SENCORE®

Means Success In Electronic Servicing

tech tips

How To Test CRT Anode Voltage With Your VA62A Digital Meter And The HP200

One of the most critical voltages in a television set is the second anode high voltage. In order for the CRT to emit the proper amount of light, the high voltage must be at the correct level. If the high voltage is low, the CRT will have a dim picture or no picture at all. If the high voltage is too high, the picture will become distorted, the set may go into shutdown, or permanent damage to the high voltage circuits may occur.

Using the HP200 50kV High Voltage Probe with the VA62A digital meter allows you to measure these high voltages up to 50,000 volts. When measuring high voltages, however, proper steps and precautions must be taken to insure accurate and safe readings.

Figure 1: Simply multiply the VA62A's digital meter reading by 100 to obtain the value of the voltage being measured. For the example shown, the reading of 244 volts represents a circuit voltage of 24,400 volts.

HP200 Extends The VA62A Impedance Range

The VA62A's digital DC meter has an input impedance of 15 megohms. This high input impedance lets you make measurements up to 2000 volts, with a direct probe, in virtually every circuit without loading them down.

The HP200 extends the VA62A's impedance to 1500 megohm, 100 times the original impedance. This high impedance divides the voltage down by a factor of 100 before the voltage reaches the VA62A's circuits.

Since the voltage is being divided by 100 by the HP200, the voltage reading on the VA62A's digital display will be smaller by a factor of 100. To obtain the value of the voltage being measured, the reading must be multiplied by 100, or simply move the decimal two places to the right. For example, if you get a reading of 244 volts on the VA62A's digital meter using the HP200, the actual voltage would be 24,400.

Setting Up The VA62A And HP200

Using the HP200 and VA62A to make a high-voltage measurement is similar to making normal DC measurements except for the 100 times multiplication factor. You start by setting the VA62A's DIGITAL METER switch to the EXT DCV 2KV DIRECT position. The supplied meter probe and ground lead are inserted in the EXT PPV & DCV and ground jacks, respectively. Then you slip the probe into the special connector on the rear of the HP200 as shown in Figure 2 and you're ready to test.

Safety Precautions

Measuring voltages above 2000 volts with the HP200 and the VA62A presents possible shock hazards. Be sure to read the following warnings and instructions before attempting to make any kind of high voltage measurement:

Discharging the CRT anode

Modern CRTs may retain a high voltage charge for a substantial period after power is removed. Before working in the high voltage section, or attempting high voltage measurements, the CRT must be discharged.

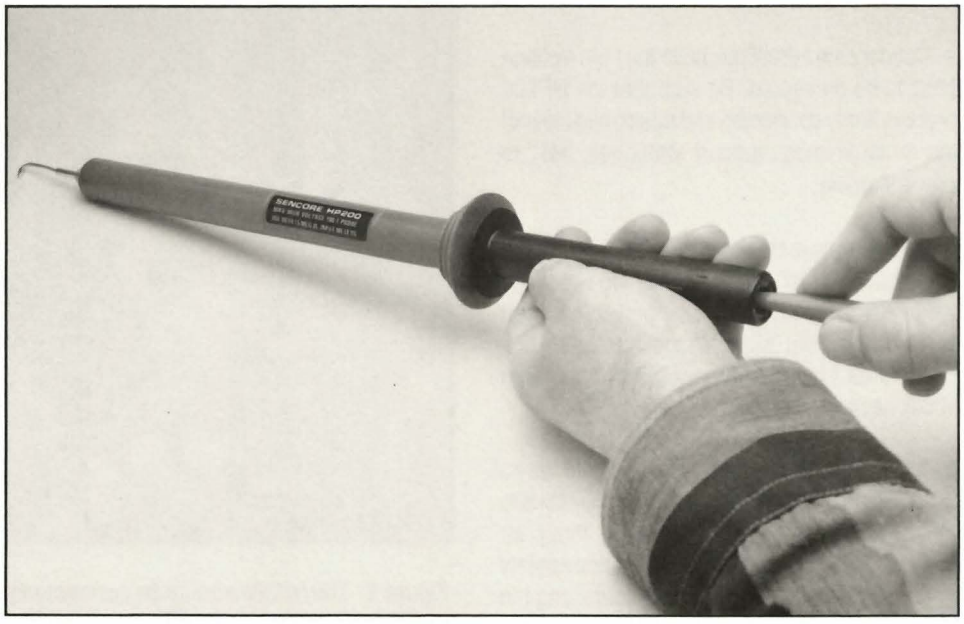

Figure 2: The HP200 fits over the end of the regular test probe and increases the measuring capabilities to 50,000 volts.

WARNING

Never attempt to perform any high-voltage testing until you have completely read and understood the following warnings and instructions.

To safely discharge the CRT high voltage, connect a 10 k ohm resistor in series with a test lead between the chassis (circuit ground) and the anode lead of the picture tube for a minimum of five seconds.

1. Never try to measure more than 2000 volts without a high voltage probe. Measuring high voltage with a direct connection may damage the VA62A, the equipment under test, and/or cause a severe shock hazard to the operator.

2. Connect the ground lead in such a way that it cannot become detached during the test. If the ground lead should become detached during a high-voltage measurement, immediately remove power to the circuit under test. *Do not touch* the ground lead, the VA62A, or the HP200 until the power has been removed as there is a severe shock hazard. Be sure the VA62A operates correctly before continuing the test.

3. Connect to the correct high voltage ground point. Some chassis use a separate ground for the primary and secondary of the high-voltage transformer. Be sure your common lead is connected to circuit ground.

4. Connect the HP200 probe to the high-voltage point to be measured. Be sure that the HP200 probe is firmly connected and positioned clear of the metal shields, support structures, etc., to prevent arcing.

5. Immediately remove power to the circuit if the high-voltage probe comes loose. Do not touch the high-voltage probe until the power has been removed and the high voltage has been discharged as there is the possibility of a severe shock hazard.

6. If the high-voltage probe must be held, do so with extreme caution. Be sure the connections to the probe and the ground lead are firmly attached. Hold the probe behind the molded safety rings to prevent the possibility of contacting the high-voltage test point or to prevent arcing across the probe to your body.

7. Remove the power to the circuit under test before making connection to the test point or before disconnecting the high-voltage probe from the circuit.

Measuring High Voltage Step-By-Step

Measuring high voltage with the HP200 and the VA62A will be safe and error free if you observe the following steps:

To measure over 2000 volts DC:

1. Remove power from the equipment in which the high voltage is to be measured.

2. Connect the banana plug side of the regular meter probe to the red EXT PPV & DCV IN jack. Be sure the plug is firmly seated.

3. Slide the tip of the meter probe into the opening at the rear of the HP200. Be sure the tip is firmly seated in the connector inside the HP200 in such a way that it cannot become detached during the measurement.

4. Securely attach the black ground lead supplied with the VA62A to the common point of the circuit to be tested. Be sure you are connecting to the correct common point and that this lead cannot become detached during the high-voltage measurement. Connect the other end to the black EXT PPV & DCV IN jack on the VA62A.

NOTE: *The common lead of the VA62A must not be floated more than 1500 volts (DC + Peak AC) above earth ground.*

5. Connect the high-voltage probe to the test point to be measured in such a way that the probe does not have to be held during the measurement; be sure there is ample clearance between the exposed probe tip and the nearby chassis or metal shields. *See warning number 6 if the probe absolutely must be held.*

6. Set the DIGITAL METER switch to the EXT DCV 2KV DIRECT position.

7. Apply power to the equipment under test.

8. Multiply the reading on the digital display by 100 to obtain the value of the high voltage being measured.

9. Remove power to the equipment under test before disconnecting the high voltage probe from the second anode.

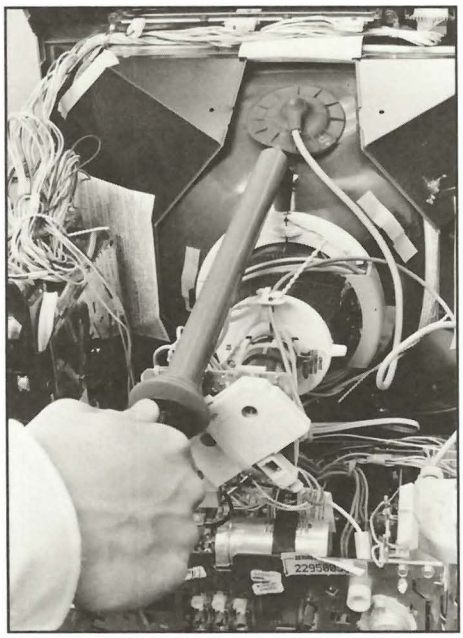

Figure 3: The HP200 should be connected to the circuit so that you do not have to hold on to it, but if this is not possible, only hold it by the black handle as shown.

For More Information
Call Toll Free 1-800-SENCORE
(736-2673)

SENCORE®
3200 Sencore Drive, Sioux Falls, South Dakota 57107

Form 4326 Printed in U.S.A.

#142 #142

#142 #142