Abstracts

Traveling-Wave Tube Nanosecond Pulse Generator in 24-Gc Region

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A 24-Gc traveling-wave tube of the type ECL-1180 /24W80 was used for generating nanosecond carrier pulses. The helix of the traveling-wave tube was modulated by a 40-Mc high voltage sine wave. Duration, power and carrier frequency shift of the output RF pulse were examined quantitatively with respect to the modulating voltage. It was found that the delay time of a traveling-wave tube has a large effect on the characteristics of the output pulse. The theory of transmission line modulators was developed to explain the pulse shaping mechanism in the traveling-wave tube. Observations of output pulses were made with three measuring devices, i.e., video-sampling oscilloscope with crystal detector, interferometer, and spectrum analyzer. The interferometer was found to be useful for measuring half-amplitude duration of carrier pulse. Output pulses with half-amplitude duration of as short as 1 nsec were observed.

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