# SERVICE CLINIC

## An easy and accurate IFT test

JACK DARR, SERVICE EDITOR

SEVERAL YEARS AGO, THE FIRST INTEGRATED flyback transformers (IFT) began to appear. Those first IFT's gave many technicians quite a bit of trouble, so it was very natural that they weren't too fond of them! However, over the years they've been dramatically improved and today are used in many modern TV sets. Because of that, we thought you might be interested in an easy and very accurate test method that we've recently run across.

The method that we'll describe here doesn't use any test equipment that you don't already have (or should have!). All that's needed is a variable transformer, a scope (either single or dual trace), an AC ammeter, and a couple of short clip-leads. Basically, all you have to do is to arrange things so that the horizontal oscillator runs. Then monitor the prescribed test points (with a scope) while gradually increasing the line voltage to approximately ⅓ of its normal value.

### Procedure

The first thing to do is to connect the variable transformer and ammeter as shown in Fig. 1. The ammeter should have a range of at least 5 amps.

Figure 2 shows a partial schematic of Sylvania's C3 color-TV chassis that we talked about last month. While we'll talk specifically about that chassis, the method we'll use can be adapted to others. Assuming that you're using a dual-trace scope, first connect Channel A of the

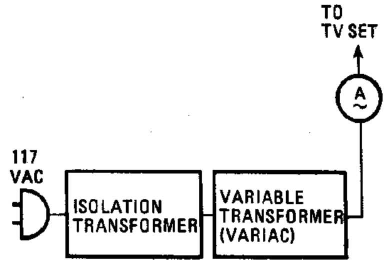


FIG. 1

scope to the output of IC500, the horizontal oscillator. (That IC isn't shown in the figure, but its output is—at the input of Q400.) Set the Channel A attenuation to 5 volts and the timebase to 10 μs-per-divi-

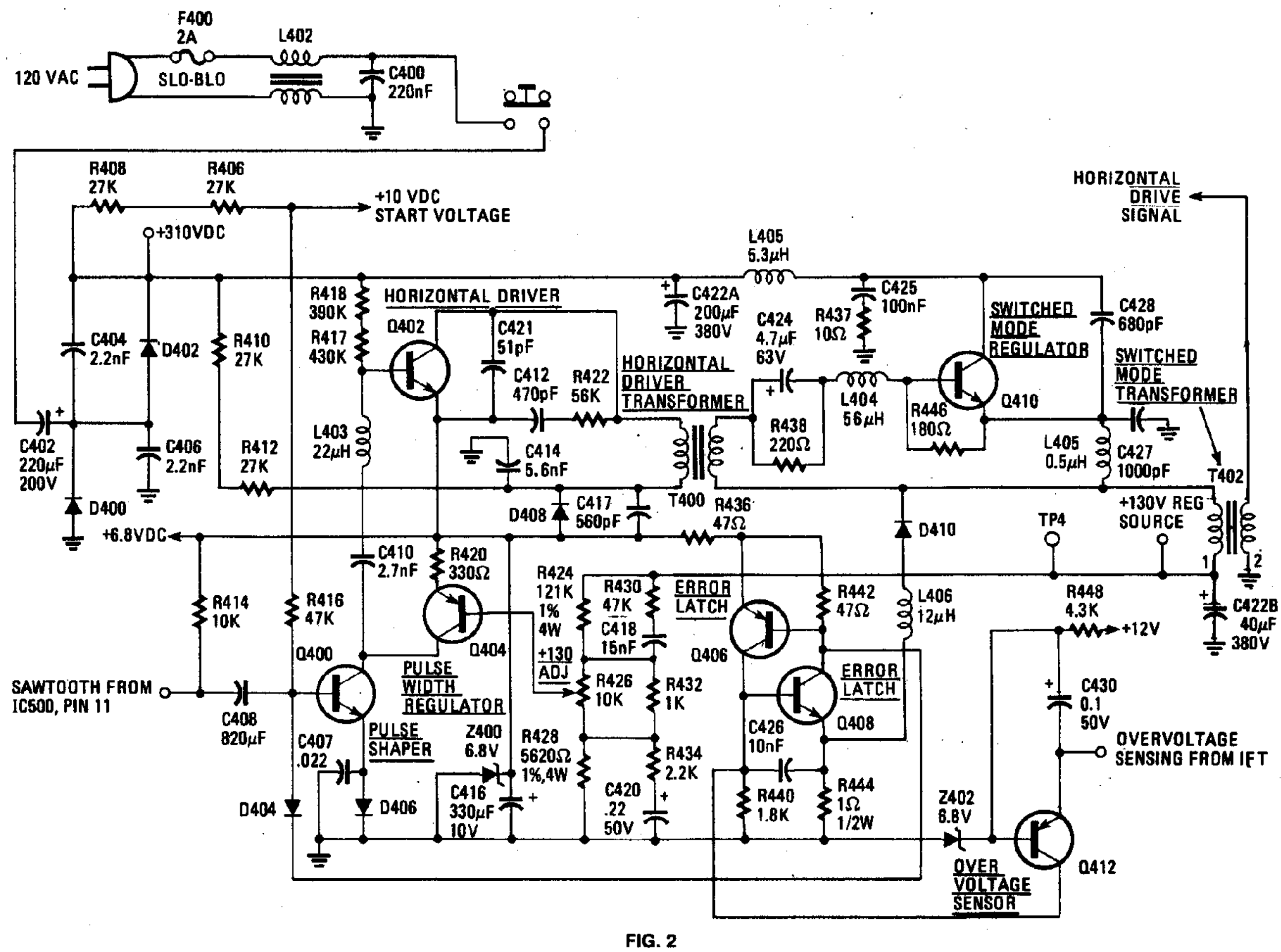


FIG. 2

sion. Now, connect Channel B to the collector of Q452, the horizontal-output transistor. (That transistor also isn't shown. The horizontal drive signal—from T402—is fed to its base.) Set the scope to 10 μs-per-division and the attenuation to 100 volts.

Next, connect a clip lead across R406 in the starter circuit. Doing so raises the start voltage to a level that will maintain the operation of the horizontal oscillator. That voltage is normally 10-volts DC, but at the reduced line voltage you should read about +5.6 volts. Note: Our tests were made with the line voltage as low as 40-volts AC; you shouldn't have to raise the voltage above 70-volts AC. Before going any further it's a good idea to disable the error latch circuit by removing R436. That's because if there's some other trouble with the set, the error latch may fire and kill the horizontal drive signal. **Caution:** be sure that the set is never plugged into full line voltage with R436 removed or you'll be inviting a mess of trouble for yourself.

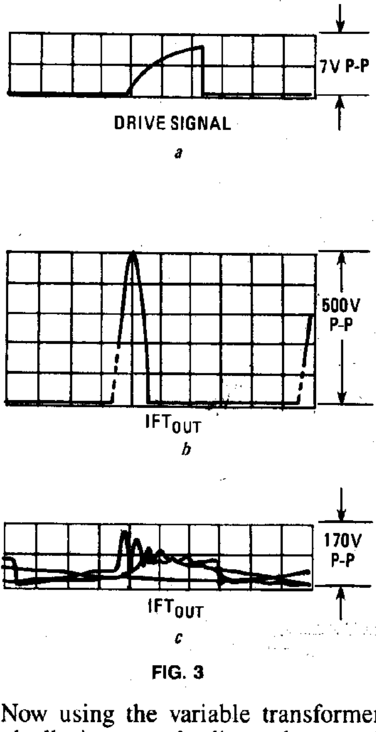


FIG. 3

Now using the variable transformer, gradually increase the line voltage until you see a 7-volt peak-to-peak sawtooth signal on Channel A of your scope. That sawtooth signal goes to the pulse-shaper and the switched-mode transformer that drives the horizontal-output circuitry. If the Channel A scope pattern is like the one shown in Fig. 3-a, you have a good drive signal. Now, look at Channel B, you should see a clean 500-volt peak-to-peak pulse as shown in Fig 3-b, if so the IFT is good. If the drive signal is good but you have a distorted or scrambled signal on Channel B, as shown in Fig. 3-c, you've got a problem.

If the signal is distorted be sure to

check all rectifiers used in the numerous low-voltage supplies (there are 4 or 5 of them). Watch out for shorts-. Should your measurements indicate a short, stop and check out all of the low-voltage supply circuits. A shorted diode in any one of those supplies will cause trouble. Also, check for blown fuses and burnt components. If you discover any evidence of a short, measure the resistance of the associated components and make any necessary repairs. Study the schematic carefully to see if there is a low-voltage shutdown circuit in the set. If so, disable it and follow the same procedure as before. (The same precautions apply.) If after making all the necessary checks, you still get an indication of a short circuit, you can be fairly sure that the IFT is bad and should be replaced. If you don't get the correct waveform, check the time-per-division setting of your scope. After servicing, check to see that all jumpers have been removed and all disconnected parts have been replaced.

Though the above method was developed for the Sylvania/Philco C3 chassis, we don't see why the basic procedure couldn't be adapted to other manufac-

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turer's sets using the same type circuitry with a little ingenuity. That is, provide a start-up and run voltage to the horizontal oscillator with an'extemal low-voltage DC supply. You don't have one? How about the bias box in your alignment setup? They have the right voltage and most of them will supply the full current needed! If you don't have one, but your sweep generator or marker/adder has one or two built-in, that's fine (my Heathkit IG-57 does).

Why not try looking for other ways to use that test setup; it just might turn out to be a handy-dandy idea! **R-E**