# Abstracts

## Gyrotron-TWT Operating Characteristics

*P.E. Ferguson, G. Valier and R.S. Symons. "Gyrotron-TWT Operating Characteristics." 1981 Transactions on Microwave Theory and Techniques 29.8 (Aug. 1981 [T-MTT]): 794-799.*

The gyrotron traveling-wave tube (gyro-TWT) is a new type of millimeter amplifier which employs the electron cyclotron maser instability as a basis for the electron-electromagnetic wave interaction. A C-band gyro-TWT, employing the fundarnental cyclotron resonance interaction with the circularly polarized TE/sub 11/ dominant waveguide mode, has been constructed and tested. Initial power measurements yielded an output power of 50 kW at 60-kV beam voltage with 16.6-percent efficiency and 6-percent bandwidth. These measurements were recorded with a flat magnetic field. Subsequent experimental testing yieIded, for a magnetic field increasing in magnitude towards the output portion of the tube, 128-kW and 65-kV beam voltage at 24-percent electronic efficiency. The maximum efficiency was 26 percent at 120.5-kW peak power, with an instantaneous bandwidth of 7.25 percent as measured in a high-beam power mode (65 kV, 7 A). In the low-beam power mode (40 kV, 4 A), the efficiency was 9.8 percent at 18.8-kW peak power at 9.3-percent instantaneous bandwidth. Additional experimental results of AM and PM modulation coefficients, spectral purity, phase Iinearity, and noise figure are presented.

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