Abstracts

Use of Microelectronic Technology in the Design of a 3.7-4.2-GHz Portable Microwave Repeater

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The use of microelectronic technology in the design of a frequency-agile portable microwave repeater (PMR) provides for light-weight compact construction without sacrifice of performance. The instrument is intended for use as an up and down converter in FM systems and operates at 20-MHz channels in the 3.7-4.2-GHz band with a 70-MHz intermediate frequency (IF). A brief discussion of its design indicates the significance of each microelectronic assembly. Key microelectronic designs include a 4-GHz transistor preamplifier with a 5-dB noise figure, a 4-GHz double-balanced mixer of coplanar construction, and a 4-GHz power amplifier with 1.5 W of output power. Comments are offered regarding the advantages and limitations of microelectronic design. Back-to-back instrument performance yields 0.2-dB flatness and 2-ns group delay over a ±7-MHz band measured at 70 MHz. FM noise performance is discussed.

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