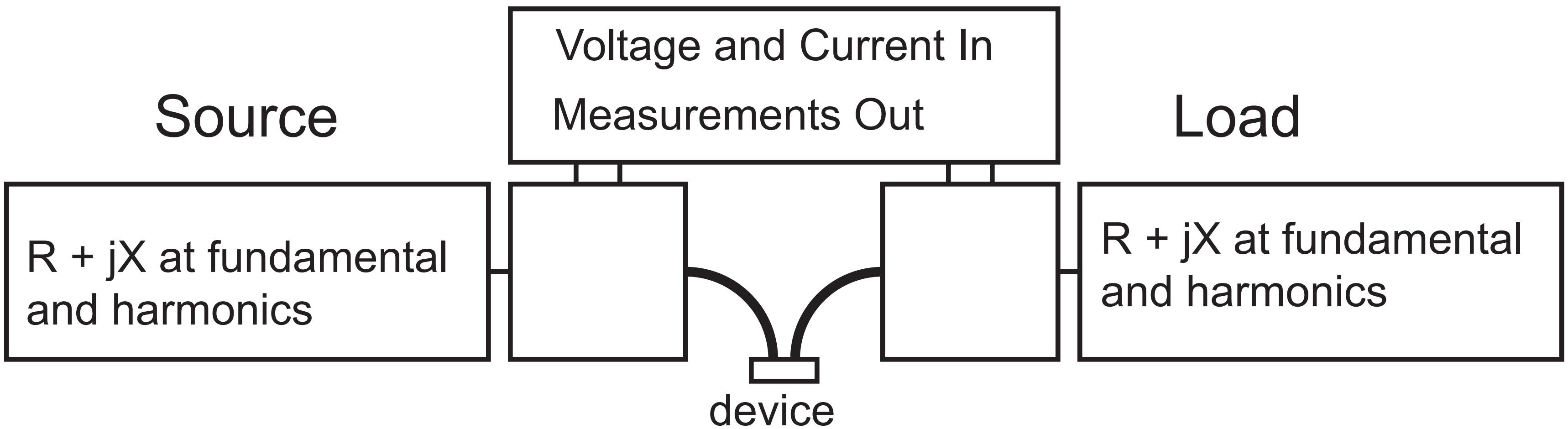
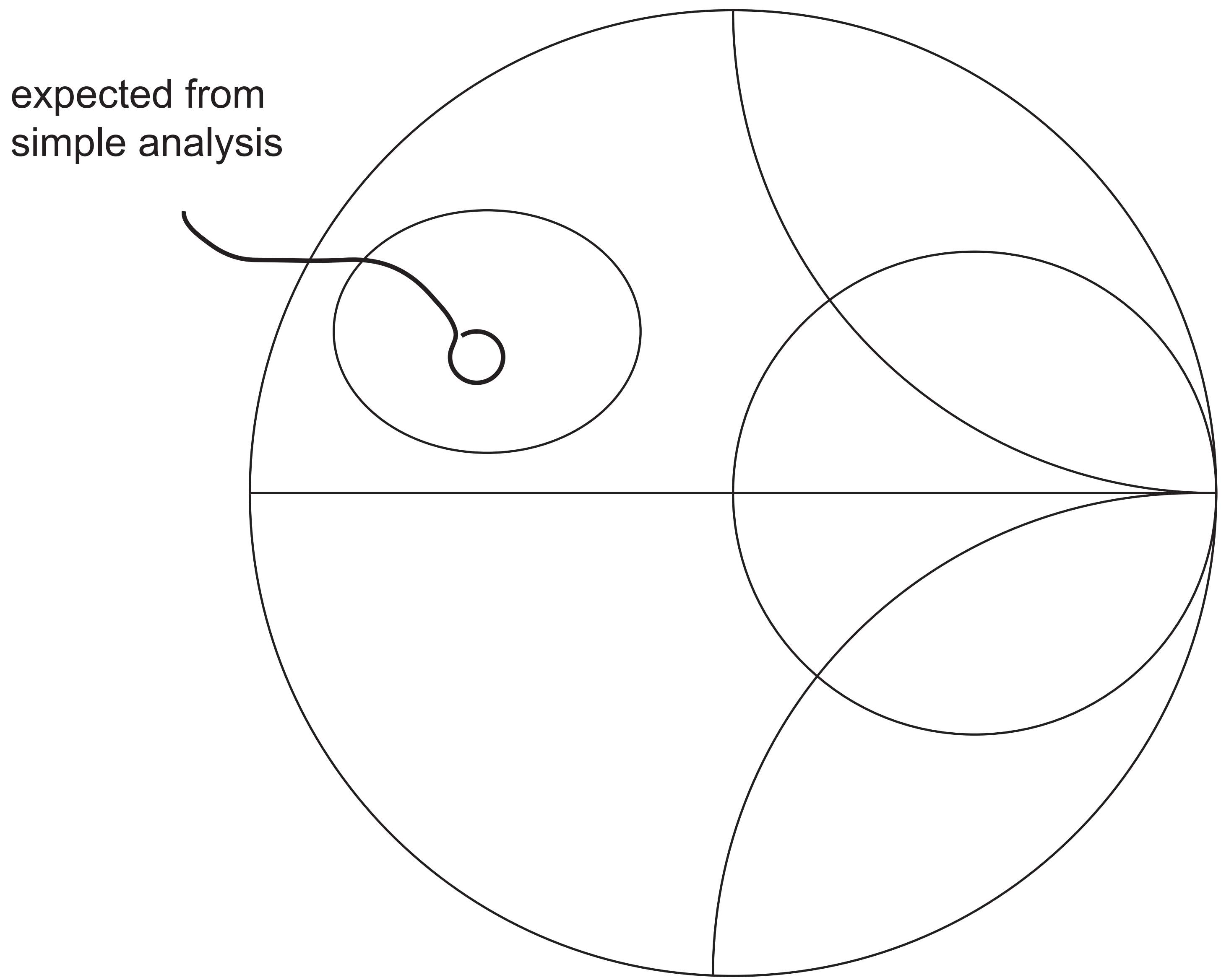
# Introduction to Load Pull




The source and load boxes contain motor driven capacitors that move along transmission lines to present any point on the Smith chart to the Device. Computer control of the motors and data collection, and computer processing of the collected data has made this process much more tedious than in previous decades...oh wait, that wasn’t supposed to happen...

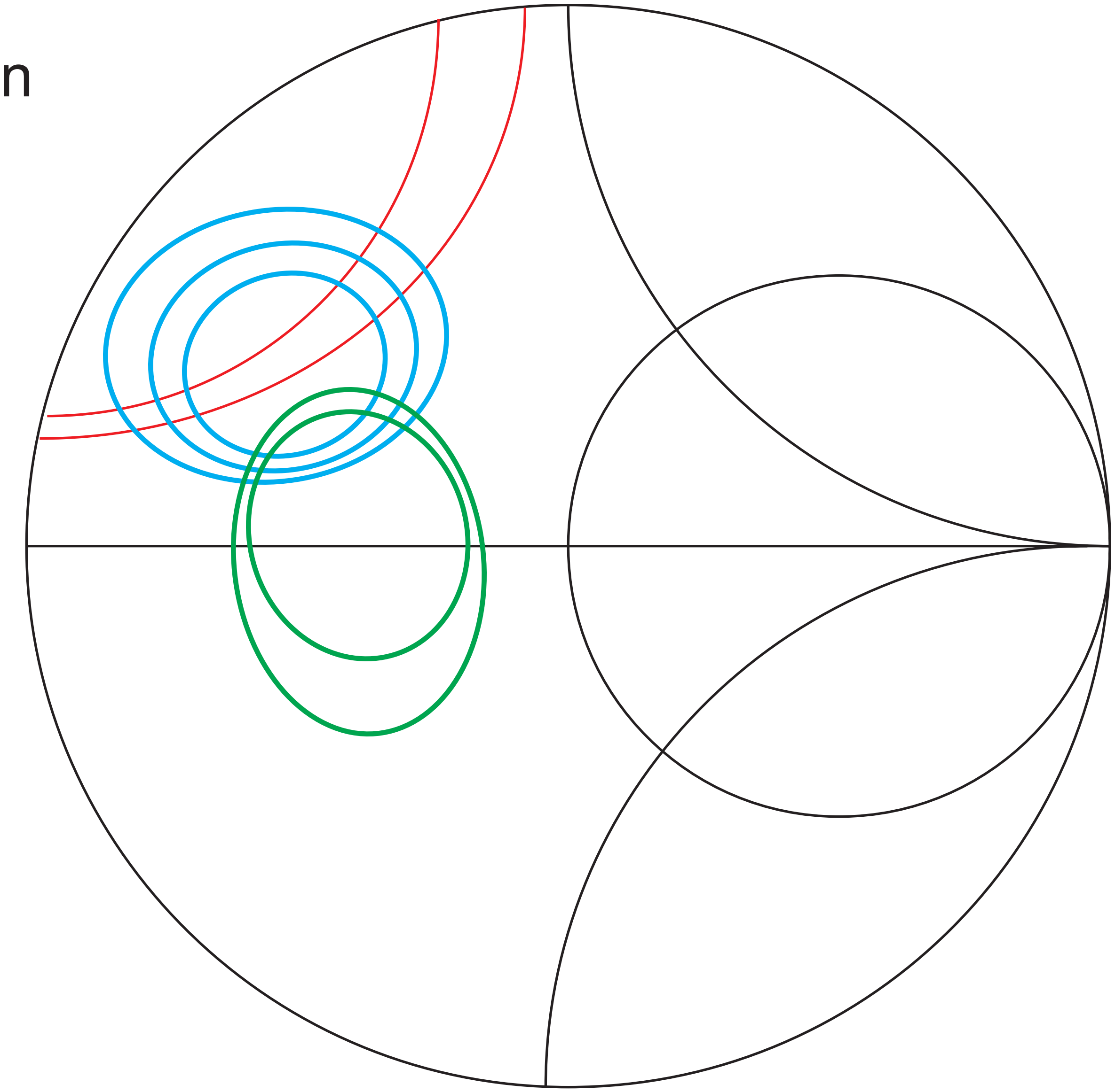
Use the Load Pull system to explore the region around the area predicted by simplified theory:



The output of the Load Pull measurements is presented as plots showing optimum load regions under specified conditions

Efficiency -- Green

Gain -- Blue



devices above and to the left of the red curve did not survive the measurements

# How to Design a PA:

Pick a supply voltage and output power

Choose a TriQuint power transistor

Design a network that presents the load to the transistor...

”that the device wants”

using the Load Pull charts

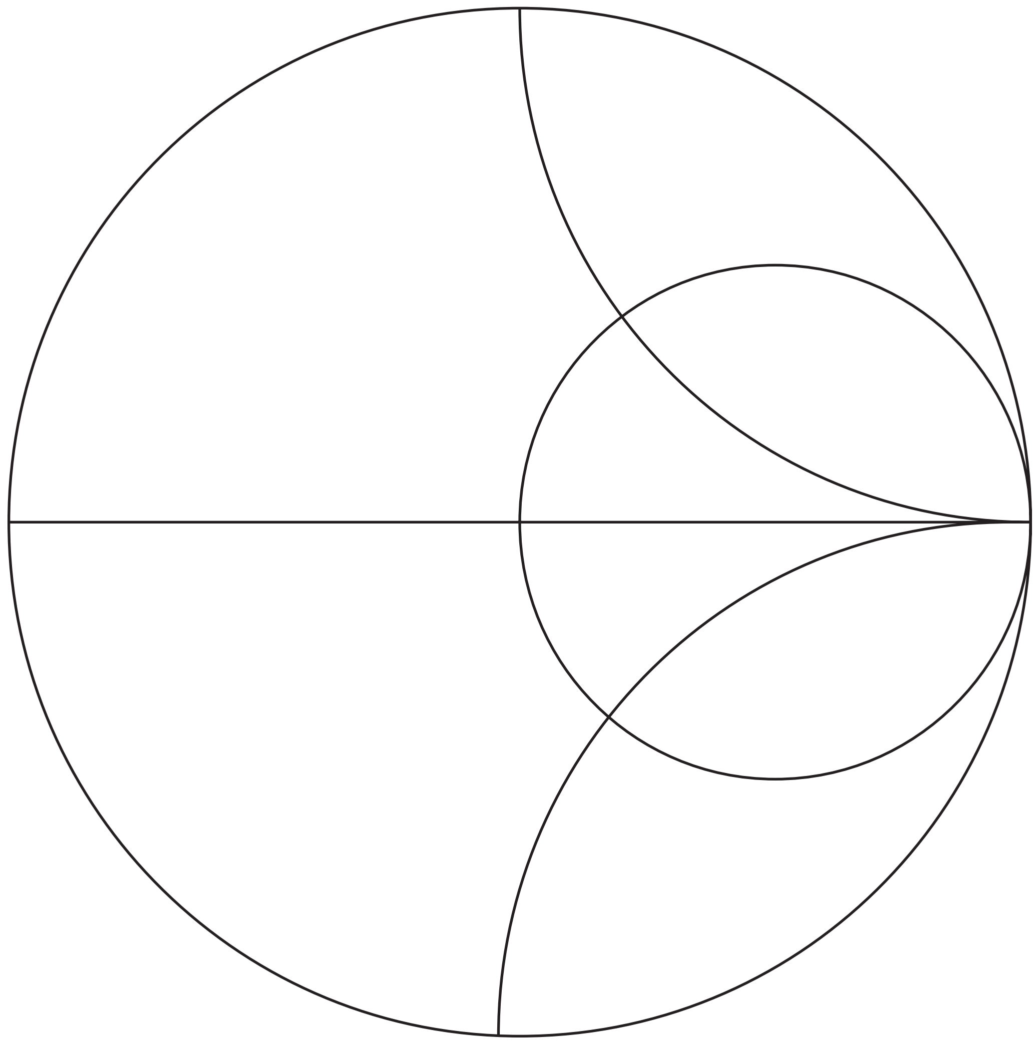
Load Pull data from individual cells may be scaled to larger devices.

So in principle, Load Pull replaces building up a set of optimized reference designs with complete measurements of the active device cells.

A good PA or LNA design still needs a good PA or LNA designer.

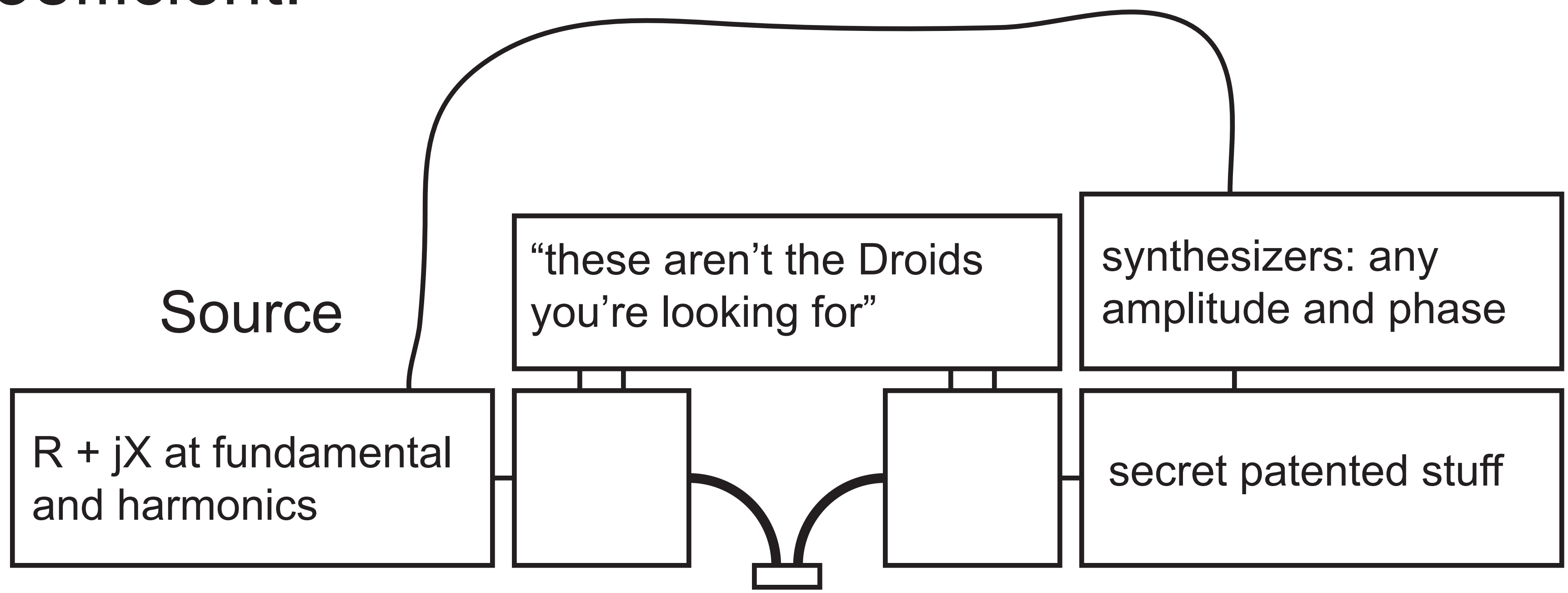
Active Load Pull: there is another way....

This is a chart of Complex Impedance....

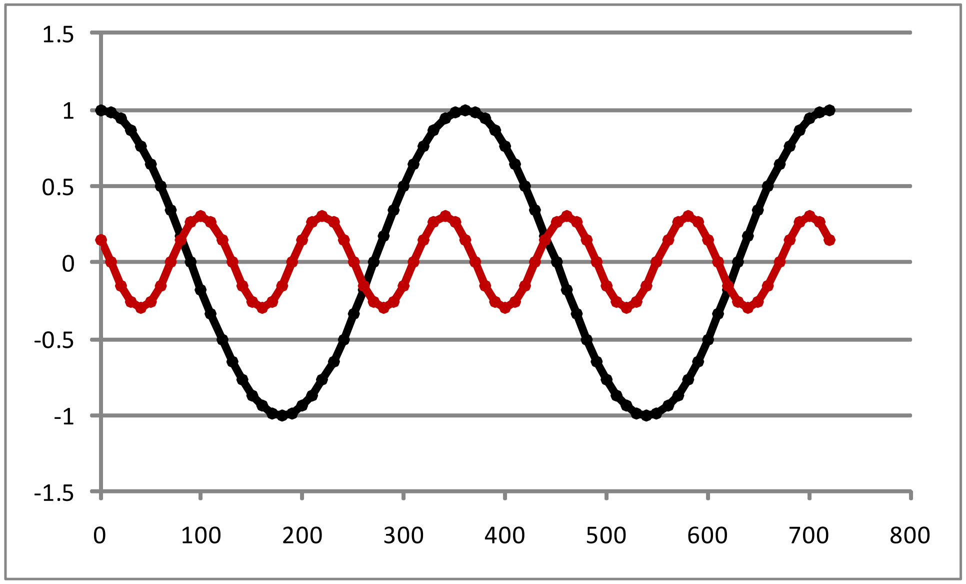


...and a polar plot of complex reflection coefficient

Instead of using motorized transmission lines and capacitors to vary impedance, we can use signal generators to simulate a reflection coefficient:

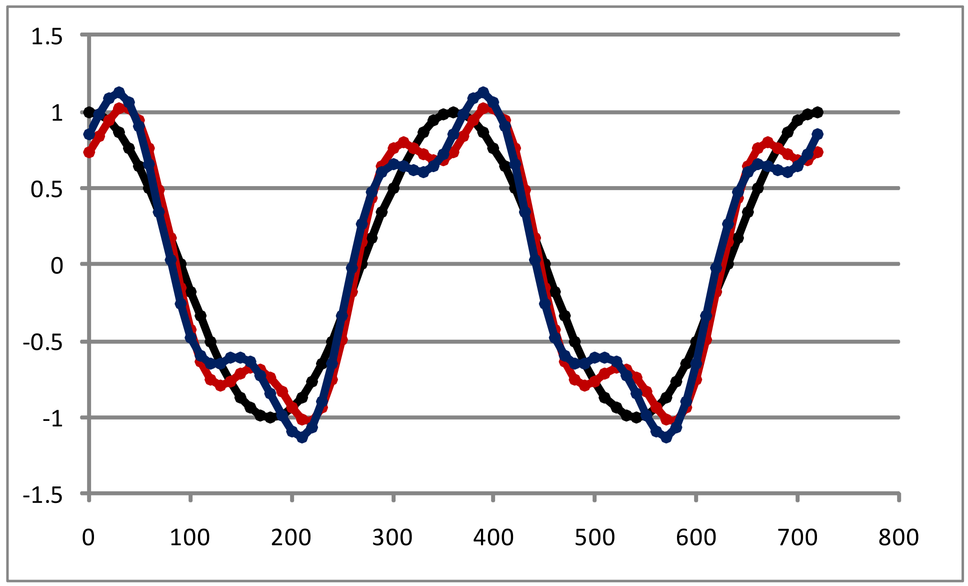


It works--but RF engineers have learned the hard way to be very conservative...




third harmonic at collector 10 dB below fundamental

# Can mess with those waveforms either by varying impedance or “reflecting” back a complex signal



Now--continue review of Smith Chart...

Into the Lab for Demo.