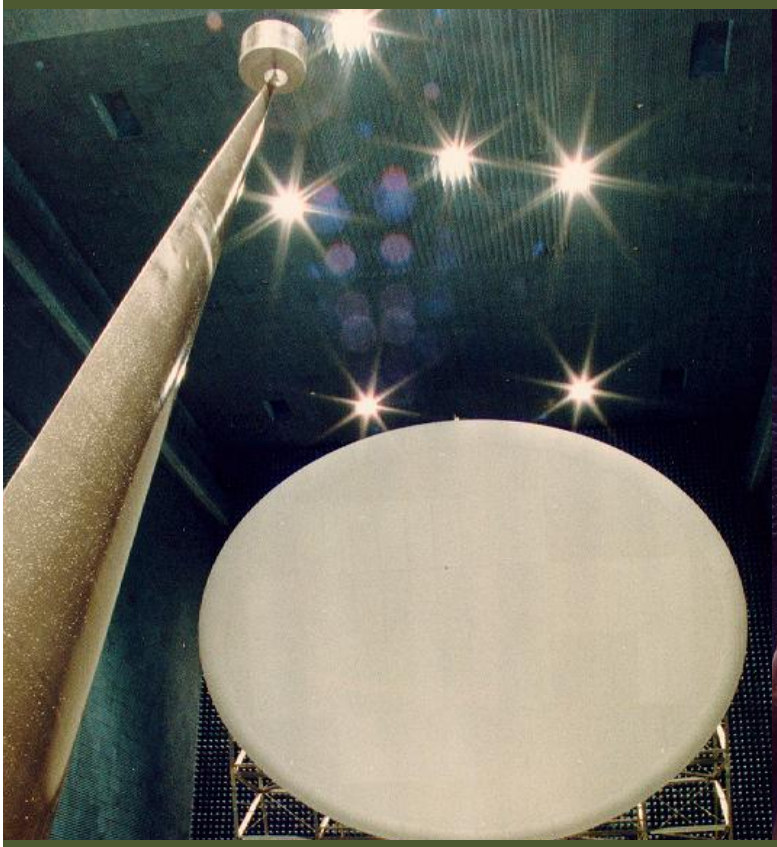
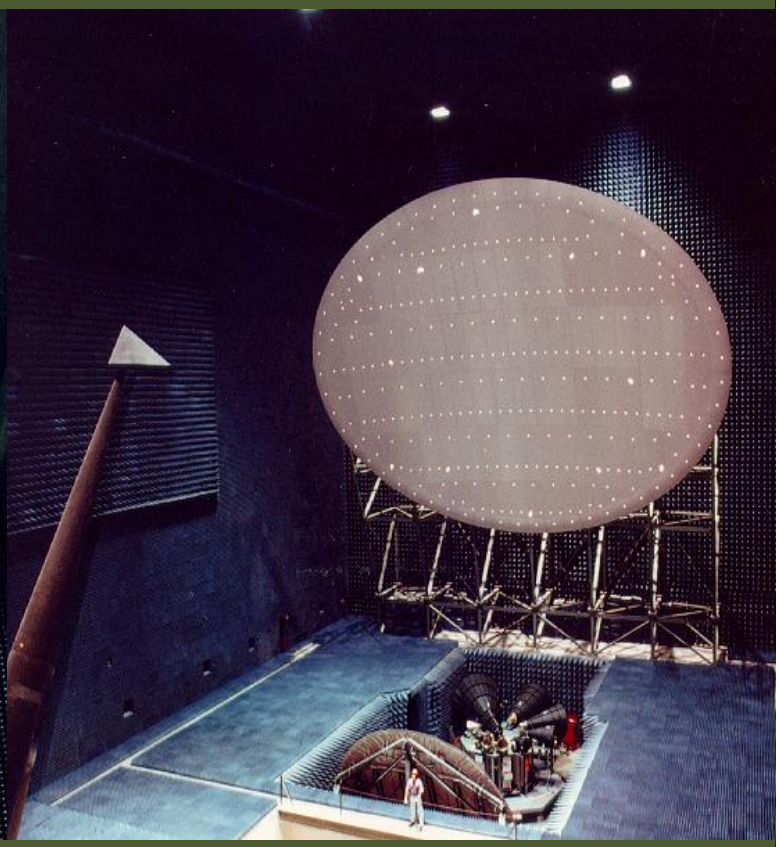
ATK RF Technologies and Test





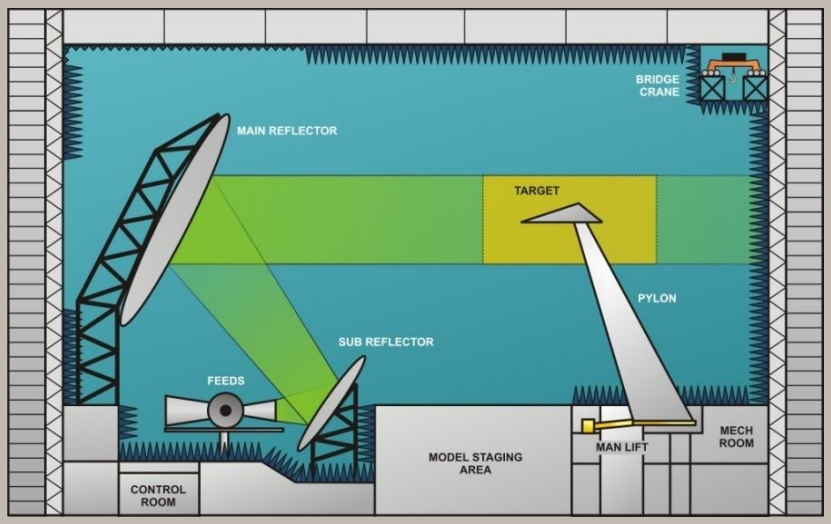
The ATK Rancho Bernardo Compact Range

ATK RF Technologies and Test, located in Rancho Bernardo, California, operates an indoor compact range. ATK RFT&T is dedicated to world class, advanced composite, aerospace structures and components, as well as radio frequency and low observable technologies. The range maintains a trained staff of engineers, technicians and support personnel, familiar with measurement systems, target support systems, model/fixture design and fabrication, and data acquisition/processing systems.

The compact range accommodates RCS or antenna/radome measurements on articles up to 40-ft wide/long, 28-ft high, and weighing 10,000 pounds. Normal operating frequencies available cover 300 MHz to18 GHz.

The 96 ft x 96 ft x 185 ft measurement chamber sits on top of a 30-ft staging area that includes four separate secure high bays. The control room includes both data acquisition and analysis computers. Data processing is concurrent with acquisition so the test matrix can be changed “real time” based on test results. The RCS acquisition system has a real time data system (RTDS) for imaging and other plotting during data acquisition. The facility accommodates up to four programs simultaneously with each program isolated from the others in order to maintain secure operations.

The chamber is spanned by a radio controlled bridge crane to lift items from the staging area to the pylon/positioner. When not in use, the bridge crane stores inside an absorber covered soffit. A telescopic hydraulic manlift installed near the base of the pylon is used to access the article during mounting, modifications, and dismounting. Each high bay area has secure roll-up doors that are interlocked to open only when access to the staging area is required for target/antenna mounting.



State-of-the-Art Facility and Services

Collimated Reflector
- Dual shaped reflector system with:
  - Main Reflector-56 ft tall x 74 ft wide (elliptical)
  - Sub-reflector-22 ft x 24 ft

Quiet Zone 30-40 ft wide x 20-28 ft high (elliptical)
- Automated feed table with feeds for:

0.3 - 0.8 GHz	2.7- 4.0 GHz	12.4 - 18.0 GHz
0.8 - 1.2 GHz	4.0 - 5.6 GHz	18 - 26 GHz
1.2 - 1.8 GHz	5.6 - 8.0 GHz	26 - 40 GHz
1.8 - 2.7 GHz	8.0 - 12.4 GHz	

Measurement System
- Élan 2000 coherent pulse RCS measurement system
- HP/Agilent 8530 and PNA-X antenna measurement systems
- Operating frequencies: 0.3-18 GHz
- Dual receive channels for polarization matrix measurements
- RCS imaging and/or multiple frequency operation

Data Processing/Software
- Full complement of RCS/antenna processing software, ISAR images, global formats, IER, etc.

Pylons, Rotators and Target Handling Equipment
- Three pylon-mounted "Top Hat" positioners: 1500, 4,000 and 10,000 lb capacity
- Multiple antenna positioners with capacities from 50 to 30,000 lb
- Model/target preparation and handling areas
- Radio controlled chamber bridge crane with 3K and 10K capacity crane hooks
- High bays with 5-ton bridge crane, 3-phase power and compressed air

Secure Spray Booth
- 35 ft x24 ft x24 ft interior dimensions
- Staffed with personnel experienced in a variety of coatings

Security and Safety
- Secure facility
- Meeting rooms available
- Four secure high bay areas with vestibule entrances

Outdoor Antenna Range Capability
- 800 ft outdoor antenna range
- Capability down to 30 MHz
- 40 ft AUT tower with:
  - 10K Az over elevation antenna positioner
  - Rollover slide model tower
  - HP 8530A receiver with ORBIT 959 software (Multi-frequency capable, coherent amplitude/phase data)

Antennas and Radomes

The ATK Rancho Bernardo technical staff has extensive experience in design, manufacture and measurement of a wide range of antennas, feed systems, radomes and frequency/ polarization selective surfaces. Design tools include:
- Ansoft high frequency structure simulators (HFSS)
- Ansoft designer
- FEKO
- Periodic moment method (PMM)

Proprietary software for characterization of materials, antennas, and radome electrical performance.

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