STANDARD AIRCRAFT CHARACTERISTICS

F-15C
EAGLE

MCDONNELL DOUGLAS

BY AUTHORITY OF
THE SECRETARY
OF THE AIR FORCE

Two
F-100-PW-220
Pratt & Whitney

Feb 92 (AFG 2, Vol-1, Addn 61) (69 of 228)

F-15C (220 engine)
MISSION AND DESCRIPTION

Navy Equivalent: None
Manufacturer's Model: 199-1C

The F-15C is a single-place, land based, twin jet, high performance air superiority fighter. The principle mission of the F-15C is to assure decisive supremacy in the air. The airplane has the additional capability to perform an attack mission with conventional externally mounted weapons and missiles. Basic armament is an M61A1 gun and four air-to-air Sparrow missiles. The M61A1 gun is mounted in the right hand wing root fillet, all of the engine inlet while the missiles are carried on the fuselage on corner mounted submerged racks. A fuselage centerline store station plus inner wing store stations are provided for carriage of either 610 gallon fuel tanks or air-to-ground weaponry. The airplane is capable of being refueled in-flight.

Special features of the F-15C are swept wings and tails, twin vertical tails, all-moving differentially controlled horizontal tails, automatically controlled external compression engine air inlets with three overhead ramps, and trailing edge flaps for low speed operations. Lateral control is achieved by the differentially controlled horizontal tails in combination with the ailerons.

The avionics subsystems provide the capability for communications, navigation, identification, detection threat warning, armament control, attack steering, and computational functions required during mission operations. The Fire Controlled Systems (FCS) provides an effective weapons systems capability for visual and all-weather air-to-air and air-to-ground missions. Provisions for a Tactical Electronics Warfare System (TEWS) are provided.

Equipment includes a pressurized cockpit with an ACES II ejection seat, liquid oxygen system, and anti-G non-pressure suit provisions.

Development

Contract: 
First Flight: June 1985
First Squadron Delivery: June 1985

BOMBS

See STOREeloadings, Page 9.

GUNS

One gun mounted in right hand wing root fillet aft of the engine inlet.

Type: M61A1
Size: 20 mm
Rds: 940
# Loading and Performance — Typical Mission

## Takeoff Loading Condition

<table>
<thead>
<tr>
<th>I: Air Superiority</th>
<th>II: Close Air Support</th>
<th>III: Counter Air</th>
<th>IV: Counter Air</th>
<th>VI: Area Intercept</th>
<th>VII: Ferry Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4) AIM-7F</td>
<td>(16) MK-82</td>
<td>(4) AIM-7F</td>
<td>(2) MK-84</td>
<td>(4) AIM-7F</td>
<td>Clean + (3) Ext Tanks</td>
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<tr>
<td><strong>TAEKOFF WEIGHT</strong></td>
<td><strong>(lb)</strong></td>
<td><strong>(kg)</strong></td>
<td><strong>(lb)</strong></td>
<td><strong>(kg)</strong></td>
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<tr>
<td>Fuel (JP-4, 6.5 lb/gal.)</td>
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<td>54,333</td>
<td>50,365</td>
<td>54,949</td>
<td>45,713</td>
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<td>Internal</td>
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<td>External</td>
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<tr>
<td>Payload (missiles)</td>
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<td>—</td>
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<tr>
<td>Payload (bombs)</td>
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<td>—</td>
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<tr>
<td>Wing loading (lb/ft²)</td>
<td>75.2</td>
<td>89.4</td>
<td>82.8</td>
<td>90.4</td>
<td>75.2</td>
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<tr>
<td>Stall speed (power off, flaps up) (kt)</td>
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<td>147</td>
<td>142</td>
<td>148</td>
<td>135</td>
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<tr>
<td>Take-off ground run at SL (ft)</td>
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<td>2,250</td>
<td>2,800</td>
<td>3,000</td>
<td>2,250</td>
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<tr>
<td>Take-off ground run at FL (ft)</td>
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<td>3,000</td>
<td>2,800</td>
<td>2,800</td>
<td>3,000</td>
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<tr>
<td>Rate of climb at SL (ft/min)</td>
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<td>1,250</td>
<td>1,250</td>
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<tr>
<td>Rate of climb at SL (1,000 ft/min) (ft/min)</td>
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<td>1,250</td>
<td>1,250</td>
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<tr>
<td>Service ceiling (100 fpm) (ft)</td>
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<td>6,750</td>
<td>6,750</td>
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<tr>
<td>Service ceiling (one engine out) (ft)</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
<td>45,000</td>
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</tbody>
</table>

## Combat Range

| (nm) | — | — | — | — | 1935/1214 |

## Combat Radius

| (nm) | — | — | — | — | — |

## Average Speed

| (kt) | — | — | — | — | — |

## Initial Cruising Altitude

| (ft) | — | — | — | — | — |

## Final Cruising Altitude

| (ft) | — | — | — | — | — |

## Total Mission Time

| (hr) | — | — | — | — | — |

## Combat Loading Condition

<table>
<thead>
<tr>
<th>I: Air superiority</th>
<th>II: BRU-26</th>
<th>III: AIM-7F</th>
<th>IV: AIM-7F</th>
<th>V: AIM-7F</th>
<th>VI: Pylon</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4) AIM-7F</td>
<td>(3)</td>
<td>(2) Wing Pylons</td>
<td>(4) AIM-7F</td>
<td>(3) Pylons</td>
<td>(4) AIM-7F</td>
</tr>
</tbody>
</table>

## Combat Weight

| (lb) | — | — | — | — | — | — |

## Combat Altitude

| (ft) | — | — | — | — | — | — |

## Combat Speed

| (knots) | — | — | — | — | — | — |

## Combat Climb

| (ft/min) | — | — | — | — | — | — |

## Combat ceiling (500 fpm)

| (ft) | — | — | — | — | — | — |

## Service ceiling (100 fpm)

| (ft) | — | — | — | — | — | — |

## Max. rate of climb at SL

| (ft/min) | — | — | — | — | — | — |

## Max. speed at 45,000 ft

| (knots) | — | — | — | — | — | — |

## Max. speed at 35,000 ft

| (knots) | — | — | — | — | — | — |

## LANDING WEIGHT

| (lb) | — | — | — | — | — | — |

## Approach speed (flaps down)

| (knots) | — | — | — | — | — | — |

## Ground roll at SL

| (knots) | — | — | — | — | — | — |

## Total from FL

| (knots) | — | — | — | — | — | — |

## Performance Basis:

- Contractors June 1986 status
- Climbing speeds per TO 1F-15A-1
- Structural limit
- Minimum power
- Detailed description of range and radius missions are given on page 7
- Maximum power
- Mission time/loss time
- External fuel tanks retained/dropped
- Allows for weight reduction during ground operation and climb

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NOTES

Formula: Radius Mission I (Air Superiority)

A. Takeoff and Acceleration Fuel Allowance (Sea Level, Standard Day)
   1. Ground Operation — 6 min at Thrust to Weight Ratio T/W = 0.2
   2. Accelerate to Mach 0.3 at Maximum Thrust — No Distance Credit

\[ \Delta \text{Fuel} = \frac{\text{mV} (W_0 - W_1)}{2 (T - D)} \]

3. Accelerate From Mach 0.3 to Initial Climb Speed at Military Thrust — No Distance Credited

B. Military Thrust Climb From Sea Level to Optimum Cruise Altitude

C. Cruise Out at Speed and Altitude for Optimum Range (Climb + Cruise = 200 NM)

D. Descend to 10,000 ft — No Credit for Fuel or Distance

E. Dash to Target Area at 10,000 ft at Mach 0.85

F. Combat Fuel Allowance: Equals Fuel Required to Attain 144,000 lb of Maneuver Energy at 10,000 ft at Mach 0.9 Using Maximum Thrust

\[ \Delta \text{Fuel} = 144,000 \times \frac{\text{w}}{P_e} \]

(Calculated Using a Clean Aircraft With 50% Total Internal Fuel, P_e at 1.0 g Flight, Retain Missiles and Ammo After Combat)

G. Dash Back at 10,000 ft at Mach 0.85

H. Military Thrust Climb From 10,000 ft to Optimum Cruise Altitude

I. Cruise Back at Speed and Altitude for Optimum Range (Climb + Cruise = 200 NM)

J. Descend to Sea Level — No credit for Fuel or Distance

K. Reserves: 20 min at Speed for Maximum Endurance at Sea Level, Both Engines Operating

Formula: Radius Mission II (Close Air Support) (Continued)

2. Accelerate to Mach 0.3 at Maximum Thrust — No Distance Credit

\[ \Delta \text{Fuel} = \frac{\text{mV} (W_0 - W_1)}{2 (T - D)} \]

3. Accelerate From Mach 0.3 to Initial Climb Speed at Military Thrust — No Distance Credited

B. Military Thrust Climb From Sea Level to 5000 ft

C. Cruise Out to Station at Speed for Optimum Range at 5000 ft (Climb + Cruise = 100 NM)

D. Loiter for Specific Time at 5000 ft at Speed for Maximum Endurance

E. Combat Fuel Allowance Equals Fuel Required to Attain 50,000 lb of Maneuver Energy at 5000 ft at Mach 0.9 Using Maximum Thrust

\[ \Delta \text{Fuel} = 50,000 \times \frac{\text{w}}{P_e} \]

(Calculated Using a Clean Aircraft with 50% Total Internal Fuel, P_e at 1.0 g Flight)

F. Initiate Search for Target and Drop Stores (Pylons, Racks, and Ammo Retained)

G. Cruise Back to Base (100 NM) at Speed for Optimum Range at 5000 ft

H. Descend to Sea Level — No Credit for Fuel or Distance

I. Reserves: 20 min at Speed for Maximum Endurance at Sea Level, Both Engines Operating, Plus 5% of Initial Fuel Load

Formula: Radius Mission III and IV (Counter Air)

A. Takeoff and Acceleration Fuel Allowance (Sea Level, Standard Day)

1. Ground Operation — 6 min at Thrust to Weight Ratio T/W = 0.2

2. Accelerate to Mach 0.3 at Maximum Thrust — No Distance Credit

\[ \Delta \text{Fuel} = \frac{\text{mV} (W_0 - W_1)}{2 (T - D)} \]

(Continued on page 8)
NOTES

3. Accelerate From Mach 0.3 to Initial Climb Speed at Military Thrust — No Distance Credited
B. Military Thrust Climb From Sea Level to Optimum Cruise Altitude
C. Cruise Out at Speed and Altitude for Optimum Range
D. Descend to 10,000 ft — No Credit for Fuel or Distance
E. Combat Fuel Allowance: Equals Fuel Required to Attain 60,000 ft of Maneuver Energy at 10,000 ft at Mach 0.7 Using Military Thrust

\[ \Delta F = 60,000 \times \frac{w}{P_f} \]

(Calculated Using a Clean Aircraft With 50% Total Internal Fuel. \( P_f \) at 1.0 g Flight)

F. Drop Stores (Retain Pylons, Racks, and Ammo)
G. Military Thrust Climb From 10,000 ft to Optimum Cruise Altitude
H. Cruise Back at Speed and Altitude for Optimum Range
I. Descend to Sea Level — No Credit for Fuel or Distance
J. Reserves: 20 min at Speed for Maximum Endurance at Sea Level, Both Engines Operating Plus 5% of Initial Fuel Load

Formula: Radius Mission V (Area Intercept) (Continued)

G. Cruise Back at Speed and Altitude for Optimum Range
H. Descend to Sea Level — No Credit for Fuel or Distance
I. Reserves: 20 min at Speed for Maximum Endurance at Sea Level, Both Engines Operating, Plus 5% of Initial Fuel Load (This Mission Includes a 5% Increase in Fuel Consumption as a Service Tolerance)

Formula: Range Mission VI (Ferry)

A. Range Free Allowance for Ground Operation, Takeoff, and Acceleration to Climb Speed Includes Fuel for 5 min at Maximum Continuous Thrust at Sea Level Static
B. Military Thrust Climb From Sea Level to Optimum Cruise Altitude
C. Cruise Out at Speed and Altitude for Optimum Range Until Only Reserve Fuel Remains
D. Descend to Sea Level — No Credit for Fuel or Distance
E. Reserves: 20 min at Speed for Maximum Endurance at Sea Level, Both Engines Operating, Plus 5% of Initial Fuel Load (This Mission Includes a 5% Increase in Fuel Consumption as a Service Tolerance)

General Mission Notes:

1. JP-4 Fuel at 6.5 lb/gal
2. Ammunition is Included in all Gross Weights
3. Maximum Continuous thrust is Defined as 85% of Military Thrust
4. Air Superiority, Close Air Support, and Counter Air Missions are F-15 Request for Proposal (RFP) Missions While the Area Intercept and Ferry Range Missions are MIL-C-5011A Type Missions

Data Reference: Contractor's Data Dated June 1986

Revision Basis: Initial Issue

F-15C (220 engine)
# External Store Loading — Supplemental

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<td>MK-20 Rockeye</td>
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<td>Miscellaneous Stores</td>
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ELECTRONICS (Continued from page 3)

Comm-Nav-Identification System
Integrated Comm/Nav/Ident Panel
Comm/Nav/Ident Antenna Group
KY-58 Control Panel
Automatic Direction Finder Set
UHF Receiver/Transmitter
IFF Interrogator Receiver/Transmitter
IFF Transponder
IFF Reply Evaporator
TACAN Receiver/Transmitter
Instrument Landing System Receiver
Secure Speech .................. KY-58
Interrogation Computer ... KIR-1A/TSEC
Cryo Computer ............. KIT-1A/TSEC
Antil Jam Comm (Prov)
JTIDS (Prov)

Flight Control
Auto Flight Control Set

Flight Instruments
Airspeed Mach Indicator
Altitude Indicator
Vertical Speed Indicator
Angle-of-Attack Indicator

Propulsion Subsystem
Air Inlet Controller System

Navigation System
Magnetic AZ, Detector Sensor
Inertial Navigation Set
Altitude and Heading Reference Set
Air Data Computer
AOA Sensor
Total Temperature Probe
Overspeed Detection Set

Fire Control System
Programmable Armament Control Set
APG-63/APG-70 Radar Set
Lead Computing Gyro Unit

Penetration Aid (TEWS) System
Countermeasures Dispenser
Radar Warning Receiver Set
Internal Countermeasures Set
TEWS Pod Provisions
Electronic Warfare Warning Set
Interference Blanker Unit
Tactical Information System (Prov)

Central Computer

Control and Display System
Head Up Display Set
Vertical Situation Display Set
Horizontal Situation Display Set
Altitude Director Indicator
Video Tape Recorder
Multipurpose Color Display Unit
Data Transfer Module