

## Triplet 3444A Power Supply Modification Notes

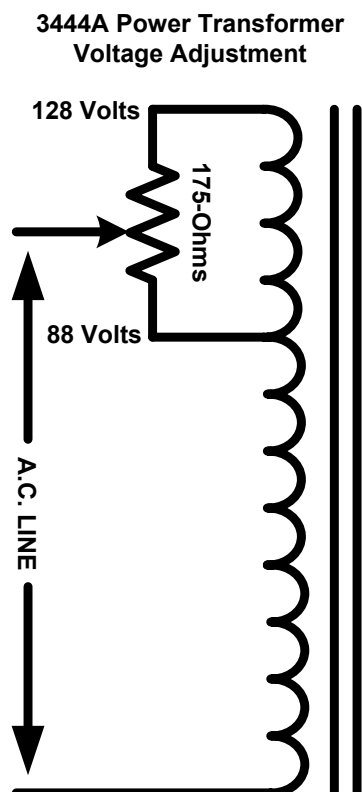
The Triplet 3444A is a superb Tube Test/Analyzer. Mutual Conductance is measured by inserting a small known AC signal on the Grid, and measuring the AC Plate current. The Mutual Conductance is displayed directly on a large meter.

The 3444A is self-calibrating, and the accuracy is as good as the 1% precision internal resistors. The unit tests tubes under conditions, of voltage and current similar to actual circuit parameters.

However the 3444A has a major shortcoming; the filament voltage swings very widely between testing, and non-testing conditions. For Power Tubes such as a 6L6 the filament voltage under test is 6.3 Volts, and rises to over 7 Volts when the 'VALUE' or 'LINE TEST' button is released. For rectifiers the voltage range is even greater.

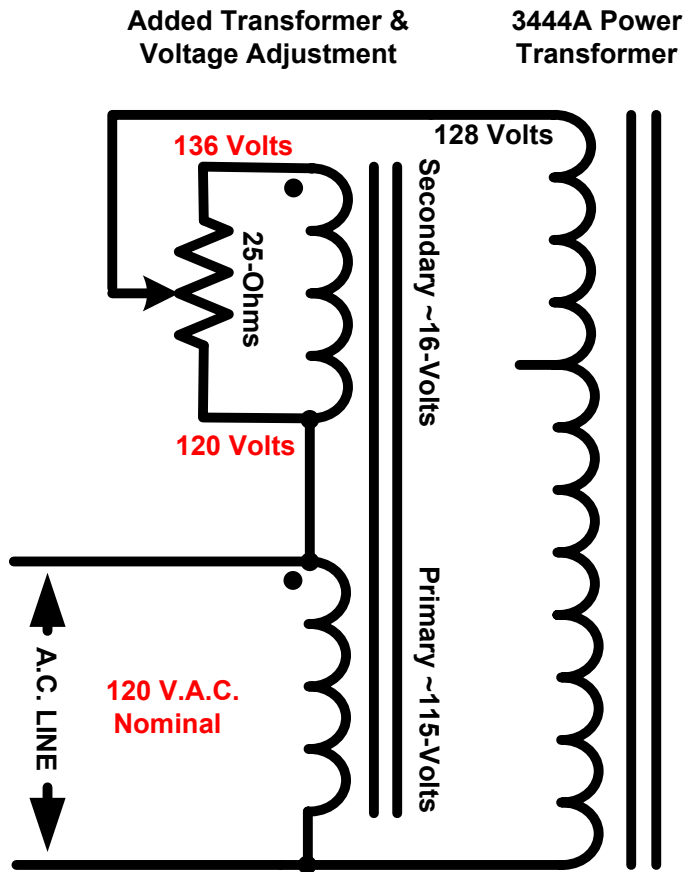
This significant overvoltage is great enough to make testing require some time for tube cathodes to cool down to the proper levels; so an accurate measurement may be read. In some cases the overvoltage may be great enough to damage the tube being tested.

The difficulty lies in the method and range of the Voltage Control for the tester. The Voltage input range is 88 to 128 Volts; 40 Volts! In North America the nominal line voltage is 120 Volts.



To achieve this range the power transformer has two taps one at 88 Volts, the other at 128 Volts. A 175-Ohm resistor bridges the transformer inputs, with the wiper going to the line. The circuit allows a wide adjustment range at the expense of introducing high impedance into the power input circuitry.

For North American operation a very significant improvement in performance can be gained by restricting the Voltage input range to 120 Volts +/- 8 Volts.



There are several ways to accomplish the necessary voltage control. A variable transformer (Variac) was considered, however space constraints were prohibitive.

A simple approach is to add an additional transformer in front of the existing transformer to step the nominal line voltage up to 128 Volts. The maximum current draw of the 3444A is ~ .5 Amps, so any transformer with a greater secondary current will do, the larger the better in terms of 'stiffness'. Because the span of the Secondary Voltage of the new transformer is only 16-Volts, the Variable resistor can have a much smaller value, while dissipating the same heat as the original resistor.

The 'Signal Transformer' 16-3000 was chosen for the task. It has a 3-Amp secondary (Well more than required), and is a 'Flat Pack' design, which is easily accommodated on the chassis of the 3444A.

Using the values shown the improvement in Voltage regulation should be a factor of seven better than the original circuit. The actual measured improvement with a 6L6 was a voltage excursion from 6.3 to 6.45 volts between 'Testing; and Non-Testing' modes.

The same technique could be used to improve the performance of the Triplet 3444 Tube Analyzer, and any other tester with a similar inappropriately wide input voltage range.

If you are interested in reviewing the calculations please contact me at: [rag@designsuccess.net](mailto:rag@designsuccess.net)

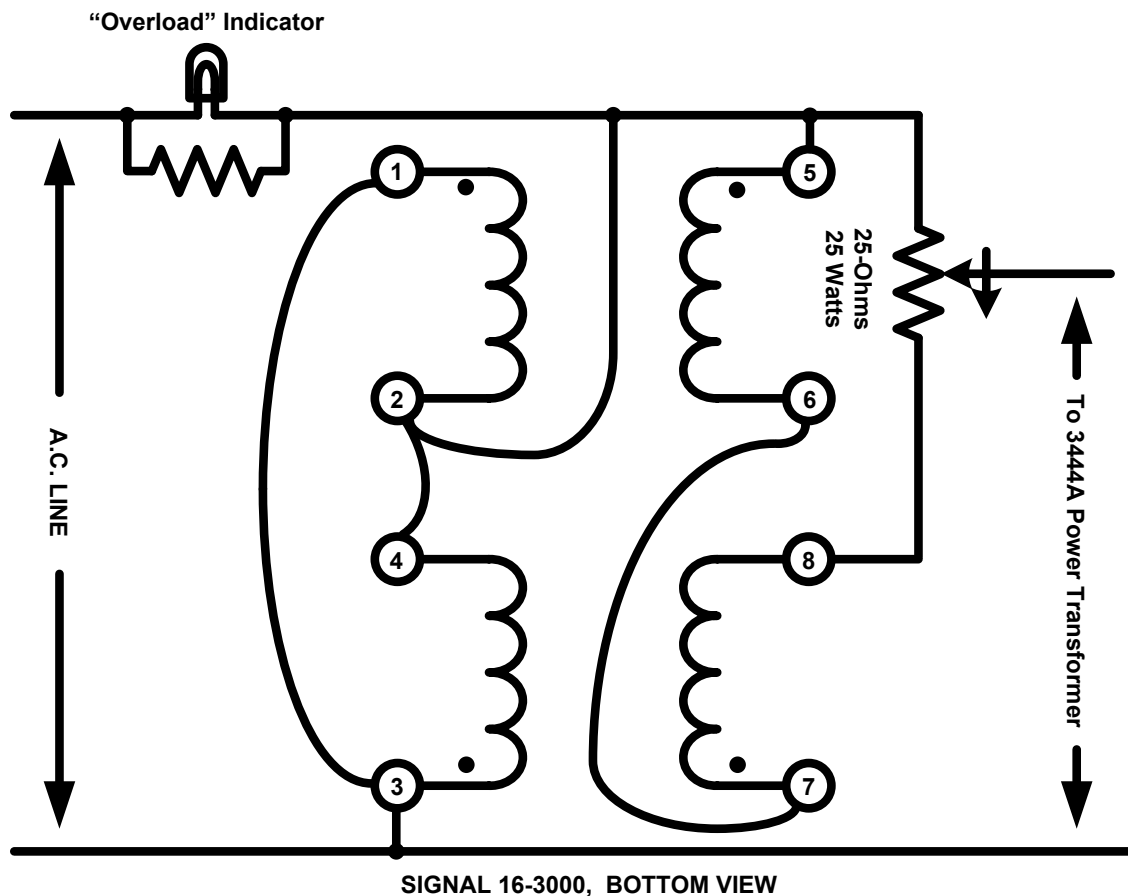
## Wiring and Installation:

For those wishing to use the same transformer; I have included a few additional notes that should prove helpful?

The Signal 16-3000 is a 'Split Bobbin' dual winding transformer.  
The Primary Windings should be connected in parallel for 120 Volt operation.  
The Secondary Windings are connected in series.  
The Secondary winding is also connected 'On top' of the Primary winding to provide a boost in voltage

The 175 Ohm, 25 Watt Variable Resistor is replaced with a 25-Ohm, 25 Watt Variable Resistor

Before beginning the modifications, identify the Power Transformer connections  
A few additional wires will need to be added to complete the modification



The 16-3000 is a Flat Package which easily fits between the existing Power Transformer and the circuit board.

As shown in the Photograph, the unit is held in place by a large 'Wire-Tie'

The 16-3000 is held off from the Power Transformer by ~ 1/4 Inch of 'Double Sticky' Foam tape. The tape serves two purposes:

Mechanical stability

Separation of the Magnetic Fields

The magnetic fields are further isolated by mounting the two transformer cores at right angle to one another.

