

PRESENT AND FUTURE CAPABILITY OF MILLIMETER-WAVE RECEIVERS

by

J. Whelehan

Abstract

Over the past several years, there have been significant improvements in solid-state devices (that is, avalanche diodes, Gunn diodes, varactors, mixer diodes, and so on) that have enhanced the overall capability of millimeter-wave receivers. With these improved devices, it is now possible to configure completely solid-state low-noise millimeter-wave receivers. Just as in the microwave range, low-noise parametric amplifiers, broadband low-conversion-loss mixers, and solid-state local oscillators are now available. Furthermore, cryogenically cooled parametric amplifiers and mixers are now possible, resulting in the ultimate in system sensitivity. With the flexibility offered by these all solid-state millimeter-wave components, it is now possible to design the optimum system configuration for the intended application whether it be an advanced communication system, a sophisticated EW application, or satisfying any of the numerous receiver requirements that are being evolved.

This paper will briefly describe the performance of present millimeter-wave receiver components and will provide a projection of their performance anticipated in the near future.