**Background**

* ATR was in operating condition 🡪 create antenna & use ATR to test
* Key characteristics of antenna: radiation pattern and directivity
* Arraying antennas can change rad pattern and directivity
  + Make antennas more directive
* Arrays typically found in satellite communications, wireless networks, and radar systems

**Process**

* Design individual patch antenna
  + Operate in X-band
* Think about manufacturing parameters
  + Rear feed line ~ input impedance of 50Ω
    - Rear feed line between GND to help reduce crosstalk
  + FR-4 dielectric – 1.57 mm thickness
  + Run calculations to find
* Simulate in WIPL-D
* Create and simulate Array in WIPL-D
  + Test in X-Band and different spacing
* Create PCB gerber files
* Order from Advanced Circuits from Aurora
* Solder SMA connectors on PCB
* Put PCB in ATR and measure
* Each element measured 🡪 superposed on top of each element

**Results**

* Objective was met
  + Array operated in Xband
  + Array became more directive
  + Measured field and simulated fields match
* Differences in field sources
  + Noise in chamber
  + Superposing may not be exact
  + Disconnecting/reconnect SMA for each element



