that a single 500-ohm adjustable "T" attenuator is available and that thermocouple meters are to be used. The necessary fixed pad values are shown in this figure.

In connection with the meters in this figure, it should be noted that when both are indicating .001 watt no meter correction need be added. Further, both can be held to this indication, provided the oscillator output level adjustment is sufficiently fine, the steps on the adjustable attenuator are of the same order of magnitude as the desired gain indication, and the output power is to be held constant. If the input level were to be held constant for the frequency-response measurement, the setting of the adjustable attenuator and the reading of M_1 would be held constant at the reference frequency, for example, 100 cps. Then, as no output adjustable attenuator is available, the variation of gain with frequency could be indicated on M_2. If the power reading on this meter at reference is termed P_R and is .001 watt, the correction in decibels is obtained for other frequencies by observing the power indicated by M_2 and determining the number of decibels corresponding to that indication referred to P_R. If this power is greater than P_R, then the number of decibels difference must be added to the gain determined for the reference frequency, or, if less, subtracted. It is probable that greater accuracy of indication can be obtained by reading small variations on the thermocouple meter scale than by the use of 0.1-db steps on attenuators.

In this same connection, if the desired input level is equivalent to —50 dbm (2.45 millivolts, rms, in series with 150 ohms), this level is achieved in the illustrative example with .001 watt indicated by M_1 and 39.5 db in the adjustable attenuator. This 39.5 db plus the 10.5 db of the matching network provides the desired equivalent of —50 db referred to .001 watt.

For further illustration, there is shown in *Fig.* 10 an arrangement using standard volume indicators as the input and output meters. This figure also indicates the necessary corrections because of the use of such meters. In particular it should be noted that the resistance of the output volume indicator in parallel with the terminating resistor must be taken into account for proper output termination.

The illustrative examples of both *Figs.* 9 and 10 are essentially similar to the general basic circuit of *Fig.* 2. However, it will be noted that the arrangement of the input meter circuit of *Fig.* 9 is such that the same input voltage appears across the input terminals of the input adjustable attenuator as that indicated by M_1, thus