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We've added this manual to the Agilent website in an effort to help you support your product. This manual is the best copy we could find; it may be incomplete or contain dated information. If we find a more recent copy in the future, we will add it to the Agilent website.

Support for Your Product

Agilent no longer sells or supports this product. Our service centers may be able to perform calibration if no repair parts are needed, but no other support from Agilent is available. You will find any other available product information on the Agilent Test & Measurement website, www.tm.agilent.com.

HP References in this Manual

This manual may contain references to HP or Hewlett-Packard. Please note that Hewlett-Packard's former test and measurement, semiconductor products and chemical analysis businesses are now part of Agilent Technologies. We have made no changes to this manual copy. In other documentation, to reduce potential confusion, the only change to product numbers and names has been in the company name prefix: where a product number/name was HP XXXX the current name/number is now Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A.

HEWLETT PACKARD

HIGH VOLTAGE 1000:1 DIVIDER PROBE

HP MODEL 1137A

Operating Note/July 1989

WARNING

The HP 1137A High Voltage 1000:1 Divider Probe is designed to prevent accidental shock to the operator when properly used. This operating note must be read and understood prior to operating probe. Improper procedures or incorrect analysis of the measurement situation may result in serious shock.

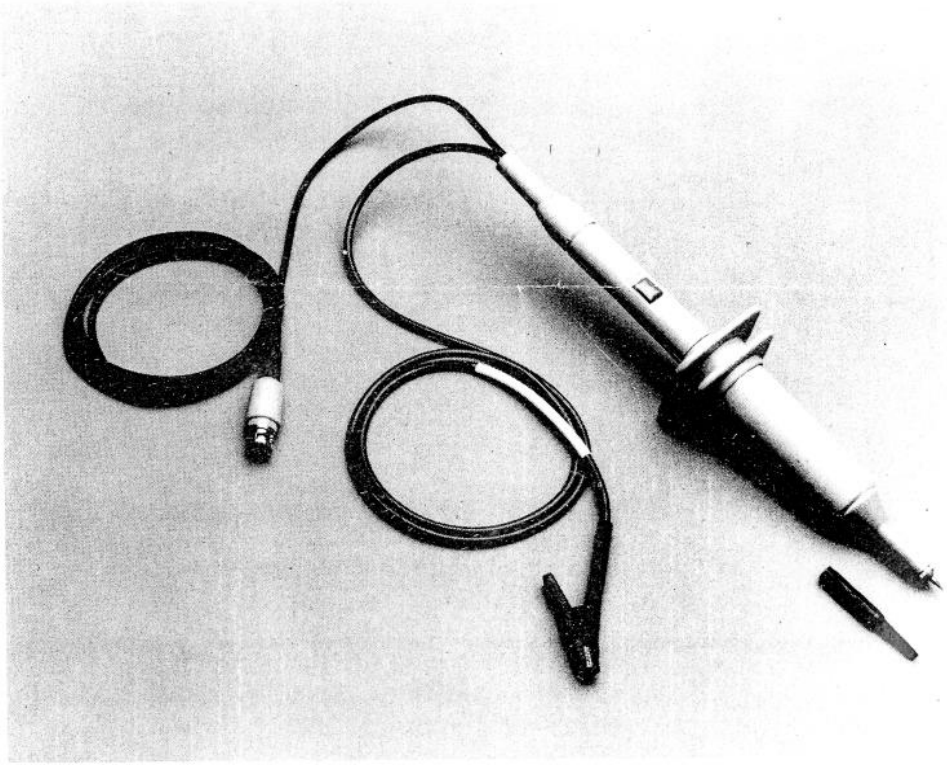

Figure 1. HP Model 1137A High Voltage 1000:1 Divider Probe

DESCRIPTION

The HP 1137A High Voltage Divider Probe is an accessory for use with analog or digital oscilloscopes having input resistance of 1 MΩ (± 1 %) and nominal input capacitance between 6 and 50 pF. The HP 1137A is a 1000:1 voltage divider probe that extends voltage measurement capability to 5 kV ac or dc.

Operating Note Part Number 01137-90901
Microfiche Part Number 01137-90801

SAFETY PRECAUTIONS

WARNING

*The HP Model 1137A High Voltage Divider Probe must be used **ONLY** by personnel trained, experienced, or otherwise qualified to recognize hazardous situations and are trained in safety precautions necessary to avoid possible injury when using such a device.*

Do not work alone when making measurements of high voltage circuits.

Remember that unexpected voltages may appear in defective equipment.

*For personal safety, inspect the probe for cracks, and frayed or broken leads before each use. If defects are noted, **DO NOT** use the probe.*

***DO NOT** not make measurements in an area where corona is present. Corona is identified by a pale-blue color, a buzzing sound emanating from sharp metal points in the circuit, or the odor of ozone.*

Hands, shoes, floor, and workbench must be dry. Avoid making measurements in humid, damp, or other environmental conditions that might affect the insulation properties of the probe or the safety of the measurement situation.

*If possible, always turn the high voltage source **OFF** before connecting or disconnecting the high voltage probe.*

It is recommended not to hold or touch the high voltage probe when making voltage measurements. This is especially true when the magnitude of the voltage is unknown.

The probe body should be kept clean and free of any conductive contamination. Refer to the section on maintenance for approved cleaning methods.

***DO NOT** subject the probe to solvents or solvent fumes, as these can cause deterioration of the molded probe body.*

If any oscilloscope/probe combination seems inappropriate for the intended application, have a trained expert in high voltage application review the equipment to be used and the intended application.

SUPPLIED ACCESSORY The following accessory is supplied with the HP 1137A High Voltage 1000:1 Divider Probe.

Trimmer Adjusting Tool

ADDITIONAL INFORMATION Figure 2 is the schematic drawing of the HP 1137A High Voltage 1000:1 Divider Probe. This drawing is supplied as additional information and is not intended for troubleshooting use.

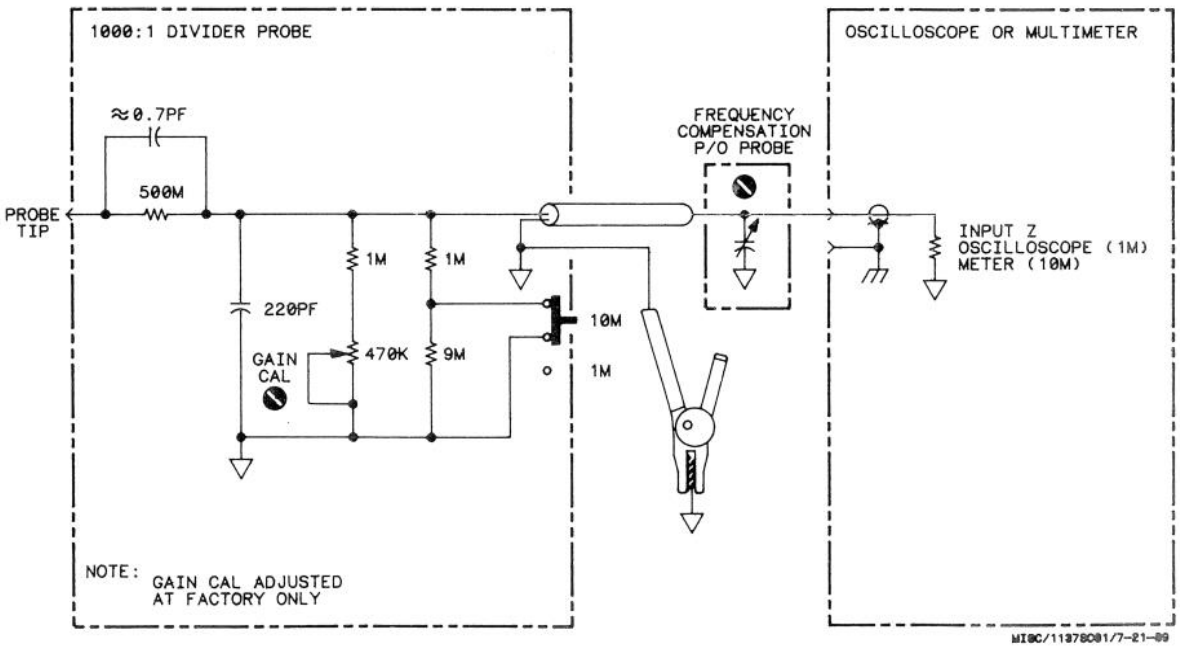

Figure 2. HP 1137A High Voltage 1000:1 Divider Probe Schematic

CHARACTERISTICS

The operating and general characteristics of the HP 1137A are listed in this section.

Operating

MAXIMUM INPUT VOLTAGE:
dc Voltage - 5 kV
ac Voltage (0 to 250 kHz) - 5 kV rms
(250 kHz to 1 MHz) - 2.5 kV rms
INPUT IMPEDANCE: 500 MΩ shunted by 3 pF (approximate).
BANDWIDTH: 1 MHz
RISE TIME: ≈350 ns (calculated from Risetime = 0.35/bandwidth).
TEMPERATURE COEFFICENT: Add 0.02% of reading/° C.
DIVISION RATIO ACCURACY:
± 1.5% of reading. See note.
COMPENSATION RANGE: For input capacitance of 6 pF to 50 pF.

Note: *Characteristic applies for operation between 0 and 55° C, <85% relative humidity. For operation above 40° C, 85%-95% relative humidity, add additional ±10% of reading.*

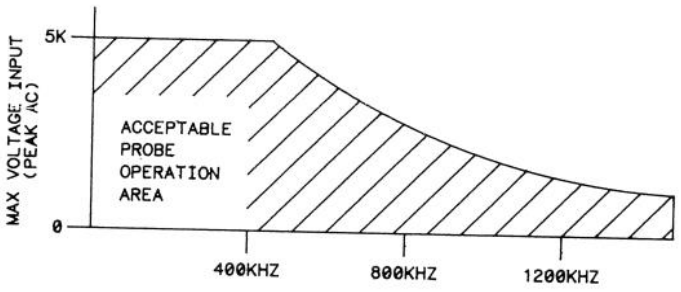

Figure 3. HP 1137A Voltage Versus Frequency Rating Curve

General

OPERATING MODES:
1M Mode - For oscilloscope input impedances of 1 MΩ (±1%).
10M Mode - Optional, for use with input impedances of 10 MΩ (±1%).
OPERATING TEMPERATURE RANGE: 0 to 55° C.
STORAGE TEMPERATURE RANGE: -20 to 70° C.
CABLE LENGTH: 1.5 meters.
ACCESSORY INCLUDED:
Trimmer Adjusting Tool

MAINTENANCE

Keep the probe clean and free of conductive contamination. Conductive contamination could serve as a current path on the probe body and be potentially dangerous. Refer to SAFETY PRECAUTIONS.

Use MILD SOAP AND WATER and a soft cotton cloth to clean the HP 1137A High Voltage Probe. A mild dishwashing detergent diluted with water is generally effective for cleaning. Harsh soap could damage the finish on the molded body.

Clean only the exterior probe body and cables. Do not submerge any of the probe body at any time.

Dry the probe thoroughly before attempting to make any voltage measurements.

ADJUSTMENTS

The HP 1137A High Voltage Probe has two adjustments: Gain Calibration and Frequency Compensation. However, Gain Calibration adjustment is performed at the factory and need not be readjusted. The Frequency Compensation adjustment compensates for input capacitance of the oscilloscope being used with the probe

Frequency Compensation Adjustment

Use a square-wave generator set for an approximate 100 Hz output. Proceed with the following steps for frequency compensation.

1. Connect probe to oscilloscope.
2. Connect probe tip to square-wave generator.
3. Adjust square-wave generator for approximate 10 volts amplitude.
4. Adjust oscilloscope for stable display.
5. Use the supplied trimmer adjusting tool to adjust C1 for flattest possible pulse top. See figure 4 for location of C1.

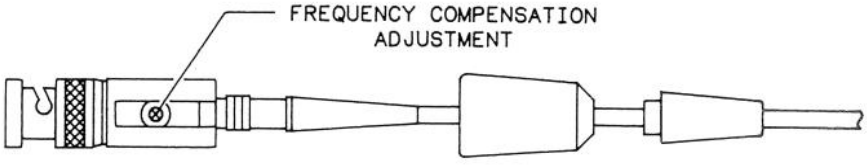

Figure 4. Frequency Compensation Adjustment Location 1187E001

OPERATION

WARNING

The HP 1137A High Voltage 1000:1 Divider Probe is designed to prevent accidental shock to the operator when used properly. This operating note must be read and understood prior to operating probe. Improper procedures or incorrect analysis of the measurement situation may result in serious shock.

WARNING

Connect the probe ground lead (alligator clip) to a good earth ground or reliable chassis ground that is connected to a good earth ground. **DO NOT MAKE ANY FLOATING MEASUREMENTS WITH THE HP 1137A HIGH VOLTAGE PROBE.**

NOTE

All HP oscilloscopes are supplied with a three-wire power cable. When connected to an appropriate AC power outlet, this cable grounds the oscilloscope cabinet to earth ground. Check the power cable and ac outlet of oscilloscope to assure that the instrument is connected to earth ground before making voltage measurements. The oscilloscope cabinet may be used for earth ground when appropriately connected in this manner.

1. Connect the probe to the BNC input of oscilloscope.

2. Select the desired volts/division range.

NOTE

The probe division ratio is 1000:1. If 5 kV is being measured, set the oscilloscope input attenuator to a range that allows a 5 V input.

NOTE

If any oscilloscope-probe combination appears to be inappropriate for the intended application, have a trained expert in high voltage applications review the equipment and intended application.

3. For personal safety and whenever possible, turn the high voltage source off before making any connections.

4. Connect the divider probe ground lead (alligator clip) to a good earth ground or reliable chassis ground that is connected to a good earth ground.

WARNING

This ground connection is critical to the safe operation of the HP 1137A High Voltage Divider Probe. Failure to make this connection when making high voltage measurments may result in personal injury or damage to the probe and/or oscilloscope. This connection must ALWAYS be made before the probe tip comes in contact with high voltage and must not be removed until after the probe tip has been removed from the high voltage source. Do not connect the ground clip lead to the high voltage source or the probe tip to ground for any reason.

5. BEFORE TURNING ON THE HIGH VOLTAGE SOURCE, MAKE SURE THAT NO PART OF PERSON HOLDING PROBE IS TOUCHING THE DEVICE UNDER TEST. ONCE THIS IS CERTAIN, TURN ON THE HIGH VOLTAGE SOURCE

7. Measure the voltage under test and observe the waveform on the oscilloscope. REMEMBER the actual voltage is 1000 times greater than the oscilloscope waveform. Restrict measurements to less than 5 minutes duration to minimize probe self-heating errors.

8. Turn off the high voltage source.

9. Disconnect the HP 1137A High Voltage Probe from the high voltage source before disconnecting the ground clip lead.

CERTIFICATION

Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Bureau of Standards, to the extent allowed by the Bureau's calibration facility, and to the calibration facilities of other International Standards Organization members.

WARRANTY

This Hewlett-Packard product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by HP. Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instructions when properly installed on that instrument. HP does not warrant that the operation of the instrument or software, or firmware will be uninterrupted or error free.

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