

*Acoustic
Image*®

**Musical Amplification:
Setting The Standard**



Ten2
Ten2 EX

IMPORTANT SAFETY INSTRUCTIONS

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with a dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Use only attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

*Owner's
Manual*

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Welcome to Acoustic Image!

You have purchased a state-of-the-art musical instrument amplifier system, combining purity, power and portability in a package that sets a new standard in high fidelity amplification.

Each of our designs is engineered to accurately reproduce the sound of acoustic and electric instruments, delivering flat frequency response across the entire musical spectrum; extended, tight, well-controlled bass; and complete clarity of sound reproduction.

This manual provides operating information for your Acoustic Image Ten2 and the Ten2 EX extension speaker cabinet.

The Basics

The Ten2 has a superb class-D power amplifier with switch mode power supply, a compact two-way speaker system and a sophisticated, sensitive preamplifier. It also has the exclusive Cabrio Docking System that allow the head unit to be removed and used as a stand-alone amplifier.

The power amp is a high efficiency, 800W design that requires no external heat sinks or cooling fans and is capable of driving loads as low as 2 ohms. AC power and output speaker jacks are located on the rear of the enclosure. A standard, three-prong detachable AC power cord is used to provide power to the unit, while an AC voltage selection switch allows the unit to operate at 115V/60 Hz or 230V/50 Hz. Japan models operate at 100V, 50/60 Hz only. See the rear panel of your amp to verify the AC voltage capability.

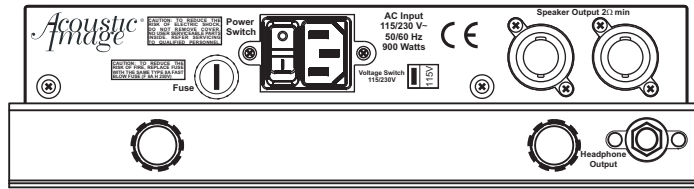
The input channels of the preamp incorporate combo jack interfaces that allow either a high impedance instrument input (to optimize the sound of piezo-type pickups) or a mic input with a built in 10 dB pad, a three-band EQ, an effects loop with return level control, a selectable low cut filter for reduction of low frequency boominess, a phase reverse switch, a direct out capability with ground lift and pre/post EQ switch, a master level control and a mute switch. The preamp also has a switch that allows the second channel to be disconnected from the main amp and connected to a satellite power amp to create a stereo system.

The speaker enclosure incorporates a 2x10-inch woofer configuration (one is downfiring and the other is front firing) and a 2.5-inch tweeter that is coaxially mounted in front of the front firing woofer. The tweeter has a three position level control (0 dB, -6 dB and off). The exclusive Room Coupling Control allows the user to adjust the output of the downfiring woofer to help control boominess in certain acoustic settings. A built-in, spring-loaded tilt mechanism allows the cabinet to be tilted back to better direct sound to your listening position. The cabinet is made of an acoustically inert, high durability, injection molded polymer material which dramatically reduces the weight of the cabinet. Each unit comes with a fitted slip cover and shoulder strap. A padded case is available.

The Ten2 is the loudest combo amp that we make but in designing it, we chose fidelity over efficiency so it won't play as loudly as the typical, lower fidelity 2x10 system. To generate higher SPLs may require an extension cabinet like the Ten2 EX or augmentation by a larger house system.

Operation

Power



Ten2 Rear Panel (shown in docking position)

Plug the detachable AC power cord into the receptacle on the back of the amp and into a wall receptacle. A power switch next to the AC connector turns on power to the pre- and power amps, illuminating a “power on” indicator on the front panel of the amp. An 8-amp fast blow fuse is mounted on the back panel. To replace the fuse, turn off the amp, remove the AC cord and use a small screwdriver to remove the fuse from the fuse holder. A spare fuse is included with this manual. The Ten2 will work with either 115 volt, 60 Hz AC or 230 volt, 50 Hz AC power. A switch located on the rear panel selects the appropriate voltage. Note that the correct AC power cord must be used for connection to the appropriate wall plug. If you do not have the right cord, you can buy one from an electronics or computer store. Be sure the switch is in the correct position for the intended application. **Operation at 230 volts with the switch in the 115 volt position will damage the unit.**

Please note that units sold in Japan operate at 100 volts only. The above mentioned voltage switch is not available for these units. **Operation of a 100 volt amp at any other voltage than 100 volts will damage the unit.**

Preamp

Refer to the signal flow diagram and the control panel drawing for more information (page 5).

Inputs

The Ten2 uses combo jacks for the input to each channel of its preamp. Either an XLR or 1/4 inch connector can be plugged into this type of jack. The 1/4 inch input has a 1 megohm input impedance that is optimized to get the best sound from piezo pickups. The XLR input is a low impedance balanced input with sufficient gain to allow microphones to be plugged into it. A switchable 10 dB pad is provided to attenuate the output of microphones that are too “hot” for the mic input. Phantom power is available through the connector for powering a mic or outboard preamp and can be activated using the push button switch located next to the connector. To avoid an audible “pop”, set the mic input level control all the way off when switching on the phantom power. An LED indicates when phantom power is on. The two channels of the Ten2 combo can be blended to mix two instruments, 2 microphones or a mic and an instrument thereby performing much like a small PA system.

Controls

The preamp has the following controls in each channel: input level, bass, mid, treble and effects level. In addition, there is a variable frequency, selectable low cut filter and a phase reverse switch in each channel and a master level control that affects both channels.

Level

The input level controls the level of the signal at the input stage of the preamp. The master volume controls the level of the signal at the output of the preamp (at the input of the power amp). Set the master control at “12 o’clock” and the input level at zero. The input level should then be used to control the overall output of the unit. The two controls are provided to allow independent control of “house” volume and “stage” volume when the unit is used as a stage monitor with a connection to a house PA. See the discussion under “Direct Out” below.

The maximum volume at which the system will play is limited by the capability of the speaker system. If more volume is needed, use a Ten2 EX extension cabinet or take a feed from the Direct Out jack to a PA system or another amplifier.

Tone

Each tone control has a center detent at the flat position. Experiment with settings to achieve the frequency balance that sounds best to you. In general, small values of boost and cut are best. The amp is designed with flat frequency response so only minor corrections should be required to compensate for room effects or “peaky” pickups in order to maintain the balanced response desired for acoustic instrument amplification. To minimize electronic noise, avoid operating all controls simultaneously at their maximum settings.

The bass control is a shelving-type that affects frequencies below 250 Hz and with a maximum boost/cut of 15 dB. The mid control affects frequencies between 300 Hz and 2000 Hz and has a maximum boost/cut of 15 dB. The treble control is also a shelving-type that affects frequencies above 1000 Hz with a maximum boost/cut of 15 dB.

Low Cut Filter/Phase Reverse

The low cut filter is a variable frequency type that inserts a 12 dB per octave rolloff at frequencies between 30 and 400 Hz, depending on the position of the control. Approximate frequency settings are noted on the frequency control. Note that the first half of the control’s rotation affects frequencies from 30 to 60 Hz, the last half of the rotation affects frequencies between 70 and 400 Hz. This is done so that there is plenty of control in the critical low frequency range. The low cut filter is used to reduce the bass output in cases where room location or instrument/pickup combination results in “boomy” sound. Depress the on/off switch to enable the filter. Start with the control fully counterclockwise and gradually turn it clockwise until the desired effect is achieved. Experiment with the position of the control to give you the sound you like best.

The phase reverse switch is used to reduce feedback and to control interactions between the two channels. If you are using two pickups or a mic and a pickup, you

will find the phase reverse switch to come in handy. Feedback resulting from the use of a mic can be reduced by inverting the phase in the channel in which the mic is input. Phase related interactions between a pickup and a mic or two pickups can be cleared up by reversing the phase of one of the channels and not the other. You should experiment with the phase reversal switch in each channel to see if the effect is one that you like.

Effects Loop

Acoustic Image preamps have output ("Send") and input ("Return") capability in each channel to allow you to use effects boxes. The send output is affected by the input volume and tone controls and can also be used as a preamp output for driving other power amplifiers. The Return input can be used to directly connect an external preamp to the unit's power amp. The effects level control in each channel controls the volume of the returned ("wet") signal relative to the original ("dry") signal. Because the effects loop is a parallel type, plugging something into the send output does not interrupt the signal path. So, a tuner can be plugged into the send output without affecting the signal going through the amp. When the effects loops are not used, the level controls should be set at zero.

The return input can also be used as an auxiliary input for connecting other line level signals such as a CD player.

Direct Out

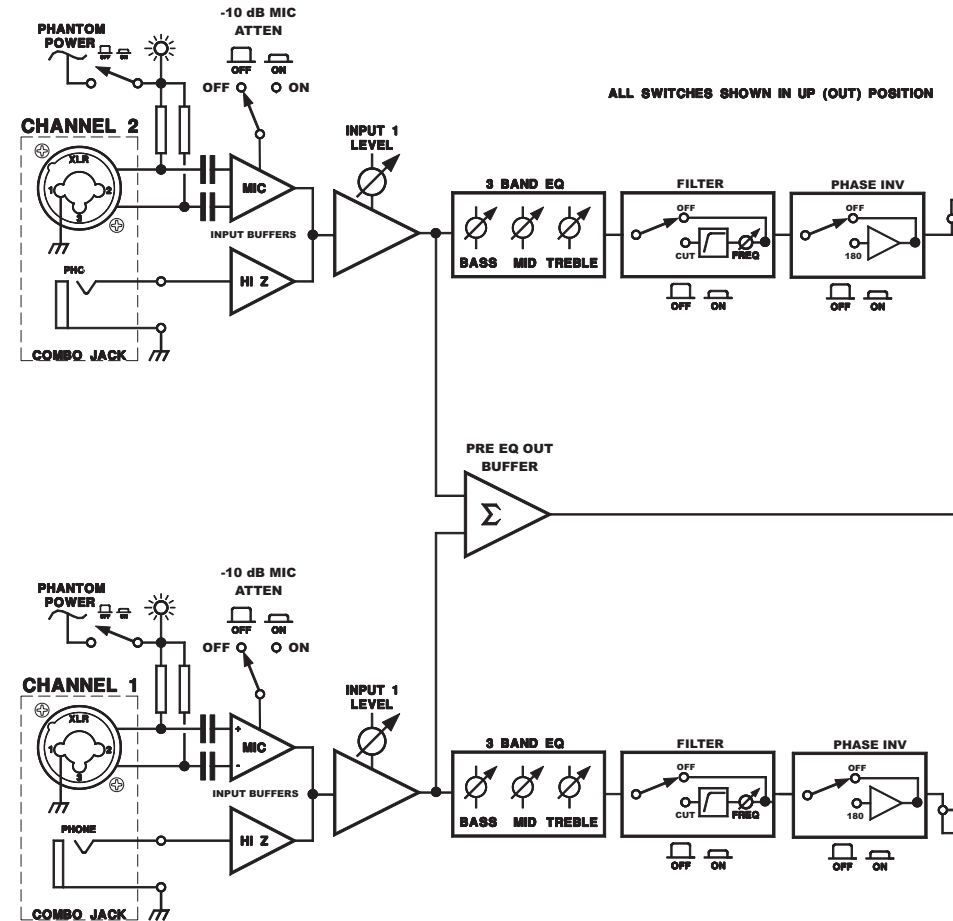
An XLR jack is provided for a Direct Out connection that allows the system's output to be fed to mixing boards of house PA systems or recording studios. As a result, the instrument amplified by the unit can be recorded or further amplified by the house PA system. In the Ten2 combo, the Direct Out signal is the combined output of the two channels. A switch is provided to allow you to select whether the output from the Direct Out jack is affected by the tone controls (post EQ) or not (pre EQ).

With the switch in either the pre or post EQ position, the input level control affects the level of the Direct Out signal, the master level does not. This allows independent adjustment of the "stage" volume (the volume coming from the combo amp) and the "house" volume (the volume in the house PA system) when the unit is used as a stage monitor. Once the level has been set for the house, if more volume is needed on stage, the master level can be increased. This will increase the stage volume but not the volume in the house PA.

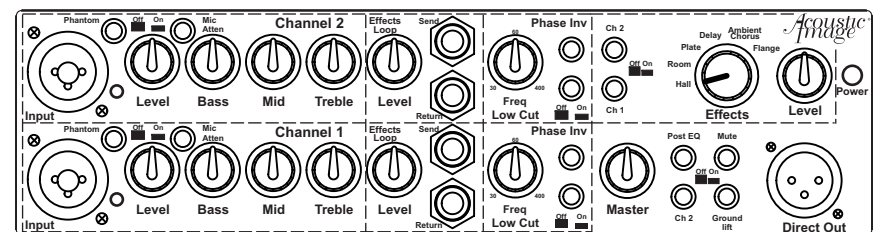
A ground lift switch is available to "lift" the ground from the output of the direct out--reducing noise should a ground loop create hum when the unit is connected to a mixing board.

Mute Switch

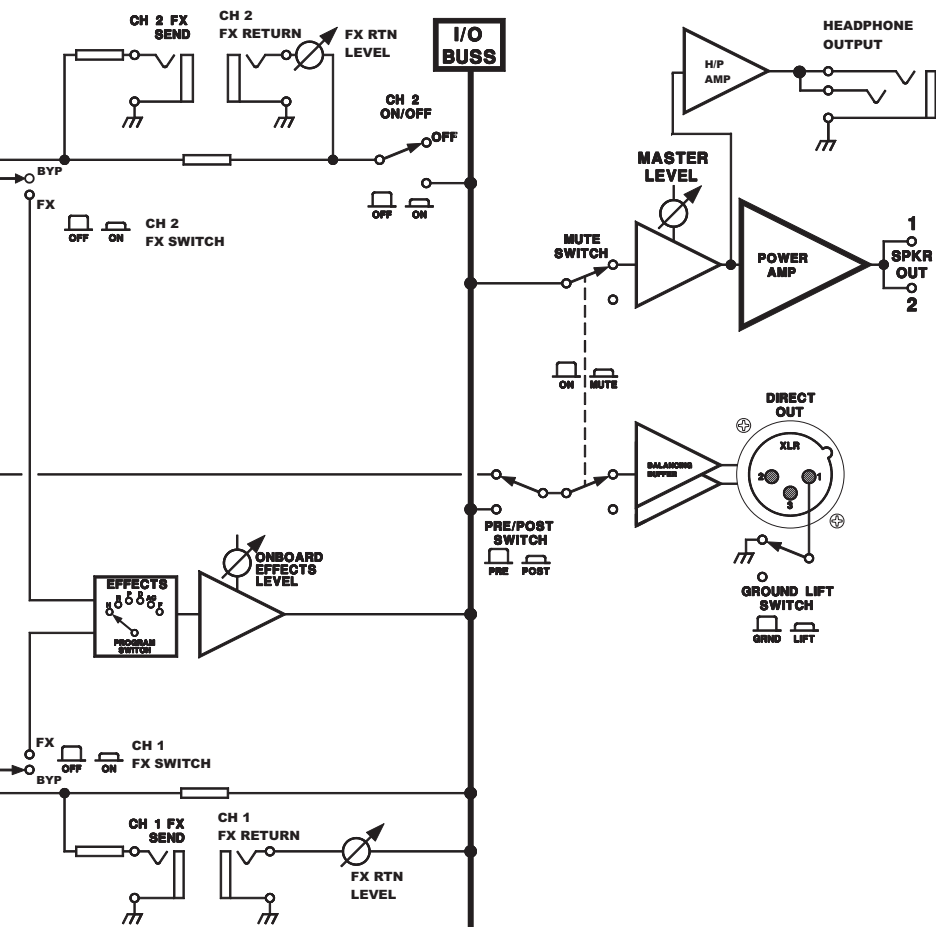
A switch is provided to allow you to mute the output of the amplifier without having to turn the amp off. This will allow you to tune your instrument on stage without being heard. The amp output and direct out signals are both muted by the switch. The mute switch has a red button on it to remind you that it is an important switch. **If you are not getting any sound out of the amp, check to make sure that the mute switch is off.**



Signal Flow Diagram for Ten2



Ten2 Control Panel



Stereo Operation

The two-channel preamp of the Ten2 can be operated in stereo mode. When it is in the “on” position, the switch labeled “Ch 2” connects the channel to the internal power amp and speaker. When it is in the “off” position, it is disconnected from the internal amp but is accessible from the channel 2 send output. By connecting the send output to a satellite power amplifier, and putting the switch in the off position, the preamp operates in stereo mode. Note that channel 2 remains in the direct out signal even when the switch is in the off position. This is done since stereo operation is typically a “stage” mode but not a “house” mode (house systems are typically not stereo). The Ch 2 switch has a red button to remind you that it is an important switch. **Note that channel 2 will not be heard through the speaker system unless the Ch 2 switch is in the depressed or on position. If you are not hearing channel 2 in the output, check to be sure that the switch is on.**

Effects

Our high-quality effects unit offers 6 program selections: 3 reverb programs (Hall, Room and Plate), a delay, an ambient chorus and a flanger. There are switches to select which of the two channels are processed by the effects unit. If both switches are engaged, the selected program appears in both channels. A level control affects the level of the effects signal that is mixed with the “dry” signal to control the overall effect of the selected program. You should experiment with both the program selection and the level control to find the sound that you prefer. When effects are not used, the switches for both channels should be off and the level control should be turned fully counterclockwise. Note that the flange effect is noisy, it is normal to hear the modulation of the flanger when no signal is present.

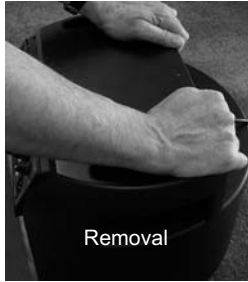
Headphone Output

There is a headphone output on the rear panel of the Ten2. You can plug a standard 1/4 inch stereo plug into this output to connect a headphone for private listening. If your headphone has a 1/8th inch plug, you can buy an adapter to allow you to use the 1/4 inch output jack.

When you plug into the jack, the amp is muted. Sound will only be heard through the headphones. The headphone is connected to the output of the preamp so all of the controls on the preamp, including effects, will affect the signal heard through the headphones. When the headphone plug is removed from the jack, the amp will come back on. **There is about a 5 second delay between removal of the plug and the amp coming back on, so expect a pause before you will hear anything from the amp after the headphone is removed.** Anytime anything is plugged into the headphone output jack, the amp will be muted so make sure that nothing is plugged into the jack when you want to use the amp normally.

Docking System

The amp head component of the Ten2 can be removed and used as a stand-alone amplifier. To remove the head unit, first disconnect the short speaker



cable that connects the speaker cabinet to the amp, then unscrew the docking screws on the rear panel until they are loose. Grip the cabinet as shown and use the tips of your fingers to push the head unit out. The fit is quite snug so some force will be needed.

Once you have removed the head, you will notice the rubber feet stored in a compartment on the bottom. Remove the feet and screw them into the four positions on the bottom of the head. When you want to put the head back into the cabinet, you will have to remove the feet and put them back into the storage compartment.

To reinsert the head unit, grip the cabinet as shown and push it in with your thumbs. Again, the fit is snug so some force will be needed. Once the head unit is in place, tighten the docking screws to pull the head tight to the docking plate. Reconnect the speaker cable and the unit is ready to go. When transporting the Ten2, it is best to disconnect the speaker cable at the speaker end so that there is no cable loop that can get caught on passing objects. The cable will have to be disconnected in this way so that the slip cover will fit over the amp.

Connecting An Extension Speaker

An extension speaker (ideally, the Ten2 EX) can be connected to the amp to increase its output level using the jack provided on your amp's rear panel. Speakers are connected via Neutrik Speakon connectors ("twist lock" type). These connectors are used because of their low contact resistance and non-shorting operation. The output of each Speakon connector is wired to pole "1". Make sure the cables you use to connect an external speaker are similarly wired.

The Ten2 has two outputs on the rear panel but one of them is used to connect to the internal speaker via the short jumper cable. So, one output is available for connecting an extension cabinet.

The power amplifier in the Ten2 is capable of driving speaker loads as low as 2 ohms. Use a high quality speaker system in order to get the maximum performance from the amp. The Acoustic Image Ten2 EX is an excellent choice.

The power amp is short circuit protected. If a short is connected to the extension speaker jack (or if the internal speaker is shorted), the output signal will be interrupted until the short is removed. If a short is present, you will hear a

ticking sound at 3 to 4 second intervals which indicates that the short circuit protection is working. **To be on the safe side, you should shut off the power to the amp before connecting or disconnecting speakers from the unit.**

The Ten2 can be operated with the speaker disconnected. This can be useful in two circumstances. The first is when you are recording from the direct out of the preamp and don't want the output of the combo amp to be heard. In that case, disconnect the internal speakers and set the master level to zero. By setting the master level to zero, the signal to the power amp is turned off and it is not driven without a speaker load which can damage the amp. **Be sure to set the master level to zero when you have disconnected the internal speaker and another speaker load is not connected to the amp. Operating the combo with no load and the master level turned up can damage the amp.**

Speaker Placement

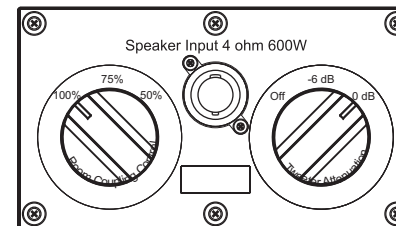
The omnidirectional low frequency output of the Ten2 and Ten2 EX makes speaker placement relatively noncritical. You will easily be heard all over the bandstand no matter where one or more are located. However, best results are obtained when the cabinet is placed on the floor. Putting the unit on a shelf or stand will reduce bass frequencies. There may be circumstances where this is desirable. Again, feel free to experiment to find the sound that is best for you.

Tilt Mechanism

In some settings, such as a hollow stage or small, "boomy" room, your amp or enclosure will produce too much bass. One way to cut unwanted bass output is to use the built in tilt back feature to lift the front of the cabinet, reducing the coupling to the floor. To do this, pull the stand into its forward position and set the combo in place on the floor. The stand is spring loaded so when you pick up the unit, the stand will spring back into its storage position. You may want to use the tilt stand at all times in order to aim the high frequency output of the speaker toward your ear so that you can better hear the amp.

Tweeter Level Control

The tweeter level control is located on the rear panel of the speaker cabinet (see picture of the rear panel below). It is a three position switch with a selection of zero attenuation, 6 dB attenuation or off. The tweeter operates from 3000 Hz an up so its effect on the sound will be audible. Under most circumstances, it should be operated with zero attenuation. Experiment with the control and pick the level of attenuation that sounds best to you.



Ten2 and Ten2 EX Rear Panel

Room Coupling Control

The Room Coupling Control is also located on the rear panel of the speaker cabinet. It is used to control the low frequency output of the downfiring woofer. It is useful in controlling “boominess” in difficult acoustic settings. It is a three position switch with settings of 100%, 75% and 50%. At the 100% setting, the downfiring woofer is operating at full output. At the 75% setting, it’s output is reduced slightly. Use this setting when there is only moderate boominess in the room. At the 50% setting, the output is reduced even more. Use this setting for the most difficult situations. Experiment with the control so you can get a good idea of its effect on the sound.

Description of the Ten2 EX

The Ten2 EX is the speaker cabinet portion of the Ten2 combo. It is about 3 inches shorter and about 5 pounds lighter than the Ten2 because the docking bay for the amplifier is not attached and the amp head is not provided. It has the same speakers and the same performance as the Ten2. It is the ideal extension cabinet for the Ten2 but it can also be used effectively with any of our other 1x10 combo amps. In fact, the other combos can be stacked on top of the Ten2 EX to create a 3x10 system.

Care

Acoustic Image combos and cabinets are made from injection molded polymer materials. A little care will keep yours looking new for years to come. Use a clean, dry cloth to clean the cabinet and metal parts of the amplifier.

Warranty and Repair

We stand behind our products with a full warranty of five years from the date of purchase. Should a problem arise, please call us before returning your amplifier or enclosure. Naturally, our warranty does not cover products that have been damaged through misuse. Be sure to check our web site regularly, we have an FAQ section and we post helpful information for getting the most out of your Acoustic Image product.

Warranty Information

Serial Number _____

Acoustic Image
5820 Triangle Drive
Raleigh, NC 27617

Phone: 919-785-1280
Fax: 919-785-1281
www.acousticimg.com

Specifications

System

Frequency Response	30 Hz - 20 kHz (40 - 16 kHz \pm 3 dB)
Max SPL	>116 dB at 1 meter
AC Power	115V/60 Hz or 230V/50 Hz, switchable, Japan version is 100V, 50/60 Hz only
Size	17" H x 15" W x 13" D, 14"H (EX)
Weight	28 lbs, 23 lbs (EX)

Preamp (Mic and Instrument Inputs through combo jack)

Mic Input	600 ohm balanced, XLR connector, switchable 10 dB pad
Phantom Power	47 volts, on/off switch w/LED indicator
Instrument Input	1 M Ω impedance, 1/4 inch jack
Direct Out	+4 dB, balanced, XLR connector, ground lift, pre/post EQ selector
Effects Loop	Parallel type with return level control
Bass Control	Shelving type, \pm 15 dB at 60 Hz
Mid Control	\pm 15 dB at 650 Hz
Treble Control	Shelving type, \pm 15 dB at 10 kHz
Low Cut Filter	-12 dB/octave sweepable from 30 to 400 Hz
Phase Reverse	Switchable 180 degree phase reversal

Effects

Type	Digital with 6 presets and level control
Program Presets	3 reverb (hall, room, plate), delay, ambient chorus, flange

Power Amp

Topology	Class D (PWM)
Switching Frequency	250 kHz
Output Power	>450W at 8 Ω , >800W at 4 Ω , >1000W at 2 Ω (internal speaker is 4 Ω)
External Speaker Output	Neutrik Speakon type (pole 1), 2 Ω min load including internal speakers, if connected

Speaker System

Woofer	Dual 10 inch, one downfiring with level control, one forward firing
Tweeter	2.5 inch forward firing with attenuation control
Crossover	Passive, alignment corrected
Impedance	4 Ω
Power rating	600W

Supplied Accessories

Fitted slip cover with cord storage pocket and shoulder strap

Available Accessories

Padded gig bag with shoulder strap made by Mooradian, kit to convert cabinet with head removed to an extension cabinet (adapter, filler panel, padded case for head)

FCC Compliance Notice

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



TEN2™
Model 570 AA

TEN2 EX™
Model 571 EX

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Musical Amplification:
Setting The Standard