

Commercial Aircraft Radomes

Nose Radomes, IFEC Fuselage and Tail Radomes



Over 75 years of radome design, manufacturing and test experience

Single and multi-band radomes for radar, communications, navigation, and IFEC SatCom applications

Overview

General Dynamics Mission Systems has an extensive and successful history in designing and developing performance critical radomes for military platforms. This experience and tool set has been successfully leveraged to develop and produce nose radomes for large commercial aircraft and business jets; as well as Fuselage and Tail Mounted Radomes for the In-Flight Entertainment and Connectivity (IFEC) market.

General Dynamics Mission Systems is capable of designing and manufacturing tailored-spectrum radome designs optimized for customer needs, including wideband radars and polarization-sensitive SatCom applications. These capabilities extend to the development and production of both single and multi-band radomes that provide excellent cross-polarization discrimination and transmission performance across X-, Ku-, K-, and Ka-bands for SatCom applications.

Our radome design methodologies have evolved to accommodate the ever-increasing capabilities and demands of airborne radars and communication systems. The industry trend toward electronically scanned array antennas (both active "AESA" and passive "ESA" varieties) has been accompanied by ever-increasing demands for control and tailoring of spectrum and polarization performance. Our capabilities have grown to meet this demand by adding to our portfolio of proprietary (in-house developed) software design and analysis tools. Meanwhile, our internal research programs have addressed the challenges of manufacturing the new radome configurations with the complex shapes and structural robustness required for the flight environment. To date this development has resulted in 2,200 high-performance production radomes for the military AESA market alone. This experience has provided powerful insights that directly benefit the commercial IFEC market, as well as other commercial airborne radome applications. Our extensive experience allows us to apply real world knowledge to the design, qualification and manufacturing processes of radomes for successful overall system performance and minimal life cycle cost.

Commercial Aircraft Radomes

Radome Background

- Over 75 years of radome design, manufacturing and test experience
- General Dynamics Mission Systems has designed radomes for over 50 platforms and produced over 65,000 radomes

Commercial Radome Experience (Partial List)

- Previous Programs: Boeing Ku ; B737 / 747 / 757 Nose Radomes; G500/600 Tail Radomes
- Current Programs: Thales Tri-Band, Boeing Tri-Band; G500 / 600 Nose Radomes

Key Capabilities

- Electrical (RF) design/analysis
- Structural design/analysis
- Lightning direct effects protection
- Mechanical design
- Tool design
- Material and process engineering
- High precision machining
- Radio frequency (RF) testing
- Non-destructive testing (NDT)
- Repair

Radome Design Approach

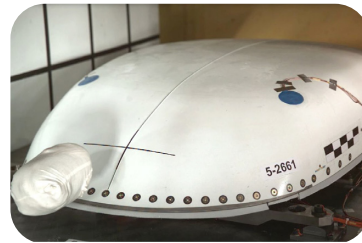
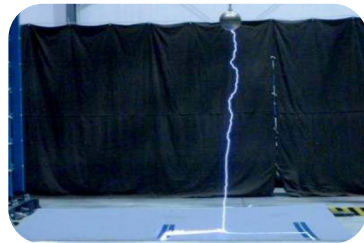
General Dynamics Mission Systems collaborates closely with our customers to choose the best design, process and materials to fit their needs for cost and performance. Employing an extensive analytical tool set, we are capable of coupling accurate RF performance predictions with FEA structural analysis to ensure a high integrity, optimal solution for your system needs. These tools can be applied early in the design process to aid in radome shape selection trade studies. When radome performance matters, our design experience, analytic and measurement tools, and manufacturing know-how provide for low-risk, high performance radome solutions.

Radome Qualification Experience

- Material Allowables
- Static Loads
- Mechanical Shock & Vibration
- Fatigue
- Bird Strike
- Low Velocity Impact Damage (LVID)
- Fluids Resistance
- Rain Impact/Erosion
- Lightning Protection
- Other Environmental Qualification
- Electrical (RF) Performance
- Supplemental Type Certification

Facilities

- Approximately one million square feet of manufacturing space in Marion, Virginia
- Indoor and outdoor RF test ranges and equipment
- Large autoclaves (up to 11 feet in diameter and 50 feet in length)
- FAA Repair Station Certification Number VQBR980L



Radome Qualification Testing, Material Qualification, - Lightning Protection and Bird Strike

GENERAL DYNAMICS

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