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Ten Things You Can Do With The HA2500 Horizontal Analyzer That You Can't Do With Any Other Instrument

Since its introduction, the HA2500 Universal Horizontal Analyzer has found wide acceptance from electronic servicers, maintenance departments and refurbishing depots. Hundreds of HA2500's are in daily use, saving many hours of servicing time. If you are an HA2500 owner, this article may provide you with some pointers that will save you even more time. If you do not own an HA2500, then be sure to read this article to see how you too could be saving time and better managing repairs through its unique time and money saving features.



1. The Only Analyzer That Simulates And Tests The Horizontal Output Stage With No AC Power Applied.

Only the HA2500 equips you to analyze the horizontal output stage for severe defects with the equipment under test unplugged. The patent pending LOAD TEST simulates the horizontal output stage operation at its proper frequency and at 1/10th its normal B+ voltage. The test frequency is adjustable from 15 kHz to 125 KHz, allowing you to test any video display from a basic television to the highest resolution monitor. The B+

voltage is adjustable from 0 to 18 volts to establish a B+ test voltage. A LOAD TEST SETUP peak-to-peak readout from 90-100 VPP confirms a proper test simulation.

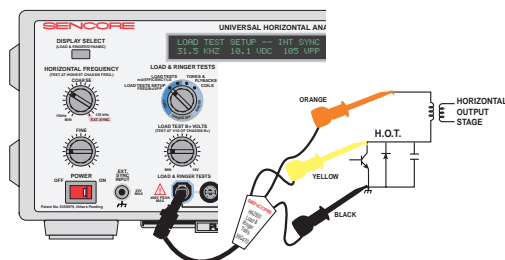


Fig. 1: The horizontal frequency and B+ voltage is adjusted to simulate the operation of the horizontal output stage during the LOAD TEST.

2. The Only Analyzer That Identifies Horizontal Defects Before Replacing Parts Or Applying AC Power.

Horizontal output stage defects cause increases in current that commonly cause horizontal output transistor, HV/deflection regulator and switch mode power supply component damage.

These parts are often replaced, only to be damaged by remaining defects when power is applied to the display.

The HA2500 Load Test provides three automatic measurements that analyze the horizontal output stage. The "mA" readout reflects the B+ supply current demand of the horizontal output stage. The "%" readout indicates if the horizontal output stage has excessive power losses associated with component defects. The "uS" readout indicates the timing of the flyback pulse generated during the test. These measurements quickly tell you if the horizontal output stage, including the integrated flyback and horizontal yoke, is functioning normally or if expensive

defects exist. Reference charts located in the “Pull Chart” of the HA2500 provide for easy lookup of the normal readings you should expect. **With the LOAD TEST you’ll get to the underlying problem faster, avoid lost time replacing parts and save on parts cost.**

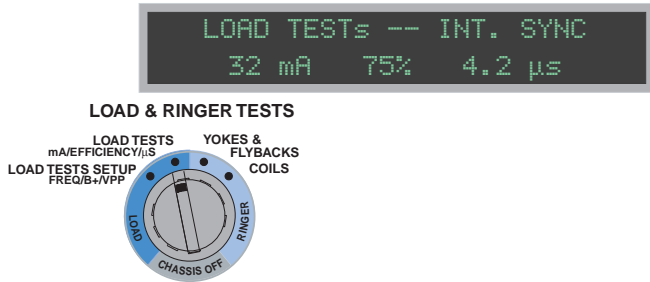


Fig. 2: Load Test readouts indicate if problems exist in the horizontal output stage that will damage replacement components.

3. The Only Analyzer That Enables Comprehensive Troubleshooting In The Horizontal Output Stages Without AC Power Applied

The HA2500 equips you to troubleshoot AC loading problems in the horizontal output stage. These defects are not indicated by an ohmmeter test but show up as high “mA” and low efficiency “%” readouts during the LOAD TEST. These defects would burnout replacement components, wasting your money and time. An effective method of isolating these defects is to repeat the LOAD TEST after opening secondary AC paths and comparing mA and % readouts. A secondary short is indicated by mA and % readouts that return to a good range. You may also use an oscilloscope to measure voltages and waveforms, looking for abnormally low or missing voltages. Normal Load Test DC voltages and waveforms are approximately 1/10th of the chassis normal.

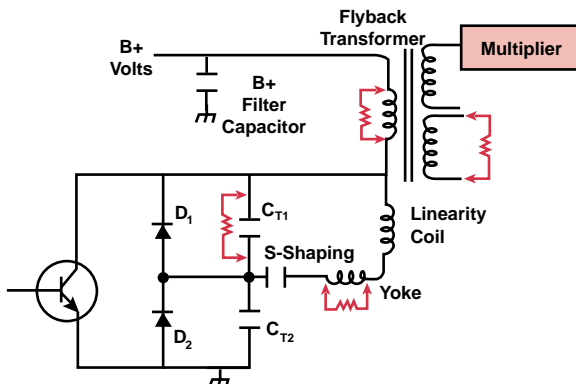


Fig. 3: AC shorts or leakage paths can be isolated using the HA2500 LOAD TEST.

4. The Only Analyzer That Proves A Flyback, Yoke Or Coil Has A Shorted Turn

Horizontal output stage defects, indicated by abnormal readings during the LOAD TEST, may result from a shorted turn in the flyback transformer or horizontal yoke. **The HA2500 Ringer Test dynamically checks the flyback or yoke’s “Q” to identify common shorted turn failures you can’t find with an ohmmeter.** A Ringer test readout of 10 or more connected to the flyback primary indicates that all windings of the flyback are free from shorted turns. Proving expensive integrated flyback windings and yoke windings good or bad prevents needless component replacement or confirms that a problem exists for confident cost estimates.

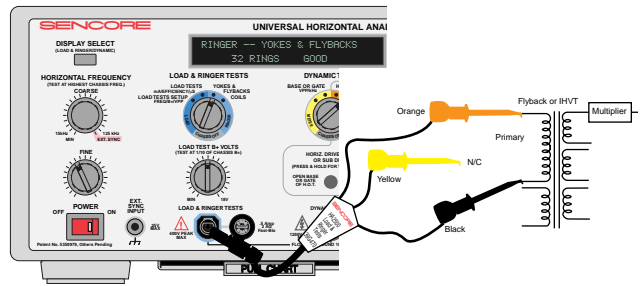


Fig. 4: The RINGER Test confirms if the flyback or yoke has a shorted turn, a common cause of high mA readings during the LOAD TEST.

5. The Only Analyzer That Simultaneously Displays DCV, Pulse VPP And Time In uS At The H.O.T. Collector Or Drain Automatically.

Only the HA2500 gives you automatic measurements that analyze the parameters of the horizontal output stage. The Collector Or Drain measurements indicate if the horizontal output stage has proper B+ voltage (DCV), is operational (VPP) and if the timing is normal (uS). These measurements are fully automatic and are all simultaneously displayed on the bright florescent display of the HA2500.

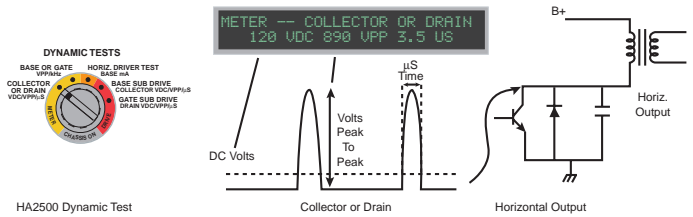


Fig. 5: The Collector Or Drain DYNAMIC TESTS analyze the horizontal output stage with 3 automatic measurements.

6. The Only Analyzer That Simultaneously Displays Drive Peak-To-Peak And Frequency At The Base Or Gate Of The H.O.T.

The Base or Gate measurements indicate if horizontal drive is present at the base or gate of the horizontal output transistor (VPP) and the frequency of the drive provided by the horizontal oscillator. In only seconds, you know if horizontal drive is missing or if the horizontal frequency is the cause of improper horizontal output stage function.

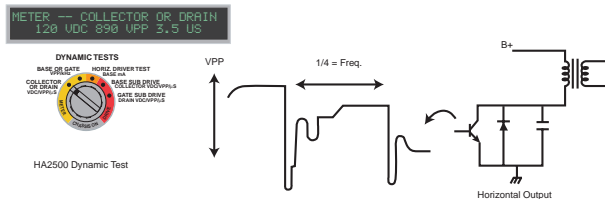


Fig. 6: The Base Or Gate DYNAMIC TESTS measure the peak-to-peak voltage and frequency of the drive to the horizontal output transistor for fast analysis.

7. The Only Analyzer That Measures Horizontal Driver Stage Output Current

The horizontal driver stage is often the cause of horizontal output stage symptoms and component failures. Because the scope waveform at the base of the H.O.T. is near normal, technicians don't suspect the driver stage and randomly replace output components hoping for a fix. Time and money are wasted and sometimes the problem is never found, resulting in lost service revenue and customer dissatisfaction. The HA2500's patent pending Horiz. Driver Test analyzes the output current capability of any horizontal driver stage to quickly and easily identify and pinpoint driver defects.

The mA readout displayed during the HORIZ. DRIVER TEST enables you to isolate intermittent or heat related defects without repeatedly damaging and replacing horizontal output transistors. Simply apply vibration or heat to the horizontal oscillator or driver stage components while monitoring the HA2500 readout. Readouts that change or drift significantly indicate a defective solder connection or component defect.

Defects in the horizontal driver stage often reduce base current in the H.O.T., resulting in seemingly normal horizontal output stage operation but excessive horizontal output transistor heating and, eventually, H.O.T. failure. Failure can occur in minutes, hours or days,

depending on the severity of the current decrease. The HA2500's Horiz. Driver Test accurately identifies weak drive current tests as the cause of output transistor heating. Compare the mA readouts during the Horiz. Driver Test to the handy reference chart provided with the HA2500.

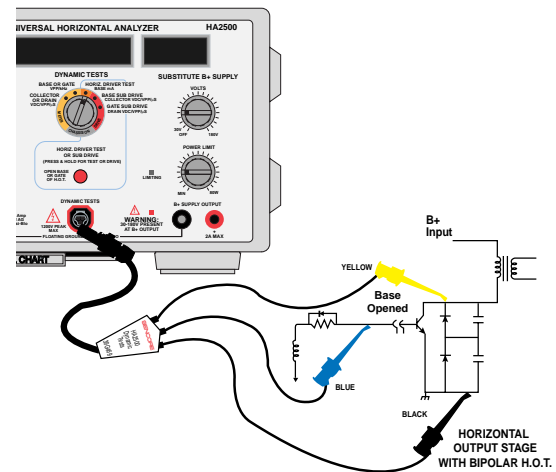


Fig. 7: The HORIZ. DRIVER TEST measures the output drive current capability of the horizontal driver stage.

8. The Only Analyzer That Substitutes Horizontal Drive To Both Bipolar And New MOSFET Horizontal Output Transistors.

With the HA2500 you can substitute horizontal drive to the base of a bipolar horizontal output transistor or gate of the newer MOSFET horizontal output transistors. The Base Sub Drive and Gate Sub Drives of the HA2500 are optimized for each transistor type, providing error-free testing of horizontal output stages. Horizontal drive substitution makes simple work out of testing the horizontal output stage when drive is missing or unusual noise or other defects are suspected.

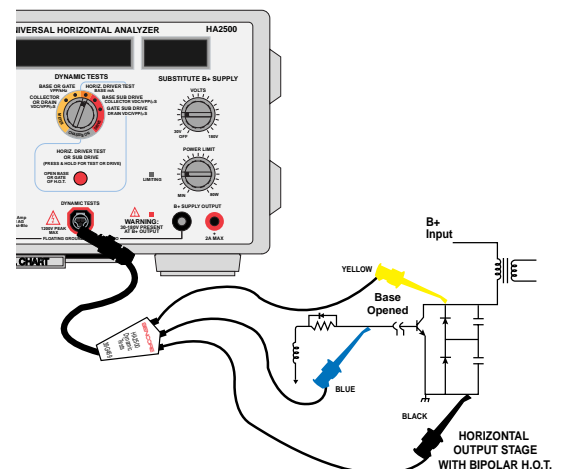


Fig. 8: The Base Sub Drive or Gate Sub Drive output a substitute horizontal drive to a bipolar or MOSFET horizontal output transistor.

9. The Only Analyzer That Lets You Substitute B+ Voltage And Slowly Increase It To Isolate Horizontal Output Component Breakdowns.

The Substitute B+ Supply is variable from 30 to 180 volts to substitute for the full range of B+ power supply voltages found in CRT video displays. The Substitute B+ Supply powers the horizontal output stage independent of the chassis switch mode power supply, allowing the technician to quickly and easily identify horizontal output stage defects or isolate B+ supply defects to the HV/deflection regulator or switch mode power supply.

Component breakdown failures in the horizontal output stage can cause high currents and abrupt failures of horizontal, HV/deflection regulator and SMPS components. The variable Substitute B+ Supply enables you to increase the B+ voltage to the horizontal output stage. Control of the output power of the HA2500's B+ Substitute Supply is provided by the POWER LIMIT control to reduce the chance of component damage.

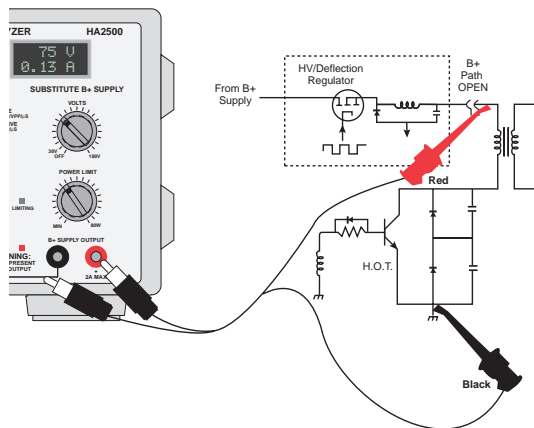


Fig. 9: The HA2500 enables you to substitute for the B+ voltage to the horizontal output stage.

10. The Only Analyzer That Dynamically Tests The High Voltage/Deflection Regulator And Troubleshoots Shutdown Defects.

HV/deflection regulator defects often cause technicians to replace horizontal output stage components since these defects result in similar symptoms. **Subbing a variable B+ voltage to the input of the HV/deflection regulator lets you analyze the stage for defects, avoiding high currents, shutdowns, or component damage.** As

you increase the Substitute B+ voltage, the regulator should begin to hold the output DCV (B+ to the horizontal output stage) constant, producing normal horizontal output stage operation and the proper high voltage or deflection.

Horizontal related defects commonly cause shutdown symptoms and momentary voltages that make it impossible to know which stage is bad. To isolate shutdown symptoms with the HA2500, substitute the B+ Supply voltage so that the high voltage does not trigger X-ray shutdown. Using a Waveform Analyzer, such as the Sencore SC3100, measure voltages and waveforms in the X-ray Shutdown circuit or HV/deflection regulator circuits to isolate the defect. With the HA2500 you can troubleshoot frustrating shutdown symptoms in minutes without randomly replacing components. **SN**

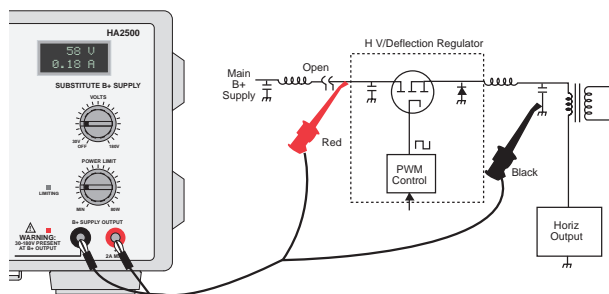


Fig. 10: Substituting B+ voltage to the input of the HV/Deflection Regulator lets you dynamically test the stage to identify defects or confirm normal operation.

10 Exclusive Analyzing Capabilities That Make You Money!

The HA2500 is the only Universal Horizontal Analyzer in the world! It's unique money and time saving features pay for itself in only days. Now, you can get up to speed using the HA2500 with a product training CD or video tape. To purchase your HA2500 or to learn more about the HA2500 applications in this article call 1-800-SENCORE (736-2673) today!

