The Smith Chart

Electrical Engineering

How to read the chart before using it: what the circles, the rotation and the centre mean.

The chart is a map of reflection coefficient, drawn in impedance coordinates.

1. **Know what is plotted**
   The chart maps reflection coefficient; the outer circle is $|\Gamma| = 1$.

2. **Plot the load**
   Normalised r + jx sits where its resistance and reactance circles cross.

3. **Move along the line**
   Rotate clockwise towards the generator; one full turn is half a wavelength.

4. **Flip for admittance**
   A half-turn about the centre converts impedance to admittance and back.

5. **Read off the match**
   The centre is a perfect match; distance from it gives $|\Gamma|$ and VSWR.

The chart maps the whole right half of the impedance plane onto a unit disc, which is why no value ever runs off the page.