

GENERAL RADIO COMPANY

In this case the stub is adjusted as indicated in a previous paragraph and the adjustable line¹ (Type 874-LAL) is adjusted to obtain a maximum indication from the Type 874-VI Voltmeter Indicator. The voltage indicated with the load connected is the effective open-circuit output voltage, and the source impedance is accurately 50 ohms. The output can be reduced by adjusting the attenuator; the actual voltage at any attenuator setting is the indicated number of db below the original calibrating value.

Since the source impedance is the same as the characteristic impedance of the line, the same effective open-circuit voltage and source impedance are obtained at the end of any length of 50-ohm line connected to the output of the voltmeter rectifier.² If the line is not lossless, the effective open-circuit voltage will be reduced by the loss in the line.

(2) The attenuator can also be used to measure the attenuation of a network by the substitution method, as indicated by the block diagram in Figure 6.

Readings of the detector output and attenuator setting are first made without the circuit under test connected. The circuit is then inserted and the Type 874-GAL Adjustable Attenuator is readjusted to give the same detector indication. The attenuation of the unknown circuit is then the difference in the attenuator readings. The pads indicated are used to make the source and load impedances very close to 50 ohms. One or both can be omitted if the source and detector impedances are matched.

(3) For monitoring purposes the input line of the attenuator can be connected in series with the line under test without introducing an appreciable reflection or loss. The changes in level in the main line can be measured accurately using the attenuator and an uncalibrated detector which may be 1) a Type 874-VR Voltmeter Rectifier with a dc microammeter or an audio amplifier such as the General Radio Type 1232-A Tuned Amplifier and Null Detector if the signal is modulated or 2) if the signal is not modulated, the General Radio Type DNT Detectors may be employed. The VSWR introduced in a flat line by the insertion of the attenuator is shown in Figure 7.

¹At the lower frequencies, it may be necessary to add lengths of Type 874-L30 Air Line in series with the adjustable line to obtain the maximum output.

²Peterson, A.P.G., "Output Systems for Signal Generators," General Radio Experimenter, June 1946, Vol. XXI No. 1.