

TYPE 874-GAL ADJUSTABLE ATTENUATOR

a detector, for the attenuator. Adjust the stub until the indicated voltage is minimized; then replace the attenuator. (If the Type 874-VR is used, connect the end containing the series resistor, engraved R, to the generator.) If the frequency is changed the stub must be reset, but a frequency calibration can be marked on the stub, for convenience when a number of measurements are to be made. At frequencies below 300 Mc, a Type 874-WN Short Circuit can be substituted for the stub, without further adjustments. With the Type 874-WN Short Circuit, accurate results can be obtained at scale readings greater than zero. At frequencies below 1500 Mc, the indicated attenuation is accurate at scale readings as low as -9 db, and at frequencies between 1500 and 4000 Mc, readings above 0 db on the calibrated scale are accurate if the stub is set as previously outlined.

An alternate method of setting a voltage minimum at the coupling point, for frequencies above 1500 Mc, utilizes the fact that the attenuation constant for the desired mode is smaller than that of the spurious modes. If the attenuator is set to a relatively large value of attenuation, the stub can be properly set by adjusting it until maximum output is obtained from the attenuator. However, a voltage minimum does not occur at the coupling point unless the effective source impedance, seen looking back toward the generator from the coupling point, is a pure resistance. When the generator and the detector are not matched, the above condition can be obtained by the use of suitable pads (Type 874-G10 or -G20) at the generator and the detector.

At the higher frequencies the attenuation is reduced as the waveguide approaches its cutoff frequency. To correct for this effect, multiply the indicated attenuation by the factor found in the frequency correction graph, Figure 3, corresponding to the operating frequency.

The impedance of the adjustable arm of the attenuator is nominally 50 ohms. However, the impedance varies appreciably with frequency, as shown by the plot in Figure 4 of the VSWR seen looking back into the output connector for a typical unit. The tolerance on the dc resistance of the 50-ohm resistor is $\pm 10\%$.

APPLICATIONS

(1) The attenuator can be used with a Type 874-VR or -VRL Voltmeter Rectifier and a Type 874-VI Voltmeter Indicator to provide the level-monitor and variable attenuator of a signal generator, when combined with a General Radio Unit Oscillator. The Type 1208, 1209, or 1218-A are recommended. A block diagram of a typical setup is shown in Figure 5.