

F-16 Wide Band Radome



Superior RF performance over broader AESA radar operational band

Greater operating space for expanded frequency hopping capability and reduced jamming vulnerability

Minimized loss of detection range across AESA radar band

Improved airborne target detection with less interference

Higher resolution maps with less interference

General Dynamics Mission Systems has designed and developed a new wide band radome to optimize the performance of the Active Electronically Scanned Array (AESA) radars utilized for F-16 aircraft upgrade programs. The existing F-16 Full-Scale Development through Block 50/52 nose radomes are narrow band radomes of a monolithic wall construction. These radomes perform well over the narrow bandwidth of the legacy Mechanically Scanned Array (MSA) radars, but are not capable of supporting full bandwidth operations of AESA radars.

Realizing the maximum performance across the full bandwidth of the AESA radars requires a wide band radome.

Our F-16 wide band radome is designed to achieve wide band performance using a multi-layer sandwich construction instead of the solid laminate construction of the heritage nose radome. A multi-layer construction has many tuning options and provides the same excellent reflection and transmission performance that a solid laminate wall achieves, but over a much broader operating bandwidth and range of incidence angles.

The General Dynamics wide band radome is compatible with the most advanced AESA radars including the APG-83 Northrop Grumman Scalable Agile Beam Radar (SABR) and the APG-84 Raytheon Advanced Combat Radar (RACR). Prototype radomes have been produced and qualified for flight testing.

F-16 Wide Band Radome

Relevant Experience

- General Dynamics is the designer and the only original equipment manufacturer (OEM) for the F-16 nose radome
- General Dynamics has designed and produced wide band nose radomes for the following platforms: F-16 Blk 60, F/A-18E/F, EA-18G, F-15E, and F-35 A/B/C

Configuration

General Dynamics' F-16 wide band radome is designed around the F-16 Blocks 20-52 and preserves:

- Existing Outer Mold Line (OML) shape
- Existing aircraft mounting interfaces
- Existing air data system

Performance

Utilization of the new wide band radome rather than the existing narrowband radome will provide:

- Superior RF performance over broader AESA radar operational band
- Greater operating space for expanded frequency hopping capability and reduced jamming vulnerability
- Minimized loss of detection range across AESA radar band
- Improved airborne target detection with less interference
- Higher resolution maps with less interference

Characteristic	Current (Solid)	Widedband (Multi-Layer)	Impact / Comment
Interface	—	—	Maintains existing aircraft mounting interfaces, air data system and OML.
Lightning Protection	—	★	Reduces RF interference, more robust and easier to maintain.
Transmission	—	★★	Minimizes loss of detection range across full AESA frequency band.
Reflection	—	★★	<ul style="list-style-type: none"> - Minimizes impact of interference sources. - Expands frequency hopping capability. - Reduces jamming vulnerability. - Improves airborne target detection. - Higher resolution maps.
BDE Repeatability	—	—	Maintains comparable post-compensation tracking error performance.

★ IMPROVEMENT

★★ SIGNIFICANT IMPROVEMENT

General Dynamics' F-16 wide band radomes provide superior performance while preserving all air data and attachment interfaces of the current F-16 radome.

Radome Retrofit Alternative

Integration of an AESA radar with the existing F-16 radome will have an impact on the AESA radar's performance. If the performance degradation is acceptable, the existing radomes must be modified to eliminate mechanical interferences and maintain aircraft signature performance.

GENERAL DYNAMICS

Mission Systems

info@gd-ms.com • GDMissionSystems.com

US & Canada: 1-877-449-0600 • Global: Your AT&T Country Code + 877-466-9467 • DSN: 312-282-1048

©2017 General Dynamics. All rights reserved. General Dynamics reserves the right to make changes in its products and specifications at anytime and without notice. All trademarks indicated as such herein are trademarks of General Dynamics. All other product and service names are the property of their respective owners. © Reg. U.S. Pat. and Tm. D-F16WidebandRadome-2-1217 Off.