



ELECTRET TRANSDUCERS

INSTALLATION MANUAL

**B-BAND A2.2 XOM™ ONBOARD PREAMP WITH B-BAND UST AND
AST TRANSDUCER**

This is a basic installation manual and tip sheet. For more information, technical support, and pictures of installations about all B-Band products please check the B-Band website at www.b-band.com or contact your B-Band dealer, distributor or B-Band directly.

23-08-2007

DEAR CUSTOMER,

Thank you very much for purchasing this state-of-the-art B-Band® acoustic transducer system. B-Band takes care to provide the highest quality product and is manufactured and supported in true spirit of acoustic instrument aficionados.

The outstanding sound reproduction of B-Band transducers is based on the technology of a very special, worldwide-patented material that is exclusive to B-Band. This material is very different from, and has nothing to do with, piezo-electric films or transducers.

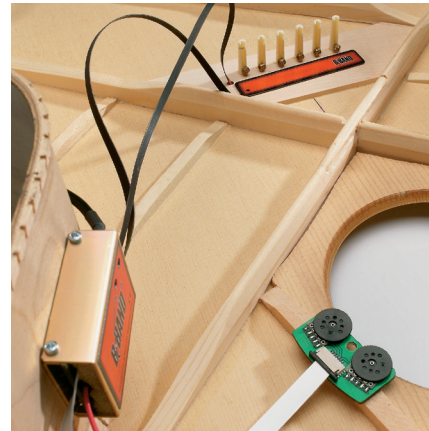
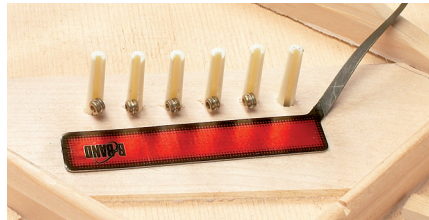
How is it different? We could write a long story here about the technical characteristics of the material, like how the “microscopic lens-like gas bubbles”™ work inside the permanently charged film, but the most important difference is the sound. Whereas piezo pickups tend to impart a sound of their own (often described as “quacky” or “plastic”), B-Band transducers act in much the same way a condenser microphone does. B-Band systems will provide an excellent reproduction of your instrument’s unique sound.

All of us at B-Band truly hope you enjoy this product.

Please contact us if you have any comments about B-Band products.

Always ready to help you.

Yours sincerely,
Heikki Räisänen, CEO
B-Band Ltd



1. SAFETY AND PRODUCT CAUTIONS

Although B-Band products could be easy to install by following these instructions carefully and checking the B-Band website and references, we highly recommend the installation be done by a professional qualified guitar craftsman or technician. Some installations require a high knowledge about woodworking and guitar structure.

B-BAND LTD AND B-BAND, INC. WILL NOT BE RESPONSIBLE FOR ANY DAMAGES, PERSONAL INJURIES OR LIABILITIES RESULTING FROM INSTALLATIONS, IMPROPERLY DONE INSTALLATIONS OR MISUSE OF PRODUCT.

Read all of these instructions closely before starting installation.

B-Band transducers (UST and AST) work with all B-Band A-series preamps.

Do not cut, pull, crimp or bend at a sharp angle any B-Band transducers.

B-Band UST and AST CANNOT be shortened or altered in any way. This will cause audible hum and void the warranty.

Long-time exposure of UST or AST to high temperatures (over 50 °C / 120 °F) may reduce the output level permanently.

B-Band transducers will only work with B-Band preamps. B-Band preamps will work with most any external audio preamps, mixers, and instrument amplifiers.

Before installation make sure instrument is in good working condition.

Do not mount battery holder to preamp.

Even with the battery secure in the holder or the battery box lid closed, the battery could get loose when transported. We strongly recommend removing the battery before transporting the instru-

ment in heavy conditions, for example, with freight companies or airlines, to avoid possible damage to the instrument.

When doing any drilling, sawing, cutting or routing at the guitar, be sure to secure the guitar so it will not move when doing such work.

2. OVERVIEW OF B-BAND UST AND AST TRANSDUCERS

Both the B-Band UST (Under-Saddle Transducer) and AST (Acoustic Soundboard Transducer) use the same-patented transducer technology.

They are very flexible, but you should never pull or bend them at a sharp angle.

B-Band transducers themselves do not require electrical power, as they are permanently charged electrets. Because of the very high output impedance (typical for condenser microphones) B-Band UST and AST always require a B-Band preamp.

Standard piezo preamps will not work properly with B-Band transducers. They will produce low output and poor bass response.

The active portion of the B-Band UST transducer is 80 mm (3.15") from the end of the transducer at the opposite side of the connector. The active portion of the 1470 AST is the 14 x 70 mm (.55" x 2.75") area that attaches to the guitar. The rest of the UST and the "lead" wire of the AST are not active. However, for best performance always keep the inactive portion of either UST or AST pickup from touching each other, or touching or rubbing on the inside of the guitar, or touching the battery or output jack wires. These can produce unwanted handling noise.

UST and Model sizes

Saddle width: 2.3 – 2.9 mm (.090" – .115" (3/32"))

B-Band model #: 22R

UST width: 2.3 mm (.090" (3/32"))

Saddle width: 3.0 mm (.118" (1/8")) or more

B-Band model #: 29R
UST width: 3.0 mm (.118" (1/8"))

3. OVERVIEW OF A2.2 PREAMP WITH XOM

The A2.2 is an onboard preamp with a remote soundhole control panel that has a volume and XOM mix control. This dual input / mono output preamp works only with B-Band UST and AST pickups. Both inputs have input gain controls at the preamp box and are accessible with a small screwdriver through the holes at the top of the preamp. These input gain controls help balance the sound of the two pickups.

All B-Band A-series preamps are designed to give optimum performance with B-Band UST and AST transducers. The main criterion in designing these preamps was to deliver studio quality and user-friendly electronics to the diverse needs of acoustic instrument musicians.

The A2.2 has the HzzLess® circuit for outstanding low noise and high output.

The A2.2 has the XOM cross-over-mix circuit. The XOM system combines the best aspects of each pickup into one complete source. By sensing the guitar from two separate locations and combining what each pickup does best, the XOM system has a very rich and complex sound that further augments the already superior sounding B-Band pickups.

The ideal process for authentic acoustic sound comes from combining the high frequencies of the AST and the low frequencies of the UST, making a sound that is much more complex, true and pure. In addition, the XOM pan pot allows the player to select between UST / AST mix and the UST alone or one of the many possibilities in-between for unlimited possibilities.

The A2.2 uses a standard 6.3 mm (1/4") plug at the output jack. There is a switch inside the output jack and the A2.2 battery power is turned-on when a plug is inserted to turn on the 9-volt power. For longer battery life unplug when not in use.

For operation of the A2.2 see the User's Guide at the end of these instructions.

4. PACKAGE CONTENTS

Note!

In the USA, transducers and preamps are packaged together. Everywhere else preamps and pickups are packaged separately.

4.1 UST package contents:

- 1 pc UST transducer

4.2 AST package contents:

- 1 pc AST transducer
- 1 pc cardboard installation guide (only AST)

4.3 A2.2 package contents:

- 1 pc A2.2 preamp circuitry board
- 1 pc A2.2 preamp box
- 1 pc A2.2 preamp box back
- 1 pc remote control panel with volume and mix control and attached ribbon cable
- 1 pc output cable with endpin jack and strap attachment
- Strap attachment includes:
 - Small hex nut
 - Small dress washer
 - Lock washer
 - Large dress washer
 - Large hex nut
- 1 pc battery holder with adhesive
- 1 pc battery cord harness (length 15 cm / 5.90")
- 2 pcs wire clips
- 1 pc adhesive for the preamp
- 1 pc instructions and user guide

5. TOOLS AND MATERIALS NEEDED FOR INSTALLATION

- Drill, preferably with continuously variable speed
- Wood or metal drill bit, 2.3 mm (.09") or 3 mm (.12") depend-

- ing on the width of the transducer
- Wood or metal drill bit, 3 mm (.12")
- Screwdriver, Posidriv #1
- Endpin reamer, 12 mm (.47") or wood drill bit, 12 mm (.47")
- Allen wrench, 2 mm (.08")
- Punch (spike)
- 13 mm (.51") wrench to tighten the nuts on the preamp endpin jack
- Small hand-held mirror
- Flashlight (penlight)
- Small round file
- Masking tape
- 1470 AST cardboard installation mounting guide (supplied)

6. PREPARING THE GUITAR FOR INSTALLATION

Please read completely before starting the actual procedure.

6.1 Test fitting AST

For test fitting 1470 AST (if applicable), loosen and remove the strings from the tuning machines.

Before removing the strings and bridge pins from the bridge check to see if the AST will fit at the bridge plate correctly. Also at this time, clean the bridge plate surface with a moist cloth and let dry completely.

The cardboard installation template for the 1470 AST is specifically made for bridges that the saddle is at a slight angle to the bridge pinholes. It may also be that the guide is too long for the space. If so, the template can be trimmed with scissors slightly to accommodate this. If in case the template still does not work the transducer may be installed by hand. Although the instructions do not specify how to do this, if you carefully read the instructions you will be able to adapt them to perform the installation by hand. It really is not that hard or critical to install if you are careful.

Alternative AST installation for steel string guitars: Some guitars

have smaller a bridge plate than others and the AST may be too large to fit in front of the pins. In this case the AST can be installed behind the bridge pins. If the bridge plate does not extend enough behind the pins, it can be installed on the top of the guitar, right next to the bridge plate. When installed behind the bridge pins you will hear more of the "top" of the guitar when the balance is turned to UST / AST XOM position. This may be desirable for any steel string installation.

For classical guitars the installation the AST is done by hand without the guide. For most classical guitars the AST is placed inside the guitar parallel to center brace that runs parallel to the strings on the bass strings side at the area between the bridge and soundhole. Sometimes there is also a flat brace running



parallel under the bridge. The AST should be placed so that the AST is on the bass side of the brace running parallel to the strings and that part of the active area of the AST, that has the lead to the preamp, goes on the brace for the bridge. If the brace there is too tall put the AST in front of the brace. Please read the instructions carefully and adapt them to the installation.

To test fit the 1470 AST in a guitar with a bridge plate, take the cardboard installation template from the tray in the box. Note! There is a small 4.5 mm (.18") round and a 4.5 mm (.18") elongated part that both need to be punched out to make their respected guide holes. The 4.5 mm round guide hole is for the low "E" bridge pin and the elongated guide hole to fit at the high "E" bridge pin inside the guitar. Peel away the protective covers from the two adhesive dots on the cardboard. Do not peel away the actual AST mounting adhesive protective cover yet!

The placement of the AST is important for connection to the preamp. For the A2.2 preamp, the AST's lead goes away from the low "E" side of the bridge.

Now mount the AST to the top of the cardboard installation template at the rectangle AST area inscribed on the cardboard. Now put the assembly to the bridge pins, with the AST towards the bridge plate and check the fit. All of the AST's active area must fit at the soundhole side of the bridge plate without hanging over the edge of the bridge plate. Make sure that there is enough space that the bridge pins or string ball-ends will not touch the AST.

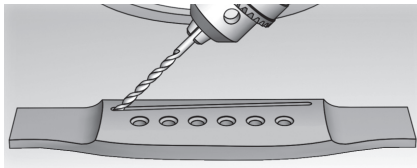


Next remove the strings, bridge pins and the saddle. If you are using a UST, check that it fits into the slot easily and that the saddle is sufficiently tight in the slot. Remove the strap button. Carefully enlarge the hole using 12 mm (.47") endpin reamer or 12 mm (.47") wood drill bit. Smooth the edge of the hole with a small file or a sinking drill bit.

6.2 Drilling hole for UST

For UST check the inside of the guitar to find the position of the braces. Drill a preferably 30 - 45 degrees angled, 2.3 mm (.09") or 3 mm (.12") hole (depending on the model of your B-Band UST) for the transducer into the one end of the saddle slot. Be careful not to damage the braces! In case you cannot make the hole angled, because of possible damage to the braces, you can make it straight down.

It is very important to smooth the edge of the hole using a bit of rolled sandpaper or a small file, to avoid pinching the UST as the saddle lies on it. For A3T preamp you must drill the hole at the low-E string side of the slot.



6.3 Placement of A2.2 preamp

The A2.2 is placed inside the guitar at the back of the guitar and so that you can see the preamp, and so that the input gains controls at the top of the preamp, are accessible with a screwdriver from the soundhole.

Be sure that the placement can be reached by both pickups and by the output jack wire.

The A2.2 preamp is held in place with the supplied adhesive.

Once the correct place is found, clean the area with a slightly moist cloth and attach one side of the adhesive.

6.4 Installing battery holder

Before installing the battery holder it should be checked by

inserting a 9-volt battery in and out of it to learn how it works. Once this is checked, find a convenient place inside the guitar where the battery holder can be reached and that there is good access to the snap. Also check that it is in a place that the battery can be put in and out easily.

Recommended places are at the neck block or at the back of the guitar.

Be sure that the entire adhesive surface will make full contact with surface you are attaching it to. Clean the surface with a moist cloth and let the moist dry completely. Remove the protective liners of the adhesive and install it. Press firmly for about 30 seconds to make it secure. It takes 72 hours for the adhesive to achieve its final holding ability.

7. CONNECTING THE TRANSDUCERS AND WIRES TO THE PREAMP.

Check the circuit board of the preamp and see the picture at these instructions for connections. Connect the transducer, battery cable harness and the output cable. Notice that the

small holes on each connector of the transducer and battery cable harness should point upwards. If UST or AST is connected improperly a loud audible hum will occur. Make sure that they are connected correctly.

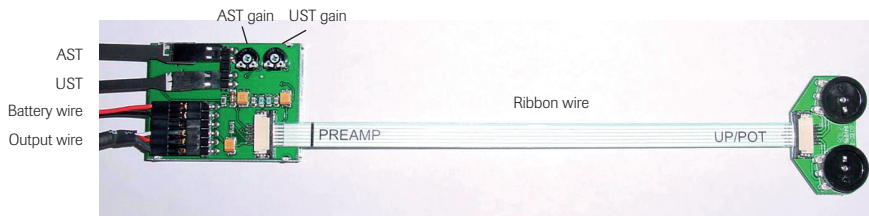
7.1 Installing the remote control board ribbon wire

At the circuit board of the preamp and the remote control there is a locking connector for the ribbon wire that connects to both. With two fingers, pull the lock to open. One end at a time, insert the ribbon with the writing on the ribbon facing up facing to the slot in the locks at the circuit and then the remote control. Do not force! Push the lock closed while holding the ribbon in place.

When transducer, battery wire and output cable are connected to preamp, close the cover and insert and tighten the four screws.

Turn the input gain controls fully clockwise- all the way up.

It is recommended to test the systems operation at this point. Before you do this, make sure that the input gains are turned fully clockwise- all the way up. Insert a battery and connect the output cable to amplifier. You should hear it from the amplifier when you tap on the transducer.



8. INSTALLING THE PREAMP

For the next portion of the installation, be careful not to catch the pickup on anything as you work; inadvertent tugging may cause damage to the transducers or pull the connectors off the pin headers at the preamp.

Regarding AST, please note to lift one corner of the protective layer of the mounting adhesive so it is easier to remove later.

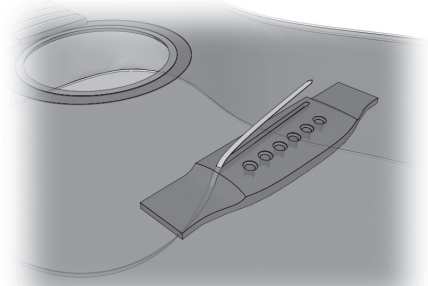
Take the preamp assembly inside the guitar and install it to its place. Let the transducer(s) and wire harnesses hang loose inside the guitar at this moment.

At the output jack unscrew the strap attachment, the small nut and the small dress washer from the endpin jack. Make sure that the large nut, lock washer and large dress washer are threaded onto the jack almost all the way to the opposite end of the output of the jack.

Next, test-fit the jack the endpin hole. It is easier to install the output jack by using an ink pen (or something similar) that fits into the jack. Put the pen through the hole at the guitar where the jack will go and with the other hand holding the output jack, and that going through the sound hole, put the jack on the pen and guide it through the hole of the guitar. Adjust the large nut so that only the smaller threaded section comes almost entirely out of the guitar. Put the dress washer and the small nut onto the threads outside the guitar. Tighten securely using an appropriate wrench. Prevent the jack from rotating during tightening by inserting a small Allen wrench into the holes of the end of the jack. Install the strap attachment. Be careful not to over-tighten it, it just needs to be snug. Connect a fresh 9-volt battery to the snap-in connector and put it in the battery holder. Attach the battery wires to the side of the guitar with the cord clamps. Roll the extra cord as a "coil" in some of the clamps if necessary.

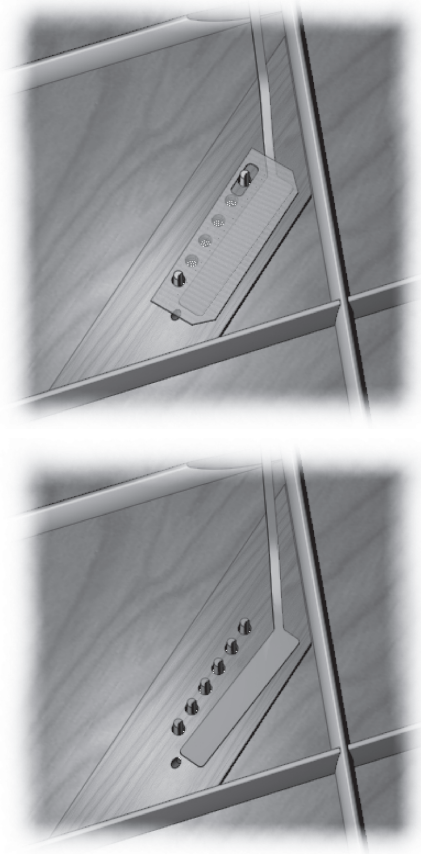
9. INSTALLING THE TRANSDUCERS AND REMOTE CONTROL

Install the UST up from inside the guitar through the hole in the saddle slot. It is easier to find the hole inside the guitar if you insert a small screwdriver or toothpick from the top through the hole as a guide. Fit the UST all the way to the other end and bottom of the slot. Then put the saddle in place.



For installation of the 1470 AST (steel string guitars; x-braces), place two bridge pins in their holes, one at the low "E" string side and one at the high "E" side. Set the bridge pins normally. This, with the cardboard installation template / AST assembly will guide the AST to fit correctly. Having the AST cardboard installation template / AST assembly lying on the bottom of the guitar, remove the adhesive protective layer from the AST. Lift the assembly up and guide the assembly so the bridge pins insert the guide holes and carefully place it to the bridge plate. Then stick it firmly by holding and pressing firmly with fingers for a short while. Next carefully remove the cardboard installation template. Make sure the AST fits there tight and secure.

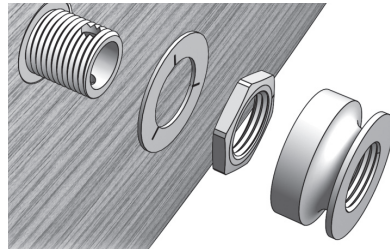
Inside the guitar, make sure that the UST and AST leads do not touch anything. We do not recommend attaching the "lead" wires of the UST or AST to the guitar by any means. This may cause excessive handling noise and resonance that sounds like distortion.



For AST remove the adhesive protective layer from the AST. Then stick it firmly by holding and pressing with fingers for a short while. If necessary, you can remove the AST shortly after attaching, but be careful when doing this. Carefully lift under the edge of the AST, with your fingernail, and work it off slowly. Don't attempt to lift the AST off by pulling on the transducer lead. Peel the adhesive off the wood, rather than peeling the pickup off the adhesive. At installation this can be removed and reattached two or three times.

Note! After 24 hours the adhesive will dry and it will be hard to remove. Removal after this time may damage the pickup.

Now install the remote control. The preferred placement is at the low E string side at the inside of the soundhole. It should be positioned so that the wheels of the volume and mix control stick out from the edge of the soundhole. The remote control panel should fit on a flat surface. Clean the surface with a slightly moist cloth and let dry before installing. Remove the tape cover at the control panel and stick it.



Test the system before putting on the strings. To do this, plug into an amplifier and then tap lightly on the top of the guitar to make sure that you can hear the transducer when you tap. Another good test is to shake the guitar when plugged into amplifier. If anything is loose or if the transducer's leads are touching something you will hear it. This should not happen.

Install the strings and test the system. Now play, keep it real and enjoy!

10. TROUBLE SHOOTING

10.1 No sound at all or intermittent sound

- Check the guitar cable and amplifier / mixer you are using.
- Check that the battery is not discharged. If the sound is noisy or distorted, replace the battery.
- Check that the transducer and battery connectors are inserted onto the pin headers of the preamp correctly.
- Check that the plug is making good connection with the output jack. It may be so that the output jack is not sticking out far enough when the strap button is on. To check, unscrew the strap button off and plug in to the jack. If the symptoms go away the output jack needs to be removed and the nuts adjusted so the jack sticks out further.
- Check that both input gains are turned fully clockwise- all the way up.
- Check that the ribbon wire from the remote control is inserted correctly. If it feels or looks like it is not connected properly- unlock and re-install.

10.2 Loud hum

- Check to see that the connectors of the UST / AST are inserted with the two holes up. If these connectors are upside down the system will work but it will buzz.
- Check that the connectors are inserted correctly onto their pin headers at the preamp.

10.3 Resonance or distortion with some played notes.

There are a couple places where a resonance can typically occur with some notes, causing distorted-sounding output. First, check that the lead portion of the transducer to the preamp is not touching anything and that the battery or output wires are not loose and thus cause resonance.

With the UST, another place, which in some cases has caused resonance, is the UST hole from the saddle slot to the inside of the guitar. Using a soft padding in it has cured these problems effectively.

With the AST, if resonance is occurring, it may be coming from the first 5 mm (20") of the "lead" wire coming from the AST.

Using double stick tape, stick this first 5 mm (20") of the lead to the guitar.

10.4 Imbalance, one or several strings sound louder or quieter than the others (with UST)

If there's only a very slight imbalance, let the saddle "shape" on the UST for a few days. The fault may be repaired on its own. Users have reported that after three (3) days the saddle has settled on the UST and the balance becomes perfect.

10.5 Possible reasons for imbalance:

- The saddle or the bottom of the saddle slot is not flat.
- The saddle fits too loosely in its slot.
- The saddle slot might be too tight for the saddle to go in all the way. Try pushing on the saddle firmly to seat the saddle all the way down on the transducer.
- The saddle is too short.
- There is debris in the saddle slot.
- The angle of some of the strings behind the saddle is too low or too high.
- The top of the guitar is bent.
- The pickup is not installed all the way to the end of the saddle slot.
- If the material of the saddle is bone.

Bone is a natural material and the density and grain may not be consistent. This may cause inconsistencies in the way the sound is distributed making some strings louder or softer than others. We highly recommend a manmade material for the saddle.

10.6 If the balance problem does not disappear on its own, do the following:

- Check there is no debris in the saddle slot.
- Check the bottoms of both the saddle slot and saddle. They should be flat and straight. It is common that the guitar top "lives" and moves and because of this the saddle slot could become curved, not straight. This may happen especially during transport or by change of season when the humidity changes. By making the saddle flexible, as in picture, these problems can be greatly avoided.
- Check saddle is not loose in its slot. The saddle should be so

tight that you cannot pull it away with your fingers.

- Check string angles behind the saddle. They should be about the same behind every string. If the angle is too low, the string will not put enough pressure on the transducer and that may cause balance problems - usually higher output from the corresponding string. To deepen the angle, you can, for example, file a wedge-shaped groove on the bridge pinhole so that the string will have deeper angle behind the saddle (see the next picture).
- On some instruments the outer most strings are too close to the edge of the saddle, causing balance problems to these strings. It may happen that the E string at the end of the UST does not come as loud as other strings. In this case, make another, shallow hole (not all the way through) at that end of the saddle cavity and move the pickup so the tip of the UST goes in the hole. If nothing else helps, you should machine the saddle slot longer and use a new longer saddle.
- Balance problems may also occur with some string sets, for example with classical guitars the G-string may cause problems.

10.7 If all things mentioned above are correct, and there still is a balance problem, you should try the following tricks:

- The easiest way is to install a spacer, made of soft wood, underneath the saddle or underneath the UST. The proper thickness is 0.5 - 0.8 mm (.02" - .03"). This will cure imbalance problems effectively.
- A very efficient way is to make the saddle more flexible by modifying it, for example see picture below. Even more efficient it is to cut the saddle into six separate pieces, or to cut it almost through between the strings but leave just a small portion on the bottom side of the saddle, i.e. cut it from the bottom towards the top.
- Most of the balance problems are due the fact that the guitar top lives. By making the saddle flexible, these problems can be greatly avoided.
- If anything else does not help, you can try to add one or two layers of ordinary letter paper under the saddle, underneath the quieter strings. This will cause a better mechanical contact between the saddle and the UST and thus increase the volume. If the volume decreases when adding the paper, the balance

problem is due to unequal pressure distribution, not bad mechanical contact. In this case, add the paper underneath the louder strings. Try this as the last choice because it is very time consuming and not so efficient.

10.8 Other problems

If you notice any other problems, please contact the dealer, distributor or manufacturer, for help.

11. CUSTOMER FEEDBACK

If you have any comments, positive or negative, about any B-Band product, please do not hesitate to contact B-Band.

12. A2.2 SPECIFICATIONS

S/N ratio: Greater than -90 dB

Distortion: 0.05 %

Frequency response: 50 Hz - 40 kHz (-3 dB)

Low-cut slope: 24 dB/octave

Voltage gain: AST channel, +15 - +30 dB;

UST channel, +15 - +30 dB

Input impedance (both channels): 50 Mohm || < 10 pF

Output impedance: < 3 kohm

Nominal output level: -10 dB u (0.245 Vrms)

Power supply: 9-volt battery (not included)

Current consumption: 2 mA typical

Connections: Transducer inputs, 2.54 mm / .10" header; Output, 6.3 mm / 1/4" jack

Weight (with accessories): 45 g

Dimensions: L 42 mm / 1.65", W 32 mm / 1.26", H 15 mm / 0.6"

13. EU / DECLARATION OF CONFORMITY

This B-Band product has been designed, manufactured and tested to comply with the requirements of EMC directive 89/336/EEC and CE mark directive 93/68/EEC and carry the CE marking accordingly.

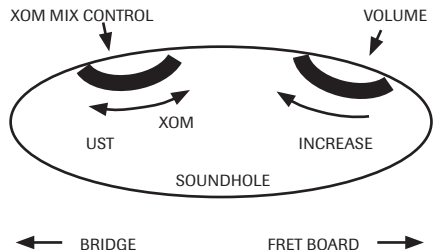
LED's in this product are Class 1 in accordance to EN 60825-1.

Statement of EU Declaration of Conformity is available from manufacturer upon request.

A2.2 USER GUIDE

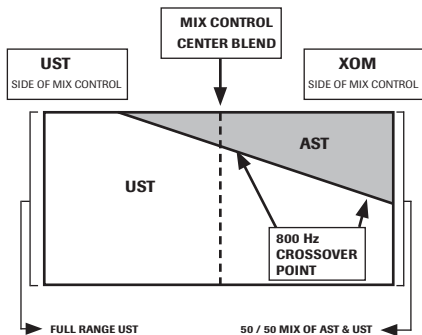
Before plugging in become familiar with the controls.

With the guitar in playing position- on your lap - feel for the wheels of the control panel at the soundhole. The control that is closer to the fret board is the volume. The control closer to the bridge is the XOM mix control.



The volume is increased when that control is turned towards the bridge and decreased in the opposite direction.

The A2.2 has the XOM mix control. When the mix control is turned all the way towards the fret board, this is the XOM position- a 50 / 50 mix of AST and UST is heard. This is the crossover mix of the AST and UST. The crossover point is 800 Hz. From 800 Hz and up is AST. 800 Hz and down is the UST. 50% is the high tones of the AST and 50% is the low tones of the UST. See diagram below.



When the mix control is turned all the way towards the bridge the sound is ONLY the UST pickup sound. Full range sound of the UST. No AST sound.

With the mix control at any position you always hear the low tone part of the UST pickup. This provides a very round and solid low tone sound at any position.

The XOM mix control blends the higher tone sounds of both the UST and AST.

Before plugging in the A2.2 make sure that the volume is turned OFF and the XOM mix control is at the UST side. The amp or mixer should be OFF, volume turned OFF and EQ setting at flat or OFF.

Plug into the amp or mixer and then plug into to the A2.2. Turn the amp or mixer ON. Turn the volume up at the amp or mixer to about "10 o'clock". Slowly turn the A2.2 volume up, now you should hear The UST pickup.

Next experiment with how the XOM mix control works. Once a sound that you like is found, you can further experiment with the EQ at the amp or mix to fine tune the sound.

Enjoy!

B-BAND LIMITED WARRANTY STATEMENT

In the unlikely event that your product needs guarantee service, please contact your dealer, distributor or manufacturer. To avoid any unnecessary inconvenience on your part, we recommend you read this instruction manual carefully before seeking guarantee service.

YOUR GUARANTEE

By this Guarantee, B-Band guarantees the product to be free from defects in materials and workmanship at the date of original purchase for a period of one (1) year from that date.

If within the guarantee period the product is determined to be defective (at the date of original purchase) due to improper materials or workmanship, B-Band will, without charge for labor or parts, repair or (at B-Band's discretion) replace the product or its defective parts subject to the terms and limitations below. B-Band may replace defective products or parts with new or refurbished products or parts. All products and parts replaced become the property of B-Band.

TERMS

1. Guarantee services will be provided only if the original invoice or sales receipt (indicating the date of purchase, model name and dealer's name) is presented with the defective product within the guarantee period. B-Band may refuse free-of-charge guarantee service if these documents are not presented or if they are incomplete or illegible. This Guarantee will not apply if the model name or serial number on the product has been altered, deleted, removed or made illegible.
2. This Guarantee does not cover transport costs and risks associated with transport of your product to and from B-Band.
3. This guarantee does not cover:
 - a) periodic maintenance and repair or parts replacement due

to wear and tear.

b) consumables (components that are expected to require periodic replacement during the lifetime of a product)

c) damage or defects caused by use, operation or treatment of the product inconsistent with normal use

d) damage or changes to the product as a result of:

i. misuse, including:

- treatment resulting in physical, cosmetic or surface damage or changes to the product

- failure to install or use the product for its normal purpose or in accordance with B-Band's instructions on installation or use

- failure to maintain the product in accordance with B-Band's instructions on proper maintenance

- installation or use of the product in a manner inconsistent with the technical or safety laws or standards in the country where it is installed or used

ii. the condition of or defects in systems with which the product is used or incorporated except other B-Band's products designed to be used with the product

iii. use of the product with accessories, peripheral equipment and other products of a type, condition and standard other than prescribed by B-Band

iv. repair or attempted repair by persons who are not B-Band employees

v. adjustments or adaptations without B-Band's prior written consent, including:

- upgrading the product beyond specifications or features described in the instruction manual, or

- modifications to the product to conform it to national or local technical or safety standards in countries other than those for which the product was specifically designed and manufactured

vi. neglect

vii. accidents, fire, liquids, chemicals, other substances, flooding, vibrations, excessive heat, improper ventilation, power surges, excess or incorrect supply or input voltage, radiation, electrostatic discharges including lightning, other external forces and impacts.

4. This guarantee covers only hardware components of the product.

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