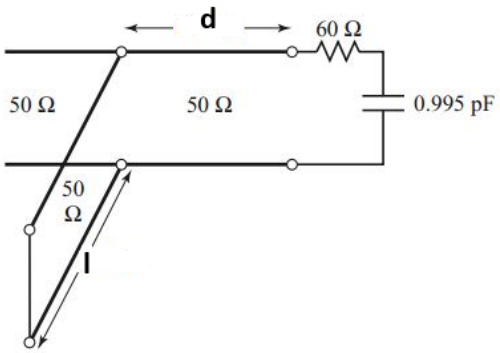
Single-Stub Tuning

The goal is to find d and l as shown in the figure.



$$Z_L = 60 - j80\ \Omega.$$

Step 1: Plot normalize load impedance $z_L = 1.2 - j1.6$.

Step 2: Draw the SWR circle.

Step 3: Convert z_L to admittance y_L.

Step 4: The SWR circle intersects $1 + jb$ circle at two points y_1 and y_2.

Step 5: Find the distance d from the load to the stub by reading the wavelengths toward the generator scale.

$$d_1 = 0.176 - 0.0065 = 0.110\lambda,$$

$$d_2 = 0.325 - 0.0065 = 0.260\lambda.$$

Now the admittance at this new points can be calculated as follows

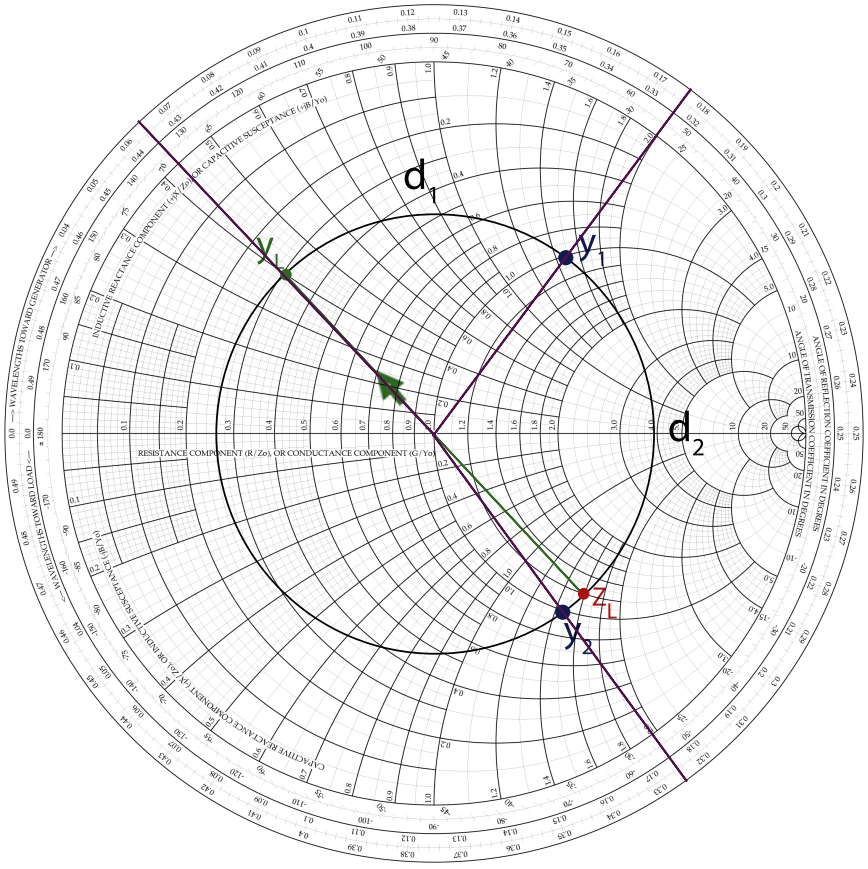
$$y_1 = 1 + j1.47,$$

$$y_2 = 1 - j1.47.$$

Hence to tune these solutions with a short circuit single stub a susceptance of $-j1.47$ is required for the first solution and similarly a susceptance of $j1.47$ is needed for the second solution.

The length of the short-circuited stub then can be found by starting at $y = \infty$ and moving along the chart toward the generator to the $-j1.47$ and $j1.47$ for the first and second solution respectively.

In this manner $l_1 = 0.095\lambda$, and $l_2 = 0.405\lambda$.



Step 1 **Step 2** **Step 3** **Step 4** **Step 5**