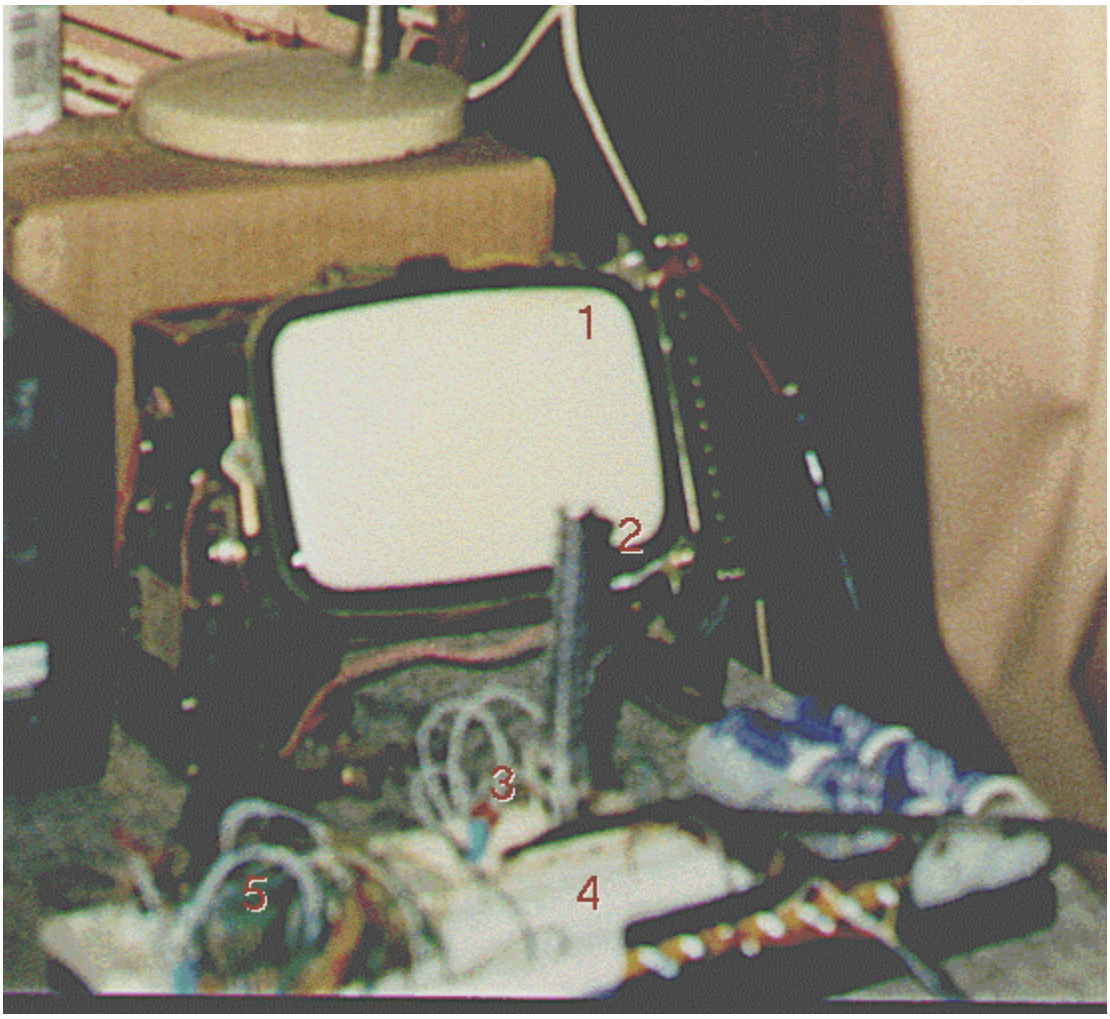
Home-Built O-Scope

Notes on converting that old compact tv set or computer monitor into an oscilloscope. Proves very useful in line quality monitoring and other low frequency applications.

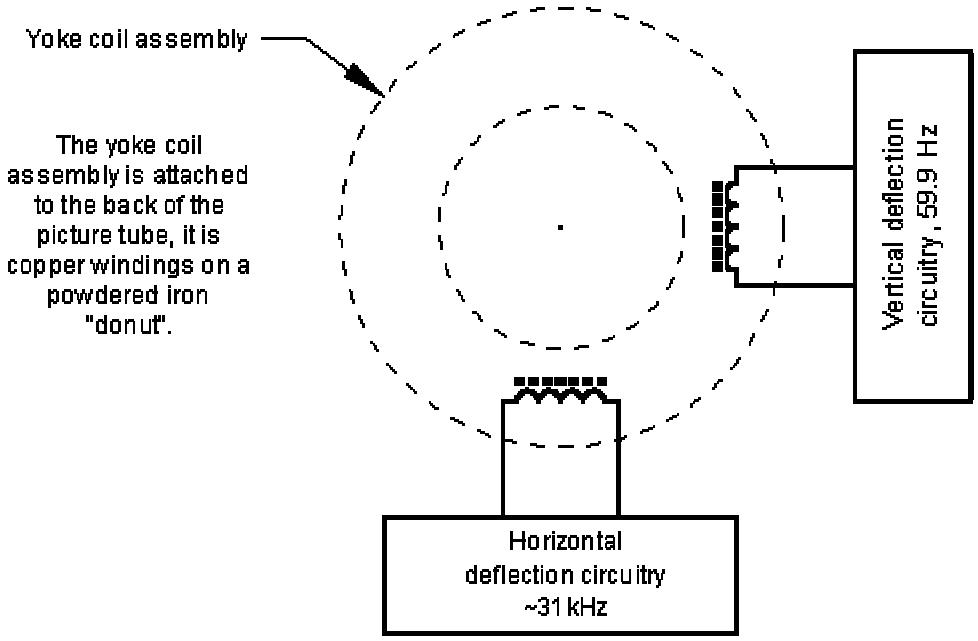


Here is a picture of the scope I built when I was 15 years old. It was a 9 inch portable black and white tv set. It was very limited, the beam only deflected to the positive. That means only one half of ac waveforms came through visible. There are numbers on the picture and here's what they denote: 1. crt screen 2.

deflection power transistor (there was only one.) 3. preamp circuitry for deflection circuit 4. breadboard 5. circuitry under test. This picture is the only one I had of a homemade o-scope, I may include a picture of the one I use now, which is a converted computer monitor.

Warning!!! Please note!!! There are high voltages inside tv sets! Use extreme caution! My advice is, never reach into the unit while it is plugged in unless you are real sure of what you are doing! I accept no liability whatsoever for the risks you take in following the plans outlined below. Not all tv sets and computer monitors are alike, so these plans are only exemplary of one way you might do this.

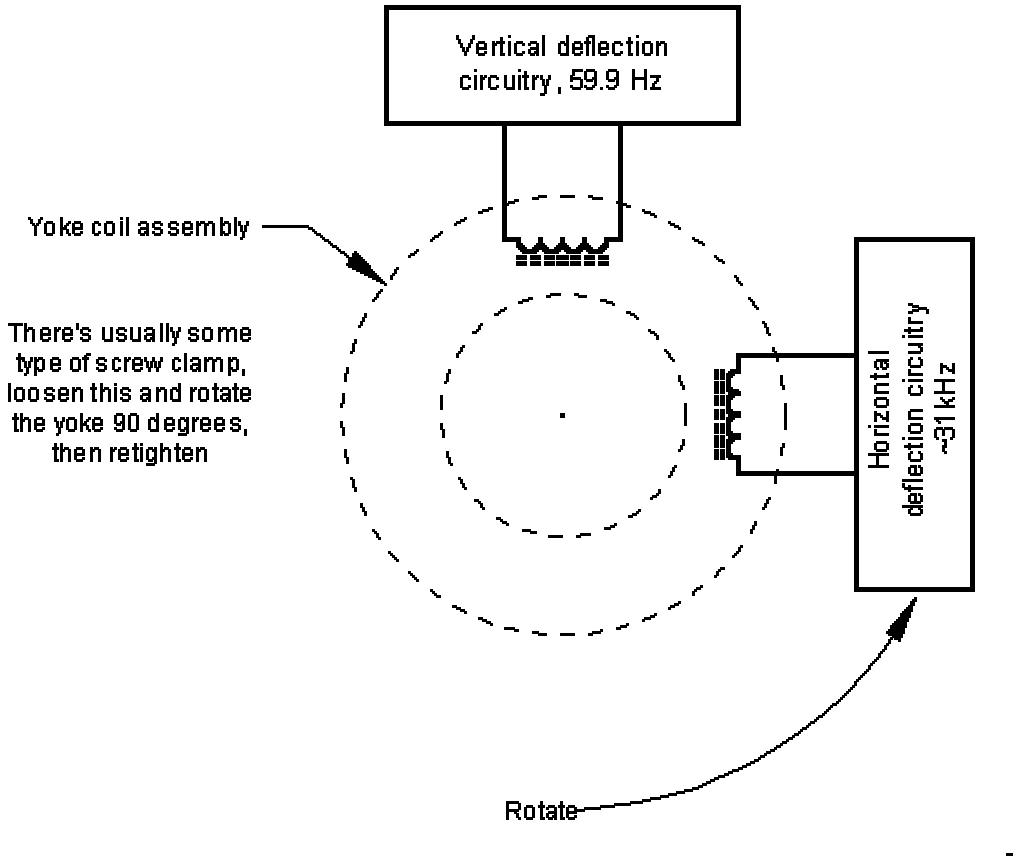
Step One:



Inside the cabinet of a TV or computer monitor you will find at the back of the picture tube, the yoke coil assembly. Once you locate it, note the clamp that secures it to the picture tube. You will need to loosen this clamp and rotate the

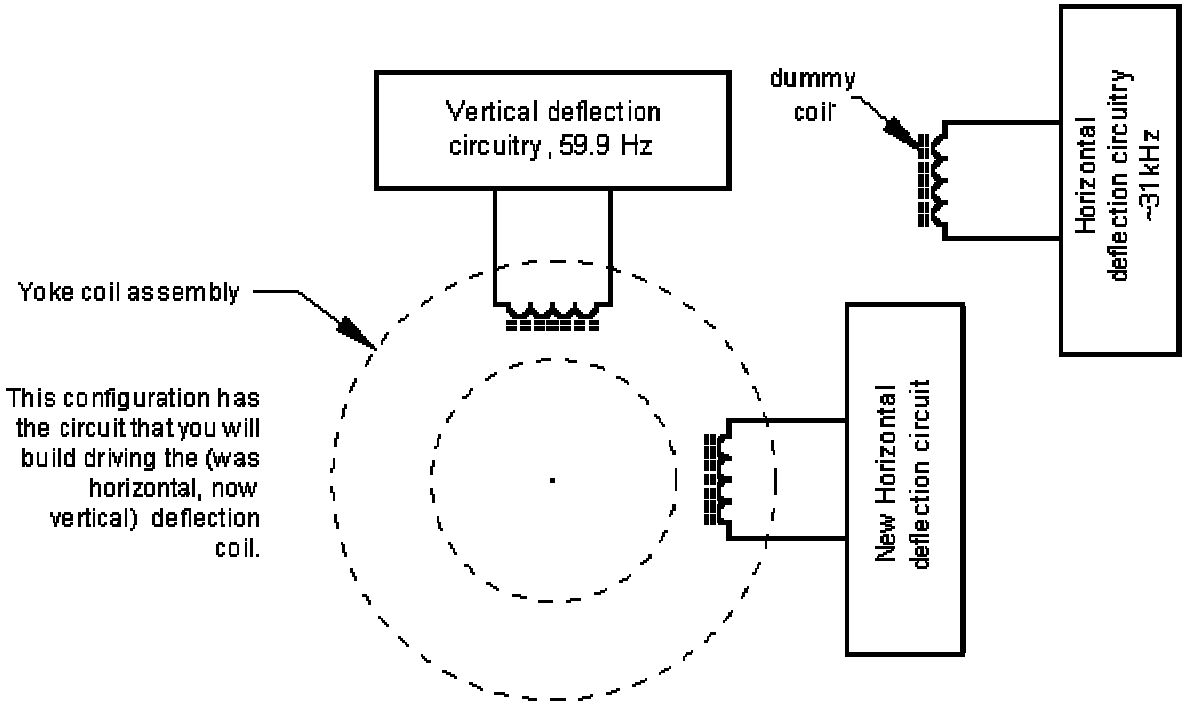
coil 90 degrees, either clockwise or counterclockwise, whichever direction makes the vertical sweep become a left to right horizontal sweep.

Step Two:



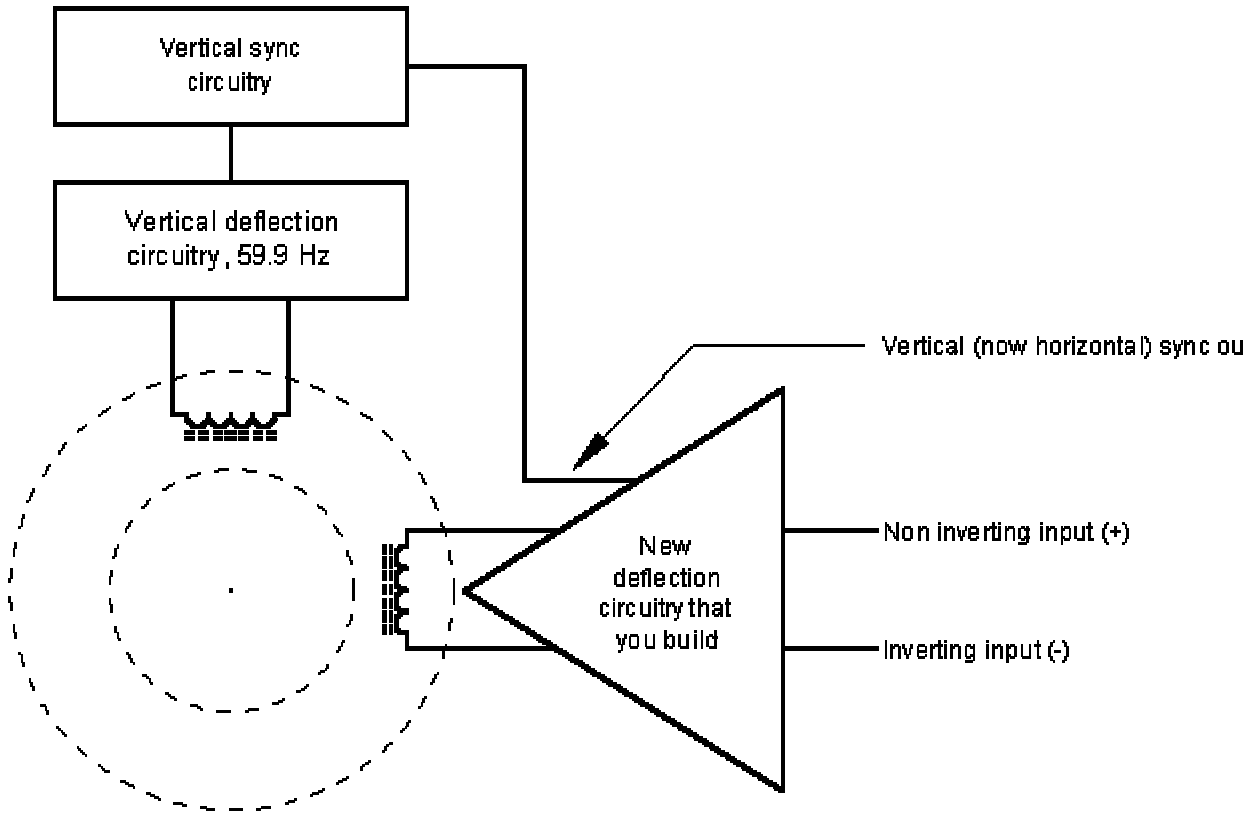
After this is done, you can retighten the clamp if you like, but keep in mind that you may want to adjust this a bit more to make the beam run in a straight line across the screen. Now the Vertical deflection circuit is the Horizontal deflection circuit.

Step 3:



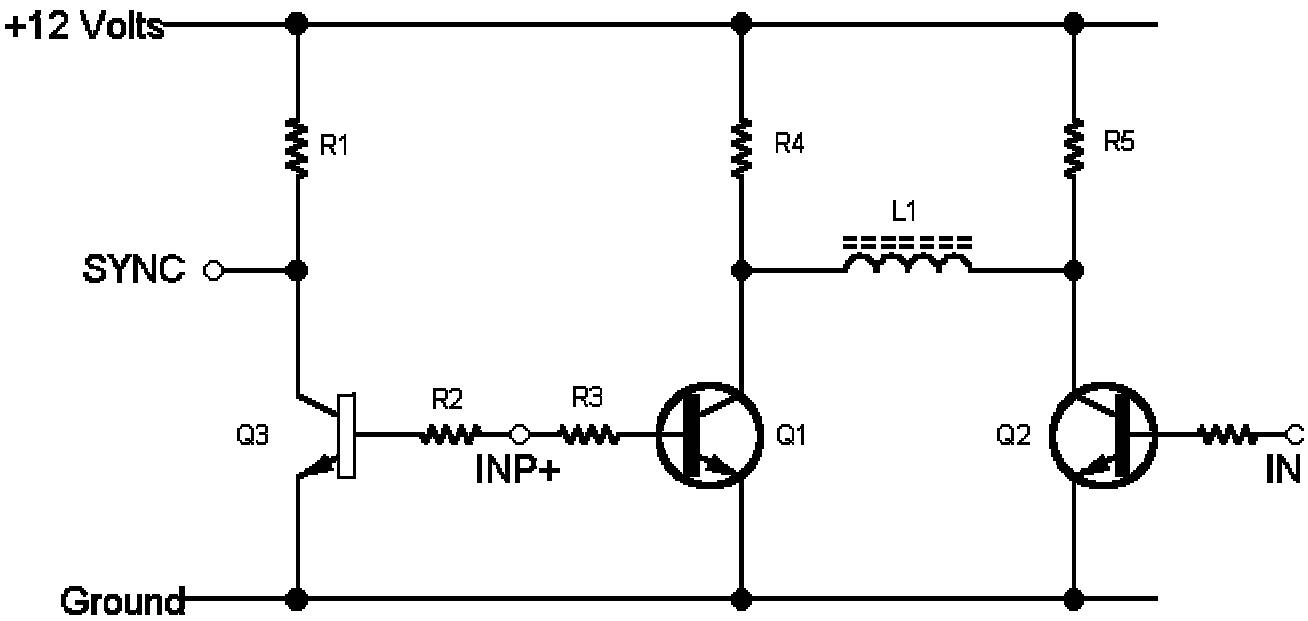
Now you need to disconnect the old Horizontal deflection circuitry from the yoke coil and possibly provide it with a "dummy" coil so that it continues to operate. (Some systems require this for the high voltage generator to operate.) After you build the new deflection circuit, you will connect it to the yoke coil for what is now a Vertical deflection axis.

Step 4:



This optional step is for the sync circuit. What you need to do is locate the wire that served as the vertical sync. If you are converting a TTL monochrome computer monitor like I did, then it's really easy to do this. On the circuit board there will likely be a wire that comes in from the signal cable that is labeled "VSYNC." Locate this wire or its trace on the circuit board and attach a wire to it so you can connect it to the new deflection circuit.

Step 5:



Here is the schematic for the new deflection circuit. This schematic is what most of you came to this site looking for. Here are the values of the components: R1, R2 are 10k 1/4 watt, and R3 and the resistor at INP- are 100k 1/4 watt resistors. R4 and R5 are flameproof, heatsink mounted resistors that are rated 50 watts and they are 5 ohms each. Q1 and Q2 are TO-3 npn darlington transistors of the 2N6578 type. Any type can be used here as long as its npn and can handle 15 amps and 120 watts or so. L1 is the yoke coil that was the horiz deflect but since you rotated the coil it deflects vertical. Q3 is a small switching npn transistor of the 2N2222 type, although many different ones could be used here, too.

Connect SYNC to the tv's vsync circuitry. Use extreme caution locating this connection.

Caution!!! The connections inp+ and inp- are very sensitive. You will have to change the values of r3 and the resistor on inp- to higher values for higher voltages under test. This circuit is very basic; I enhance it where necessary to provide the information I need from my circuit under test. It could be enhanced

with op amps and other circuitry to make it both more accurate and user friendly.

Good Luck!