OSA

Empipe™ CONNECTION BETWEEN

OSA90/hope™ AND *em*™

OSA-92-OS-13-V

October 1, 1992

Optimization Systems Associates Inc.

Dundas, Ontario, Canada

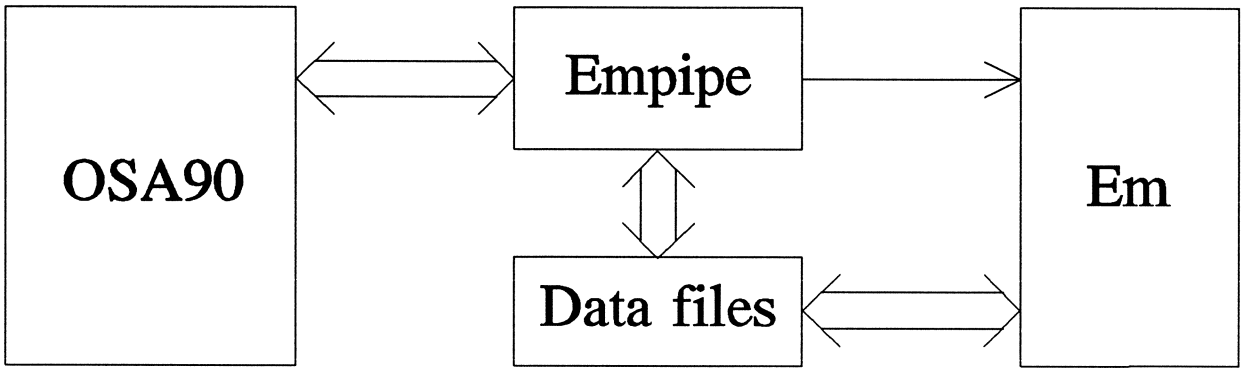
Empipe™ CONNECTION BETWEEN

OSA90/hope™ AND *em*™

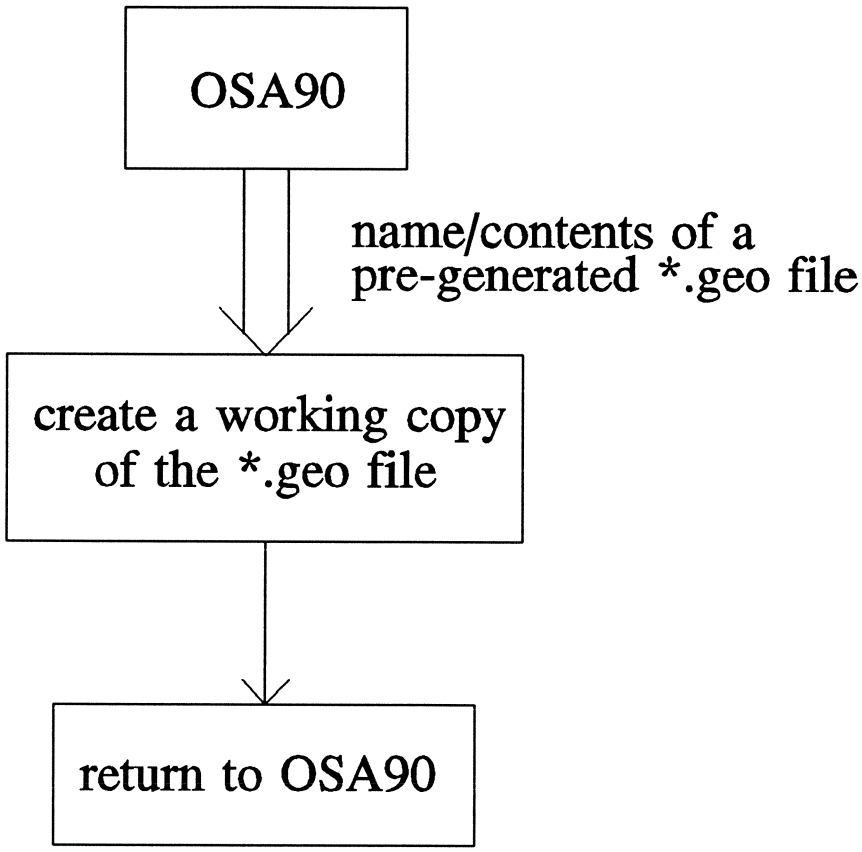
OSA-92-OS-13-V

October 1, 1992

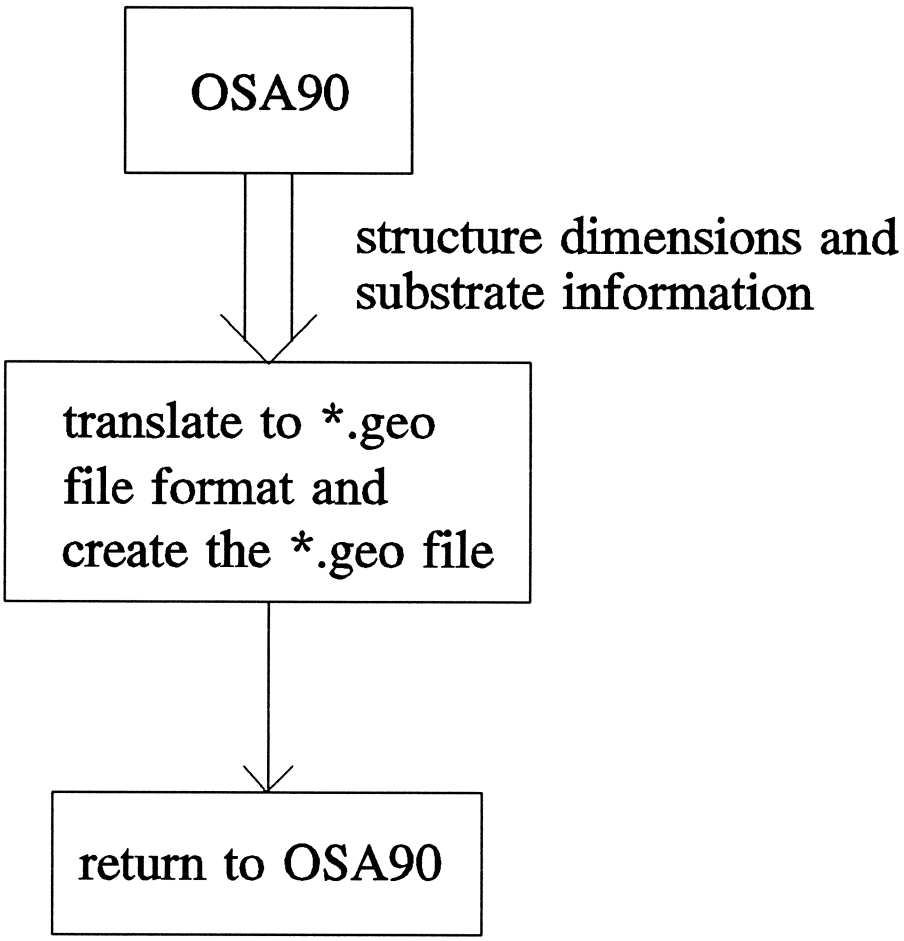
Empipe™ connection between OSA90/hope™ and *em*™



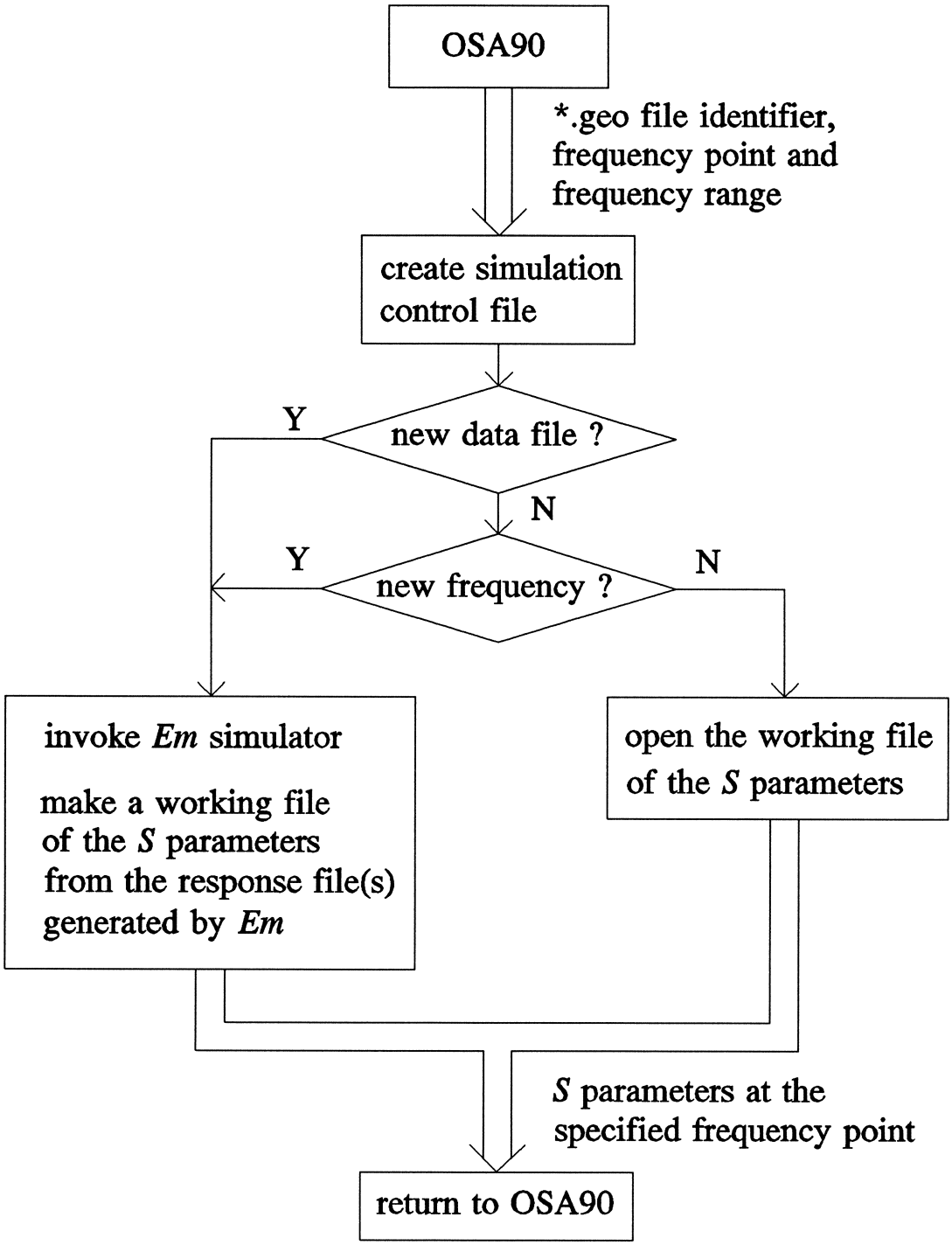
Stage 1 of Empipe™ for Fixed Structures



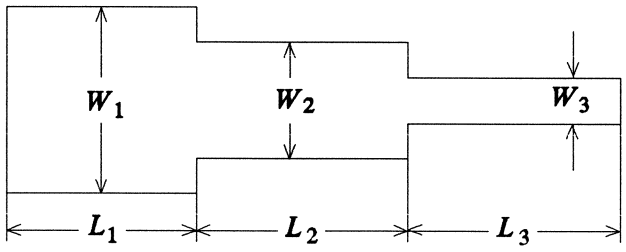
Stage 1 of Empipe™ for Optimizable Structures



Stage 2 of Empipe™



Design of a Three-Section Microstrip Impedance Transformer



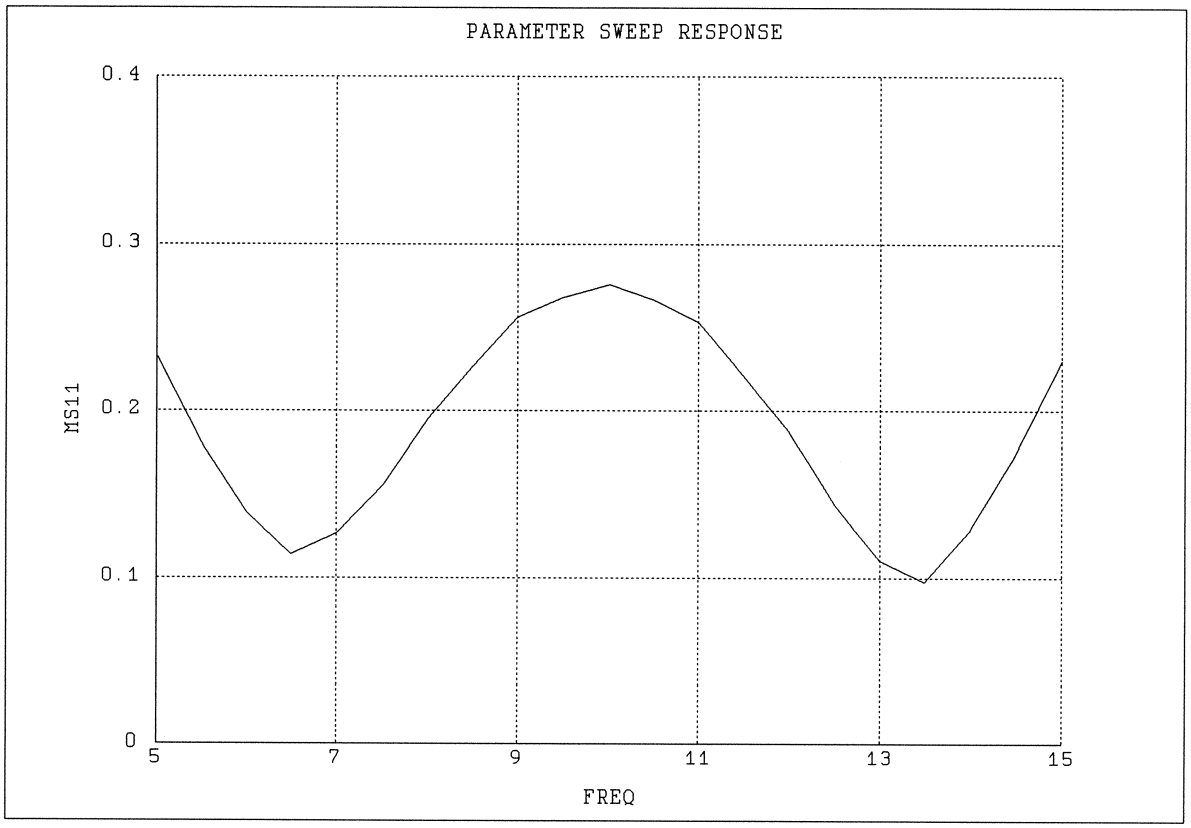
Specification

minimize $|S_{11}|$ with 50 ohm termination on port 2 over 5-15GHz

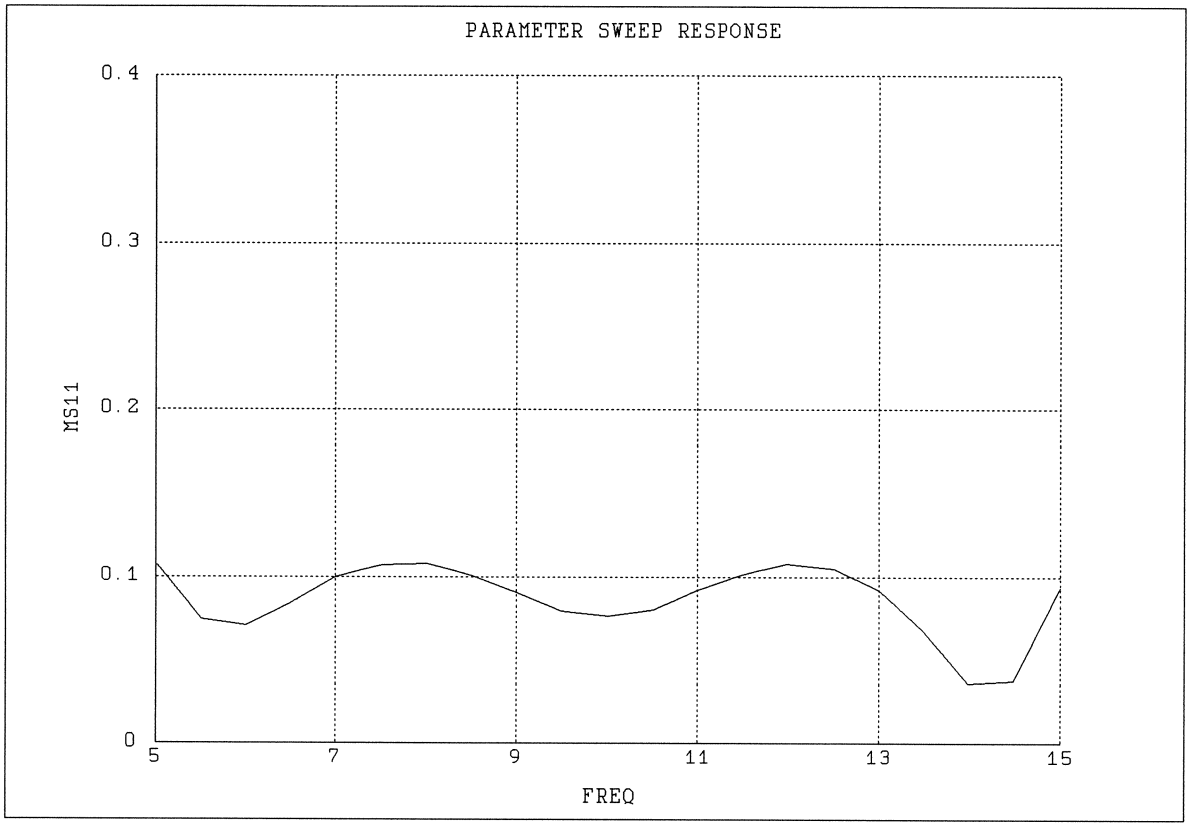
Variables

W_1, W_2 and W_3

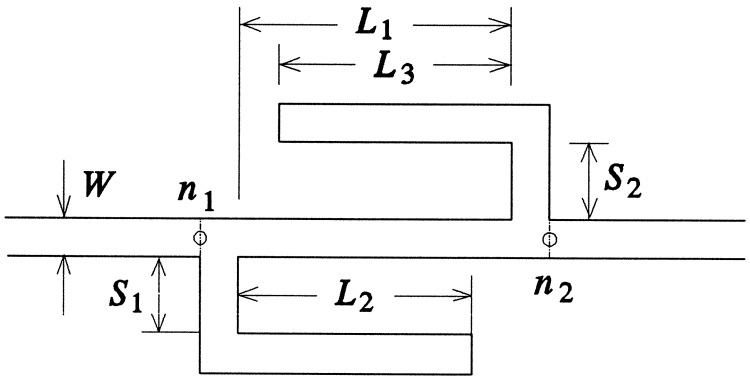
Impedance Transformer before Optimization



Impedance Transformer after Optimization



Design of a Double Folded Stub Microstrip Structure
(*James C. Rautio, 1992*)



Specifications

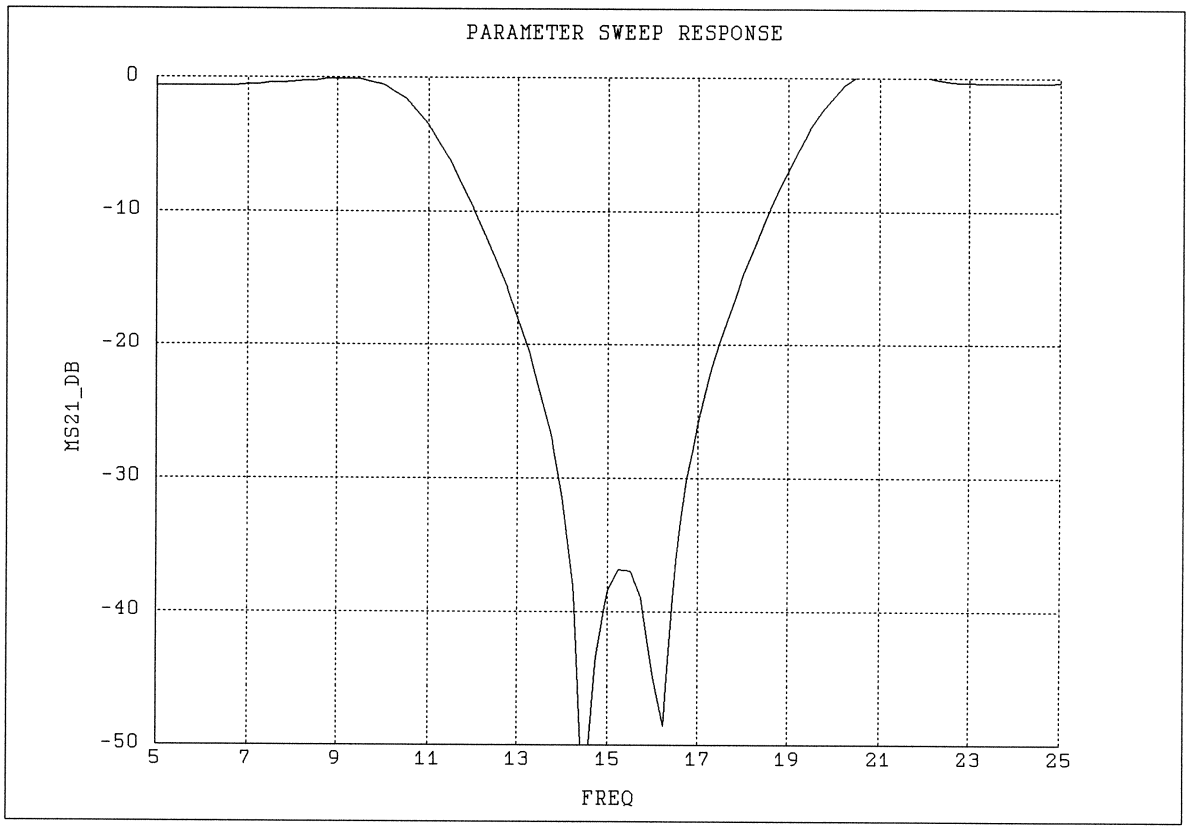
$|S_{21}|$ > -3dB for f < 8GHz or f > 18GHz

$|S_{21}|$ < -30dB for 12GHz < f < 14GHz

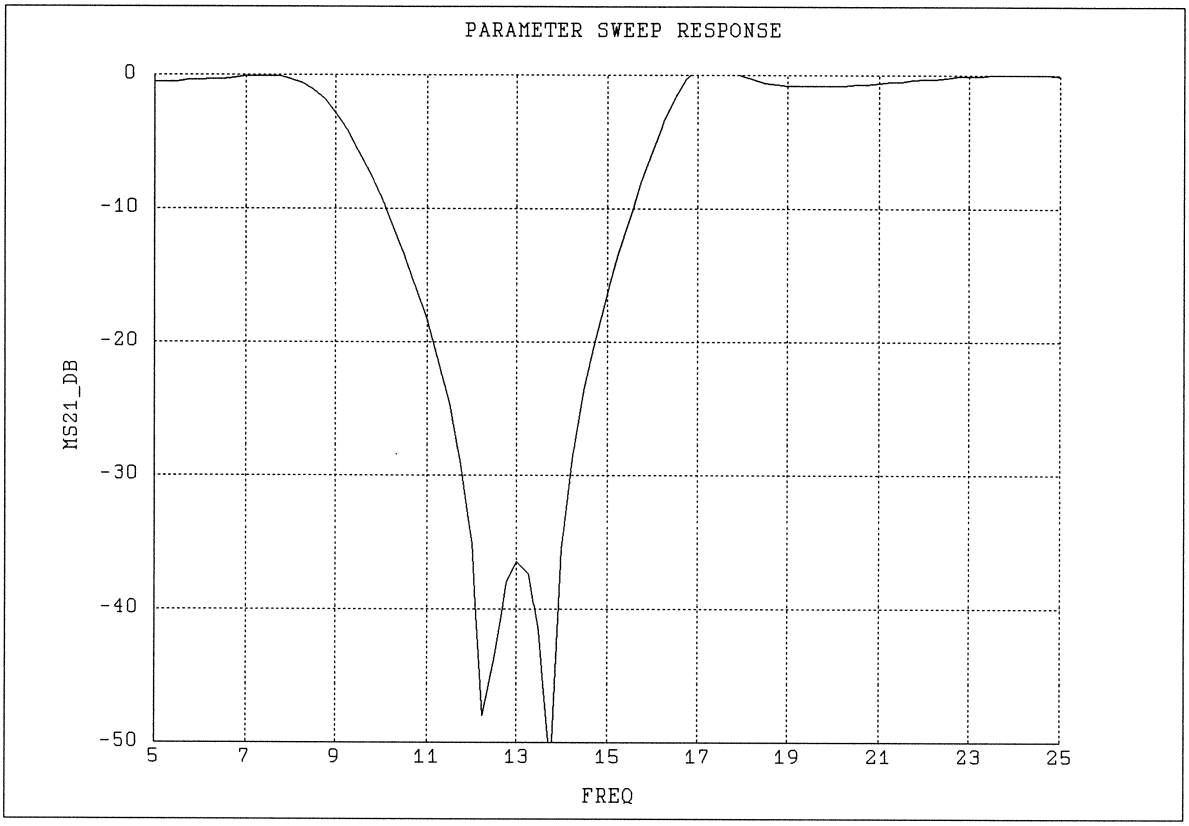
Variables

S_1, S_2, L_1, L_2 and L_3

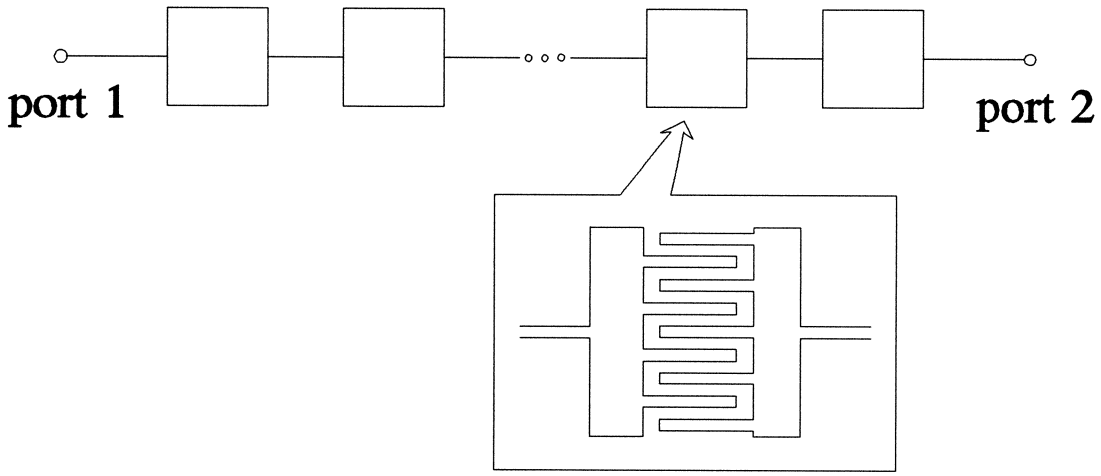
Double Folded Stub Structure before Optimization



Double Folded Stub Structure after Optimization



Design of an Interdigital Capacitor Filter
(*Dan Swanson, 1992*)



Specifications

$|S_{11}| < -20\text{dB}$

26GHz - 40GHz

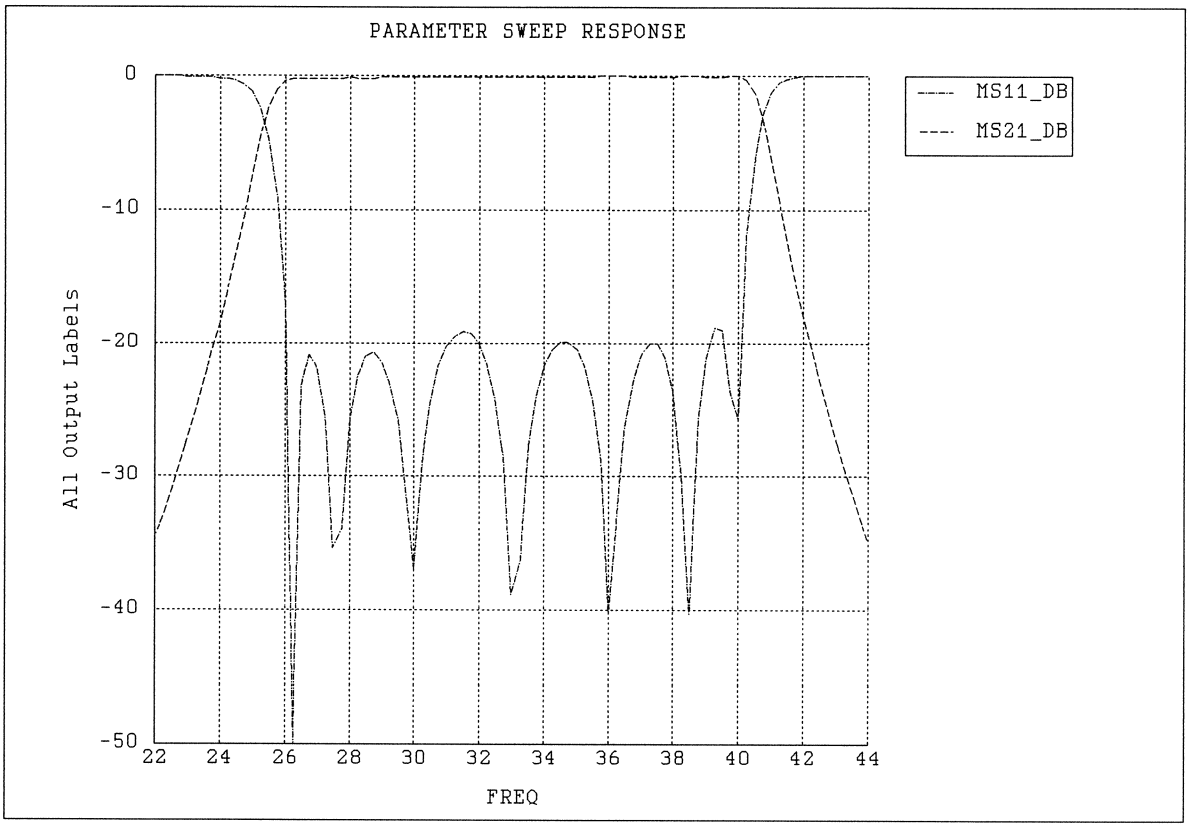
$|S_{21}| > -0.5\text{dB}$

Variables

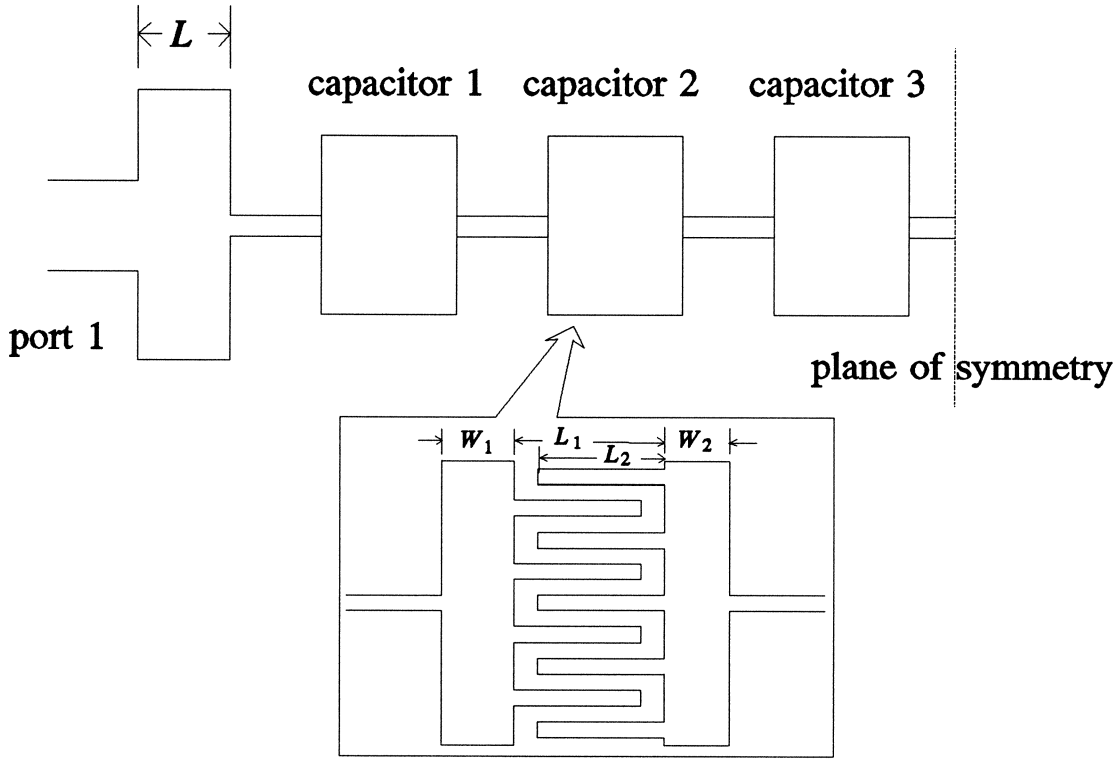
13 optimizable geometrical dimensions, including finger lengths, spacings, etc.

26-40GHz Interdigital Capacitor Filter after Optimization

rounded to 0.1 mil resolution



Interdigital Capacitor Filter
(*Dan Swanson, 1992*)



optimization variables include L, L_1, L_2, W_1 and W_2, totalling 13

Notes:

(1) CPU time

the optimization of the three-stage impedance transformer took 1.5 hours on HP 720, 7 hours on SparcStation 1+ (10 minimax iterations).

(2) $|S_{21}| > 0$dB in the double folded stub structure

it is caused by large grid size and the linear approximation. (the grid size used was 2.4mil, half of the line width.) if we reduce the grid size to 1.6mil, $|S_{21}| < 0$dB.