ZENITH
THE SOUND OF PERFECTION
ATTACK
MODULE

ATTACK MODULE

ART ATTACK AMPLIFIERS USER'S GUIDE

Tube-equipped 100-watt amplifiers:
Model T28 equipped with two 8" custom-designed speakers
Model T12 equipped with one 12" custom-designed speaker
Model T12C equipped with one 12" specially designed Celestion speaker

Solid-state 80-watt amplifiers:
Model S28 equipped with two 8" custom-designed speakers
Model S12 equipped with one 12" custom-designed speaker

Speaker cabinets:
Model 731 equipped with two 8" custom-designed speakers
Model 732 equipped with one 12" custom-designed speaker
Model 733 equipped with one 12" specially designed Celestion speaker

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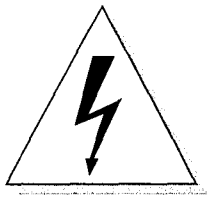
Unpacking

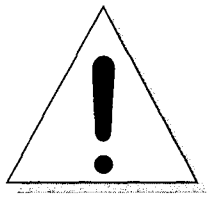
Before you plug in, inspect your Attack amp for any damage and to make sure that its power cord is included. If parts are missing, or if any damage has occurred, contact your dealer. We designed the original box and packing materials to protect your amp during shipment. Save these packing materials. If you ever need to send your amp to us or to anyone else, the original box and packing materials will ensure safe transit.

ATTACK MODULE

SAFETY PRECAUTIONS



Warning: To avoid the risk of shock or fire, do not expose this amplifier to moisture. Do not remove the chassis from its cabinet, or remove metal covers from chassis parts. Removing the chassis from its cabinet exposes extremely dangerous high voltages. There are no user-serviceable parts inside. Hazardous voltages are present inside the chassis. Refer all servicing to qualified personnel. Caution: To avoid a fire hazard, always replace the fuse with the same type and rating.



Caution: Always replace the line cord (mains supply) with the proper type.

Caution: Always turn off the amplifier before connecting or unplugging any speakers.

Caution: This amplifier is very loud. Do not operate with your ear directly in front of the speaker.

In the event that you have questions, comments, or suggestions, please contact us at:

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Rochester, NY 14608
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Introduction

Thank you for purchasing an Attack amp—and congratulations: You now own an amplifier that represents one of the biggest leaps forward in the history of amplification. Traditional overdrive and clean textures join with ART's revolutionary Quad-S Sonic Stereo Spatial Sound, plus sustainer/compressor and chorus circuits, to create the versatility that today's musician demands. Other highlights include dual-channel operation, sophisticated signal processing, flexible patching options, an extremely roadworthy housing, and 80 or 100 watts of power (depending on the model) that can drive up to three cabinets simultaneously.

Features

- High power
- Low noise
- Built-in chorus
- Built-in sustainer/compressor
- Dual-channel operation
- Quad-S stereo emphasis circuitry
- Lightweight, durable carbon fiber composite cabinet
- Extremely strong steel grille
- Remote footswitch jack for channel switching and Lead Turbo Gain Boost
- Stereo effects loop
- Stereo line output
- Stereo headphone jack
- Designed and manufactured in the United States of America

Fill in the following information for your reference:

Model name _____

Date of purchase _____

Purchased from _____

Serial number _____

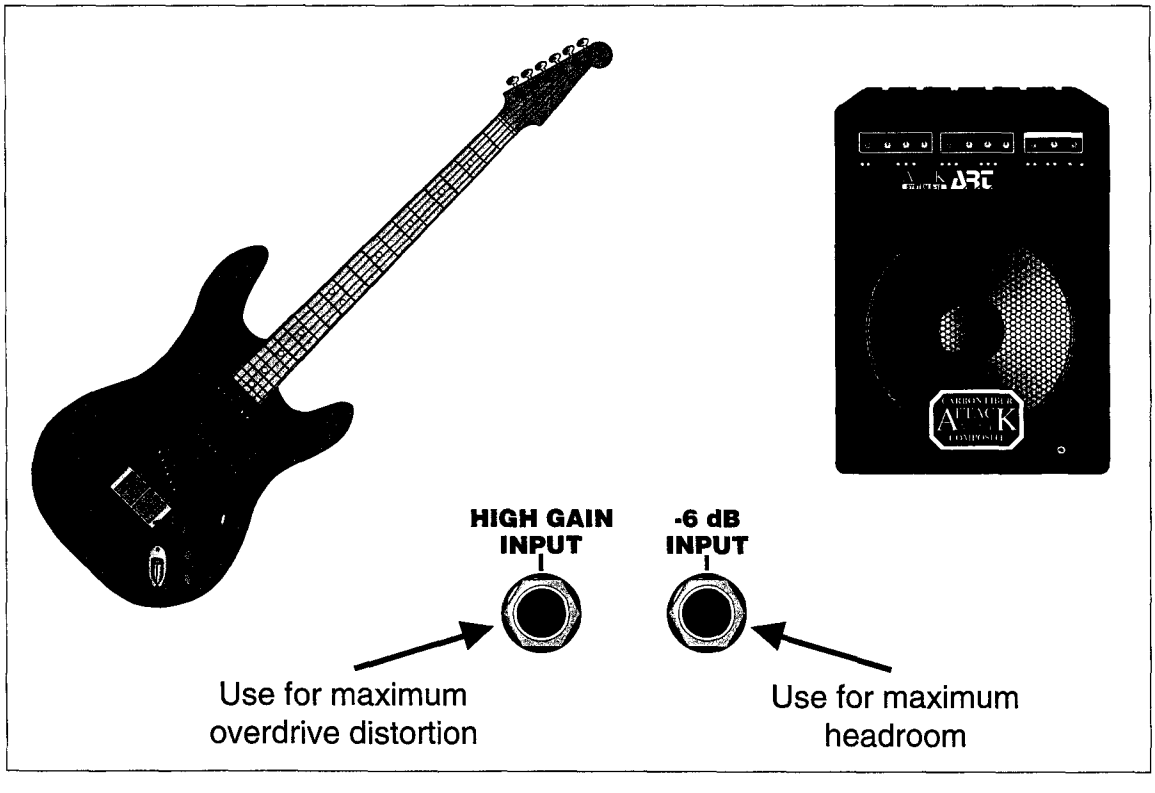
700-5004-101

Quick Start Instructions

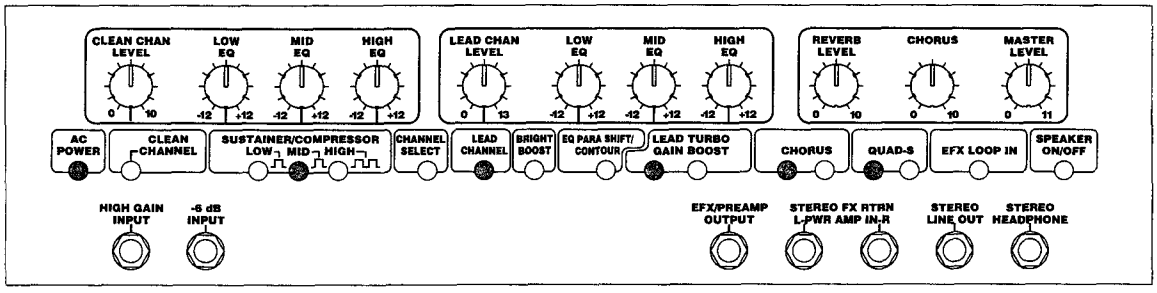
By now you've pulled your new amp out of the box and want to try it out. We don't blame you. Just follow the few instructions below, and you'll be ready to play to your heart's content. Then, when you want in-depth information on how to get the most out of your amp, check out the rest of the manual.

1. Plug the AC cord into the back of the amp.
2. Plug the AC cord into the wall socket.
3. Plug your instrument into either the High Gain Input or the -6dB Input (the first one is much hotter—ideal for overdrive guitar tones). Use a good, shielded cord.
4. Make sure the Clean Channel Level, Lead Channel Level, and Master Level are turned all the way down (fully counterclockwise).
5. Check that the front-panel Speaker On/Off switch is in the "on" position.
6. Turn your Attack amp on (the power switch is in the recessed area in the back of the amp). Note: If your amp has a tube in its preamp section (Model T28, Model T12, or Model T12C), it will take about a minute to be fully warmed up.
7. Turn up the Clean Channel and Lead Channel levels, as well as the Master Level.
8. Turn up your instrument's volume and start playing. Adjust the levels to suit your taste.

Twist the knobs, push the buttons, and get familiar with the Attack's amazing range of sounds. Then crack open this manual. See you in a few hours.



FRONT PANEL CONTROLS



AC Power LED

When the amp is on, so is this LED. If the LED isn't glowing, refer to the section on page 12 labeled Fuseholder.

About The Clean Channel

The Clean channel can give your instrument a crystal-clear sound, especially desirable for samplers, drum machines, some guitar styles, etc. It also has enough gain to drive the amp beyond full clipping, so rest assured that you aren't locked out of distortion when you use this channel. The preamp and power amp stages have built in EQ that gives a well-balanced sound with the furnished speaker. This hidden EQ allows the front-panel EQ controls to either add or subtract frequencies in their ranges, to accommodate a wide variety of sounds. The EQ center frequencies are specially chosen for guitar.

Clean Channel LED

When the Clean Channel LED is illuminated, your instrument is routed through the Clean Channel, and all Clean Channel functions are active.

Clean Chan Level

This sets the level from your instrument on the way to the preamp section. Setting it too low and turning up the Master Level too high can cause the signal entering the preamp to be anemic, resulting in more noise than you want, so make sure that your preamp is receiving a healthy signal. The Clean Chan Level knob also works with the Master Level to set the distortion amount. Even though it's designed as a clean channel, hot pickups and/or high Clean Chan Level settings can make the Clean Channel's preamp introduce grit—which can be a great way to add dynamics and punch to your rhythm work. See the section labeled Front Panel Jacks, page 10, for details on setting optimum clean levels.

Low EQ

The foundation, support, or strength that form the backbone of your tone come from this control. It has a fixed center frequency where you can boost or cut by ±12dB. At the center point (12 o'clock), there's no boost or cut. Because speakers react differently to different amounts of volume and distortion, the Low EQ's effect on your overall sound will be different at high and low volumes and high and low distortion amounts.

Mid EQ

The Mid EQ circuitry provides the "meat," or "body," that fills out your sound. It has a fixed center frequency where you can boost or cut by ±12dB. At the center point (12 o'clock), there's no boost or cut. While most players are tempted to only boost this control, try cutting—the effects, especially for Strat-style rhythm, can be dramatic.

High EQ

With a specially selected center frequency and a boost/cut range of ±12dB, the High EQ lets you control the highlights of your tone, from bright and glassy to dark and sinister. Like the other EQ controls, at the center point in the knob's rotation (12 o'clock), there's no boost or cut.

Sustainer/Compressor

The Sustainer/Compressor has attack and decay characteristics carefully chosen to be very musical with guitar, much like some of the older tube- and pedal-type compressors that are favorites with studio producers and engineers.

The Sustainer/Compressor has three settings:

Setting	Compression Amount
Low	10dB
Mid	20dB
High	30dB

To select the low setting, push in the left switch; to select the mid setting, push in the right button; and to activate its high setting, push in both buttons. The LED between the two switches glows whenever the compressor creates more than a 1dB gain reduction, providing you with a relative indicator to help set your guitar and clean level controls.

Note: The Clean Chan Level control comes after the compressor, making it easy to balance your compressed and uncompressed sound levels.

Channel Select switch

The Channel Select switch lets you change the operational channel from the Clean Channel to the Lead Channel (the LED indicator on each channel tells you which one is active). Switching may be done by a remote footswitch. See page 13 for details.

About The Lead Channel

The name should be a dead giveaway, but the Attack amp lets you create any kind of lead tone you want, whether it's clean yet crunchy, singing and sustainy, or full-out ultra overdrive on the brink of autodestruct. Like the Clean Channel, the EQ control ranges are specially selected for their musicality with a guitar. In addition, the Lead Channel provides you with extra sonic tools, a Bright Boost switch, an EQ Para Shift/Contour switch, and the hair-raising Lead Turbo Gain Boost switch.

The Lead channel's distortion characteristics clean up smoothly at lower levels and increase smoothly at higher levels, giving you a very balanced, workable sound. The tube-equipped Attack amps (Model T28, Model T12, or Model T12C) have 6dB more lead gain than their solid-state counterparts, and therefore their distortion is slightly denser at extreme settings, but virtually all other distortion characteristics are similar.

Lead Channel LED

When the Lead Channel LED is illuminated, your instrument is routed through the Lead Channel, and all Lead Channel functions are active.

Lead Chan Level

The Lead Channel Level knob regulates the Lead Channel preamp's volume and works with the Master Level to set the amp's overall level and distortion amount. A simple rule of thumb is, the higher the Lead Chan Level is set, the more distortion you get. Its effect on distortion varies, depending on the output from an instrument (hot or standard pickups), the signal strength coming from stomp-box or other effects between the instrument and the Attack amp, and the setting of the tone controls, Bright Boost, and Lead Turbo Gain Boost.

Low EQ

The foundation, support, or strength that form the backbone of your tone come from this control. It has a fixed center frequency where you can boost or cut by ±12dB. At the center point (12 o'clock), there's no boost or cut. Because speakers react differently to different amounts of volume and distortion, the Low EQ's effect on your overall sound will be different at high and low volumes and high and low distortion amounts. When the Lead Channel is set for overdrive, note that the low end can be exaggerated. As always, experiment until you find the setting that suits you.

Mid EQ

The Mid EQ circuitry provides the "meat," or "body," that fills out your sound. It has a fixed center frequency where you can boost or cut by ±12dB. At the center point (12 o'clock), there's no boost or cut. Boosting this control, especially with heavy overdrive, fills up the sonic spectrum and makes the sound extra-chunky. Cutting, especially to extremes with heavy overdrive, gives the tone a "sucked-out" sound.

EQ Para Shift/Contour

This button works in conjunction with the Mid EQ circuitry, and it shifts the center frequency of the Mid EQ control. Because the EQ Para Shift/Contour circuit works in conjunction with the Mid EQ control, to hear its effect, make sure that the Mid EQ control isn't set at its 0dB (12 o'clock) position. When the Mid EQ control is fully cut (-12dB) and the Bass and Treble slightly boosted, the EQ Para Shift/Contour control gives you two distinctly different metal sounds. For example, with the Mid EQ boosted and the Bass and Treble near their center point, you can get a midrangey American amp sound when the EQ Para Shift/Contour is out. With the EQ Para Shift/Contour switch in, the sound takes on a more characteristically British texture.

High EQ

With a specially selected center frequency and a boost/cut range of ±12dB, the High EQ lets you control the highlights of your tone, from bright and glassy to dark and sinister. At the center point (12 o'clock), there's no boost or cut. Note that the apparent effect of the High EQ control changes in relation to the amount of distortion, as well as whether the Lead Turbo Gain Boost and/or Bright Boost are engaged.

Bright Boost

The Bright Boost acts similarly to the bright switch on some vintage amps, providing more treble pre-emphasis on the front end of the distortion circuitry. This results in a denser high end—perfect for shredding leads.

Lead Turbo Gain Boost

The Lead Turbo Gain Boost switch kicks in extra gain on the Lead Channel. Therefore, you can set up the Attack as a three-channel preamp, with Clean Channel sound, Lead Channel Level-controlled chunky rhythm distortion sound, and Lead Turbo Gain Boost cutting lead sound. Using an external footswitch to turn the Lead Turbo Gain Boost on and off makes this virtual three-channel setup easy to control. See page 13's section, Remote Switch jack, which describes the procedure for using a footswitch.

Reverb Level

Like classic amps that span the history of rock and roll, your Attack is equipped with a spring reverb. One knob controls its effect on the signal coming from both preamp channels.

Chorus

This knob sets the speed of the Chorus' sweep. Turning clockwise increases the speed; turning counterclockwise slows it down. In addition to thickening the sound, the Chorus also changes mono sources into stereo, making them seem even more expansive.

The Chorus effect is much more evident in stereo. When the amp is operating in mono, you still get the growl, pitch detuning, and thickening effects of the chorus, but some of the spatial effects won't be apparent. The Chorus and Quad-S enhance one another in both stereo and mono mode. If your amp has a single speaker, you can hear the stereo effects without plugging in an external speaker: Use either the Stereo Headphone output jack into headphones or the Stereo Line Out into a stereo monitor system.

Chorus Switch

Push this switch in, and the chorus is activated (the LED will tell you it's on). Push it again, and the chorus is off. The chorus has a preset depth and mix, plus its output is stereo.

Master Level

The master governs the amp's maximum loudness, but it's also the second half of the Clean Channel Level and Lead Channel Level controls. That is, by regulating a channel level control and the Master Level, you change the distortion characteristics, as well as the overall loudness.

Quad-S switch

We added a unique feature called Quad-S, which gives the sound a wider feel, especially when the chorus is on and when an extension speaker cabinet is used. It turns a mono source into a stereo image. The Model T28 and Model S28 have two speakers and are driven in stereo, so the effect is very noticeable, even without extension cabinets connected.

For Quad-S to be most apparent, the amps must be in stereo mode, which makes the effect's imaging component more easily perceived. Otherwise, when you engage Quad-S while the amp is in mono mode, you will hear tonal differences and some bass enhancement, but you won't get the full effect.

Note: The Quad-S and Chorus enhance one another in both stereo and mono mode.

EFX Loop In switch

This switch lets you bypass the effects plugged into the effects-loop jacks. If you have effects patched into the effects loop, it's a good idea to check the in/out status of this switch before you play the first note of your set.

Speaker On/Off switch

This switch lets you turn off the speakers, which is handy when you're tuning up or practicing with headphones plugged into the amp. Note, though, that the headphones can be used when the speaker is turned on, so before you crank it up for a headphone practice session at 3:00 AM, make sure the speaker is off.

FRONT PANEL JACKS

High Gain Input

This is the normal input, designed to provide enough gain before clipping with most pickups.

-6dB Input

If your guitar has "hot" pickups or an active preamp with a lot of gain, or if you want a clean sound that never reaches the clipping point, this is the input to use.

ART's engineers designed the Attack amps to help guide you, should you need assistance finding the best input for your needs. Try this: Plug into the clean channel. Turn off the Compressor/Sustainer by having both of its switches in the "out" position. With both switches out (meaning that the compressor is off), the LED between the switches now acts as an input clipping indicator. To get your best clean sound, adjust the Clean Channel Level control until the LED rarely or never lights, except when you really whack a full chord.

EFX/Preamp Output

You can place signal processors in the signal path between the Attack's preamps and the power amp section very easily. A standard shielded cord from the EFX/Preamp Output to a signal

processor, and another shielded cord from the processor to the Left (mono) Stereo FX Rtrn/Power Amp In jack is the easiest way. (Note: Never use a speaker cord to connect signal processors in effects loops.) If your signal processor has stereo outputs, you can connect its second output to the right Stereo FX Rtrn/Power Amp In jack.

Be sure to set your straight/effects blend at the signal processor, since all of your preamp's signal passes through the effects loop. Do not use an effects-only output to return from the processor to the amp. Always use the "mix" output, if the unit has one.

Note: If your Attack amp has only one speaker, and no external speakers attached, then the stereo return signal will be automatically mixed to mono.

Note: Always turn your amp off, or the channel volume all the way down, before connecting any external gear to your amp.

The EFX/Preamp Output jack can be used to supply two different outputs. The first—a preamp output with reverb, but no chorus—is taken by inserting a plug all the way into the jack. A second type of output—a signal from the preamp without reverb—is accessed when you insert the plug only halfway. This second option is useful for recording the basic sound directly to tape without effects.

Stereo FX Rtrn/Pwr Amp In L&R

These two jacks are located after the reverb and before the Chorus, Quad-S, and Master Level. If you use mono effects in your effects loop, then bring their output to the Left Stereo FX Return/Power Amp In jack. If your effects are stereo, use both Stereo FX Return/Power Amp In jacks. If the right return jack is used by itself, it only delivers signal to the right power amp.

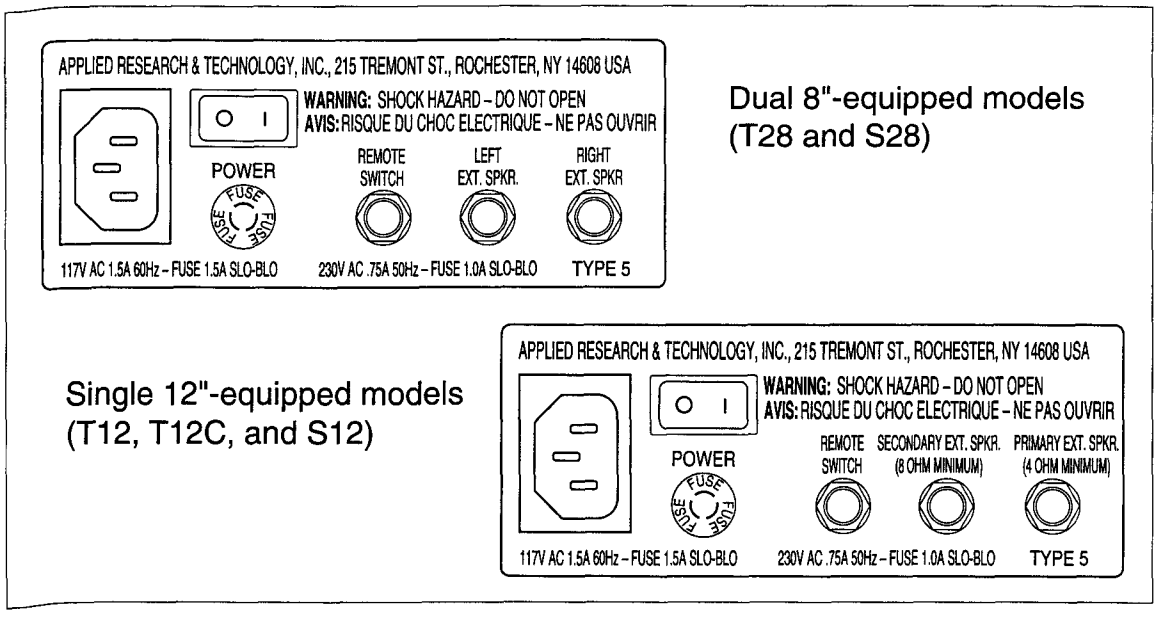
Stereo Line Out

The Stereo Line Out jack offers outputs for recording or P.A. connection that are post-effects and pre-Master Level. Like the headphone output jack, the tip is wired for the left channel, and the ring is wired for the right.

Stereo Headphone

The Stereo Headphone jack has plenty of output for most types of headphones. Note that it's still active when the Speaker On/Off switch is in the "off" position.

REAR PANEL



AC cord receptacle

A detachable power cord plugs into the receptacle on the rear of the amp. Always use the cord supplied with the amp, and in the event that the power cord requires replacement, replace it with the same type of power cord. Consult your ART dealer or ART's Customer Service for further information.

Be sure to plug this cord into a grounded electrical (mains) power socket whenever possible. These outlets have a grounding pin in addition to the normal line and neutral pin. The power cord supplied with your amp has a 3-pin plug so that you and your amp are protected from shocks. Do not cut off or damage the ground pin. If the available electrical outlet is of the older 2-pin type, use a suitable ground-lift adapter.

Note: Avoid using long extension cords. Long cords have sufficient resistance to electrical current that the voltage arriving at your amp can be significantly reduced. This can adversely affect your amp's (and other gear's) performance.

On/off switch

This switch turns the amp on and off—nothing more. Pushing the side of the switch with the "I" turns it on; pushing the side with the "O" turns it off.

Fuseholder & fuse values

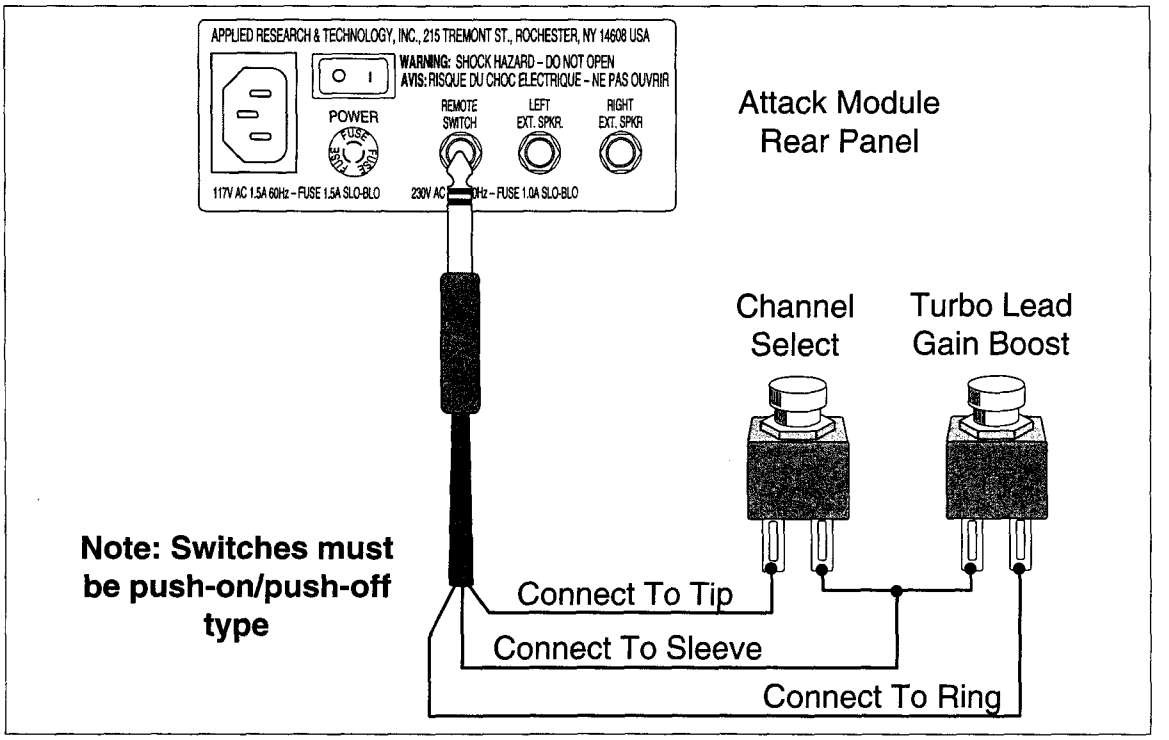
The fuseholder houses a fuse that protects the amp's circuits from damage from electrical malfunctions such as shorts or momentary surges. Your amp is equipped with the following fuse type:

In U.S.A.: 3AG, 1.5 ampere Slo-Blo
In Europe: 1 ampere Slo-Blo

A symptom of a blown fuse is no illumination of the front-panel AC Power LED and no sound coming from the amp. Before replacing the fuse, check the power switch to make sure it's really on. Also check that the line cord is plugged into the wall socket (and make sure the wall socket is "live"—plugging in a radio, light, or fan is a good way to check, if you're in doubt). If the outlet is "live," the cord is plugged in, and the AC Power LED still isn't lit, turn off the amp's power switch, unplug the amp from the wall, and check the fuse on the Attack amp's rear panel—grasp the fuseholder, turn it counterclockwise while pushing in, and then pull it out. Look at the fuse: The thin, silver strip, called the filament, should run continuously from one end to the other. If the filament appears broken or melted, or if the inside of the glass appears burned, replace the fuse with an exact replacement. If a replacement fuse blows, turn off the amp and consult your ART dealer or ART's Customer Service department.

Remote Switch

The rear-channel jack marked Remote Switch is actually a jack for two switches that control the Channel Select and Lead Turbo Gain Boost switching. The jack is a 1/4" TRS type (tip/ring/sleeve—best known as the type used for stereo headphones). If you plan to use two footswitches, you will need to connect them to a 1/4" TRS plug in the following manner (they must be push-on/push-off types):



As the diagram shows, the Channel Select is connected to the tip, and the Lead Turbo Gain Boost is connected to the ring. The sleeve is a common connection. The Channel Select and Lead Turbo Gain Boost switches operate uniquely: The front-panel switches invert the operation of the external switches. That is, if you use your footswitch to select the Lead Channel, you can push the Channel Select button on the front panel and change it to the Clean Channel. And if you select Lead Turbo Gain Boost from the footswitch, you can turn it off at the front panel. This can be useful if you have LEDs on your footswitch and want the footswitch's LEDs to be in sync with the front panel.

About The External Speaker Jacks

All of the Attack Module amps have stereo processing from the effects section in the preamp through the power amp stages.

Single 12" Speaker Models

In the single-12" models, we run the power amps in bridged mono mode (meaning that their outputs are combined) if no external extension speaker is used. This maximizes their output power. To fully appreciate the stereo effects processing, connect an external extension speaker to the jack on the rear panel labeled Primary Ext. Spkr. (By doing this, you split the power amps into stereo, with each speaker getting half of the total voltage.) The Secondary Ext. Spkr. jack should only be used to drive an external speaker when the Left Ext. Spkr. jack is used first.

Note: Always use extension speaker cabinets with an 8-ohm impedance.

Dual 8" Speaker Models

In the dual-8" speaker-equipped models, the speakers are already powered in stereo, so connecting external speaker cabinets doesn't have to be done in any particular order.

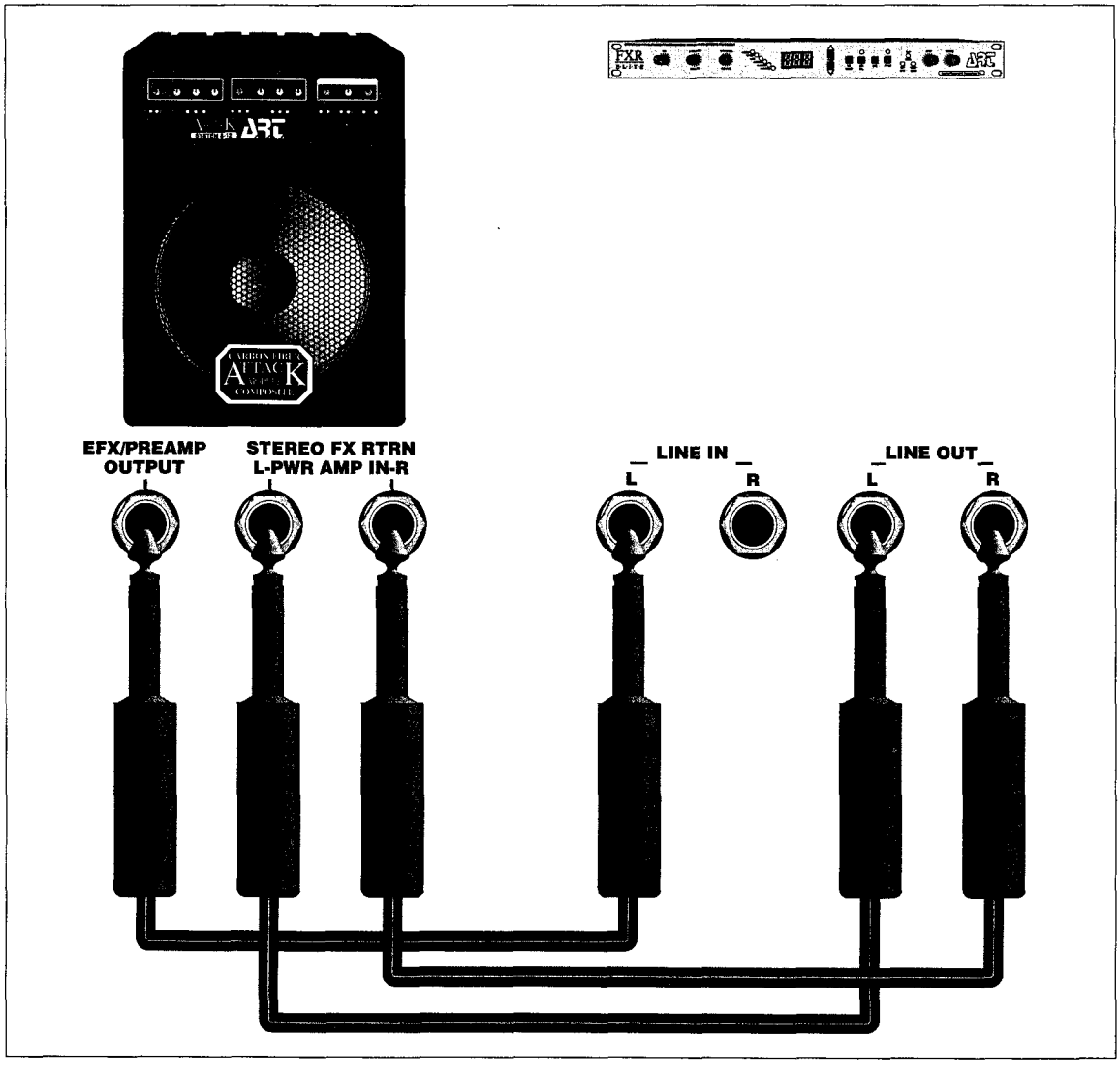
Warning! Never connect an External Speaker output to the input of any amplifier, tape recorder, mixer, headphones, or signal processor. The high power level from the Attack's power amp section may cause tremendous damage to gear designed for instrument- or line-level sources. Only connect speakers with sufficient power-handling capabilities to the External Speaker outputs.

CONNECTING THE ATTACK AMPLIFIER WITH OTHER GEAR

The following illustrations will help you to properly connect your Attack amp to other amps, extension speaker cabinets, and recording and P.A. gear. Make sure your amp and all other gear are turned off whenever you make or change any connections.

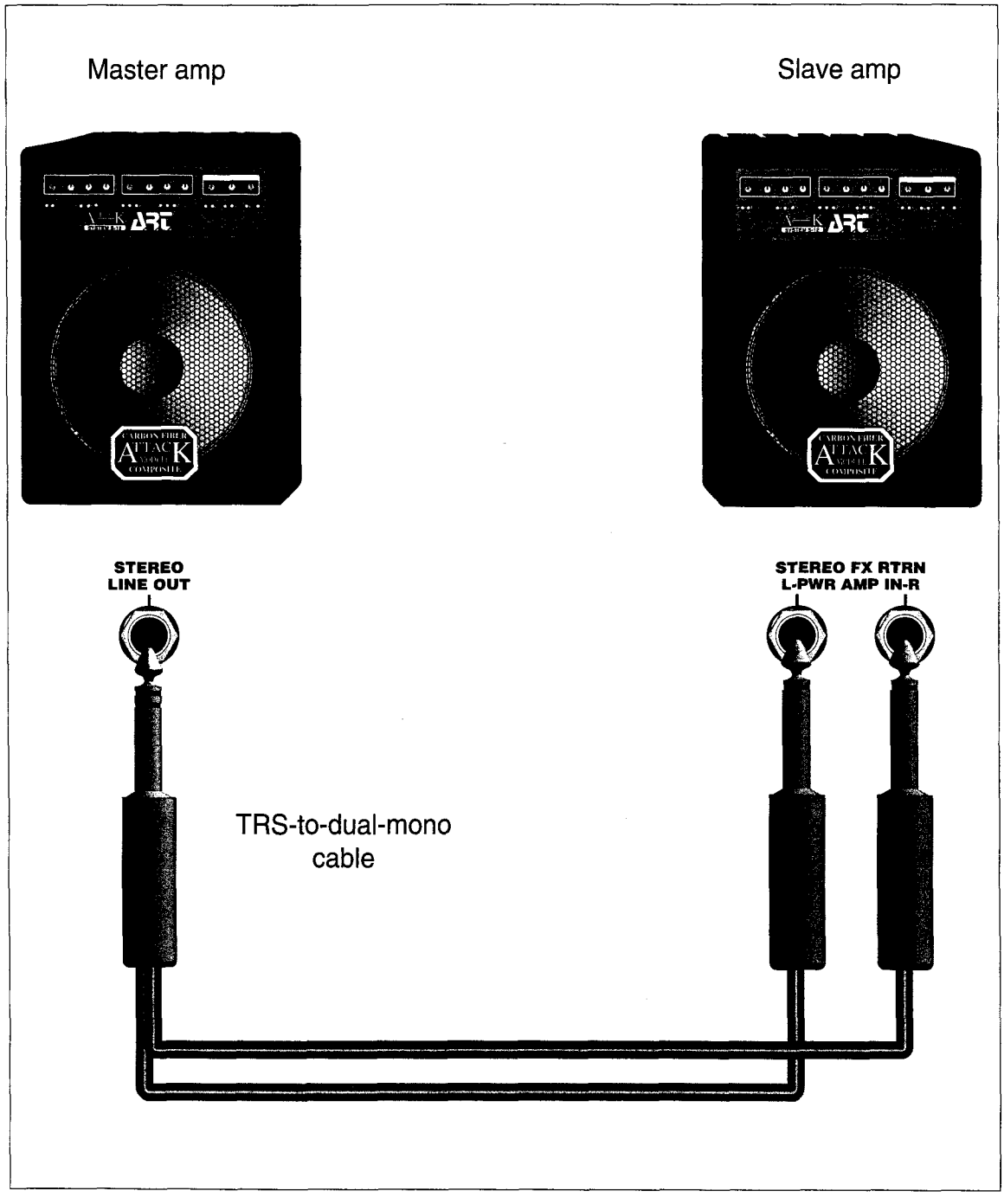
Using The Effects Loop

Insert a shielded cord with a 1/4" plug into the Attack Module's EFX/Preamp Output jack, and insert the other end into the input of a signal processor such as an ART FXR Elite. Run the signal processor's mix output to the Attack's Stereo FX Return section's L Pwr Amp In jack. If the signal processor has stereo outputs, you can run another cord from the second output to the Stereo FX Return's R Pwr Amp In input. Note: If the "send" cord is plugged all the way into the EFX Preamp Output jack, the output comes after the reverb, but doesn't contain chorusing. If you pull the jack out halfway (it will click into place), the output contains only the preamp's signal without reverb or chorus. Don't forget to check the EFX Loop In switch to make sure the effects loop isn't bypassed.



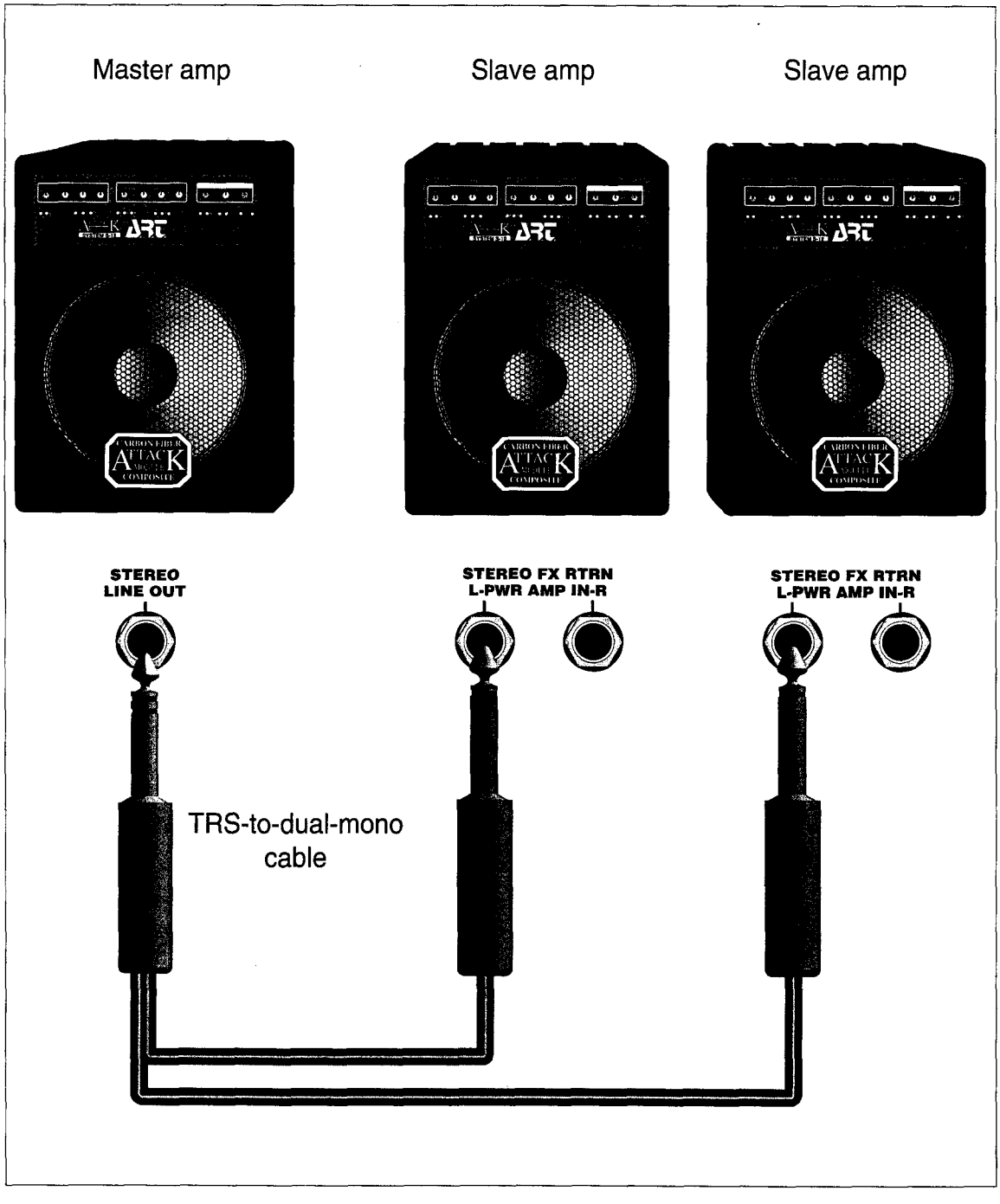
Slaving One Attack Module Amp

Use a TRS (tip/ring/sleeve)-to-dual-mono shielded cord to connect the Stereo Line Out from the "master" Attack Module to the Stereo FX Rtrn inputs on a second Attack Module amp. When these inputs are used, all the tone and processing of the first amp is input into the second amp. However, Chorus, Quad-S, and Master Level functions remain "live" on the second amp. Alternatively, you can use the first amp's EFX/Preamp Output instead of the Stereo Line Out, although Chorus and Quad-S effects (and Reverb, if the plug is only inserted halfway) won't be sent to the second amp. Use a cable with mono 1/4" plugs at both ends for this sort of connection.



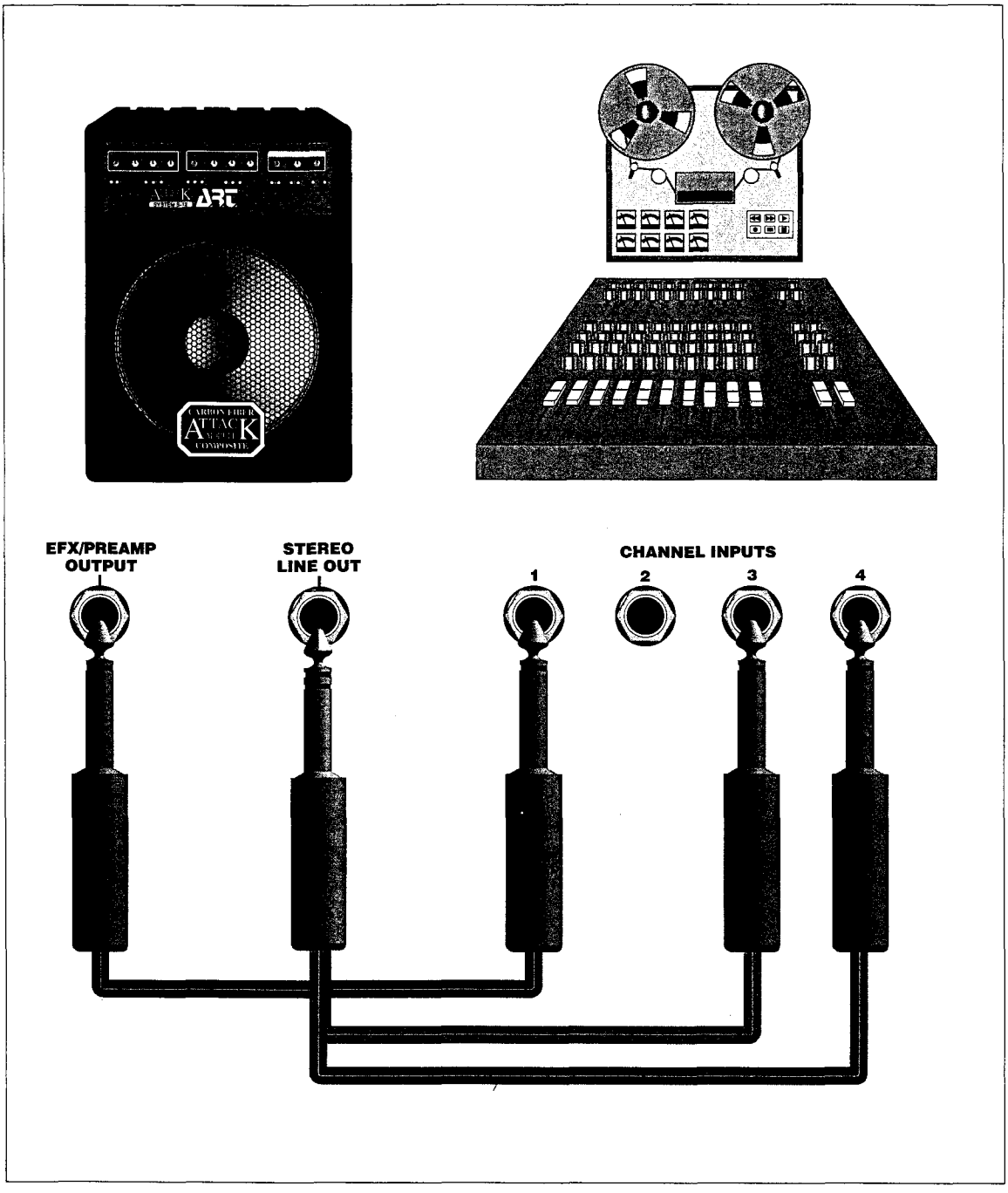
Slaving Two Attack Module Amps

Use a TRS (tip/ring/sleeve)-to-dual-mono shielded cord to connect the Stereo Line Out from the "master" Attack Module to the Left Stereo FX Rtrn inputs on a second and third Attack Module amp. When these inputs are used, all the tone and processing of the first amp is input into the other amps. However, Chorus, Quad-S, and Master Level functions remain "live" on the slave amps. Alternatively, you can use the first amp's EFX/Preamp Output instead of the Stereo Line Out, although Chorus and Quad-S effects (and Reverb, if the plug is only inserted halfway) won't be sent to the second amp. Use a "Y" cable with mono 1/4" plugs at all three ends for this sort of connection.



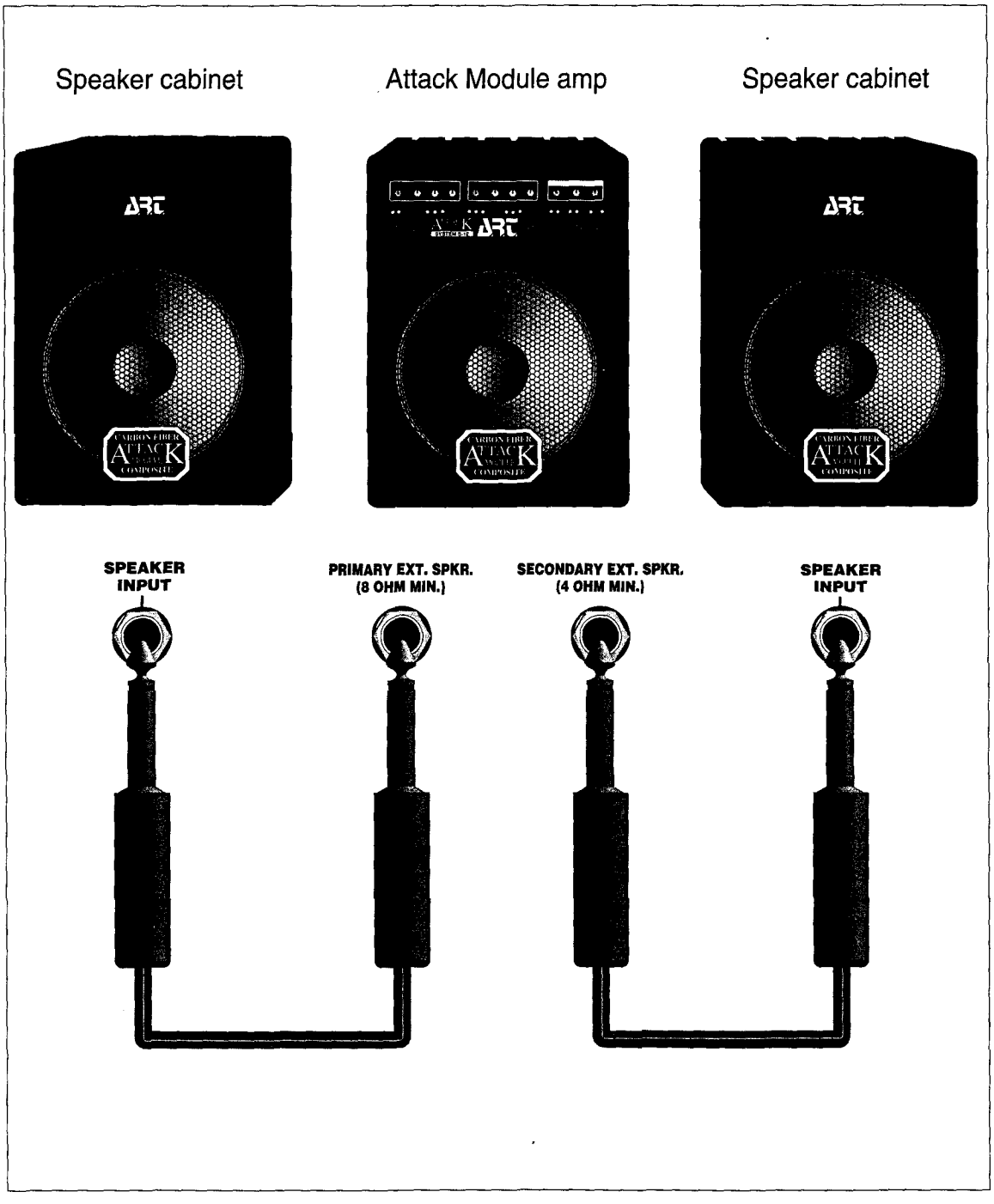
Sending A Direct Signal To P.A. Or Recording Gear

Using a TRS (tip/ring/sleeve)-to-dual-mono shielded cord, connect the Attack Module's line output to the line inputs or channel inputs on a mixer or recorder. (The signal comes from the amp's output stage, so all tone, distortion, effects, and overdrive characteristics are included.) Alternatively, you can use a mono cord to connect the EFX/Preamp Out to one channel of the mixer or recorder. If the send cord's plug is inserted all the way into the EFX/Preamp Output jack, the output comes after the reverb, but doesn't contain chorusing. If you pull the jack out halfway (it will click into place), the output contains only the preamp's signal without reverb or chorus. Caution: Never use the speaker output.



Driving Extension Speaker Cabinets

If your amp is equipped with a single 12" speaker, follow the order on the rear panel when connecting extension speaker cabinets. If you use only one extension cabinet, use the jack labeled Primary Ext. Spkr. If you employ a second speaker cabinet, use the Secondary Ext. Spkr. jack in addition to the first one. If your amp is equipped with two 8" speakers, you can use either or both jacks. Regardless of your amp's speaker configuration, use only speaker cords for connecting extension cabinets; shielded instrument cables aren't designed to handle the high power that comes from Attack amps.



Speaker

The T12C Attack amp has a Celestion 12" lead guitar speaker. In other models, the speakers are different, but we modify the internal EQ to get about the same balance of sound at low and medium levels. However, the Celestion has its own unique kind of cone distortion and directionality that makes it a favorite for some forms of music. Our other models have their own types of sonic character at high levels, where the speakers' dynamics become a integral part of the total sound. We feel they offer a range to choose from for virtually any type of player.

Enclosure

All Attack Module amps and speaker cabinets feature an extremely strong, non-resonant Carbon Fiber Composite material, which has internal ribbing and bracing that serve as acoustic baffling. This design offers the advantages of a wood enclosure without the weight, plus it's shaped like no other cabinet. The steel grille protects the speaker, plus the recessed jacks on the back prevent accidental breakage or unplugging of speaker cord plugs.

Care & Feeding

Be kind to your amp, and it will be kind to you.
We built your amp to be roadworthy, but just because it's tough doesn't mean that you should abuse it. Don't drop it, kick it, or use it as a basketball. And don't leave drinks, burning cigarettes, etc., on it. When you move it from place to place, cover it or put it in a flight case (or use the box it came in—think of it as a recyclable case).

Don't expose it to the ravages of the elements.
Translation: Don't leave your amp out in the cold or rain, and don't store it in a damp place. Keep it dry and reasonably warm, and it will be happy.

If your amp has a tube, let it warm up.
Nobody should be so impatient that they can't wait a minute for their preamp tube to warm up. If your amp is a Model T28, Model T12, or Model T12C, you'll have to wait for the tube to glow, so use that 60 seconds wisely: Turn on the power switch, and practice a few chords, begin tuning up, or make sure the song list is in a convenient place.

Make sure the power cord is tightly plugged in.
This is critical at both ends of the cord. And don't use one of those 3-pin-to-2-pin adapters unless you connect the ground lug to the outlet. Remember, it's dangerous to unground any electrical device—including this amp—that's supposed to be grounded.

Clean your amp once in a while.
You can use a damp cloth or one dipped in a weak solution of dishwashing detergent and water (lots of water!) to wipe off any sludge that accumulates on the exterior. Make sure the amp is unplugged first! Never expose the speaker, controls, or jacks to moisture, though.

Don't try to "improve" or alter it.
Some musicians like to "hotrod" their equipment, or feel that they can do their own repairs. A

few of them actually are skilled and competent at this—very few, indeed. Messing around inside your amp is (1) dangerous and (2) the perfect way to void your warranty. We carefully choose each of our components for optimum performance. In fact, "hot" replacement tubes may not work as well as factory-selected tubes. If your amp ever gives you trouble, contact ART Customer Service or your ART dealer. Stick to playing your instrument, and leave the electronics work to us.

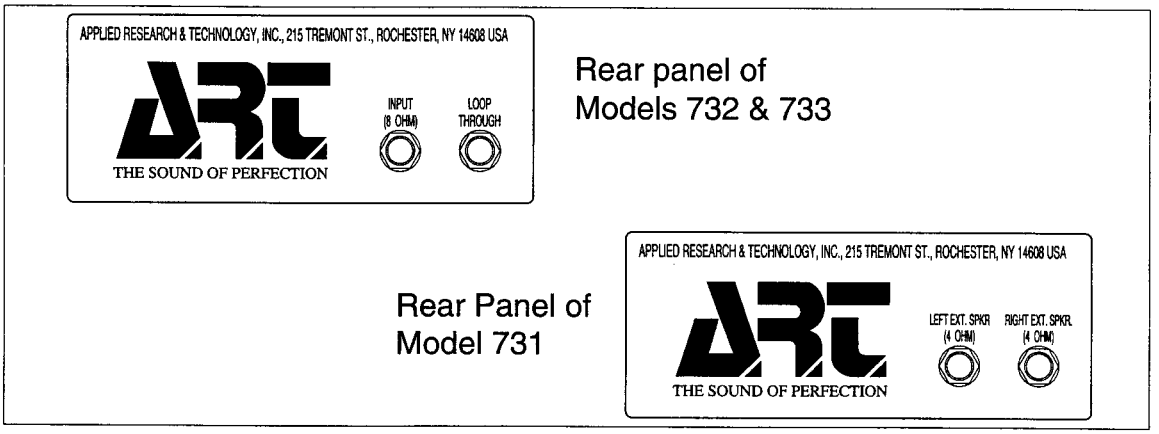
ART Attack Module Speaker Cabinets

Three models of speaker cabinet are included in the Attack Module series, including:

Model	Speakers	Cabinet Impedance
731	Two 8" custom design	4 ohms
732	One 12" custom design	8 ohms
733	One 12" specially designed Celestion	8 ohms

These are ideally suited to connection with any of the Attack Module amplifiers. They're designed to handle the awesome power that the Attack Module amps deliver, providing dependable, high-quality tone at any volume setting. Always use a good-quality speaker cord—never a shielded instrument cable. See page 19 for a diagram illustrating how to hook up extension cabinets. (If you plan to drive one or more Attack Module extension speaker cabinets with another manufacturer's amplifier, follow the impedance information given on the back of the amp or in its manual.)

Using one or more extension speaker cabinets with an Attack Module amplifier is a great way to spread your sound, plus it lets you get terrific, room-filling stereo separation, which brings out the best in the built-in Chorus and Quad-S. Note: To keep your cabinet in top-notch condition, refer to the Care & Feeding section on page 20; what's good for Attack Module amps is good for Attack Module speaker cabinets.



About The Connections

The Model 731 has two 8" speakers that act independently to produce stereo when you plug into both of its inputs. When you plug into just one input, only the selected speaker operates. The Model 732 and Model 733 are mono cabinets equipped with a single 12" speaker. Connect your amp's output to the cabinet's jack labeled Input. If you would like to connect another cabinet in parallel with the first cabinet, connect the cabinet to the amp as just described, and then use a second cord between the Loop Through jack and another cabinet's Input.

Stacking Amps & Speaker Cabinets

The 731, 732, and 733 all feature the same tough construction as their amp counterparts, including the channels that are molded into their outside surfaces. Two rubber blocks are included with your speaker cabinet to help secure stacked cabinets. Simply place the blocks in the two outermost channels on a speaker cabinet's top, and then set the amp onto the speaker cabinet, making sure that the blocks fit into the amp's corresponding bottom channels.

ATTACK MODULE

ART Attack Amplifier Specifications

High Gain input impedance: 470k ohms
-6dB input impedance: 470k ohms
Line output impedance: <1k ohm
Total harmonic distortion: <0.4%
Preamp tube: One 12AX7A (T28, T12, and T12C models only)
Output power: 100 watts RMS into 8 ohms (T28, T12, and T12C models)
Output power: 80 watts RMS into 8 ohms (S28 and S12 models)
Operating voltage: 115 volts AC in U.S.A. (products manufactured for use outside of the United States are configured for country of destination)
Maximum power consumption: 220 watts
Speaker impedance: 8", 4 ohms
12", 8 ohms
Speaker types: 8" custom-designed Oxford
12" high-quality custom-designed for ART
12" Celestion specially designed for ART
Treble control: ±12 dB boost/cut
Midrange control: ±12 dB boost/cut
Bass control: ±12 dB boost/cut
Reverb type: 2-spring
Footswitch functions: Channel switching, Lead Turbo Gain Boost on/off
Dimensions: 19" H or W x 15" W or H x 14" D
Amp weights: T28 & S28, 24 lbs.; T12 & S12, 28 lbs.; T12C, 31 lbs.
Speaker cabinet weights: Model 731, 17 lbs.; Model 732, 21 lbs.; Model 733, 24 lbs.

ART retains a policy of constant product improvement. Therefore, specifications are subject to change without notice. ART reserves the right to make changes in design or make additions to or improvements upon this product without any obligation to install the same on products previously manufactured.

Designed and manufactured in the United States of America.

Applied Research & Technology, Inc.
215 Tremont Street
Rochester, NY 14608

OUR NEW AREA CODE IS 585

(716) 436-2720
(716) 436-3942 (FAX)

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WARRANTY & SERVICE INFORMATION

LIMITED WARRANTY

Warranty service for this unit will be provided by Applied Research & Technology, Inc. in accordance with the following warrant statement.

Applied Research & Technology, Inc. (ART) warrants to the original purchaser that this product and the components thereof will be free from defects in workmanship and materials for a period of one year from the date of purchase. Applied Research & Technology, Inc. will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to the factory service department or authorized service center, accompanied by proof of purchase date in the form of a valid sales receipt.

EXCLUSIONS: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. This warranty is void if the serial number is altered, defaced, or removed.

ART reserves the right to make changes in design or make additions to or improvements upon this product without any obligation to install the same on products previously manufactured.

ART shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights and you may also have other rights which vary from state to state.

For units purchased outside the United States, service will be provided by an authorized distributor of Applied Research & Technology, Inc.

SERVICE

The following information is provided in the unlikely event that your unit requires service.

1) Be sure that the unit is the cause of the problem. Check to make sure the unit has power supplied, all cables are connected correctly, and the cables themselves are in working condition.

2) If you find the unit to be at fault, write down a description of the problem, including how and when the problem occurs.

3) Call the factory for a Return Authorization (RA) number.

4) Pack the unit in its original carton or a reasonable substitute. Print the RA number clearly under the address.

5) Include with your unit: a return shipping address (we cannot ship to a P.O. Box), a copy of your purchase receipt, a daytime phone number, and a description of the problem.

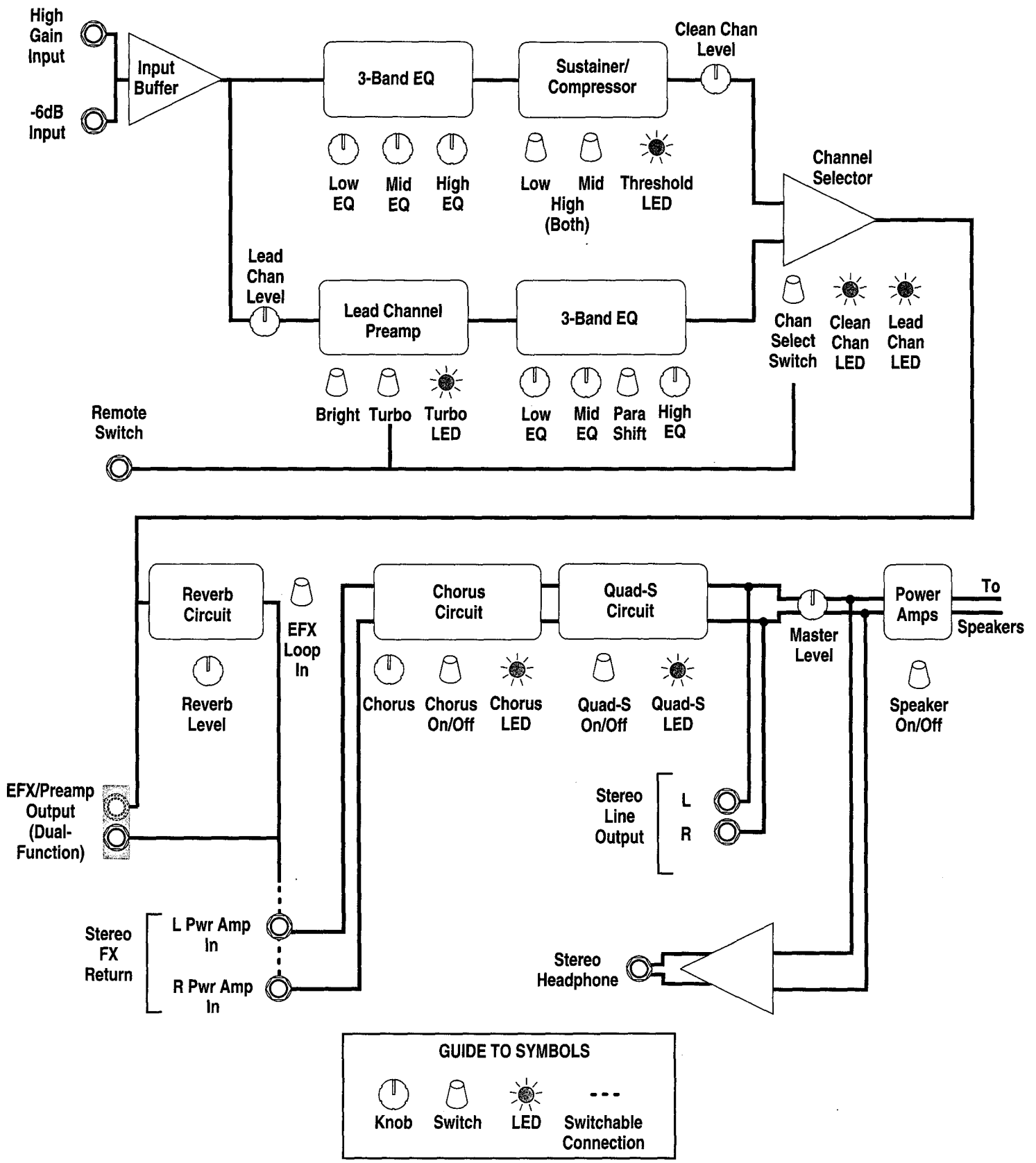
6) Ship the unit to:

APPLIED RESEARCH & TECHNOLOGY, INC.
215 TREMONT STREET
ROCHESTER, NY 14608
ATTN: REPAIR DEPARTMENT
RA # _____

7) Contact our Customer Service Department at (716) 436-2720 for your Return Authorization number or questions regarding repairs. Customer Service hours are 9:00 AM to 4:00 PM Eastern Time, Monday through Friday.

Customer Service

You may contact ART's Customer Service Department between the hours of 9:00 AM and 4:00 PM Eastern Time Monday through Friday. The Customer Service Department will answer technical questions about ART products and provide information concerning service.

ATTACK MODULE

Block Diagram Of The Attack Module