

Vox AC30 Topboost - Reasons & Origins

One of the most most loved and distintivly styled guitar amplifiers is the VOX AC30. It's been in production from 1958 until this day. It's familiar Black Vynide covering, Diamond speaker cloth, Gold margin, & large "VOX" logo, are virtually synonymous with the 60's, and in particular the British music scene. An integral feature of the AC30 since the very early 60's has been the "Topboost" or "Brilliance" unit. The following is a close look at the reasons for, and the origins of the AC30 Topboost. Also exposing for the first time, the source of the actual Topboost circuit and a quirk of fate still operating to this day

The very first AC30's were quite different to the ones we're familiar with these days. They were designed to be a doubled power version of the successful AC15 and were a single speaker unit too, utilising a 25W Goodmans Audiom80 15" speaker and EL34 output stage. Also, rather than Normal, Brilliant & Vib/Trem channels, the originals had only a Normal and Vib/Trem channel with 2 inputs for each, and hence were known as an AC30/4. They used an EF86 pre-amp. The EF86 is a pentode tube which provided a brilliant tone at a high level. The sound was ideal, but the performance was a problem. The EF86's were susceptible to failure due to vibration, and that's something you definitely find in an amplifier. The early AC30/4 1x15" were not a great success with guitarists, being more suitable for Bass and Keyboard amplification. But once the idea of having a quartet of the more sparkling EL84's, and 2 x 12" Audiom60 speakers (15W) was tried, the AC30 as we know it today was born. The AC30/4 twins were fawn covered with a distinctive Black control panel and are highly sought after these days, not only due to the rarity, but that brilliant sounding EF86 pre-amp.



TV Front style AC30/4 with 1x15" -1958

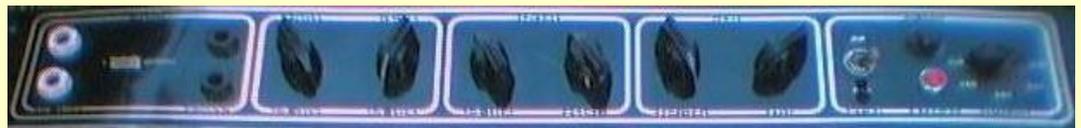


1960 AC30/4 Twin 2 x 12" Speakers. Only in Fawn Vynide

The AC30/4 twin rapidly gained popularity among the British groups. The EL84's and 2 x 12" Audiom 60's provided the beginnings of the lively chiming tone desired by guitarists, and a little later when Celestion Alnico G12's were used it reached what many describe as the 'ultimate' tone. To this day some swear by the sound of the original AC30/4's with Celestion Alnico G12 speakers. It was available in 'Normal' or 'Bass' voicing. It also had a Brilliance switch for the Normal Channel

The problems with EF86 failure were still haunting the AC30. These pentodes were proving a little too much of a problem for JMI and so by 1961 the AC30 had been re-designed to remove the sensitive EF86 and replace it with the more robust 12AX7, a twin triode, also affording the opportunity to add another channel - the 'Brilliant' Channel. JMI control panels had become the well known candy apple or copper colour by this stage and the AC30 was re-designated AC30/6. (6 inputs)

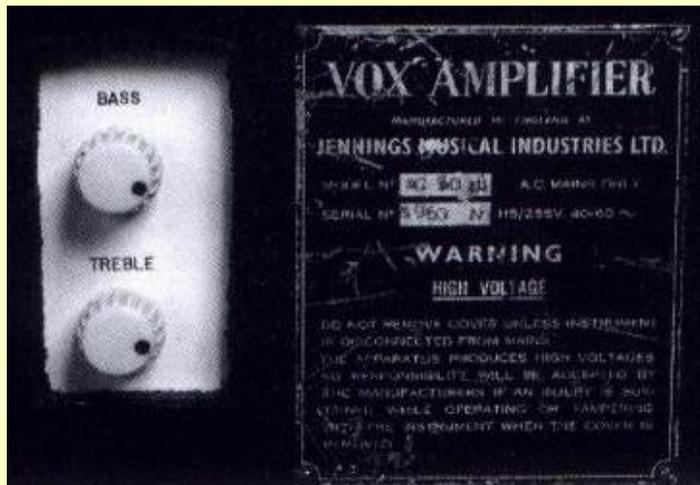
AC30/4 Twin Black Control Panel. 4 Inputs, 2 Vib/Trem controls, 2 Vol controls, 1 Brilliance switch, and 1 Tone control. In use '58 - '60



The failure problems were solved but the buyers weren't fully happy with the new AC30/6. It didn't have the same gain and brilliance of the AC30/4. JMI produced three different 'voicings' of the AC30/6. The 'Treble' version was favoured by lead guitarists as it brought back some of the brilliance of the AC30/4. The 'Normal' Version was the standard voicing, favoured by guitarists and keyboard players. The 'Bass' version was the third voicing, obviously intended for bass players, but keyboard players quite liked it too.

All 3 still lacked gain though. The 3 versions were achieved by merely changing capacitor values in the signal path. Nothing

active was inserted at this stage. There was still a requirement to recapture the lively brilliant tone of the AC30/4 in the new AC30/6.



Early 60's rear panel "Brilliance" or "Top Boost" unit added to an AC30/6. By this stage black was the common colour of the amps



1954 Gibson GA-77 "Vanguard" - An Amplifier known for it's 'high gain' channel. It came in two-tone brown buffalo grained tolex and used 1x15" Jensen Speaker. It's 2nd stage is literally the same as the Vox 'Brilliance' or 'Topboost' unit.

Rather than 're-invent the wheel', it appears that Dick Denney went looking for an amp that had the features he wanted. It needed to be high gain with tone controls. Not meaning to discredit Mr Denney either, as this sort of "building block" approach is very often taken by designers, particularly with tube amps, circuits of which can often be traced right back to early editions of the RCA Radiotron designers Handbook. And credit is certainly due for implimenting the circuit in a way that finally produced the AC30's benchmark tone.

The amplifier Denney found was a Gibson. The GA-70 & GA-77, which had been in production since 1954 were known as an amps with a high gain channel, Treble & Bass controls. The interesting point is that the original Gibson diagrams for the GA-70 & 77 happen to have an error on the Bass pot, grounding one end that should be left floating. This error was carried across to the Vox unit. This fact, and the very unusual 50p high pass cap (along with every other component) show that this was certainly the circuit used for the JMI 'Brilliance' unit.



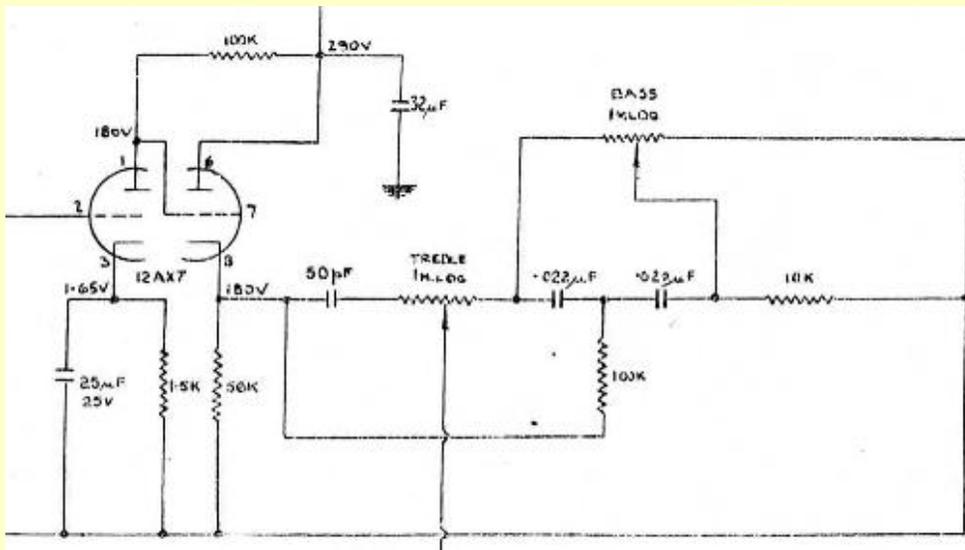
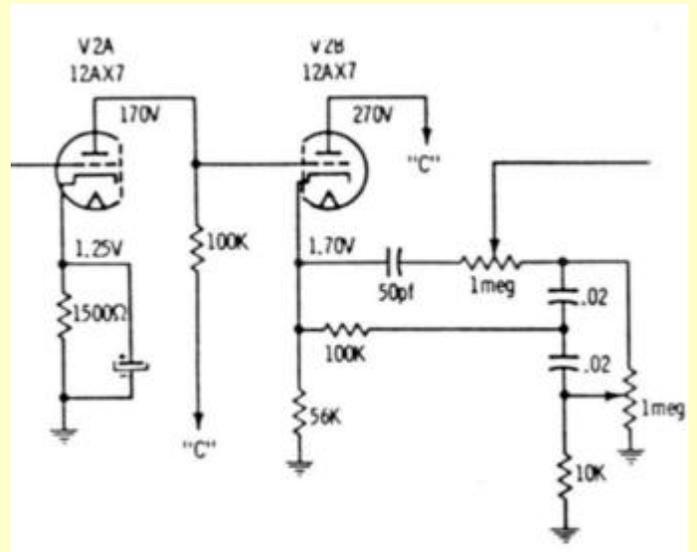
Rear view of an original JMI "Brilliance" unit. It consisted of an 'L' shaped bracket, with a 12AX7 mounted sideways, & the two tone pots facing the rear. A white labelled fascia plate was also included

Some early AC30/6's appeared with Black panels, but by far the majority are found in Copper. Here is the classic AC30/6 non-Topboost control panel. In use from '61 - '65.





The author's '64 JMI AC30/6 non-Topboost with recently added rear panel Topboost. The side mounted 12AX7 visible on the left.



Above is the 2nd stage and tone control section of the Gibson GA-77 Vanguard from 1954.

Left is the Optional "Brilliance unit" schematic drawn by J Bell of JMI on 11.12.1961. These were originally fitted as a rear panel add-on to AC30/6's and later became known as the "Top Boost".

If you compare them closely you'll find that the two circuits are completely identical. Every component value & position, the 12AX7 valve configuration and biasing, the tone network, and particularly - the grounding error on the Bass Potentiometer.

By '63 Topboost was so popular that JMI re-designed their control panel to include the Topboost Tone controls. Non-Topboost copper panel AC30's were still produced into the grey-panel era too. Many of these are still being fitted with the rear panel kit - still available today.

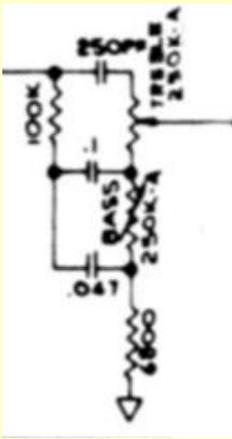


A 1963 Copper control panel with integral Topboost. The existing jacks and controls were squeezed together to make room, and the Treble & Bass controls were added alongside the Tone Cut Control. Inside, the extra 12AX7 was added to the preamp section of the chassis. Only the addition of a Standby switch and the small JMI logo distinguishes this from the current AC30TB

The error in the Bass tone control has been mentioned a few times now. Some may wonder what problems or differences may be caused. Fortunately, there is no huge problem. It wouldn't have taken 41 years for it to be noticed if this was the case. The differences lay in the way the tone controls interact and the effect of the Bass control on mid band. Normally it would be desirable for the the Bass control to effect only the Bass content of the tone, but in the case of the Topboost circuit, the Bass control will effect the midrange and to some extent the Treble when it is at it's extreme travel. Even in correct form the circuit is not ideal. It's a compromise to keep the component count low, but the error does make it slightly harder to control Treble and Bass separately. The other point I would make is that the same error will be present on every Vox amp that contains the Topboost section. This means every AC30TB thru to the present, every AC50, every AC100, AC15TB thru to the present. There are quite likely others too.

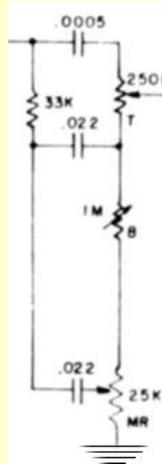
To the left is an extract of a Fender amplifier circuit. It shows the tone control configuration used by Fender in most of their amps. Note the ladder consisting of 3 resistances. Treble pot at the top, Bass in the middle, and a fixed resistor at the

To the left is the tone control section from a Marshall amp. This is found on virtually all their amps. Once again, the ladder, with the caps and resistors in the standard



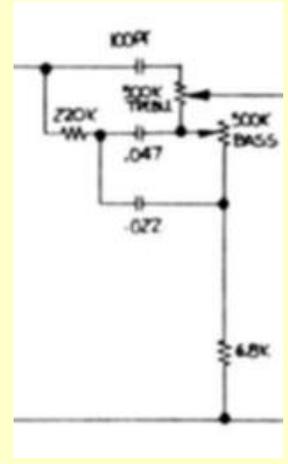
Fender Tone Circuit

bottom. This is the STANDARD circuit to be found in most amplifiers having Treble and Bass controls. The resistor and cap values may vary, but the layout must remain the same for it to work effectively. The Vox Topboost circuit was clearly meant to be this standard circuit.



Marshall Tone Circuit

places. The one difference is the fixed resistor at the bottom being replaced by a pot. This actually becomes the Midrange control. To the right is a Magnatone circuit. The same tone control layout once again.



Magnatone circuit

Virtually every Vox amplifier derived from the AC30/6 has the Bass pot error. All the AC30TB amps from the JMI era thru to the present. The error is so entrenched now that it might be more accurately described as a feature. We have all become familiar with the way the tone controls interact, and have our favourite settings. If you're curious to hear how the tone controls were meant to respond it's not a difficult thing to do. Just unsolder the ground connection from the Bass pot. You can leave it floating or join this terminal to the wiper to make it a variable resistor. You may even like it....



From about 1963 onwards virtually all AC30's were produced in Black Vynide. Here's a nice clean 60's model but you can still purchase a current model AC30TB that looks virtually identical to this. The circuit is no longer point to point wired but the schematic is the same and even utilises the Gibson GA-77 2nd stage and tone network, still including the Bass pot grounding quirk.

- glen lambert July 2002

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