Abstracts

A Computer Designed, 720 to 1 Microwave Compression Filter (Dec. 1967 [T-MTT])

H.S. Hewitt. "A Computer Designed, 720 to 1 Microwave Compression Filter (Dec. 1967 [T-MTT])." 1967 Transactions on Microwave Theory and Techniques 15.12 (Dec. 1967 [T-MTT]): 687-694.

Compression filters with bandwidths up to 1000 MHz have application in high-resolution radar system and rapid-scan receiver systems. A technique is presented for realizing a microwave linear delay (quadratic phase) versus frequency compression filter with sufficient delay accuracy to make compression ratios of up to 1000 to 1 feasible. The dispersive element in the compression filter is a silver tape with its broad side placed perpendicularly between the ground planes (instead of parallel, as in conventional stripline). The tape is folded back and forth upon itself in such a way that substantial coupling takes place between adjacent turns of the tape. A computer program has been written to determine the dimensions of the tape to achieve a linear delay versus frequency characteristic. A folded tape compression filter was constructed with a differential delay of 1.2 µs over a bandwidth of 600 MHz centered at 1350 MHz giving a compression factor of 720 to 1. This filter was constructed in four identical sections, each section of which had a differential delay of 0.3 µs over the same bandwidth as the complete filter. The entire filter (four sections) occupies a volume about 16 by 4 by 5 inches. Measurement data are presented which illustrate that the desired accurate delay characteristic was realized to within the ±1 ns measurement uncertainty.

❑ Return to main document.