

Figure 1. Model 444A Untuned Probe

The Model 444A is a sensitive broadband microwave untuned probe used with the hp Model 809B Universal Probe Carriage with appropriate slotted sections, or with the Model S810A Waveguide Slotted Section. It also may be used with other carriages which have a 3/4-inch mounting hole. The detector covers the frequency range from 2.6 to 10 Gc.

The 444A consists of a crystal rectifier plus probe in a convenient housing that permits probe penetration to be varied quickly and easily. The output appears at a BNC connector. The detector element is a modified 1N76 silicon crystal, and is suitable for use in standing-wave measurements over a wide range of frequencies.

The convenient no-tuning-required feature of the 444A is made possible by keeping the lead length between crystal and probe to a minimum. With reactances thereby minimized, high efficiency and flat response across a broad band can be achieved without tuning. Polyiron inserts damp out spurious resonances.

1. OPERATION

The probe as it comes from the factory can be used with X- and P-band slotted sections (1 in. x 1/2 in. waveguide or smaller). A set (two each) of four extensions is supplied with the probe to lengthen it for use with the larger-size waveguide sections. To put on an

an extension, it is not necessary to disassemble the 444A. Simply slip the extension over the tip of the probe. To retain good efficiency and optimum response, use the shortest extension which will give the necessary penetration.

CAUTION: The tip is the center conductor of the crystal.

The probe is easily adjusted to and locked at any desired penetration. The locking device is a ring on the housing (see Figure 1). Penetration should not exceed the minimum required to obtain a reading. The probe is an admittance shunting the line. Loose coupling (small penetration) is one of the factors which keeps this admittance small. (See Good Practice in Slotted Line Measurements, Hewlett-Packard Journal, Vol. 3, Nos. 1, 2.)

2. MAINTENANCE

A. EXTENSIONS.

If an extension for the probe tip gets loose, it can be tightened by crimping the contact portion over a 0.031-inch mandrel (shank of #68 drill).

B. CRYSTAL REPLACEMENT.

The crystal used in the 444A is a modified Sylvania 1N76, hp Stock No. 444A-25E. It is recommended that replacement crystals be obtained from your sales representative or the Hewlett-Packard Company.

To remove the crystal:

- 1) Loosen the locknut, and lift the crystal holder free of the housing.
- 2) Unscrew the BNC connector from the holder (a male connector may be used to loosen the BNC female).
- 3) To free the crystal, push on the end of the probe. (The bakelite disk in the probe end of the holder is a disc resistor with which the center conductor of the crystal makes contact.)

Install the new crystal in reverse order.

NOTE: Parts and assemblies are identified in Figure 2.

C. RESISTOR REPLACEMENT.

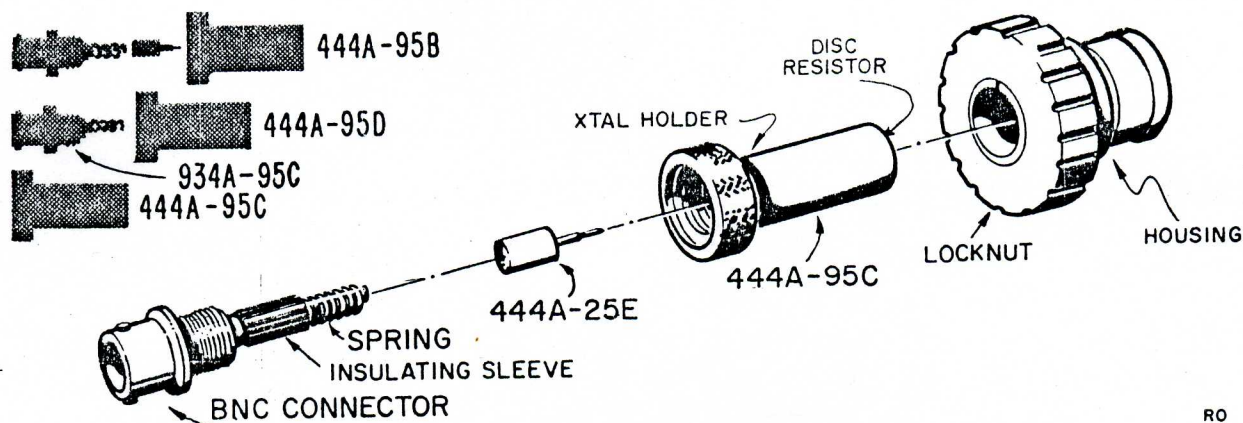
Installing the disc resistor in the crystal holder is a factory operation. Therefore the resistor installed in the holder is available as a replaceable part (assembly 444A-95C). To install assembly 444A-95C:

- 1) Remove the old assembly 444A-95C: loosen the locknut, and lift the holder out of the housing.
- 2) Unscrew the BNC connector from the holder (a male connector may be used to loosen the BNC female).
- 3) Remove the crystal from the old holder, and install it in the new.

- 4) Install the old BNC connector in the new holder.
- 5) Replace the holder in the housing.

Specifications

FREQUENCY RANGE:	2.6 to 18.0 Gc
OUTPUT CONNECTOR:	BNC female
ACCESSORIES FURNISHED:	Model 11506A Probe-tip kit, 2 each: 1/4 in, 5/16 in, 3/8 in, 7/16 in.



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Figure 2. Model 444A Untuned Probe Exploded View With hp Part Numbers