

PERCENT MODULATION NOMOGRAM

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A simplified method of determining the percentage of amplitude modulation by use of a straightedge.

IN AM transmitters, it is necessary to check the percent modulation so that the limits set by the FCC are not exceeded. The methods of obtaining the waveforms are not discussed here since they can be found in any standard text. This nomogram does, however, offer a simplified means of determining the percent modulation from the waveforms.

Fig. 1 shows a series of oscilloscope patterns of an r.f. carrier being amplitude-modulated by a sine wave. Fig. 2 shows a series of trapezoidal patterns of the same waves. *Percent Modulation* (M) = $[(A - B)/(A + B)] \times 100$ where A is the crest amplitude and B is the trough amplitude. The values of A and B are measured from the oscilloscope patterns.

M is found by extending a straightedge from the measured

value of A on its scale to the measured value of B on its scale. The percent modulation is found where the straightedge crosses the diagonal scale. A and B may be in any units as long as both are measured in the same units.

Example: Find the percent modulation of a wave whose crest amplitude is 6.3 centimeters and whose trough amplitude is 2.7 centimeters.

Solution: Extend a straightedge from 6.3 on the A scale to 2.7 on the B scale. The straightedge crosses the M scale at 40 which is the percent modulation.

(Note: For symmetrical modulation, the above equation produces the same results as the equations: $M = (A - C)/C$ or $(C - B)/C$, where C = carrier amplitude.) ▲

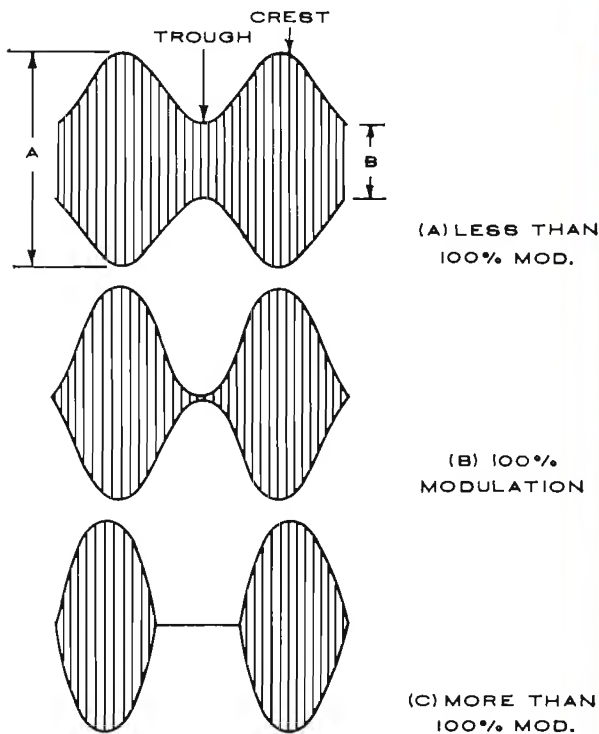


Fig. 1. Amplitude modulated r.f. carrier waveforms.

Fig. 2. Trapezoidal modulation patterns seen on scope.

