# Abstracts

## Dominant Pole Synthesis of Transmission Line Networks (1969 [MWSYM])

*S. Mahdi and A.B. Macnee. "Dominant Pole Synthesis of Transmission Line Networks (1969 [MWSYM])." 1969 G-MTT International Microwave Symposium Digest of Technical Papers 69.1 (1969 [MWSYM]): 388-391.*

This paper describes a procedure for synthesizing transmission networks which are interconnections of uniform line elements. An iterative, digital computer algorithm is developed which achieves a dominant pole synthesis. The line lengths and the characteristic impedances are controlled individually, which gives design flexibility not found in synthesis procedures based on Richard's transformation. Thus, the characteristic impedances may be restricted by upper and lower bounds when there is no restriction on the line lengths. The procedure is detailed for a TEM mode structure of alternating open stubs and connecting lines. The method uses a Newton-Raphson iterative scheme to adjust the characteristic impedances and lengths of the transmission lines for a prescribed set of dominant transmission poles. If the poles are chosen to give a low-pass characteristic when all of the transmission zeros are at infinity, the finite transmission zeros produced by the stubs modify substantially the transfer characteristic realised. By controlling the stub line lengths and modifying the dominant pole positions an improved transmission characteristic and bounded characteristic impedances can be achieved simultaneously.

❑ Return to main document.