

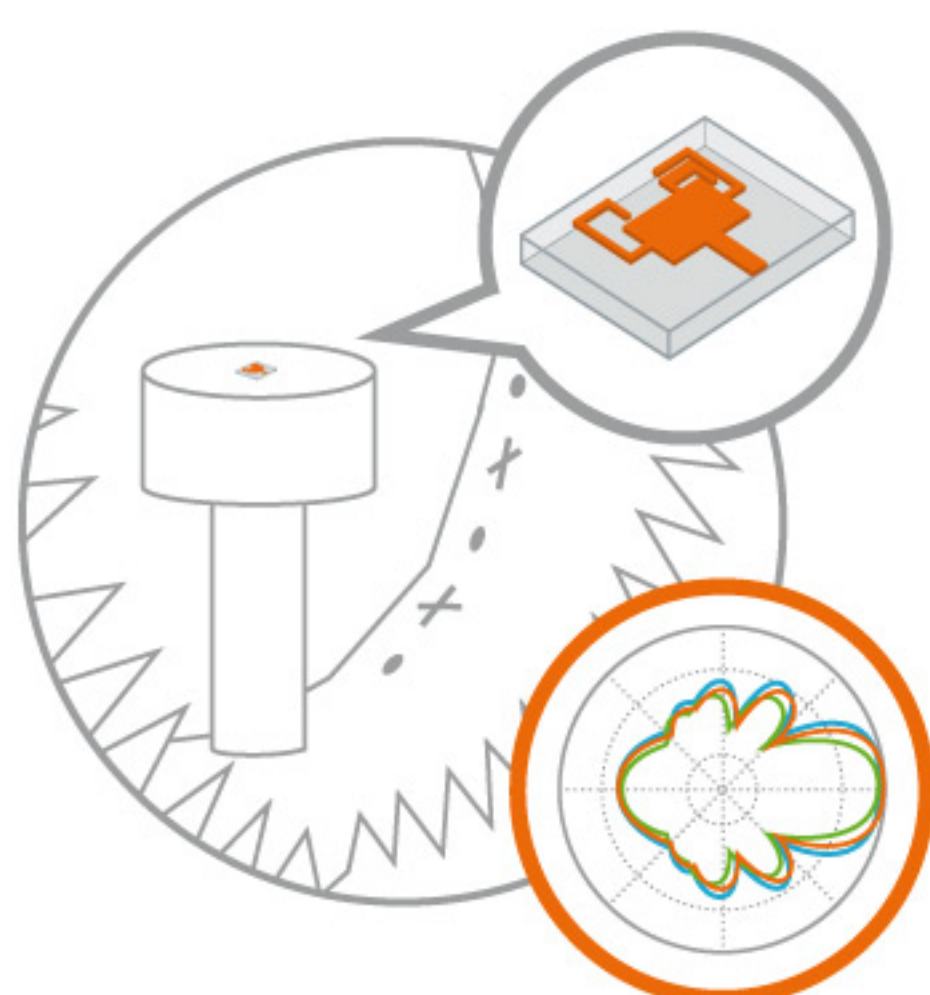
# Mobile Device Design

## Why Test a Mobile Device?

- ✓ To ensure that the hardware functions as expected.
- ✓ To ensure that the software functions as expected.
- ✓ To ensure that it meets all the requirements and specifications.
- ✓ To ensure that it is working properly in real-life environments.

## THE 4 STAGES IN TESTING ANTENNAS AND WIRELESS CONNECTIVITY

### 1 TEST THE STAND-ALONE ANTENNA PERFORMANCE



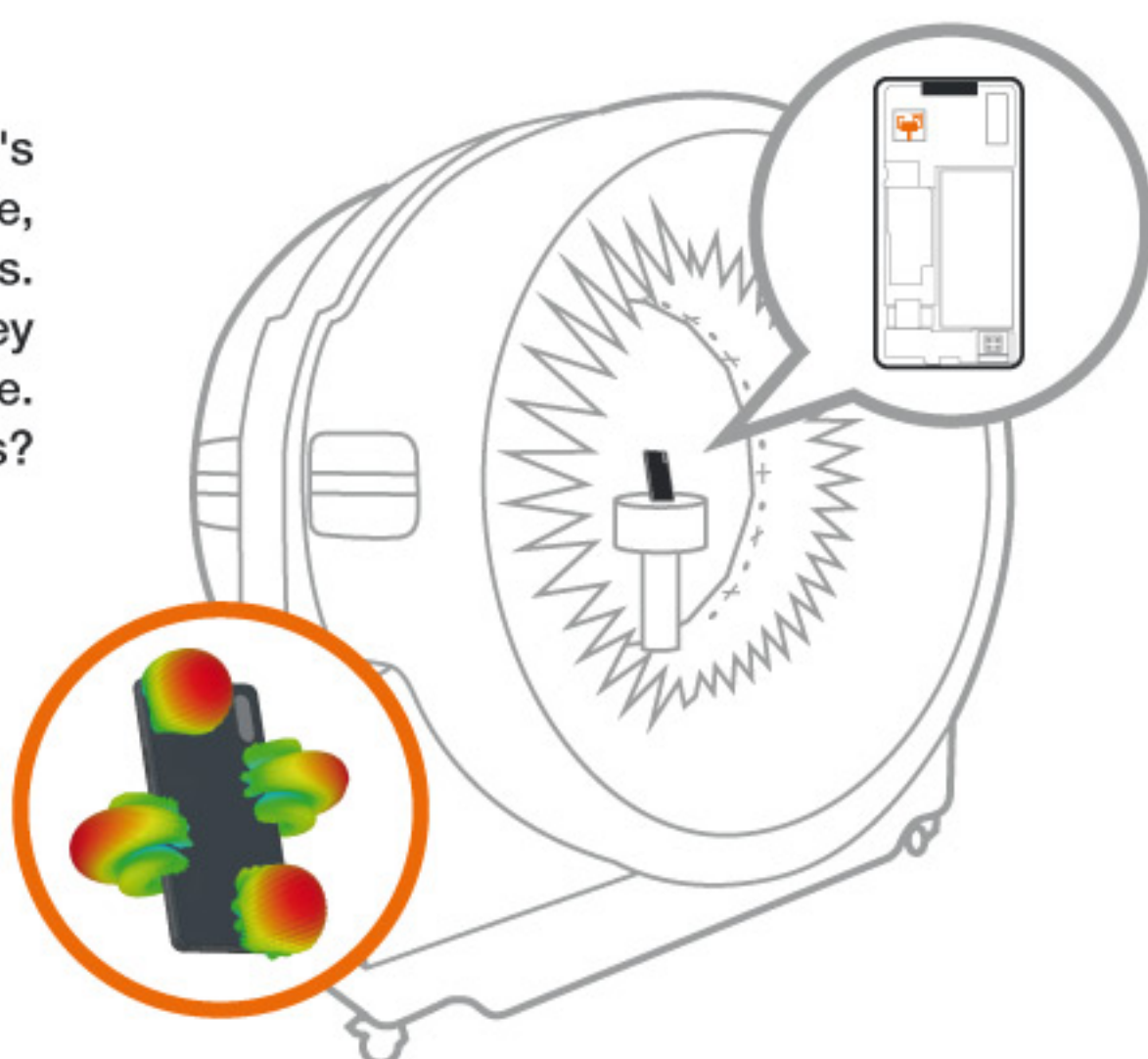
To determine in which directions and how well energy radiates from the antenna(s). Are the antenna radiation patterns in accord with specifications?

#### ANTENNA MEASUREMENTS

- GAIN
- POLARIZATION
- EFFICIENCY
- BEAMWIDTH

### 2 TEST THE INTEGRATED ANTENNAS

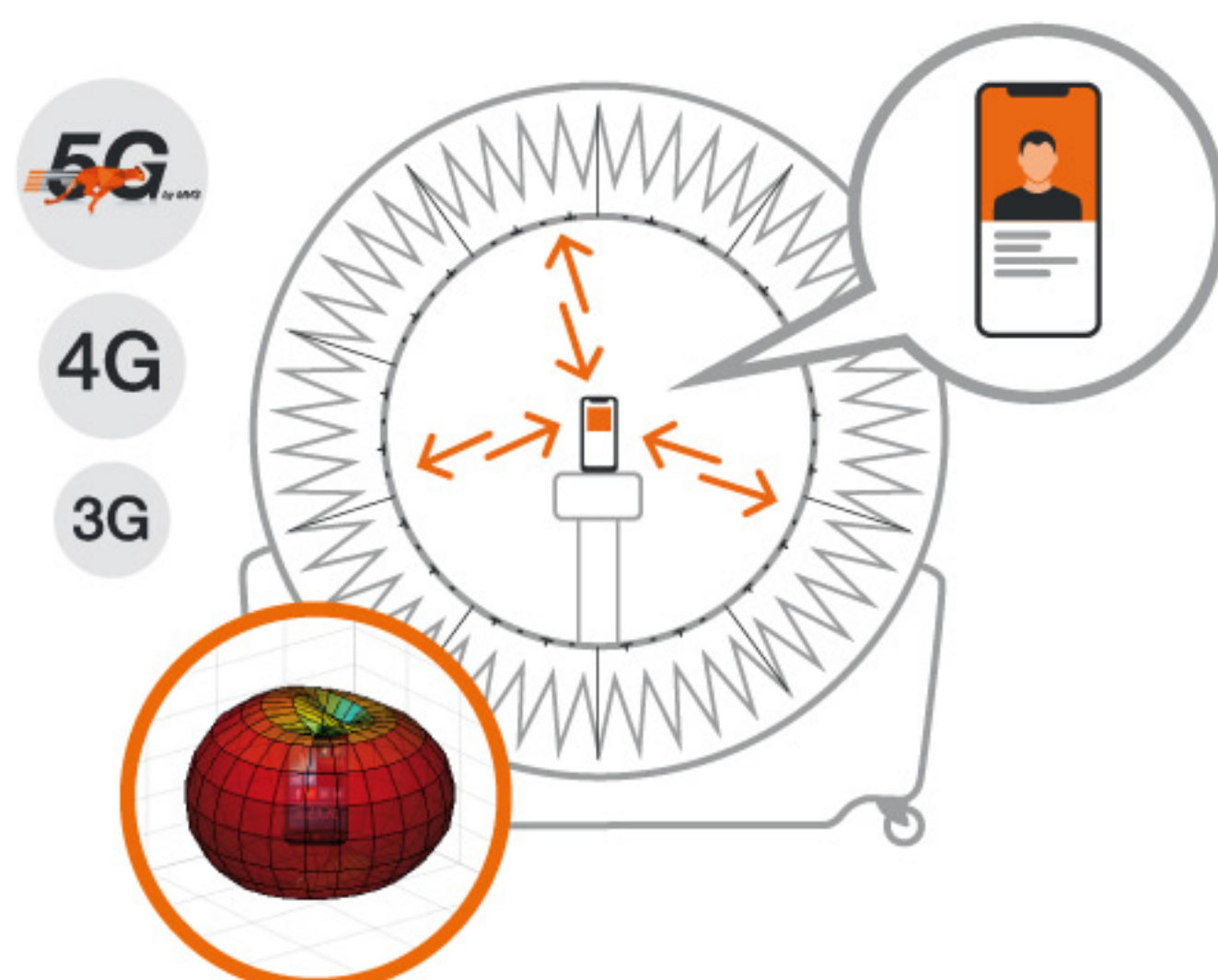
To determine the effect of the antenna's immediate surroundings upon it - ground plane, other antennas, device parts and components. For placement on large devices, extract key parameters to be used in simulation software. How will integration alter the antenna patterns? Which antennas need adjustments?



#### ANTENNA MEASUREMENT and SIMULATIONS

- DIFFRACTION
- SCATTERING
- COUPLING
- DECOUPLING

### 3 TEST THE DEVICE'S OTA PERFORMANCE



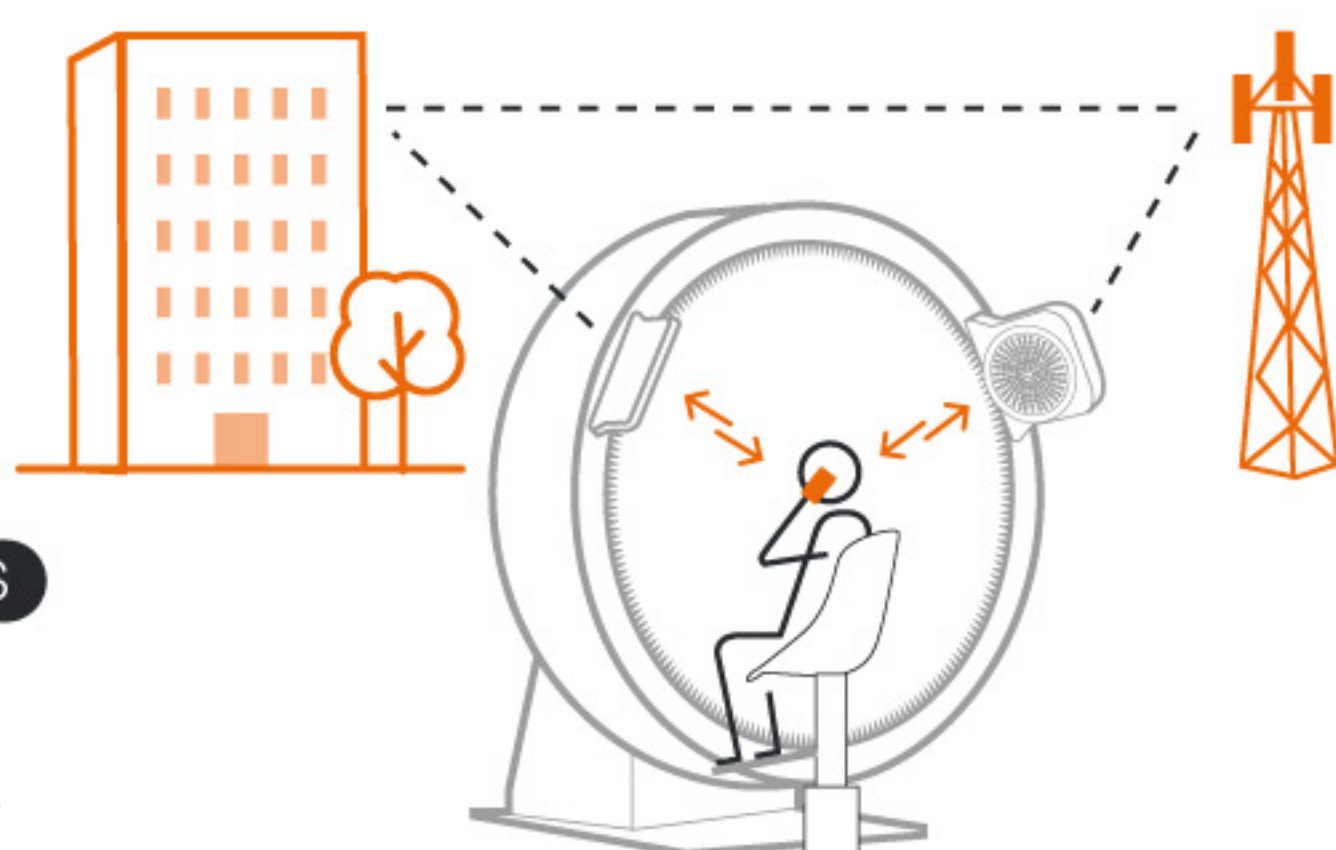
To evaluate the performance of the device over the air (OTA) with respect to various protocols. How well will the device connect to different networks- wifi, 4G, 5G, etc. ?

#### OTA MEASUREMENTS

- TRP
- TIS
- EIRP
- EIS
- NETWORK AND PROTOCOL COMPATIBILITY

### 4 TEST HOW THE DEVICE FUNCTIONS IN THE REAL WORLD

To evaluate how a device is influenced by its external environment and optimize its wireless connectivity capabilities. Will its performance be deteriorated by barriers or can it use multipath propagation to its advantage?



#### REAL ENVIRONMENT EMULATIONS

- END-TO-END
- MULTI-PATH
- HAND, HEAD, AND BODY IMPACT

With MVG measurement systems and software, mobile device antenna and connectivity testing can be performed quickly and effectively, ensuring design iterations meet project milestones.

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