F-16 Block 70

FOR INDIA. FROM INDIA.
EXPORTED TO THE WORLD.

F-16 Block 70
The F-16 Block 70 is an evolution of the proven design of the Mid-Life Update (MLU) and Common Configuration Improvement Program (CCIP).

**Next Generation Roadmap**

The evolving M-series operational flight program provides the affordable foundation for the F-16 Block 70.

**Planned F-16 Architecture Evolution**

The F-16 Block 70 becomes the new F-16 baseline.

**The Next Generation F-16 Production and Retrofit Configuration**

The F-16V upgrade and the new production Block 70 are the next generation technology insertions that leverage a common worldwide sustainment infrastructure which support nearly 2,000 aircraft. This new upgrade and production configuration will be the predominant configuration for the F-16 worldwide fleet. The new avionics configuration is the largest leap in F-16 combat capability and represents the most significant F-16 upgrade to date. For some F-16 users, this configuration forms the foundation for their avionics systems which will remain in service for years to come.

The Lockheed Martin F-16 Block 70 configuration provides relevant combat capabilities in a scalable and affordable package with a high-volume, high-speed data bandwidth. The F-16 Block 70 configuration is unique to Lockheed Martin, the F-16 original equipment manufacturer, which retains exclusive data rights, knowledge and expertise to affordably modernize the aircraft design.
Latest Technology in Avionics Equipment To Meet Customer Requirements

ADTE – Advanced Data Transfer Equipment
AESA – Active Electronically Scanned Array
CDEEU – Common Data Entry Electronics Unit
DFLCC – Digital Flight Control Computer
EGI – Embedded GPS/INS
iPDG – Improved Programmable Display Generator
JHMCS II – Joint Helmet-Mounted Cueing System
NVIS – Night Vision Imaging System

Flexible To Integrate Customer Requirements
AESA Radar

5th Generation Fighter Radar Capabilities for the F-16 Block 70

• Greater detection and tracking ranges
• Multiple target track (20+ quality tracks)
• High-resolution Synthetic Aperture Radar (SAR) maps for all-environment precision strike
• Interleaved air-to-air and air-to-surface mode operations for improved situational awareness, operational effectiveness and survivability
• Robust electronic protection for operations in dense RF environments
• Auto target classification and cueing
• Greater system reliability and availability (3–5 times over legacy MSCAN radars)
• Non-cooperative target recognition
• Advanced growth modes
  – Terrain following
  – Radar common data link
  – Inverse Synthetic Aperture Radar (ISAR)

The F-16 Block 70 radar, the APG-83, is an Active Electronically Scanned Array (AESA) radar that provides multimode capability. The APG-83 beam agility enables interleaved air-to-air and air-to-surface operations that can be tailored to meet specific mission requirements. Approximately 95 percent of the APG-83 suite of operating modes have been ported directly from the latest generation AESA and have demonstrated outstanding capability to detect and engage the spectrum of air, surface and sea targets, even in the most challenging electronic warfare environments. The APG-83 is three to five times more reliable than legacy mechanically scanned radars, which means higher availability rates and lower sustainment costs.

The APG-83 AESA radar provides long-range search and track capability against airborne targets, regardless of their aspect. Multi-target track provides good track quality on at least 20 targets within ±60 degrees of the F-16 nose while continuing to support a designated scan pattern. The air combat mode automatically acquires and tracks the first target detected within the scan volume selected by the pilot.

The APG-83 can detect and track fixed and moving ground and sea targets. The high-resolution synthetic aperture mode enables autonomous, all-environment precision targeting.

Most of the air-to-air and air-to-surface modes can be interleaved on a scan-to-scan basis providing the pilot with increased situational awareness and operational effectiveness and survivability.
The Improved Programmable Display Generator (IPDG) adds the ability to display high-resolution, color video on the Center Pedestal Display (CPD). The IPDG shows color video on the Common Color Multifunction Displays (CCMFDs). The IPDG allows each display to operate alone, independent of any other display. The IPDG includes multiple core Central Processing Unit (CPU) technologies. The IPDG includes a new three-dimensional graphics processor module that is an improvement over legacy video processing. Extensive use of commercial nonproprietary standards, data buses and software provides a built-in, industry-defined growth path that minimizes the impact of obsolescence and ensures a low-risk avionics system development program for indigenous upgrades.

The IPDG includes CPU technology that allows vast amounts of data to be processed. This processing capability plans for substantial growth capacity for future applications and data processing, as the customer's needs change. Several cores of the CPU are reserved for future growth, which allows for more than 50 percent growth capability.

High-resolution video transmits on the Ethernet network by using Motion Picture Experts Group (MPEG) compression. MPEG is the standard used for compression. MPEG compresses the video format to the IPDG. The IPDG then decompresses the video using industry-standard video chipsets. The IPDG displays the video on the CPD or the CCMFDs. The compressed video allows for a lower recurring cost by limiting the amount of new cable installation necessary. Future growth is easier because subsystems transmit video for display by using the existing Ethernet cables rather than installing new video cables for each new video source.

The CCMFDs and CPD, in combination with the IPDG, display important mission-related information such as Active Electronically Scanned Array (AESA) radar information, Link-16 data link information and Color Moving Map (CMM) information. Subsystem fault information can also be displayed. Video from pods such as the SNIPER Targeting pod and the LITENING Targeting pod is displayed on CCMFDs or CPD. High-resolution AESA Synthetic Aperture Radar (SAR) images are also displayed on CCMFDs or CPD.

**Center Pedestal Display**

- New on-board and off-board sensors drive the need for a bigger and higher resolution display
- Increased viewing area display is 6 x 8 inches
  - Relative 1-ft SAR resolution provides 503,316 ft²
  - A-A situation display is larger and easier to sort targets
  - A 2 x 6 pinup display can be used below the 6 x 6 format on the CPD

**Greater Pilot Situational Awareness**
Operational Capabilities

Embedded GPS/INS
- Integral to precision SAR radar operation, LANTIRN, AGCAS
- Includes a 24-channel GPS receiver compatible with a Selective Availability Anti-Spoofing Module (SAASM)
- High performance with low noise achieving unequaled navigation and Synthetic Aperture Radar (SAR) stabilization performance
- Robust GPS performance by tracking all-in-view satellites
- Improved atmospheric correction by tracking satellites on both frequencies
- Simplified key handling using unclassified keys; unit is unclassified when keyed
- 999 steerpoints, 100 additional mission planning points, DAFIF database, database searching, alphanumeric naming and searching, emergency airfields
- Reduced GPS jamming vulnerability
- ICAO/user-defined points for navigation/reference
- Emergency airfield mode to shorten decision cycle

Advanced Identification Friend-or-Foe
- The AN/APX-126 AIFF that performs IFF Modes 1, 2, 3/A, C, 4, and Mode S ELS, supports Mode 4 with KIV-6 Crypto and upgradable to Mode 4/5 with KIV-78 Crypto
- 115-NM range capability
- Supports situational awareness and BVR weapons delivery
- Upgradable to secure Mark XIA with growth to Mode 5 capability
- Upgradable to Automatic Dependent Surveillance-Broadcast (ADS-B)
- RF compatibility associated with internal EW and Data Link provides improved RFC capability between the AIFF and the rest of the weapon system

Automatic Ground Collision Avoidance System
- Automatically prevents collision with the ground
  - Avionics project future aircraft trajectory over digital terrain
  - Avionics request an avoidance maneuver at last instance
  - Flight control systems automatically performs recovery
  - Recovery model easily tailored to different aircraft
  - No additional sensors required
- High authority autopilot momentarily takes control from pilot
- Embedded integrity monitoring prevents erroneous system behavior
- Pilot Selectable Recovery (PARS) for disorientation case
- Available for aircraft with digital flight controls

Missionized Aft Cockpit for Reduced Pilot Workload
Aft Station Interface Unit (ASIU) and aft seat HUD monitor provides a missionized aft cockpit capability that fully integrates advanced F-16 weapon systems and two-man crew to maximize combat effectiveness and eliminate task saturation. ASIU provides increased capabilities for a front/aft cockpit team to share the mission tasking challenges to better employ a two-seat F-16.
- Aft Seat Interface Unit (ASIU) provides a common hands-on throttle and stick (HOTAS) mechanization for individual control of displays and/or sensors in either cockpit
- Enables aft seat pilot/Weapon System Officer (WSO) to use HOTAS to autonomously manage radar displays, track air-to-air targets, slewing and track air-to-ground targets, and manage Navigation Pod (NVP) operations
- Limited Dual Line-of-Sight (LOS) capability means front and aft cockpit can independently operate separate Fire Control Radar, Targeting Pod, or Weapon LOS controls for simultaneous employment of air-to-air and air-to-ground weapons
- Front cockpit always has take-control authority and gets automatic display control through multiple mode changes and switch actions or a simple Display Management Switch (DMS) – aft
- Aft cockpit ASIU panel provides a Flight or Avionics selection to define the use of the aft cockpit Side-Stick-Controller (SSC) for either training (flight controller) or combat (avionics controller):
  - Flight – SSC functions per baseline as flight controls from aft cockpit
  - Avionics – SSC functions as a joystick for the SOI/DOI that aft cockpit controls

Expanding Operational Effectiveness and Safety
Missionized Cockpit
Joint Helmet Mounted Cueing System II (JHMCS II)

Joint Helmet Mounted Cueing System II (JHMCS II) displays aircraft performance and weapons employment data on the pilot's visor. JHMCS II enables the pilot to aim weapons and sensors simply by turning his/her head. Key aircraft performance and tactical data are continuously available regardless of where the pilot looks, providing a significant increase in situational awareness. In critical phases of employment, pilots can accomplish weapons aiming and employment fully heads-up and not needing to divert their attention back to the cockpit displays to obtain needed data.

JHMCS II is based on combat proven hardware and incorporates today's enhanced technology. JHMCS II is a digital system that incorporates a new hybrid optical-inertial tracker and operates with a single lightweight aircraft interface and is more affordable, requiring less support equipment than previous systems. JHMCS II does not require cockpit magnetic mapping as previous versions. JHMCS II provides growth provisions for color symbology, pilot health monitoring, and G-LOC detection and warning. The color symbology increases pilot's immediate recognition of friendly, threat and unknown targets. The system is compatible with Night Vision Goggles.

System Advantages

- Digital Image Source Replaces Earlier JHMCS Cathode Ray Tube (CRT)
- Potential Growth to Color Display – Readily Visible – Day and Night
- Cues Weapons and Sensors to Pilot's Line of Sight

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Air-to-Air

- Cues Radar to Any Air Target Within Radar Sweep Limits
- Designed for Use With High Off Boresight Missile (HOBS)
- Integration of HOBS on F-16 With JHMCS II Provides Unparalleled First Shot Capability With Effective Target Designation up to 80 Degrees Either Side of the Aircraft's Nose During Air Combat Maneuvering

Air-to-Ground

- Radar Cueing for SAR Mapping for Planned or Unplanned Targets
- Mark Point Updates
- Target Pod Cueing for Ground Target Engagements/Designation

F-16 Block 70 Unparalleled Survivability with Modern Internal Electronic Warfare System

The F-16 Block 70 provides a state-of-the-art, customizable electronic warfare system. This system supports an integrated Radar Warning Receiver (RWR), which provides RF threat awareness, and Electronic Countermeasures (ECM) system, which provides active countermeasures capabilities. The RWR provides a wide band digital receiver with parallel receiver resources for a high probability of intercept and excellent Directional Finding (DF) accuracy. Full integration with the Countermeasures Dispensing System (CMDS) provides chaff and flare expendable countermeasures.

Passive System

- Channelized Digital Receiver
- High Probability of Intercept Wideband Receiver
- Operates in High-Density Environments
- EW Data Recording
- Situation Awareness Capability

Active ECM (Jammer)

- Lightweight, High Performance
- Defeats Pulsed, Pulsed Doppler and Continuous Wave Threats
- Supports Growth for Advanced Countermeasures
- Full Frequency Coverage

EW Control

- Fully Automatic
- Cockpit Control
- Manage Expendables
- On-Board Training

Dispenser Unit

- Integrated Chaff and Flare Operation
- Provides Manual, Semi-Automatic, and Automatic Dispense Capabilities
- Fully Integrated

Increased Survivability in a Multilayered and Multidimensional Environment
Managing the Battlespace

Unknown Tracks
Details of position, heading and sovereignty of air, land or sea track as received by surveillance platform.

Aircraft Status
Provides details of A/C platform status such as engagement status, remaining armament, fuel and equipment for friendly air platform participants.

Targeting Tracks
Provides exchange of target position data.

Command and Control Assignments
Allows Command and Control (C2) platforms to issue engagement orders to flight lead of an F-16 flight package. Typically, orders will vary between engagement against air tracks, return-to-base orders, attack orders against a ground/sea target, etc.

Command and Control Messages
Typical C2 messages are used for vector commands, desired flight path point commands or commands to hand over control to second C2 unit. Messages can also be used to correlate local fighter radar tracks with those already identified on the C2 unit’s sensors.

Friendly Tracks
Details of position, heading, equipment status, identity, etc.
F-16 missions. The result is a true simultaneous, multirole fighter with accurate, lethal, day and night, all-weather capabilities.

These weapons span multiple classes and categories of weapons which can be utilized over a broad range of multirole fighters. We have certified USAF common weapons as well as a large number of country-unique weapons onto store types. Our experience as a weapon integrator has enabled the F-16 to develop into one of the most versatile customers, Lockheed Martin has certified > 3,300 carriage and release configurations for greater than 180 weapon and match the weapons integration experience of Lockheed Martin. In concert with the USAF and multiple F-16 FMS Lockheed Martin has more than 36 years of weapon integration experience with the F-16. No other organization can

Certified Advanced Weapons

F-16 Block 70

Most Payload Flexibility
- 11 store stations
- Takeoff capacity over 5,000 kg
- Certified for over 100 stores
- Rapid stores integration capability
- Foreign weapons integration

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Air-to-air weapons are managed in the same fashion. The SMS base page and control page functions for both short-range missiles and medium-range missiles are organized identically. The missile Launch Zone (LZ) information in the Head-Up Display (HUD) and Joint Helmet-Mounted Cueing System II (JHMCS II) is similar across short-range missiles. Beyond Visual Range (BVR) missiles are presented in similar intuitive formats. The HOTAS functions for all weapons are similar; this allows quick and easy transition from one missile type to another.

Sensors and situational awareness displays follow the same philosophy. A hands-off switch action on the display or a HOTAS function for the radar or targeting pod are similar to the control and display functions for other formats, such as the Horizontal Situational Display (HSD). The controls from one targeting pod type to another are similar in location and symbology including Launch Acceptability Region (LAR) displays.

The F-16 controls and displays have been carefully crafted and combat-tested. The F-16 controls and displays require less training and provide for enhanced pilot lethality and increased engagement opportunities in a high-tempo battle space. These display and control conventions for weapons and targeting pods are explained in more detail in following sections.

The F-16 controls and displays have been carefully crafted and combat-tested. The F-16 controls and displays require less training and provide for enhanced pilot lethality and increasedengagement opportunities in a high-tempo battle space. These display and control conventions for weapons and targeting pods are explained in more detail in following sections.

The F-16 Block 70 software includes a robust pilot weapon delivery training simulation capability that covers all the requested weapons. The simulation training provides full training without the need to carry weapons on board the aircraft. The weapon delivery simulation provides full pilot display interaction capability and weapon delivery symbology including Launch Acceptability Region (LAR) displays.

Flexibility To Engage Multiple Target Types and Scenarios

WEAPONS SUBJECT TO USG RELEASE POLICY
Taking 40 Years of Unmatched Industrial Partnering to a Whole New Level

India – The New Epicenter of the World’s Most Extensive, Industrial Defense Network

LM Aero
Delivered: 3,616

SABCA, Belgium
Delivered: 222

Fokker, The Netherlands
Delivered: 308

TAI, Turkey
Delivered: 308

KAI, Korea
Delivered: 128

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