DIONYSUS

COMNAV ENGINEERING
Custom filters for wireless
communication & navigation systems

the microwave filter design tool that
leaves more time for wine & song…

Welcome to **DIONYSUS,** a multi-functional design and synthesis program to design, edit, analyze, and combine filter circuits from audio to microwave frequencies.

DIONYSUS is capable of designing from many different transfer functions, including Bessel, Gaussian, Butterworth, Tchebychev, Elliptic, and Pole Placed.

As easy as:
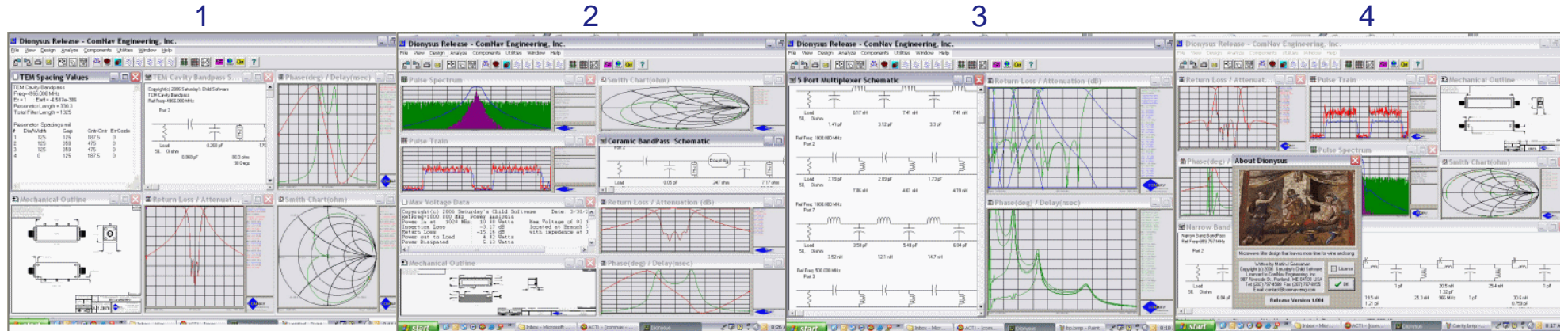
1
Specify your filter design

2
analyze your design

3
optimize the element values

4
save your filter file
now drop it into ADS or MW-Office
to analyze at the system level

In addition, the user can input G or KQ values from any source for any other transfer function. Numerous lumped and distributed circuits are available directly from menu selections and many more types can be created through editing and joining circuits, along with the various switches available during the design process that give the user complete control and flexibility over the circuit topology.

The user interface of **DIONYSUS** is designed to provide maximum flexibility, yet still be friendly enough to allow both the experienced filter designer and novice to immediately begin designing complex filter circuits. The logical order in which data is entered and edited provides a framework to quickly become an expert user. When designing filters, data is requested by the program as it is required. This minimizes the amount of guessing required during the design process. Most of the time, the program provides cues such as minimum or maximum values for the required data. The message box will pop up at during the design process to provide instructions from the program to tell the inexperienced user what to do next.

DIONYSUS allows the user to design numerous types of Lowpass, Highpass, Bandpass, and Bandstop filters. In addition to filter circuits, the program also designs amplitude and delay equalizers and attenuators. These circuits can then be joined together in series, parallel, or multiplexed to construct more complex circuits. The analysis routines can then provide full characterization of the overall network, displaying a graphical or tabular display of the circuit response.

In addition to filters **DIONYSUS** provides a quick and painless method of designing "puck" dielectric resonators, coaxial dielectric resonators. Puck Resonators are designed with mode matching techniques outlined in Kajfez and Guillon's "Dielectric Resonators" using industry standard materials. Coaxial Resonators are designed with the standard TEM transmission line equations using standard industry materials.

Mechanical drawings are provided that allow the user to select the desired package from non-hermetic open frame SMT packages to connectorized machined boxes and cavities and can be printed on any printer that works with windows. These drawings can be scaled and modified from the pop-up menu on the drawing by right clicking any where on the drawing. For resonators the drawings include additional information such as unloaded Q and Resonant Mode.

Upon completion of the design the user can then analyze the performance of the filter with the integrated S-Parameter analyzer which will provide a graphical view of the filter response. Standard displays include plots of return loss, thru loss, phase linearity, and delay variation along with a tabular listing of data.

Advanced users can also customize the plots or hit a single button and go back to the defaults. The program will also generate a Smith chart plot and write an S-Parameter file to be used in system simulators. An FFT pulse analysis routine is also included to provide an insight into the distortion inherent in filtering digital pulses. For high power applications, **DIONYSUS** provides a unique power analyzer to rotate a mismatch around the smith chart and locate the highest voltage, current, and power dissipation in the circuit.

Designs can be saved and recalled using **DIONYSUS**'s file utilities. All design parameters from all the menus are saved in various files. Upon exiting the program the user is asked if the default files should be updated with the current data.

Multi-function design & analysis program for ceramic, LC & cavity filters, including:

Lowpass Filters	Multiplexers	Puck Resonators
Highpass Filters	Delay Equalizers	Microstrip, Stripline, Round and Square Rod Coupled and Transmission Lines
Bandpass Filters	Amplitude Equalizers	Straight Wire and air wound Inductors
Notch Filters	Attenuators	Coaxial and Parallel plate capacitors
Diplexers	Coax Resonators	

Analysis Capabilities

S-Parameters

  Return Loss, Attenuation
  Phase Linearity, Delay
  Smith Chart
  Write Industry Standard *.S2P files for further simulation

Fourier Pulse Sequences

  Define Pulse Train
  Set Noise Level
  View Pulse Distortion

RF Power

  Rotate source and load impedances
  Set Impedance Mismatch
  Identify max Voltage, Current, and Power dissipation

Internet Enabled

  Go direct to ComNav Engineering's Archive of Drawings
  Email RFQ's with current design to ComNav Engineering
  for quick quoting
  Report Bugs or Comments from inside the program

Cavity/ Distributed Filters:

  Combline
  Coupled TEM
  Interdigital
  Edge Coupled Half Wave
  Hair Pin

Calculates Dimensions of Resonators and Spacing
Automatic Unloaded Q Calculations
Multiple Transfer Functions - Tchebychev, Butterworth, Bessel, Gaussian 6 dB or 12 dB, Automatic / Manual Pole Placer, User Input G or K values
Multiple Package Options - Surface Mount, Thru-hole, Hermetic or Non-Hermetic, or Connectorized
Diplexer and Multiplexer Design and Analysis
Multiple Preprogrammed Design Routines - Tank, Mesch, Helical, Lowpass - Bandpass, Embedded Notch, & Tubular Bandpass - Lowpass
Numerous Design Optimizations - Force Component Values, Flying node removal and Automatic Impedance Matching

For assistance in using DIONYSUS - contact one of the Microwave Resource Engineers at Theta-j Associates