56th Fighter Wing

Integrity - Service - Excellence

F-35 Capabilities

Slides: Unclassified

Capt Shaun "MOBY" Dickinson

U.S. AIR FORCE

Overview

- State of the F-35A
- Aircraft Capabilities

F-35 Multi-role Strike Fighter

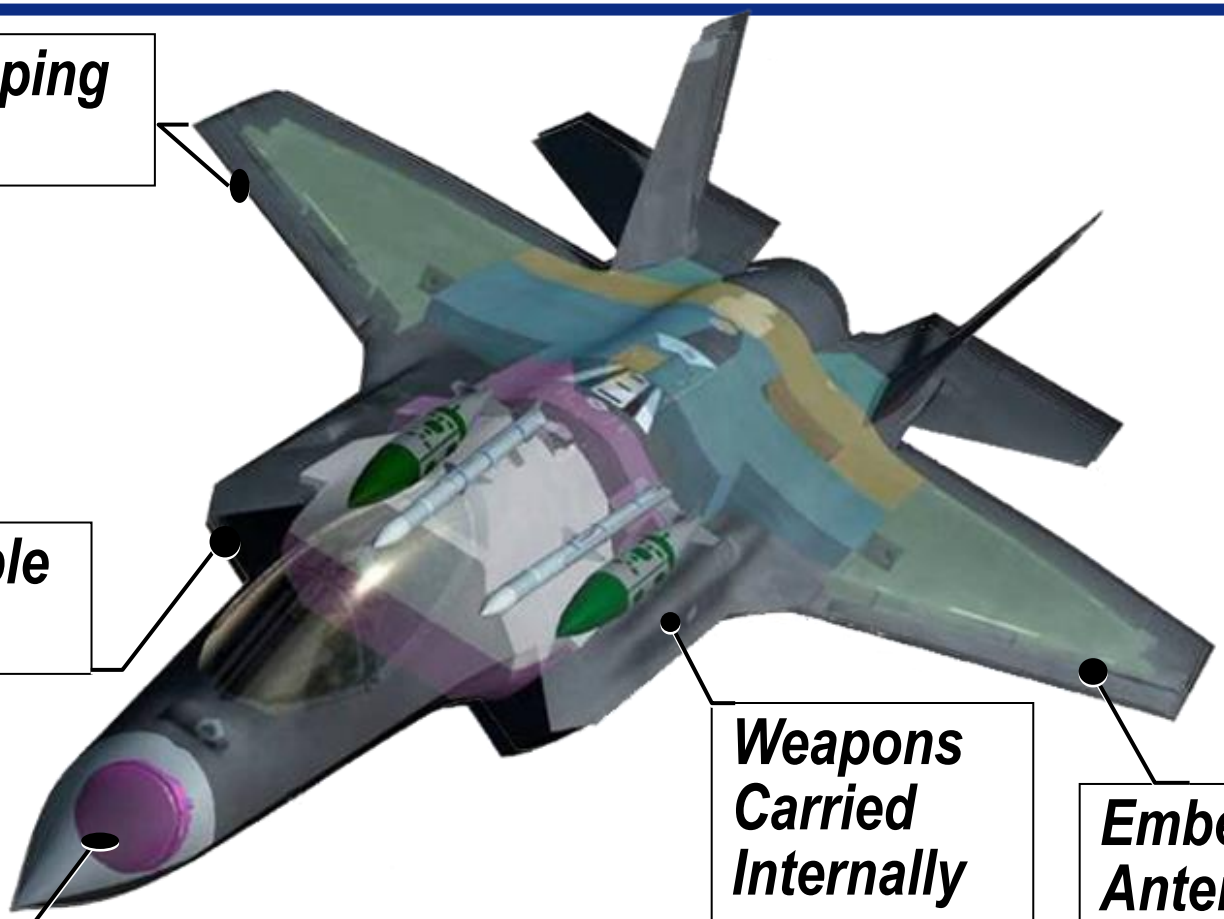
- **Goal: 80% commonality across variants**
  - **Common airframe, hardware/software, maintenance, and training**
  - **Future upgrades and software updates more easily incorporated**
  - **Allows more efficient test and checkout procedures**

Variant Comparison

CTOL	STOVL	CV
Span (ft) 35 Length (ft) 51.4 Wing Area (ft^2) 460	Span (ft) 35 Length (ft) 51.1 Wing Area (ft^2) 460	Span (ft) 43 Length (ft) 51.4 Wing Area (ft^2) 668
Weight Empty (lb) 29,036 Internal Fuel (lb) 18,480	Weight Empty (lb) 32,161 Internal Fuel (lb) 14,003	Weight Empty (lb) 32,072 Internal Fuel (lb) 20,085

UNCLASSIFIED

LO Design



Aircraft Shaping

Low Observable Seams

Low-Emission Radar and Avionics

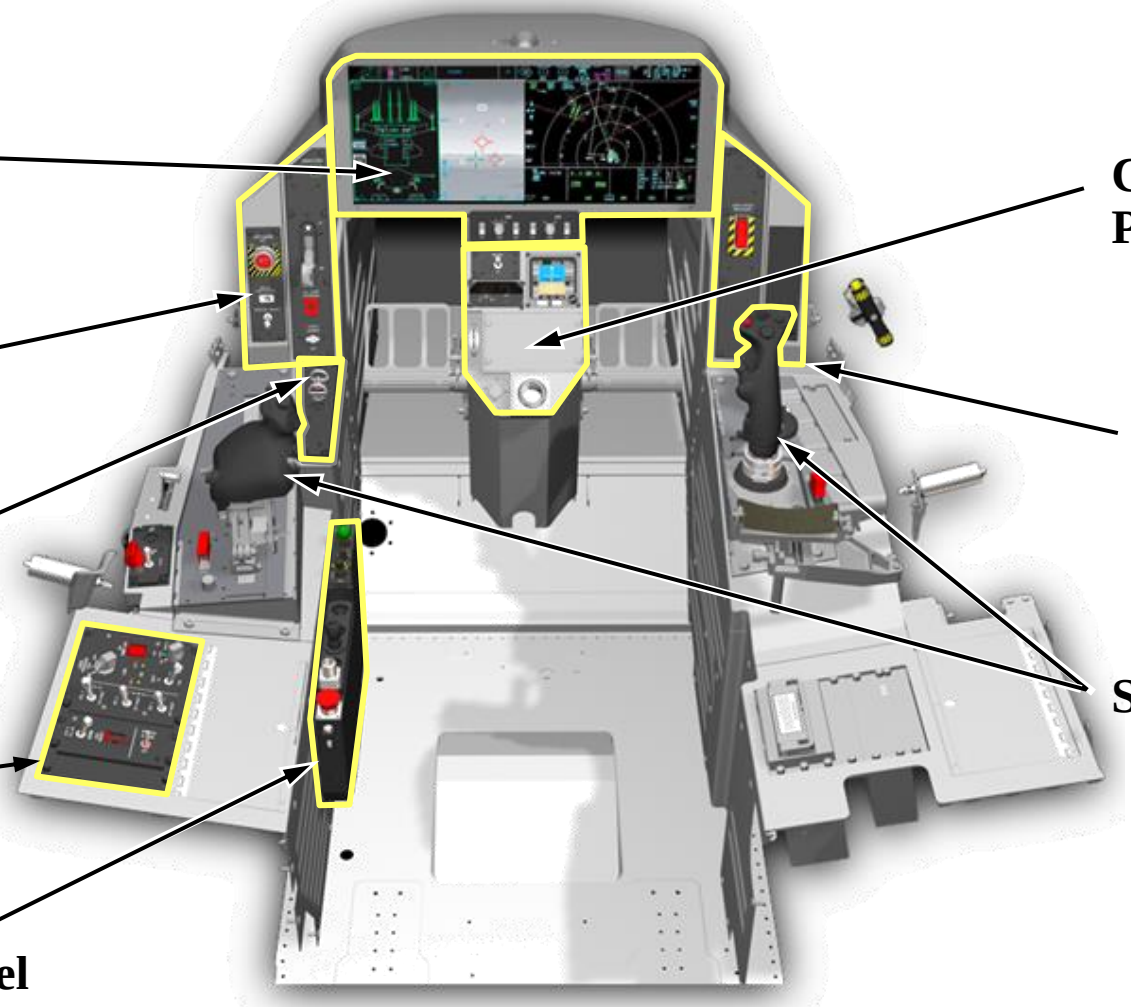
Weapons Carried Internally

Embedded Antennas

UNCLASSIFIED

Cockpit Overview Comparison

Cockpit Overview
F-35 Layout

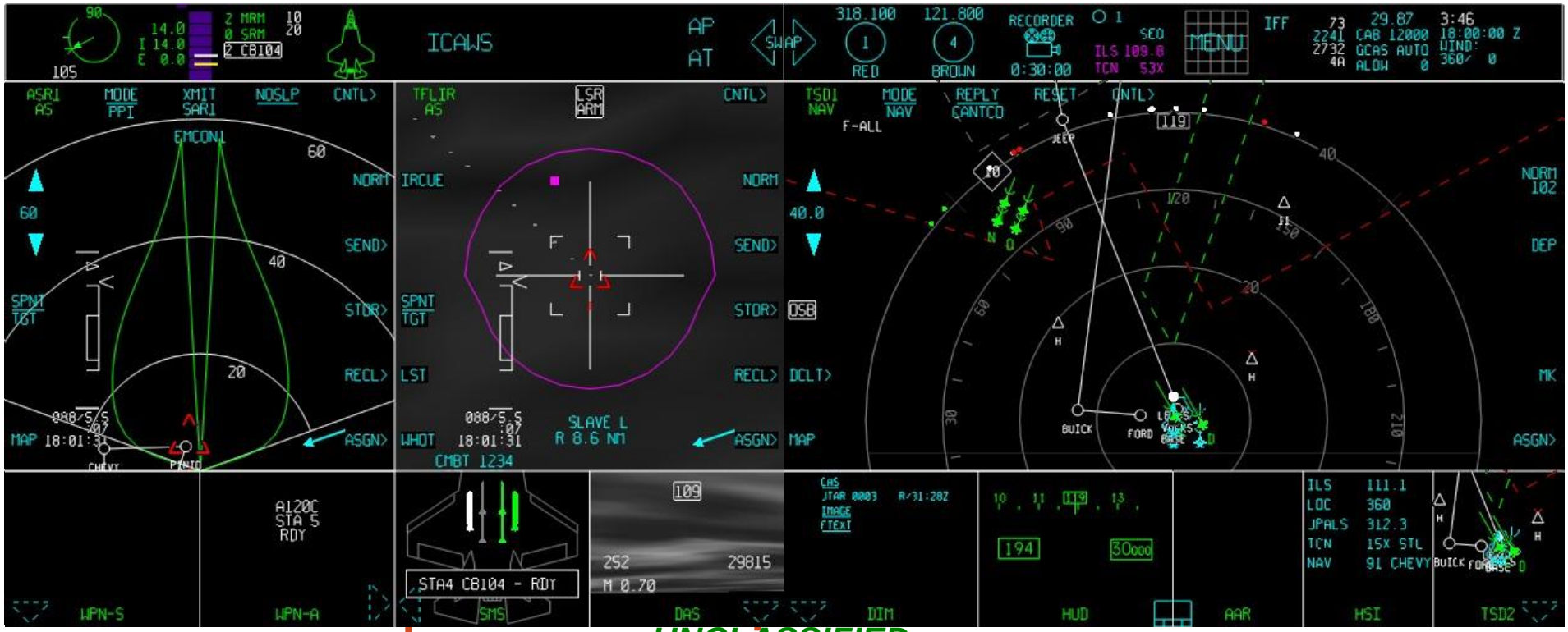


UNCLASSIFIED

Cockpit Displays
Configurable Display Concept

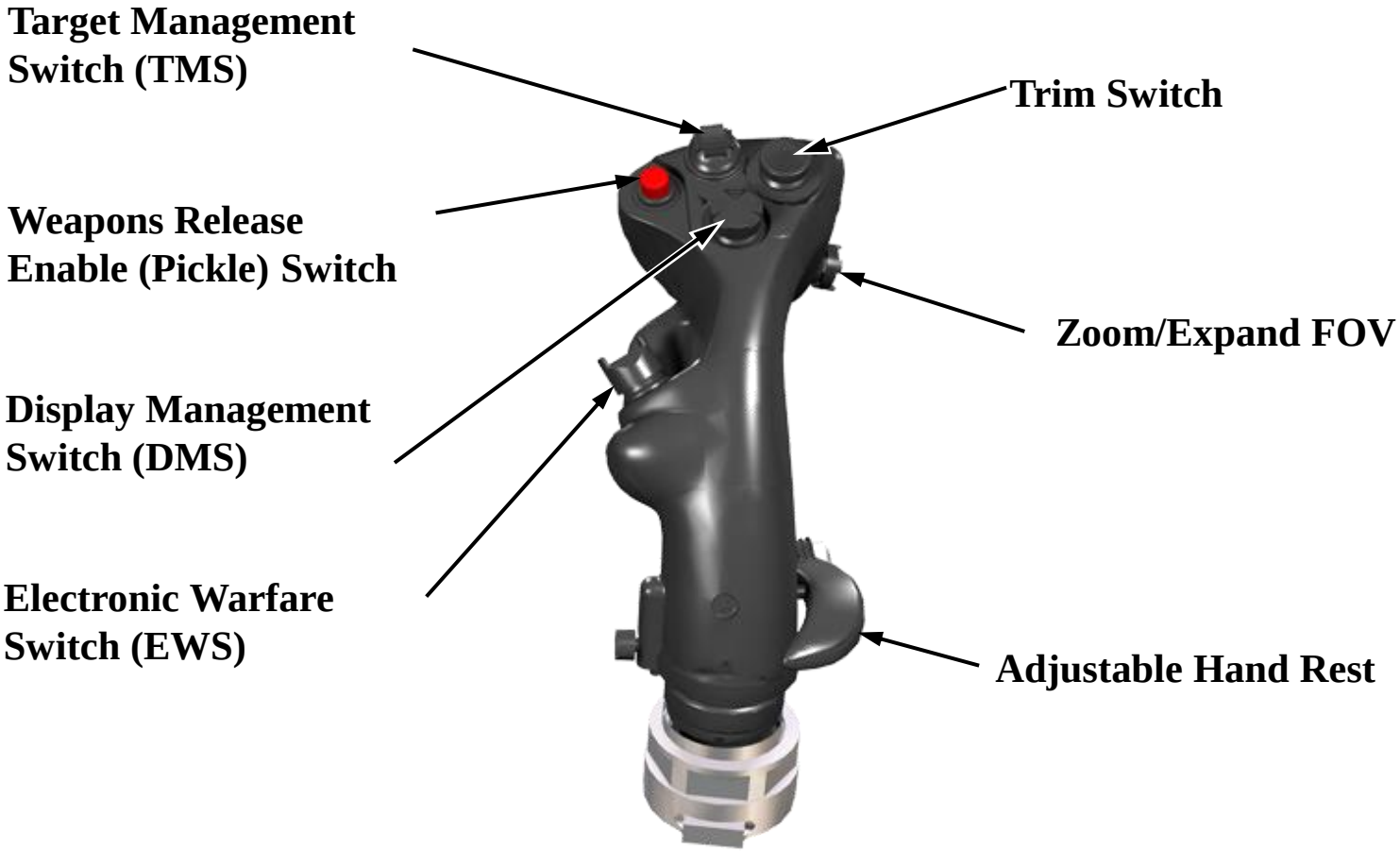
Cockpit Displays
Configurable Display Concept

- Portal control
- Pilot configurable
- Master Modes



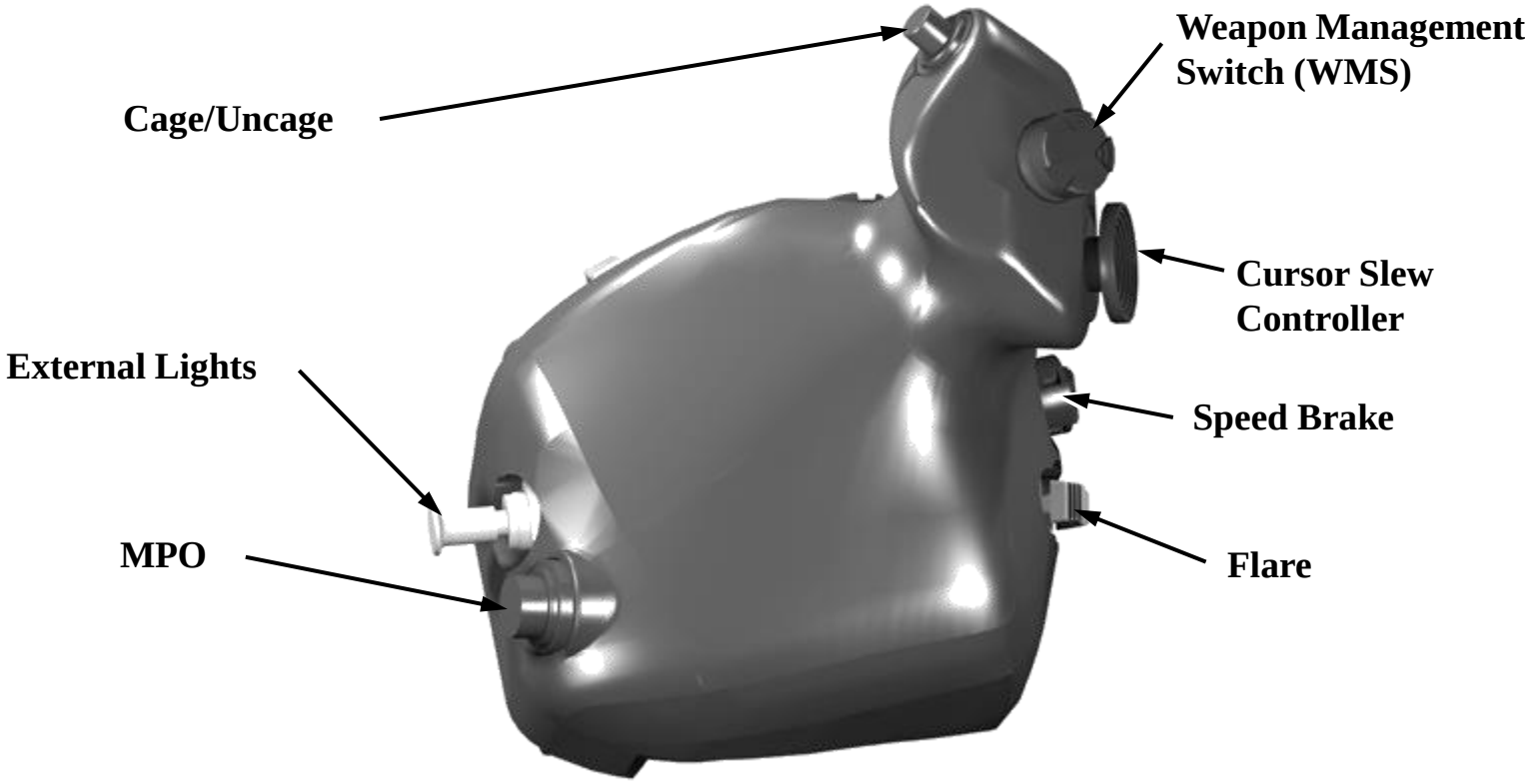
Cockpit Displays
Virtual Data Entry Device (vDED)

Sidestick



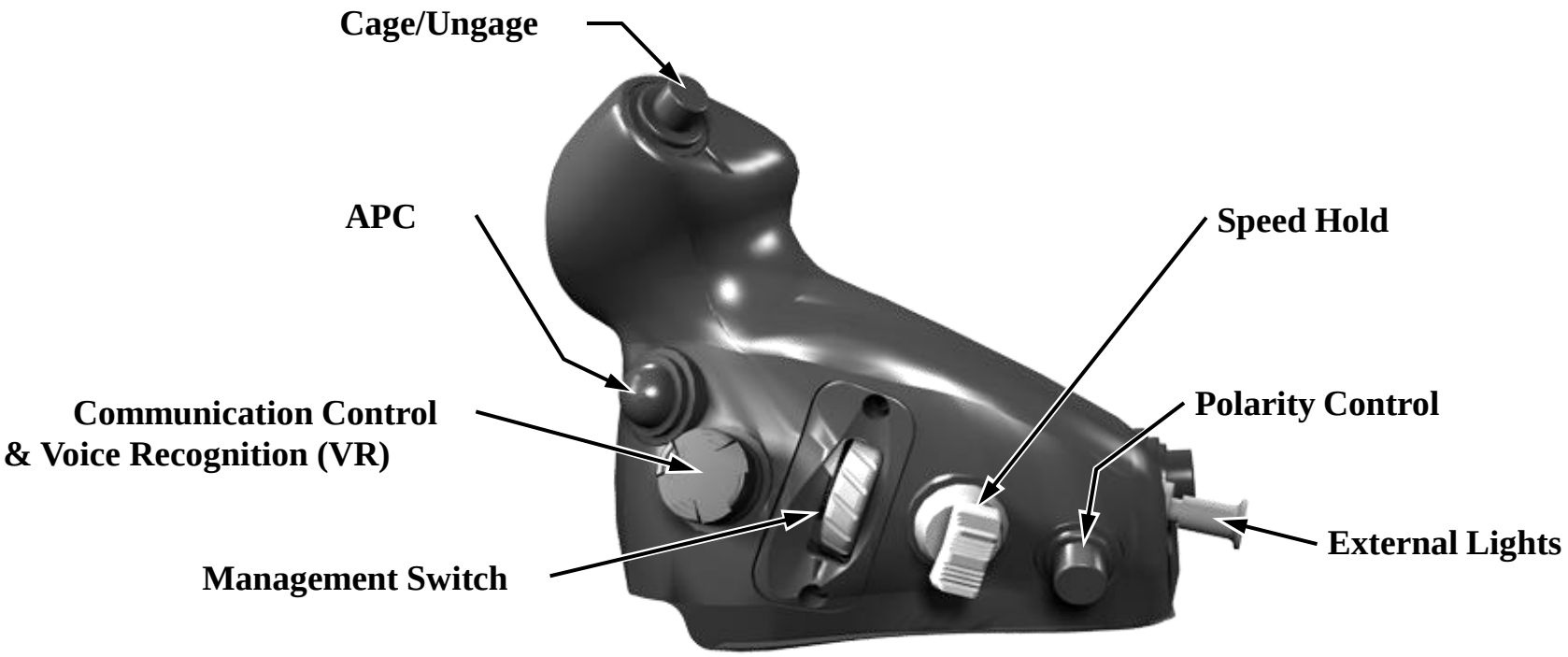
Sidestick
(View From Back)

Throttle Grip



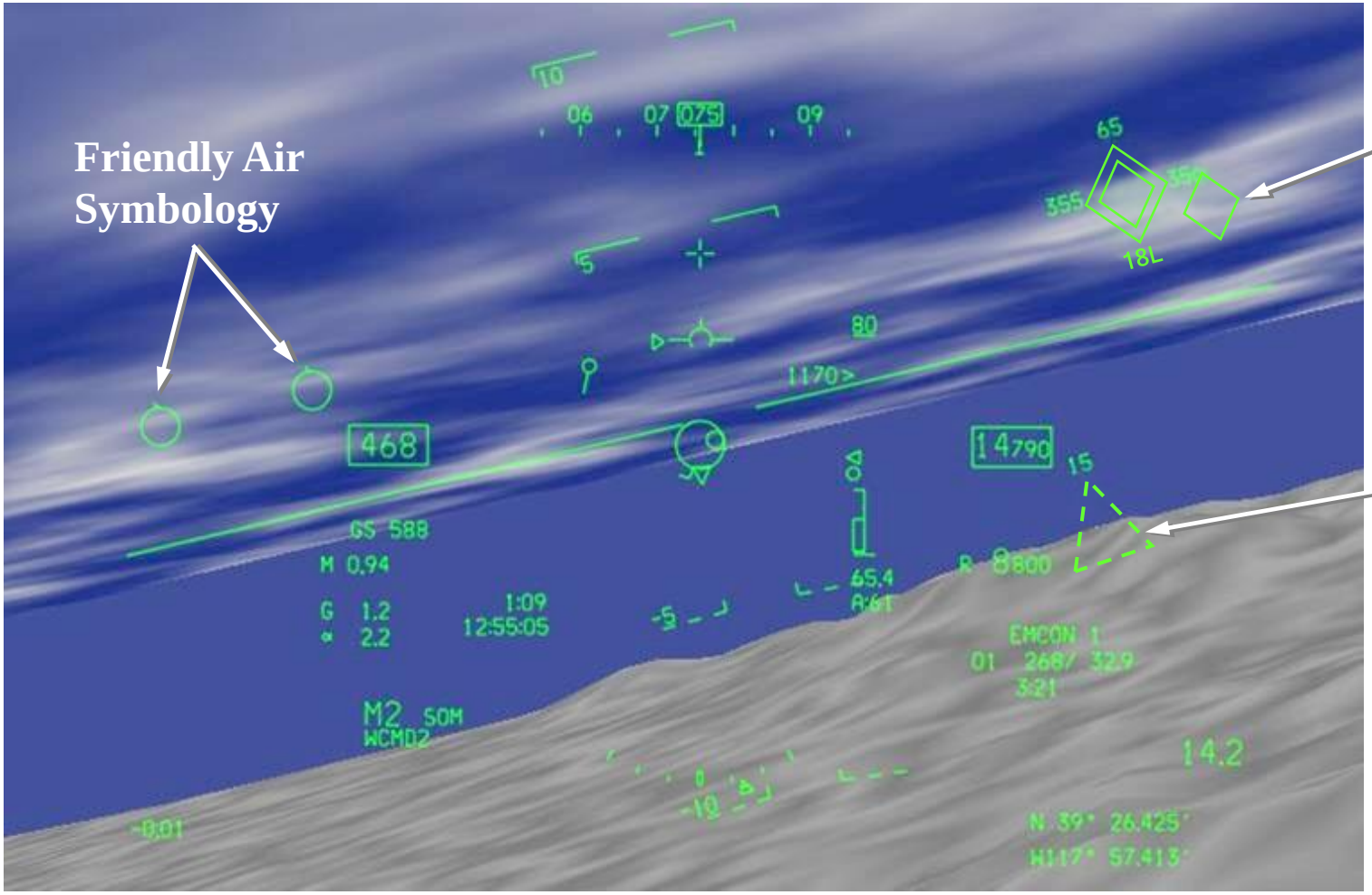
Throttle Grip
(View From Top)

Throttle Grip

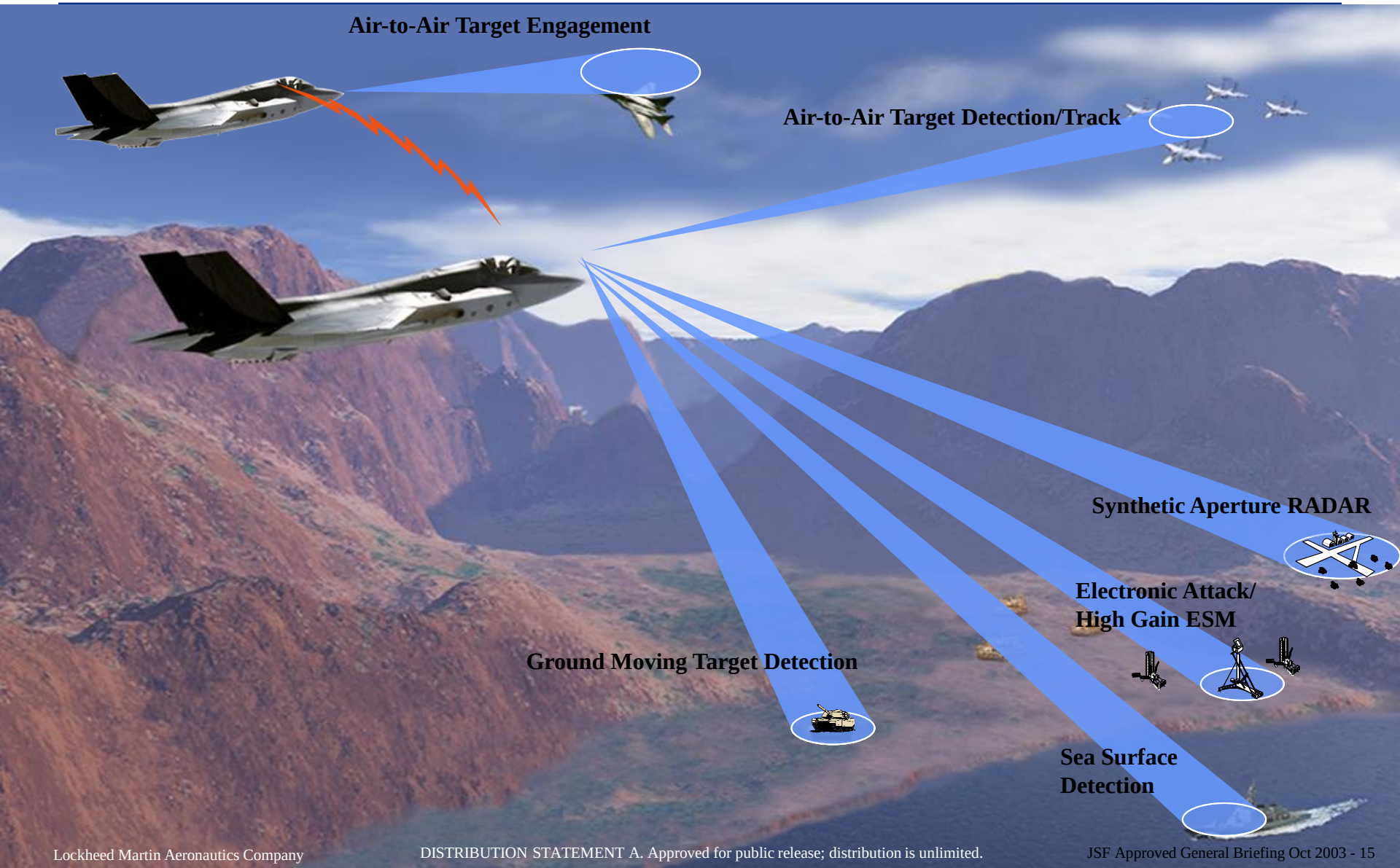


Throttle Grip
(View From Front)

Helmet Mounted Display (HMD) Symbology

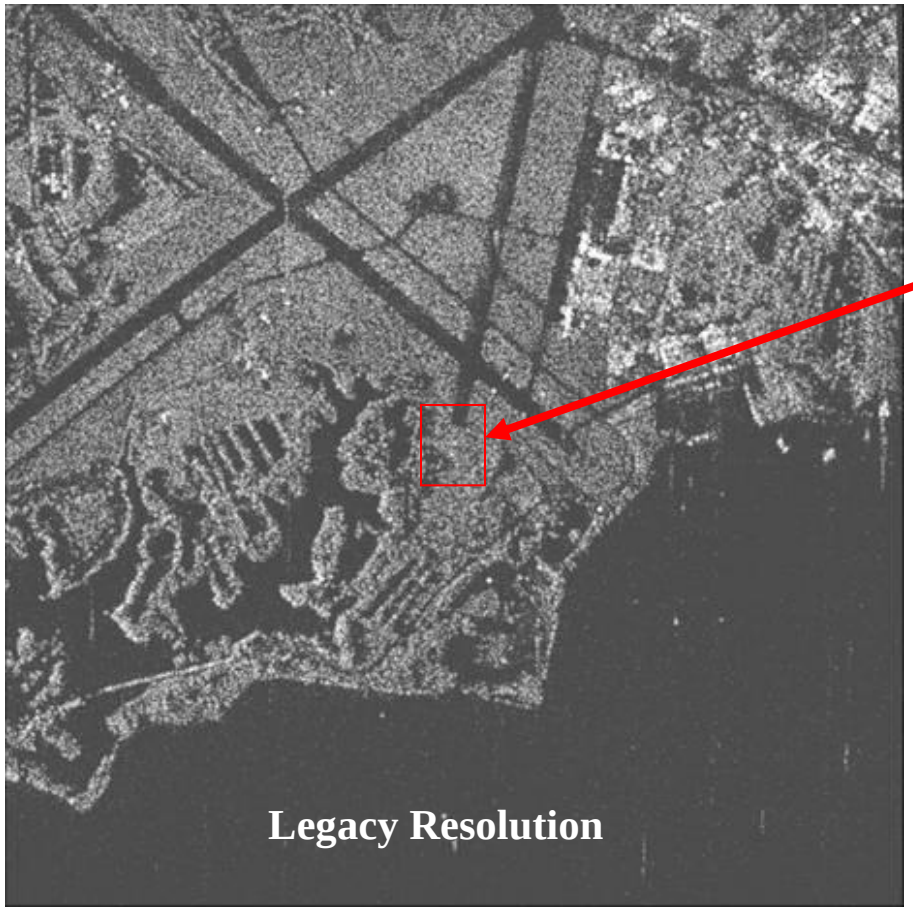


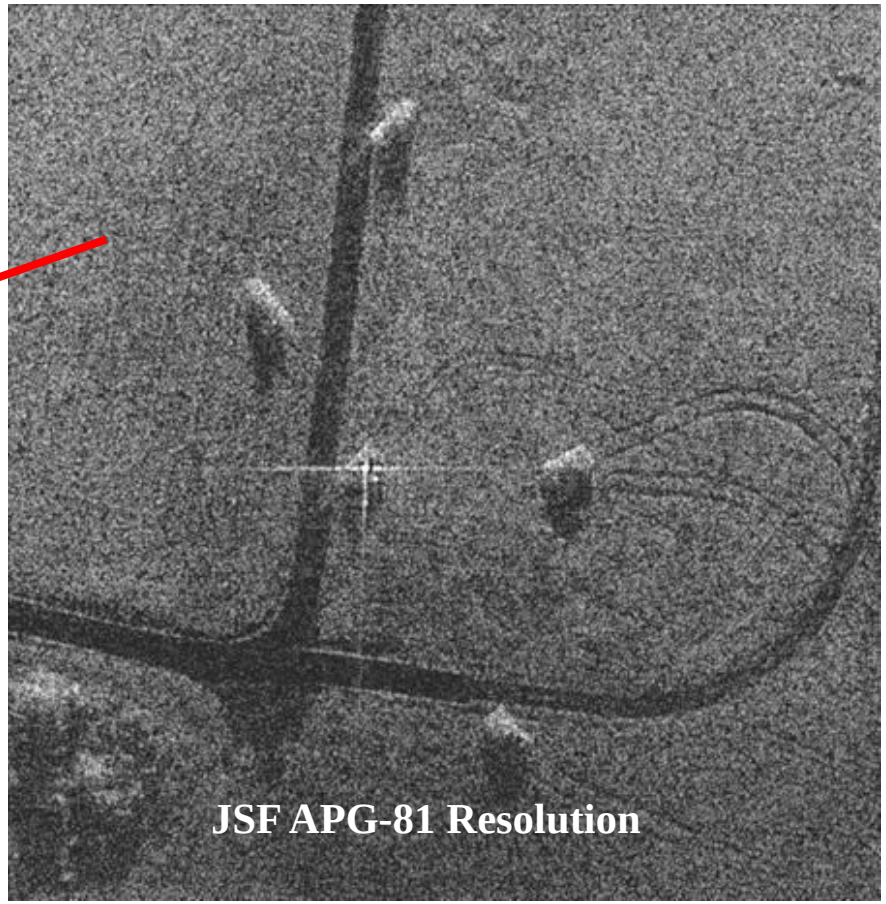
APG-81 Radar Advanced Electronically Scanned Array



DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

SAR Maps





Integrated Avionics Suite

EO
Targeting
System

Full Spherical Coverage by Distributed Aperture System

RWR
360 Deg Coverage

Fwd Band 3/4

Band 3/4
Radar
Warning

Fwd Band 2

RADAR
Array &
Electronics

RADAR

DAS Apertures

Aft Band 2

ESM

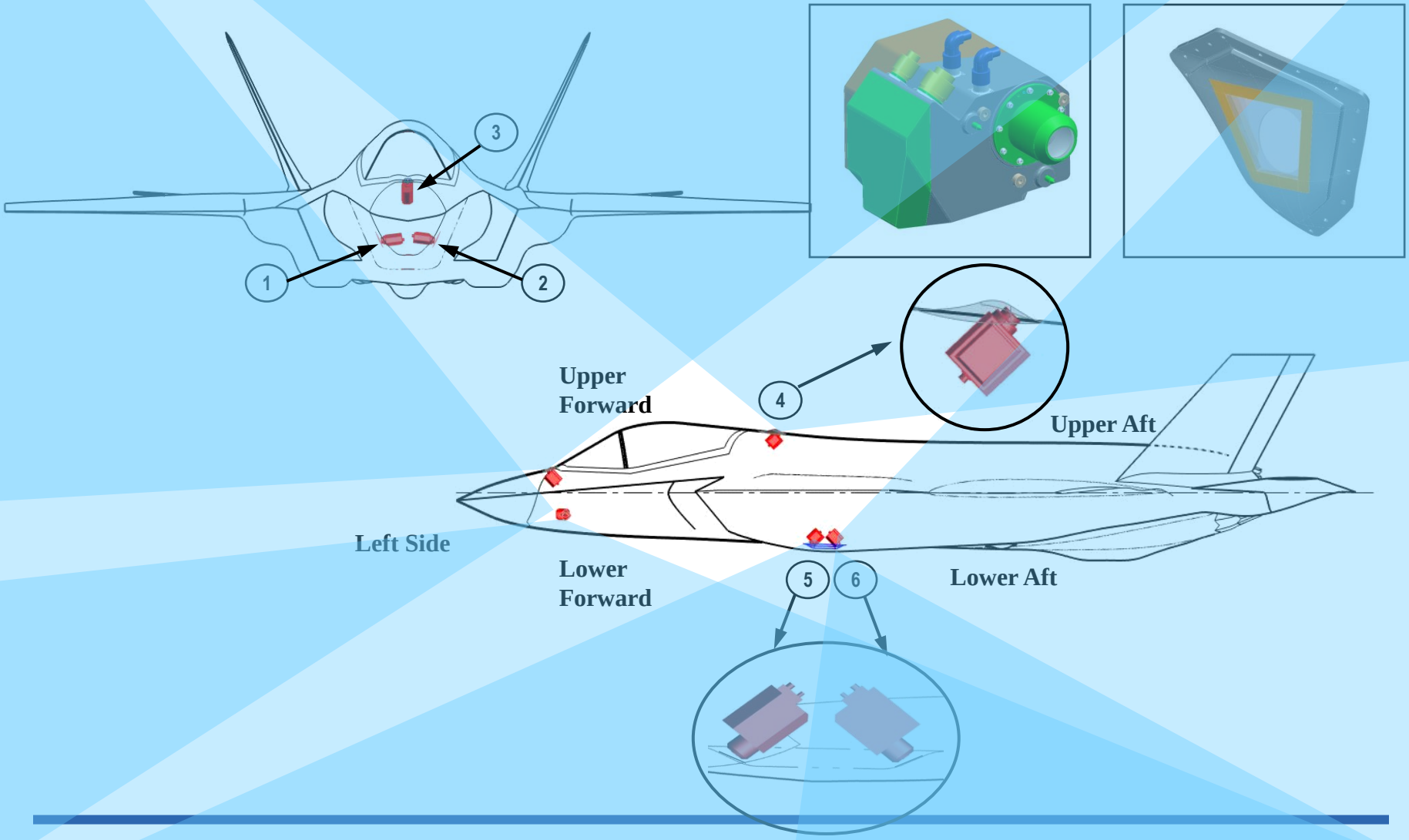
Fwd Band 2

Band 3/4
Radar
Warning

Fwd Band 3/4

Emitter Locating

Distributed Aperture System (DAS) Sensor Array

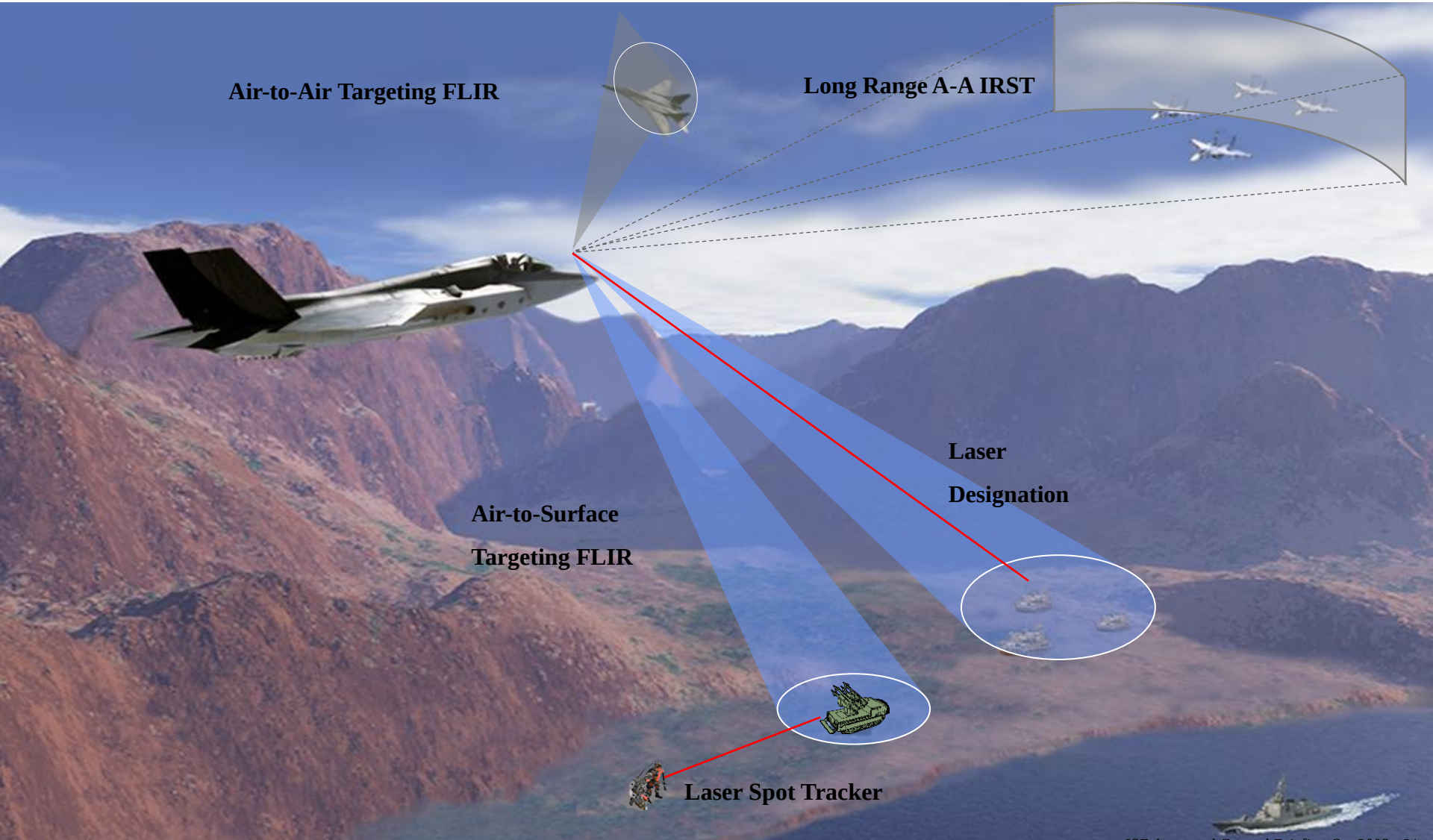


Distributed Aperture System

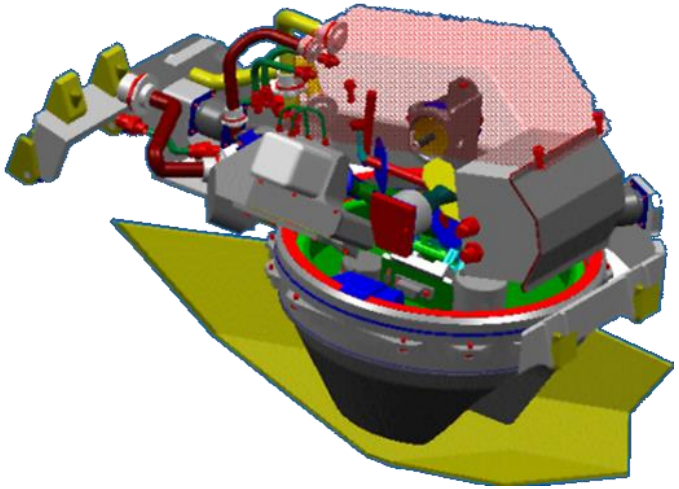
- Internally Mounted
- Missile Launch Detection
- Threat Aircraft Detection
- Track Wingman
- NAVFLIR Functions
- Integrated With HMD

Capabilities
DAS Missile Warning Symbology

Electro-Optical Targeting System (EOTS) Capabilities

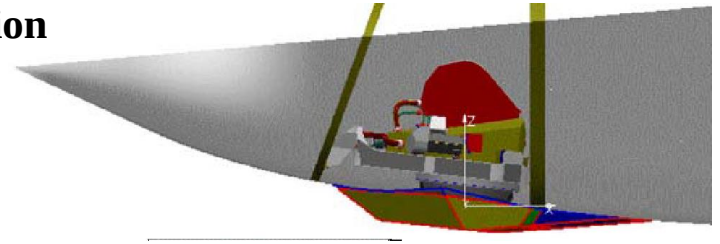


Electro-Optical Targeting System (EOTS) Sensor Location

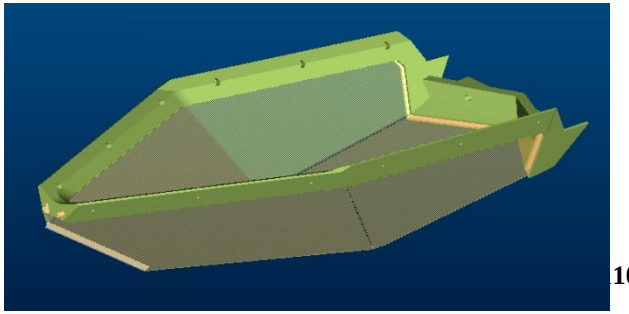


EOTS

Sensor/Window Installation



Seven Sapphire Faceted Window Configuration



10°

Communication, Navigation, ID (CNI) Capabilities

Voice Communications
- VHF Lo-FM (30-88 MHz)
- VHF AM (108-156 MHz)
- VHF Hi-FM (136-174 MHz)
- UHF AM (225-400 MHz)
- UHF FM (225-400 MHz)
- Havequick
- SINCGARS
- GUARD Monitor (243/121.5)
- KY-58 Secure Voice

Data Message Formats
- TADIL-J
- JVMF / VMF (K-series)
- TADIL-C (partial)
- OTCIXS-II
- OTH-Gold
- TACFIRE
- AFAPD

Data Communications
- Link 16
- Link 16 Enhanced Throughput
- MADL (JSF Wideband)
- Weapon Data Link (AWW-13)

Navigation/Landing Aids
- INS
- GPS
- Radar Altimeter
- ILS Marker Beacon
- ILS Glideslope
- ILS Localizer
- TACAN
- Carrier ILS
- MLS (w/DME-P)
- JPALS*

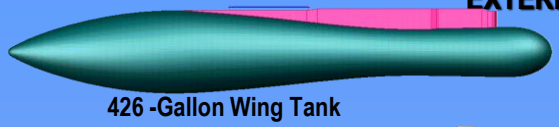
Identification/Surveillance
- Mark XII Transponder
- Mark XII Interrogator

Audio Functions
- Voice Messaging
- Voice Recognition (Support)
- Air Refuel Intercom (CTOL)
- Maintenance Intercom
- Active Noise Reduction

CTOL Weapons Carriage Requirements

Store Fully Certified During SDD

EXTERNAL WEAPONS


426 -Gallon Wing Tank

Stormshadow

GBU-38 JDAM 500-lb (MK-82 Warhead)

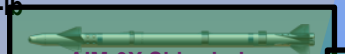
AGM-158 JASSM

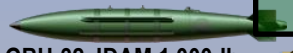
MXU-648/CNU-88 Baggage Pod

AGM-154A/C JSOW Glide Bomb

AIM-120B/C AMRAAM

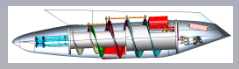
GBU-31 JDAM 2,000-lb (MK-84 Warhead)


AIM-9X Sidewinder


GBU-32 JDAM 1,000-lb (MK-83/BLU-110 Warhead)

BDU-57/58/60 Laser-Guided Training Round

GBU-31 JDAM 2,000-lb (BLU-109 Warhead)

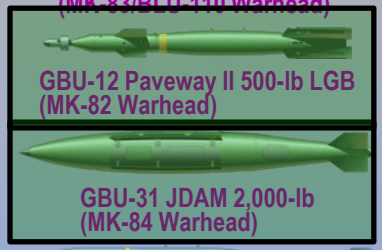

Missionized Gun

Brimstone/Joint Common Missile

MK-76/MK-58/BDU-48

INTERNAL

GBU-32 JDAM 1,000-lb (MK-83/BLU-110 Warhead)

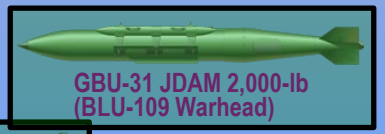


AGM-154A/C JSOW Glide Bomb

CBU-103/105 WCMD

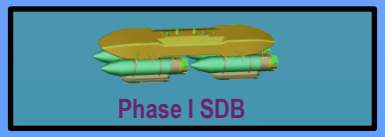
GBU-38 JDAM 500-lb (MK-82 Warhead)

Brimstone/Joint Common Missile



AIM-132 ASRAAM

Weapons Currently Under Development



EXTERNAL WEAPONS

GBU-10 Paveway II 2,000-lb LGB (MK-84 Warhead)

GBU-24A/B Paveway III 2,000-lb LGB (MK-84 / BLU-109 Warhead)

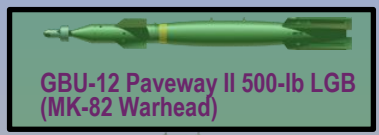
GBU-16 Paveway II 1,000-lb LGB (MK-83 Warhead)

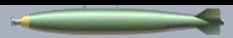
MK-83 BLU-110 LDGP 1,000-lb LDGP

MK-83 BSU-85 HDGP

MK-84 2,000-lb LD/HDGP

MK-84 BSU-50 Ballute 2,000-lb HDGP




MK-82 500-lb LD & HD

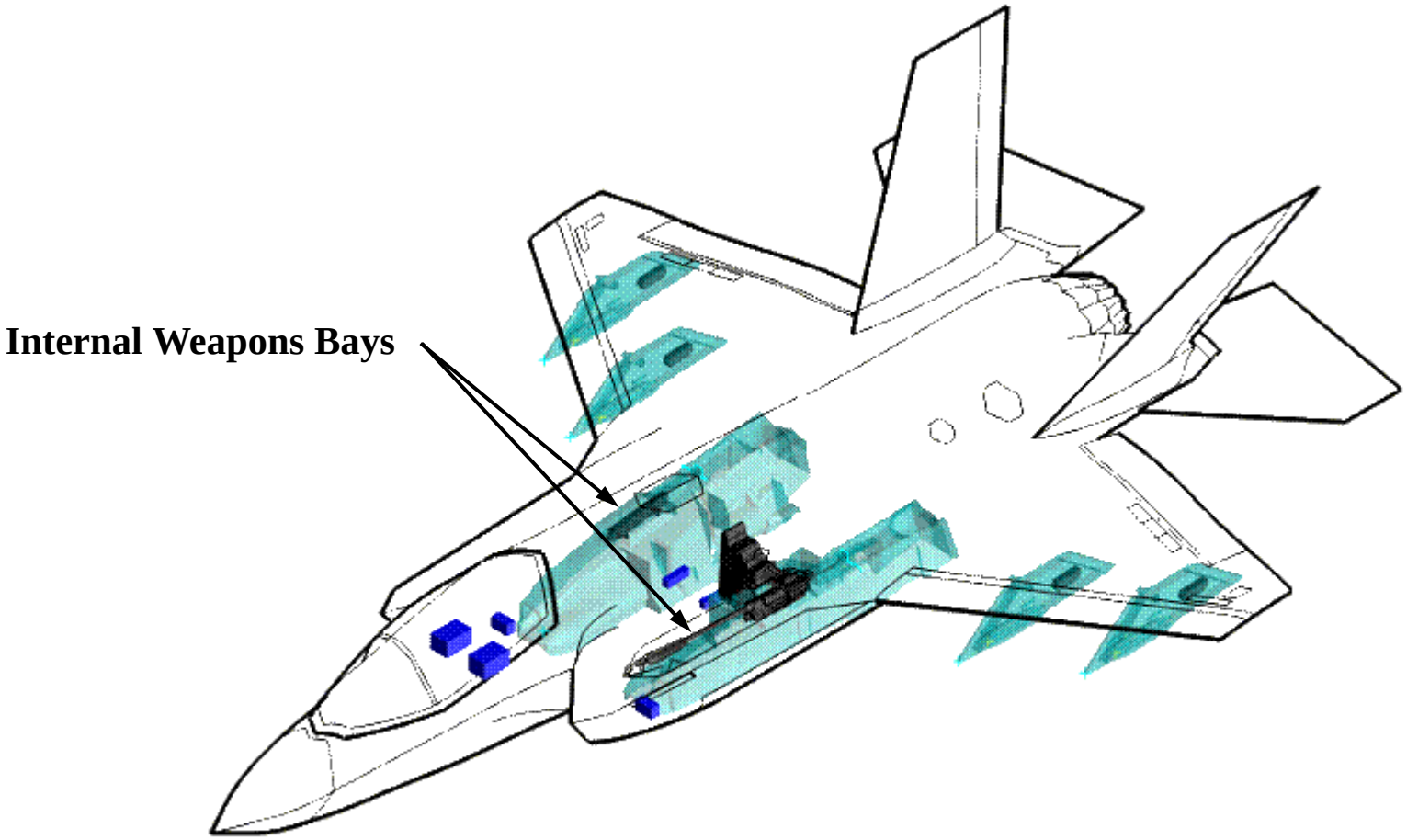
CBU-99/100 Rockeye II Cluster Munition

CBU-103/105 WCMD

AIM-132 ASRAAM

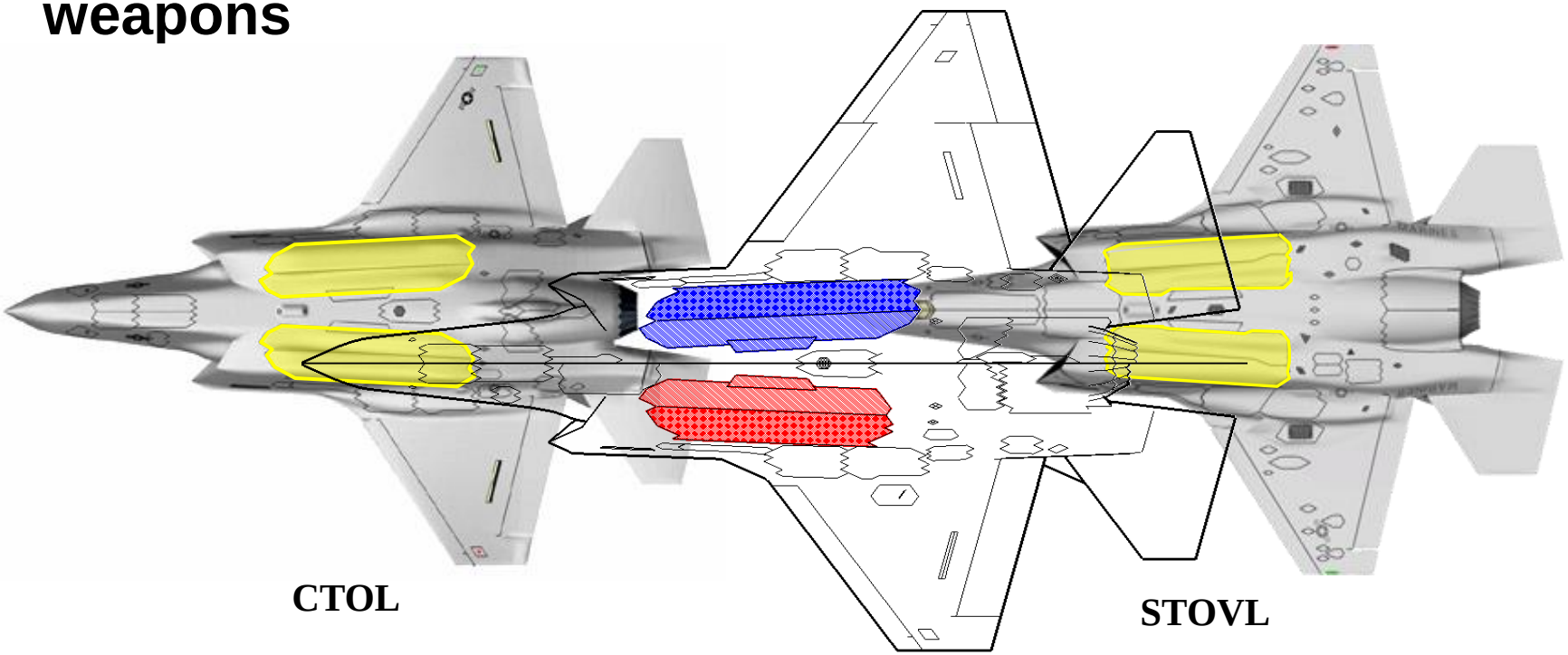
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

Weapons Bays Airframe Orientation



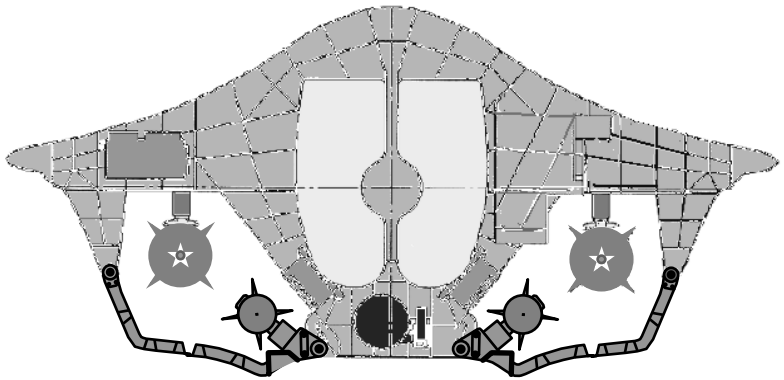
Components Doors

- CTOL and CV variants share same bay and can carry 2000 lb weapons
- STOVL has a smaller bay and is limited to 1000 lb class weapons

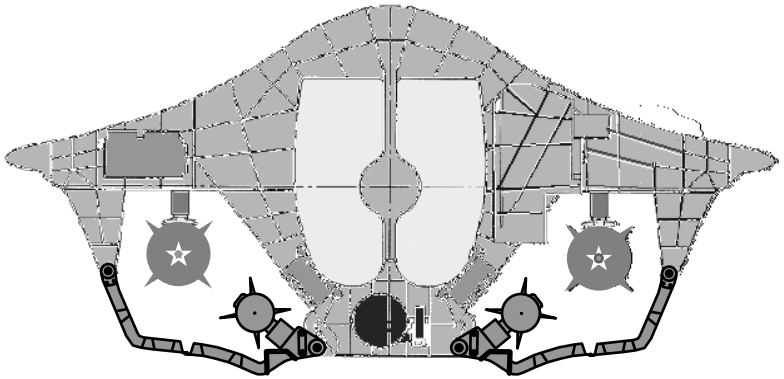


Components Doors

- Two operational modes
  - Ground = 10-15 seconds open/close
  - Inflight = 2.4 seconds open/close



Ground Operations



In Flight Operations

UNCLASSIFIED

27

Weapons Stations
Station Designation & Specifications

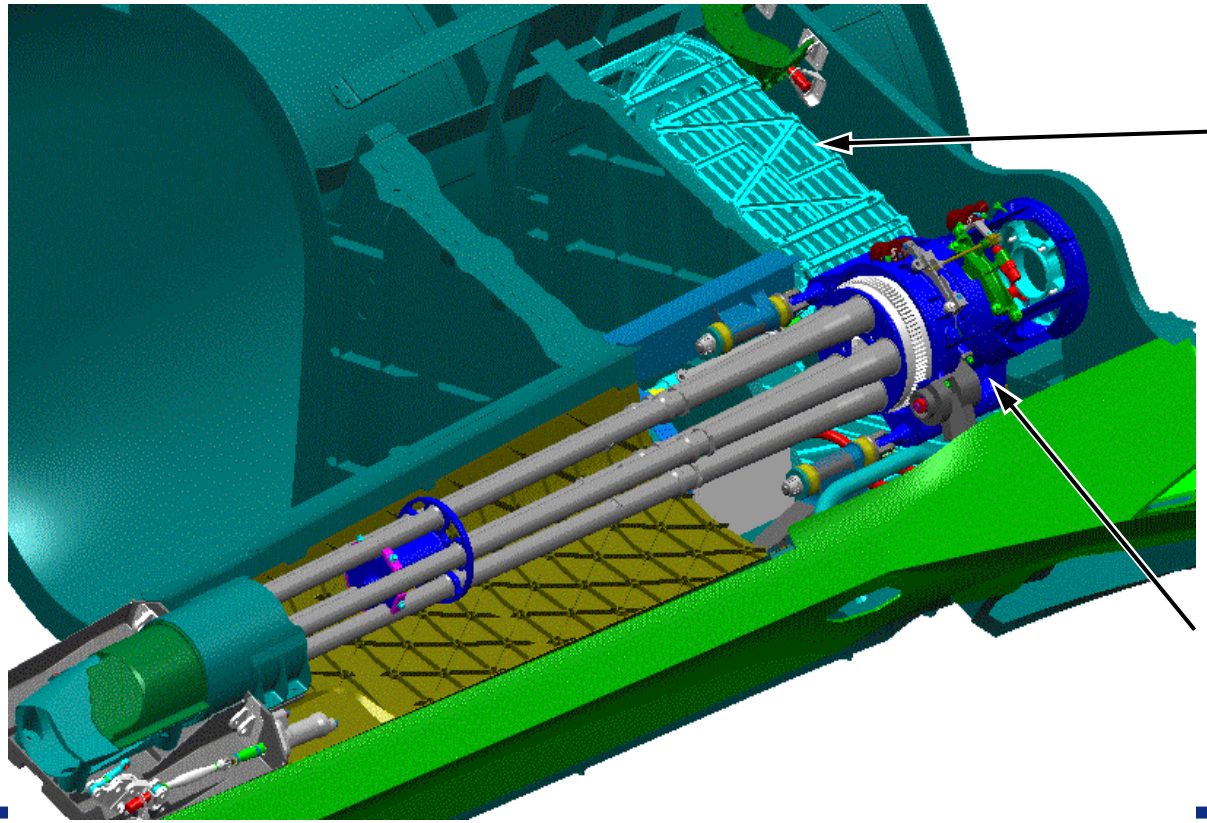
- 4 internal weapons stations (similar on all variants)
  - Stations 4 & 8 (outboard, internal) can carry either air-to-surface stores or air-to-air missiles
  - Stations 5 & 7 (inboard, internal) can carry air-to-air missiles

Weapons Stations
Station Designation & Specifications

- **Seven external weapons stations (similar on all variants)**
  - **Stations 3 and 9 carry 5000-lb stores or fuel**
  - **Stations 2 and 10 carry 1000-lb stores**
  - **Centerline station (6) can carry missionized gun only**
  - **Remaining 2 stations (1 and 11) can carry AIM-9X or AIM-132 ASRAAM missiles**

Gun System Components & Operation

- Internal Gun
  - 181-round Ammunition Handling System (AHS)



UNCLASSIFIED

OCA/DCA

- **SCL**
  - DCA 4 x AIM-120
  - Future Sidekick 6 x AIM-120
  - OCA 2 x AIM-120, 1 x GBU-31, 4 x GBU-39
- **Playtime**
  - 35.6 to 60 mins

Questions?