Takamine

Acoustic DSP

AD Series Preamp

Owner's Manual

Introduction To DSP

The Takamine AD series preamp is a completely new approach to acoustic guitar preamp design. Using the latest analog-to-digital conversion technology, the AD preamp translates the output of Takamine's exclusive Palathetic bridge pickup into a high-resolution digital code. Once in the digital domain, the signals from the pickup are processed by a computer program which precisely adjusts all of the audio parameters the preamp is designed to control. This is referred to as Digital Signal Processing (DSP). DSP means greater precision in parametric EQ control as well as the capability for exciting effects and easy-to-use performance enhancements like built-in tuning, control settings memory, and feedback control. Take a few moments to read through this tutorial so that you can fully realize the capabilities of this extraordinary acoustic guitar preamp.

Getting Started

Installing Batteries

The AD series preamps require two AA (LR6) batteries to operate. Takamine recommends use of high quality alkaline batteries. They usually last longer and are less prone to leaking which can damage your preamp. It's good practice to remove the batteries from your guitar if you plan to store your guitar for a year or more. Follow these three simple steps below to install batteries (see fig. 1 on next page):

- ⇨ ***Remove the battery cover on the preamp by pushing the tab to the left and lifting***
- ⇨ ***Note the polarity diagram inside of the battery compartment, and Install the two batteries referring to this legend.***
- ⇨ ***Replace the battery cover.***

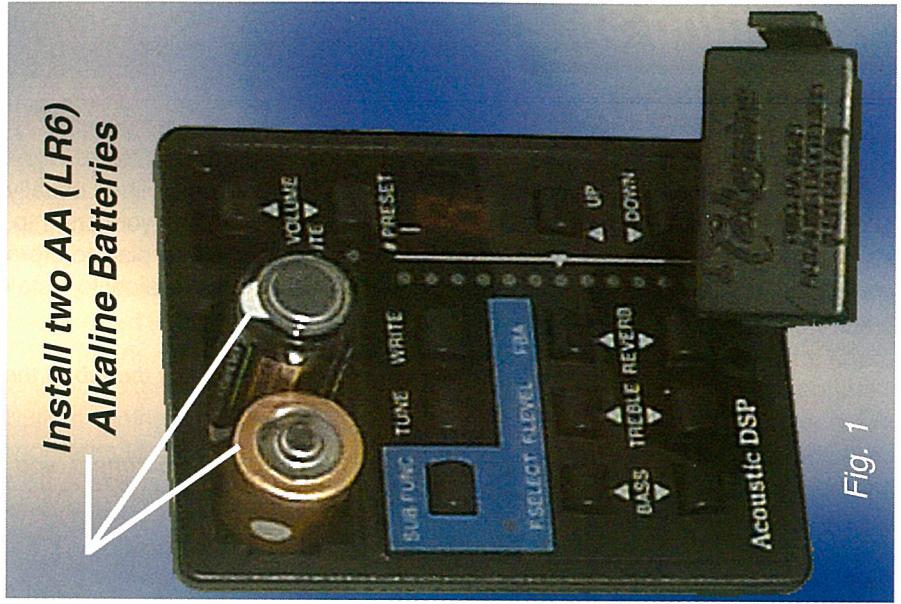

Fig. 1

Getting Started

Connections

To connect your guitar to an amplifier, first turn down the volume on the amp and connect a standard ¼" instrument cable into the guitar's endpin jack. Then insert the other end into the appropriate input jack on your amp or PA system. Increase the volume control on your amp to the desired level.

Basic Operation

The control panel of the preamp is well-organized and simple to use. Referring to fig. 2 on page 7, let's get started with some of the basic functions that will allow you to start making some great sounds right away! In order to perform the next few control adjustments, make sure that the "SUB FUNC" LED ⓫ is *not* lit. *If it is illuminated, press the "SUB FUNC" button ⓬ to turn off the LED.*

Volume Control

Perhaps the most important function of any preamp is volume control. In the upper right corner of the panel, you'll note the VOLUME control. By pressing the button above this label ❶, the volume level increases. At the same time you'll see the parameter value LEDs activate and move toward the top of the LED parameter value display ❹. In the same way, pressing the button below the label ❷ will decrease the volume level and cause the display to signify a lower level. In order to conserve battery power, the LED display will automatically extinguish about 30 seconds after your last parameter change.

Tone Control

Like most modern preamps, the AD series features on-board tone control. The TREBLE and BASS controls are located on the lower third of the control panel. These controls, ❼, ❽, ❾,and ❿ operate in a classic boost/cut format. When

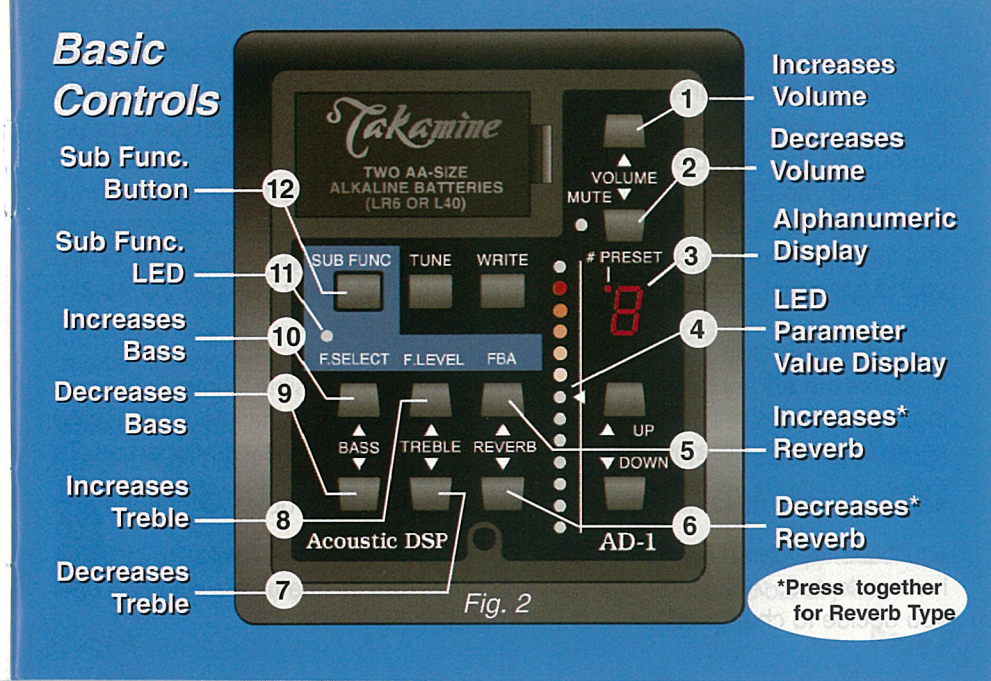

Fig. 2

you press the "up" or "down" button of either tone control, the parameter value display ❹ will first illuminate the flat, or centered value of the EQ in addition to the current setting for the EQ band you're adjusting. As you continue to press the buttons the LED display will move up or down to indicate the EQ boost or cut. When an LED above the center pointer is illuminated, the circuit is in a boost mode – exaggerating harmonics in that tone band. LED indication below the mark means the circuit is diminishing the harmonics in that part of the sound spectrum. The preamp also uses sophisticated preset EQs (see pp. 22-24).

Reverb Level Control

Because the AD series utilizes digital technology, it's possible to integrate exciting digital effects within the preamp. Whether you're plugging into a small amp or the largest PA, breathtaking digital reverb will literally be at your fingertips. To adjust the level of the reverb, press the REVERB ▲ up ❺ or down ❻ ▼ buttons and you'll see the parameter value display change to reflect the level of reverb you have selected. Adjust to an appropriate level and this setting is retained until you decide to change it!

Reverb Type Selection

There are two distinct reverb types built into the AD series. To select reverb type, press both REVERB ▲▼ buttons simultaneously. You'll see the alphanumeric display ❸ indicate  for "bright" reverb or  for "dark" reverb. Bright reverb is programmed with considerable upper harmonic content while the dark reverb has a mellow, soft-edged characteristic. Pressing both buttons simultaneously "toggles" reverb type between these two sounds. Again, the AD preamp will hold your choice until you decide to reset this parameter,

Battery Low Indication

The average battery life in the preamp is about 8 hours. When the battery voltage falls to a level that can cause distortion, the alphanumeric display will alert you with a  indication. It's a good idea to change your batteries as soon as possible. It is also good practice to unplug your guitar between "sets" to extend battery life.

Advanced Functions

The advanced features of the AD series preamps include some of the most useful tools upon which many guitarists have come to depend. A **built-in tuner** with optional **output muting**, as well as a precise **parametric equalizer,** will keep you sounding your best in every acoustic environment. Ever have trouble with acoustic guitar feedback when the sound level on stage gets a little aggressive? The integral **Feedback Absorber** will go far to help you control your sound whenever you need a little more gain to "cut through the mix." Finally, and perhaps the most powerful feature of all, is the ability to permanently store up to 10 of your own sound settings into discrete **Patch Memory** locations that can be recalled at the touch of a button! Please see fig. 3 on page 11 for references.

Sub Functions

Many of these advanced functions share the use of the control buttons already discussed. In order to allow these controls to perform a second function, the SUB FUNC push-button ⑫ is pressed and you'll see the SUB FUNC

Advanced Controls

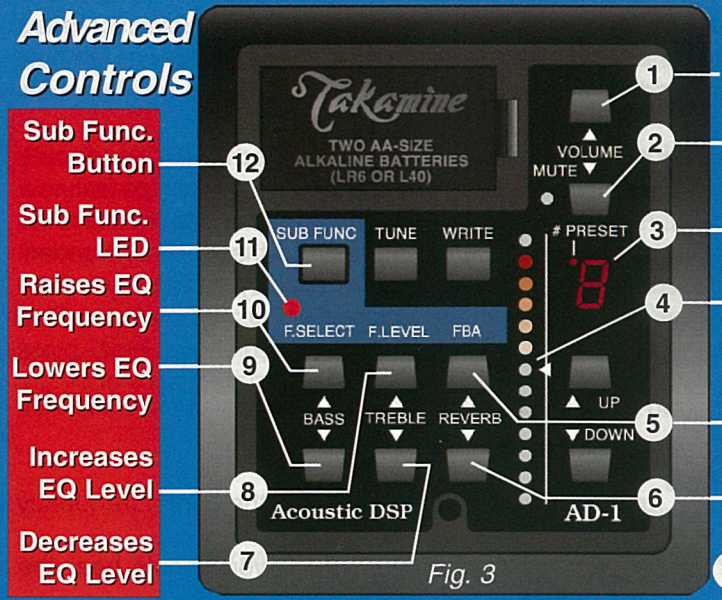

Fig. 3

Sub Func. Button

Sub Func. LED

Raises EQ Frequency

Lowers EQ Frequency

Increases EQ Level

Decreases EQ Level

Increases Volume*

Decreases Volume*

Alphanumeric Display

LED Parameter Value Display

Increase/ Decrease Feedback Attenuation

*Press together for Mute

LED ⓫ illuminate. When this LED is lit, the control labels in the blue screened area of the control panel are active and their respective push-buttons will now allow you to control additional parameters.

Parametric Equalization

Besides the bass and treble controls already discussed, these preamps feature a flexible parametric EQ. Parametric EQs allow the user to set the parameters of the tone circuitry. In the case of this preamp, you have control of the two most important parameters - the center frequency of the spectrum affected by the circuitry and the amount of boost or cut of that spectrum. To access this EQ, first, press the SUB FUNC button to illuminate the SUB FUNC LED as described above. Next, press F.LEVEL ▲ TREBLE ▼ up ❽ or down ❼ push-buttons to increase the boost or cut of the filter.

Next, press the F SELECT ▲ BASS ▼ up ❿ or down ❾ switches to shift the center frequency of the filter. As you sweep through the filter range you should hear the

effect of the filter on the spectrum as it moves. Select the boost or cut as desired along with the desired frequency and the preamp will hold that setting until you decide to alter it. Avoid distortion by careful use of boost.

Feedback Absorber

Very often, when performing in a live, amplified situation where the sound level is high, the natural acoustic resonances of the guitar will cause a low frequency feedback due to coupling of the sound field and the guitar's body. In order to get the most from the electrical performance of your Takamine preamp, a tunable feedback attenuation circuit has been included. To use this feature, you must enter the sub function mode (switch ⓬), illuminating the SUB FUNC LED. Follow these steps to "tune out" feedback:

- ⇨ ***Determine the note name of the feedback frequency (C-G#, etc.).***
- ⇨ ***Once in the SUB FUNC mode press the*** FBA ▲ REVERB ▼ ***"up" button ❺ to increase feedback attenuation to maximum. The note name appears in alphanumeric display ❸.***

- ⇨ *Increment note name by holding down the FBA REVERB "down" button ❻ while pressing the "up" button ❺ as required to bring the alpha-numeric display to indicate the proper note name.*

  or

- ⇨ *Decrement the note name by pressing and holding the FBA REVERB "up" button ❺ while repeatedly pressing the lower button as required.*

- ⇨ *Readjust the attenuation level to obtain the minimum required attenuation for feedback-free performance.*

The dot in the upper left corner of the alphanumeric display indicates that the note name is raised by 1/2 tone (i.e. sharp) thereby allowing precise chromatic control of the note selection. If you have not correctly assessed the feedback note, it may be necessary to experiment with several FBA frequencies (notes) to obtain best results. Like the other control functions, this setting will remain intact until you readjust it at some later time.

Tuner Function

A tuner is an indispensable tool for a guitarist. In the TUNE mode, software in the preamp recognizes the note played and indicates when a string is sharp, flat, or on pitch. Follow these steps (fig. 4) to use the tuner:

Fig. 4

Repeat these steps for each string. When you're satisfied with the tuning, press the **TUNE** button again and the preamp will exit the tune mode. The default reference pitch for the tuning function is A= 440Hz. You can change this setting to other

reference frequencies as shown in the table. To calibrate, **before** entering tune mode follow the steps in fig. 5 (then continue with tuning procedure).

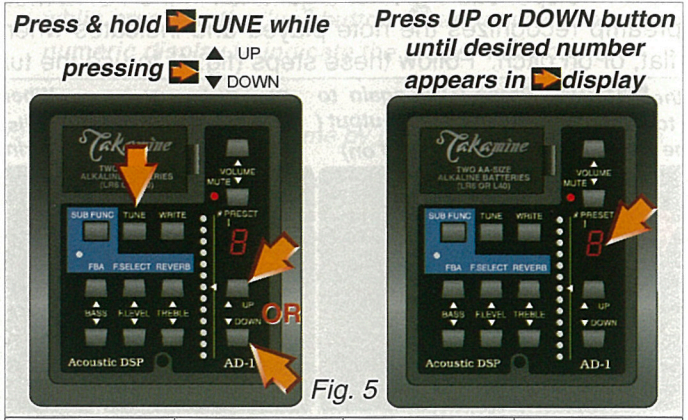

Fig. 5

8 A=438Hz	9 A=439Hz	0 A=440Hz	1 A=441Hz
2 A=442Hz	3 A=443Hz	4 A=444Hz	5 A=445Hz

Using Patch Memory

The most power feature of the AD series preamps is the ability to store and recall the settings you use most often. Once you've adjusted your EQ, reverb settings, feedback absorber, and volume so that they're "just right" for the style of music you're about to play, you can store this "patch" into the digital memory and recall it any time you need it. In fact, AD series preamps have the ability to store and recall 10 discrete user memory patches. For your convenience, the user presets come preprogrammed from the factory with some great contemporary sounds. In addition, there are 10 permanent factory settings that include special fixed EQ settings that you can incorporate into your own patches. A complete listing of factory settings appears later in this manual.

Recalling Factory Preset Patches

When the AD preamp is powered up (by inserting a cable into the guitar's endpin jack) the alphanumeric display will indicate the number of the last patch memory used. To explore the permanent factory patches or the pre-preprogrammed user

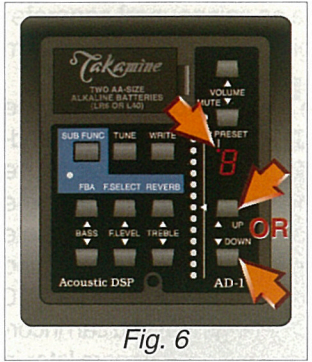

Fig. 6

settings memory locations simply press the one of the ▲ UP ▼ DOWN memory select buttons (see fig. 6) to increment or decrement the memory number in the alphanumeric display. All permanent factory presets are designated by the dot in the upper left corner of the display. All memory numbers without the dot indicate user-programmable locations. Listen carefully to all presets and make notes if you wish, of those which may be useful to your playing style or performance environment.

Changing Programmed Settings

After you've checked out the factory-programmed sounds, pick one you'd like to edit. You can make this selection "by ear" or use the factory preset table on page 22. Please note that the permanent factory setting 0 is essentially a neutral or "flat" EQ setting which will allow you to build your

sound from a basic configuration. Now, using the techniques discussed earlier, "tweak" any or all of the parameters until you get the sound you desire. Don't worry about losing the original patch... you can start all over by simply recalling the patch as described above. Continue your adjustments until you get "your" sound.

Writing Your Own Patch Presets

Once you have set all the controls appropriately for your sound, you can store these settings into memory for future use. You can store sounds for leads, rhythms, solos, ensemble, etc. - up to 10 customized patches. See fig. 7 for the procedure used to write your patch into memory. Don't forget, Only memory locations 0-9 are available for user programs. ***Make sure the dot in the upper left of the display is off.*** This means you have accessed a user memory location. If you try to write to a permanent factory memory location the software in the preamp will automatically assign the patch you create to the user 0 memory location. You will lose the patch previously assigned to this number if you confirm the WRITE command. Otherwise, the user memo-

ries you program will remain intact until you reprogram them with new settings.

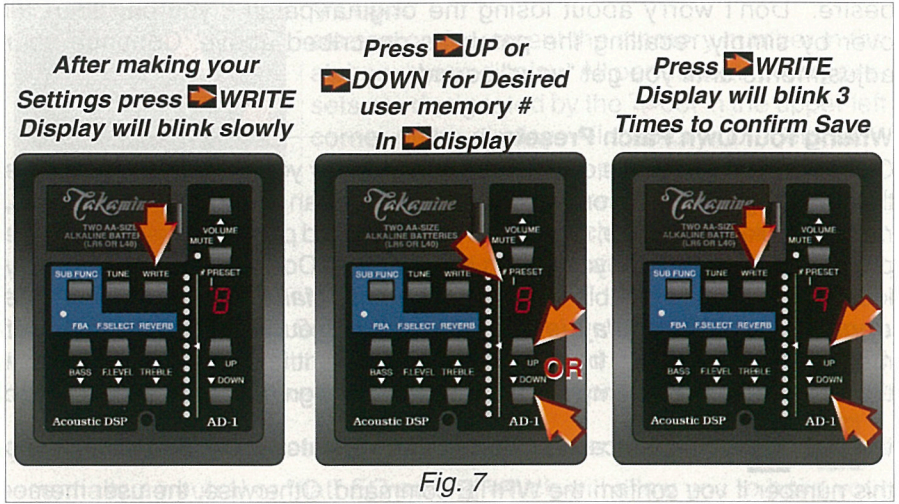

Fig. 7

Technical Talk

The last section of this manual features the technical specifications of the AD series preamps. Charts 1 & 2 explain the specific parameters of the factory programming in both the permanent and user-preset memory locations. Chart 3 is the EQ table that is referenced in charts 1& 2 (column 3) which describes the fixed digital EQ available in the both memory banks.

Electrical Specifications

AD/DA:	18 Bit
Sample Freq:	44.1KHz
Bass EQ:	Shelving, F_c = 100Hz @ +15dB/-12dB
Treble EQ:	Shelving, F_c = 6KHz @ +12dB/-24dB
Parametric EQ:	F_c = 220Hz-12K @ +12dB/-12db
P. EQ Value LEDs:	220,360,450, 550, 630, 800, 1K, 1.5K, 2K, 3K, 5K, 8K, 12K
Battery Life:	Approx. 8 Hr.

Permanent Memory Settings (All FBA off)

Chart 1

PRESET #	VOL.	EQ TABLE	BASS	TREB.	REVERB TYPE	REVERB LEVEL	F. SELECT	F. LEVEL
0	9	0	6	6	D	0	6	0
1	9	1	6	6	D	0	0	6
2	9	2	6	6	D	0	0	6
3	9	3	6	6	D	0	0	6
4	9	4	6	6	D	0	0	6
5	9	5	6	6	B	1	0	6
6	9	6	6	6	D	1	0	6
7	9	7	6	6	D	7	0	6
8	9	8	6	6	D	4	0	6
9	9	9	6	6	D	9	0	6

Factory Programmed User Settings (All FBA off)

Chart 2

USER #	VOL.	EQ TABLE	BASS	TREB.	REVERB TYPE	REVERB LEVEL	F. SELECT	F. LEVEL
0	9	0	6	6	D	0	0	6
1	7	1	11	9	D	4	0	6
2	11	2	8	6	B	6	2	2
3	8	3	8	5	D	7	3	8
4	9	4	8	9	D	3	6	3
5	8	5	8	8	B	4	12	7
6	11	6	6	6	D	9	8	3
7	10	7	5	6	D	6	8	4
8	11	8	6	5	D	3	2	4
9	7	9	9	7	D	0	0	6

Fixed Digital EQ Table:

SH=Shelving EQ PK=Peaking EQ

Chart 3

EQ TBL	BAND1-SH	BAND2-PK	BAND3-PK	BAND4-PK	BAND5-PK
0	FLAT	FLAT	FLAT	FLAT	FLAT
1	5K/-2DB	4.9K/3.4DB	8.4K/3DB	FLAT	100Hz/11DB
2	FLAT	558Hz/3DB	3K/2.5DB	972Hz/3.5DB	82Hz/11DB
3	6K/5DB	930Hz/-6DB	4.9K/5DB	749Hz/4.5DB	92Hz/8.5DB
4	FLAT	1.5K/2DB	2.1K/6DB	13K/-12DB	129Hz/10DB
5	5K/5.4DB	6K/2DB	11K/10DB	1.6K/3DB	167Hz/7DB
6	FLAT	875Hz/-8DB	250Hz/4DB	4K/3DB	120Hz/4DB
7	2.2K/4DB	2.3K/-2.4DB	875Hz/-8DB	7.5K/3.5DB	120Hz/7DB
8	4.4K/1.4DB	2.2K/-6.6DB	4K/3.6DB	737Hz/-10DB	63Hz/9DB
9	FLAT	2K/6DB	1.2K/-12DB	250Hz/-6DB	63Hz/13DB

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