

Foremost Technology for Absolute Acoustic Reproduction



INSTALLATION INSTRUCTIONS AND USER'S GUIDE

**B-BAND UST AND AST TRANSDUCERS
A-SERIES PREAMPS**

10.1.2006

HIGH TECHNOLOGY WITH SPIRIT

Congratulations and thank you for your purchase of this state-of-the-art acoustic transducer system. B-Band takes care to provide the highest quality product and is manufactured in the true spirit of acoustic instrument aficionados.

The outstanding sound reproduction of the B-Band electret transducer is based on the technology of a novel, worldwide-patented hi-tech material exclusive to B-Band. This film is very different from piezo-electric films and transducers, and is entirely unique in the industry.

How is it different? We could go into a long discussion about the technical aspects, like the "microscopic lens-like gas bubbles"[™] 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"), the B-Band transducers act in much the same way a condenser microphone does. This results in excellent reproduction of your acoustic guitar's unique sound. We at B-Band do truly hope you enjoy this product.

Please contact us if you have any comments about this product.

Always ready to help you.

Yours sincerely,

Heikki Räisänen
Managing Director, B-Band Ltd.



A1 / A1N



A2



A2.2



A3.2



A4.2



A5



A6.2



UST



AST 1470

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1. GENERAL INFORMATION


This instruction guide is a very detailed and valuable reference for the installer and user. For a quick pictorial overview of the installation process we highly recommend you to visit the installations page at www.b-band.com

1.1 SAFETY AND PRODUCT WARNINGS


Before installing or using any B-Band products this manual should be read carefully.

 This symbol represents an important safety or warning note and should be considered carefully.

Although the UST, AST, AG-MIC, A1, A1N, A2, A2.2, A3.2 and A4.2 products can be easy to install, we highly recommend that a qualified guitar craftsman or technician to do the installation.

 Note: If installing A1N-1470 refer to installation of A1 and 1470 AST.

The A5 and A6.2 require a skilled knowledge of woodworking, guitar structure and tools. A professional qualified guitar craftsman or technician should do the installation.

 Do not use phantom power with B-Band preamps.

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

If you have any questions about installation or use, please contact a B-Band dealer, distributor or B-Band directly (B-Band contact numbers are at the back of this booklet).

1.2. B-BAND ELECTRET TRANSDUCERS

Both the B-Band UST (Under-Saddle Transducer) and AST (Acous-

tic 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. They will produce low output and poor bass response.

The active portion of the B-Band UST transducer is 80 mm (3 3/16") from the end of the transducer at the opposite side of the connector. The rest of the UST is not active. The active portion of the AST is the area that attaches to the guitar. However, for best performance always keep the inactive portion of either UST or AST pickup from touching or rubbing on the inside of the guitar. This can produce unwanted handling noise.

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

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

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

1.3. A-SERIES PREAMPS

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.

XOM (Cross Over Mix)

In our continuing search for realistic acoustic tone the B-Band research and development team has applied a crossover system to our

exclusive patented pickup material. The crossover mix (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 complex and rich sound that further augments already superior sounding Emfit film pickups.

The ideal process for authentic acoustic reproduction comes from combining the high frequencies of the AST and low frequencies of the UST, making a sound that is much more complete, true and pure. In addition, the XOM pan pot allows the player to select between UST / AST XOM mix crossed over at 700 Hz or the full range UST, or one of the many points in-between resulting in almost unlimited possibilities.

At the UST side of the mix control only the UST is heard. At the AST side of the mix control, a crossover mix of the UST low frequencies and AST high frequencies is heard.

XOM is now being presented in A2.2, A4.2 and A6.2 preamps.

The A1 is a single input endpin preamp designed for use with either UST or AST transducers.

The A1N is a single input endpin preamp designed for use only with the 1470 AST transducer. This modified A1 endpin preamp has an intergraded frequency notch of 6 dB at 180 Hz.

The A2 is a two input / two output endpin preamp. Designed as a platform for two sources, the best performance is with the combination of UST and AST. The second input can also be configured for use with the B-Band AG-MIC condenser microphone or a passive magnetic pickup with the mini dipswitches inside the A2. With the A2 you will need a stereo Y-cable in order to control the mix between the two outputs at a mixer or amplifier. With a standard guitar cable the output will be that of channel 1 only (normally the UST).

The A2.2 is a two input / single output onboard preamp with XOM and is designed specifically for use with UST and AST only. It has an onboard remote XOM mix and volume control board that mounts just inside the edge of the guitar's sound hole.

The preamp mounts inside the guitar at the back and has input gain trims for both transducers that are adjustable with a screwdriver.

The A3.2 is a side mount preamp with a 4-band "graphic" equalizer. This single input preamp will accept either a UST or AST.

The A4.2 is a two input / single output sidemount preamp with XOM and is designed specifically for use with UST and AST only. The controls include a volume, 3-band "graphic" eq and the XOM mix control. There are separate input gain trim pots, accessible with a screwdriver, at the faceplate for adjusting the inputs of the UST and AST.

The A5 is a single input design for use with either UST or AST. The A5 controls include sliders for the volume and a 4-band graphic equalizer (bass, midrange, treble and presence), two rotary controls for adjustment of a notch frequency and a notch depth for feedback suppression and a phase control push button.

The A6.2 is a dual input / single output preamp with XOM specifically designed for use only with a UST / AST combination. The A6.2 has slider control for volume, a 3-band graphic equalizer (bass, midrange and treble) and the XOM mix control. It also has two input gain trim controls for the UST and AST that are adjusted with a screwdriver, two rotary controls for adjustment of notch frequency and depth for feedback suppression and a phase control push button.

The A1, A1N, A2.2, A3.2, A4.2, A5 and A6.2 use a standard 1/4" plug to turn on the 9-volt power. The A2 uses a custom endpin jack that allows either standard 1/4" mono or stereo plug to turn on the 9-volt power.

⚠ DO NOT USE B-BAND A-SERIES PREAMPS WITH PHANTOM POWER!

1.4. OPTIONAL CONDENSER MICROPHONE FOR A2 PREAMP

The B-Band AG-MIC microphone option is an excellent choice and value for an additional condenser microphone. The mic capsule

is especially designed for acoustic instruments, with suitable bass roll-off and treble boost.

2. PACKAGE CONTENTS CHECKLIST

2.1. UST package contents:

- 1 pc UST transducer

2.2. AST package contents:

- 1 pc AST transducer
- 1 pc cardboard installation guide (only 1470)

2.3. A1 preamp package contents:

- 1 pc A1 preamp with strap attachment
- Strap attachment includes:
 - Small hex nut
 - Small dress washer
 - Lock washer
 - Large dress washer
 - Large hex nut
- 1 pc cover tube for preamp
- 1 pc battery clip with adhesive
- 1 pc battery cord harness (length 65 cm / 25 3/8")
- 2 pcs wire clamps
- 1 pc instructions and user guide

2.4. A1N-1470 AST bundle package contents:

- 1 pc AST transducer
- 1 pc cardboard installation guide (only 1470)
- 1 pc A1N preamp with strap attachment
- Strap attachment includes:
 - Small hex nut
 - Small dress washer
 - Lock washer
 - Large dress washer
 - Large hex nut
- 1 pc cover tube for preamp
- 1 pc battery clip with adhesive
- 1 pc battery cord harness (length 65 cm / 25 3/8")
- 2 pcs wire clamps
- 1 pc instructions and user guide

2.5. A2 preamp package contents:

- 1 pc A2 preamp with strap attachment
- Strap attachment includes:
 - Small hex nut
 - Small dress washer
 - Lock washer
 - Large dress washer
 - Large hex nut
- 1 pc battery clip with adhesive
- 1 pc battery cable harness
- 2 pcs wire clamps
- 1 pc instructions and user guide

2.6. A2.2 preamp package contents:

- 1 pc A2.2 preamp with adhesive
- 1 pc volume and XOM control board
- 1 pc ribbon wire for connection of control board to preamp
- 1 pc output cable with end jack and strap attachment, which includes:
 - Small hex nut
 - Small dress washer
 - Lock washer
 - Large dress washer
 - Large hex nut
- 1 pc battery clip with adhesive
- 1 pc battery cable harness
- 2 pcs wire clamps
- 1 pc instruction and user guide

2.7. A3.2 and A4.2 preamp package contents:

- 1 pc preamp circuitry board (A3.2 or A4.2)
- 1 pc A3/A4 preamp box with top and bottom halves
- 1 pc faceplate (A3.2 or A4.2)
- 4 pcs 2.2 x 4.5 mm screws (chrome) for box
- 2 pcs 2.2 x 9.5 mm screws (black) for faceplate
- 1 pc output cable with endpin jack and strap attachment, which includes:
 - Small hex nut
 - Small dress washer
 - Lock washer
 - Large dress washer

- Large hex nut

- 1 pc battery clip with adhesive
- 1 pc battery cord harness (length 15 cm / 5 13/16")
- 2 pcs wire clamps
- 1 pc instructions and user guide

2.8. A5 and A6.2 package contents:

- 1 pc A5/A6.2 preamp box
- 1 pc faceplate (A5 or A6.2)
- 2 pcs 2.2 x 9.5 mm screws (black) for faceplate
- 1 pc output cable with endpin jack and strap attachment, which includes:
 - Small hex nut
 - Small dress washer
 - Lock washer
 - Large dress washer
 - Large hex nut
- 1 pc battery clip with adhesive
- 1 pc battery cord harness (length 15 cm / 5 13/16")
- 2 pcs wire clamps
- 1 pc instructions and user guide
- 1 pc preamp hole-cutting guide

3. TOOLS AND MATERIALS NEEDED FOR INSTALLATION

3.1. Basic Equipment needed for all products:

- Drill, preferably with continuously variable speed
- Endpin reamer, 12mm (1/2") or wood drill bit, 12mm (1/2")
- Allen wrench, 2 mm (3/32")
- Punch (spike)
- 13 mm (1/2") wrench to tighten the nuts on the pre-amp endpin jack
- Small hand-held mirror
- Flashlight (penlight)

For UST installation you also need:

- Drill, preferably with continuously variable speed
- Wood or metal drill bit, 2.3 mm (3/32") or 3 mm (1/8") depending on the width of the transducer
- Small round file

For AST installation you also need:

- 1470 AST cardboard installation mounting guide (supplied)

For A3.2, A4.2 installation you also need:

- Wood or metal drill bit, 3 mm (1/8")
- Wood or metal drill bit, 7 mm (9/32")
- Screwdriver, Pozidriv # 1
- Masking tape
- Wood or metal drill bit, 5mm (3/16")

For A5, A6.2 installation you also need:

- Masking tape
- Pencil or marker
- Wood or metal drill bit, 5 mm (3/16")
- Rotary wood router with a sharp 3 mm (1/8") cutting bit
- Fine wood finishing file

4. BEFORE INSTALLATION, PLEASE READ THE FOLLOWING

For a quick pictorial overview of the installation process we highly recommend you to visit the installations page at www.b-band.com



Before you begin the installation, make sure that the instrument is in good working condition.

4.1. UST (Under-Saddle Transducer)

From an operational point of view, it is important that the angle of the strings behind the saddle is correct. An angle of 30 - 45 is ideal. If some of the strings (or all) don't press on the saddle with enough force, balance problems may occur. The angle of the strings behind the saddle should be about the same on all the strings. Sometimes higher-pitched strings have milder angle than the lower ones. Talk to a guitar technician about this if there are any questions.

A good contact between the B-Band UST and the saddle is needed underneath every string to achieve good string-to-string balance.

For this to occur, the bottom of the saddle slot and the bottom of the saddle itself must be absolutely flat. Also, the bottom of the saddle slot should be free of debris. If this is not the case, some of the strings

may sound louder or quieter than others. Louder strings may even cause feedback problems.

The saddle should fit in tight. If you are able to easily pull the saddle out of its slot with your fingers, it is too loose.

The B-Band UST is so thin (0.4 mm / .018") that it practically does not increase the height of the saddle when installed. The depth of the saddle slot should, however, be deep enough to prevent the saddle from tilting forward when the strings are tightened. For the same reason, the saddle must fit tight in the slot. A tilted saddle does not press a large enough area of the transducer satisfactorily. It may be necessary to compensate for the forward tilt by sanding the bottom of the saddle oblique. If you have had a piezo-electric transducer in your instrument, we recommend you to remove it and replace the saddle with a properly sized saddle. Another possibility is to install a suitable wooden spacer underneath the saddle.

In some guitars the saddle can be so narrow that even the 2.2 mm / 3/32" wide B-Band UST does not fit in. In such cases, the slot has to be made wider and the saddle has to be replaced with a wider type. In other guitars, the saddle might be an adjustable-height type or there could be a separate saddle piece for each string. In these cases it may be necessary to fill and reroute the saddle slot and make a new, proper size saddle.

Before starting the installation, make sure that you have a B-Band UST of the right model. Measure the width of the saddle slot. Check that you have the correct model and the system really fits into your guitar.

⚠ Some undersaddle pickup manufacturers recommend to file the saddle bottom in a slight U-shape in order to create more pressure on the center area of the pickup. Also, there are saddles on the market, where portions of the saddle bottom have shallow slots (looks like a saw blade) in order to create excessive pressure on the pickup. Do not use these types of saddles with the B-Band UST. The saddle bottom must always be straight and flat with the B-Band UST.

⚠ We cannot guarantee a successful installation with every instrument, since there are so many different saddle widths.

4.1.1. UST models and sizes:

Steel strung guitar or bass:

Saddle width	Model	UST width
2.3 - 2.9 mm / .090 - .115" (3/32")	22L	2.3 mm / .090"
3.0 mm / .120" (1/8") or more	29L	3.0 mm / .118"

Classical guitar or very small body steel string guitar with use of A1, A1N, A2 or A2.2 endpin preamp:

Saddle width	Model	UST width
2.3 - 2.9 mm / .090 - .115" (3/32")	22S	2.3 mm / .090"
3.0 mm / .120" (1/8") or more	29S	3.0 mm / .118"

⚠ 22S and 29S are for use only with A1, A2 and A2.2 preamps in classical guitars or in instruments where the saddle is very close to the area where the endpin preamp will be. In all other models of guitars, use the "L" model with the A1, A2 and A2.2 preamps. When using A3.2, A4.2, A5 or A6.2 preamps, always use "L" size transducer. "L" models simply are longer in overall length than "S" models. There is no difference with frequency response.

4.2. AST (Acoustic Soundboard Transducer)

The model B-Band 1470 AST works with all B-Band A series preamps. In steel string guitars the 1470 AST is attached to the length of the bridge plate. In classical guitars the 1470 AST is attached parallel to the bracing between the bridge and the soundhole. The supplied peel-and-stick adhesive attaches the 1470 AST. Do not use any other adhesive.

Before installing the 1470 AST, the area where it is to be attached should be checked that it is good condition and that there is enough space for the transducer to fit. The area should be flat, smooth and clean! All of the 14 x 71 mm (.546" x 2.73" or 9/16" x 2 13/16") area of the 1470 AST must attach to the area's flat surface.

5. PREPARING THE GUITAR FOR INSTALLATION

⚠ Please read completely before starting the actual procedure.

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

5.1.1. Before removing the strings and bridge pins from the bridge check to see if the 1470 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 mounting guide 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 guide can be trimmed with scissors slightly to accommodate this. In case the guide 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 if you are careful.

⚠ For classical guitars the installation is done by hand. For most classical guitars the 1470 AST is placed inside the guitar parallel to center brace on the bass strings side that runs parallel to the strings at the area between the bridge and soundhole. Sometimes there is also a flat brace running parallel under the bridge. The 1470 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 (see picture at 8.3). 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, take the cardboard mounting guide from the tray in the box. Note! There is a small 4.5 mm (3/16") round and a 4.5 mm 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 1470 AST is important for connection to the preamp. When using the A1, A2 or A2.2 preamp, the lead of the 1470 must go away from the high "E" string side of bridge area and towards the butt-end of the guitar. When using the A3.2, A4.2, A5 or

A6.2 preamp the lead goes away from the low "E" side of the bridge area and towards the upper bout of the guitar (see pictures). When using A3.2, A4.2, A5 or A6.2 in left-handed guitars follow the rule of the A1 / A2 / A2.2 AST placement.

5.1.2. Now mount the 1470 AST to the top of the cardboard mounting guide at the rectangle 1470 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 14 x 71 mm active area must fit at the soundhole side of the bridge plate without touching the bridge pins or string ball-ends or hanging over the edge of the bridge plate. Also, if using a UST / AST combination, be sure that there is enough room in that area for the hole for the UST.



With A1 and A2, A2.2 preamps.



With A3.2, A4.2, A5, A6.2 preamps

5.2. 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.

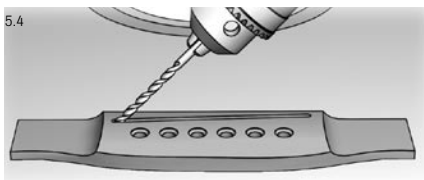
5.3. Remove the strap button. Carefully enlarge the hole using 12 mm (1/2") endpin reamer or 12 mm (1/2") wood drill bit. Smooth the edge of the hole with a small file or a sinking drill bit.

5.4. For UST check the inside of the guitar to find the position of the braces. Drill a preferably 30 - 45 angled, 2.3 mm (3/32") or 3 mm (1/8") 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. If you use A3.2, A4.2, A5, or A6.2 preamp, you must drill the hole at the low-E string side of the slot.

⚠ If you will be installing a 1470 AST along with the UST, the drilled hole for the UST will determine where the AST will be placed laterally.

⚠ When the UST is treaded through the hole, it should not touch the AST. The two transducers should not touch each other!



5.5. For A3.2 or A4.2 put masking tape to the upper bout of the guitar and mark carefully the holes with a punch (spike) using the drilling-hole guide at the end of this manual. Drill 7 mm (9/32") holes for the potentiometer shafts, 3 mm (1/8") holes for mounting screws and 5 mm (3/16") holes for the lo-batt LED and, if installing the A4.2, holes for the UST / AST input gain controls. Use a small file or sinking drill bit to smooth the edges of all holes carefully and then remove the masking tape.

5.6. For A5 and A6.2 installations, please read the following carefully:

⚠ It is very important to check inside the guitar body that there is enough clearance for the preamp at the side between the soundboard and the back of the guitar.

⚠ The sides of the guitar where the preamp will be installed should

be inspected for accessibility and stability. Inside some guitars there is kerfed lining (the wood reinforcement between the back and sides inside the guitar) and other reinforcements that may make the area too small to install the A5 / A6.2. If these reinforcements are altered it may cause instability at the guitar's side.

Guitars with solid sides or that have very thin sides may not be stable after cutting a hole to fit the A5 / A6.2. It may be necessary to reinforce this area from the inside of the guitar with an extra piece of plywood before cutting or drilling holes. The thickness of the guitar side should be at least 2 mm / 5/64" and preferably 2.5 - 3 mm / 3/32" - 1/8". If needed glue in a piece of plywood of suitable thickness to reinforce that area.

Please consult with a qualified luthier, technician, guitar dealer or the manufacturer of the guitar about performing the above.

5.7. For A5 or A6.2, find a location at the side of the guitar at the flattest place between the waist and the shoulder of the upper bout. Be sure to check that the transducer will reach the preamp from its position under the saddle and / or bridge area.

5.8. Cover the planned installation area with masking tape and mark the area with a pencil using the provided preamp hole-cutting guide at the end of this manual. Prepare the guitar for cutting the preamp hole with the rotary wood router by securing it in some way so that the guitar does not move while doing the cutting. Cut out the area for the preamp using the rotary wood router with a sharp 1/8" / 3 mm cutting bit. Do this slowly and very carefully so the router's cutting bit does not accidentally move outside the area that you have marked with the guide. Smooth the edges of the finished hole with a small file or sand paper and remove the masking tape.

5.9. 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. The clip that holds the battery in the holder is stiff to hold the battery firmly even while transporting. 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 move the clip that holds the battery. 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.

⚠ Do not attach the battery holder to the back of a preamp.

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 liner from the supplied piece of 3M VHB-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.

6. CONNECTING THE TRANSDUCERS AND WIRING TO THE PREAMP

6.1. Open the preamp and see appropriate picture (below) for connections. Connect the transducer(s), battery cable harness and if you have A3.2, A4.2, A5 or A6.2, the output cable. Notice that the small holes on each connector of the transducer and battery cable harness should point upwards. The exception is the AG-MIC condenser microphone (if applicable) -the holes of the connector for the AG-MIC condenser mic should point downwards. If UST or AST are connected improperly, a loud audible hum will occur. Make sure that they are connected correctly.

6.2. For the A2.2, connect the remote control board (with the volume and XOM mix controls) to the preamp with the ribbon cable.

With your fingers carefully and simultaneously open each side of the wire clip on the preamp board and the control board. When the wire clip is open carefully insert the control wire with the "up" side facing up, and then close the wire clip with the wires inserted in the wire clip.

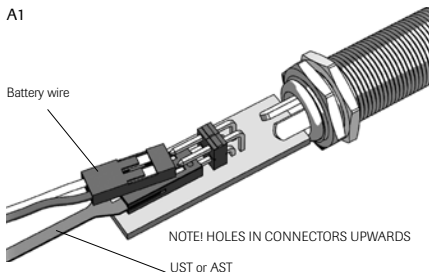
6.3. For the A2: inside there are four DIP-switches. Switch #1 is an on-off switch for the treble boost on channel one (normally UST). Set that at on-position if you prefer a mild treble boost. Switch #2 is an on-off switch for the second channel bass roll-off 6 dB (-3 dB @ 500 Hz when at on-position). Set it at the on-position only when using a condenser microphone to reduce low frequency feedback.

Switch #3 is an on-off switch for second channel bias-voltage (9-volt phantom power). Set it at on-position only when you use condenser microphone on the second channel. Switch #4 is an on-off switch for

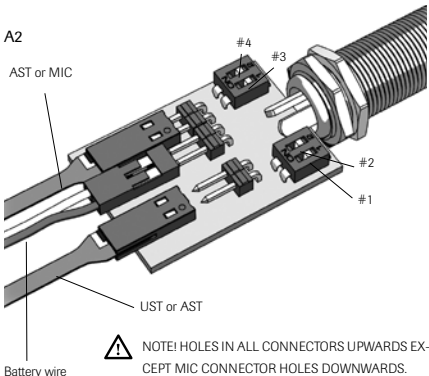
channel two gain reduction (24 dB at off, and 0 dB at on). This also must be set it at on-position when you use a condenser microphone or passive magnetic pickup connected to the second channel. From the factory, all the switches are set at off-position.

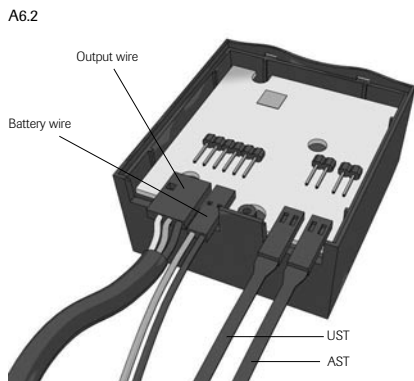
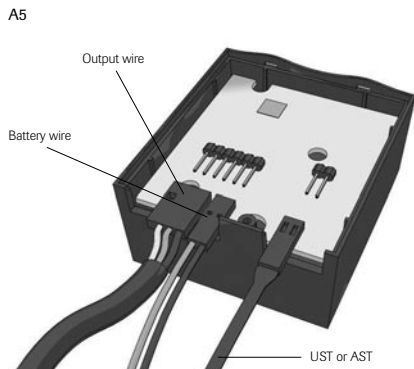
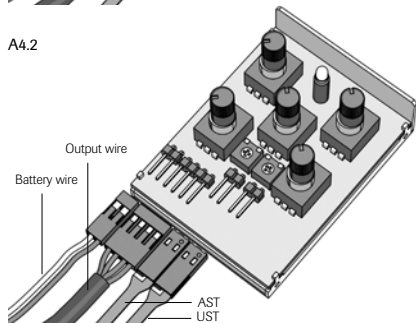
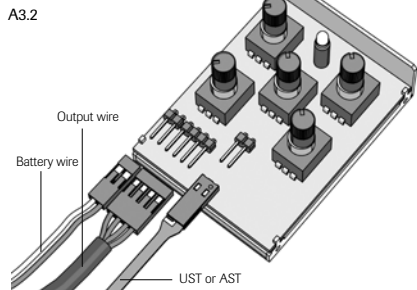
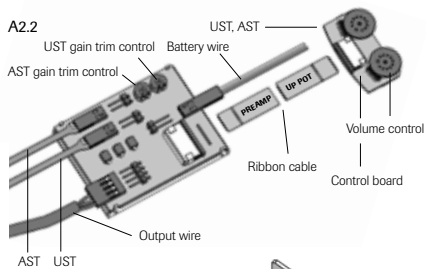
6.4. Close preamplifier enclosure.

A1



A2





7. INSTALLING THE PREAMP

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

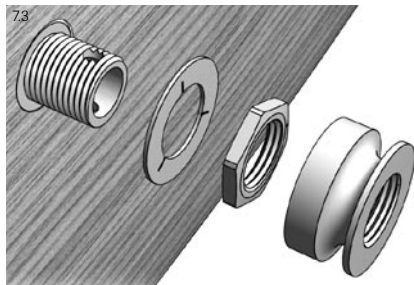
⚠ For AST please note to lift one corner of the protective layer of the mounting adhesive so it is easier to remove later.

7.1. For A3.2, A4.2, A5 and A6.2, take 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. For A3.2, A4.2, A5 and A6.2, install the front plate and attach the screws. It is important that you have a good quality screwdriver to avoid it slipping during tightening and thus scratching the guitar. Be careful to tighten the screws properly. It may be wise to tape the area around the front plate with masking tape in case you slip with the screwdriver. Do not over-tighten the screws as it may strip the screws or, with the A5 and A6.2, the corners of the front plate may flex away from the surface of the side of the guitar.

7.2. For all preamps 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.

7.3. Next, test-fit the jack in your strap button hole. 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.

⚠ In rare cases, some guitars may have an unusually thick wood tail block. This may restrict the jack from sticking out far enough. This may cause a plug not to go all the way in and not connecting correctly. With the A1 or A2 preamp it may be necessary to remove the large nut and washer (keep the lock washer on) to get more length.



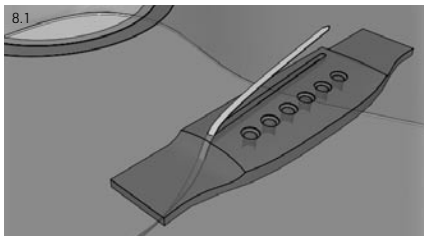
7.4. Connect a fresh 9-volt battery to the snap-in connector and put it in the battery holder. Attach the battery wires to the side of the guitar with the cord clamps. Roll the extra cord as a "coil" in some of the clamps if necessary.

EVEN WITH THE BATTERY SECURE OR THE (OPTIONAL) BATTERY BOX LID CLOSED, THE BATTERY CAN GET LOOSE. WE STRONGLY RECOMMEND YOU TO REMOVE THE BATTERY BEFORE TRANSPORTING THE INSTRUMENT IN HEAVY CONDITIONS, FOR EXAMPLE, BY FREIGHT COMPANIES OR AIRLINES, TO AVOID POSSIBLE DAMAGE TO THE INSTRUMENT.

8. INSTALLING THE TRANSDUCERS

8.1. If installing UST, do it now. Thread the B-Band 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.

8.2. 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 mounting guide / AST assembly will guide the AST to fit correctly. Having the AST cardboard mounting guide / AST assembly



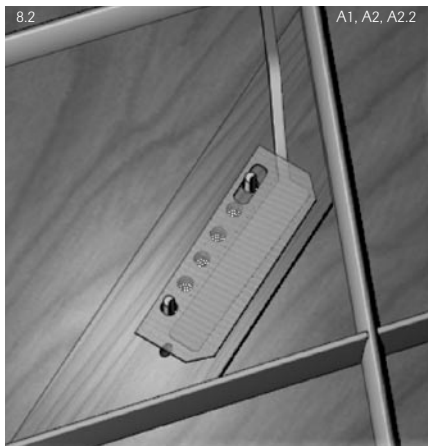
lying on the bottom of the guitar, remove the adhesive protective layer from the AST. Lift the assembly up and guide the assembly so the bridge pins insert the guide holes and carefully place it to the bridge plate. Then stick it firmly by holding and pressing firmly with fingers for a short while. Next carefully remove the cardboard guide. Make sure the AST fits there tight and secure.

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

8.3. For classical guitars the install the 1470 AST by hand at the area described at 5.1.1. Remove the adhesive protective layer from the AST. Then stick it firmly by holding and pressing with fingers for a short while.

8.4. If necessary, you can remove the AST 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 that after 24 hours the adhesive will dry and it will be hard to remove. Removal after this time may break the pickup.

8.5. If you are installing an A2 with the optional B-Band AG-MIC condenser microphone, install the mic at this point. There are a variety of possible locations, depending on your own taste and preferences. The two most used places are:





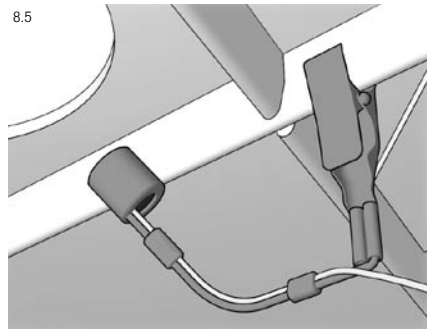
- Connect the mic near the intersection of the X-braces at the top and position the mic so that it points towards the soundhole at the strings. This will give a bright sound but may be more sensitive to feedback.

- Connect the mic to a back brace and point the microphone so that it points to the top of the guitar behind the saddle. In this position the sound is warm and less sensitive to feedback.

After attaching the mic, it is possible to adjust its direction in a wide range, simply by bending the metal wire. Bend it carefully to avoid making a sharp bend, as the paint could come loose. It will require some experimenting to find the optimal location for your particular guitar. Be patient and you'll get a great sound.

Attach the mic cable to the inside of guitar using the two supplied cable clamps. If needed, roll extra cable as a "coil" in one of the cable clamps.

8.6. 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 (and microphone, if used) to make sure that you can hear the transducer(s) 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.

⚠ A2 users, remember that when using a combination of two input sources the system requires a stereo “Y” cable and a two-channel amplifier or a multi-channel mixer. If a standard (mono) cable is used the signal from the number 1 input channel will only be heard (usually the transducer).

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

⚠ DO NOT USE B-BAND A-SERIES PREAMPS WITH PHANTOM POWER!



9. A2.2 UST AND AST GAIN TRIM ADJUSTMENT

9.1. For the A2.2 there are a UST and AST gain trim adjustment at the preamp. These are adjustable with a small screwdriver through the two holes at the preamp labeled AST and UST.

9.2. Fine-tuning the UST and AST gain trim pots.

When you turn the XOM mix control at the control board to the AST side the tone should become brighter and tapping on the top should be audible, if this is the case the gain trims are in proper adjustment.

If the tone of the instrument does not become brighter when turning the mix control to the AST side, turn the UST gain pot down in 10 percent increments until the tone does become brighter.

If the tone of the instrument is too bright turn the AST trim pot down in 10 percent increments until a pleasing tone is achieved.

⚠ Final adjustment of the UST gain should be done 2 – 3 days after the installation because the UST output lowers slightly the first days under pressure.

10. A4.2 AND A6.2 UST AND AST INPUT GAIN TRIM CONTROL ADJUSTMENTS

10.1. For the A4.2, there are two input gain trim pots at the faceplate that can be accessed with a small screwdriver through the two holes. There is one trim pot each for the UST and at the AST the trim is for the combination of UST / AST with cross over point (as described at sections 1.3 and 10.2 in the A4.2 description). Both trim pots are set at the full setting from the factory. The UST input gain trim pot should be adjusted so the output level is equal in level to the AST / UST. Before adjusting the input gain make sure that both gain controls are at the full setting.

⚠ Adjustment of the UST input gain will change the balance of the AST / UST crossover blend at the AST side of the mix.

10.2. For the A6.2, there are two input gain trim pots at the faceplate that can be accessed with a small screwdriver through the two holes. There is one trim pot each for the UST and AST. Both trim pots are set at the full setting from the factory. The UST input gain trim pot should be adjusted so the output level is equal in level to the AST. Before adjusting the input gain make sure that both gain controls are at the full setting.

⚠ Final adjustment for both A4.2 and A6.2 gain trim should be done 2-3 days after the installation because the UST output lowers slightly upon the first days under string pressure.

11. CONTROLS (A3.2, A4.2, A5 and A6.2)

11.1. A3.2 preamp

The A3.2 has five knobs. The VOLUME controls the output volume. At “0” it is completely OFF. At “12” it is LOUD! The BASS, TREBLE and PRES tone controls are normal boost/cut shelving controls. The MIDDLE tone control is normal boost/cut filter. The center detent on these tone controls yields a flat frequency response. “+” boosts the tone; “-” cuts the tone.

11.2. A4.2 preamp

The A4.2 has five knobs. The VOLUME controls the output volume. At “0” it is completely OFF. At “12” it is LOUD! The BASS and TREBLE

tone controls are normal boost/cut shelving controls. The MIDDLE tone control is normal boost/cut filter. The center detent on these tone controls yields a flat frequency response. "+" boosts the tone; "-" cuts the tone.

The A4.2 also has a XOM mix control for UST / AST mix. At the "12 / 0 AST" position the sound is special blend of the UST and AST. This blend is made by a frequency crossover point at 700 Hz. Sound above 700 Hz is the AST sound and sound below 700 Hz is the UST sound. At the "0 / 12" UST position the sound is only from the UST. As the mix control is rotated from the UST side towards the AST side the UST high-mid and high frequency sounds gradually give way to the AST high-mid and high frequency sounds. If one side of the mix is louder than the other, adjust the input gain trims to balance them.

11.3. A5 preamp

The A5 has five slider type controls, two rotary controls and one push button. The VOL slider controls the output volume. At "0" it is completely OFF. At "+12" it is LOUD! The BASS, MID, TRE, and PRES slider controls are a 4-band equalizer for controlling tone. The BASS and PRES (presence) tone controls are normal boost / cut shelving controls. The MID (midrange) and TRE (treble) tone controls are normal boost/cut filters. The center detent on these tone controls yields a flat frequency response. "+12" boosts the tone; "-12" cuts the tone.

The two rotary controls, N FRE (notch frequency) and N DEP (notch depth), one push button control, Phase, and "Batt" LED are described at 11.5.

11.4. A6.2 preamp

The A6.2 preamp is a dual input / single output preamp. The A6.2 has five slider type controls, two rotary controls and one push button. The VOL slider controls the output volume. At "0" it is completely OFF. At "+12" it is LOUD! The BASS, MID, TRE slider controls are a 3-band equalizer for controlling tone. The BASS and TRE (treble) tone controls are normal boost/cut shelving controls. The MID (midrange) tone control is normal boost/cut filter. The center detent on these tone controls yields a flat frequency response. "+12" boosts the tone; "-12" cuts the tone.

The A6.2 has a slider UST / AST mix control. This slider controls the mix or balance of the two transducers. Set at "6/6" you will get an even mix of what you have set with the UST / AST input gain controls (more about that later). Pushing the slider to the "UST" side at "0/ 12" you will get only the signal of the UST. Pushing the slider to the "AST" side at "12/0" you will get only the signal of the AST. Everything in-between is up to you but you will find a lot of usable sounds this way.

11.5. A5 and A6.2 Notch controls, phase switch and "Batt" LED.

The two rotary controls are for feedback control. Feedback can be a nasty and unwanted sound that sometimes happens at medium to loud volume levels and sometimes when standing close to the speaker that is reproducing the guitar sound. The N DEP (notch depth) and N FRE (notch frequency) can help control feedback. The N DEP at "0" is off; at "-6" it cuts the level of the N FRE by six decibels; and "-15" by fifteen decibels. The N FRE indicates a range of frequencies that can be affected from 100 Hz to 330 Hz. These should be used sparingly as they may affect the tone. Set up by first turning the N DEP off to the full counter clock-wise position "0". Set the rest of the controls to suit your taste taking care that as you do this control any initial feedback by turning down the volume control. Once you set your sound turn the volume control up. As you reach a feedback threshold and hear feedback, turn the N DEP up half way and using the N FRE finds the frequency where the feedback is reduced. Once this is found you can move the N DEP either way to make this effect stronger or weaker.

The PHASE button controls the phase of the transducer(s) in relationship to the phase of the speaker(s) that are being used with the system. Pushing this button in will put the transducer(s) "out of phase" with the speaker(s). When the button is out both transducers are "in phase." This control is most useful for feedback control and will provide a tone color.

Once you experiment with the settings of these controls you will find more about how they work.

12. TROUBLESHOOTING

12.1. No sound at all

- 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(s), mic and battery connectors are correctly inserted onto the pin headers of the preamp.

12.2. 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 correctly inserted onto the header.

12.3. Resonance or distortion with some played notes (with UST)

There are a couple places where a resonance can typically occur with some notes, causing distorted-sounding output. First, check that the UST is not touching anything and that the wires (battery / mic) are not loose and thus cause resonance.

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

12.4. 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.

12.4.1. 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

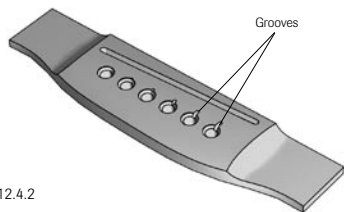
way. Try pushing on the saddle firmly to seat the saddle all the way down on the transducer.

- 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 man-made material for the saddle.

12.4.2. 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 due the guitar top "lives" and moves the saddle slot is not straight. This may happen especially during transport or by change of season when the moisture changes a lot. 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 B-Band 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. Often the e-string on the end of the UST does not come as loud as other strings. In this case, make another hole to that end too and put the tip of the UST to that 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.



12.4.2



12.4.3

12.4.3. 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. This will cure imbalance problems effectively.
- Very efficient way is to make the saddle more flexible by modifying it for example according to the picture 12.4.3. 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.

12.5. Other problems

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

13. CUSTOMER'S FEEDBACK

If you have any comments, positive or negative, about any B-Band product, please do not hesitate to contact B-Band (contact numbers are at the back cover).

14. CE-MARK STATEMENT

This B-Band product is of highest quality and its functionality is fully pre-tested. The product conforms to EMC Directive (89/336/ EEC) and CE mark Directive (93/68/EEC).

15. LIMITED WARRANTY

WARRANTY PERIOD IS 12 MONTHS FROM THE DATE OF PURCHASE. DURING THIS TIME, B-BAND WILL REPAIR OR REPLACE FAULTY PRODUCT AT THEIR DISCRETION. THIS WARRANTY DOES NOT COVER PARTS THAT WEAR OUT NORMALLY, CONSEQUENTIAL DAMAGES OR DAMAGE DUE TO MISUSE, ACCIDENT, OR NEGLIGENCE. THE RIGHT TO MAKE SUCH DETERMINATION IS RETAINED BY B-BAND. ANY SUCH DETERMINATION WILL BE DONE AT THE FACTORY. THIS WARRANTY REMAINS VALID ONLY IF THE PRODUCT HAS NOT BEEN MODIFIED AND IT IS RETURNED PREPAID AND PROPERLY PACKED TO THE DEALER, DISTRIBUTOR OR MANUFACTURER. A COPY OF THE ORIGINAL BILL OF SALE FROM AN AUTHORIZED DEALER INDICATING WHERE AND WHEN THE PRODUCT WAS PURCHASED, SHOULD ACCOMPANY THE PRODUCT. DETAILED FAULT DESCRIPTION, CUSTOMER'S NAME AND COMPLETE DELIVERY ADDRESS MUST ALSO BE SENT.

16. SPECIFICATIONS

A1 and A1N Specifications

Integrated notch filter:	6 dB @ 180 Hz (A1N only)
S/N ratio:	Greater than -90 dB
Distortion:	0.05 %
Frequency response:	50 Hz - 33 kHz (-3 dB)
Low-cut slope:	-12 dB/octave
Input channel voltage gain:	+24 dB
Input impedance:	50 M Ω < 10 pF
Output impedance:	1 k Ω
Nominal output level:	-10 dB u (0.245 V _{rms})
Power supply:	9 V battery (not included)
Current consumption:	0.4 mA typical
Connections:	Transducer input - 2.54 mm / .10" header; Output - 1/4" jack
Weight (with accessories):	60 g
Dimensions:	13 mm / .50", L 89 mm / 3.50"

A2 Specifications

S/N ratio:	Greater than -90 dB
Distortion:	0.05 %
Frequency response (both channels):	50 Hz - 40 kHz (-3 dB)
Low-cut slope (both channels):	-6 dB/octave
Ch 1 voltage gain:	+18 dB
Ch 2 voltage gain:	0 / +27 dB
Ch 1 input impedance:	50 M Ω < 10 pF
Ch 2 input impedance:	20 M Ω (2.2 k Ω with mic phantom on)
Output impedance (both channels):	150 Ω
Nominal output level (both channels):	-10 dB u (0.245 V _{rms})
Mic bias voltage:	9 V through 2.2 k Ω
Preset treble enhancer boost:	+3 dB @ 6.3 kHz; +5 dB @ 14 kHz (when on)
Power supply:	9 V battery (not included)
Current consumption:	1.5 mA typical (2 mA with mic)
Connections:	Transducer inputs, 2.54 mm / .10" header; Output, 6.3 mm / 1/4" jack

Weight (with accessories):	50 g
Dimensions (incl. jack):	W 32 mm / 1.25", H 18 mm / .70", L 82 mm / 3.20"

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, 0 - +24 dB; UST channel, 0 - +24 dB
Input impedance (both channels):	50 M Ω < 10 pF
Output impedance:	< 3 k Ω
Nominal output level:	-10 dB u (0.245 V _{rms})
Power supply:	9 V battery (not included)
Current consumption:	0.8 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"

A3.2 Specifications

S/N ratio:	Greater than -90 dB
Distortion:	0.05 %
Frequency response:	50 Hz - 40 kHz (+0, -3 dB)
Low-cut slope:	-6 dB/octave
Input channel voltage gain:	+24 dB
Input impedance:	50 M Ω < 10 pF
Output impedance:	< 3.5 k Ω
Nominal output level:	-10 dB u (0.245 V _{rms})
Bass control range:	\pm 12 dB @ 70 Hz (\pm 3 dB @ 300 Hz)
Middle control range:	\pm 12 dB @ 400 Hz; (Q = 0.5)
Treble control range:	\pm 12 dB @ 2.5 kHz; (Q = 0.5)
Presence control range:	\pm 12 dB @ 12 kHz (\pm 3 dB @ 2.2 kHz)
Power supply:	9 V battery (not included)
Current consumption:	0.8 mA typical
Connections:	Transducer input, 2.54 mm / .10" header; Output, 6.3 mm / 1/4" jack

Weight (with accessories):	90 g
Dimensions:	L 60 mm / 2.36", W 47 mm / 1.85", H 25 mm / 1.00"

A4.2 Specifications

S/N ratio:	Greater than -90 dB
Distortion:	0.05 %
Frequency response (both channels):	50 Hz - 40 KHz (-3 dB)
UST channel voltage gain:	0 - +24 dB
AST channel voltage gain:	0 - +24 dB
UST channel input impedance:	50 M Ω
AST channel input impedance:	50 M Ω
Output impedance:	< 3.5 k Ω
Nominal output level:	-10 dB u (0.245 V _{rms})
Bass control range:	Shelving ± 12 dB @ 100 Hz (± 3 dB @ 330 Hz)
Middle control range:	Peaking ± 11 dB @ 1.1 kHz; (Q = 0.5)
Treble control range:	Peaking ± 12 dB @ 12 kHz; (± 3 dB @ 3.5 kHz)
Power supply:	9 V battery (not included)
Current consumption:	0.8 mA typical
Connections:	Transducer inputs, 2.54 mm / .10" header; Output, 6.3 mm / 1/4" jack
Weight (with accessories):	90 g
Dimensions:	L 20 mm / .80", W 47 mm / 1.85", H 45 mm / 1.80"

A5 Specifications

S/N ratio:	Greater than -90 dB
Distortion:	0.05 %
Frequency response:	50 Hz - 40 kHz (-3 dB)
Input channel voltage gain:	+24 dB
Input impedance:	50 M Ω
Output impedance:	< 3 k Ω
Nominal output level:	-10 dB u (0.245 V _{rms})
Bass control range:	Shelving ± 12 dB @ 70 Hz (± 3 dB @ 300 Hz)
Middle control range:	Peaking ± 12 dB @ 400 Hz; (Q = 0.5)

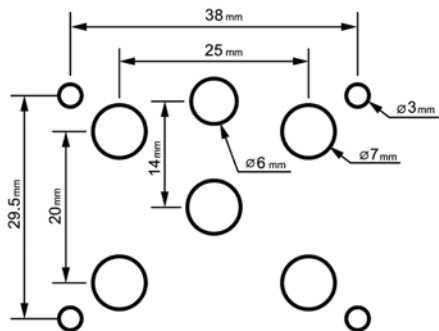
Treble control range:	Peaking ± 12 dB @ 2.7 kHz; (Q = 0.5)
Presence control range:	Shelving ± 12 dB @ 10 kHz (± 3 dB @ 2.2 kHz)
Notch frequency range:	100 Hz - 330 Hz
Notch depth range:	-15 dB (Q = 3.3)
Power supply:	9 V battery (not included)
Current consumption:	4 mA typical
Connections:	Transducer input, 2.54 mm / .10" header; Output, 6.3 mm / 1/4" jack
Weight (with accessories):	140 g
Dimensions:	H 42 mm / 1.65", W 56 mm / 2.20", L 61 mm / 2.40"

A6.2 Specifications

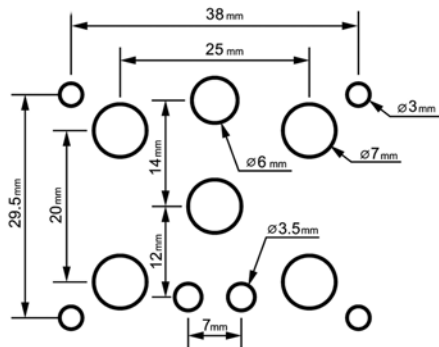
S/N ratio:	Greater than -90 dB
Distortion:	0.05 %
Frequency response (both channels):	50 Hz - 40 kHz (-3 dB)
UST channel voltage gain:	0 - +24 dB
AST channel voltage gain:	0 - +24 dB
UST channel input impedance:	50 M Ω
AST channel input impedance:	50 M Ω
Output impedance:	< 3.5 k Ω
Nominal output level:	-10 dB u (0.245 V _{rms})
Bass control range:	Shelving ± 12 dB @ 100 Hz (± 3 dB @ 330 Hz)
Middle control range:	Peaking ± 11 dB @ 1.1 kHz (Q = 0.5)
Treble control range:	Shelving ± 12 dB @ 12 kHz (± 3 dB @ 3.5 kHz)
Notch frequency range:	100 Hz - 330 Hz
Notch depth range:	-15 dB; Q, 3.3
Power supply:	9 V battery (not included)
Current consumption:	4 mA typical
Connections:	Transducer inputs, 2.54 mm / .10" header; Output, 6.3 mm / 1/4" jack
Weight (with accessories):	140 g
Dimensions:	H 42 mm / 1.65", W 56 mm / 2.20", L 61 mm / 2.40"



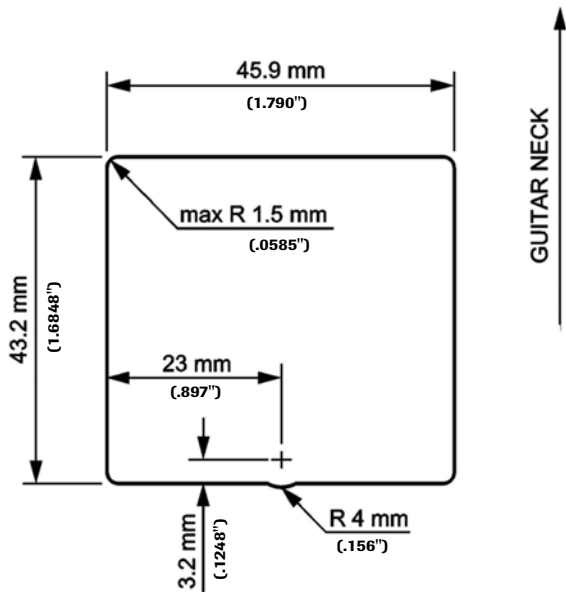
A3.2 drill hole guide



A4.2 drill hole guide



A5 and A6.2 preamp hole-cutting guide







ELECTRET TRANSDUCERS

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