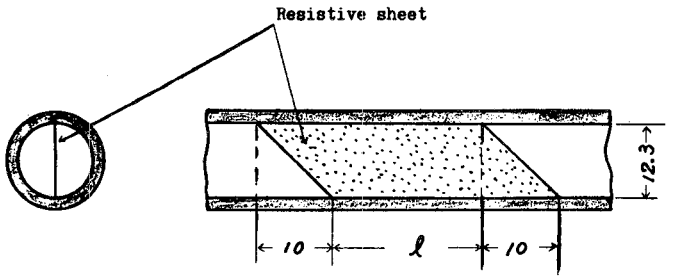

Fig. 3. Mode filter for attenuating the TE_{11} mode having a polarization parallel to the resistive sheet. Dimensions are in millimeters.

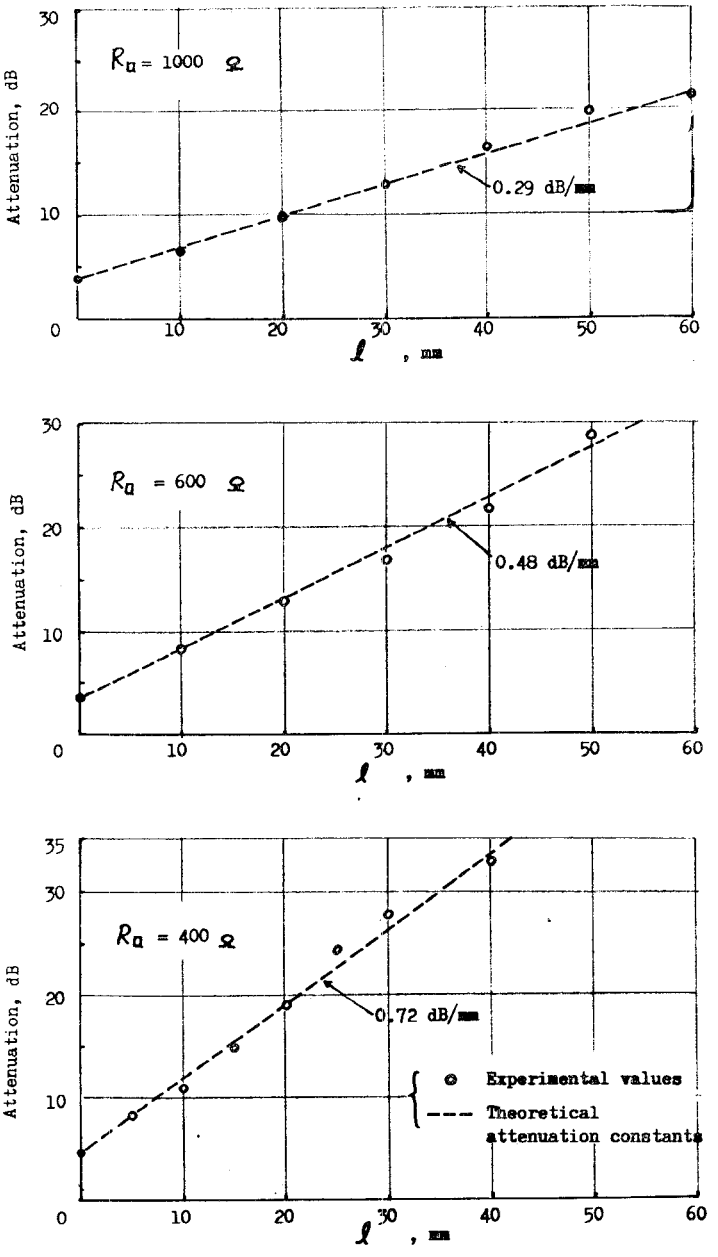

Fig. 4. Attenuations of the TE_{11} mode in the mode filter of Fig. 2. The frequency is 50 Gc/s.

SADAKUNI SHIMADA
Hitachi Central Research Lab.
Kokubunji, Tokyo, Japan

Calibration of Coaxial Bolometer Mounts

The Radio Standards Laboratory announces that an additional service is now available for the measurement of the calibration factor[1] of nominal 50-ohm coaxial bolometer units. The new service provides for calibration at 3 GHz, in addition to the frequencies of 100 MHz and 1 GHz that have been available for a number of months. Measurements are made of the 1- and 10-milliwatt power levels only, with no provision at present for the calibration of bolometer-coupler units.

The limit of uncertainty in determining the calibration factor at 3 GHz is within 1.5 percent for well-designed bolometer units. Limits of uncertainty may be greater for bolometer units having a VSWR higher than 1.1. The service includes the calibration of both barretter and thermistor types of bolometer units having operating resistances of 50, 100, and 200 ohms.

NATIONAL BUREAU OF STANDARDS
Engineering Division
Radio Standards Laboratory
Boulder, Colo.

Manuscript received November 9, 1965.

[1] The calibration factor of a bolometer unit is defined as the ratio of the substituted dc power in the unit to the RF power incident upon the bolometer unit.

Rectangular Waveguide Short Circuit with Cylindrical Slugs

The design of precision waveguide choke shorts imposes many problems, especially as concerns millimeter wave devices. A guide consisting of a rectangular waveguide with a cylindrical rod placed along its axis may help to solve the problem. Such arrangements are used in coaxial-to-strip line adapters [1], [2]. Adequate electric characteristics can be achieved in very simple mechanical designs of shorts comprising cylindrical sections of low and high impedance [3]. To design such a short it is necessary to know, however, the wavelength in the rectangular waveguide comprising a cylindrical rod—a problem which still appears to be unsolved.

The cutoff wavelength of the TE_{11} mode excited in a waveguide with a rod placed inside may be calculated from the empirical equation

$$\frac{\lambda_c}{2a} = 1 + \frac{1}{2}\left[\left(\frac{D}{b}\right)^2 + 1\right] \cdot \left[\frac{a}{2b}\left(\frac{D}{b}\right)^2 + 0.1\frac{D}{b}\right]$$

Manuscript received October 12, 1965; revised November 16, 1965.