

# Technician Class Course

## Session 6



**ARRL** *The national association for*  
**AMATEUR RADIO**

# ANTENNAS



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# The Antenna System

- Antenna: Facilitates the sending of your signal to some distant station.
- Feed line: Connects your station to the antenna.
- Test and matching equipment: Allows you to monitor antenna performance.

# Antennas

- Antennas need to:
  - Resonate
  - Radiate
- One does not automatically imply the other!

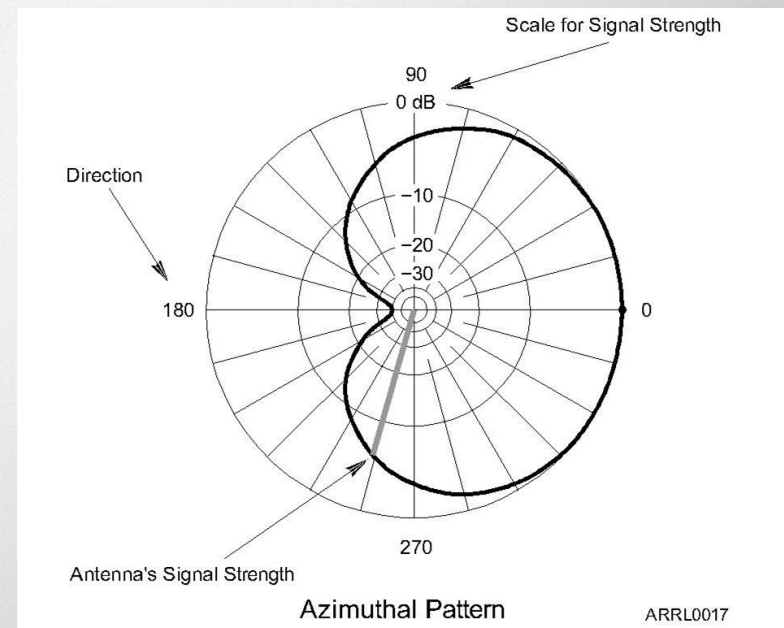


# The Antenna (Some Vocabulary)

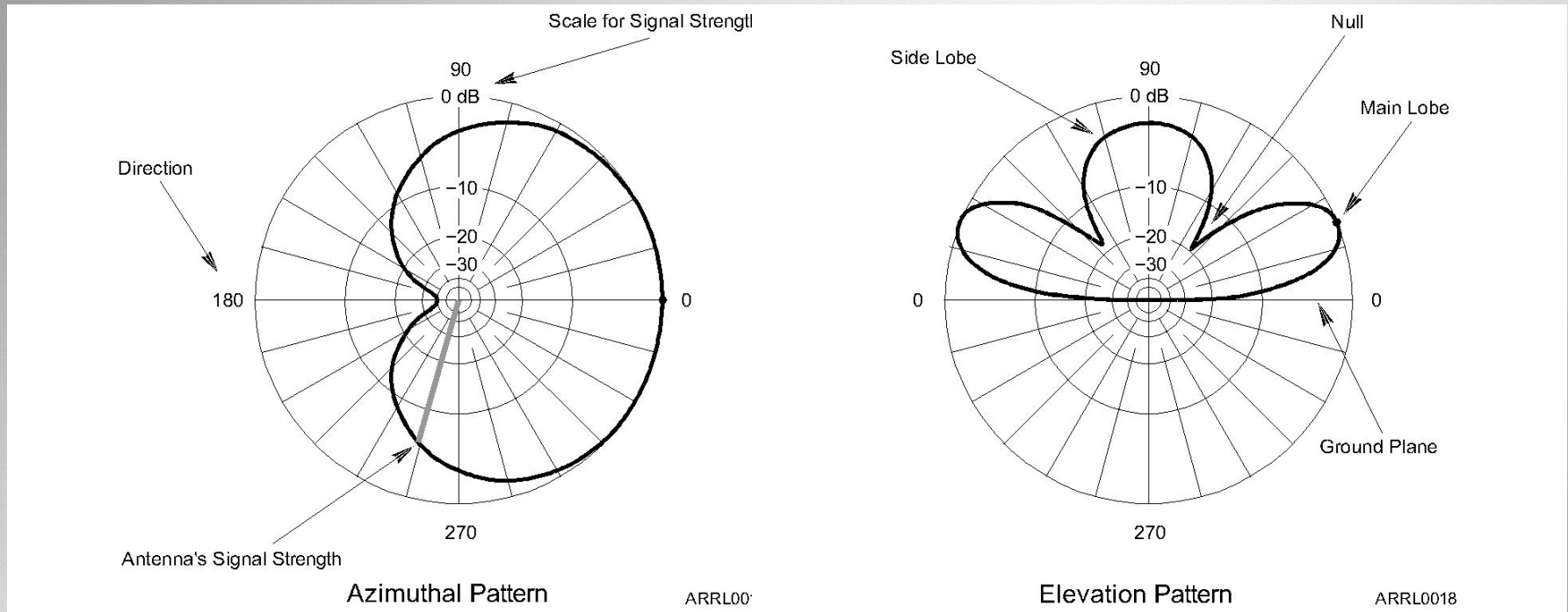
- Omni-directional – radiates in all directions.
- Directional beam – focuses radiation in specific directions.
- Gain – apparent increase in power in a particular direction because energy is focused in that direction.
  - Measured in decibels (dB)

# Antenna Radiation Patterns

- Radiation patterns are a way of visualizing antenna performance.
- The further the line is away from the center of the graph, the stronger the signal at that point.



# Antenna Radiation Patterns



*Refer to Cisco white paper antenna patterns for 3D representations*

# Antenna Impedance

- Antennas have a characteristic impedance.
- Expressed in ohms – common value 50 ohms.
- Depends on:
  - Antenna design
  - Height above the ground
  - Distance from surrounding obstacles
  - Frequency of operation