

# Abstracts

## Cooling of Microwave Crystal Mixers and Antennas

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*G.C. Messenger. "Cooling of Microwave Crystal Mixers and Antennas." 1957 Transactions on Microwave Theory and Techniques 5.1 (Jan. 1957 [T-MTT]): 62-63.*

The development of low-noise mixer crystals has reached the point where the noise figure is approaching fundamental, theoretical limits. The desire for still greater sensitivity has led to the consideration of other possible means for noise reduction. This paper will discuss two possibilities: physically cooling the mixer crystal, and using an antenna directed toward background noise which is lower than room temperature. The improvement which can be realized increases rapidly as the room-temperature noise figure is reduced.

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