to 32 WaveMaps can be stored in the unit at a time.

These can be for the same instrument with different mics or mic positions, or for different instruments.

ToneDexter II does not come pre-loaded with any existing WaveMaps because they would not work optimally for your particular instrument, pickup, and mic.

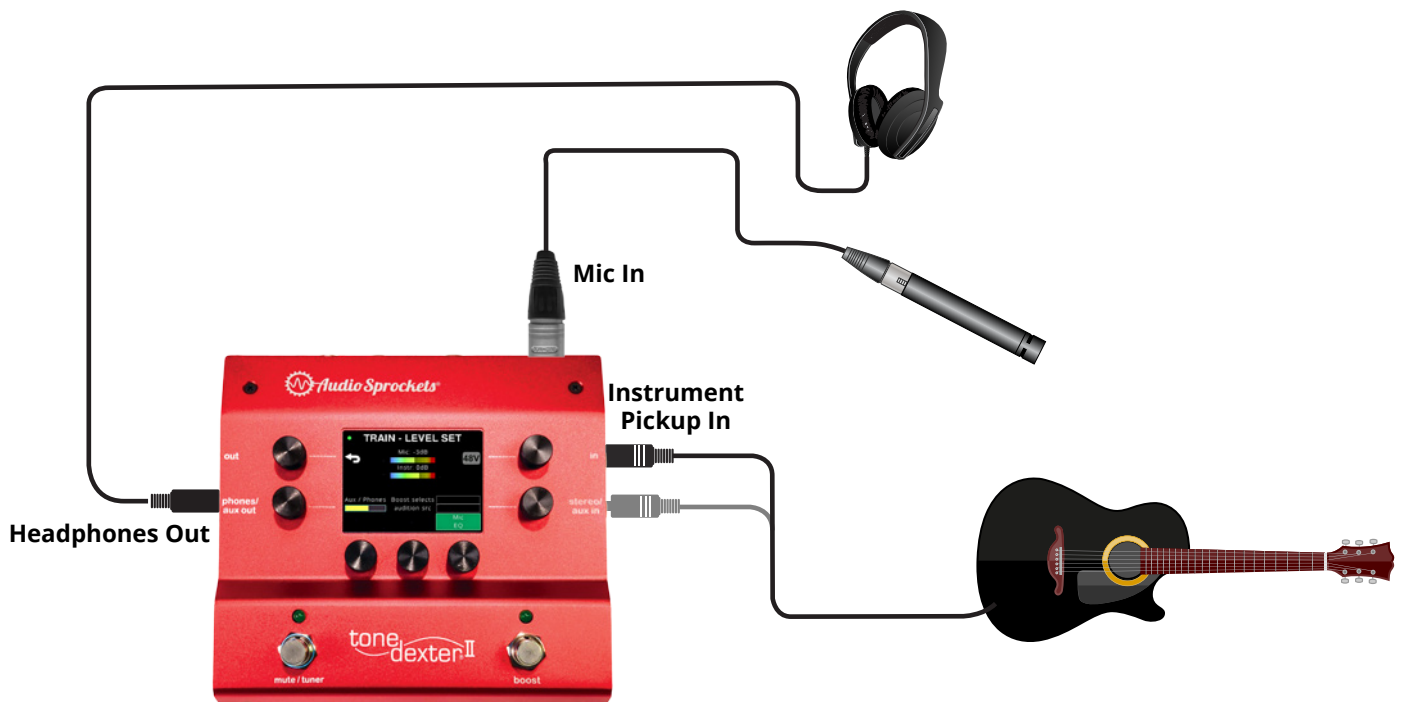
However, training is easy so let's get started!

What You'll Need

- **ToneDexter II** with included power supply or suitable alternative.
- **Your instrument, fitted with a pickup.** Most active and passive piezo pickups will work. Magnetic pickups can work to some degree – it may make the sound 'more acoustic' – but will not achieve a realistic miked sound.
- **Microphone.** It doesn't need to be expensive. What works best for studio recording is not necessarily optimum for training as the requirements are different. See Helpful Training Info below and the Audio Sprockets website for microphone guidance.
- **Microphone stand.** This is important so that whatever position you choose will be fixed and repeatable.
- **Headphones (optional).** Closed ear type. This is useful to assess the sound as you position your microphone, and to compare results. If you don't have headphones, don't worry—you can still get great results.

Training

tone dexter II



Training Procedure

1. Set up a mic on a stand, and plug it into the Mic in jack.
2. Plug your instrument into either the Instrument (In) or Aux jack. ToneDexter II will know which one you are connected to.

Helpful Tip: For standard mono pickups, you will normally just use the Instrument jack. If you are using a dual-source or stereo pickup, you can use either the Instrument jack or the Aux jack, and ToneDexter II will just use the mono (TIP) connection for training.

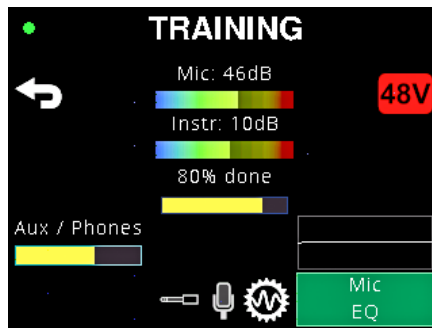
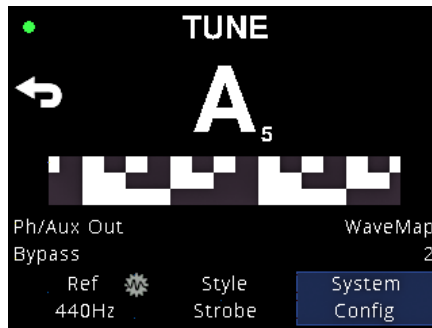
3. If you are using headphones to monitor the training process, plug them into Aux out.

4. **Tap Mute** to get to Tune mode if you are not there already.

5. Then **Tap Boost** to get into Train-Level Set mode. At this point, all outputs except Aux will be muted.

6. Once you position the mic, start playing at a medium loudness. ToneDexter II will automatically set the instrument and microphone gains to give you enough headroom to avoid distortion. You should see the level meters both be in the middle range.

Helpful Tip: Don't worry about precisely how loud you are playing, the resultant WaveMap will be at a fixed power level, independent of pickup and mic gains and how loudly you play during training.



7. Once the levels are set, ToneDexter II will automatically proceed to Training mode. Play for about a minute as you hear the training in the headphones and watch the progress bar shown on the screen. **Tapping Boost** changes the sound routed to the headphones between WaveMap, pickup and microphone.

Helpful Tip: It doesn't need to be musical. What's important is that the instrument's character and overtones are excited. Furthermore, playing soft and loud doesn't help the training process. Play at a medium level, being careful not to move your position relative to the mic.

Recommended approaches:

- Guitar, mandolin, banjo, etc – open chords, open strings, barre chords up and down the neck to say 5th position or so. Fingerpicking or flat picking are both fine. Flat picking may train a little faster though. The resulting WaveMap will apply to any style of playing.
 - Violin, cello, double bass – double stops and string sweeps on open strings and higher. Bassists should ideally use a bow and not pizzicato, as arco best facilitates training. The resulting WaveMap will apply to any style of playing.
8. Once the training period completes, the WaveMap will be transferred to a holding position, awaiting confirmation as to which slot to store it in. Before deciding to keep it, you can still tap Boost to audition the WaveMap, the raw pickup, and the live Mic sound for comparison. Brace yourself for a shock!
 9. You can name the WaveMap by either using the etch-a-sketch controls (Cursor and Char), or use a small temporary name for now and rename more conveniently later using the web interface.
 10. The next available empty slot will be selected automatically to save the new WaveMap, but you can select any other slot. If that slot is occupied it will be overwritten.

11. **Press-Hold Boost** to store the WaveMap.

Helpful Tip: You can quickly copy an existing WaveMap's name to the first empty slot by scrolling to that WaveMap's slot and **pressing Copy Title**. The Save location will reset back to the first unused slot and add the copied title to the edit bar. This is handy when making multiple WaveMaps for a single instrument.

Helpful Training Info

- If you stop playing, the training process will just wait for you to continue.
 - To cancel out of training, **Tap Mute** or the **Back** button.
 - Mic EQ can be adjusted during training, by tapping Mic EQ. This will reset the training process back to the start to use the new EQ. The next time you train, the Mic EQ adjustments will be remembered, but the default will always be flat when you restart the unit.
 - **Press-Hold the Mic EQ button** to reset the Mic EQ to flat. Note that the mic high-pass filter cannot be turned all the way off during training as a minimum setting of 20Hz is required for the training process.
 - You can store several WaveMaps using different mics and/or mic locations and decide later which ones to keep or move to different locations.
 - You can train in virtually any location—you don't need a refined acoustic space, since the WaveMap training picks up very little of the room sound. Small tiled rooms are not recommended however.
 - A small diaphragm condenser (capacitor) mic is recommended. Large diaphragm mics can also work well but may be more finicky about placement due their response coloration.
 - Dynamic mics such as common vocal mics, can yield good results, though generally will not have as much high frequency information, and tend to be quite colored. That might just be the sound you're after!
 - Tube (valve) mics, due to their high non-linearity, are not recommended but may yield good results nonetheless.
 - Both cardioid and omni-directional pickup patterns will give excellent results. Using an Omni mic can often get a more balanced sound quicker.
 - Ribbon mics may also be used. Passive ribbon mics may be used so long as they can tolerate 48V phantom power. If using a passive ribbon mic, consider either plugging in the mic first before powering up the unit, or first disabling 48V phantom power.
- **A note about hum:** If you are using a passive piezo pickup, you may hear some AC power line buzz or hum if your system is not grounded. In normal use, ToneDexter II will be connected to an amplifier or PA system, which is grounded (earthed), and you will not experience any noticeable hum.

But if you do experience hum in your headphones when training, plugging one of the other outputs into a grounded system will eliminate it.

Helpful Tip: 48V phantom mic power is on by default. If you want to turn it off, **tap [System Config](#)** from Tune and tap the red 48V control. It can also be turned on or off from the Training page.

Nuts and Bolts

— Sprockets and Chains —

Color and Text Meaning

Gold text (or **Red slots** on the web interface) indicates the slot contains a trained WaveMap.

Blue text (or blue slots) indicates the slot does not contain a trained WaveMap, but has had other parameters adjusted such as gains, EQ, or routing configuration. These would typically be used for a dual source configuration with blending or crossover, or instruments for which training wasn't required.

Gray text (or gray slots) indicates unused (empty) slots. Changing any gain, EQ or routing parameter will turn it Blue.

Italics indicate that adjustments have been made to the WaveMap since it was last saved as a Baseline. More about Active and Baseline memory in the Parameter Adjustment section below.

Straight text indicates the WaveMap is in its Baseline configuration.

Operating Modes

This section provides a summary of all the operating modes.

Play

- The Default Mode processes your pickup sound with a WaveMap and any EQ or Tone Shaping settings like Anti-Feedback Control or Spaciousness.
- Input levels and input source selection are WaveMap-specific parameters and are automatically recalled as you change WaveMap.
- Output and boost levels are System settings that stay fixed as you change WaveMaps.
- FX and Output routing as well as tuner reference frequency are by default System settings but may optionally be set to be WaveMap-specific. These parameters can be switched from System to WaveMap settings by tapping them and will be Gold if the WaveMap setting is being used.

Tune

- **Tap Mute** to mute all outputs except Aux, which can be configured to be muted or receive the by-passed pickup signal while tuning.
- Engages a precision tuner which is accurate to 1 cent.
- Automatically tunes from whichever jack (Instrument or Aux) you are plugged into. If you have instruments plugged into both jacks, it tunes from whichever jack the WaveMap slot has set as its input.
- Display style and reference frequency can be adjusted.

Boost

- **Tapping Boost** during Play Mode Increases the output level by 2-8dB. Tapping again returns to normal level.
- The boost level is configurable on the Outputs page, reached by **Tapping Out Vol** from the main page.
- The extra gain provided is in the analog domain, so as not to compromise digital headroom. If you already have the output level set very high, the full boost level may not be achievable.

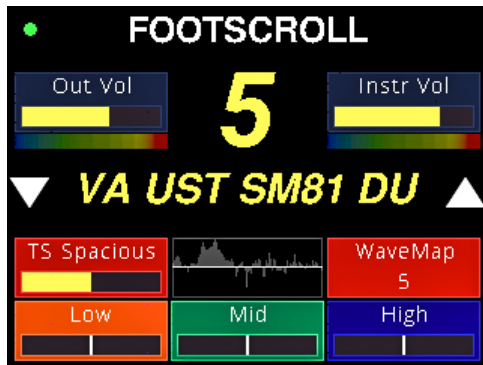
If you want 8dB of boost, make sure the Output level is set to 6dB or less, for example.

Bypass

- **Press-Hold Mute** to enter and exit Bypass mode. Audio is routed straight from the digital input to the digital output, bypassing all signal processing.

Footscroll

- **Press-Hold Boost** to enter Footscroll mode. In this mode, Boost and Mute increment and decrement the WaveMap selection. To go between Play and Tune in this mode, **Press-Hold Mute**. **Press-Hold Boost** again to exit Footscroll mode.



Helpful Tip: From [System Config](#), you can configure external footswitches to provide the same Footscroll function, thereby keeping the on-board footswitches conveniently available for their normal Mute and Boost functions.

Train - Level Set

- **Tap Boost** from Tune mode to enter Train - Level Set mode.
- Automatically sets instrument and mic gains to facilitate training.
- This gain setting is retained for the saved WaveMap as the optimum for signal strength and headroom, but can always be adjusted later.

Train

- Train starts automatically after Level Set completes.
- **Tapping Boost** cycles through audition Sources: Pickup, Mic and WaveMap.
- Mic EQ can be adjusted to tailor your mic's sound. The training will create a WaveMap to match.

Post Train

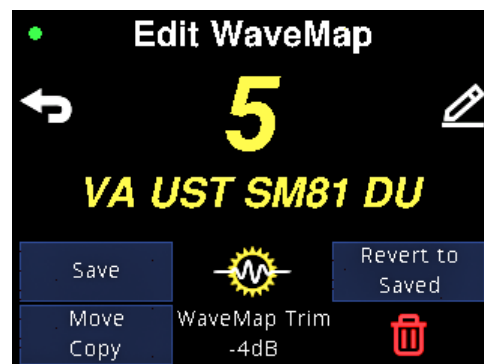
- Happens when training is complete, before you save the newly created WaveMap into a chosen slot.
- **Tapping Boost** cycles through audition Sources: Pickup, Mic and WaveMap.
- You can also adjust the main EQ before saving the WaveMap. Any adjustments you make will be included in the WaveMap's Baseline when you save it.

This could be useful if you've trained but aren't sure it's going to suffice without a little EQ. This will allow you to conveniently answer that question.

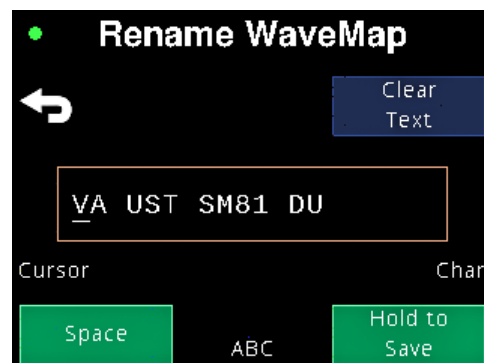
Helpful Tip: Name your new WaveMap something simple that you'll remember later. You can more easily edit the name to something more descriptive later via the web interface.

Edit WaveMap

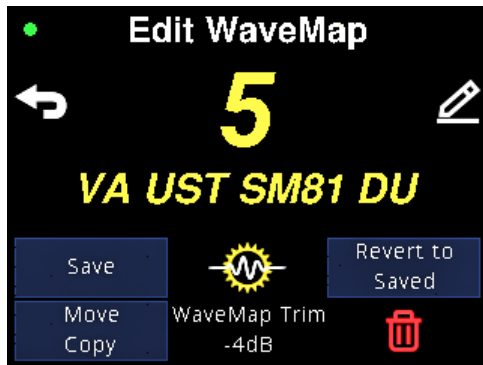
- **Tap WaveMap** to show the Edit WaveMap page.



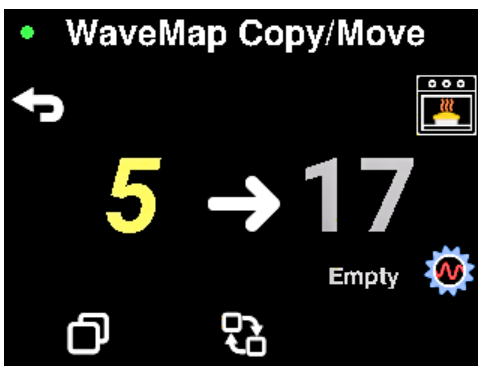
- **Tap Save** if you're happy with your sound and want to save the current configuration to the WaveMap's Baseline, which can then be recalled at any time, allowing you to further adjust and tweak.
- Rename your WaveMap using the Etch-a-Sketch style controls.






Edit WaveMap *Continued*



- **Tapping Delete** requires confirmation before deleting all WaveMap data in the current slot.
- **Tap Revert to Saved** to set the active parameters back to the Baseline parameters.
- **Turn the WaveMap Trim control** to adjust the level up or down by as much as 6dB. This is independent of the input or output gain settings and is useful for matching the WaveMap loudness to the bypassed loudness. It is also useful for adjusting WaveMaps before baking – see [Advanced Features](#).
- **Tap the Trim button** to toggle between listening to the WaveMap and Bypassed levels.



- **Tap Move Copy** to do the following:
 - **Tap the Copy Icon**  to overwrite the data at the destination slot.
 - **Tap the Move Icon**  to swap the source and destination slots. If the destination has data saved already, it will ask you to confirm.
 - **Tap the Oven Icon**  to bake a WaveMap. (see [Advanced Features](#))

Helpful Tip: Renaming, copying, and moving WaveMaps can also be done, more conveniently, by using the [WaveMap Management](#) web interface described later in this guide.

Active and Baseline Memory

Any time you adjust EQ, Tone Shaping, or Input Mode parameters, the change is automatically saved with the Active WaveMap memory—you don't have to think about it. When that WaveMap is recalled, the parameters will be recalled exactly as you left them, even after powering down and back up.

If you're happy with the sound and want to save the active parameter settings in the Baseline Memory, **press-hold WaveMap (or tap WaveMap then Save)**.

This will copy all Parameters to the Baseline Memory for the current WaveMap.

You are now free to make new changes to, say, tailor your sound for a particular venue, and can revert to the Baseline configuration at any time, which may be a better starting point for the next venue.

To recap: changed parameters are automatically stored in the Active Memory without having to take any action. Baseline settings are those that were deliberately saved.

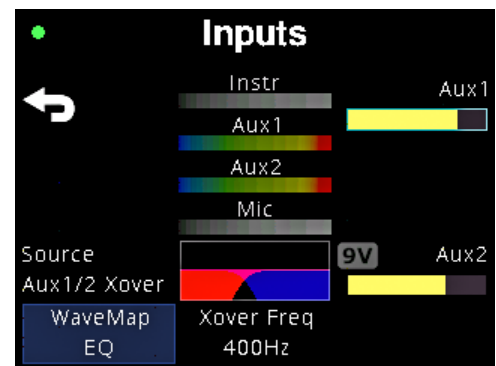
You can recall the baseline settings by tapping the WaveMap control, then tapping Revert to Saved.

Input Source Modes

Tap the upper right Vol control to set input source.

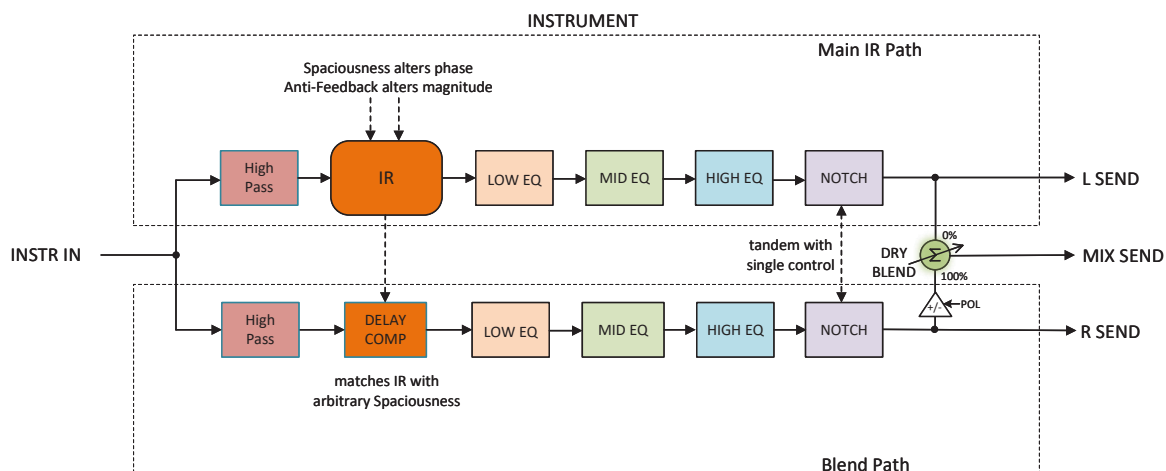
ToneDexter II supports eight different input modes that cover a broad range of use cases. The input source mode selection is a WaveMap-specific parameter that is recalled when the WaveMap is selected.

Helpful Tip: You don't have to save a trained WaveMap to use any of these options. A basic bypass WaveMap is pre-loaded into all Empty slots.



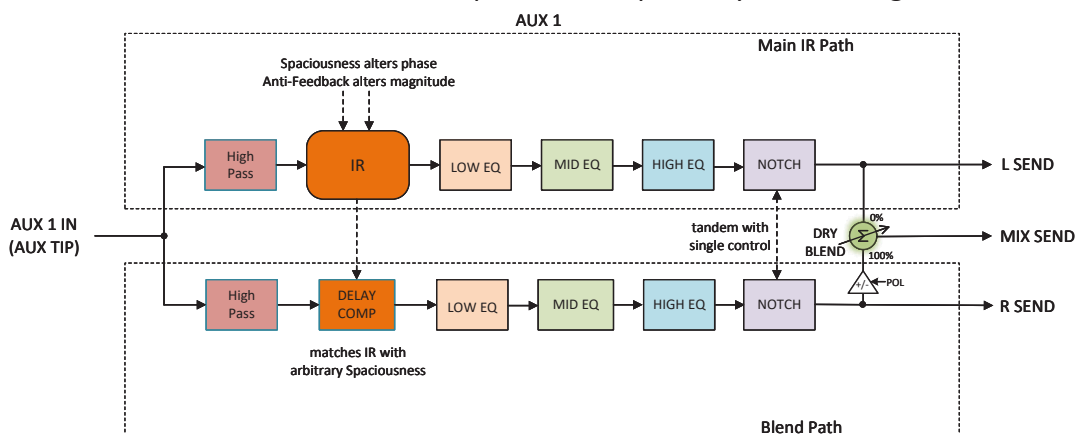
Instrument

Typically, you would plug a standard mono pickup into the In jack. You can blend the WaveMap with the dry pickup signal, which has its own EQ. This is the Default configuration. **Tap the Blend control** if you want to reverse the polarity of the **In dry** signal that is blended with the **In IR** path. A blue phase symbol will light.



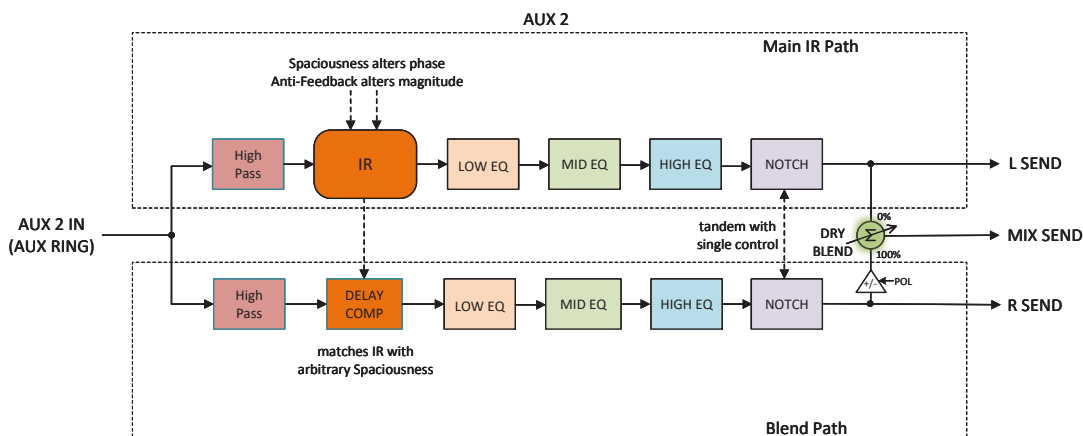
Aux1

You can also plug a mono pickup into Aux, and it will go to Aux 1 (Aux TIP). You can blend the WaveMap with the dry pickup signal, which has its own EQ. **Tap the Blend control** if you want to reverse the polarity of the **Aux1 dry** signal that is blended with the **Aux1 IR** path. A blue phase symbol will light.



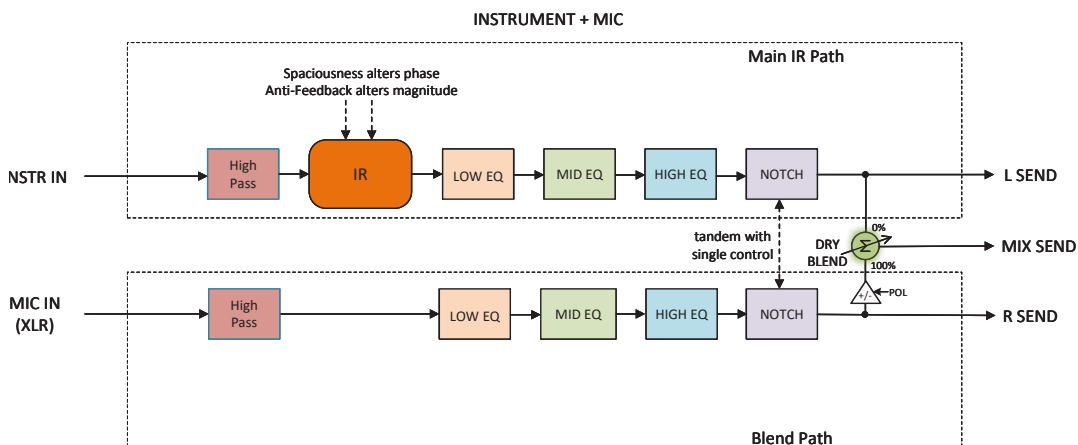
Aux2

With a custom cable, you can connect a mono pickup via the Aux jack to Aux2 (Aux RING). You can blend the WaveMap with the dry pickup signal, which has its own EQ. **Tap the Blend control** if you want to reverse the polarity of the **Aux2 dry** signal that is blended with the **Aux2 IR** path. A blue phase symbol will light.



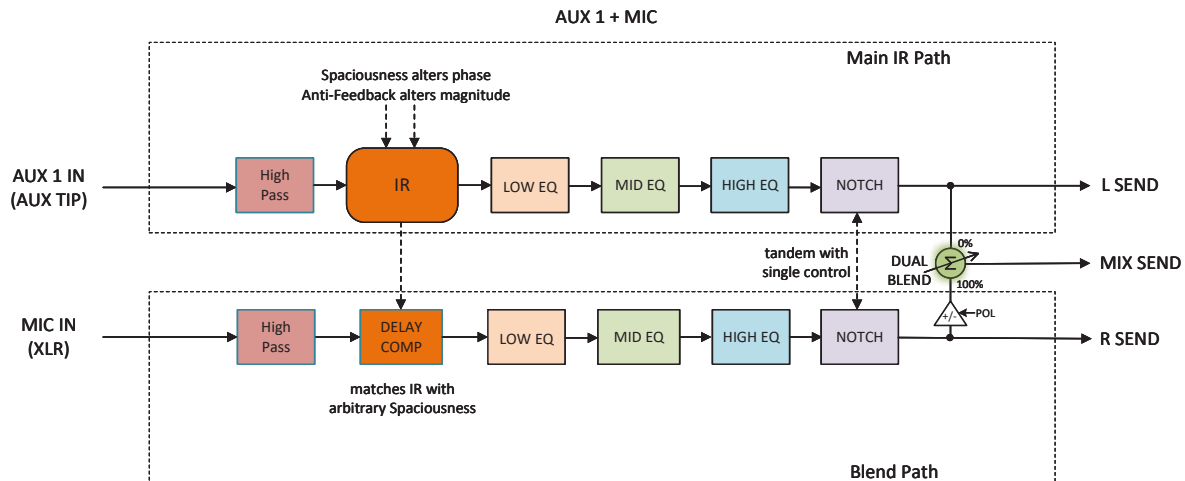
Instrument+Mic

Used for blending a mono pickup plugged into the In jack with a microphone plugged input to the XLR input. The Mic has its own Gain and EQ settings before the blend control. **Tap the Blend control** if you want to reverse the polarity of the **mic** signal that is blended with the **In IR** path. A blue phase symbol will light.



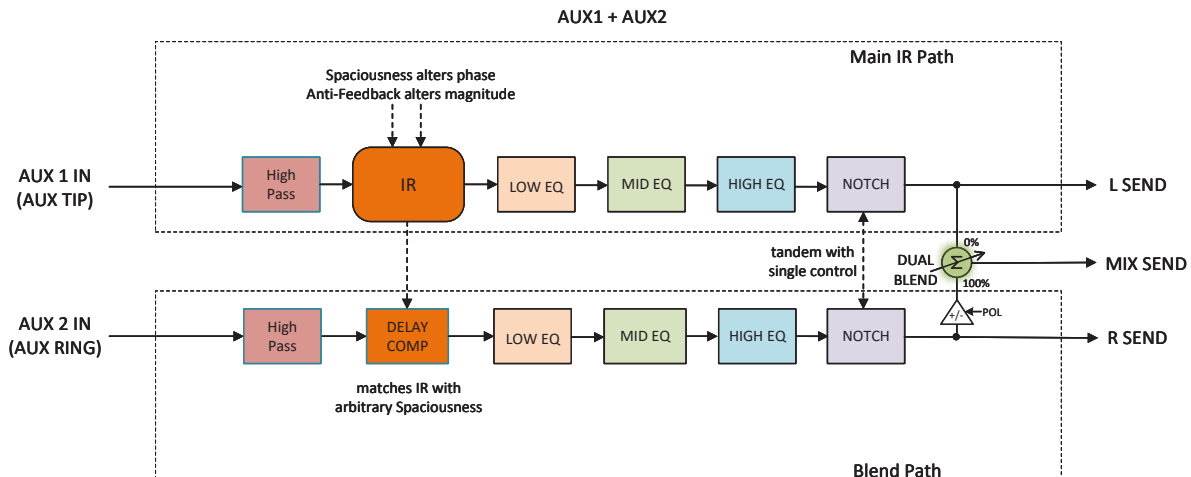
Aux1+Mic

Used for blending a mono pickup plugged into the Aux jack with a microphone plugged input to the XLR input. The Mic has its own Gain and EQ settings before the blend control. **Tap the Blend control** if you want to reverse the polarity of the **mic** signal that is blended with the **Aux1 IR** path. A blue phase symbol will light.



Aux1+Aux2

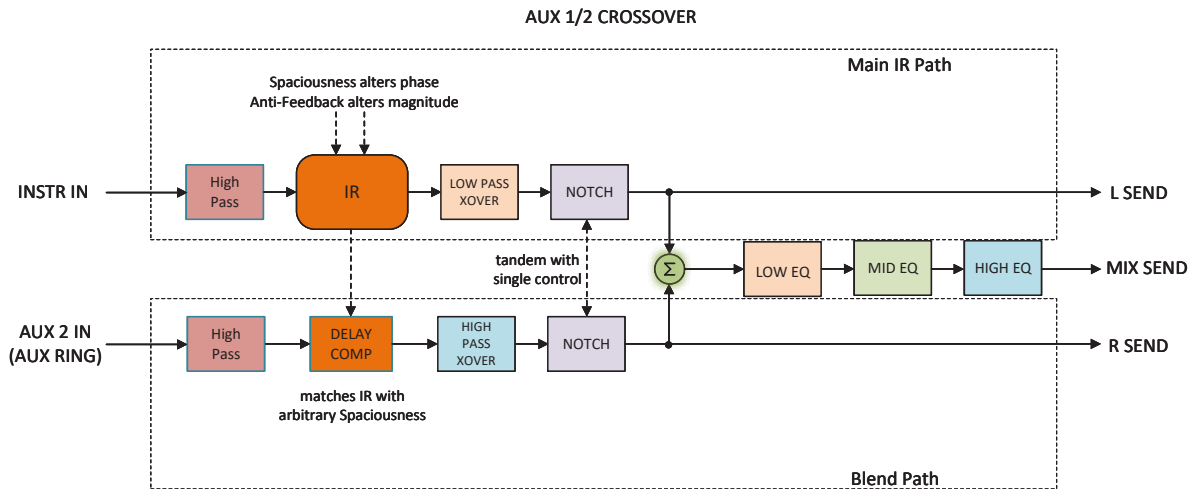
Used for Dual-source pickups plugged into the Aux jack, where the main (WaveMap) source comes from Aux1 (TIP) and a secondary source from Aux2 (RING). The Aux 2 signal has its own Gain and EQ settings before the blend control (which defaults to 50%). A switchable 9V bias voltage can be added to Aux 2 for internal mics by **tapping the Aux 2** control. **Tap the Blend control** if you want to reverse the polarity of the **Aux2 dry** signal that is blended with the **Aux1 IR** path. A blue phase symbol will light.



Aux1/Aux2 Crossover

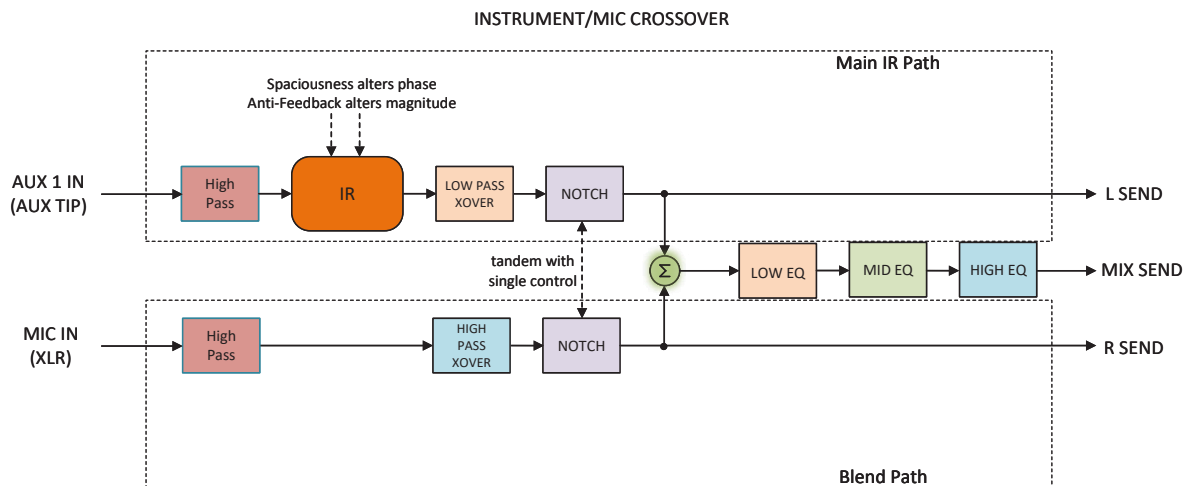
Input Source Modes Continued

Used for Dual-source pickups plugged into the Aux jack where you want to use the WaveMap Aux1 (TIP) signal for low frequencies and a secondary mic (or second pickup) Aux2 (RING) source for high frequencies. The WaveMap signal can be either a straight-through impulse or a trained IR. The output is a crossover summing of low-pass filtered WaveMap Aux1 with high-pass filtered signal Aux2. A switchable 9V bias voltage can be added to Aux 2 for internal mics by **tapping the Aux 2 control**.



Instrument/Mic Crossover

Used where you want to use a mono pickup plugged into the In jack for the low frequencies and a microphone plugged into XLR jack for high frequencies.



Adjusting levels

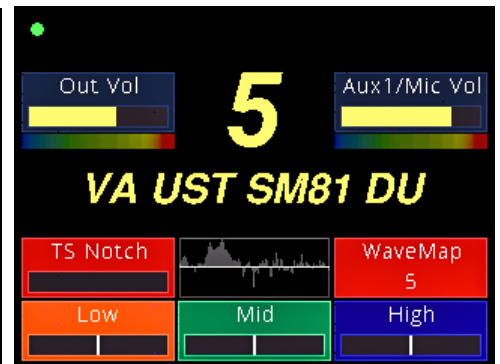
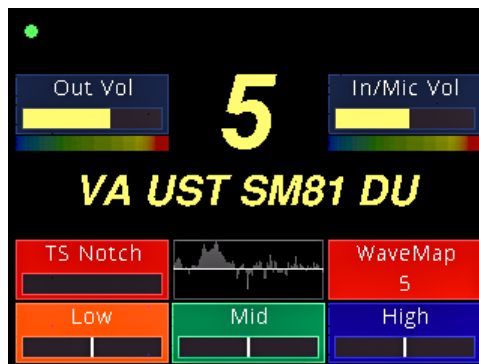
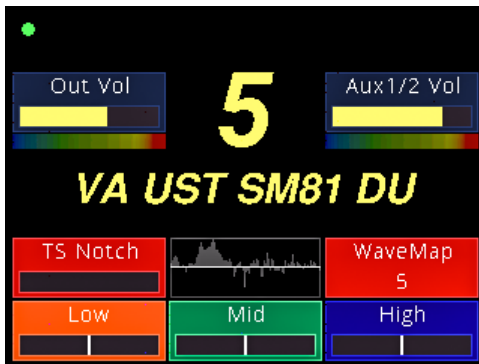
Input Source Modes Continued

When a dual source input is selected (either with a mic or Aux 2 as the second source), each input's level can be adjusted individually on the Inputs page to get a good level, then the Blend control used to get the right balance at the output. When you return to the main page, you'll see the Input Volume has changed to...

Aux1/2

In/Mic

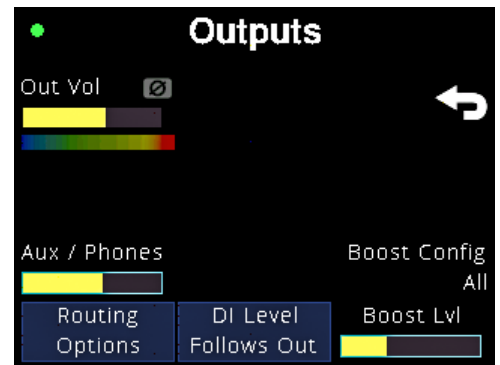
Aux1/Mic



indicating that the control now changes both volumes together, in tandem.

Output Controls

Tap **Out Vol** to access the Output Controls.

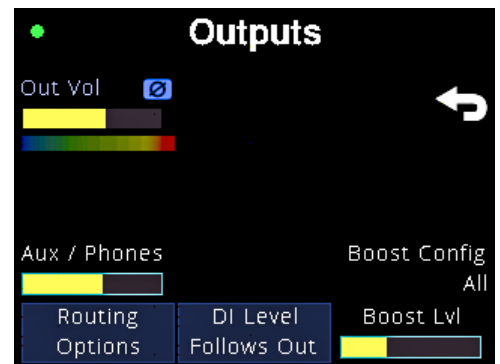


Volume Controls

Turn **Out Vol** or **Aux/Phones** to set their levels.

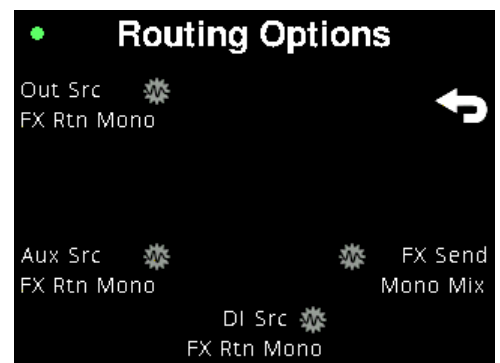
Tap **Out Vol** again to change the phase (polarity) of all the outputs. This can be a good first step in fighting feedback on stage. The phase symbol will turn blue.

Helpful Tip: Even if you are wearing headphones, one polarity position or the other will sound like it has more bass. Use whatever sounds best, keeping in mind that the position that gives minimum feedback on stage is impossible to predict, so try them both.

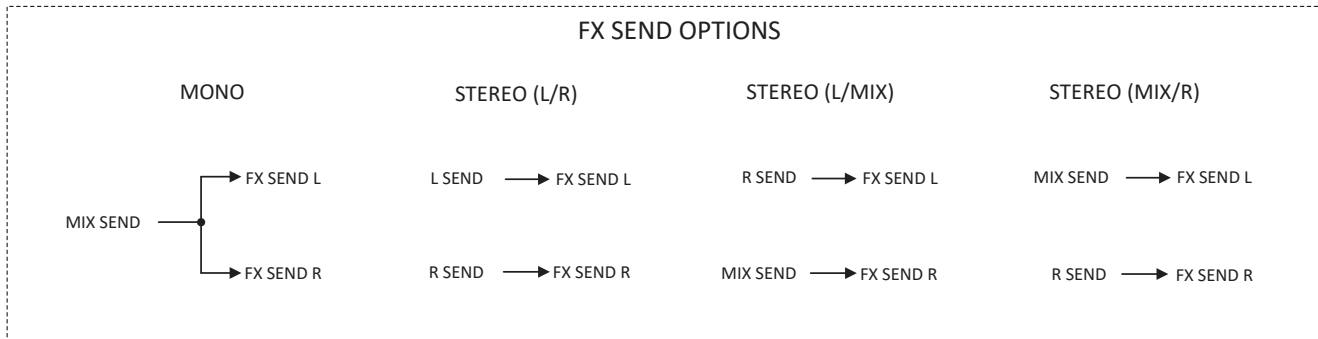


Routing Options

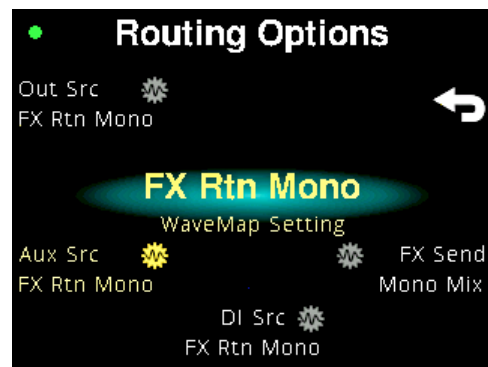
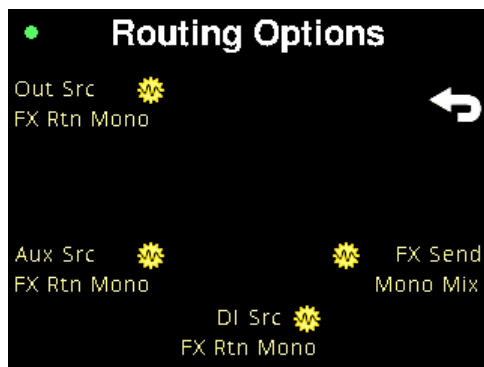
Tap **Out Vol**, then **Routing Options** to access the Routing Options page.



One of four options can be selected to drive the FX output jack as shown. The FX Sends are *half-normalled* to the FX Returns, which means that unless a cable is inserted in the FX Return jack, FX Send signals are internally looped through to the FX Return signals. Since plugging into the FX Output jack does not break the internal loop-through connection, the FX outputs can be used as a separate mono or stereo send to a tuner, mixer or recorder. It stays on during mute and is not affected by the boost control.

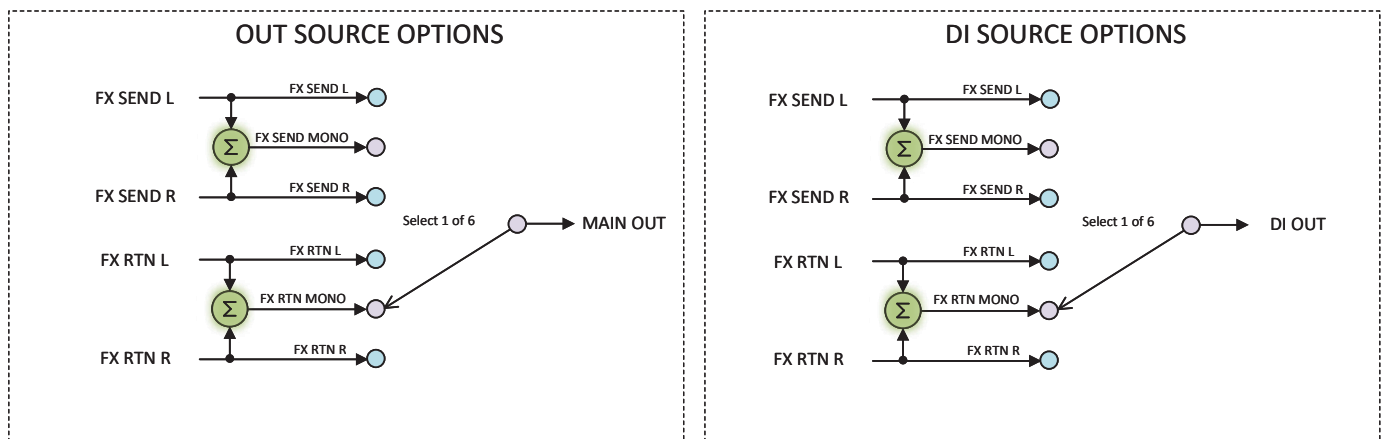


By default, all of the output routing parameter selections are system parameters and will not differ as you change WaveMap. However, if you want a particular WaveMap to behave differently, they can each be stored separately and uniquely for each WaveMap by tapping the associated control to light the gold sprocket.



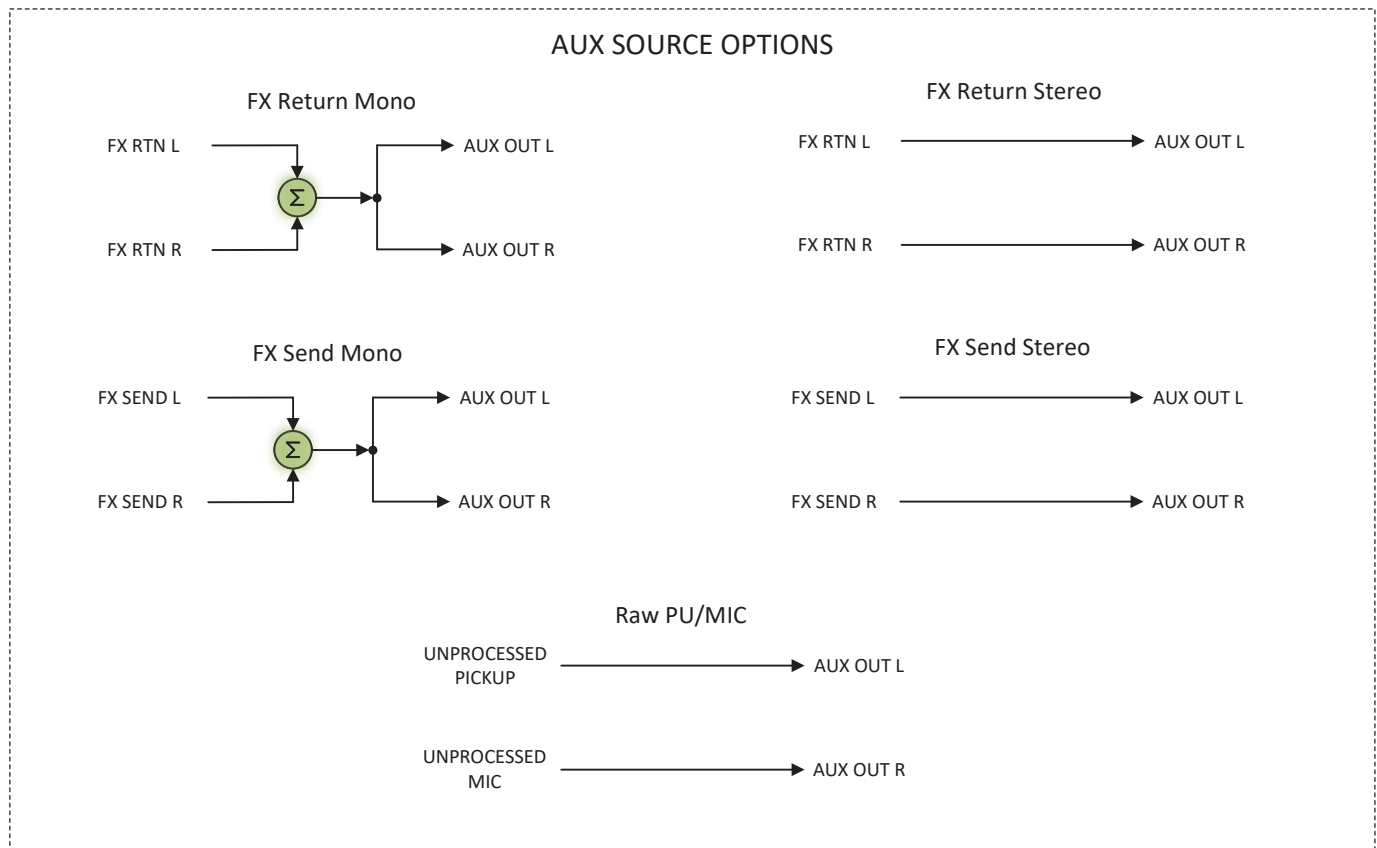
Out and DI Sources

You can independently choose one of six audio sources to send to the ¼" Output and DI jacks, as shown here. Three are pre-FX loop (SEND), and three are post-FX loop (RTN). The default in both cases is FX RTN MONO.



One of five options can be selected to drive the ¼" Aux Out jack. The last choice would be useful if you wanted to record the training session, for example. The default is FX Return Mono.

Helpful Tip: *Aux Out is normally used to drive headphones but could also be used as a separate line level stereo feed to a mixer or recorder using a stereo breakout cable.*



EQ

There are three blocks of EQs, one each for the Main path, the Blend path and the Mic path. Each EQ block has a high pass, low band, mid band and a high band EQ. There is one notch filter control affecting all the outputs. See the Input Source Mode diagrams above for more details.

From the main page, **turn the Low, Mid, and High EQ controls** to set the gain for that band. **Press-hold them** to quickly go back to 0dB gain (EQ band by-passed).

Tap the Low, Mid, or High controls to adjust all the other parameters for that EQ band. The High-Pass filter adjustment is accessible on the Low page and can be turned on by turning or tapping its control. **Turn it back off** by turning the frequency back to minimum or by **press-holding the control**.

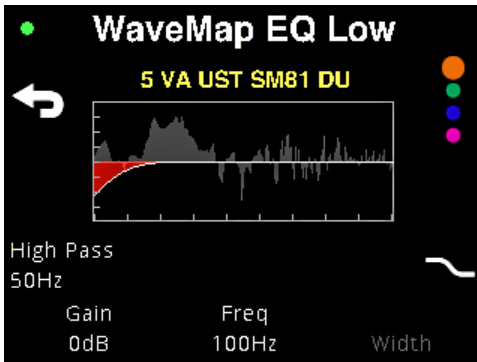
Each band is color-coded, indicated by the dots next to the top right control. **Switch between EQ bands by tapping or turning this control.** The Main path EQ also cycles through the Tone Shaping page.

Blend and Mic EQ blocks are accessible from the Inputs page, reached by **Tapping the upper right Vol control**. Only the blocks that are used for the selected input mode can be adjusted.

Helpful Tip: *In crossover modes, the main page EQ block is after the crossover.*

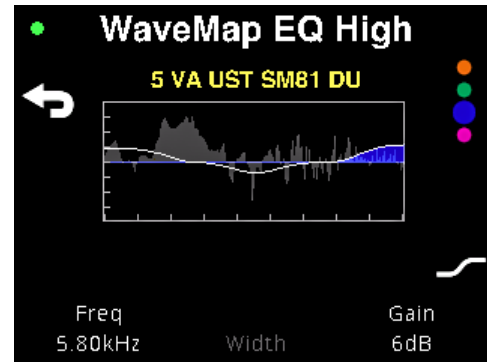
High pass filter

- 2nd order 12dB/octave
- 20Hz - 180Hz
- The high-pass filter area is shown with red shading



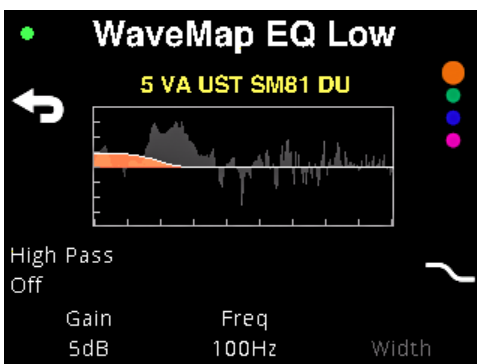
High band filter

- 2nd order bell or high shelf
- ± 12 dB
- 3.0 – 15.0KHz
- The High band filter area is shown with blue shading



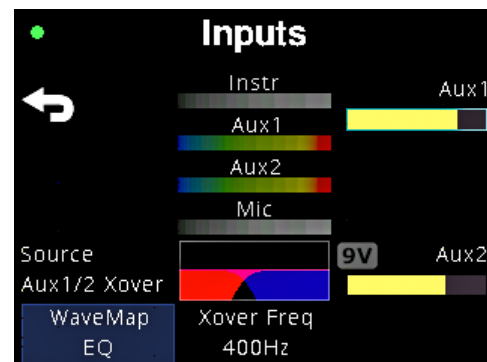
Low band filter

- 2nd order bell or low shelf
- ± 12 dB
- 20Hz – 500Hz
- The low band filter area is shown with orange shading



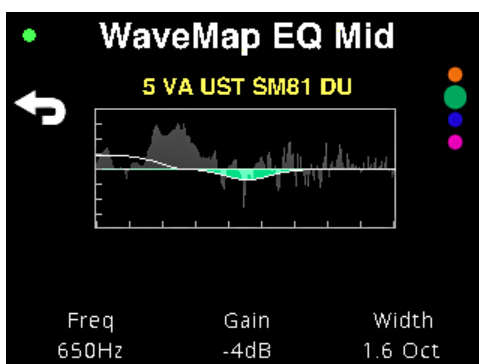
Crossover filters

- 4th order Linkwitz Riley
- 300Hz – 800Hz
- Applies to Aux input when Input Mix set to cross-over mode.



Mid band filter

- 2nd order bell
- ± 12 dB
- 200Hz – 8KHz
- 0.2 to 6.0 octaves width
- The Mid band filter area is shown with green shading



Tone Shaping (TS)

Besides EQ, there are three powerful controls you can use to modify your amplified sound to suit your needs.

- **Tap the TS control in the left lower position.** This control will be labelled with one of the three options indicated in parenthesis below, depending on what has been selected to persist on the main page.
- Tapping Tone Shaping (TS) will always give access to all three controls no matter which is shown on the main page.

Show on Top (Tone Shaping)

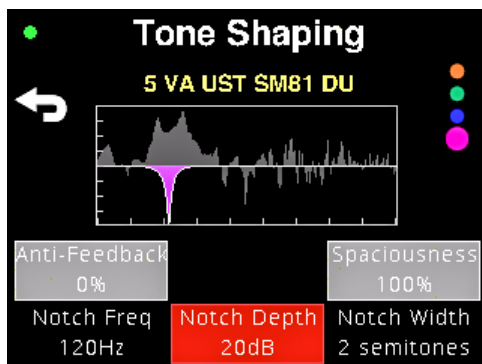
On the Tone Shaping page, **Tap Anti-Feedback, Notch Depth or Spaciousness** to select that parameter to show on the Main page, allowing easy adjustment and comparison between WaveMaps. The parameter that is currently selected to show on the main page is highlighted red.

Helpful Tip: Because Anti-Feedback and Spaciousness adjust the WaveMap's impulse response, they are only available when there is a trained WaveMap present in the current slot. For slots with no trained WaveMap (those colored gray or blue), Anti-Feedback and Spaciousness controls are disabled and the Main Page shows Notch depth only.

Notch Filter (TS Notch)

Turn the TS Notch controls to configure the notch filter with variable frequency, width, and depth. This filter is applied to all outputs and can help to tame a specific frequency, particularly one that is caused by a room resonance that can't be dealt with using the anti-feedback control.

Helpful Tip: Often you can play a note on your instrument that matches the problem frequency. Turning the Notch Freq control will display the center frequency both in Hz and the note name (185Hz is F#3 for example) to make finding the problem easier.

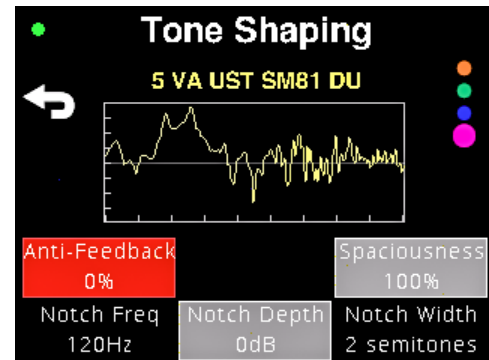


- 2nd order PEQ
- 0-24dB depth
- 1-10 semitones width
- The Notch filter area is shown with violet shading.

Anti-Feedback (TS Anti-FB)

Acoustic body instruments have natural resonances, the strongest of them are frequencies that can cause feedback problems when using a mic or a typical impulse response. These resonances show as peaks in the WaveMap due to the mic hearing them during training, so ToneDexter II allows the user to reduce them without having to know what frequencies they are.

Tap or turn TS Anti Feedback to show the frequency response plot of the WaveMap.



This can help you visualize what is going on, but your ears are the final judge.

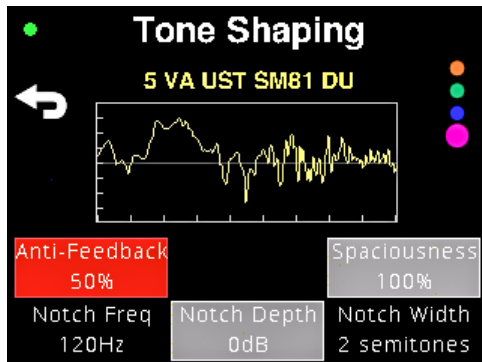
Helpful Tip: this does not represent what your ear is hearing, as it is not taking into account what the pickup is sensing from the strings and instrument's body. It represents the difference between your pickup and what the mic heard during training.

The horizontal ticks are notes A0 (27.5Hz) through A9 (14,080Hz). Vertical ticks are every 5dB. This curve shows how the WaveMap is altering (filtering) what your pickup is sending through it. It is normal to have large peaks and dips. This is a large part of what makes an acoustic instrument pickup sound like a mic — rich and interesting.

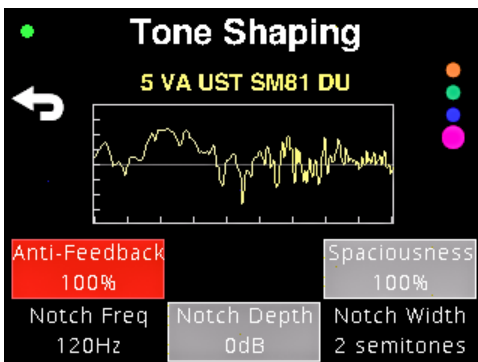
At the default 0% position, the Anti-Feedback control is not altering the response from what the mic heard.

Anti-Feedback (TS Anti-FB) *Continued*

Turn the control **CW** to increase it from 0%, you'll see the peaks in the lower region from 50Hz to 480Hz start to be reduced from the top down, starting with the highest one first.

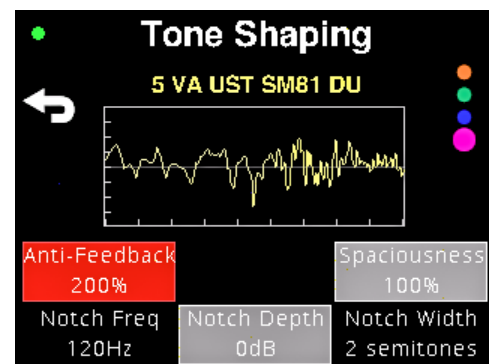
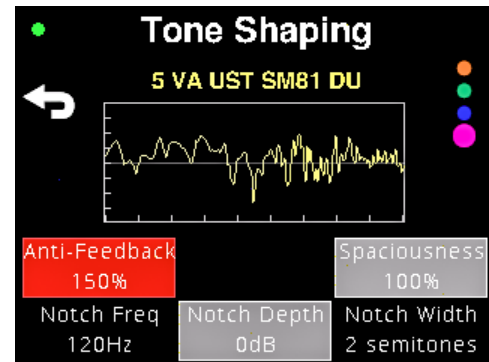


Then, as the highest one reaches the level of the next highest one, they will both go down together until at 100%, the whole lower region is approximately flattened out, leaving no dominant peaks in the lower region. At this setting, a high degree of feedback correction is achieved.



But sometimes even that isn't quite enough. For example, if you have a sound board transducer which senses a lot of resonances (as most do), some resonance peaks will still be present even though you won't see them on this curve. (Remember this curve just represents the difference between the pickup and mic and not the pickup itself.)

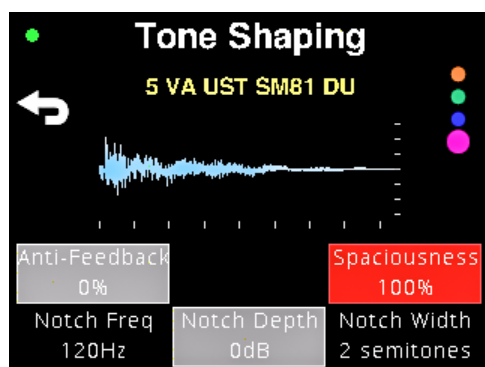
If you still have feedback issues, **turn the Anti-Feedback control CW past 100%** and you will see the resonances dip below the average level which will help to further reduce feedback. It is normal for the bass tones to sound weaker at these extreme settings. You can mitigate this to some degree by carefully boosting the lows with the Low Band EQ.



Spaciousness (TS Spacious)

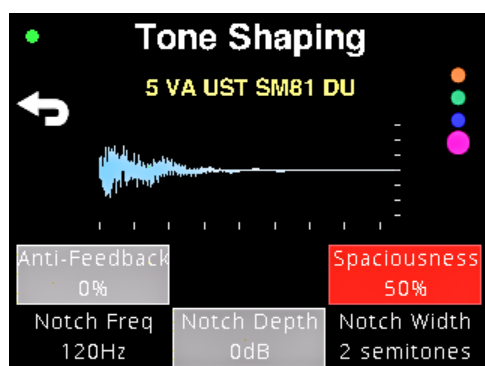
Acoustic body instruments act like miniature echo chambers and the vibrations can last as long as 20-30ms or more. This is especially true of upright basses where the time spread is usually much longer than a guitar. The WaveMap creation process captures this, and the degree to which it is applied to the pickup signal can be controlled with a parameter called Spaciousness.

Turn the **TS Spaciousness control** to show the Impulse Response plot (IR). This can help you visualize what the Spaciousness control does but use your ears as the final judge. The horizontal ticks are 5ms. Only the first half of the filter is shown, as although the second half is important for proper low-end support, it is of little interest visually.

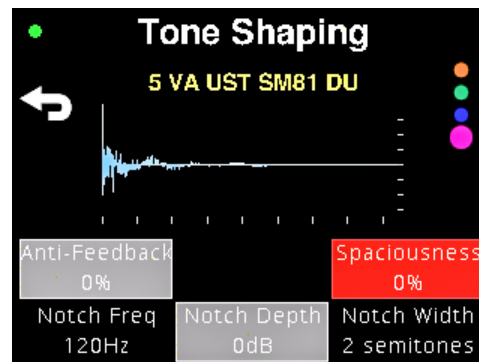


At the default of 100%, the response is the exact difference between your pickup and what the mic heard during training and is the most natural sound. However, this natural spaciousness can often get lost through a PA system which has its own spaciousness character in the room environment. Thus, it is helpful to be able to dial it back so as to cut through the PA system better.

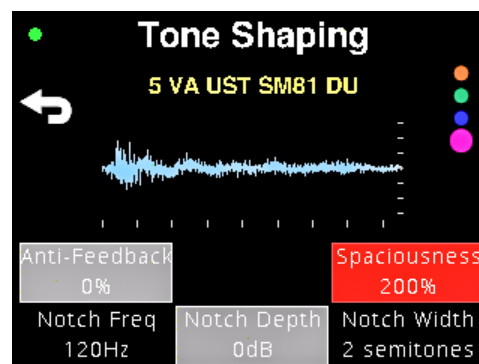
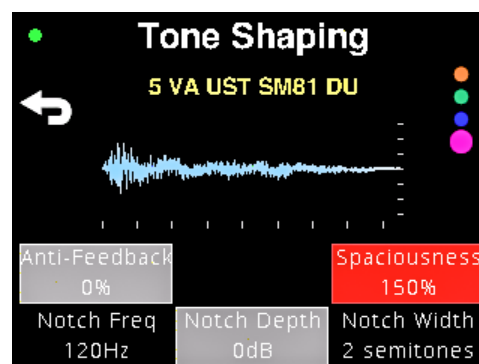
Turn the **Spaciousness control CCW** to go from 100% towards 0%. This shortens the time span as it moves energy toward the left (towards time = 0). A setting of 50% cuts the time span roughly in half.



Going all the way to 0% takes all the excess time out of the IR, reducing it to a minimum phase filter, still with the tonality of the original.



It may be desirable to add more time to the IR to increase its sense of spaciousness and lushness, probably not for live performance but rather for recording purposes. To do this, you can **dial the Spaciousness control CW** up past 100% towards 200% which roughly doubles the original time span.



Helpful Tip: This alteration does not change frequency response or tonality. The Spaciousness and Anti-Feedback controls are completely independent. For the technically minded, Spaciousness adjusts the phase (and time) while Anti-Feedback adjusts the magnitude.

WaveMap Management

Using On-board Controls

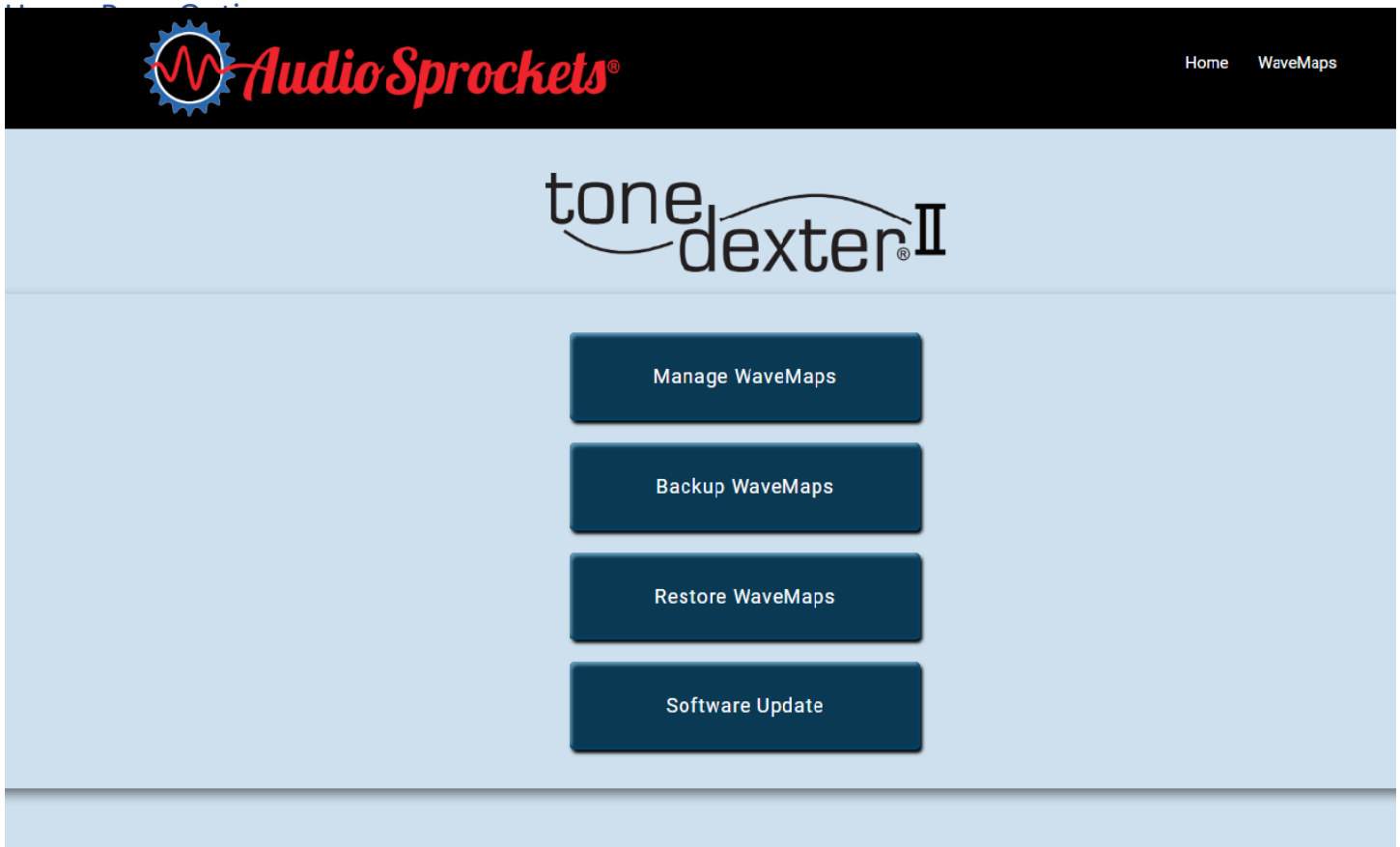
WaveMaps can be moved, copied, renamed, and deleted using the on-board controls. **Tap the WaveMap control** to access the Edit WaveMap page then **tap the control** for the desired action.

Helpful Tip: you will always be asked to confirm before deleting a WaveMap.

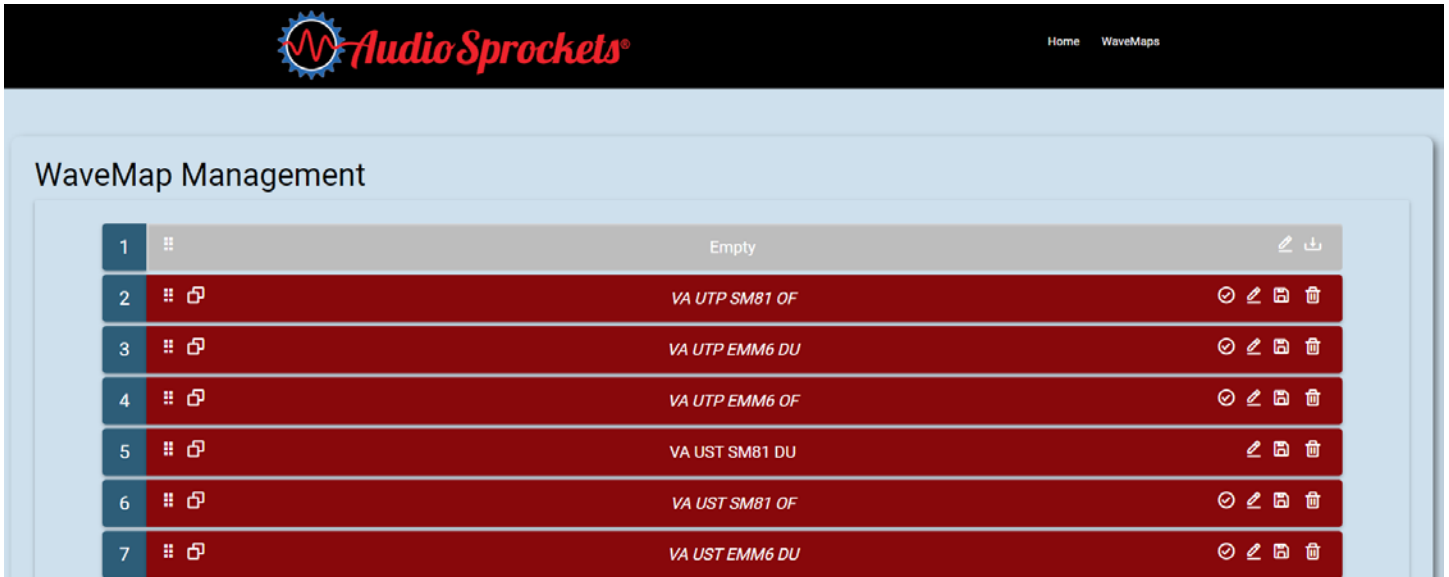
Using the Web Interface

- Connect ToneDexter II to your computer, either Mac or PC, using the provided USB cable.
Helpful Tip: Some Micro-USB cables supplied with toys or other non-technical devices only have the power pins connected, as they are only used to charge the device's internal battery. If you use a different cable other than the one supplied, make sure it is a data cable.
- Go to your favorite browser and type in the URL 192.168.7.1
- The Web Management tool should appear. It is a live link to your ToneDexter II, and not to an external site.
- Save that as a bookmark for future reference.

Helpful Tip: Changes that are made on the web interface, such as naming a WaveMap, will instantly take affect and be permanently saved on your ToneDexter II.



Manage WaveMaps



⋮ Click and drag a **WaveMap** to another location to reorder your set.

📄 **Copy WaveMap** creates a clone in the next available slot. Appends **C** to the name.

🔍 **Save to Baseline** only applies to WaveMaps with italicized names, indicating there have been adjustments to the WaveMap in active memory that haven't been saved to baseline memory. Use this if you want to save those active parameter adjustments to the baseline memory.

✎ **Edit the name**

📄 **Saves the WaveMap** to a file.

***Helpful Tip:** The file saved includes the WaveMap plus Baseline but not any adjusted parameters that haven't been saved to the Baseline. The web interface will warn you before saving a file that has parameters in active memory.*

🗑 **Deletes the WaveMap**

Backup WaveMaps

Writes all existing into a **.bak** file. The front part of the file name should be changed to something meaningful.

Restore WaveMaps

Reloads WaveMaps from a **.bak** file.

Updating Software

Normal method

- It is strongly recommended that you make a backup of your WaveMaps before starting the software update procedure. See Backup WaveMaps above.
- Save the latest software release (it will be of the form **filename.bin**) from the [Audio Sprockets website software download page](#) to your download folder, or any other convenient location.
***Helpful Tip:** If your computer complains about not knowing what to do with a .bin file, don't worry, you're just saving it to your hard drive, not running it.*
- Click the Software Update button on the web interface and browse to the **.bin** file you just saved.
- Click open or okay at the prompt, then the red upload button and ToneDexter II will be updated.

Back door method

Always try the Normal Method first, but if for some reason the software update fails and the screen goes black, use this back door method to restore and update the unit using the **.uf2** file ([also available on the Download page](#)), instead of the **.bin** file.

- Connect a USB cable and the power supply.
- **Press and hold the red boot button** on the rear for at least 1 second and let go. A removable drive named **RPI-RP2** will appear on your computer.
- Drag (or copy and paste) the **.uf2** file to this drive. Say OK to any warnings. The removable drive will disappear once transfer is complete. Ignore the eject warning.

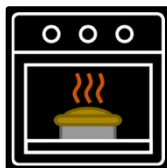
Advanced Features

Baking WaveMaps

Baking a WaveMap makes a copy of the WaveMap that incorporates all EQ, Anti-Feedback, Spaciousness and Trim settings into a new WaveMap in which those settings are baked in, as if it had been created that way from the start.

This resets all adjustment parameters and allows them to be reused anew on the baked WaveMap. This is useful for tweaking them to your liking, thus leaving the EQ and Tone Shaping tools available to deal with venue specific adjustments rather than WaveMap corrections. It's also useful for creating WaveMaps tailored to other target pickups.

- **Tap the WaveMap control**
- **Tap Move Copy**
- **Tap the Oven icon** to make a copy of the WaveMap that incorporates all EQ, Anti-Feedback, Spaciousness and Trim settings into a new WaveMap in which those settings are baked in.

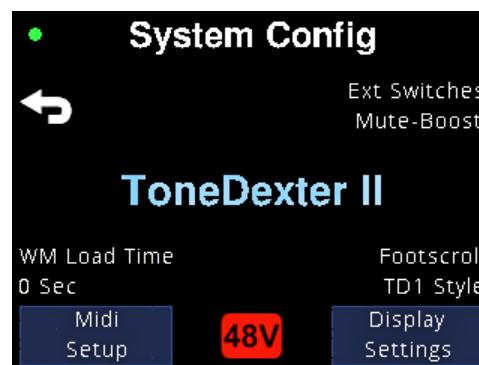


This resets all adjustment parameters and allows them to be reused anew on the baked WaveMap.

Helpful Tip: Baking a WaveMap always makes a copy, leaving the original unaltered. A 'B' is appended to the name to remind you, but you can always rename them. A WaveMap can be baked with variations as many times as you like. A baked WaveMap can even be re-baked, creating a biscotti 😊.

System Config

To get to the System Config page **Tap Mute** switch to go to the Tune page, then tap **System Config**.



External Footswitch

Set the Control Select switch to pedal to use an external dual momentary footswitch. You can set it up to either duplicate the on-board Mute and Boost functions or scroll up and down through the WaveMap slots.

Go to the System Config page, then **select Ext Switches** as either Footscroll or Mute-Boost.

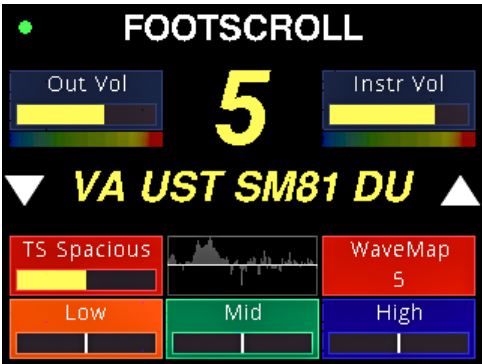
Helpful Tip: When set to Footscroll, the on-board switches will only function as Mute and Boost. This will prevent an accidental **Press-Hold to Boost** from engaging Footscroll mode.

Footscroll Options

Press-hold Boost to change to Footscroll mode. That changes what the Mute and Boost buttons do as follows:

Tap Mute: Decrement the WaveMap Number	Tap Boost: Increment the WaveMap Number
Press-Hold Mute: Toggle into and out of the Tuner	Press-Hold Boost: Leave Footscroll mode

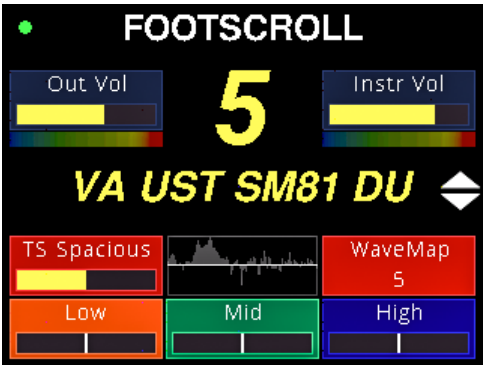
In this Footscroll mode, you'll see up and down arrows on either side of the WaveMap name.



On the [System Config](#) page you can change the behavior to match how the **Original ToneDexter** used to work:

Tap Mute: Toggle into and out of the Tuner	Tap Boost: Increment the WaveMap Number
Press-Hold Mute: Leave Footscroll mode	Press-Hold Boost: Decrement the WaveMap Number

The up and down arrows are now both on the right-hand side indicating the original ToneDexter behavior.



MIDI

You can choose a WaveMap using Program Change commands via the MIDI interface. The control select switch on the rear needs to be set to **midi**, then plug in any MIDI controller via a standard MIDI-TRS cable.

Tap the Midi Setup control from the [System Config](#) page, and you can configure the ToneDexter to respond to all midi channels (default) or select a channel from 1 to 16.

Any Program Change (PC) number (0-127) can be configured to change to any WaveMap slot (1-32). Default mapping is PC[0] maps to WaveMap 1, PC[1] to WaveMap 2, etc, repeating such that PC[32] is back to WaveMap 1 again, and so on. Choose a PC number and then update which WaveMap it points to. It saves automatically when leaving the MIDI setup page.

If your midi controller sends Control Change (CC) messages instead of Program Change, you can use the Bank Select (command 0). The data value (0-127) then maps to WaveMap slots using the same mapping as Program Changes.

Output Volume can be controlled by Control Change 7 (Volume).

WaveMap Load Time

Depending on your instruments and how you use them, you may be connecting different instruments with wildly different levels that need much more or much less gain. In those cases, selecting the wrong WaveMap could cause a large jump in signal level, which could potentially cause roaring feedback as you scroll through.

If you're worried this might happen to you, increase the WM Load Time on the [System Config](#) page anywhere from 0.5 second up to 2 seconds. This will allow you to see which WaveMap you're about to load before you load it, and you can scroll past high gain WaveMaps without them loading.

Note: the load time is fixed at 1 second while on the Tuner page, to give you time to read what WaveMap you've just selected without obscuring the Tuner display for too long. The WM Load Time setting affects the Main page only.

Page Timeout

The pages reached by tapping a control (such as an EQ band adjust or Inputs) will time out and return to the Main page after a few seconds of inactivity. This is useful if you wanted to make a change while at a gig, then stand back up and continue playing without having to push the Back button.

However, you may want to stay on one of those pages for longer, especially if you're new to the ToneDexter and are wondering what to do next. In those cases, set the Page Timeout to a higher value, up to 20 seconds. If you keep going past 20 it turns the timeout off altogether and you will have to **push the Back button** to return to the previous page.

Start In

The ToneDexter starts up in Play mode by default. You can use the **Start In control** to change it to start in Tune mode with the main and DI outputs muted.

IR Underlay

You can view the Frequency Response Plot of the WaveMap on the main page by **changing IR Underlay to Show**. This adds a grey plot of the IR response behind the EQ curve, which may be useful for comparing WaveMaps at the expense of a little extra clutter.

Resetting to Defaults

Sometimes you might be adjusting an EQ gain or Spaciousness (for example) and realize it was better before you started changing things, in which case a shortcut to return the control to its default is to **press-hold the control**. This works for:

- Input Source Mode (resets to Instrument)
- Blend Percentage (resets to mode dependent default)
- Boost Config (resets to All)
- EQ Gains (resets to 0dB)
- Anti-Feedback (resets to 0%)
- Spaciousness (resets to 100%)
- High Pass Filter (resets to OFF*)
- Blend and Mic EQ Blocks (**press-hold the Mic EQ, Dry EQ or Aux2 EQ control** to set all bands to 0dB and HP filter to OFF*)

*High Pass filter cannot be turned off on the Mic channel during Training and will instead default to the minimum of 20Hz.

Additional Information

Troubleshooting

This section lists the most common issues you may have and the remedies.

No Sound

If you are plugged in but getting no sound from the outputs:

- Make sure the input and output gains are not turned all the way down. You should see activity on the level meters.
- Make sure you haven't selected an input source that you are not plugged into, such as **Aux1** when you are **plugged into In**. See the **Input Source Modes** section.
- Make sure you haven't selected the output source to be the right channel only but have no dry blend or dual source feeding the right channel. See the OUT, DI, and AUX source option diagrams.

Hum

- If you are using a passive piezo pickup, you may hear some AC power line buzz or hum if your system is not grounded. In normal use, ToneDexter II will be connected to an amplifier or PA system, which is grounded (earthed), and you will not experience any noticeable hum. But if you do experience hum in your headphones when training, plugging one of the other outputs into a grounded system will eliminate it.

Screen going white

- The power supply you are using is under-powered, see [A Word About Power Supplies](#).

Unit continuously resetting at startup

- The power supply you are using is under powered, see [A Word About Power Supplies](#).

Working some of the time but not at other times

- The power supply you are using is under powered, see [A Word About Power Supplies](#).

WaveMap loading, Backups and Software Updates not working

- For versions prior to V2.0 there were issues with sending data to the ToneDexter using the Safari web browser. Backups and WaveMaps saved in previous versions will load with the V2.0 or higher with no problems.

Manage WaveMaps on the Web Interface stuck on 'loading...'

- Most likely cause is an attempt to load a WaveMap using Safari has corrupted that WaveMap slot. Delete that WaveMap from the WaveMap page on the unit itself, then reload your WaveMap once you've upgraded the software to version V2.0 or higher.

I can't get into/out of Tune when using Footscroll mode

- Since the Mute button is now used to scroll down through WaveMaps, getting into and out of Tune mode is achieved with a **press-hold of Mute** instead.

Web Interface not loading or has stopped responding

- Make sure you're using a micro-USB data cable like the one supplied with the ToneDexter II, and not a charging-only cable.
- If you normally see the web Interface but it has stopped responding, try unplugging and reconnecting the USB cable, or resetting the ToneDexter by tapping the red boot button on the rear panel. You may then need to refresh/reload the page.
- Note that after a software update, the ToneDexter resets and so will disconnect the web interface. The page should reload automatically a few seconds after reboot is complete.

Technical Specs

Instrument Input (in)

- 1/4" phone jack
- Input impedance: 1M Ω if using a standard mono plug, 10M Ω if using a TRS plug with RING unconnected
- Gain range: -38dB to +25dB
- Maximum signal level before clipping: +16dBVrms

Aux Input- Aux1 TIP and Aux2 RING

- 1/4" TRS phone jack
- Input impedance: 1M Ω
- Gain range: -38dB to +25dB
- Maximum signal level before clipping: +16dBVrms
- If +9V bias enabled, 10K Ω on RING

Mic Input

- XLR female
- Input impedance: 2K Ω differential
- Gain range: -11dB to +49dB
- Maximum signal level before clipping: +18dBVrms
- Switchable +48V phantom power

Main Output

- 1/4" TRS phone jack
- Unbalanced single ended, or impedance balanced differential drive
- Source impedance: 300 Ω per side
- Gain range: off, -34dB to +14dB
- Maximum signal level before clipping: +18dBVrms

DI Output

- 1/4" TRS phone jack
- Voltage and impedance balanced differential drive
- Source impedance: 300 Ω per side
- Gain range: off, -28dB to +20dB
- Maximum signal level before clipping: +24dBVrms differential

Aux Output

- 1/4" TRS phone jack
- Dual mono or stereo operation, capable of driving most headphones
- Source impedance: 20 Ω per side
- Gain range: -22dB to +26dB
- Maximum signal level before clipping: +24dBVrms differential

FX Send

- 1/4" TRS phone jack
- Dual mono or stereo operation
- Source impedance: 500 Ω per side
- Maximum signal level before clipping: +18dBVrms

FX Return

- 1/4" TRS phone jack
- Dual mono or stereo operation
- Input impedance: 1M Ω per side
- Maximum signal level before clipping: +16dBVrms

USB Jack

- USB 2.0
- Micro B

DC Power Input

- 2.1mm pin, 5.5mm barrel
- Accepts 9-15VDC, either polarity
- Requires 8W minimum startup, 7W continuous

Control Jack

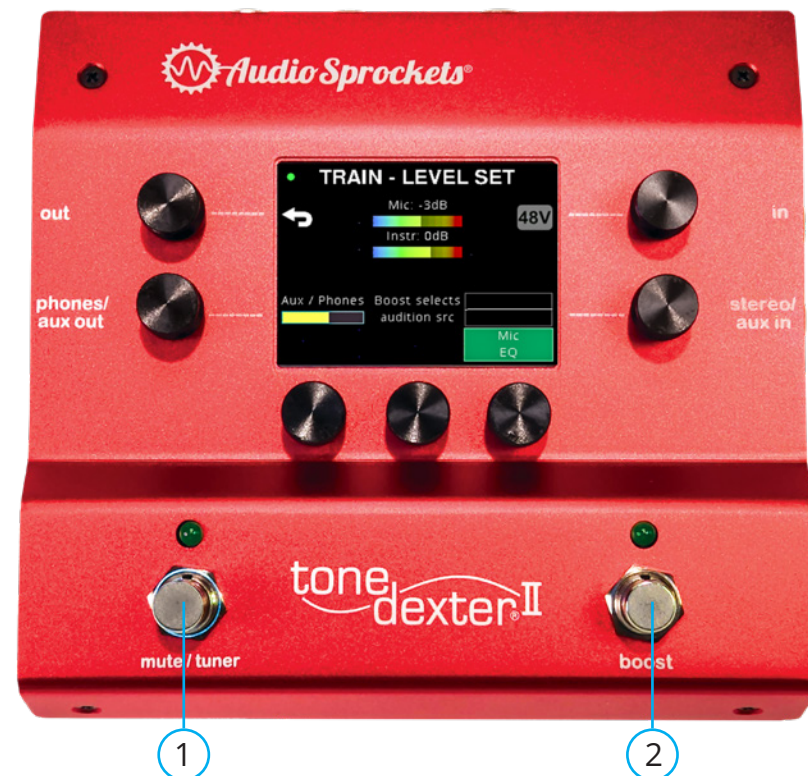
- 1/4" TRS phone jack
- If Midi selected, optically isolated input wired to the TRS MIDI standard
- If footswitch selected, Tip and Ring are pulled up to +5V with a 20mA current source
- Connected footswitches must be momentary-type and make connection to ground when pressed.

On Board Footswitches

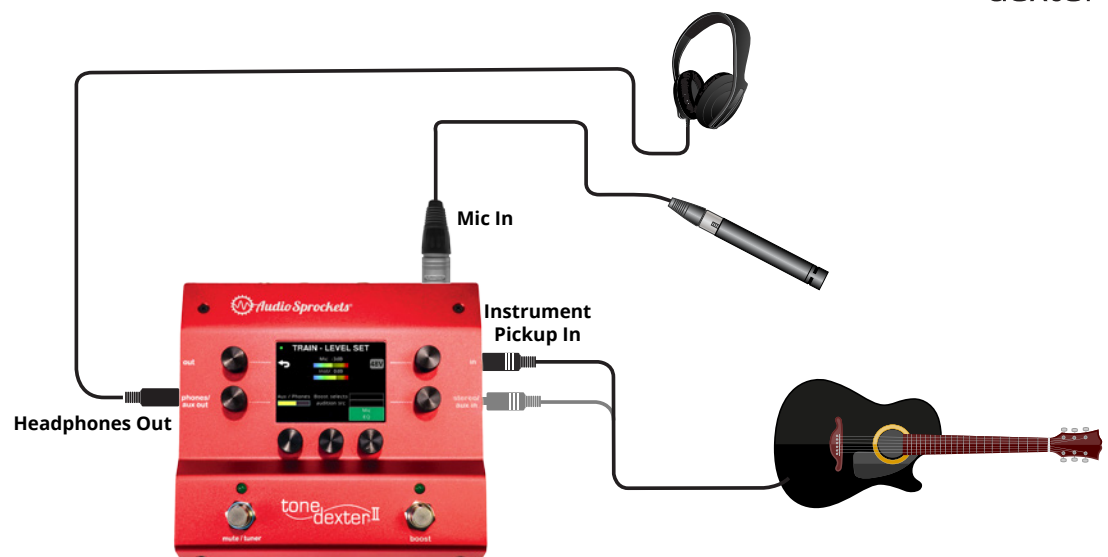
- Optical interrupter sensors for zero wear operation

ToneDexter II Training - Quick Start Page

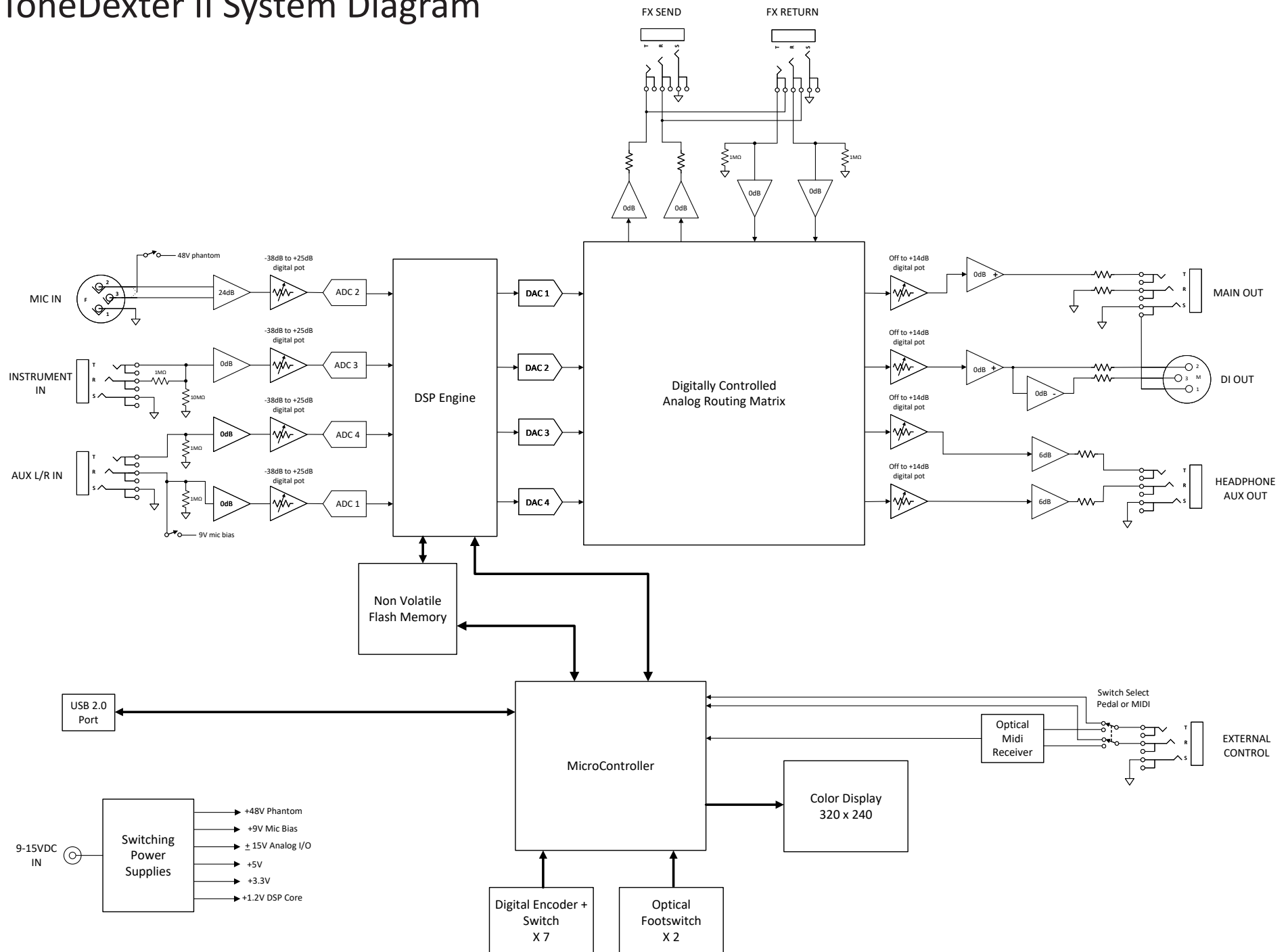
1. Set up a mic on a stand, plug it into the **Mic in** jack.
2. Plug your instrument into either the **Instrument (In)** or **Aux jack**. ToneDexter II will know which one you are connected to.
3. If you are using headphones to monitor the training process, plug them into **Aux out**.
4. **Tap the Mute switch (1)** to get to **Tune** mode if you are not there already.
5. **Tap the Boost switch (2)** to get into **Train-Level Set** mode (see screen right). At this point, all outputs except Aux will be muted. Condenser mics require 48v phantom which can be switched on/off with the lower middle control.
6. Once you position the mic, start playing at a medium loudness. ToneDexter II will automatically set the instrument gain and the mic gain to give you enough headroom to avoid distortion. You should see the level meters both be in the middle range.
7. Once it sets levels, ToneDexter II will automatically proceed to Training mode. Play for about a minute as you hear the training in the headphones and watch the progress bar.
8. Once the training period completes, the WaveMap will be transferred to a holding position, awaiting confirmation as to which slot to store it in. Before deciding to keep it, you can successively **tap the Boost switch (2)** to audition the **WaveMap**, the **raw pickup**, and the **live Mic sound** for comparison.
9. Training complete will automatically select the next empty slot, but you can select any slot and if occupied will be overwritten. **Press-Hold Boost (2)** to store the WaveMap in your choice of slots.
10. You can name and rename the WaveMap by either using the etch-a-sketch controls (**Cursor and Char**), or more conveniently by using the web interface.
11. Connect to your USB computer port and type in the browser URL 192.168.7.1 to rename and backup your WaveMaps.



Training



ToneDexter II System Diagram





Additional support and operational information is available on the Audio Sprockets website including:

SUPPORT - [AudioSprockets.com/support](https://www.audiosprockets.com/support)

- Frequently Asked Questions FAQs with sections about which pickups work with ToneDexter II, power supply info and general questions about operation and training
- Software Versions - Version history, downloads and install
- Setup and Training videos
- WaveMap Transfer and Archive, info and how-to video
- Support Request Forms

