0   1   2   3   13 21 34 55 89 | binary = 1.1001111000110111011

1.6180339887   89 55 34 21 13 8 5 3 2 1 1 0 | HEX = 1.9E3779B97F4A7C1

Master Time, Space, and Dimension
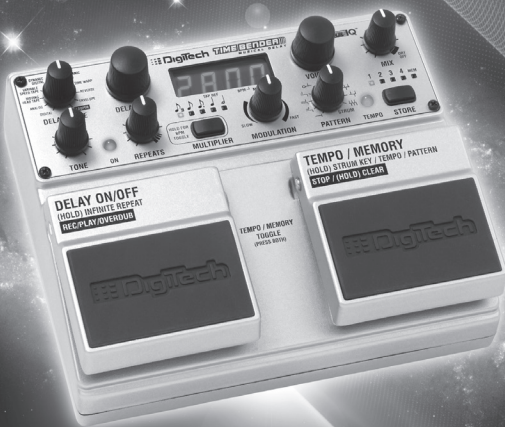
TIME BENDER
MUSICAL DELAY

Owner's Manual

DigiTech.

IMPORTANT SAFETY INFORMATION

IMPORTANT SAFETY INFORMATION

ELECTROMAGNETIC COMPATIBILITY

This unit conforms to the Product Specifications noted on the **Declaration of Conformity**. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

Operation of this unit within significant electromagnetic fields should be avoided.

- use only shielded interconnecting cables.

U.K. MAINS PLUG WARNING

A molded mains plug that has been cut off from the cord is unsafe. Discard the mains plug at a suitable disposal facility.
NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAINS PLUG INTO A 13 AMP POWER SOCKET.
Do not use the mains plug without the fuse cover in place. Replacement fuse covers can be obtained from your local retailer. Replacement fuses are 13 amps and MUST be ASTA approved to BS1362.

DECLARATION OF CONFORMITY

Manufacturer's Name: DigiTech®
Manufacturer's Address: 8760 S. Sandy Parkway
Sandy, Utah 84070, USA

declares that the product:

Product name: TimeBender™

Product option: all (requires Class II power adapter that conforms to the requirements of EN60065, EN60742, or equivalent.)

conforms to the following Product Specifications:

Safety: IEC 60065 (7th ed. 2001)

EMC: EN 55013 (2001+A1)
EN 55020 (1998)

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC.

Vice-President of Engineering — MI
8760 S. Sandy Parkway
Sandy, Utah 84070, USA
Date: February 24, 2009

European Contact: Your local DigiTech Sales and Service Office or

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Warranty

We at DigiTech® are very proud of our products and back up each one we sell with the following warranty:

1. The warranty registration card must be mailed within ten days after purchase date to validate this warranty, or you can register via our website (www.digitech.com).

2. DigiTech warrants this product, when used solely within the U.S., to be free from defects in materials and workmanship under normal use and service.

3. DigiTech liability under this warranty is limited to repairing or replacing defective materials that show evidence of defect, provided the product is returned to DigiTech WITH RETURN AUTHORIZATION, where all parts and labor will be covered up to a period of one year (this warranty is extended to a period of six years when the product has been properly registered by mail or through our website).   A Return Authorization number may be obtained from DigiTech by telephone. The company shall not be liable for any consequential damage as a result of the product's use in any circuit or assembly.

4. Proof-of-purchase is considered to be the burden of the consumer.

5. DigiTech reserves the right to make changes in design, or make additions to, or improvements upon this product without incurring any obligation to install the same on products previously manufactured.

6. The consumer forfeits the benefits of this warranty if the product's main assembly is opened and tampered with by anyone other than a certified DigiTech technician or, if the product is used with AC voltages outside of the range suggested by the manufacturer.

7. The foregoing is in lieu of all other warranties, expressed or implied, and DigiTech neither assumes nor authorizes any person to assume any obligation or liability in connection with the sale of this product. In no event shall DigiTech or its dealers be liable for special or consequential damages or from any delay in the performance of this warranty due to causes beyond their control.

NOTE: The information contained in this manual is subject to change at any time without notification. Some information contained in this manual may also be inaccurate due to undocumented changes in the product or operating system since this version of the manual was completed. The information contained in this version of the owner's manual supersedes all previous versions.

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Introduction

Congratulations and thank you for purchasing the DigiTech® TimeBender™ musical delay!

The DigiTech TimeBender is a new kind of delay pedal. It completely rebuilds the idea of delay and what it can add to your performance.

It has an entire pedalboard worth of different kinds of delays built right into it: Digital, Analog, Variable Speed and Moving Head Tape, plus several more. And you can control their repeat patterns by strumming your guitar. The delay repeat patterns will imitate whatever pattern you strum (up to six delays in a single pattern). You can also select from a long list of preset repeat patterns.

The TimeBender can also change the pitch of the repeats and keep them in the key you're playing in. The result can be a melodic hurricane of musical notes following every note you play, all with the right rhythm and harmonies.

It's incredibly powerful and it adds tremendous depth to your music, yet it's simple to control: it only has two footswitches. The best place to begin is the Tutorial section of this manual on page 10. And once you get to know the TimeBender, there's no limit to the incredible musical delays you'll be able to create.

Included Items
TimeBender
PS0913B Power Supply
This Manual
Registration Card

Introduction

Features

- Five seconds of true stereo delay.
- Selectable voicings, for musically intelligent arpeggios and harmony-based delays.
- Set tempo, key, and even time patterns just by strumming your guitar.
- Strum Pattern allows you to easily create and save custom delay patterns on the fly.
- Tempo Multiplier button lets you produce delays in between beats and makes complex patterns such as triplets much easier to configure.
- Traditional delay sounds (Digital, Analog, Fixed Head Tape and Variable Speed Tape, Reverse) are easily selectable and ensure that this is the only delay pedal you'll need.
- Fits in your pedal chain like any other delay.
- Built-in 20 second Looper lets you create and overdub loops on the fly.
- Harmony-shifted delays let you create new delay sounds in any key.
- Save your favorite sounds to four memory locations.
- Tone control gives you full control over the sound of your delays.
- Modulation control with three speed ranges can be used with all the delay types.
- Envelope delay creates musically correct arpeggios as well as tempo-based rhythm-chopping effects.
- Dynamic Delays "duck" the repeats while you play and leave the repeats when you stop.
- Expression pedal input lets you morph between two saved settings for amazing new effects.
- Optional FS3X footswitch input enables up and down memory changes.
- Supports both mono and stereo inputs and outputs, as well as full stereo effects including ping-pong, stereo modulation, and dual-delay lines.

Guided Tour - Front Panel
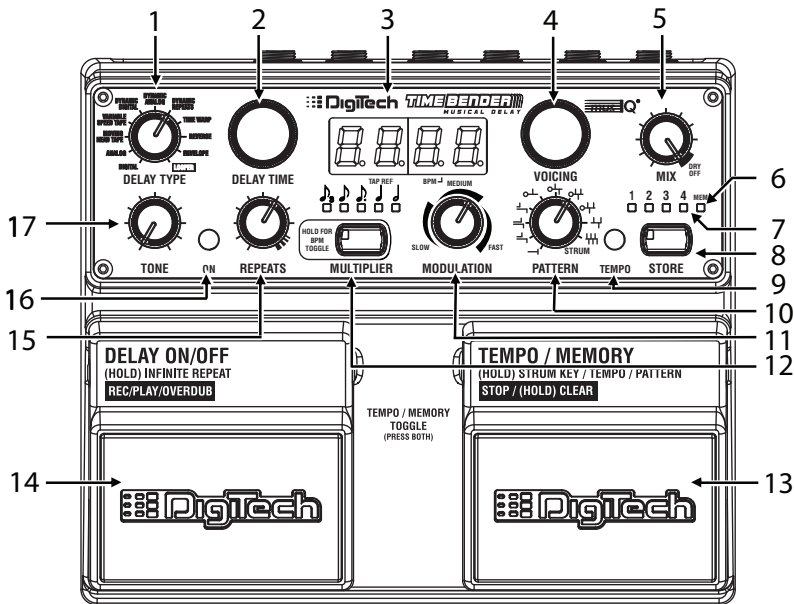
1. Delay Type Knob

The Delay Type knob selects the different delay types and styles. Each delay type has a unique sound which is described in detail on page 18.

2. Delay Time Knob

The Delay Time knob sets the length of the delay. The display shows the delay time when you turn this knob.

3. Display

The display usually shows the current delay time (the time it takes for a repeat to be heard). It shows this in either **delay time** or in **beats per minute**. For delay time, the format is [S.MMM] where S is seconds, and MMM is milliseconds. For beats per minute, the delay time is expressed in terms of quarter note beats per minute, with a resolution of 1/10 beat.

Guided Tour - Front Panel

When you turn the Voicing knob, the display shows the currently selected voicing. If the Voicing knob is untouched for two seconds, the display goes back to showing the current delay time. The display also shows the selected delay when you turn the Delay Type knob.

When the Looper is selected, the display reads $LooP$. When recording starts, the available loop time (shown in seconds) begins to count down in the display. When the loop is playing back, the current playback position within the loop is shown as a series of vertical bars moving across the display in proportion to the length of the loop.

4. Voicing Knob
The Voicing knob lets you change the pitch of the delayed signals (repeats) that you hear. When the voicing is set to unison (U or U U), the TimeBender™ creates a traditional delay effect. But by changing the delay voicings, you have access to a huge canvas of sonic possibilities like octave shifts and intelligent musical intervals. Turn the Voicing knob by a single click to see the currently selected voicing set. Turn it again to cycle through the other available voicing sets. The voicings are described on page 21.

5. Mix Knob
The Mix knob controls the level of the delayed signal or Looper playback. Turn it all the way down (counter-clockwise) to hear just your guitar and no delays. As you turn the Mix knob up (clockwise), the delayed signal gets louder. For a 100% wet mix (all delay, no input guitar signal), turn the Mix knob all the way up to the black region marked DRY OFF. The display will briefly show $d.OFF$ for all delay types except Reverse, Envelope, and Looper. To get the dry signal mixed back in, turn the Mix knob counter clockwise until it is out of the DRY OFF region (the display will briefly show $d.$ On). For every delay type except Reverse and Envelope, the Mix knob controls the level of the delays only – the input guitar signal is the same undigitized signal you would hear if the TimeBender were turned off. But when Reverse or Envelope are active, the input guitar signal level gets reduced as you turn up the Mix knob, so you can adjust a wet/dry mix.

6. Memory Indicator LED
When the Memory Indicator LED is lit, you can step on the right footswitch to advance to the next memory location. When the Memory Indicator LED is off, you can use the right footswitch to set the tempo by tapping at the desired beat. Holding down both footswitches at the same time turns the Memory Indicator LED on or off.

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7. Memory Location LEDs

The Memory Location LEDs indicate which memory location is currently loaded. To make it easier to see at a glance which memory location is being used, all LEDs up to and including the currently loaded location are illuminated. When no memory LEDs are illuminated, no memory location is loaded, and the TimeBender™ is set exactly how the controls, LEDs, and (optional) expression pedal indicate. When you load a memory location by stepping on the Tempo / Memory footswitch, the settings stored in that location become active, and the knob positions and displays may not match how the TimeBender sounds.

8. Store Button

If any changes are made to the knobs or buttons, the Store button's LED lights up. Press the Store button once and the current Memory Location LED flashes (or the first Memory Location LED, if no memory location is loaded). Use the right footswitch to select which memory location to use. Press the Store button a 2nd time to store the changes into that memory location. After the store operation, this memory location will now be active. To cancel the store procedure while the Store LED is flashing, press the Delay On/Off footswitch or the Multiplier button.

9. Tempo LED

The Tempo LED flashes at the quarter note reference delay time. If the Multiplier is set to something other than the quarter note reference, the delay repeats will not be heard in sync with the Tempo LED flash rate.

10. Pattern Knob

The Pattern knob selects the delay pattern that will be repeated at the selected tempo (like single delay, dual delay, multi-tap, etc.). When the "Strum" setting is chosen, you can hold down the right footswitch to strum out a time pattern. See page 13 for more information on creating patterns.

11. Modulation Knob

The Modulation knob lets you add chorusing to any delay type. There are three ranges on the knob that correspond to the speed of the modulation that will be applied. As the Modulation knob is turned through the first range, you'll hear a slow modulation with increasing depth. As you pass into the second range, the modulation depth will drop to zero and then increase, but this time with a faster modulation speed. The final range implements a very fast modulation.

Guided Tour - Front Panel

When Time Warp is selected, the Modulation knob adds synchronized pitch vibrato to the delay signal in three different sync ranges.

12. Multiplier Button

The Multiplier button changes the repeat rate by a fixed multiple or sub-multiple of the quarter note reference delay time (up to a maximum of five seconds; multiplying the reference delay time to more than five seconds pushes it out of range, indicated by dashes ---- in the display). For example, if your current reference delay time is set to 1 second, setting the tempo multiplier to the quarter note value will cause the current pattern to be repeated every second. If you change the tempo multiplier (by pressing the multiplier button) to the half note setting, the pattern will repeat every two seconds. When the "triplet" eighth note setting is selected, the pattern will repeat every 1/3 of a second. The tempo multiplier also makes it easier to create off-beat delay patterns. For example, if you use the dotted eighth note setting with a single delay, you can play on eight note boundaries and get delays played back in between your own notes.

Note: Even though the tempo multiplier always changes the delay time, the display will not reflect this if it is set to show BPM because BPM timing is always reported in terms of quarter note beats. To switch between BPM display and time display, press and hold the Multiplier button for one second.

13. Tempo/Memory Footswitch

The Tempo/Memory Footswitch's function depends on the state of the Memory Indicator LED. When the Memory Indicator LED is off, the footswitch can be used to tap out a tempo that will be reflected in the display. Otherwise, the footswitch advances to the next memory location each time it is pressed. See the Memory Indicator LED description on page 4 for more information.

Additionally, this footswitch can be used to set several important delay effect parameters using only your guitar. Pressing and holding the Tempo/Memory footswitch activates the Smart Strum feature. With the Smart Strum feature, you can do the following: strum a chord to set the scale used for voicings with intelligent shifts, or strum at a steady beat to set the reference delay time. Also, if the time pattern knob is set to "Strum", you can strum a time pattern, as described on page 13.

Guided Tour - Front Panel

14. Delay On/Off Footswitch

The Delay On/Off footswitch turns the delay effect on and off. When the delay is off, your guitar signal is never digitized, so your tone is preserved. If any repeats are being heard when the delay is turned off, the repeats fade out instead of silencing instantly. For all delay types except Envelope, Reverse, and Looper, this footswitch can also be used to freeze the delay line so you can, for example, solo over a repeating backing track. To do this, hold down the footswitch for one second—the Delay Indicator LED turns yellow, the delays loop continuously, and the input guitar signal stops feeding into the delay line. Step on the pedal again to re-enable the feedback loop input and return the pedal to the "on" position.

When Looper is selected, press the Delay On/Off footswitch once to start recording a loop; press it again to stop recording and begin loop playback. Step on it while a loop is being played back to overdub your current guitar signal onto the existing loop.

15. Repeats Knob

The Repeats knob controls the amount of signal that is fed back into the delay lines. When the Repeats knob is turned all the way down (counter-clockwise), you hear one or very few repeats of the delay pattern. As you turn the Repeats knob up, the pattern circulates more and more causing the delays to repeat for longer and longer time periods. When Envelope is selected, the Repeats knob controls the shape of the envelopes applied to the input guitar signal. In the leftmost position, the envelope has a sharp onset and a rapid decay, giving the effect of a newly plucked note. As the Repeats knob is turned up, the envelope shape changes. It first begins to shorten until it becomes quite percussive, then becomes longer with a more level sustain section. Towards the end of the range the envelope has an upward ramp with a quick decay resulting in a reverse envelope sound.

16. On LED

When this LED is green, the delay effect is turned on. When the LED is yellow, the delay signal is set to Infinite Repeat (no input signal is being added to the delay line). When Looper is selected, the LED is red during recording, green during playback, and yellow during overdub.

17. Tone Knob

The Tone knob alters the tonal characteristics of the delay signal. Although the exact tonal change depends on the selected delay type, generally turning the knob to the left creates a darker (bass) tone, and turning it to the right creates a brighter (treble) tone. In the center position, no additional tone coloring (beyond what is already part of the currently selected delay type) is applied. Hint: An easy way to control the quality of the tape in the Tape delay is to turn down the Tone knob.

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Guided Tour - Rear Panel
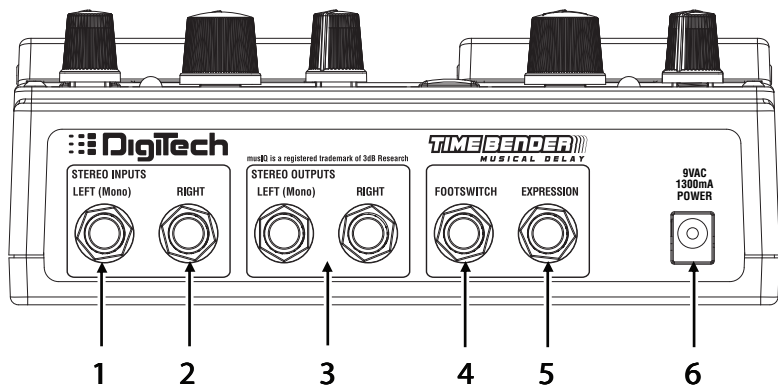
1. Left (Mono) Input

If you have separate left and right inputs, connect your left input to this jack. If you're using a mono input/stereo output configuration, connect to this input if you want the delays to "ping-pong" between the right and left outputs (for delay types with multiple taps).

2. Right Input

If you have separate left and right inputs, connect your right input to this jack. If you're using a mono input/stereo output configuration, connect it to this input if you want all delays (other than dual-delays) to be panned center.

3. Main Outputs

Connect the outputs to your amp or mixer. Use only the left output for mono, or connect both for full stereo sound.

4. Footswitch Input

Connect an optional 3-button FS3X footswitch to this input to step through the memory locations. On the FS3X, the right button moves you up one memory location, and the center button moves you down one location. When Looper

is selected, the left button takes you directly to overdubbing. Connect or disconnect the optional FS3X footswitch only when the TimeBender™ is turned off.

5. Expression Pedal Input

Connect a mono (tip/sleeve) passive expression pedal to this input to morph between two different delay settings. (Any volume pedal in the 100 kOhm – 500 kOhm range, with log taper, will work as well.) See page 16 for details on how to use an expression pedal with the TimeBender™.

6. Power Supply Jack

Connect the PS0913B power supply here.

Tutorial

This section walks you through some basic functions and helps you get familiar with the controls. It also gives you an idea of what the TimeBender™ is capable of. This Tutorial uses the Mono In/Mono Out setup, as shown below.

Make Connections

Before connecting the TimeBender, make sure that the power to your amplifier or P.A. is off and that the TimeBender is powered on. There is no power switch on the TimeBender. To turn the TimeBender on or off, connect or disconnect the included PS0913B power supply from the Power Supply jack.

1. Connect your guitar to the Left (Mono) Input jack.
2. Make sure your amp's volume is turned all the way down.
3. Connect the Left (Mono) output jack to your amp or other effects.
4. Turn on your amp.
5. Gradually increase your amp's volume until you reach a comfortable listening level.

Connect your guitar to the TimeBender™'s Left input.

Connect the TimeBender's Left output to your amp's input.
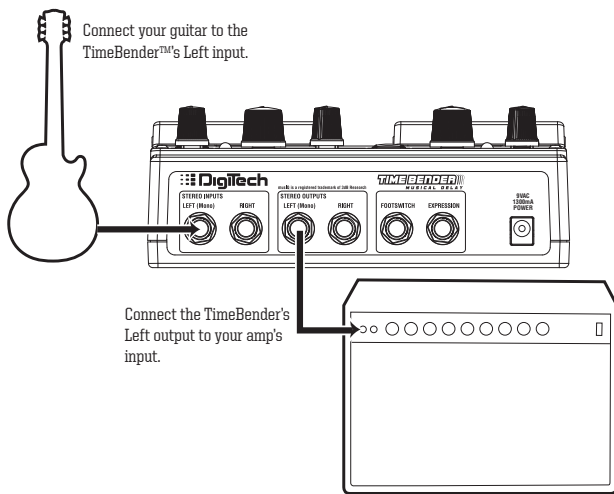
Tutorial

Set Up the TimeBender™

Before you begin the tutorial, follow these steps to set up the TimeBender™:

1. Make sure your guitar is in tune using a tuner set to A-440.
2. Set the right footswitch to advance the memory locations. To do this, step on both footswitches so that the Memory Indicator LED is lit.
3. Press and release the right footswitch until no Memory Location LED is lit.
4. Set the right footswitch to control delay tempo. To do this, step on both footswitches so that the Memory Indicator LED is not lit.
5. Make sure the delay time is shown in seconds (where the decimal point is between the 1st and 2nd digits in the display) rather than beats per minute (where the decimal point is between the 3rd and 4th digits in the display). To switch between beats per minute and seconds, press and hold the Multiplier button for one second.
6. Turn the Modulation knob all the way down (counter-clockwise).
7. Turn the Pattern knob all the way down (counter-clockwise).
8. Turn the Voicing knob to the left until U appears in the display.
9. Set the Tone knob to the 12 o'clock position.
10. Finally, make sure the multiplier is set to quarter notes. To do this, press and release the Multiplier button until the quarter note is selected.

Create a Basic Digital Delay

1. Select Digital Delay by turning the Delay Type knob all the way to the left. " $d\ iG\ i$ " will appear briefly in the display.
2. Adjust the Delay Time knob so that 0.500 appears in the display.
3. Set the Repeats knob to the 9 o'clock position.
4. Set the Mix knob to the 12 o'clock position.
5. Press and release the Delay On/Off footswitch so the On LED lights up.
6. Play a single note. You should hear a simple delay.

Try a Different Pattern

1. Turn the Pattern knob one click to the right. $P2$ will appear briefly in the display.
2. Play your guitar and note how the repeat pattern is different than before.

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Tutorial

Change the Multiplier Value
1. Press and release the Multiplier button one time, so the half note is selected. The delay time shown in the display should now be 1.000.
2. Play a single note. Notice how the repeats take twice as long as they did when the quarter note was selected.
3. Now press and release the Multiplier button twice, so the eighth note is selected. The delay time shown in the display should now be 0.250.
4. Play a single note. Notice how the repeats are twice as fast as they were when the quarter note was selected.

Set the Key by Strumming a Chord
1. Turn the Pattern knob to any pattern other than Strum.
2. Press and hold the right footswitch. The display briefly shows the current key, then goes blank.
3. While holding the right footswitch down, strum a G major chord. G appears in the display. The key is now set to G, and any scalic or triad-centered voicings will create pitch-shifted repeats based on this key.

Note: The outputs are muted while setting the key.

Set the Tempo by Strumming with Muted Strings
1. Turn the Pattern knob to any pattern other than Strum.
2. Press and hold the right footswitch.
3. Mute the strings with your left hand (if you're playing right-handed). That is, cover them with your fingers but don't press them down to the fretboard.
4. Strum the tempo you want. Notice how the blue Tempo LED blinks in time with the tempo you're strumming.
5. Release the right footswitch.

Note: The outputs are muted while setting the tempo.

Set the Key and Tempo by Strumming
1. Press and hold the right footswitch.
2. Strum a G major chord at the tempo you want. Having more silence between strums will increase the accuracy of the tempo detection. Notice how the blue

Tutorial

Tempo LED blinks in time with the tempo of your strumming, and the display shows ⎍. (Minor keys are indicated by a dash after the note in the display.)

Note: The outputs are muted while setting key and tempo by strumming.

Set the Repeat Pattern by Strumming (Smart Strum)
1. Turn the Time Pattern Knob to the last position to select the Strum pattern (5ɧ⎍).
2. Press and hold the right footswitch. The display briefly shows the currently stored key and flashes ⎅ while you hold down the footswitch.
3. Strum multi-tap time pattern. Your first strum marks the start of the delay pattern, and each subsequent strum automatically creates a delay (tap) at that time. You can strum up to seven times in order to set all six delay taps. You can also set a pattern by playing two or more repeats of the pattern while holding down the footswitch. Whenever more than seven strums are detected, Smart Strum will organize the strums into repeated groups and use this for the pattern.
4. Release the right footswitch. If a consistent pattern was detected, the display will briefly show ⎍ood. If a consistent pattern could not be found, the display will briefly show ⎆⎆⎆⎆ and the existing pattern will not be changed.

Note: When you set a repeat pattern with Smart Strum, you also set the tempo. The tempo is the time between the first strum and the last strum in the resulting pattern. The outputs are also muted when using Smart Strum.

Add a Pitch-Shifted Voice
1. Turn the Voicing knob one click to the right. The current voicing pattern will appear briefly in the display. Using this tutorial, it should read ⎍ ⎍.
2. Once the display shows the delay time again (⎕.5⎕⎕ for instance), turn the Voicing knob four clicks to the right. The display should briefly show ⎍ ⎊, then go back to showing the delay time.
3. Play a single note in the key of G major. Notice how some of the repeats are slightly higher than the original note, and how they're in harmony.

Adjust the Repeats
1. Turn the Repeats knob to the 1 o'clock position.
2. Play a single note and notice how much longer the repeats last.

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Change the Delay Type
1. Turn the Delay Type knob to Analog.
2. Play a single note and notice how the repeats gradually decrease in fidelity.

Add Modulation
1. Turn the Modulation knob to the 12 o'clock position.
2. Play your guitar and listen to the chorus-like effect applied to the repeats.

Store the Current Settings to a Memory Location
1. Press the Store button. The currently active (or first available) Memory Location LED flashes.
2. Press and release the right footswitch until the Memory Location 1 LED is lit.
3. Press the Store button again. The TimeBender™'s current settings are stored to Memory Location 1.

Note: You can abort the store procedure by pressing the Delay On/Off footswitch.

Load Settings from a Memory Location
1. Set the Tempo/Memory footswitch to select memory locations. To do this, press both footswitches until the Memory Indicator LED is lit.
2. Press and release the right footswitch to select a memory location, indicated by the Memory Location LEDs. Note that when location 2 is selected, LEDs 1 and 2 are lit; when location 3 is selected, LEDs 1, 2, and 3 are lit, and so on.
3. Settings load automatically when a memory location is selected.

Using the Looper
The TimeBender's Looper lets you record, play back, and overdub loops up to 20 seconds long. Enable the Looper by turning the Delay Type knob to the Looper position. Note that the Looper sums stereo input signals to mono, and outputs a mono signal only.

The voicing still works when the Looper is active, so you can do things like record a bass line with the voicing set to an octave down (8L), and then set the voicing to unison and play over the looped bass line. Also, with an expression pedal, you can store a unison voicing in the toe position and an octave down in the heel position, and switch between your "bass" and guitar on the fly.

Tutorial

When recording your loop, you hear what is actually being recorded. The only effect that you hear before recording is the pitch shift (so you can record a bass line and then a regular guitar line, for example). That means you won't hear the mix, modulation and tone effects until the loop is being played back since they are applied after recording. It also means you can adjust these effects during playback to change the sound of the loop.

The following controls are active when Looper is selected:

Mix Knob	Controls the playback level of the looped audio.
Tone Knob	Controls the tone of the loop. In the center position the tone will match what was recorded.
Modulation Knob	Adds modulation effects to the looped audio.
Store Button	Stores the current Mix, Tone, and Modulation knob settings into a memory location. When this memory location is recalled, the TimeBender™ will activate the Looper with these settings. You can only store a Looper preset when a loop is not playing.
Left Footswitch	When the Looper is active, the left footswitch controls Record, Play, and Overdub functions (see below).
Right Footswitch	When the Looper is active, the right footswitch controls Stop and Clear functions (described on the next page). Note that when the Memory Indicator LED is lit and there is no loop in memory, the right footswitch will maintain its memory advance function so you can move through memory locations in the usual way. Whenever a loop is recorded, the right footswitch won't step through memory locations or set the tempo, and you can't press both footswitches to turn the Memory Indicator LED on or off. When the loop is cleared, you can do those things again.

Activating the Looper
When you first activate the Looper (either by recalling a memory location in which the Looper was previously stored, or by turning the Delay Type knob to the Looper

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position), the display will read L⌐⌐P and the loop memory will be cleared.

Recording a Loop
To begin recording a loop, start playing your guitar as you press and release the left footswitch. The display will begin to count down the available recording time, and the On LED will turn red. As you finish your loop, press and release left footswitch again. The On LED will turn green and the loop will immediately begin to play back at the current mix level. The TimeBender™ automatically adjusts the starting and ending loop points to match them as closely as possible. This makes it extremely easy to get smoothly transitioning loops on the first try.

Stopping and Starting a Loop
To temporarily stop a loop from playing, press and release the right footswitch. The On LED will turn off. You can restart the loop by pressing and releasing the left footswitch. When the loop is playing back, the display will show the position of play-back within the loop with a progress bar.

Overdubbing
Whenever a loop is playing, you can press and release the left footswitch to start overdubbing. In this case, the On LED will change to yellow, and your playing will be added to the current loop without replacing the existing audio. In this way, complex loops can be built up successively.

Clearing a Loop
To clear the loop memory, stop the loop playback, then press and hold down the right footswitch for two seconds. The Delay On LED blinks twice and the memory is cleared.

Using an Expression Pedal
Using an expression pedal with the TimeBender is an easy way to unlock a whole new set of stunning time-varying delay effects. An expression pedal lets you smoothly morph between different settings for a given delay type, voicing, and time pattern al-lowing control over parameters such as delay time, tone, repeats, and modulation.

To use your expression pedal with the TimeBender:
1. Make sure no Memory Location LED is lit (see Set Up the TimeBender on page 11).

Tutorial

2. Plug your expression pedal's standard 1/4" connector into the Expression Pedal input on the back of the TimeBender™ Delay.
3. Set the expression pedal to the minimum (heel) position.
4. Adjust the controls on the TimeBender to get a starting sound that you like.
5. Step forward on the expression pedal to put it into the maximum (toe) position. Adjust one or more of the delay time, voicing, mix, tone, repeats, modulation, tempo multiplier, pattern, and key to get the sound that you like.
6. Move the pedal from the heel to the toe position while you're playing and listen to the delay blend between your two settings.

When you store your changes to a memory location, both the heel and toe settings are stored. If you don't have an expression pedal connected when that memory location is loaded, you'll hear the toe position setting. To restore your expression pedal's heel and toe positions to match what the TimeBender controls are showing, simply step through the memory locations until no memory location is selected; the expression pedal's heel and toe positions will now be reset. You can also unplug the expression pedal and plug it back in to accomplish the same thing.

Using the Envelope Delay Type
When you use Envelope, you might notice that a short note won't produce any audible delays. That's because Envelope creates delays using a completely different approach than the other delay types. Instead of playing back a delayed version of your input signal, Envelope "slices" up the current signal using configurable envelope shapes, and then plays these slices back at the delay times defined by your current pattern. If you've set voicings other than unison, these slices will be pitch shifted as well. Envelope works best with effects that have long sustains, like most distortion effects.

Changing Envelope Shapes
When the Envelope delay type is selected, the Repeats knob controls the shape of the envelopes applied to the input guitar signal. In the leftmost position, the envelope has a sharp onset and a rapid decay, giving the effect of a newly plucked note. As the Repeats knob is turned up, the envelope shape changes. It first begins to shorten until it becomes quite percussive, then becomes longer with a more level sustain section. Towards the end of the range the envelope has an upward ramp with a quick decay resulting in a reverse envelope sound.

Delay Types

The TimeBender™ includes 11 different delay types. Some recreate classic delays that have remained popular for decades, while others (like Dynamic Repeats and the TimeBender's unique Envelope) are totally new, ready for you to try them out for the first time.

1. Digital (*d iG i*)
The Digital delay provides a clean digital sound and a flat frequency response with the tone knob at the 12 o'clock position. A limiter in the feedback path prevents clipping and keeps the sound clean even when the Repeat knob is turned up high. When you change the delay time in Digital delay, you'll notice that the old delay fades out while the new delay fades in—so the pitch of your delayed signal remains constant.

2. Analog (*AnA*)
The Analog delay is based on the solid-state "bucket brigade" delays of the 1970s. When the tone knob is at 12 o'clock, you'll hear the substantial high-frequency roll-off characteristic of these devices. The feedback path includes a saturator that will introduce some distortion when the feedback signal becomes large. When changing the delay time, you'll notice the delay "slides" to the new value resulting in a pitch shifted signal while the delay is moving.

3. Moving Head Tape (*tAP i*)
The Moving Head Tape delay is based on early (tube-based) systems that had movable playback tape heads. Like the fixed head tape delay, the Moving Head Tape delay also has saturation in the feedback loop and a characteristic high frequency and low frequency roll-off. There is also a mid-boost sound across the tone range common in tube-based systems. When changing delay time, you'll hear the sound of a moving tape head rather than the sound of changing the tape speed—the pitch shift amount will depend on the size of the delay change.

4. Variable Speed Tape (*tAP2*)
The Variable Speed Tape delay is based on early tape delays, in which the delay was controlled by changing the speed of the tape. With the Tone knob at 12 o'clock, you'll hear both high frequency and low frequency roll-off. The feedback path contains a saturator that mimics the saturation characteristics of

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Delay Types

physical tape. When changing delay time, you'll hear the pitch of the delayed signal change in exactly the same way as if you had changed the speed of a real tape recorder—the pitch shift amount will depend on the difference between the speed that the delayed signal was recorded at and the new speed. Note that the amount of time required to move from one delay to another (and for the pitch to return to normal) is equal to the amount of time it takes for the tape to move from the record head to the fixed-playback head. As a result, moving from a short delay to large delay will take much longer than moving from a large delay to a short delay since in the first case, you need to slow the tape down.

5. Dynamic Digital (dd iO)

The Dynamic Digital delay type has built-in output "ducking". Output ducking automatically reduces the level of the delay effect while the input signal is loud. When the input signal decays in volume, the delay effect rises in volume resulting in a very dynamic sound.

6. Dynamic Analog (dAnA)

The Dynamic Analog delay type includes the same automatic ducking algorithm as Dynamic Digital, but applies this to an analog delay.

7. Dynamic Repeats (drEP)

The Dynamic Repeats delay type is totally new, and combines a Variable Speed Tape delay with a new method of ducking called "feedback ducking". Perfect for large feedback levels, feedback ducking not only lowers the output level while your playing is loud, but it also reduces the level of the signal going into the feedback loop. This keeps the feedback loop from getting overly saturated while you are playing, and means that the first delay sounds that become audible will be clean.

8. Time Warp (˥ i)

Time Warp is similar to the Analog delay, except that the modulations are synchronized with the delay time and the depth can be much more extreme, varying by hundreds of milliseconds.

Delay Types

9. Reverse (rE **)**

The Reverse delay type records the input signal in "chunks" with a length equal to the current delay time setting, and then plays these sound segments back in reverse. Unlike other reverse effects in which the chunks are arbitrary, the TimeBender™ starts chunks at note onsets where possible in order to avoid having notes cross chunk boundaries. When using Reverse, the Mix knob starts to attenuate (reduce) the dry signal when you turn the knob up, so you can adjust the wet/dry mix.

10. Envelope (En **)**

The Envelope delay type creates delayed versions of the input signal using a completely different approach than the other delays. As an input signal is being played, equal duration "slices" of the current signal are played back with a particular voicing (as specified by the voicing encoder). The Repeats knob can be used to alter the shape of each slice; for example, at the maximum position, a reverse envelope shape is created having a slow attack and very quick decay. When using Envelope, the Mix knob starts to attenuate (reduce) the dry signal when you turn the knob up, so you can adjust the wet/dry mix.

11. Looper ($LooP$ **)**

The Looper lets you record, overdub, start and stop loops. What makes this Looper special is the fact that it analyzes your start and stop loop points and automatically adjusts these in order to get the cleanest loop possible. This makes it much easier to set up a loop because you don't need to be nearly as accurate as with traditional looper pedals. See page 14 for a detailed description of how to use the Looper.

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Voicings

Voicings (Pitch-shifted Repeats)

One of the most exciting features of the TimeBender™ is its ability to change the pitch of the delayed signals. When the voicing is set to Unison (U), the delayed signal has the same pitch as the guitar input, just like with traditional delay pedals. But with the TimeBender, you can change the delays' pitch to one or two "voicings" that relate to the original note.

There are three main types of voicings: scalic, triad-centered, and fixed shift (chromatic). These are described in the tables below, but you may find it easier to experiment with the TimeBender itself by trying different voicings (turn the Voicing knob) while you play. Note that scalic and triad-centered voicings sound best when you play in the key the TimeBender is set to (see page 12 for more on setting the key by strumming).

Scalic Voicings	
Display	**Description**
2o	Input is shifted down by 2 octaves.
8L	Input is shifted down by 1 octave.
7L	Input is shifted to the 7th scale tone down.
6L	Input is shifted to the 6th scale tone down.
5L	Input is shifted to the 5th scale tone down.
4L	Input is shifted to the 4th scale tone down.
3L	Input is shifted to the 3rd scale tone down.
2L	Input is shifted to the 2nd scale tone down.
2H	Input is shifted to the 2nd scale tone up.
3H	Input is shifted to the 3rd scale tone up.
4H	Input is shifted to the 4th scale tone up.
5H	Input is shifted to the 5th scale tone up.
6H	Input is shifted to the 6th scale tone up.
7H	Input is shifted to the 7th scale tone up.
8H	Input is shifted up by an octave.

Voicings

Triad-Centered Voicings

Note: the triad-centered voicings are very similar to the scalic voicings shown on the previous page, but with additional voicings listed below.

Display	Description
LL	Same as Scalic 6L except for the 5th of the scale which is shifted to the root.
L	Same as Scalic 3L except for the root of the scale which is shifted to the 5th.
H	Same as Scalic 3H except for the 5th of the scale which is shifted to the root.
HH	Same as Scalic 6H except for the root of the scale which is shifted to the 5th.

Fixed Shift (Chromatic) Voicings

Display	Description
-12, -11, ... -1	Input is shifted down by the indicated number of semitones.
1, 2, ... 24	Input is shifted up by the indicated number of semitones.

Random Voicings (Envelope delay type only)

Display	Description (Randomly applies the pitch shifts shown.)
rnd1	8L LL L U H HH 8L
rnd2	8L 5L 3L U 3H 5H 8H
rnd3	8L -7 -5 U 5 7 8H
rnd4	2o 8L U 8H 24
rnd5	8L U 8H
rnd6	4L 3L 2L U 2H 3H 4H
rnd7	3L 2L U 2H 3H
rnd8	8L 6L 5L 4L 2L U 3H 4H 5H 7H

Time Patterns

Time Patterns

The TimeBender™ includes several ready-made delay patterns you can choose with the Pattern knob. They're described here and in the table that follows, but you may find it easier to sit down and listen to each one while using the TimeBender.

Each pattern has one or more "taps" where the delays occur, represented in the pattern symbols by a vertical line. Each tap happens at a certain "chronological distance" from the original note, described in the table below as a percentage of the total pattern's length of time. Each tap is also panned (left, center, or right), and each tap has a voice assigned to it.

There are four types of delay patterns: Simple Delays, Dual Delays, Multi-tap Pattern Delays, and Root-Based Pattern Delays. Each type is described below. With all these delay patterns, the TimeBender™ can be used as a traditional delay, where the input is delayed and played back unshifted, or in combination with pitch shifting (using the Voicing knob), where the input signal is shifted before being delayed.

Simple Delay

The Simple Delay has one tap and just repeats whatever you're playing. As the Repeats knob is turned up, you'll hear more and more repeats until the signal dies out.

Dual Delay

A Dual Delay is really just two simple delay lines that can be independently configured. So you can have different repeat rates for each line. When using a stereo setup, these lines are hard panned to the left and right channels. The TimeBender includes three dual delay configurations in which the left channel repeat rate can be 1/2, 3/4, or 1/3 of the right channel delay which is controlled by the Delay Time knob.

Multi-tap Pattern Delay

A Multi-tap Pattern Delay is a delay line with more than one tap, resulting in a more complex delay effect. The TimeBender includes two different multi-tap patterns: three-tap and six-tap.

Time Patterns

Root-Based Pattern Delay

The Root-Based Pattern delay is a new concept that, when combined with the Time-Bender™'s pitch shifting abilities, can create a wide variety of new sounds. Unlike Multi-tap Pattern delays, every repetition in a root-based pattern begins with the original unshifted note that you played. You always hear this unshifted note repeat at the specified delay time, followed by the rest of the notes in the pattern. The pattern gets its name from the fact that it is commonly used for arpeggiation. For example, with 3H and 5H voicings, playing a note with a root-based pattern will result in a musically intelligent arpeggio starting with the note you played. As you turn up the Repeats knob, the arpeggiation will repeat over a longer time. And because of the root-based nature of the pattern, you'll hear the root of the arpeggio during each repetition.

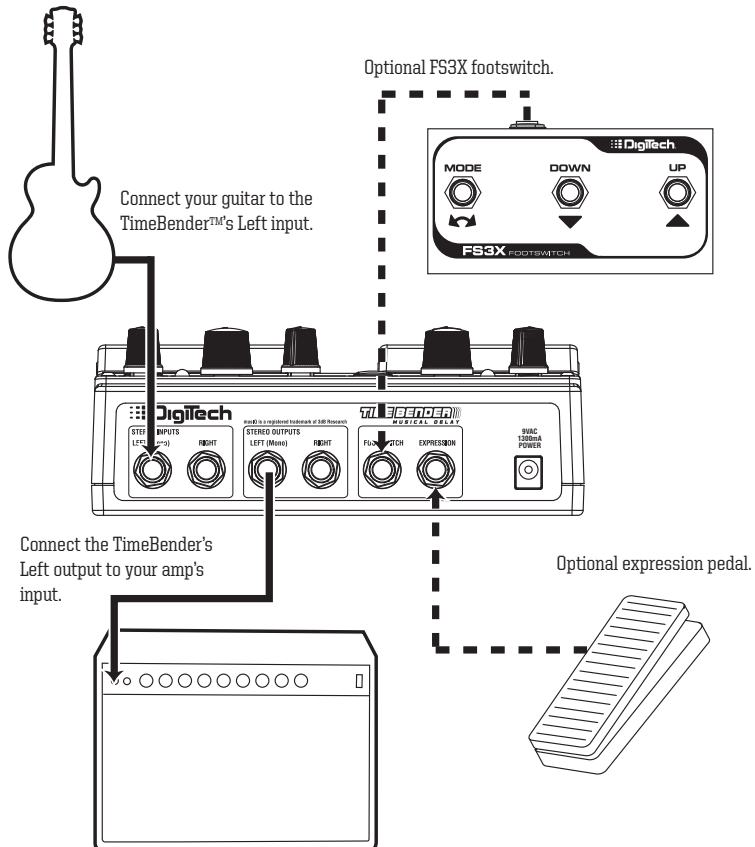| Time Patterns			
Pattern	**Symbol**	**Number of Taps**	**Description**
P 1	⌐⌐	1	Simple Delay Tap 1: Delay = 100%, Pan = Center, Voice = V1
P2	⌐⌐	2	Dual Delay (1/2, 1) Tap 1 : Delay = 50%, Pan = Left, Voice = V1 Tap 2 : Delay = 100% Pan = Right, Voice = V2
P3	⌐⌐	2	Dual Delay (3/4, 1) Tap 1 : Delay = 75%, Pan = Left, Voice = V1 Tap 2 : Delay = 100% Pan = Right, Voice = V2
P4	⌐⌐	2	Dual Delay (1/3, 1) Tap 1 : Delay = 33%, Pan = Left, Voice = V1 Tap 2 : Delay = 100% Pan = Right, Voice = V2
P5	o⌐	1	Root-Based Pattern Delay (2/4 time) Tap 1 : Delay = 50% Pan = Left, Voice = V1

Time Patterns

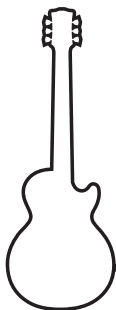| Pattern	Symbol	Number of Taps	Description
P6	⊶⊤	2	Root-Based Pattern Delay (3/4 time) Tap 1 : Delay = 33% Pan = Left, Voice = V1 Tap 2 : Delay = 66% Pan = Right, Voice = V2
P7	⊶⊔	3	Root-Based Pattern Delay (4/4 time) Tap 1 : Delay = 25% Pan = Left, Voice = V1 Tap 2 : Delay = 50% Pan = Right, Voice = V2 Tap 3 : Delay = 75% Pan = Left, Voice = V1
P8	⊶⊔	3	Root-Based Pattern Delay (4/4 swing time) Tap 1 : Delay = 33% Pan = Left, Voice = V1 Tap 2 : Delay = 50% Pan = Right, Voice = V2 Tap 3 : Delay = 83% Pan = Left, Voice = V1
P9	⊔	3	Multi-Tap Pattern Delay Tap 1 : Delay = 37.5% Pan = Left, Voice = V1 Tap 2 : Delay = 70% Pan = Right, Voice = V2 Tap 3 : Delay = 100% Pan = Left, Voice = V1
P10	⊞	6	Multi-Tap Pattern Delay Tap 1 : Delay = 16.6% Pan = Left, Voice = V1 Tap 2 : Delay = 33% Pan = Right, Voice = V2 Tap 3 : Delay = 50% Pan = Left, Voice = V1 Tap 4 : Delay = 66% Pan = Right, Voice = V2 Tap 5 : Delay = 83.3% Pan = Left, Voice = V1 Tap 6 : Delay = 100% Pan = Right, Voice = V2
Str	**STRUM**	1-6	Pattern set by holding down the right footswitch (when Looper is not selected) and strumming the pattern, up to six taps after the initial strum.

Connection Diagrams

Connection Diagrams

The following diagrams show different ways of hooking up your TimeBender™.

Mono In/Mono Out

Optional FS3X footswitch.

Connect your guitar to the TimeBender™'s Left input.

Connect the TimeBender's Left output to your amp's input.
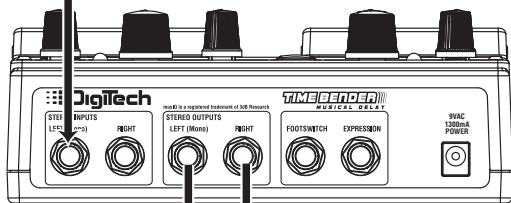
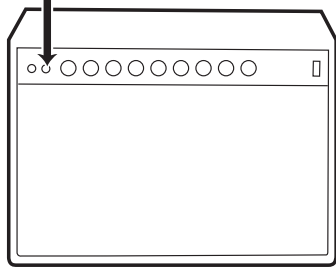Optional expression pedal.

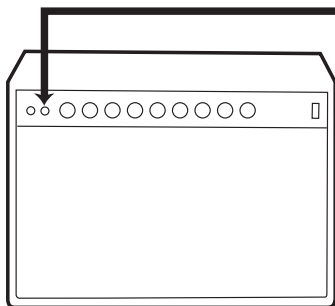# Connection Diagrams

Mono In/Stereo Out (Ping-Pong Delays)

Connect your guitar to the TimeBender™'s Left input.

Connect the TimeBender's stereo outputs to two amps or two channels on a mixer.

Connection Diagrams

Mono In/Stereo Out (Centered Delays)

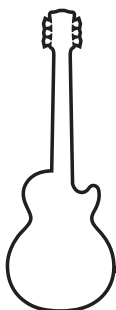Connect your guitar to the TimeBender™'s Right input.

Connect the TimeBender's stereo outputs to two amps or two channels on a mixer.
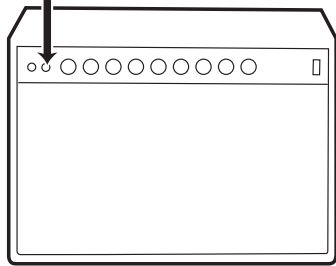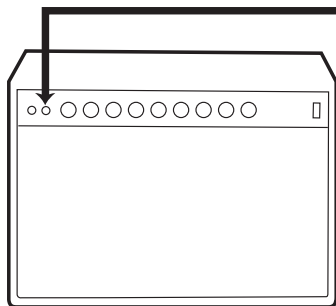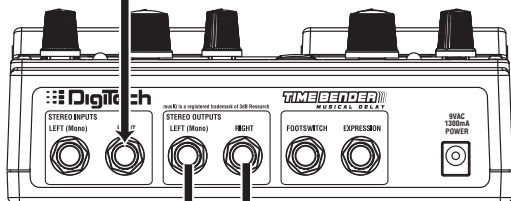
Connection Diagrams

TimeBender™ in an Effects Loop

Connect your guitar to your amp's input.

Connect your amp's effects send to the TimeBender™'s Left input.

Connect the TimeBender's Left output to your amp's effects return.
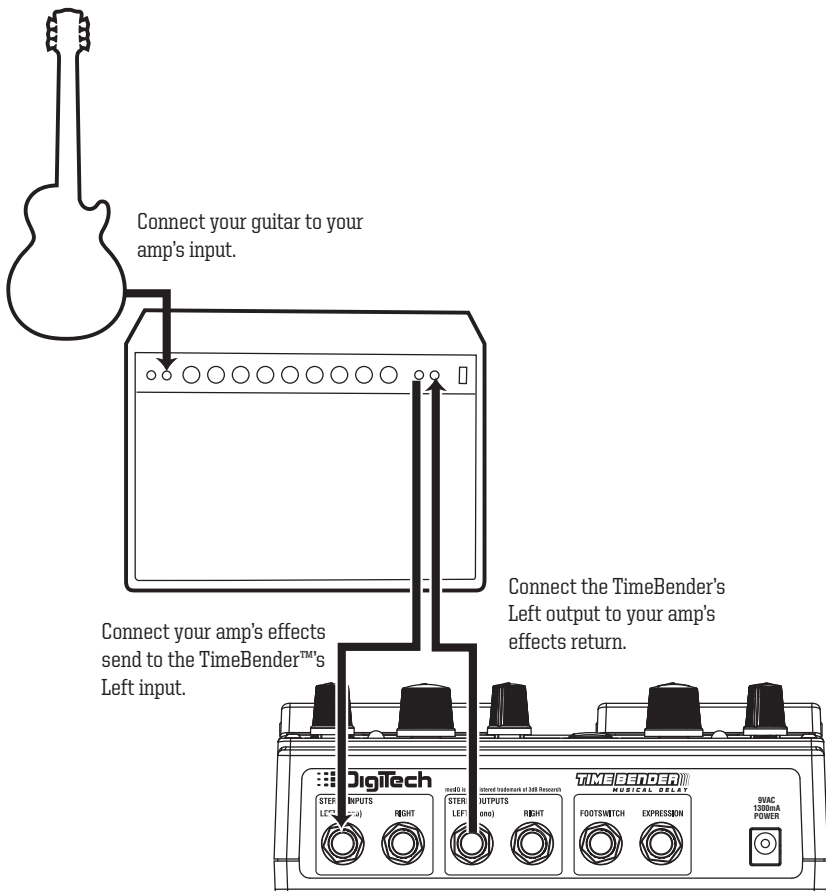
Connection Diagrams

TimeBender™ in an Effects Chain (Stereo In/Stereo Out)

Connect your guitar to your effects chain input.

CHORUS/FX (POST) OVERDRIVE DIGITECH® WHAMMY WAH

REVERB

Appendix

Factory Reset

The Factory Reset procedure replaces all the memory locations with their default settings as shipped from the factory.

Warning: Performing this procedure erases any changes you have made to the memory locations!

1. Press and hold the Store button for three seconds. All the Memory Location LEDs flash and the display reads *FAC*.
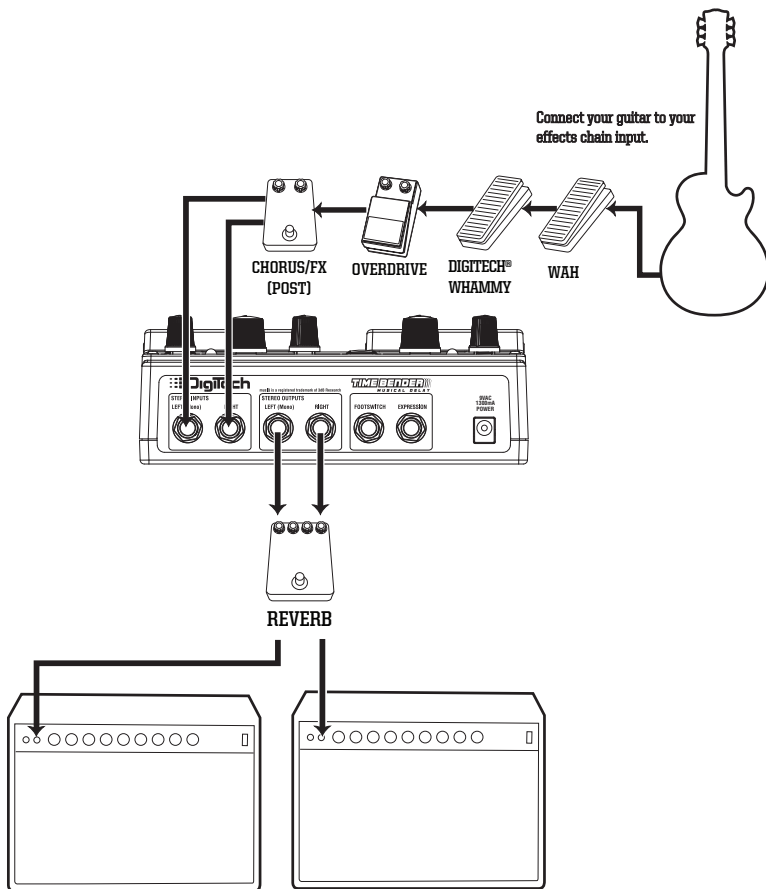2. Press and hold the Store button for three seconds again to perform the factory reset, or press the left footswitch or the Multiplier button to cancel.

Troubleshooting

Q: The TimeBender™ isn't doing what the controls say it should be doing.

A: You might have a memory location selected, which means the TimeBender has loaded the settings stored to that memory location (regardless of what the knobs and LEDs currently show). Also, if you have an expression pedal plugged in, the expression pedal will morph between its settings for the heel position and toe position. To get the TimeBender back to what the controls show, make sure the Memory Indicator LED is lit (step on both footswitches if it isn't), then press and release the right footswitch until no Memory Location LED is lit. If you're using an expression pedal, unplug it when no Memory Location LED is lit to be sure the knobs reflect the true state of the TimeBender.

Q: When I strum a tempo or pattern, the key sometimes changes unexpectedly.

A: Distortion pedals with extreme settings can boost hum and other noise that might be interpreted as a note. Try turning off any effects and keep your strings completely muted when strumming tempo and patterns.

Q: Why do I get a flashing *P* when I am trying to strum a tempo?

A: You may have Strum selected on the Pattern knob, or a memory location is loaded with the Strum pattern saved to it. If you are using an expression pedal,

Appendix

the Strum pattern may have been saved to the current heel or toe position. To get the TimeBender™ back to what the controls show, make sure the Memory Indicator LED is lit (step on both footswitches if it isn't), then press and release the right footswitch until no Memory Location LED is lit. If you're using an expression pedal, unplug it when no Memory Location LED is lit to be sure the knobs reflect the true state of the TimeBender.

Q: The output keeps getting louder and louder!
A: Maybe the Repeats knob is set too high (or a memory location is loaded where the Repeats knob was saved at a very high setting). To get the TimeBender back to what the controls show, make sure the Memory Indicator LED is lit (step on both footswitches if it isn't), then press and release the right footswitch until no Memory Location LED is lit. If you're using an expression pedal, unplug it when no Memory Location LED is lit to be sure the knobs reflect the true state of the TimeBender. Then turn down the Repeats knob.

Q: The tempo LED is flashing with a different timing than the delay time shown on the display.
A: When the delay time is shown in seconds (as opposed to BPM), the display only matches the tempo LED when the Multiplier button is set to the quarter note position.

Tips and Tricks
- If you turn the Voicing knob one click, the display shows the current voicing without changing it.

- Stepping on the right footswitch while muting your guitar shows you the current key.

- Use the LED with the Envelope delay type to synchronize your playing with the pattern.

- Try using the $\boldsymbol{BL}$ voicing with the Looper to make your guitar sound like a bass when recording your loop.

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Specifications

Input/Output Connections

Left (Mono) and Right Inputs   1/4" mono (unbalanced, tip/sleeve)
Maximum Input Level: +6 dBu
Input Impedance: 1 MΩ

Left (Mono) and Right Outputs 1/4" mono (unbalanced, tip/sleeve)
Nominal Output Level: +12 dBu
Output Impedance: 1 kΩ

Footswitch   1/4" (tip/ring/sleeve)

Expression Pedal   1/4" (tip/sleeve). Recommend passive expression (volume) pedal in the 100 kΩ to 500 kΩ range.

A/D Performance

Sample Rate Frequency   44.1 kHz
Bit Depth   24-bit Processing

Memory Capacity

Delay Time   Up to 5 seconds of true stereo delay
Looper   Up to 20 seconds (mono)

Power

US and Canada:	120 VAC, 60 Hz	Adapter:	PS0913B - 120
Japan:	100 VAC, 50/60 Hz	Adapter:	PS0913B - 100
Europe:	230 VAC, 50 Hz	Adapter:	PS0913B - 230
UK:	240 VAC, 50 Hz	Adapter:	PS0913B - 240
Australia:	240 VAC, 50 Hz	Adapter:	PS0913B - 240-AU
Power Input:	9 VAC 1.3 A		
Power Consumption:	7 Watts		

General

Dimensions: 6.7" Width x 5.6" Length x 2.6" Height
Weight: 2.88 lbs

DigiTech® engineers are constantly working to improve the quality of our products. Specifications are therefore subject to change without notice.

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