Preserve the historic record and still have it "work".

"SST1D" - A solution for open audio transformers of the 1920s.

(Single Primary to Single Secondary Winding – No Taps)

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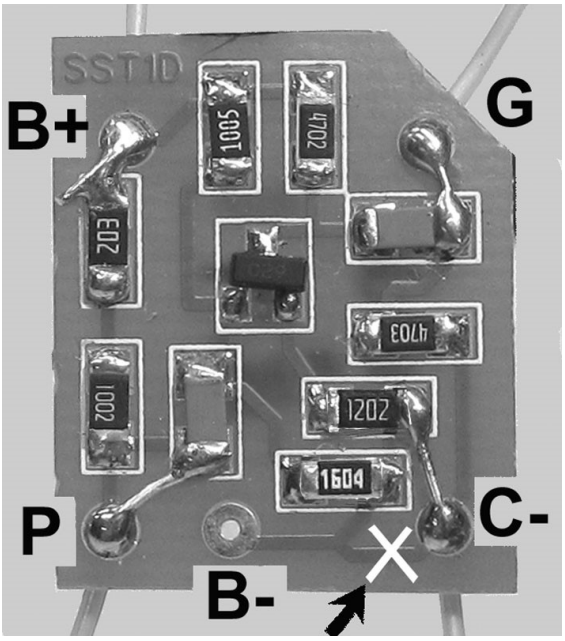
For over 50 years now collectors of pre-1930 radio receivers have frequently encountered audio coupling transformers with open windings. There are multiple possible causes, none of which we can change. There is an almost universal curiosity to know how receivers perform by actual operation with over the air signals. Many of us are clever enough to change-out old parts for new; or get lucky enough to find exact replacements. Others know to bypass the transformer using R-C coupling between stages. The down-side is loss of voltage gain provided by the transformer. Others will attempt to rewind or replace the windings with new coils. I for one, have a very, **very strong** desire to preserve as much of the original artifact as possible. I wondered if there might be another way **to keep all the original parts in place** and make no wiring changes at all that could not be completely and easily reversed.

Jay Kinnard in Texas proposed a 10 - component electrical solution that, except for having a much flatter frequency response in the audio range, provides about the same voltage gain and levels of distortion as a generic 1:3.5 ratio audio transformer working with triodes of the mid-1920s.

I have years of experience in printed circuit board design and thought I should be able to make a surface mount version of the circuit small enough to almost disappear in the innards of a radio. I call it the **SST1D** (**Solid State Transformer** (with) **One Darlington**). This board is less than 0.8 square inches and the total height is less than 1/8th inch. The board can be hidden inside a simple sleeve of black paper. The wires leading to the board are covered by black cotton sleeving just 1 mm in diameter. It could be made even smaller, but I wanted to use components that did not require machine placement and reflow soldering which would add considerable up-front expenses for a product with unknown market acceptance. The good news is that once parts and boards were acquired, the units could be assembled and sold by a hobbyist like me in small quantities for under $15 each. For the serious historian, it is becoming more and more difficult to discover artifacts that have not been modified for the expediency of making them work until something else breaks. **At least this method can frequently prevent the loss of original audio transformers in your otherwise factory original 1920s radio.**

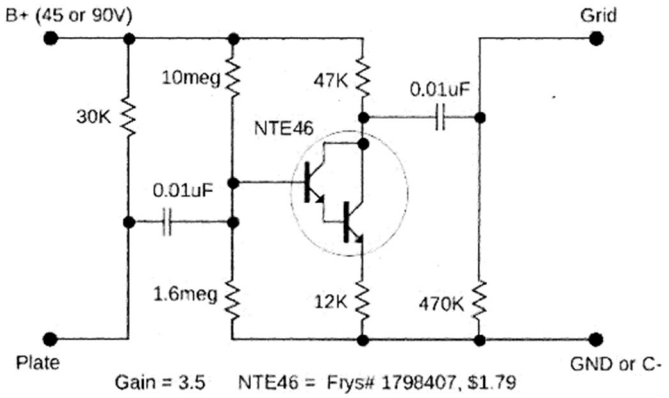
See details on next page.

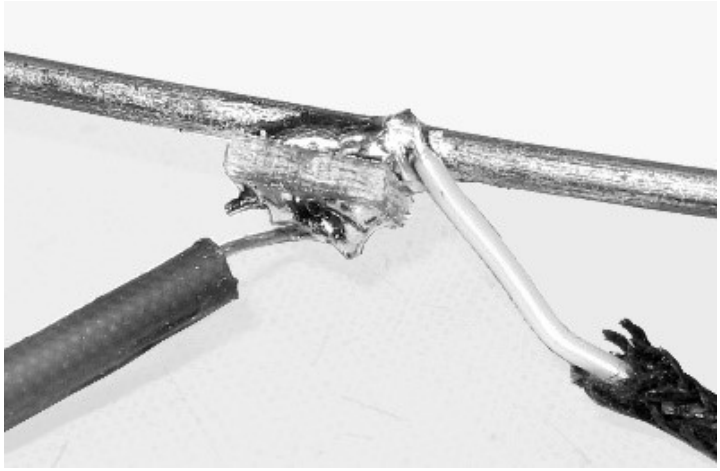
SST1D Installation Notes: Note that this circuit is designed to work in 1920s vintage radios with nominal plate supply voltages of 45 ***to*** **90 VDC**. There are two configurations, the only difference being the two resistors that set the circuit gain at 3.5 or 5.0. You may find that the 5.0 gain works best between the detector and the first audio amplifier, while the 3.5 gain is best between the first and second audio amplifier tubes. Each board comes with the two alternate resistor values so you can swap them if you are familiar with soldering surface mount parts.



There may be some receiver circuits where the **-C** bias is obtained from a high impedance source. In that case, you can cut the trace shown and lift the wire tail so that the 470K resistor is the only load to **C-**. The other two resistors are returned to **B-** or chassis common.

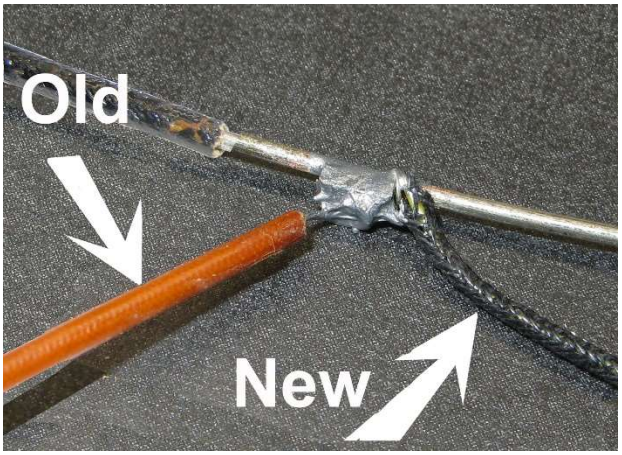
Cover the wires with braided outer covering taken from 1mm diameter black beading string; available at craft shops. (A length of the braid is included.) Bend the stripped 26 gauge wire into a tight loop before trying to slip over the braid, or you will go mad.





To change Gain to 5.0, change 1.6 Meg. (marked 1604) to 1.2 Meg. (marker 1204)

Change 12 K (marked 1202) to 8.2 K (marked 8201)



You can anchor your connections to buss wires or the old transformer terminals using a tiny die of double-side PCB material (supplied). The new connection and the PCB die is tacked to the active circuit and the old audio connection is 'parked' on the little insulated island formed on the other side.

You wrap the board in a slip of black paper to virtually make the whole unit disappear.

Clean the joints and apply a dab of gray acrylic paint to hide your work. You don't want your clever work to detract the viewer from the original intent of the maker many decades ago.