Vintage Vox Tune-up Guide

By Ken Fischer

If there's one brand of amplifier that has truly developed a mystique about its servicing and maintenance, the vintage Vox is that animal. Amp techs who can service a Marshall or Fender amp blindfolded, shudder when they see a J.M.I. Vox walk through their door. This reputation is based on two realities. First is the fact that Vox amps of the Fifties and Sixties were more prone to dying in a cloud of smoke than other brands of the same day. The other reason for their hard to service reputation stems from the fact that, outside of England, there just aren't a lot of people who have worked on enough Vox amps to gain the extra experience these amps require for their maintenance.

I'm going to cover several of the more popular vintage Vox models in this article in the hope it will keep more of these great amps alive and running as they should. The disclaimer: Guitar amps contain dangerous voltages, even unplugged. The following information is intended for qualified personnel to use at their own risk. Ken Fischer, Trainwreck, nor *Vintage Guitar* can be held responsible for any damage to man or machine caused by using any of the information contained herein.

General information

Like any amplifier, vintage Vox amps are subject to the failure of parts due to normal wear and use, and old age. In some models of Vox amplifiers, parts may fail sooner because of design flaws, particularly those relating to excessive heat.

As in my Marshall tune-up guide in last month's issue of *Vintage Guitar*, a good starting point is to change all electrolytic capacitors. Clean and tighten all tube sockets. Replace any that are broken or burnt. Clean all controls. Replace any that are worn out. Replace any broken switches. Replace any obviously defective or broken parts. Check all tubes for proper operation. In other words go through the general checklist you would use on any other brand of amp you would normally service.

The AC-4

The AC-4 is the "baby" of the Vox line up. Think of it as a Tweed Champ with a vibrato circuit and an EL-84 in place of the Fender's 6V6 output tube. It's a single ended design, and uses a 3.2 ohm eight inch speaker.

This amp uses four tubes. These are as listed with the European tube numbers, followed by the American numbers.

1: EZ80/6V4
2: EF86/6267
3: ECC83/12AX7 or 7025
4: EL84/6BQ5

An interesting feature common to the AC-4 — and on one channel of the following two channel Vox models such as the AC-10, AC-15, and the first year (1960) AC-30/4 — is the use of an EF86/6267 *pentode* first gain stage. Far more common is the use of a triode first gain stage in most guitar amps.

The AC-4, being such a simple amp, does not suffer the breakdown problems of the larger Vox amps. Fresh electrolytics, good tubes, and the amp is happy. This amp has a 115/230 volt selector. Besides the one amp main fuse, there is a two amp backup fuse located in the main's voltage selector plug. I've seen AC-4s have their power transformers replaced because a tech didn't know about the second fuse, and thought he had a dead transformer. This is a classic example of why it takes a Vox experienced tech to handle the work on your prized Vox amplifier. It really is a shame that there isn't a school for guitar amplifier servicing. Amp techs are forced to learn about vintage amps either by on the job experience, reading the limited number of books on the subject, or knowing a person who has the needed knowledge, and is willing to share it.

The AC-10

The AC-10 is the next step up from an AC-4. The AC-10 uses six tubes, has a push-pull output stage, and moves up to a ten inch speaker. It also has both a normal and vibrato channel. The tubes used are as follows:

1: EF86/6267
2: EZ81/6CA4
3: ECF82/6U8
4: ECC83/12AX7 or 7025
5 and 6: EL84/6BQ5

The AC-10 has an input voltage selector for 115, 160, 205, 225, and 245 volts. Always be sure it is set for the correct voltage for your country. Weak points on the AC-10 include a 200 ohm, 5 watt resistor that connects to pin 3 of the EZ81 tube. All the B+ voltage of the amplifier flows through this resistor which can open up, shutting down the amp. Also, there's a 100 ohm resistor on each of the power tubes, connected to the plate (pin 7). These should be checked also. The ECF82 tube controls the vibrato circuit and the normal channel. If this tube dies, the normal channel won't work and you'll have no vibrato. The AC-10 contains a speaker lead junction block with an 8 and 16 ohm speaker tap. This is a common feature on many other Vox models of the time. If a set-screw vibrates loose, or you over tighten the set-screw and cut a wire, the amp won't work. Always check the speaker junction block when working on Vox amps. The speakers used in this model were not heavy duty, and I've seen many with open voice coils from being pushed hard into the overdrive range.

The AC-15

This is the little Vox that started it all! An eight tube screamer with a 12 inch speaker. This model has both vibrato and tremolo. The tubes used are as follows:

1: ECC83/12AX7 or 7025
2: EF86/6267
3: EZ81/6CA4
4: ECC82/12AU7
5: ECC83/12AX7 or 7025
6: ECC83/12AX7 or 7025
7 and 8: EL84/6BQ5

The AC-15 likes to have a well matched pair of output tubes at all times. Under distortion the AC-15 exceeds the design limits for maximum power of its power tubes. Rule #1 for an AC-15 is a well matched pair of EL-84s that don't draw excessive current at idle. This amp contains an internal pre-set trim pot for its vibrato/tremolo strength. If the vib/trem doesn't work, first check the ECC83 tube (V6) which is the oscillator for both. Next check the footswitch, and then check the pre-set. If the pre-set is turned down the vib/trem, of course, won't work. Why would the pre-set be turned down? People who don't use the vib/trem circuit will sometimes turn it down so they can't accidentally engage this feature. Some rough boys will actually cut off the footswitch so it doesn't "get in the way!" On the normal channel of an AC-15 there's a "brilliance" switch. If this switch adds too much high end for your taste an easy trick is to put a resistor across it to reduce its effect. Start with 220K and reduce from there to cut highs, or increase the value to bring more highs back. Do this with the top cut control at the full treble position. If you need more high end, or a different type of high end, you can bypass the volume control (on either channel) with a 100 pf cap from hot (input) on the pot to the wiper (center terminal). The AC-15 runs hot so always place it so that air can flow around it at all times.

The AC-30

The Vox AC-30 isn't one amp, but in fact a series of amps with the AC-30 designation. Most people know the AC-30 as a three channel amp with a Class "A" EL-84 output stage, and two 12 inch speakers. The first AC-30 to see the light of day was a "T.V." front amp with two EL-34 tubes in its output. This amp came out in 1959. I've seen this version in both a single 12 inch, and a single 15 inch speaker combo. In 1960 the AC-30/4 was introduced. This amp used four EL-84 tubes in class "A", and has two channels. One channel retained the EF86/6267 pentode of the AC-15 model. The control panel is black and gold. This amp was soon replaced by the AC-30/6 model. This model has three channels. The control panel is a bronze color, also referred to as "brown" or "red".

The AC-30/6 was built in bass, normal, and treble versions. Since at this point the amp had no tone controls, except for a "top cut," Vox used different capacitor values and circuit variations to "pre-set" the frequency response curves to please Vox users. Any tech could change the internal values to turn one version into another. If you own a non-top boost Vox this is the way you should use to adjust your amp if its frequency curve doesn't suit you. In 1961 the top boost circuit became an option. This gave you a bass and treble control, and extra gain on the top boost channel. At first the top boost was added to the back cover panel. Later the circuit would become standard, and was moved to the control panel. Reverb was also an option early on. The first amps to use reverb used a piezo reverb tank. There are no current replacements for this unit. If it dies, a rework to the later reverb design is the only cure.

As time went on the brown grill cloth was changed to black, and the control panel went from bronze to grey. The AC-30 suffers from overheating problems. There just isn't enough airflow to keep it cool. (Not a problem on the current production Vox amps.) This becomes a problem if you cut up your Vintage Vox to give it some airflow; you'll ruin its vintage value. Without increased airflow, your already well cooked amp will suffer even more.

The AC-30 Tune-up

Replace all that's cooked. Clean all that is dirty. Tighten all that is loose. Use well matched EL-84s. The standard grade Sovtek works well, as does Groove Tubes and other premium matched sets. The AC-30 uses a 5AR4/GZ34 rectifier tube. Use only this type. The 5AR4 is a controlled warm-up tube. That is, it takes longer to "turn-on" than the other tubes in the amp, allowing them to reach proper operating temperature before high voltage is applied. The Vox doesn't have a standby switch, so this is really important. Use an American or European 5AR4. The current production 5AR4 tubes are fine for most amps, but a Vox AC-30 (or Trainwreck Rocket) will eat them alive due to high current draw.

To reduce buzz and hum, trace the filament line on the pre-amp tubes. One tube will have a wire going from the filament line to a ground terminal. Disconnect the wire from the tube to the ground terminal. From pins 4 and 5 (which are connected together) run a 100 ohm, 1/2 watt resistor between pins 4 and 5 and the ground terminal. From pin 9 of the same tube run another 100 ohm, 1/2 watt resistor between pin 9 and the ground terminal.

The AC-30 has an 8 and a 16 ohm output tap. If you run the standard 8 ohm speakers they must be wired in series and connected to the 16 ohm tap. If you substitute two 16 ohm speakers, they must be wired in parallel and connected to the 8 ohm tap.

Some AC-30s contain a "brimistor". This is a controlled warm-up device in series with the power switch. If this part is bad, replace it with a piece of 18 gauge wire. It's not needed with a proper 5AR4 rectifier tube.

Well, I don't want to cause an information overload. If anyone requests it, I'll cover the AC-50 and AC-100 models in another issue.

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"I never do anything wrong, but I always wind up in a courtroom!" Kimo Leong — Coconut Grove Music

"I don't own a Trainwreck, what's my name doing here?" Eric Clapton — England

"I can fix any chassis!" Jim Grey — Collision Technology, North Carolina

"Paint my house." Billy F. — Texas

"Postal Inspector? Oh, no!" Steve Medve — Walcott, Vermont

Next issue: How to make French nuclear toast!

Ken builds his highly-regarded Trainwreck amplifiers in Colonia, New Jersey.

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