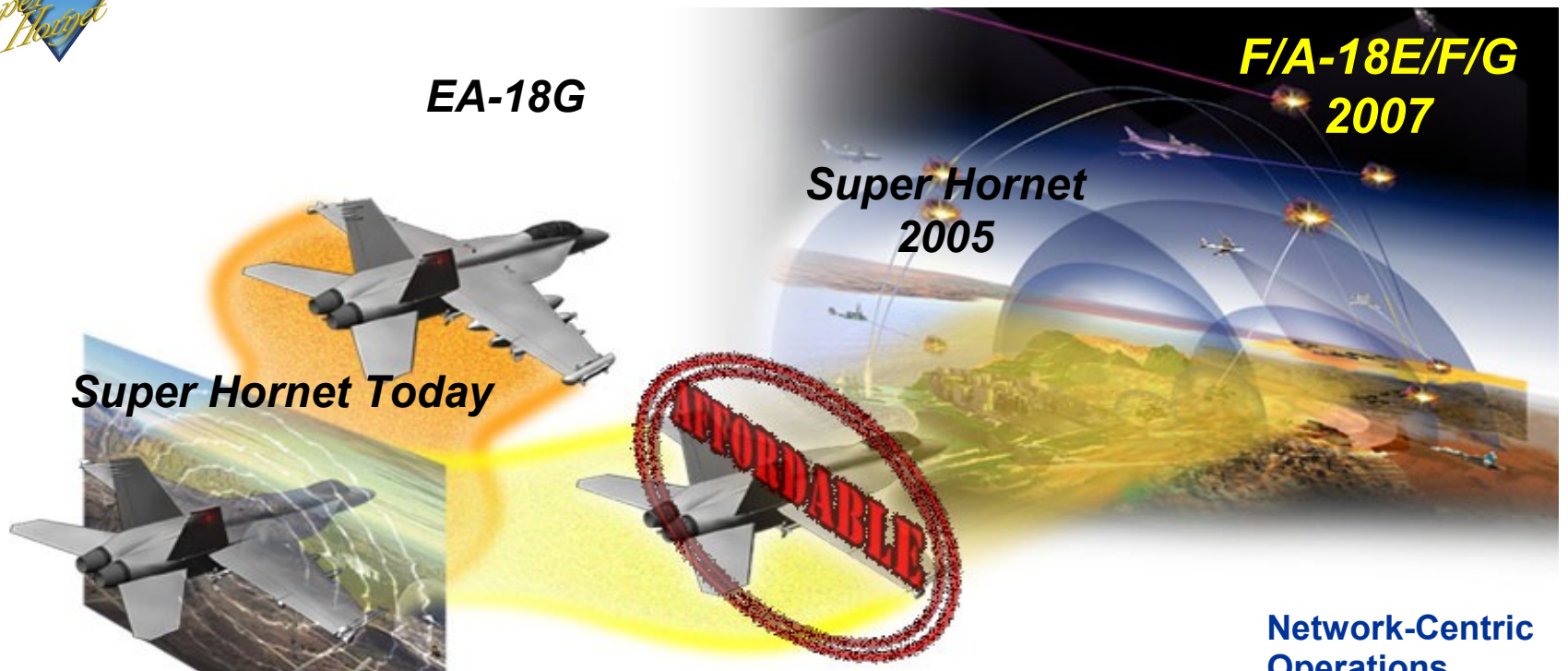
The F/A-18E/F Super Hornet

Tomorrow's Air Power Today

Strategic Transformation…



Performance better than plan

- MYP I: $700M in customer savings
- On cost, ahead of schedule
- Balanced: Survivability and stealth
- Commercial-based logistics

Time-critical precision engagement

- MYP II: FY05-09, 210 A/C, includes 56 EA-18G
  - Contract: 30 Dec 2003
  - $1.1B Savings, $100M CRI
  - FMS increases savings
- Spiral development
  - ATFLIR – IDECM – MIDS
  - AESA – AMC&D – ACS
- Neck-down: replaces EA-6B, F-14, S-3
- $1B annual fleet operations savings

Network-Centric Operations

- Integrated battlespace
- 6 - 10 times capability multipliers
- Effects-based warfare
- Fast track technology transition

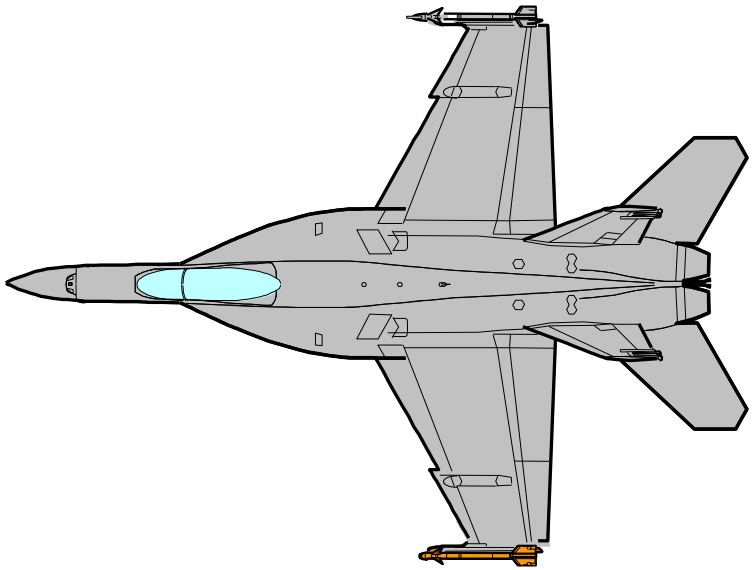
. . . of Tactical Aviation

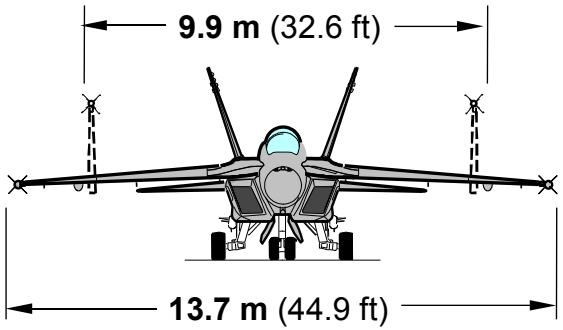
New, now, network centric

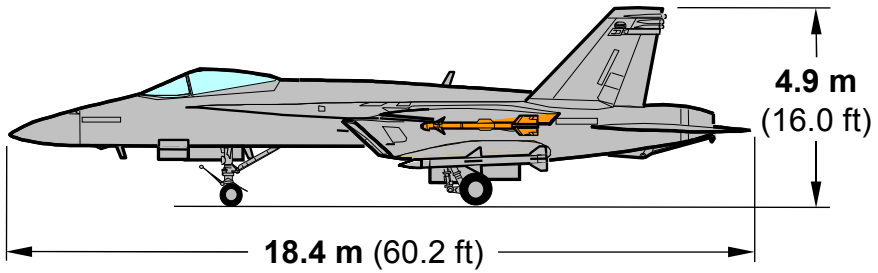
Physical Characteristics

Wing area	46.5 m^2	(500 ft^2)
Weight		
Empty	14,288 kg	(31,500 lb)
Payload	8,493 kg	(18,727 lb)
Max TOGW	29,932 kg	(66,000 lb)
Fuel (JP-8)		
Internal	6,780 kg	(14,950 lb)
External*	7,430 kg	(16,380 lb)

* (5) 1,820 liter (480 gallon) external tanks







Greater range and payload than the F/A-18C/D with greater reliability

F/A-18E/F Super Hornet Key Features

High survivability/lethality

- Low radar cross section
- Low vulnerability
- Advanced electronic warfare
- Advanced radar and FLIR
- 11 weapon stations

Long range/endurance

- 6,780 kg (14,950 lb) internal fuel
- 7,430 kg (16,380 lb) external fuel
  - (5) 1,820 liter (480 gal.) external tanks
- Air refueling store for tanking

Improved deployability

- Short field performance
- Minimal support equipment

Growth Potential

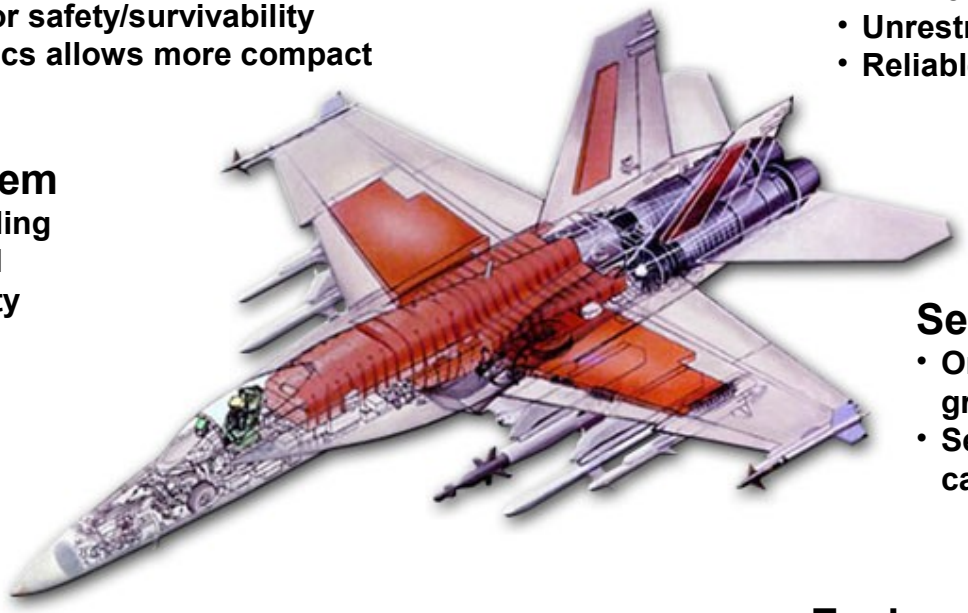
- Space
- Electrical power
- Cooling
- Hydraulics

The Super Hornet will provide the capability to fight and survive well into the 21st century

F/A-18E/F Subsystems

Hydraulic system
- Independent circuits for safety/survivability
- Dual pressure hydraulics allows more compact system

Flight control system
- Proven excellent handling qualities for safety and combat maneuverability
- No angle-of-attack limitations for most combat configurations



Propulsion system
- Twin engines for safety/survivability
- Unrestricted engine operation
- Reliable and maintainable engines

Secondary power system
- Onboard power/cooling for ground maintenance
- Self contained engine start capability

Fuel system
- Large internal fuel capacity plus 5 external tanks
- Aerial refueling store capability

Electrical system
- Redundant generators for safety/survivability
- Significant growth capacity

Environmental control system
- Cooling capacity for all environmental extremes
- Significant growth capacity

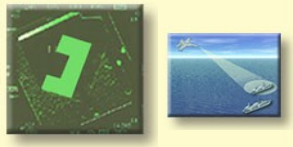
F/A-18E/F systems provide robust mission capability, safety, and growth

F/A-18E/F Key Enabling Technologies

AESA

Air-to-air

Air-to-surface

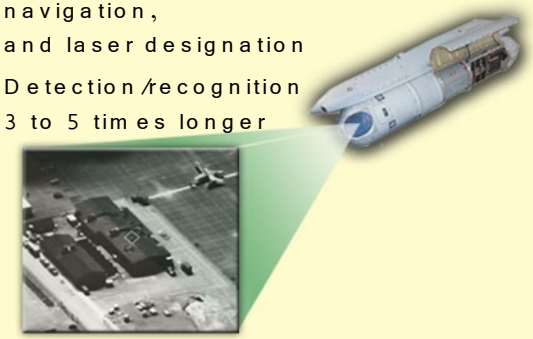


APG-65/73 AESA radar	Ground Maritime

- 2–3 times longer detection range
- Simultaneous air-to-air and air-to-ground tracking
- High resolution maps at long ranges
- Precision bombing in all weather conditions

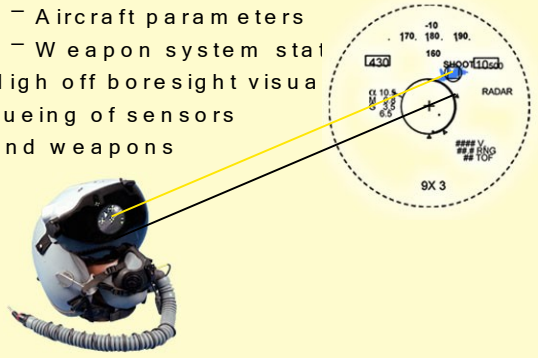
3rd generation FLIR

- Targeting, navigation, and laser designation
- Detection/recognition 3 to 5 times longer

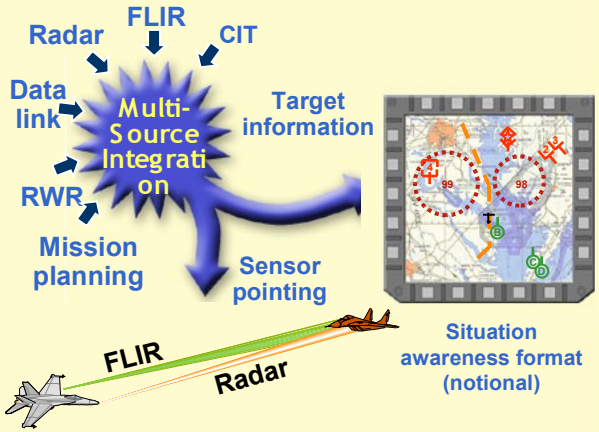


JHMCS

- Critical information always in pilot's field-of-view
  - Aircraft parameters
  - Weapon system stat
- High off boresight visua cueing of sensors and weapons



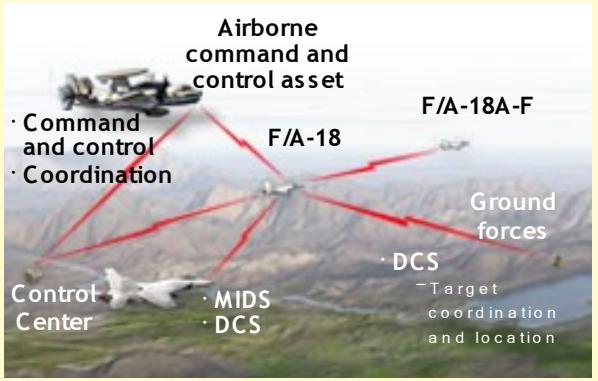
Avionics integration



Payload

- 11-store stations
- Flexible
- Asymmetric capability

Network Centric Operations



Electronic Warfare Systems

ALR-67(V)3 radar warning receiver

- High pulse density
- Improved emitter ID
- Improved sensitivity

ALE-50 towed decoy

- Complement to ALQ-214
- Increases threat miss distance

ALQ-214 onboard jammer

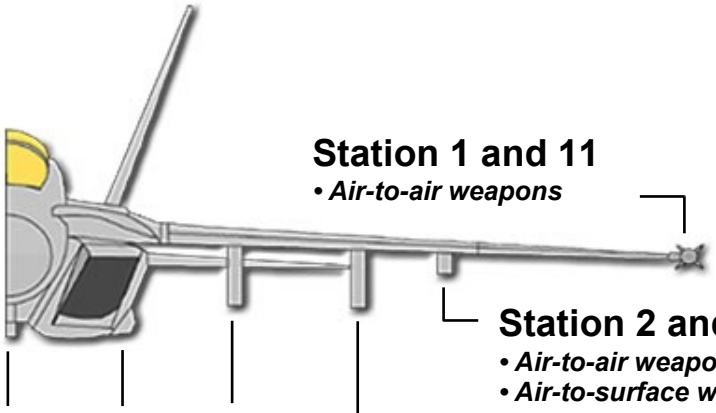
- Defeats pulse, pulse doppler, and continuous wave threats

ALE-47 countermeasure dispenser

Integrated Defensive Electronic Countermeasures (IDECM)

Advanced electronic warfare system provides survivability against modern threats

Large Payload Capability and Multi-Mission Flexibility



Station 1 and 11
- *Air-to-air weapons*

Station 2 and 10
- *Air-to-air weapons*
- *Air-to-surface weapons*

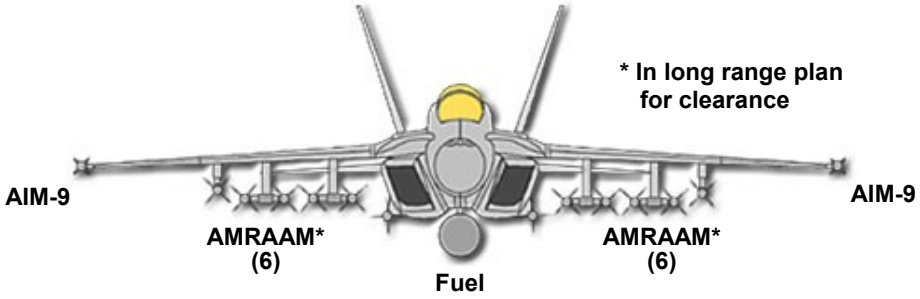
Station 3 and 9
- *Air-to-air weapons*
- *Air-to-surface weapons*
- *Fuel tank*

Station 4 and 8
- *Air-to-air weapons*
- *Air-to-surface weapons*
- *Fuel tank*

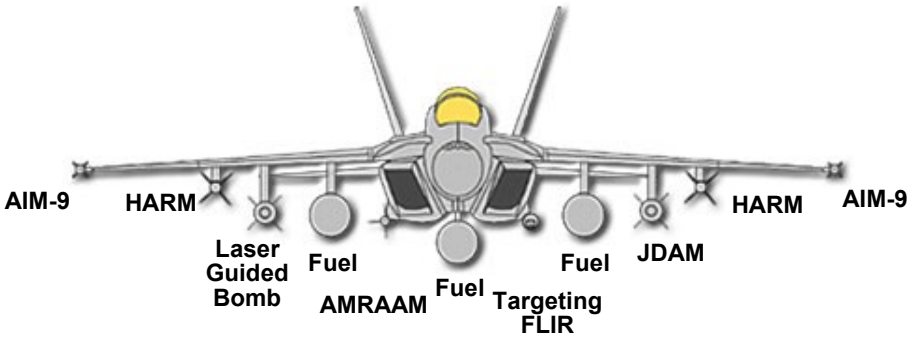
Station 5 and 7
- *Sensors*
- *Air-to-air weapons*

Station 6
- *Sensors*
- *Air-to-surface weapons*
- *Aerial refueling store*
- *Fuel tank*

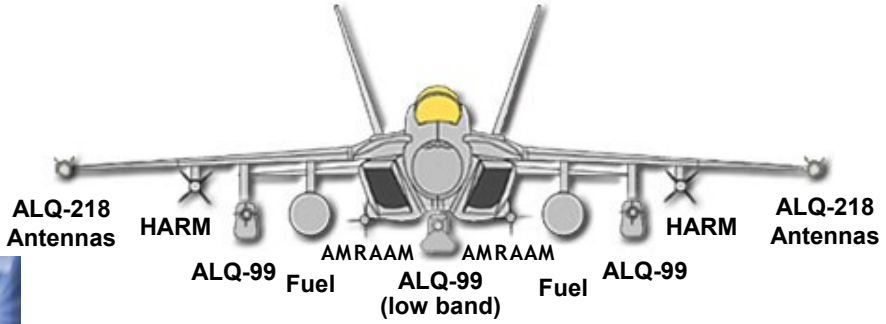
11 Store stations



Air-to-air payload



Precision strike with self-escort/self-protection



Airborne electronic attack

Significant weapon payload/flexibility increases warfighting options

Advanced Flight Controls

- Excellent flying qualities
- High departure resistance
- Rapid nose-pointing capability (in excess of 30°/sec)
- Slow landing speeds
- Precise target acquisition

Plus……

- ***No angle-of-attack limits*** for any symmetric Air-to-air or air-to-ground configurations
- ***No dedicated speedbrake*** because traditional control surfaces used for deceleration
- ***Self-repairing flight controls*** for increased safety and combat survivability

Highly maneuverable and safe to fly

Advanced Forward Cockpit

Head-up display
(20° field-of-view)

Up-front
control/display
Touch-sensitive LCD
(10.2 cm x 12.7 cm)
(4 in. x 5 in.)

Engine/fuel display

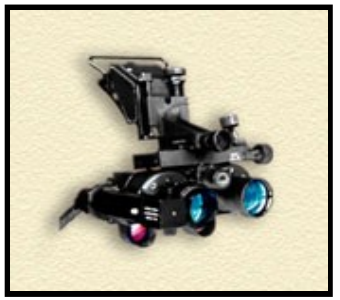
HOTAS controls

Multifunction
color displays
(12.7 cm x 12.7 cm)
(5 in. x 5 in.)

Multipurpose
color display
(15.2 cm x 15.2 cm)
(6 in. x 6 in.)

Joint helmet
mounted cueing
system

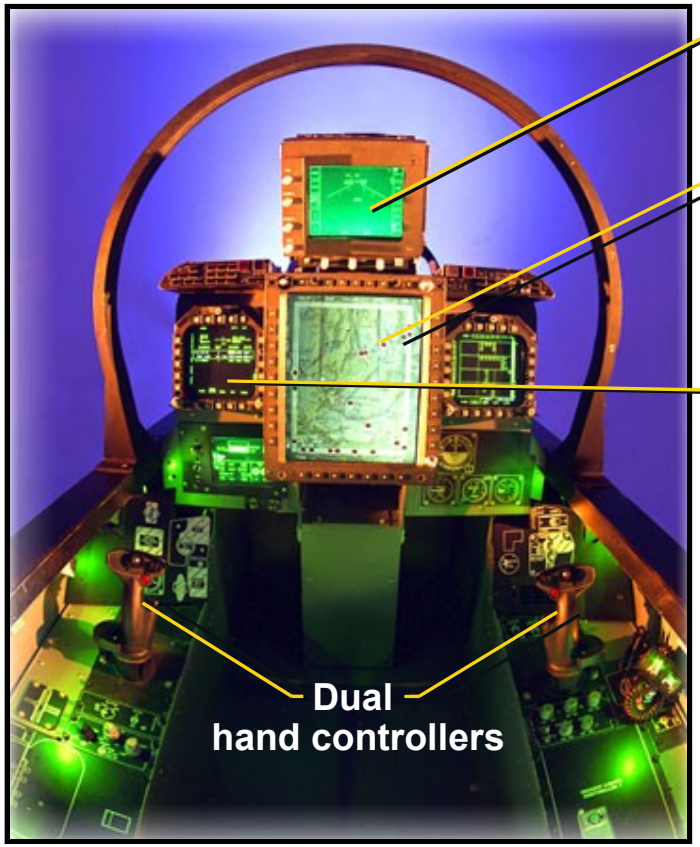
Nigh-vision
compatible



Easy to fly – optimized for minimum pilot workload

Advanced Aft Cockpit

- Fully missionized for increased lethality and survivability
- Complementary crew operations
- Independent controls
- Large display
  - Precise target designation
  - Improved situation awareness
- Combat capable two-seat trainer



Up-front control/display
Touch sensitive LCD

Advanced tactical display
Full-color
(20.3 cm x 25.4 cm)
(8 in. x 10 in.)

Advanced multi-purpose displays
Full-color LCD
(12.7 cm x 12.7 cm)
(5 in. x 5 in.)

Nigh-vision compatible

Joint helmet mounted cueing system

Large full-color display enables maximum situation awareness and targeting efficiency

Air Superiority

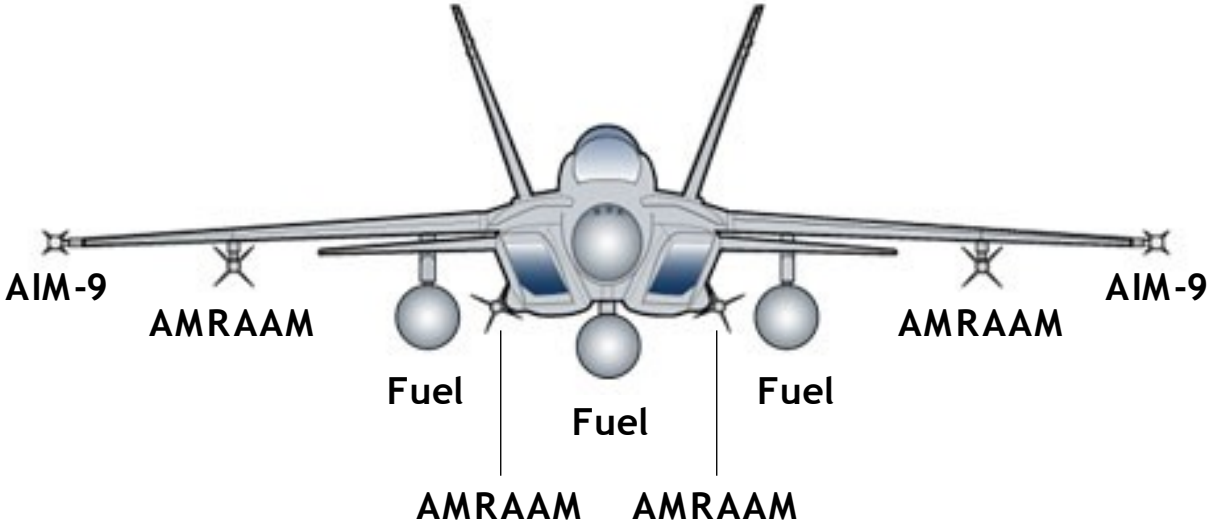
- **Situational awareness**
  - Long range AESA radar
  - ATFLIR
  - Data link
  - Electronic identification
  - Integrated digital map
  - Target data fusion

- **Long range dominance**
  - Stealth
  - AESA radar
  - AMRAMM

- **Close-in lethality**
  - High maneuverability
  - Helmet mounted display
  - Agile, high angle missile

First look – First shot – First kill

Range and Endurance
Combat Air Patrol



- 380 NM mission radius
- 2.0 hours CAP (no tanking)

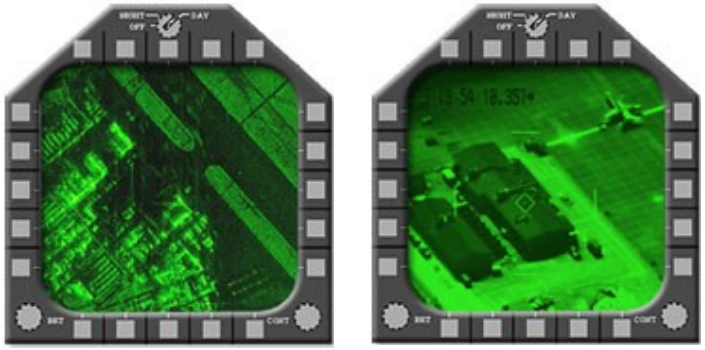
The Super Hornet's long combat air patrol time provides effective protection of sovereign airspace

Precision Attack

Weapon load flexibility

Precision weapon delivery

- All-weather, day or night
- Long standoff range
- Multiple targets per pass



Target location/designation

- High resolution SAR
- Advanced FLIR

Survivability

- Advanced countermeasures
- Maneuverability with stores
- Damage tolerant airframe/systems

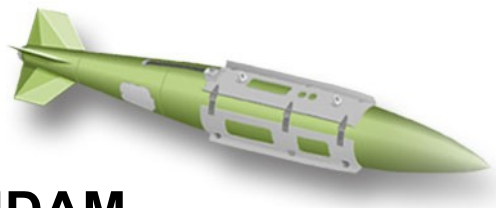
The Super Hornet finds and destroys targets with precision accuracy in any weather, day or night

Advanced Weapons

Current

AIM-9X

- High off-boresite capability
- Highly maneuverable
- IR countermeasures resistant



JDAM

- Adverse weather day/night
- Multiple targets per pass

Planned

AIM-120

- Long-range BVR
- Upgrade

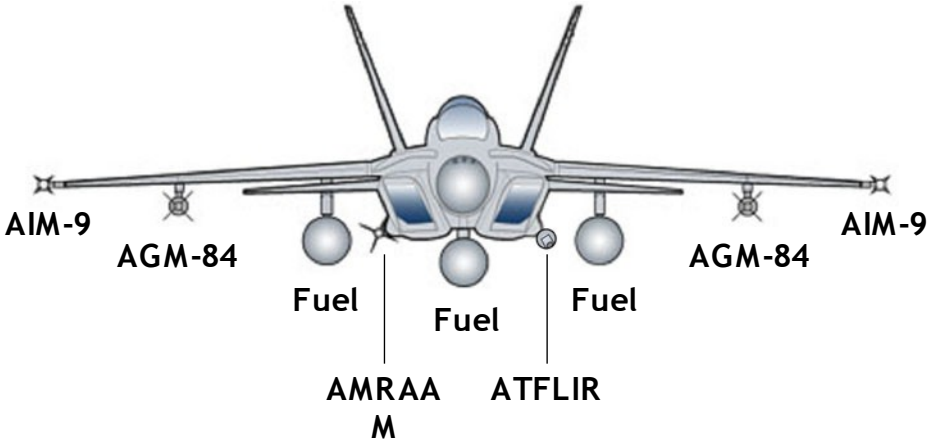
JSOW

- Max kinematic range 70NM
- Adverse weather day/night
- Smart submunitions or unitary warhead

Long term combat proven

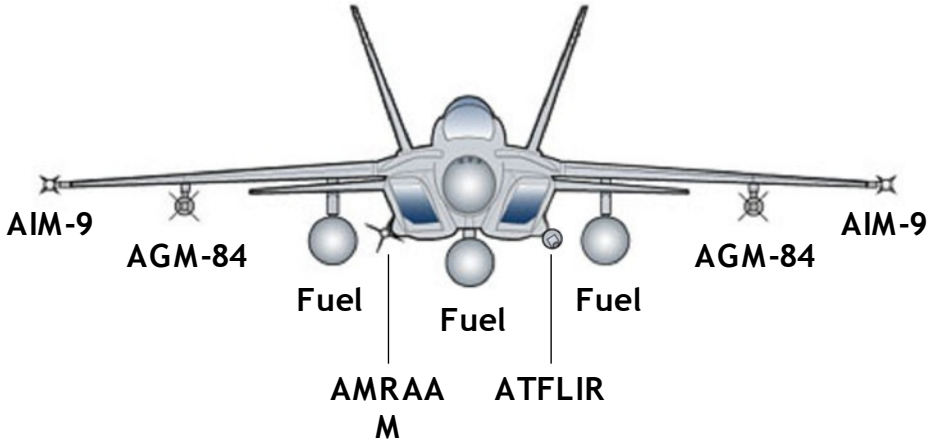
Range and Endurance

Ship Attack Mission



- 805 NM mission radius
- 1,135 NM mission radius

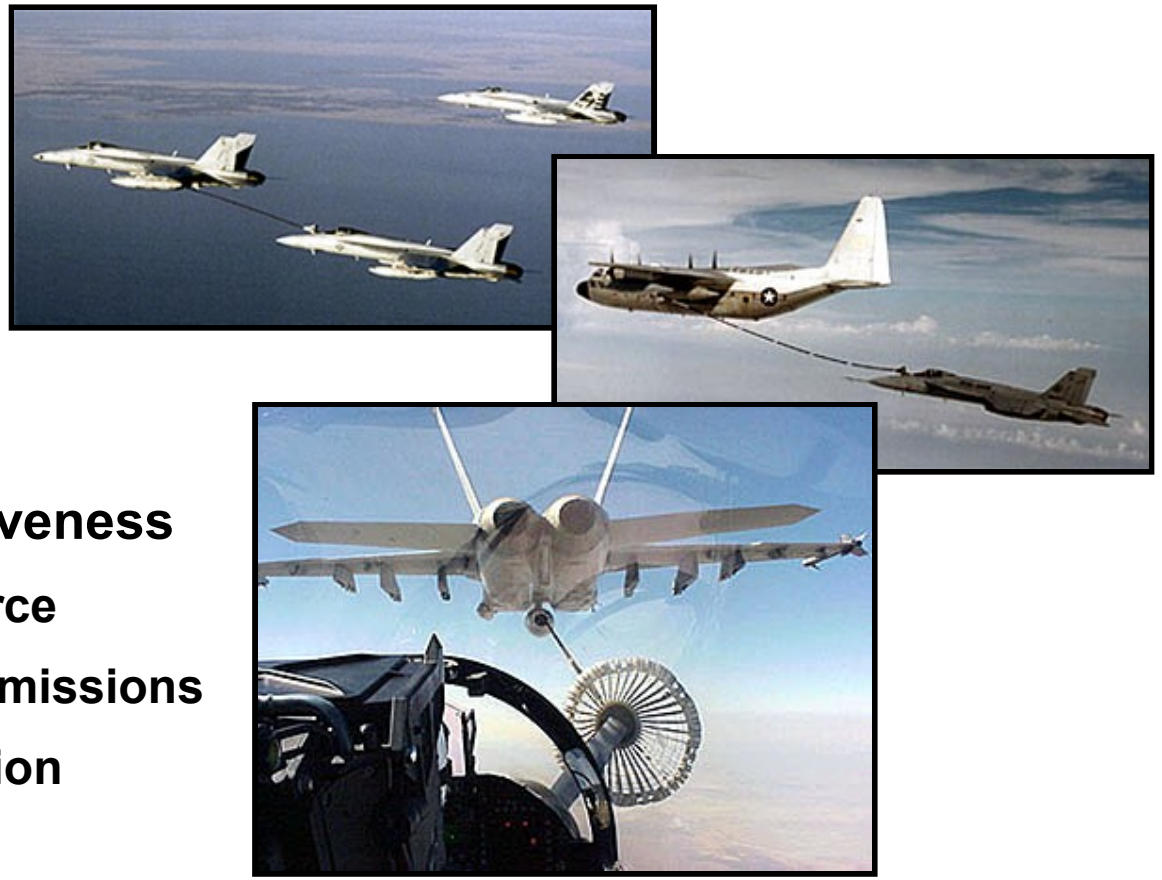
Maritime Patrol



- 300 NM mission radius
- 2.3 hours patrol time
- 3.2 hours patrol time

In-Flight Refueling Tanker

- Force structure flexibility
  - Easier coordination of tanker and combat aircraft
- Long range deployment
- Increased combat effectiveness
  - Self-contained tanker force
  - Extended range combat missions
  - Increased mission duration
  - Greater weapon payload



Every F/A-18E/F is capable of serving as an in-flight refueling tanker

F/A-18E/F Survivability

Balanced approach to survivability

- Low radar cross section

- Long standoff range
  - Integrated, long range sensors
  - Standoff weapons

- Integrated countermeasure
  - Onboard and towed jamming

- Survive if hit (low vulnerable area)
  - Twin engines
  - Active fire suppression

F/A-18E/F Easily Deploys to Remote Sites

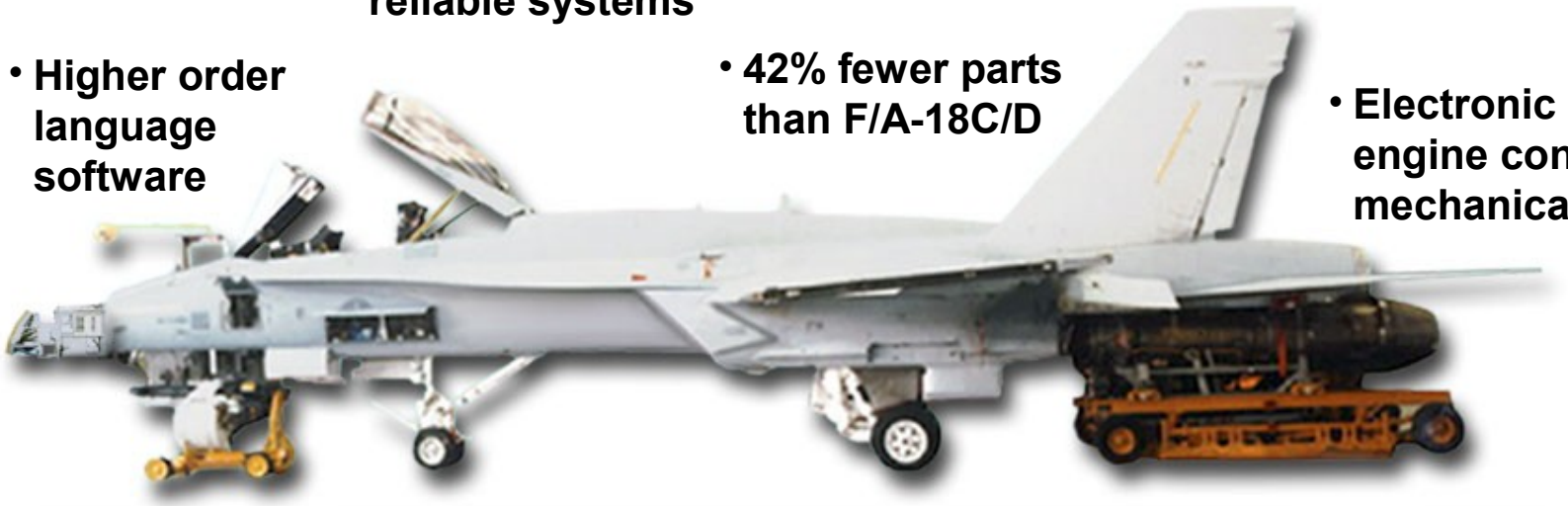
- Minimal support equipment required
  - Excellent reliability
  - Ease of maintenance
  - Auxiliary power unit
  - Self-contained ladder
  - No liquid oxygen

- Excellent short field performance
  - Very slow approach speed
  - Steep glide slope
  - Precise touchdown
  - Rugged landing gear
  - Excellent ground handling

U.S. Navy carrier suitability influence provides excellent austere basing capability

Supportability Advantages

- Maintenance free APU and brake accumulators
- Advanced, highly reliable systems
- Electronic flight control rigging
- Improved corrosion resistance
- Higher order language software
- 42% fewer parts than F/A-18C/D
- Electronic engine control (no mechanical rigging)



- Expanded built-in-test (98% fault isolation capability)
- Improved landing gear and wheels
- Engine change in less than 30 minutes

Reliability and maintainability advantages

Tailored Support

- Organizational Level
  - Extensive BIT, rapid turn around
  - Daily, Turnaround inspections
  - Engine remove and replace
- Intermediate Level
  - Minimal investment required
    - Low cost solution - utilize existing USN/OEM/Regional capability
  - Extensive capability available
    - Higher level of autonomy
- Depot Level
  - No scheduled aircraft level maintenance
  - Component maintenance beyond Intermediate capability at U.S. Depot, OEM or in-country industry

F/A-18E/F support is tailored to customer requirements

Super Hornet Summary

- USG is committed to Super Hornet
  - Super Hornet is a key catalyst to foster government-to-government relations
  - Provides key capability, promotes interoperability
  - stable/declining cost…low risk – demonstrated affordability
  - E/F/G leads-to and complements F-35…No change long-term F-35 planning
  - E/F/G = F-35: Complementary capabilities – mitigates capability gap
  - Committed to long-term, stable production
- F/A-18E/F: Available now, supportable now, interoperable now
- USG prepared for direct offer: Near term aircraft, training and support
- The HIT is international
- USG/HIT prepared to offer sale and and financing alternatives
  - FMS, direct commercial, hybrid… flexible
  - Financing, leasing and other alternatives
- Relationship with USN enables affordable improvement of capabilty
  - Opportunities for collaborative upgrades
  - Cooperate with USN with incorporation of planned capability roadmap: Advanced sensors and network centric capability

Secures potential capability gap