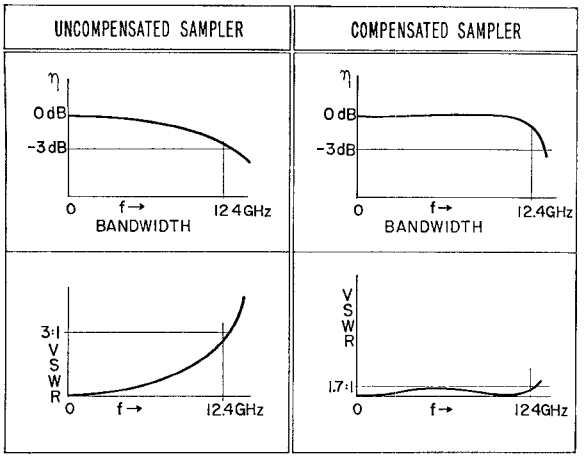

Fig. 15. Average measured performance.

Conclusion

The bandwidths obtained, using the electromechanical configuration just described, are well in excess of 12.4 GHz. This represents an increase in bandwidth of three to four times that previously available. It is safe to assume that this technique will eventually be used to achieve bandwidths in excess of 18 GHz.

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Theoretical and Practical Applications of Capacitance Matrix Transformations to TEM Network Design

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***Abstract*—TEM propagation on an array of parallel conductors is described in terms of the normalized static capacitance matrix. Important properties of capacitance matrices are discussed and a physical and network interpretation is given to a useful linear transformation of the static capacitance matrix. Several practical applications of capacitance matrix transformations are given. These include 1) equivalent circuits for directional couplers with equal terminations, 2) design procedures for directional couplers with unequal terminations, and 3) element value tables and design details for compact coaxial filter-transformers. Construction details and experimental results are presented for a 3:1 bandwidth filter-transformer constructed with multiple re-entrant coaxial lines.**

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I. Introduction

AN IMPORTANT ASPECT of TEM quarter-wave network synthesis and design is the multiplicity of physical configurations that yield iden-