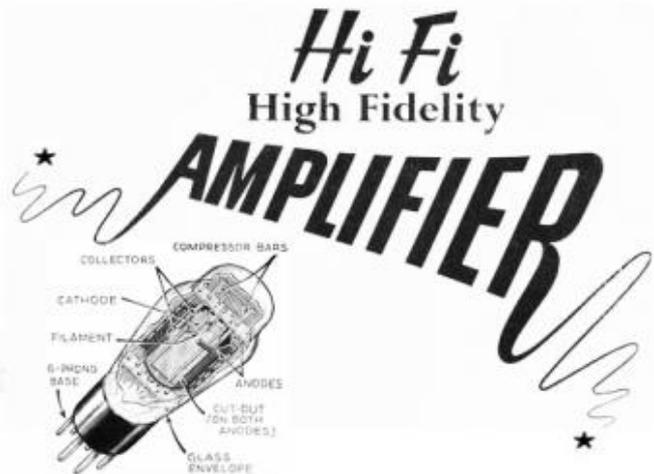
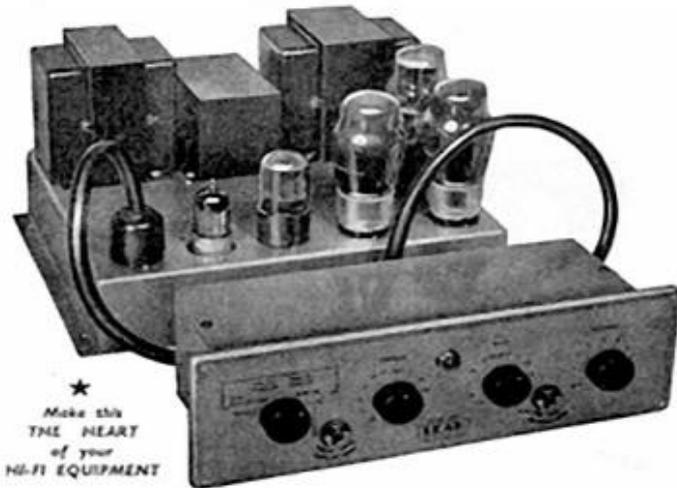


EVOLUTION AUDIO *presents*

{ THE CARE & FEEDING OF VACUUM TUBE AMPLIFICATION }



It is vital that you read and understand all of the documentation accompanying your amplifier before attempting to use it.

► Take your time, and seek advice from your dealer if you are unsure about any aspect of set-up.

NB It is wise to retain all packing materials and documentation.

Vintage valve amplifiers should be checked and serviced by a qualified and experienced expert before use. Vintage amps can be 50 to 70 years old: safety standards were very different, components can change value and fail, and they may never have been designed to work with modern equipment or voltages.

NB The result of simply switching-on and hoping-for-the-best could be electrocution, fire, or destruction of your hifi equipment.

Please ensure your amplifier is designed for your mains voltage – different countries or states often use different AC voltages. For use in the UK an amplifier must accept 240VAC @ 50Hz.

► Many amplifiers have a mains voltage selector, sometimes at the rear, underneath, or even inside the casing – check this is correctly set.

► Aftermarket power cords should only be used if properly specified for your operating voltages and amplifier current requirement, and should be fully type-approved - e.g. CE and BS marked.

NB Power cords must be fitted with appropriately-rated fuses.

Site the amplifier on a clean, firm, level, vibration-free surface where it cannot be knocked, dislodged, nor have anything spilled or dropped upon it.

► Valve amps are heavy – lift carefully or seek help.

► Before moving your amplifier make sure valves are cool and then either remove them or make sure covers are securely in place.

► Ensure all cables are routed to avoid damage to them or a trip-hazard to passers-by.

Valve amplifiers typically become very **hot** - valves themselves can cause severe burns if touched!

They also contain components operating at **lethally high voltages!**

- ▶ Do not remove or insert valves with the amplifier running!
- ▶ Ensure children, pets and idiots are supervised when your amplifier is in use - especially idiots.
- ▶ Keep away from flammables such as solvents, fuels and flammable gases.
- ▶ Never insert anything into ventilation holes.

Keep well-ventilated and do not stand on soft or padded surfaces such as carpets and upholstery, as this will block ventilation holes on the underside.

- ▶ Allow at least 30 cm free space above, and 15cm around all sides of the amplifier.
- ▶ Never cover, or place any object upon the amplifier.
- ▶ Do not place near a radiator or other heat source.
- ▶ Do not use inside a cupboard or other enclosed space.
- ▶ Ensure curtains, blinds &c. cannot come into contact with the amp when opened or closed.

NB In exceedingly hot weather, it's OK to use a small room fan! Possibly even sensible.

Keep dry, do not use outdoors, and do not use wet cleaning agents or solvents.

- ▶ Allow 24 hours for the amplifier to reach room temperature if it has previously been stored in a cold outbuilding or vehicle – condensation can cause dangerous short-circuits.
- ▶ Do not use in excessively dusty environments. Carefully remove any dust build-up when the amplifier is switched-off and cool.

Never switch-on the amplifier unless it is properly connected to loudspeakers.

- ▶ Connect loudspeakers correctly with respect to polarity, i.e. + to + (usually **red-red**) and – to – (usually **black-black**).
- ▶ Make sure you connect the speakers to the correct output-impedance terminals (or switch appropriately). Use your loudspeakers' lowest impedance figure as a guide, not the highest.
- ▶ If using bare wire, ensure no stray strands can short-circuit the **+red** and **-black** terminals.
- ▶ Ensure the output terminals and connected cables cannot touch any nearby metal surfaces.

Switch-on the amplifier with the volume control set at minimum.

- ▶ Many valve amplifiers have a start-up muting circuit and all of them take a little while to reach operating temperature, so don't be surprised if no sound emerges at first – and don't be tempted to turn the volume up high initially.

NB If there is no sound after a few minutes, check the source selector switch is in the correct position, that the source is switched-on and playing, and that interconnects are properly connected.

- ▶ Brand-new amplifiers sometimes benefit from “running-in” time – as much as several hundred hours in some cases – before internal components have stabilised and they sound their best.
- ▶ All valve amplifiers tend to sound at their best after 15-45 minutes of warm-up time.

Allow your amp to warm-up at low to moderate volumes for 5 mins before running at high volume.

- ▶ **Do not run at excessive volumes** - an unpleasant, harsh, strident, "scratchy" or overdriven sound indicates the amplifier is clipping: reduce volume **IMMEDIATELY**, or permanent damage to amp and speakers (and probably your hearing) **WILL** result.

Do not connect or disconnect interconnects with the amplifier switched on.

- ▶ Use the best quality screened and grounded interconnects that you can - *within reason* - afford.
- ▶ Plug and unplug all cables by grasping the plug body itself; ensure hands are dry when so-doing.

Do not switch off and straight back on - leave for a few minutes before doing so.

Do not switch operational modes while the unit is switched-on: *e.g.* 4 Ohm outputs to 8 Ohm outputs, or Ultralinear to Triode mode. Switch off and leave for a few minutes before making any change, and then switch-on again.

Mild hum is not unusual with many valve amplifiers. Nonetheless, best results will be obtained by keeping your amplifier as far away from magnets and other electronics as possible - notably: mobile 'phones, televisions, computers, phono stages, turntables, speakers, radio-frequency transmitters of any kind (*e.g.* baby monitors & wireless routers), and anything with an electric motor.

- ▶ Use fully grounded screened interconnect cables and try to route them away from power cables and other electronics.
- ▶ Don't coil excessively long cables of any sort – buy shorter lengths.
- ▶ If a system ground “lift” switch has been installed by the manufacturer it can be worth experimenting to see if connecting/disconnecting ground reduces any residual hum.

Leaving the amp switched-on and unattended for long periods wastes both power *and* valve life.

Valves can be microphonic – do not place amp in the “line-of-fire” of loudspeaker drivers or ports.

Valves are consumables, often with unpredictable service-lifetimes. If you experience a decline in sound quality, lack of high *and/or* low frequencies, microphonics, crackles, whines, glitchy, intermittent noises, severe hum or buzzing, or an obvious failure (flash, opacity, silence, etc.), replace with compatible and suitably-matched new replacements from a reputable source.

NB Often, such faults will be confined to one channel, and the valve can be identified by systematically swapping valves between channels until the fault moves channels with the swapped valve.

- ▶ A blue glow indicates gas in a valve, but is only of concern when extensive and obvious.
- ▶ Loss or whitening of the metallic coating inside a valve may be a sign it is approaching end-of-life.
- ▶ Handle valves gently, especially when inserting/removing - and only when they are cool.
- ▶ Be aware that valves have a specific orientation or key – do not force a reluctant valve.
- ▶ Allow at least 48 hours for new valves to burn-in and sound their best.
- ▶ **Never** be tempted to try valves for which your amplifier was not designed!
- ▶ If a valve breaks - switch off & unplug immediately before replacement. Beware of broken glass!

Some amplifier designs require biasing of replacement power valves, others require matched power valve sets – **R.T.F.M.** and find out what's right for yours; don't compromise on care or quality!

- ▶ Servicing & repair must be left to a qualified professional. **Lethal voltages lurk within!**
- ▶ Never open the case of the amplifier – again, because **lethal voltages lurk within!**

If a fuse blows, switch off and disconnect your amplifier from the mains before replacing.

- ▶ Do not replace fuses with higher current-ratings, differing types (*e.g.* fast-blow with slow-blow), or different voltage rating.
- ▶ Additional fuses may be present inside the amplifier (*e.g.* to protect output transformers). Changing these should be left to a qualified professional.
- ▶ **NEVER** bridge fuse terminals with wire, foil, &c.

NB Incorrect fusing invalidates domestic insurances and can cause fire or lethal electrocution.

► **The likeliest cause of a fuse blowing is a valve failing** – take note if any emit a flash, excessive blue glow or internal-sparking before such an event, or look for obvious discolouration or visual changes to a valve – and replace it.

NB Power valves of the same age may need replacing as a set when a valve failure has occurred due to reaching their end-of-useful-life.

Never disconnect mains Earth – nor connect your equipment to a power supply, cable, distribution block or filter that is not connected to mains Earth. **Fire and death** are just two of the possible side-effects.

► People routinely confuse mains Earth with system Ground – they are not the same thing, nonetheless system ground should also not be “lifted” or disconnected unless the manufacturer has installed a switch to do so.

UNSURE ABOUT ANYTHING? 📍 ASK YOUR DEALER OR MANUFACTURER

📍 **We sell and recommend Puresound valve amplification: <http://www.puresound.info/>**

📍 **For out-of-warranty & classic equipment service or repair we recommend: <http://ampregen.com/>**



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