DigiTech™

PITCHRIDER 7000 MARK II

INSTALLATION
and
OPERATION
MANUAL

by ivl Technologies Ltd

Contents

Overview

Congratulations on your purchase of the Pitchrider 7000 Mark II by IVL Technologies. The Pitchrider opens up a whole new range of creative possibilities through MIDI (Musical Instrument Digital Interface - the standard communications format of the music industry). With proper care and use you should experience a vastly expanded creative potential and many hours of musical pleasure.

The Pitchrider 7000 is a guitar to MIDI interface that allows guitar players to control synthesizers from their favorite guitar. The Pitchrider consists of a hexaphonic pickup that mounts on the guitar, and a rack mounted controller. The pickup outputs a separate signal from each string on the guitar. The controller takes the signals from the pickup and determines what note is being played on each string and outputs this note information in MIDI format to any MIDI equipped device (ie. synthesizers, drum machines, sequencers, recorders, etc.). In effect, the guitar takes over the function of the keyboard on the synthesizer and allows the guitar player access to the exciting synthesized sounds and effects that before were only available to keyboard players.

The Pitchrider 7000 Mark II is an enhanced version of a proven product which differs from earlier models in several respects. A non-volatile battery-powered **programmable memory** allows you to program and store numerous Pitchrider settings, which remain in memory even after you power down. Instead of limited control of the Pitchrider through a single foot switch you now have the option of using a multiple position foot controller accessory, giving you **hands-free control** of Pitchrider functions. Another new feature is the ability to **change parameters while in play mode** so you can hear the effect of any given change while making adjustments.

In keeping with IVL's philosophy of maintaining product integrity and support, we

will strive to make further enhancements available to you by way of software upgrades wherever possible. In order to be eligible to receive such upgrades and news of other product developments we require you to fill in and return your warranty card immediately upon receipt of your new Pitchrider.

Installation

The first thing you must do before operating the Pitchrider is to mount the pickup on the guitar. This is not a difficult task, but proper mounting of the pickup is absolutely essential for correct operation of your Pitchrider 7000, so follow the installation instructions carefully.

Selecting the guitar

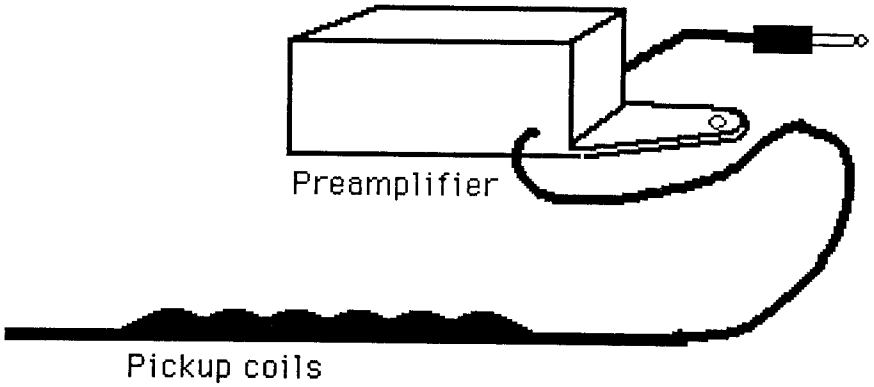
The Pitchrider 7000 pickup is intended to be mounted on a solid body electric guitar; it will not work well on a hollow body guitar. This is because the top of a hollow body guitar resonates when notes are sounding, which causes both the pickup and the other strings to vibrate, causing signals to be detected on strings that are not being played. If you have more than one solid body guitar, choose the one with the least body and neck resonances; this will generally be the one with the best "sustain".

The pickup mounts on the guitar close to the bridge (ideally about 1/2" away), between the bridge and the first existing pickup. If you have a choice, choose the guitar that will allow the pickup to be mounted closest to the bridge.

Since the Pitchrider determines what note is being played on each string by analyzing the "sound" from each string, make sure that the guitar is adjusted so there is no fret buzz or other rattles or buzzes which could confuse the note determination.

Pickup mounting

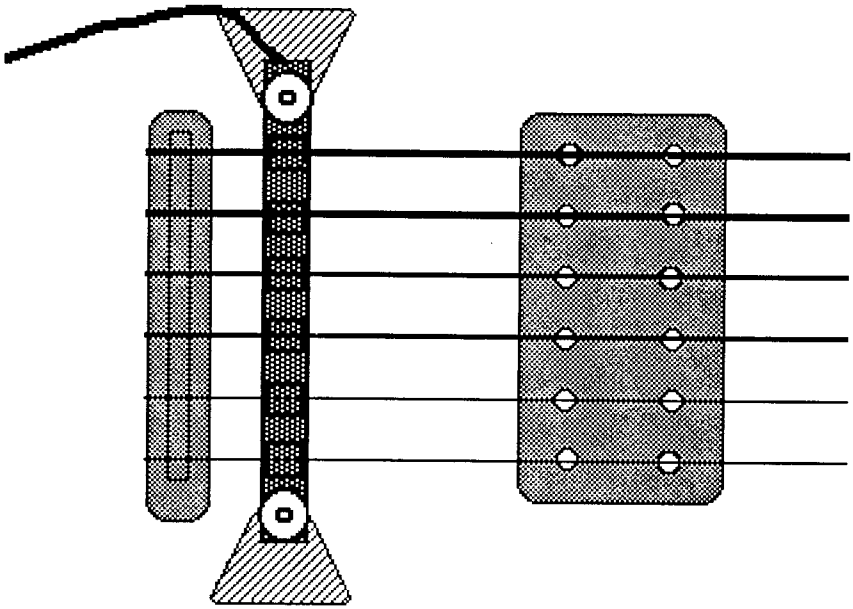
Unpack the pickup. It consists of a small bar with six separate coils connected by about 12 inches of wire to a small preamplifier box with an 8 pin DIN connector on it to allow it to be cabled to the controller.



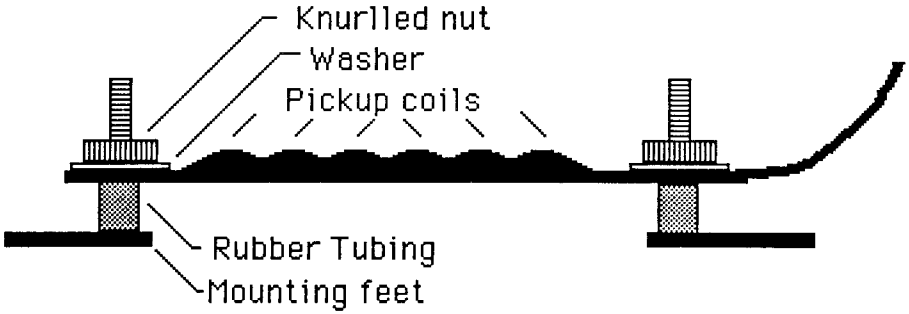
1. The pickup will be one of three sizes. Make sure you have the size of pickup that matches the string spacing on your guitar. The distance between the center of the outside two pickup coils will be 2.15 inches (54.6 mm) for guitars with 7/16 string spacing, 2.05 inches (52 mm) for guitars with 13/32 string spacing, or 1.95 inches (49.5 mm) for guitars with 25/64 string spacing. Hold the pickup under the strings where it will be mounted and check that the outside strings fall right over the center of the two outside pickup coils.

2. Bend the pickup carefully by hand so that the curvature of the top of the pickup coils exactly matches the curvature of strings on your guitar. Check the curvature by holding the pickup under the strings. It should just touch each string. If your bridge has saddles that are adjustable in height make sure that the strings follow an even curve.

3. Determine and mark the exact location for mounting the pickup feet so that the strings lie above the center of each pickup coil and the center of the pickup is about 1/2" from the bridge. Be careful not to mount the feet too far apart as this will tend to pull the pickup back into a flat position and will prevent it from matching the curvature of the guitar. The wire to the preamp box should be adjacent to the low E string.

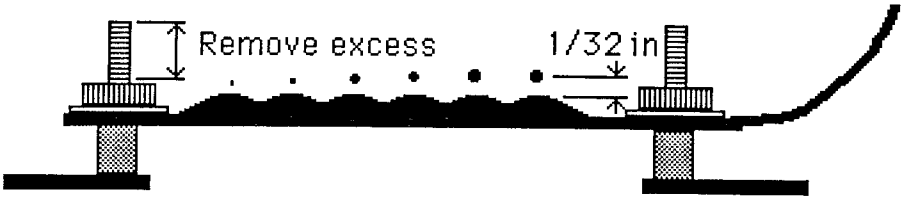


4. Cut two pieces of rubber tubing to act as springs in holding up the pickup. The length of the tubing should be just enough to push the pickup firmly up against the strings. The knurlled nuts can then be used to adjust the pickup down so that it doesn't contact the strings.



5. Slide the rubber tubing onto the mounting feet. Put the pickup under the strings, turn it on edge and slide on the mounting feet. Remove the backing from the adhesive on the feet and rotate the pickup into the normal position and stick it in place on the spot you marked in step 3. If there is limited clearance you may have to loosen the strings before you can rotate the pickup into position.

6. The rubber tubing should now be holding the pickup against the strings and the pickup coils should be centered exactly under each string. Thread the knurlled nuts onto the posts of the mounting feet and tighten them just enough so that the strings won't buzz against the pickup when the top note on each string is played. The pickup should be extremely close to the string (about 1/32 of an inch).



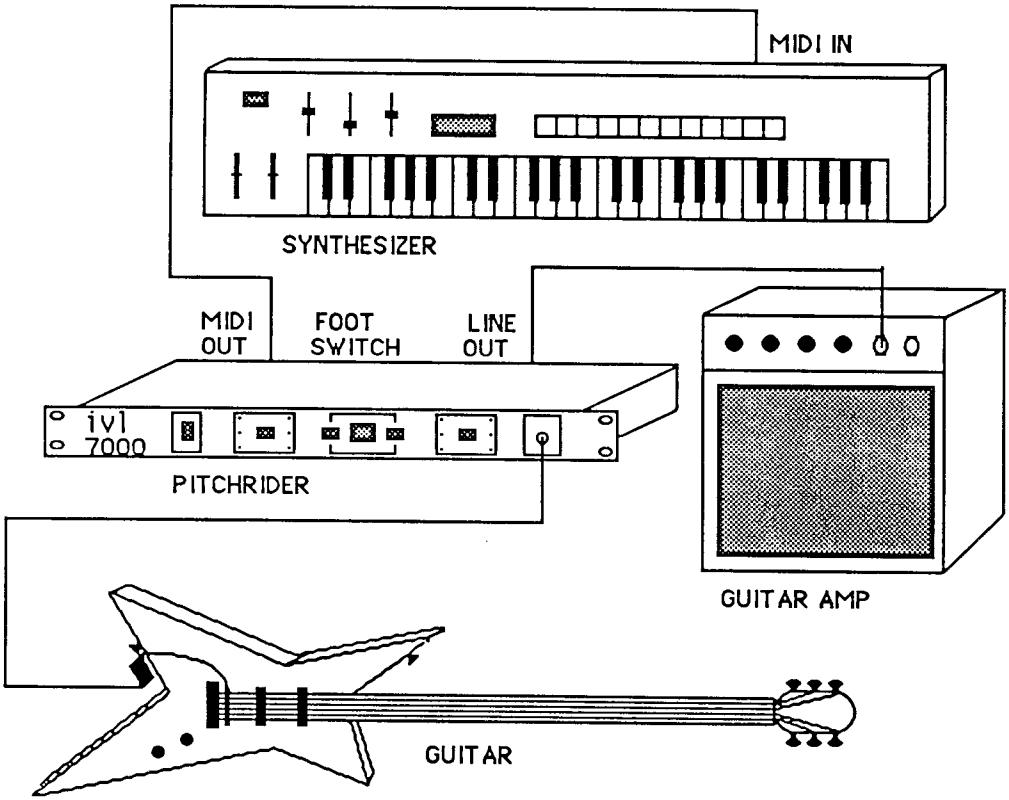
7. Cut off the excess length of the threaded posts from the mounting feet.

8. Unscrew the strap button from the end of the guitar and attach the preamplifier box to the guitar under the strap button. Make sure it is securely in place as excessive movement can damage the internal wiring.

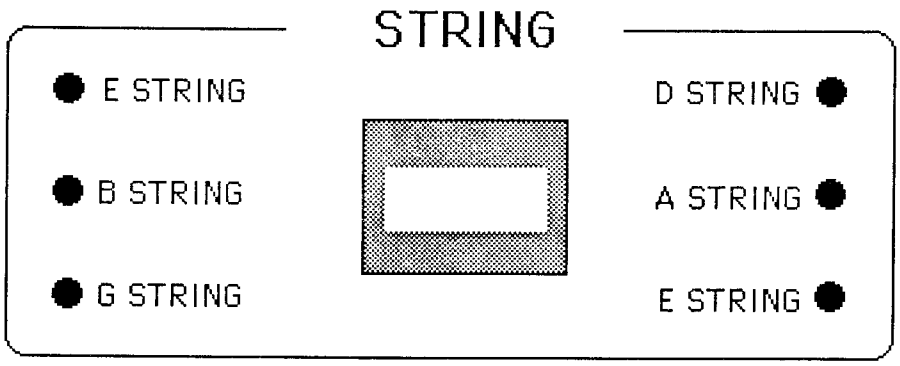
The pickup installation is now complete and you are ready to connect the guitar to the Pitchrider 7000. Once you have verified that the pickup positioning is correct you may want to make the mounting more permanent using the permanent mounting kit provided. Permanent mounting is strongly recommended for optimum performance.

Getting started

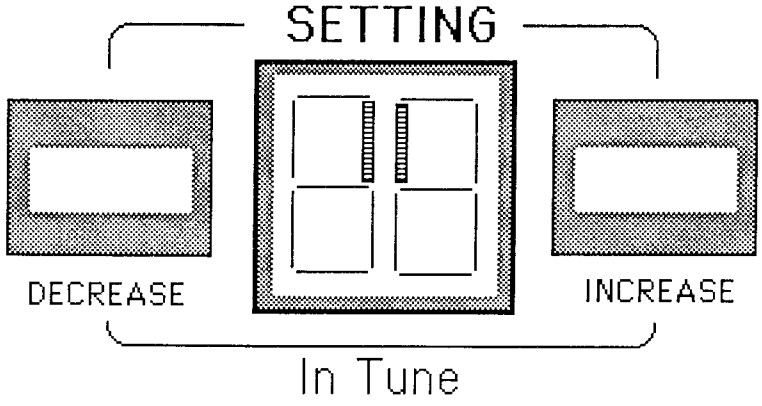
In addition to the Pitchrider 7000 and the guitar, you will need a MIDI synthesizer and a MIDI cable. Connect the equipment as shown on the next page. The 1/4 inch jack coming out of the preamp box on the guitar plugs into the output of the normal pickups on the guitar. The line out jack on the back of the Pitchrider 7000 is connected to this line so you can connect from the line out jack into your guitar amplifier and thus only one cable is needed from the guitar. The 8 pin DIN cable supplied with the Pitchrider 7000 connects from the preamp box on the guitar to the input connector on the front panel of the Pitchrider 7000. The MIDI cable connects from the output on the rear of the Pitchrider 7000 to the MIDI IN on the synthesizer. If more than one synthesizer is used, then the MIDI THRU connecter of the first is connected to the MIDI IN on the second, and so on.

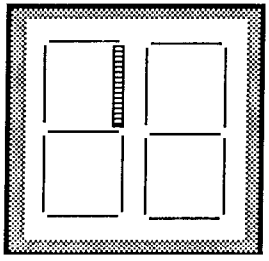

MIDI IN
SYNTHESIZER
MIDI
OUT
FOOT
SWITCH
LINE
OUT
ivl
7000
PITCHRIDER
GUITAR AMP
GUITAR

Plug the wall mount transformer into an AC outlet and plug the power plug into the rear of the unit. Now turn on the unit. The first thing to do is to check the tuning of the guitar. Play each open string one at a time. As each string is played the LED next to the corresponding string name will light.

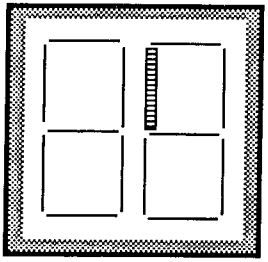


In addition to the string display, the Setting window will act as a tuning meter and show if the string is sharp or flat as follows.

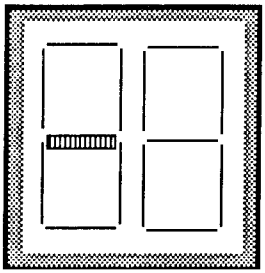




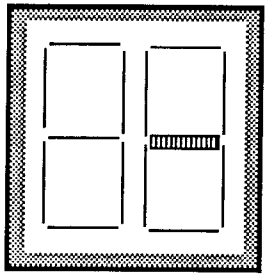
Flat 4-10 cents



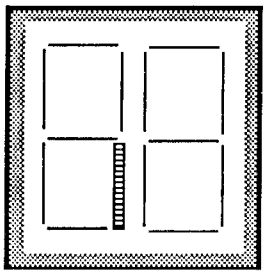
Sharp 4-10 cents



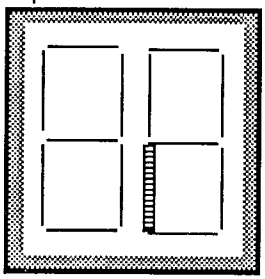
Flat 10-20 cents



Sharp 10-20 cents



Flat > 20 cents



Sharp > 20 cents

After you have adjusted each string so that it is in tune check the intonation of the guitar. Play the note on each string that is one octave above the open string. These notes too must be in tune, if they are not; adjust the bridge until both the open string and the note one octave up are in tune.

Operation

The Pitchrider 7000 has been designed to be easy to use. As soon as the unit is powered up it is ready to begin recognizing the notes being played on the guitar and outputting the information in MIDI format to a synthesizer. Make sure the synthesizer is set to receive data on MIDI channel 1. Most synthesizers will default to this channel. If it isn't, consult the synthesizer manual and follow the instructions for changing to MIDI channel 1, or adjust the Pitchrider 7000 to transmit on the MIDI channel the synthesizer is set to receive on. The instructions for changing the MIDI channel on the Pitchrider are found later in this manual.

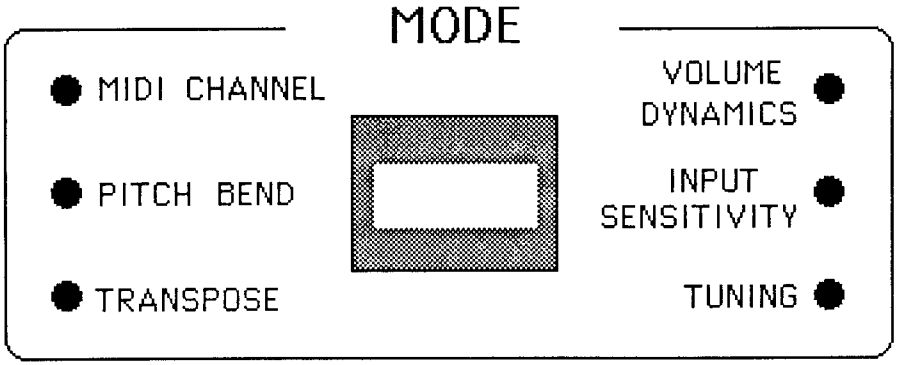
To verify that the synthesizer is connected properly and will respond to the MIDI data from the Pitchrider 7000 a MIDI test mode is provided. By pressing the Increase and Decrease button at the same time you can cause the Pitchrider to send a sequence of notes to the synthesizer. The string display on the Pitchrider 7000 will operate just as if the notes were being played on the guitar, the sequence is 19 notes long three notes on each of the E,A,D,G,and B strings and 4 notes on the high E string.

After powering up the Pitchrider, strum the guitar several times to allow it to adapt to the signal level coming out of the pickup. The level is different from guitar to guitar depending on the weight of the strings on the guitar and how close to the strings and bridge the pickup is mounted. If you have occasion to unplug one guitar and plug another one in while the unit is powered up, you may find it hard to play the second guitar because the Pitchrider is adapted to the signal level from the first. If this occurs you can either turn the Pitchrider off and on or adjust the input sensitivity as explained later.

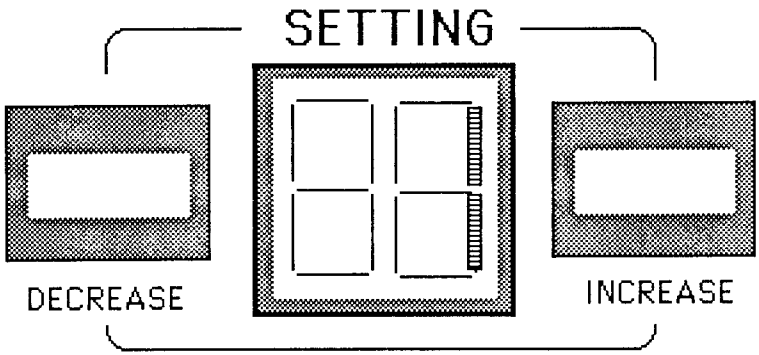
Now play the guitar and try out various "sounds" on the synthesizer. You will find that some sounds on the synthesizer are more appropriate than others for different kinds of playing. Some sounds have slow attack times and take a long time to build up in volume. These sounds can be very nice for filling in behind the natural guitar sound, but are not appropriate for playing fast licks. Sounds with faster attack times are better for playing fast lead lines. With a little experimenting you will find the sounds that are most appropriate for different musical expression.

You will notice that it may take a few minutes to get used to the slight delay between the time you pick the note on the guitar and the time the note sounds on the synthesizer. The delay comes from three sources. First, it takes some time to recognize what note is being played. Second, it takes a short time to send the MIDI information to the synthesizer. And finally, it takes a while for the synthesizer to begin sounding the note. The length of time to recognize the note in the Pitchrider is related to the pitch of the note; low notes on the bottom strings of the guitar will take longer to recognize than higher notes on the top strings of the guitar. One trick you can use if you want to play fast passages in the bottom register is to transpose the synthesizer down an octave and play the part an octave higher. Not all synthesizers respond to MIDI data equally fast, so you should choose a synthesizer that works quickly.

The Pitchrider 7000 has a number of controls that allow you to change the mode of operation to suit your particular requirements. There are four switches and associated LED displays to allow you to alter and display the settings that control the function of the Pitchrider. To alter a setting, first select the Mode setting which applies by pressing the MODE button.

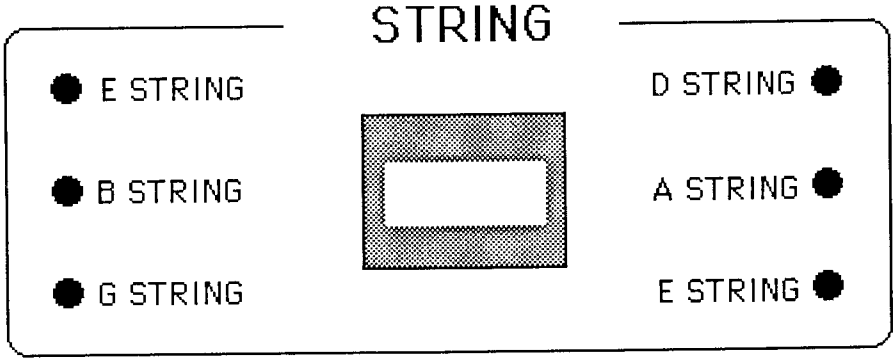


The LED indicator next to MIDI CHANNEL will light indicating that the MIDI channel that the Pitchrider transmits on can be changed. The numeric display in the SETTING window will now show the current MIDI channel selected. Immediately after power up this will be 1.



The setting can now be changed by using the INCREASE and DECREASE buttons. Each time you push the INCREASE button the setting will increase by one, pressing the DECREASE button will change the setting down by one. It is sometimes

useful to have Mode settings set differently for different strings, for instance, the Pitchrider could be set to send note information from the E and A strings on MIDI channel 1 and note information from the other four strings on MIDI channel 2. Two synthesizers or one polytimbral synthesizer could be used to play different sounds from different strings. To set the Pitchrider up this way you select which string a particular setting is to apply to using the STRING select button.



Normally, when you select a Mode to change the setting, all the string LED indicators will light indicating that the setting applies to all strings. If you wish to change the setting associated with a particular string, press the STRING select button. The first time you push it all indicators except the one next to the E STRING will turn off; the setting for the E string can now be adjusted. Pushing the button another time will cause the indicator next to the B STRING to light and the setting for the B string can be adjusted. Each time the STRING button is pushed the next string will be selected. If you wish to return to adjusting the parameter for all strings, push and hold the STRING button for about 2 seconds, at which time all the String indicators will light.

The following section descibes in detail the functions of the various Mode settings.

MIDI Channel

Settings = 0 - 15

0 = MIDI disabled

1 - 15 = MIDI Channel used to transmit

Set this to the MIDI channel your synthesizer is set to receive on. If you have more than one synthesizer or a polytimbral synthesizer you can set the Pitchrider to transmit on different MIDI channels for different strings and access different sounds on the synthesizer. For example, The E and A strings could be set to transmit on MIDI channel 1 driving a bass sound on one synthesizer, while the D, G, B, and E strings could be set to channel 2 driving a Saxaphone sound on another synthesizer. You could then play both the bass and lead part from the guitar.

Pitch Bend

Settings = 0 - 12

0 = Pitch Bend Disabled (Chromatic Mode)

1 - 12 = Pitch Bend Range (Number of semitones for full bend)

On a synthesizer, the pitch bend control, usually a lever or wheel, allows the keyboard player to "bend" a note in the same way that a guitarist can by bending the string. How far the synthesizer can bend a given note is specified by the pitch bend range control on the synthesizer. That is, if you set a synthesizer to have a bend range of seven semitones (a

fifth), then moving the pitch bend lever full in one direction will cause the synthesizer to bend the note a full seven semitones. The Pitchrider can be made to output pitch bend information to allow the synthesizer to track along exactly with the guitar when you bend the string. In order to do this the Pitchrider must know what is the current pitch bend range setting on the synthesizer. Choose a pitch bend range that is slightly larger than the maximum interval you bend a string, and set both the synthesizer and the Pitchrider to have the same pitch bend range. Because of the way the pitch bend works on a synthesizer where one pitch bend wheel controls the whole synthesizer, the MIDI interface standard has been defined so that all notes on one MIDI channel are controlled from one Pitch Bend Command. Because of this limitation of MIDI if you are using a single synthesizer on one MIDI channel the Pitchrider will only output pitch bend information when you are playing one note at a time. You can get around this restriction by assigning each string to a different MIDI channel and using more than one synthesizer or a synthesizer that will receive simultaneously on more than one MIDI channel. You cannot adjust pitchbend range differently on different strings unless they are assigned to a different MIDI channel.

Transpose

Settings = -36 to 36

0 = no transposition

-36 to 36 = number of semitones of transposition

The MIDI note information that is output from the Pitchrider can be transposed up or down from the note that is being played on the guitar by as much as an octave. You can use this to have a simple harmony part playing along with you or to adjust the sound up or down an octave to make it complement the sound of the guitar. Each string can be adjusted independantly.

Volume Dynamics

Settings = 0 - 9

0 = No Volume Information Sent

1 - 9 = Volume Dynamics Scaling

Many synthesizers have what are called "velocity sensitive" keyboards. These keyboards can sense how hard you strike the note and then the synth can respond appropriately by playing the note louder or changing filters or modulation to get a different sound. The Pitchrider can be made to transmit MIDI velocity information to the synthesizer based on how hard you strike the string. In this way, the synthesizer will track the dynamics of your playing. The scaling factor can be used to expand or compress the range of the volume dynamic information. A setting of nine will cause slight changes in picking to cause large changes in the synthesizer sound, a setting of 1 will cause large changes in picking to cause small changes in the synthesizer sound. Use this along with the "Keyboard Scaling Factor" on your velocity sensitive synthesizer to get the right feel for your playing style.

Input Sensitivity

Settings = 0 - 7

0 = Least Sensitive

7 = Most Sensitive

The Pitchrider has automatic controls to allow it to adapt to the peak level of the signals. What it needs to be told is what the smallest signal is which it should recognize as a valid note so that it doesn't mistrigger on extraneous signals. The size of these extraneous signals depends on the resonances of your guitar, how good a job you did in adjusting the pickup, ambient sound levels that cause strings to vibrate on their own, and your playing style. Find the level that gives best rejection of unwanted notes without compromising playing styles. If you change guitars without turning off the Pitchrider, press both the INCREASE and DECREASE switches simultaneously and strum the guitar several times to allow the Pitchrider to adapt to the signal levels coming out of the pickup.

As with other settings, each string can be adjusted independantly. This is especially useful if your fingers do not all play with equal strength or if you want to split the strings up for different effects. Try tapping a string when set on maximum; this can be used to produce some interesting effects, especially for percussive patches.

Tuning

Settings = 00-60
A Ref = 400 Hz to 460 Hz
440 Hz = Default

If you wish to have your guitar tuned to a reference of other than A440, you can adjust that reference note between 400 and 460 Hz. using the INCREASE and DECREASE switches.

Footswitch Operation

The Pitchrider 7000 has facility to plug in a multifunction footswitch accessory. Operation of the footswitch is covered more fully in the footswitch manual.

Pitchrider 7000 Mark II Specifications

Dimensions:-19 in (482.5mm) W x 6.5 in (165mm)D
x 1.75 in (44.5mm)H

Weight: -8.5 lbs (3.85kg)

Power: -117 vac 15 VA

Pickup: -hexaphonic magnetic pickup

Inputs: -6 signals sensed by hexaphonic pickup
-1.75 v p-p maximum
-line in from existing guitar pickups

Outputs: -MIDI OUT
-line out to guitar amp

Speed of Response: -12 milliseconds or 1.5 cycles of note
whichever is greater

Indicators:
-tuning of each string
-activity of each string
-operating mode settings

Controls:
-power on/off
-foot switch (optional)
-operating mode controls
-MIDI channel select (off,1-15)
-pitch bend range (0 to 12 semitones)
-transpose interval (-36 to +36 semitones)
-volume dynamics scaling (off, 1-9)
-input sensitivity (0 to 7)
-tuning reference adjust (A = 400 to 460 Hz)

MIDI Data:
- note on/off (with velocity)
- pitch bend
- patch change (with optional footswitch)

Warranty: -one year from date of purchase