

High Fidelity Transformer Modification for Johnson Viking Valiant (The Central Coast Sound Made Simple)

Overview: This procedure documents the method to insert a high fidelity audio transformer in the Valiant, bypassing all of the low level audio and clipping stages. This new Transformer must be driven by an eight ohm, high fidelity audio amplifier, with approximately 30 Watts (or more) output power. The transformer should have one winding with 8 ohms, and the other winding should be between 3000 and 9000 ohms, center tapped, with audio specs from 20 Hz to 20 kHz.

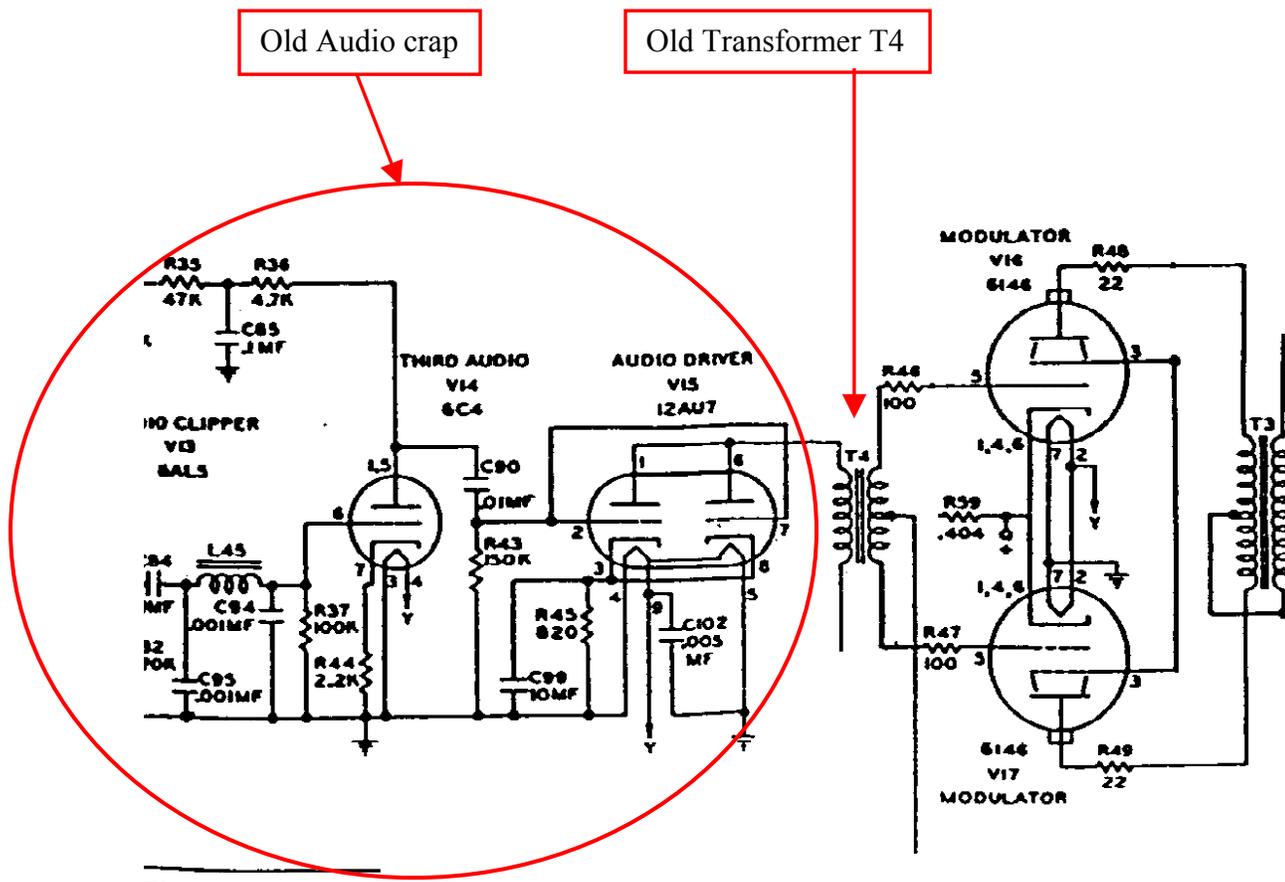


Figure 1. Existing Valiant Circuitry

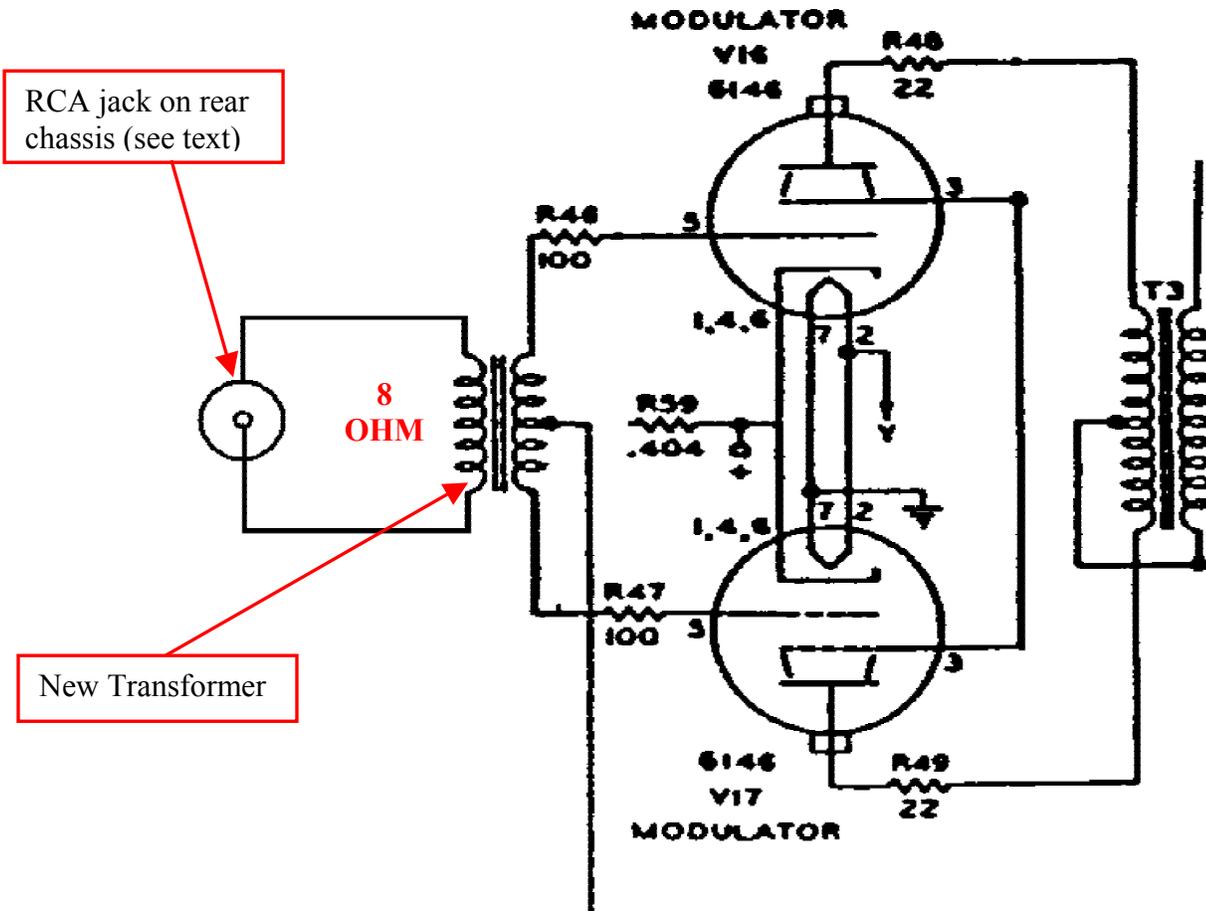


Figure 2. New Circuit wiring.

Existing T4 transformer

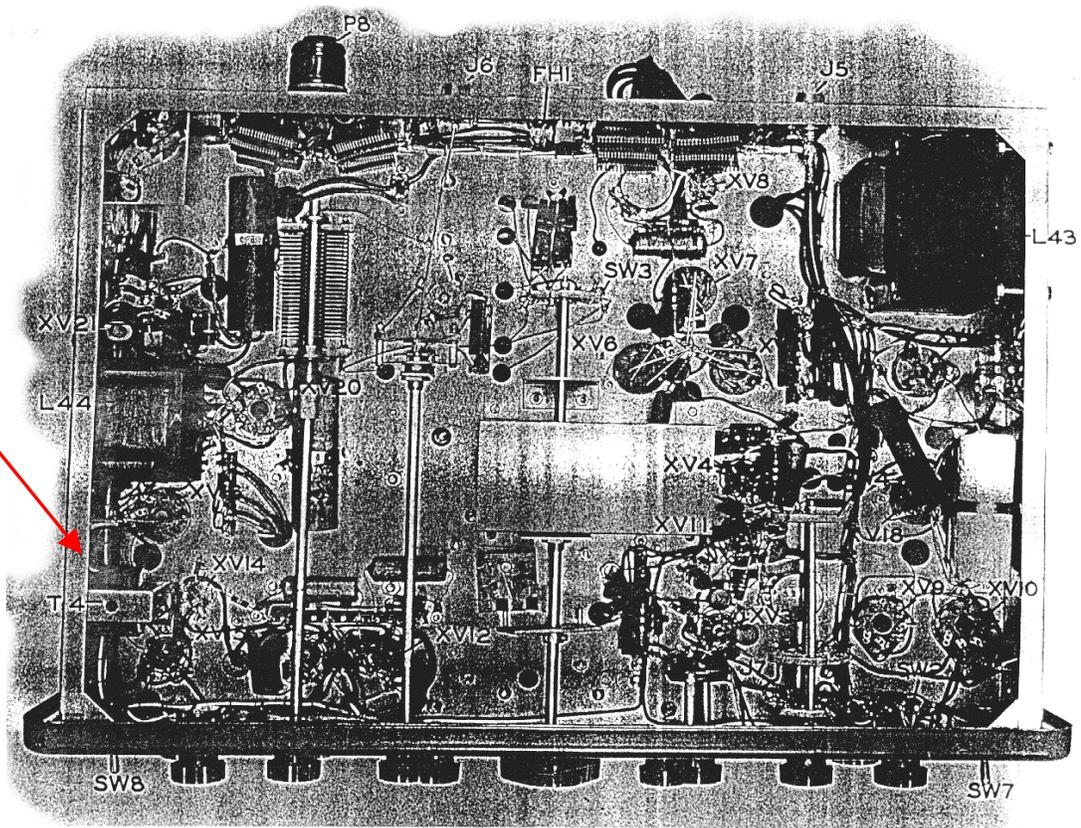


Figure 3. Location of original T4 Transformer

Use existing tapped hole to secure new transformer

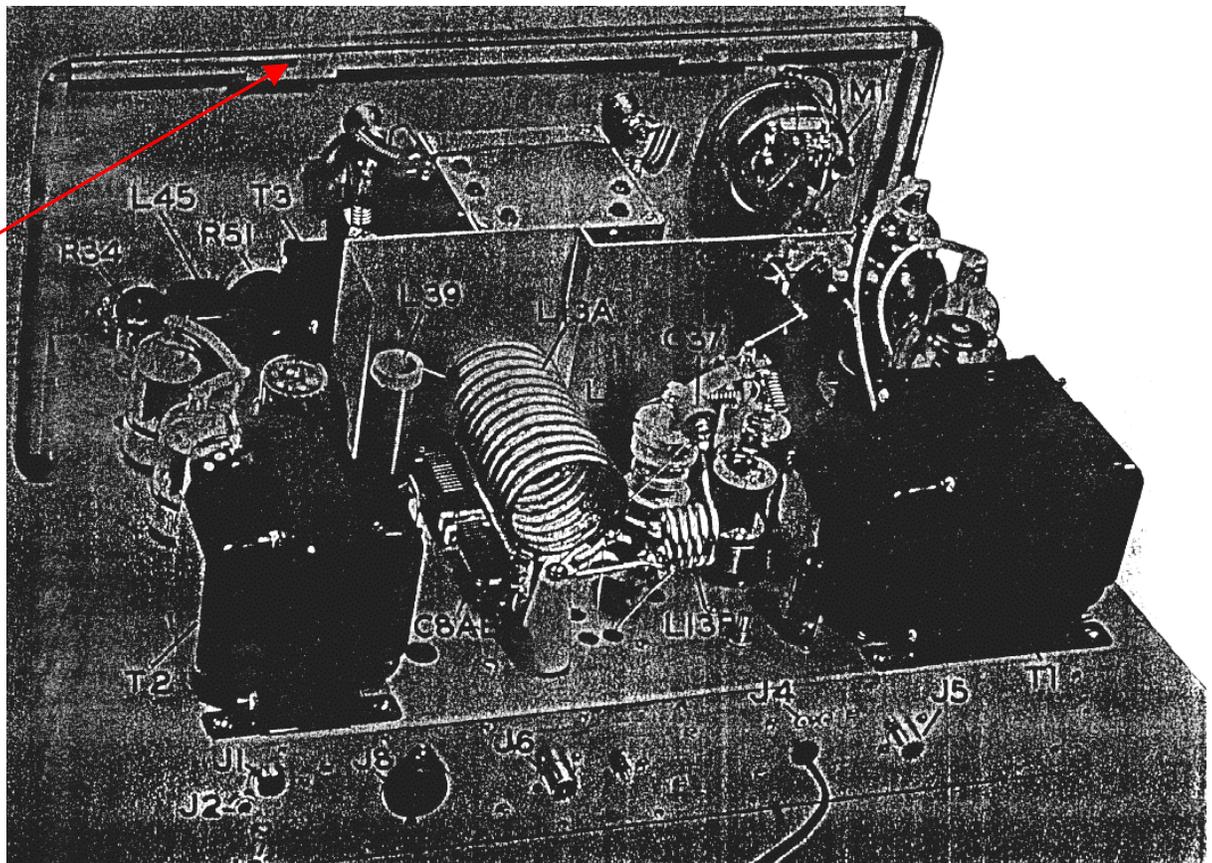


Figure 4.

Procedure:

- 1) Remove cover from chassis
- 2) Locate T4. See Figure 3.
- 3) Notice that on T4, there are two wires on one side, and three wires on the other side. You only care about the three wires on the one side. Follow these three wires, and note where they connect. The middle one is your center tap, and it is the bias. The two outer wires are the high impedance windings that feed the grids of the modulator tubes. Also, connected to this point are the two 100 ohm resistors, R46 and R47. Make sure they remain in the circuit. Remove all three wires, and heat shrink them. They will not be used unless you want to come up with a switch to reconnect them, and disconnect the new transformer, and vice versa. You are on your own for that.
- 4) Mount the new High Fidelity Transformer on the top side of the Chassis. It will hang from one of the four mounting flanges on one of it's four corners. Insert a short machine screw through the flange on the transformer, and then into the existing threaded hole that is depicted in Figure 4.
- 5) Make the three wires on the high impedance side of the new transformer long enough to nicely run through an existing grommet, and go to the points that the original wires went. These three wires should be twisted, or braided. Solder them neatly, and remember that the 100 Ohm resistors are still in the circuit.
- 6) Obtain a piece of shielded audio cable. (shield on the outside, and a wire in insulation in the Middle) Connect it to the 8 Ohm side of the new transformer.
- 7) Route this audio cable down through a grommet to the under side of the chassis. The shield will connect to the outer part of the RCA jack on the rear of the chassis. The center wire will connect to the center part of the RCA jack. *Note that the RCA jack is isolated from the chassis.*
- 8) Install the cover, using the extra long screw in one of the other holes that was in need of one, or give it to a friend that needs one.
- 9) Connect your 8 Ohm audio amplifier output, Left or Right channel, pick one.
- 10) If you used the Left channel, then you will connect your audio equipment to the left channel input of the amp. If this is a power amp without a preamp, then you will need a mixing console, or a line level output to drive the amp. If it is an integrated amplifier, that has a preamp built in, then your mic processor's line level output will feed the Aux input of the integrated amplifier.
- 11) You should ALWAYS run a peak limiter of some type as your last piece of gear before the input of the preamp.

12) Typical audio chain consists of a good mic like an Electrovoice RE-20. This feeds in to a Valley 400, or 401 Mic processor. If a high amount of compression is used, the normal room acoustics will be diminished. Under these conditions, it may be desirable to introduce a slight amount of reverb. A rack mount reverb can be used in the effects loop. Also in the effects chain could be a BBE Sonic Maximizer Model 422A to create pleasant sounding even harmonics. The Line level output of the Mic Processor should feed a multi band compressor like the Behringer 9024, then a multiband peak limiter (another 9024 in a limiting mode. If the 9024's are not available, then a Symetrix or other brand of limiter should be used. With this limiter in line, you will not overmodulate in the negative direction. Furthermore, if you install negative cycle loading circuitry on the output of the modulation transformer, you can use an O-Scope to advance the audio drive, and set the polarity of the modulator plate caps for greater positive peaks, with out exceeding 100 % or pinching of the carrier. If you use 6146B modulators, you can reach positive peaks of 130%.