OPERATION MANUAL

Model A-22

Head and Combo

08/10

Thank you for purchasing an Andrews Amplifier. The Model A-22 is built to the highest standards of craftsmanship and is finely tuned for the ultimate tone. This amp is very simple to operate but we suggest reading this short manual in order to get the most from your new amp.

FEATURES;

- **ALL TUBE CIRCUITRY PURE WARM TUBE SOUND – Your guitar signal does not pass through any transistors or integrated circuits (ICs). We have also avoided using any relays or other switching devices so nothing interrupts your pure guitar signal.**

- **ALL HAND-WIRED CONSTRUCTION – Also sometimes called "point-to-point" wiring, the A-22 utilizes a very high quality turret board made of super-tough G10 composite. This glass-epoxy laminate is specified for its extremely high strength and high dimensional stability over temperature. The extra-thick board material will never warp, melt, or absorb moisture and there are no copper traces to peal away from the board over time. All wiring and soldering is done by hand and quality checked to ensure many years of trouble free operation.**

- **CUSTOM-WOUND, AMERICAN-MADE TRANSFORMERS – These transformers are built to our specifications specifically for the requirements of this amp design. They are wound on paper bobbins like in "the good old days" and are rated to withstand extreme heat for high reliability. In addition, a special type of steel core is utilized for maximum efficiency, lighter weight and superior tone. The output transformer is interleaved for optimum balance. Output impedance is switchable to 4, 8 or 16 ohms and 2 speaker jacks are provided.**

- **CUSTOM DESIGNED CHASSIS – Our chassis is designed specifically for this amp model so that every part can be mounted in the optimal location for lowest noise and highest stability.**

- **CUSTOM DESIGNED CABINET – Our cabinets are specially designed for maximum durability and superior tone. We use very high-grade void-free Baltic Birch ply for our cabinets. The cabinet components are precision cut using high-tech equipment and are hand assembled with care. Dovetail joints are used at the corners for maximum strength. The combo cabinet features a 3-piece back that can be configured as closed-back or semi-open to allow for even more tonal versatility. Unlike most other combo amps, the speaker compartment is isolated from the tubes. This greatly reduces the chances of the tubes being vibrated by the sound pressure waves coming off the back of the speaker therefore reducing tube microphonics, rattling and premature failure.**

- **EXTERNAL BIAS TEST POINTS – The A-22 is equipped with external bias test points and an externally accessible adjustment control. This makes output tube replacement fast and economical. In fact, with a low cost multi-meter you can adjust bias yourself. This can be a real advantage in case of a tube failure during a performance or recording session. See the section about the rear panel for more information.**

Warnings and Precautions

Vacuum tubes generate a lot of heat. Do not touch hot tubes. Insure plenty of ventilation behind the amp. Keep away from curtains and other flammable objects. Keep the amplifier away from children.

Do not expose your amplifier to rain. Never set any cups, glasses, bottles or cans of liquid on your amplifier.

Do not use any solvents to clean your amplifier.

Never operate your amplifier without a proper speaker load or damage may occur. See the section about the rear panel features for more information.

Make sure the amplifier is always properly grounded. Never remove or defeat the ground pin from your power cord. Always unplug the amplifier before changing tubes or fuses.

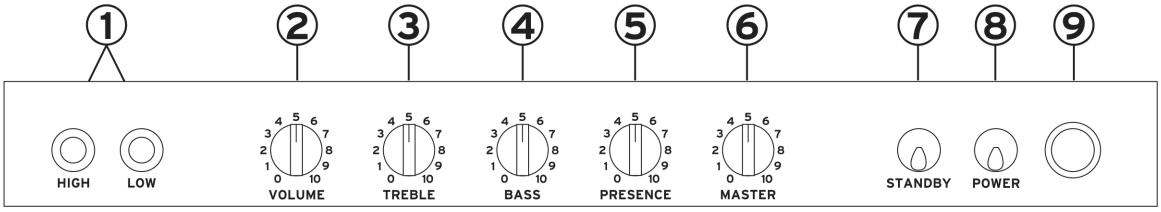
Use only correctly rated fuses. See the rear panel of your amplifier and this manual for proper fuse ratings.

This amplifier can create high sound pressure levels. Please use proper hearing protection and/or maintain an adequate distance from the amplifier to avoid hearing damage.

There are no fuses or other user serviceable parts inside your amplifier. Please refer servicing to qualified service personnel.

Never insert any tool or other object into ventilation holes, tube sockets or other openings unless instructed to do so in this manual. Otherwise, you may come in contact with dangerous high voltages inside the chassis.

Front Panel



1. **INPUT JACKS –** For maximum versatility, we have provided two input jacks (labeled HIGH and LOW). For maximum overdrive, use the HIGH jack. For a more usable range of clean and crunch tones, try the LOW jack, especially with high output pickups or noisy pedal boards. The HIGH jack has 9db more gain than the LOW jack.

2. **VOLUME CONTROL –** This control could also be labeled “Preamp Gain” or “Input Volume”. It is used in conjunction with the MASTER VOLUME CONTROL. When the MASTER VOLUME is turned to 10, the VOLUME CONTROL acts as a standard volume control as if the amp did not have a MASTER VOLUME CONTROL. That is, when the volume control is turned up, the amp will give you a nice warm overdriven tone at its maximum volume. When the MASTER VOLUME is turned lower, you can still get nice overdrive tones at lower output volume. By using the HIGH or LOW input jack and adjusting the VOLUME and MASTER VOLUME controls to various positions, you can fine tune the amount of crunch and overdrive desired at different volume levels. If you find that you are always setting this control below 5 or 6, try changing the V1 preamp tube to a 12AU7 (ECC82). This will result in lower gain and give you a wider range of clean and crunch tones on the VOLUME control. See the section on Tube Replacement for more details.

3. **TREBLE CONTROL -** This control varies the amount of treble and upper midrange frequencies. It is most effective when the input volume setting is low. Use the PRESENCE control to dial in the treble content of overdriven signals (when the Input VOLUME is turned up).

4. **BASS CONTROL –** This control varies the amount of bass and lower midrange frequencies.

5. **PRESENCE CONTROL –** This control can be used to reduce unwanted treble frequencies from your signal and is especially effective when the Input VOLUME is turned up high and he Master Volume is set to a low level. Crank it up for a little more bite or back it off for a warmer, smoother tone. By carefully adjusting the TREBLE and PRESENCE controls, you can vary the balance of high frequencies for both clean and overdriven tones.

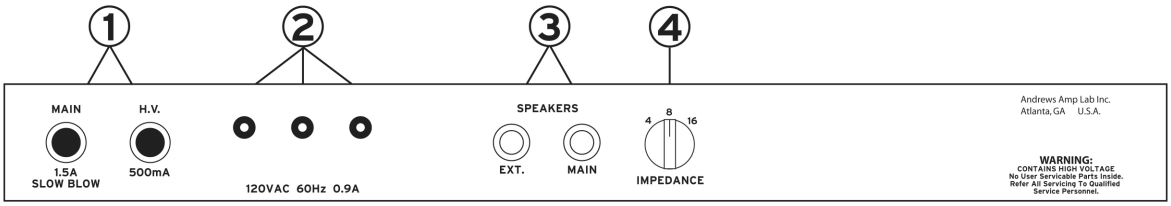
6. **MASTER VOLUME CONTROL –** This control is designed to be very versatile. Used in conjunction with the VOLUME control and HIGH or LOW inputs, you can obtain varying levels of overdrive at different volumes. Full output power can be achieved with at a setting of 8.5 - 10 Try experimenting within this range to get subtle tonal differences.

7. **STANDBY SWITCH –** This switch turns on the high voltage for the tubes. When turning on the amp, make sure the STANDBY switch is in the off (down) position. Turn on the POWER (UP position) switch first. The pilot light will light up. Wait at least 30 seconds to allow time for the tubes to warm up completely before turning on the STANDBY switch. After the tubes are warmed up, turn on the STANDBY switch (UP position) to operate the amp. It is a good idea to turn the STANDBY switch off when not using the amp for more than a few minutes. This will quite the amp and the stop plate current from flowing in the tubes, resulting in longer tube life.

8. **POWER SWITCH –** This switch turns on the main power to the amplifier. Always turn off the POWER SWITCH when not using the amp for several hours or more.

9. **PILOT LIGHT –** This light indicates when the main power is turned on. For bulb replacement, simply unscrew the red lens, grab the bulb with your fingers, push in while turning counterclockwise and release. Replace with a standard # 47 bulb. For longest life a $755 bulb may also be used. The lens thread fits many standard lamp lenses and “jewels” allowing you to customize the color if you desire.

Rear Panel



1. **FUSES –** Always use correctly rated fuses. The MAIN fuse should be replaced only with a 1.5 Amp "Slow Blow" 250 volt type. The H.V. fuse should be replaced only with a 500mA (1/2 Amp) fast acting 250V type. Always unplug the AC cord before changing fuses. When installing a new fuse, first insert it into the cap of the fuse holder, then while holding only the cap, insert the fuse into the holder, push in and turn clockwise to lock the cap and fuse in place.

2. **BIAS TEST POINTS AND ADJUSTMENT CONTROL –** These are provided for ease of measurement and adjustment of the idle current of the output tubes. Bias adjustment is necessary whenever the output tubes are replaced. See page 9 for bias adjustment instructions and precautions. The adjustment control is located on the underside of the chassis near the test points.

3. **SPEAKER JACKS –** Always use the jack labeled MAIN first. If an additional cabinet is to be used, meaning that two cabinets will be connected at the same time, connect the second cabinet to the jack labeled EXT. This amplifier produces 22 watts RMS output power before clipping. When the amp is driven into distortion at high volume, the output power can exceed 40 watts. Make sure any speakers you connect can handle the output power of the amp. Always set the impedance selector switch to match the correct speaker load. See chart below. *NEVER OPERATE THE AMPLIFIER WITHOUT A SPEAKER CONNECTED OR DAMAGE MAY OCCUR AND THE WARRANTY WILL BE VOID.*

   Speaker "Break-In" – New speaker cones are tight and stiff. This results in a brighter tone with less bass and low mids and may even be considered "harsh" at times. By the time your speaker has been played hard for 20 to 30 hours or more, its true character and tone will become apparent. Until your speaker is fully broken-in, you may find that you can achieve better tone by reducing the PRESENCE and/or TREBLE controls.

4. **IMPEDANCE SELECTOR –** Always set this switch to the proper speaker load according to the chart below. Note: The A-22 combo incorporates a built-in **8 ohm** speaker so leave it set to **8** when not connecting another cabinet.

Setting	For One Cabinet	For Two cabinets
4	One 4 ohm cabinet	Two 8 ohm cabinets
8	One 8 ohm cabinet	Two 16 ohm cabinets
16	One 16 ohm cabinet	

Convertible Cabinet (specific versions only)

The cabinet back features a removable center-section to allow for more tonal versatility. When the center-section is left in place, the cabinet will function as a closed-back speaker enclosure. In this mode, the sound will be more focused or directional and the bass response will be tighter. When the center section is removed, the cabinet will function as a semi-open enclosure. The overall volume will be increased, especially the bass response. In addition, the sound will become less focused and the bass will sound looser.

As speakers are “broken in” they tend to become looser sounding. This condition will continue to progress as the speaker is used more and more. Another advantage of being able to close the back of the cabinet is that it may help to tighten the response of an aging speaker.

To remove the center section, remove the 10 screws along the top and bottom the removable portion, being very careful not to press too hard on the screw heads. The screws are threaded into T-nuts which may push out if too much pressure is applied to the screws when removing them. If this happens, you may need to hook a pair of needle nose pliers under the head of the screw and pull outwards on the screw while turning it to keep the nut from turning. The center panel is designed with gaps at the ends that are big enough to insert a coin to aid in removing the panel. Also, the panel is raised slightly so that it can be more easily removed by hand.

When re-installing the center panel, please follow the same precautions regarding excessive pressure on the screws.

If the back panel is to be removed to replace the speaker, the best option is to remove just the middle and upper or lower section. This will give you access to the speaker and should create a big enough opening to allow the speaker to be removed. If the entire rear panel is removed in one piece, it may be damaged.

FOR TECHNICAL TYPES

We have provided this information for those who have a technical interest, proper equipment and proper training in dealing with high voltage circuits. GUITAR AMPLIFIERS CONTAIN LETHAL VOLTAGES. If you have any doubt about your ability to safely perform this procedure, refer the job to a qualified technician!

Bias Adjustment Procedure:

Precautions:

- *Lethal voltages are present inside the chassis and at the tube pins. Do not open the chassis or insert any objects into any openings other than where directed by these instructions.*
- *Vacuum tubes get very hot. Always allow the tubes to cool completely before touching them.*
- *When replacing output tubes, use only the very highest quality tubes or the amplifier may be damaged. For more details, see the section below regarding tube replacement.*

1) Unplug the amplifier and allow the tubes to cool. The output tubes are the two tall tubes on the left side of the amp when viewed from behind.

2) Unsnap the retaining clips that hold the output tubes in place and remove the tubes. Install a new matched pair of EL84 or 6BQ5 tubes taking care not to bend any tube pins. Snap the retaining clips back into position.

3) Using a digital multi-meter, set for DC Volts measurement and select a range that will show 0-100 mV. Insert the black meter lead into the black test point terminal. Insert the red meter lead into the *left* red test point terminal.

4) Insert a small flat blade screwdriver into the adjustment control hole and gently turn the control to its mid position. The adjustment control is located on the underside of the chassis near the bias test points.

5) Plug in the AC cord and turn on the amplifier's main power switch. After waiting at least 30 seconds, turn on the standby switch. The meter should display a few millivolts (mV).

6) While taking care not to touch any hot tubes, insert the screwdriver into the adjustment control and very slowly turn the adjustment until the meter reads 20mV. Turning clockwise will increase the voltage, counterclockwise will reduce the voltage.

7) Now remove the red meter lead from the test point and insert it into the *right* red test point terminal and take a reading. The two terminals are reading a voltage which represents the idle current of the two output tubes. If you get readings within 5mV of each other at each test point, the tubes are considered to be matched. Be sure to adjust the bias so that neither tube idles at more than 20mV. We have found that the optimum bias point is reached when the tubes test points read 20mV each but it is ok to set to any voltage from 15mV to 20mV without causing any damage. **Allow the tubes to warm up for at least 5 minutes and re-check bias. Repeat the adjustment procedure if necessary.**

8) It is a good idea to re-check the bias periodically (every 500 hours or so) as the idle current can drift over time as the tubes age.

TUBE REPLACEMENT

Precautions: Always unplug the amplifier and allow the tubes to cool completely before touching them.

After years of experience with various available tubes, we have chosen specific tubes for this amp. This decision has been made for tone and reliability reasons.

You can safely replace any of the three preamp tubes any time without concern about biasing. ECC803S, ECC83S and 7025 are variations of 12AX7 and are interchangeable. In the V1 position (far right, looking from the back), a 12AX7 or its variations will give the maximum amount of gain. The JJ ECC82 (12AU7) also sounds very nice in the V1 position if less gain is desired. Larger plate tubes such as the ECC803S or 12AX7LPS work especially well in the V2 and V3 positions. Different brands will give slightly different tones which may be preferable to some players. However, some brands have reliability problems and may have more noise, microphonics or hum.

For output tube replacement, we strongly suggest using JJ brand EL84 tubes. Sovtek brand EL84s are also reliable and long lasting but may not sound as full and smooth when new compared to the JJs. This amp applies very high voltages to the output tubes and lesser quality tubes may not be reliable in this model. Also, it is absolutely necessary to adjust the bias when replacing the output tubes. Please check our web site periodically for updates on recommended tube brands since tube production is constantly changing and new brands are becoming available.

When to replace tubes: 12AX7 preamp tubes will generally last for many thousands of hours but occasionally problems can development before they “wear out”. If you hear cracking, popping, ringing, or other strange noises, try replacing your preamp tubes; one at a time. This may resolve the problem. Also, if you hear a scratchy sound when turning the VOLUME control, try replacing V2.

Output tubes usually have a somewhat shorter life – They will often start to sound bad long before they fail. If you notice that your amp is gradually loosing volume, headroom or “punch”, or if you notice that low notes are sounding a little “flabby”, or you notice that you are hearing unpleasing harmonics or overtones, it might be time for a new matched set of high quality output tubes. This could happen after a few months or it might take several years, depending on how much and how hard the amp is played. Don’t forget about biasing the output tubes. These symptoms can also be caused by a worn out speaker so be sure to try the amp on another cabinet to be sure.

LIMITED WARRANTY – Valid in USA and Canada only

Andrews Amp Lab warrants this product to be free of defects in materials and workmanship for a period of 5 years from the original date of purchase **to the original purchaser**. For subsequent owners, the length of warranty shall be for a period of 1 year *from the original date of purchase*. During the warranty period, in the unlikely event that a defect occurs, Andrews Amp Lab will at its discretion, repair or replace the product at no charge to you for parts or labor. You must provide a copy of the original purchase receipt in order to receive warranty service.

What is covered:

- All components other than vacuum tubes are covered for the periods listed above.
- Vacuum tubes are covered for a period of 90 days from the original date of purchase.

What is not covered:

- Any damage due to abuse, accident, improper AC power, lightening, AC power surge, flood, moisture, rain, solvents and other liquids, fire, smoke, improper connections, improper bias adjustment, improper service, defective tubes or normal wear and tear
- Any amp with altered, defaced or removed serial numbers
- Any product that has been altered or modified an any way not authorized in writing by Andrews Amp Lab Inc.
- Andrews Amp Lab Inc. shall not be liable for any consequential and/or incidental damages.

How to obtain warranty service: Contact Andrews Amp Lab to arrange for service by calling 770-671-0485 or e-mailing info@andrewsamplab.com. Check the web at www.andrewsamplab.com for the latest contact information. After confirming warranty status, send or bring your amp to the location specified. If shipping, you are responsible for the cost of getting the amp to us and we will pay the return shipping costs. Canadian customers are responsible for shipping costs in both directions.