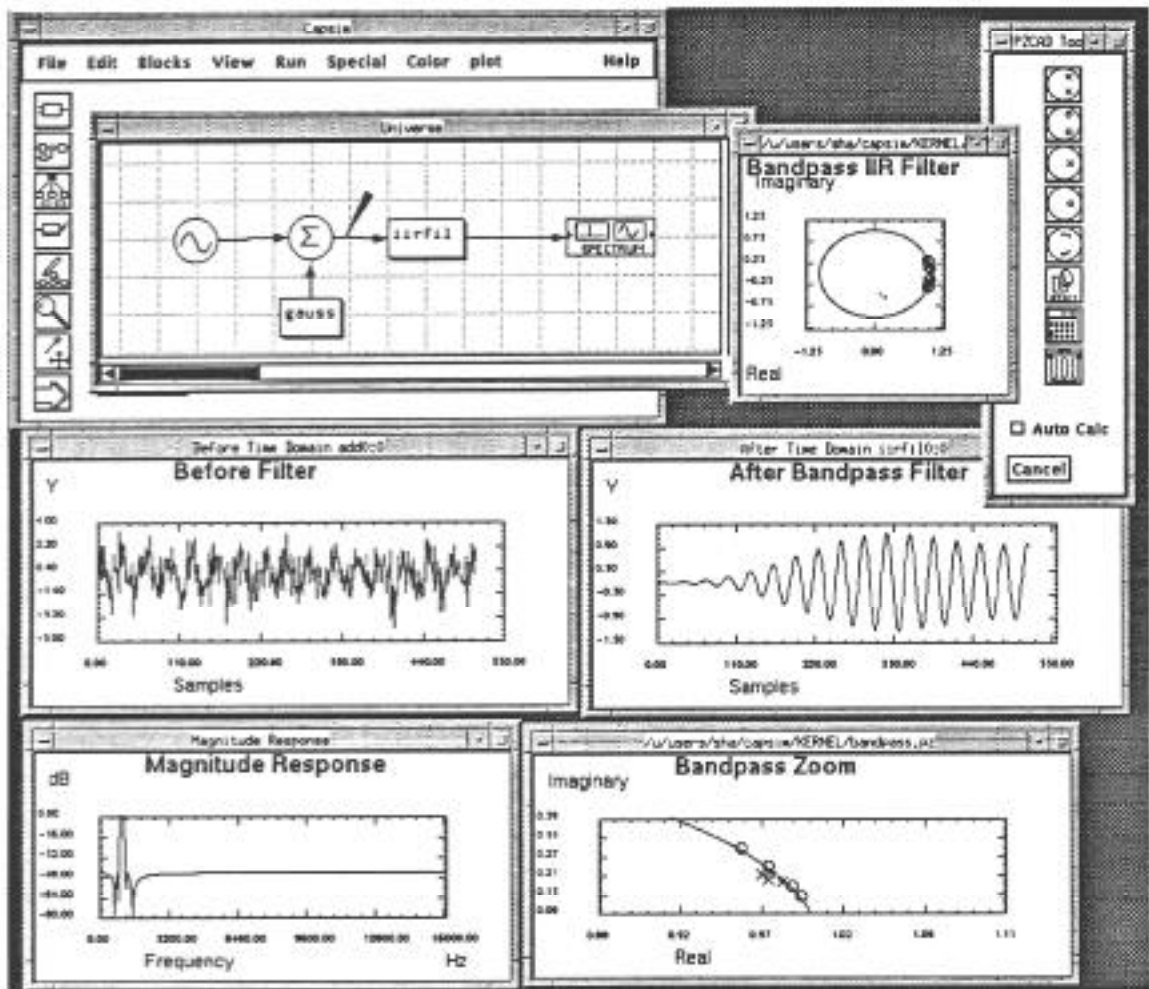


Integrated Pole-Zero Design and Analysis Package



XCAD introduces the Interactive Pole-Zero Design package (IPZD). The IPZD package is integrated into the Integrated Interactive Plotting Package (IIP) and is supplied with Capsim. With IPZD you can edit pole-zero diagrams of IIR filters designed in Capsim. You can instantaneously view the magnitude, group delay and impulse response of the filter as you change the position of poles(zeroes), delete them, or add new ones. The filter described by the poles and zeroes can be stored using different structures. The filter structures supported are direct form, cascade and normalized lattice. The stored filter can be simulated in fixed point or floating point in Capsim without leaving the session. Thus, the filter performance in a system can be simulated and evaluated iteratively.

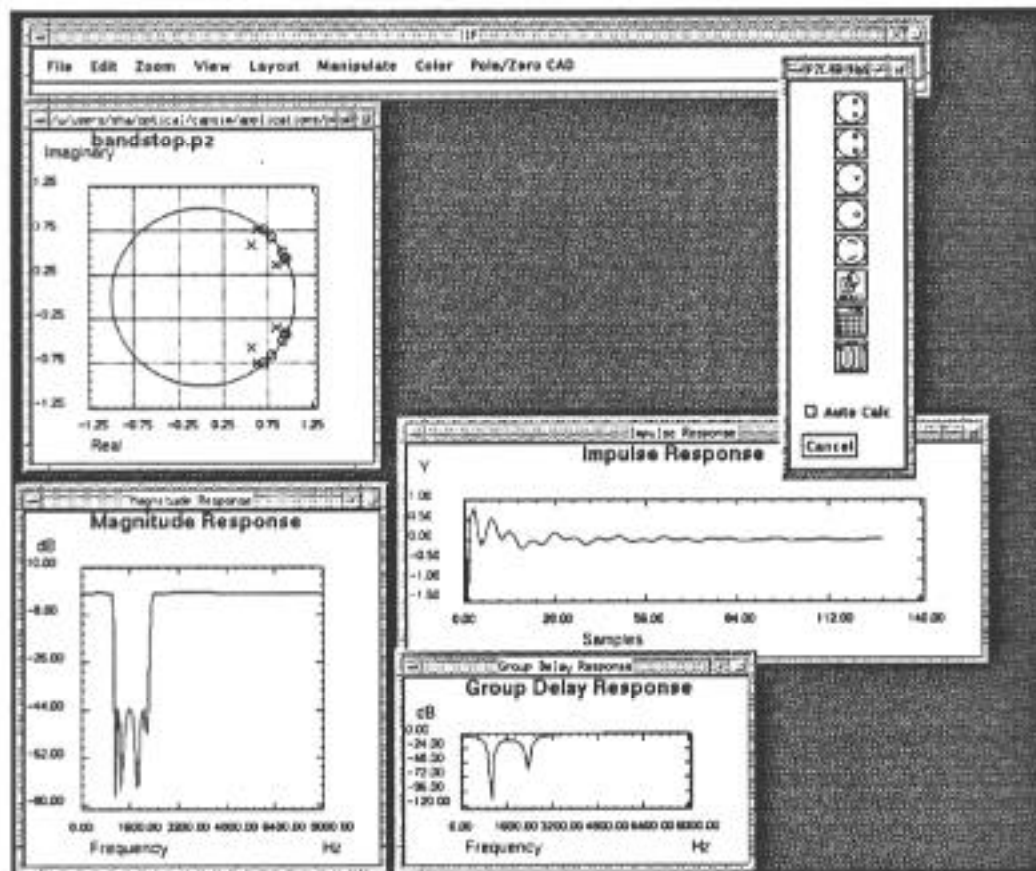
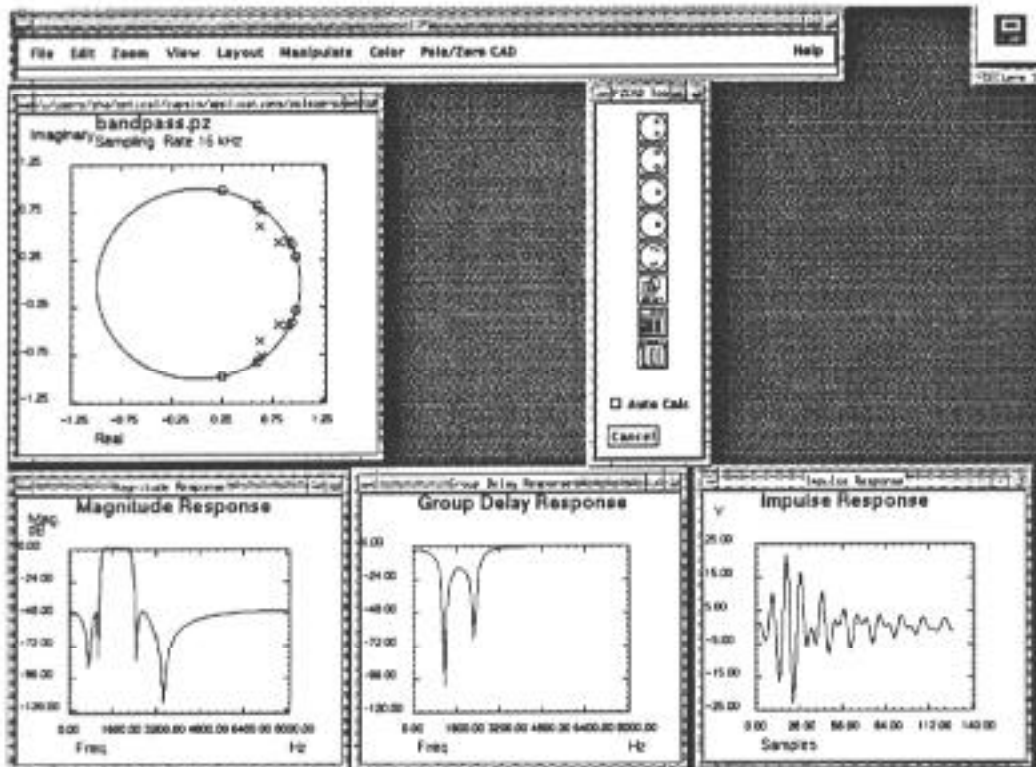
IPZD also supports the automatic generation of IIR digital filters for Digital Signal Processors. IPZD will create an initialization routine and a callable subroutine for integration into DSP programs for real-time digital filtering. The DSP filters generated by IPZD are guaranteed not to overflow and achieve the minimum roundoff noise in fixed point implementations.

All of the powerful interactive plotting capabilities of IIP are available when you use IPZD. These capabilities are illustrated in the following pages. Enjoy!

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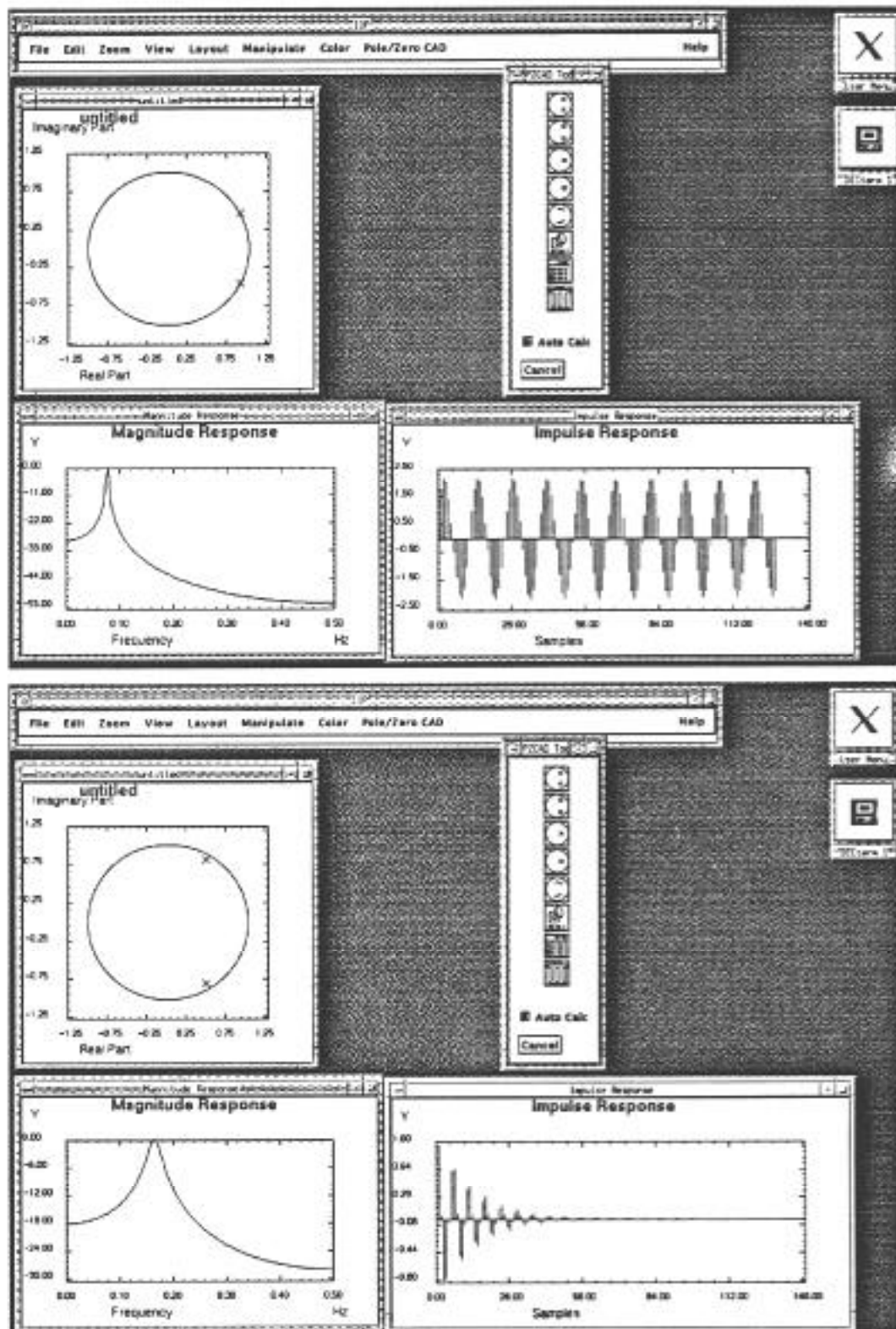
Integrated Interactive Pole Zero Design Package

Bandpass and Bandstop IIR Filters



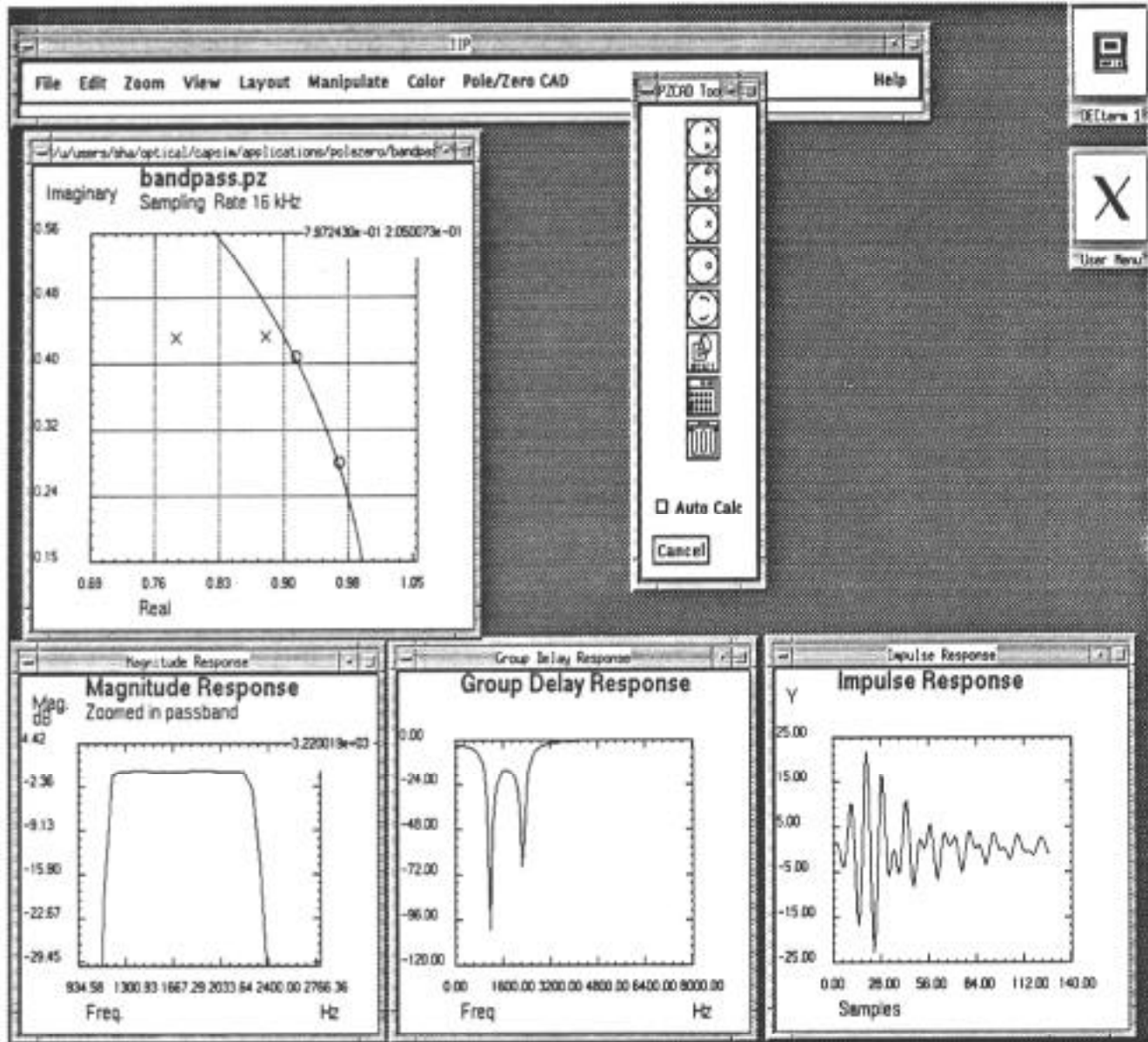
Integrated Interactive Pole Zero Design Package

Analysis of Pole Movement in the Unit Circle



Integrated Interactive Pole Zero Design Package

Fine Tuning Pole-Zero Designs



While you are designing filters, all of the capabilities of the Integrated Interactive Plotting Package are available. In the above session, the poles and zeroes of a band pass filter are observed using zoom in. Also note the display of the cursor position. The passband region of the magnitude response is also zoomed-in so

that the effect of pole/zero movement on passband ripple can be observed.