Standard Aircraft Characteristics

NAVY MODEL
F-8J
AIRCRAFT

THIS MANUAL SUPERSEDES NAVAIR 00-110AF8-7
DATED JANUARY 1970 WHICH SHOULD BE DESTROYED
IN ACCORDANCE WITH APPLICABLE SECURITY REGULATIONS

PUBLISHED BY DIRECTION OF THE
COMMANDER OF THE NAVAL AIR SYSTEMS COMMAND

MARCH 1973
NAVAIR 01-110AF8-7

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STANDARD AIRCRAFT CHARACTERISTICS

F-8J "CRUSADER"

VOUGHT AERONAUTICS
DALLAS, TEXAS

MARCH 1973
POWER PLANT

Engine ........................................... J57-P-420
Augmentation ................................. Afterburning
Manufacturer .......................... Pratt and Whitney
Length .................................. 269.52 inches
Diameter ................................ 40.44 inches
Specification ......................... N-6141 (14 July 1969)
Compressor .............................. Axial Flow

RATINGS
Specification Thrust Ratings (sea level static)
maximum** .......................... 19,600 lbs.
(15 minute limit in flight, and 5 minute limit in takeoff and ground operation)**
military ................................ 12,400 lbs.
(normal) .................................. 9,150 lbs.
*With afterburning
**Additional limitations noted in NATOPS Flight Manual

MISSION AND DESCRIPTION

The F-8J airplane is a single-seat, carrier or land-based jet fighter designed to maintain air superiority during task force strikes and to deliver, as an attack airplane, a large number of stores of various types and sizes. The airplane is a re-manufactured F-8E airplane with the primary improvements: (1) J57-P-420 engine, (2) increased service life wing, (3) improved landing and arresting gear, (4) external fuel provisions, (5) larger horizontal tail, (6) double hinge line leading edge droop in combination with a blowing type of boundary layer control (BLC) system in the upper leading edge surface of the ailerons and inboard flaps for increased high lift capability in the low speed flight regime, (7) AN/APO 124 radar for improved detection and attack capability, and (8) AN/ASA-62 Missile Acquisition Programm to allow launching of AIM-9D missiles with lead on the target. The basic F-8J airplane is the same externally as the F-8E airplane except for the changes resulting from the incorporation of BLC; double wing leading edge droop, the larger horizontal tail, decreased wing incidence with the wing up, and increased aileron and flap deflections in the landing condition.

ELECTRONICS

UHF Command Radio ................. AN/ARC-51A
Speech Security Equipment .............. KY-26/TSEC
ADF .................................. AN/ARA-50
TACAN ................................ AN/ARN-52(V)
IFF .................................. AN/APX-72
IFF Mode 4 Computer ................. KIT-1A/TSEC
Radio Altimeter ..................... AN/APN-22
Altitude Encoding Computer ....... CPU-46A/A-22
Gyro Stabilized Magnetically
Stereed Compass ...................... MA-1
Autopilot ............................ CV/AES-6
Armament Control System .............. AN/AWG-4
Includes AN/APO-124A Radar Set,
EX-16 Computer Group,
CP-742A/APO Devoted Pursuit
Computer and AN/ASA-63
Missile Acquisition Programm)
EOM .................................. SHOEHORN
( Includes AN/AQ-51A/100, AN/APR-27,
AN/ALE-29A and AN/APR-30)
FUSE Control ......................... AN/AIW-2A
Approach Power Compensating System
Inflight Monitor Tester ............ TS 1843

DIMENSIONS

Wing
Area .................................. 379 sq. ft.
Span .................................. 38' 8"
M.A.C. .................................. 141.4"
Sweepback 1/4 chord .................. 42.9"
Length .................................. 54' 5.75"
Height .................................. 15' 9.1"
Tread .................................. 9' 8"

SERVICE

LOADING ...................................... LB  LT
Empty ........................................ 19,815
Basic (Guns only) ...................... 20,691
Design ..................................... 26,000
Combat ...................................... 26,793
MAX T.O., Field ......................... 34,000
MAX Land., Field ....................... 26,000
MAX Catapult ......................... 35,000
MAX Land., Carrier ...................... 25,000

FUEL AND OIL

GALS .................................... NO. TANKS ... LOCATION
513 ...................................... 3 ...... Fuselage, blader, main system
263 ...................................... 5 ...... Fuselage, blader, transfer system
572 ...................................... 1 ...... Wing, integral, transfer system
Fuel capacity (total usable) ...... 1348 Gallons
Fuel specification ................... MIL-F-5624C
Fuel Grade .............................. JP-5

OIL

Oil capacity (total usable) ....... 6.1 Gallons
Oil specification .................... MIL-L-23699

ORDNANCE

NO. ................................... DESCRIPTION ................ LOCATION
4 ..................................... 20-MM Aircraft Guns,........................ Fuselage
 .......................................................... MK-12 
 .......................................................... Front Section
500 ..................................... 20-MM Ammunition Rounds

EXTERNAL

2 or 4 Fuselage Pylons for Each Side of
Sidewinders or Fuselage
LAU-23/A, LAU-35/A
2 Round Zuni Launchers

2 Wing Mounted Pylons* (Wet or Dry)

*See STORE LOADING for stores carried
### Take-off Loading Condition

<table>
<thead>
<tr>
<th>HEIGHT IN MISSION (ft)</th>
<th>WING LOAD (lb/ft²)</th>
<th>STALL SPEED (knots)</th>
<th>TAKEOFF GRD. RUNOVER 50 FT OBS = CALM WIND, SLIGHT</th>
<th>TAKEOFF GRD. RUNOVER 50 FT OBS = CALM WIND, LIGHT</th>
<th>BRIT WAX SPEED/ALTITUDE (kn/min)</th>
<th>MRT RATE OF CLIMB AT SL</th>
<th>MRT TIME SL TO 3000 FT</th>
<th>MRT SERVICE CEILING 1090 FT</th>
<th>COMBAT RANGE (NM)</th>
<th>AVERAGE CRUISING SPEED (kn)</th>
<th>CRUISING ALTITUDE (ft)</th>
<th>AVERAGE CRUISING SPEED/WITH IFR</th>
<th>IFR FUEL TRANSFERRED/DISANCE FROM BASE (lb)</th>
<th>VISA VISIBILITY (NM)</th>
<th>LOITER TIME 12 W/ MISEMED (HR)</th>
<th>IFR FUEL TRANSFERRED/DISANCE FROM BASE (lb)</th>
<th>ACCELERATION AT 3 MAX A89 FT/SEC (G)</th>
<th>DAY CBT INCR OPERATIVE</th>
</tr>
</thead>
</table>

### Performance Summary

#### General Purpose Mission

- **Weight**: 32,850 lb
- **Fuel**: 32,850 lb

#### General Purpose Fighter Mission

- **Weight**: 32,850 lb
- **Fuel**: 32,850 lb

#### General Purpose Fighter Mission 2 (2 Siders)

- **Weight**: 32,850 lb
- **Fuel**: 32,850 lb

#### General Purpose Fighter Mission 3 (4 Siders)

- **Weight**: 32,850 lb
- **Fuel**: 32,850 lb

#### Close Air Support Mission

- **Weight**: 32,850 lb
- **Fuel**: 32,850 lb

#### Close Air Support Mission 2 (8 Mk 82 SABREXES)

- **Weight**: 32,850 lb
- **Fuel**: 32,850 lb

#### Close Air Support Mission 3 (8 Mk 82 SABREXES)

- **Weight**: 32,850 lb
- **Fuel**: 32,850 lb

### Notes

1. **Payload Includes 500 Rounds of Ammunition. Does Not Include External Fuel Tanks.**
2. **Field Takeoff Configuration.**
3. **Time-to-climb considers weight reduction due to ground operation and fuel used to climb.**
4. **Close Air Support Radius is for 1 Hour loiter time on station.**
5. **Refuel Altitude is Determined with Refueling to Full Internal Fuel Capacity.**
6. **Mission Time Excludes Time for Warmup and Takeoff and 20-Minute loiter at Sea Level.**
7. **Refuel Altitude is 34,000 ft.**
8. **Refuel Altitude is 34,000 ft.**
9. **Refuel Altitude is 34,000 ft.**
10. **Refuel Altitude is 26,462 ft.**

### March 1973
Minimum Wind Over Deck Required for Catapulting

- Sea Level
- Standard Day
- C-11A Catapult
- Maximum Thrust
- Airplane Rotation to 0.90 CL\textsubscript{MAX}
- Landing Condition (BLC-ON)
- CG at 18% MGC

Minimum Wind Over Deck Required for Arresting

- Sea Level
- Standard Day
- MK 7 MOD 1.2 Arresting Gear
- Based on Flight Manual Approach Speed
- Landing Condition (BLC-ON)

Wave-off Acceleration

- Sea Level
- Standard Day
- Military Thrust
- Landing Condition (BLC-ON)
- Four Sidewinders

Optimum Carrier Approach Speeds

- Sea Level
- Standard Day
- CG at 22% MGC
- FUSELAGE ANGLE OF ATTACK ~ 8.0\degree
- Landing Condition (BLC-ON)
### Mission Summary—Alternate Loadings

#### External Store Loading

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>2 MK-84 G.P.</td>
<td>34,853</td>
<td>174</td>
<td>1.73</td>
<td>265</td>
<td>1.34</td>
<td>429</td>
<td>1.87</td>
<td>224</td>
<td>1.35</td>
<td>319</td>
<td>1.48</td>
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<tr>
<td>a = 4.84 FT/SEC/SEC²</td>
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<tr>
<td>8 MK-81 SNAKEYES</td>
<td>33,767</td>
<td>125</td>
<td>1.56</td>
<td>212</td>
<td>1.20</td>
<td>361</td>
<td>1.66</td>
<td>197</td>
<td>1.29</td>
<td>260</td>
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<td>a = 5.19 FT/SEC/SEC²</td>
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<tr>
<td>8 MK-82 SNAKEYES</td>
<td>35,000</td>
<td>61</td>
<td>1.35</td>
<td>147</td>
<td>0.93</td>
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<td>1.33</td>
<td>159</td>
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<td>186</td>
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<tr>
<td>8 MK-82 SNAKEYES</td>
<td>35,927</td>
<td>92</td>
<td>1.42</td>
<td>195</td>
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<td>1.56</td>
<td>189</td>
<td>1.24</td>
<td>240</td>
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<tr>
<td>2 MK-83</td>
<td>32,883</td>
<td>200</td>
<td>1.83</td>
<td>276</td>
<td>1.39</td>
<td>450</td>
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<td>332</td>
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<tr>
<td>8 FUSELAGE ZUNI²</td>
<td>32,010</td>
<td>181</td>
<td>1.77</td>
<td>257</td>
<td>1.34</td>
<td>440</td>
<td>1.88</td>
<td>218</td>
<td>1.37</td>
<td>313</td>
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</tbody>
</table>

#### Notes

1. Mission time excludes time for warmup and 20-minute loiter time at sea level.
2. Acceleration, $a$, is at 0.90 $C_{L_{\text{max}}}$ with combat thrust at 90%.
3. MK32 warhead on Zuni rockets.

March 1973
## STORE LOADING

<table>
<thead>
<tr>
<th>TYPE OF LOADING</th>
<th>STATIONS 1 &amp; 4</th>
<th>UNIT WT. (INT/STORE) LB.</th>
<th>UNIT DRAG INDEX</th>
<th>STATIONS 2 &amp; 3</th>
<th>UNIT WT. (W/T/STORE) LB.</th>
<th>UNIT DRAG INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>RACKS</td>
<td></td>
<td></td>
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<tr>
<td>NO CARRIED PER STATION</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>AIR-TO-GROUND ROCKETS + MISSILES</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>MAXIMUM NO. CARRIED PER STATION</td>
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<tr>
<td>GENERAL PURPOSE BOMBS</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MAX NO. CARRIED PER STA</td>
<td></td>
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</tbody>
</table>

### Notes:
- **MAX NO. CARRIED PER STA:**
  - F-111: 8
  - F-16: 10
  - F-18: 10
- **MAX NO. CARRIED PER STA:**
  - F-111: 8
  - F-16: 10
  - F-18: 10
- **MAX NO. CARRIED PER STA:**
  - F-111: 8
  - F-16: 10
  - F-18: 10
- **MAX NO. CARRIED PER STA:**
  - F-111: 8
  - F-16: 10
  - F-18: 10

**SOURCES:**
- **SOURCES:**
  - NAVWEPS 100041 (Rev. 7-69)

**DATE:**
- **DATE:**
  - MARCH 1973
### Store Loading

<table>
<thead>
<tr>
<th>Type of Loading</th>
<th>Stations 1 &amp; 4 (WT/STORE)</th>
<th>Unit Drag Index</th>
<th>Stations 2 &amp; 3 (WT/STORE)</th>
<th>Unit Drag Index</th>
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<tbody>
<tr>
<td><strong>Cluster Bombs</strong></td>
<td></td>
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<tr>
<td>Max. No. Carried Per STA</td>
<td>A MK 20 ROCKETS II</td>
<td>47</td>
<td>10.5</td>
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<tr>
<td></td>
<td>CBU 24</td>
<td>20</td>
<td>23.0</td>
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<tr>
<td></td>
<td>CBU 26</td>
<td>20</td>
<td>23.0</td>
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<td>CBU 42</td>
<td>20</td>
<td>23.0</td>
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<td></td>
<td>MK 24</td>
<td>57</td>
<td>4.6</td>
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<tr>
<td></td>
<td>MK 26</td>
<td>57</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MK 45 MOD 1</td>
<td>57</td>
<td>3.3</td>
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<tr>
<td><strong>Practice Bombs</strong></td>
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<tr>
<td>Max. No. Carried Per STA</td>
<td>A MK 24 MOD 2, 3 &amp; 4</td>
<td>27</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MK 45 MOD 1</td>
<td>27</td>
<td>3.3</td>
<td></td>
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<tr>
<td><strong>FLARES</strong></td>
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<tr>
<td>Max. No. Carried Per STA</td>
<td>A MK 24 MOD 2, 3 &amp; 4</td>
<td>27</td>
<td>3.3</td>
<td></td>
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<tr>
<td></td>
<td>MK 45 MOD 0</td>
<td>27</td>
<td>3.3</td>
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<tr>
<td><strong>External Fuel Tanks</strong></td>
<td>AERO 10</td>
<td>208</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Includes pylon
2. Or AERO 26, 1 EBR
3. Does not include pylon and AERO 7A-1 EBR
4. Contains 7.25 in. FFAV
5. Contains TRG 5.0 in. FAAZI ROCKETS.
6. Contains fourteen 2.75 in. FFAV
7. Contains four 5.0 in. FAAZI ROCKETS.
8. The LAU 33A was designed for only the lower station of the dual fuselage pylon on station 2. The LAU 33A can be used on any other dual or single pylon station.

Unit drag index reflects maximum interference drag and mechanical force drag on bombs. Refer to NATO's Flight Manual (NAVY) Model P-3B aircraft, NAVAIR 00-400-211 for loadings with smaller interference drag.

March 1973
NOTE

GENERAL PURPOSE AND ESCORT FIGHTER

WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust and 1 minute with maximum thrust at sea level.

CLIMB: On course to cruise altitude with military rated thrust.

CRUISE-OUT: At altitudes and speeds for maximum range.

ACCELERATE: With maximum thrust at 36000 feet from cruise speed to 1.5 M.

COMBAT FUEL ALLOWANCE: At 36000 feet for 2 minutes at 1.5 M. (No distance credited)

CRUISE-BACK: At altitudes and speeds for maximum range.

RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 per cent of initial fuel load.

GENERAL PURPOSE FIGHTER WITH IN-FLIGHT REFUEILING

(A3B TANKER)

WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust and 1 minute with maximum thrust at sea level.

CLIMB: On course to cruise altitude with military rated thrust.

CRUISE-OUT: At altitudes and speeds for maximum range.

DESCEND to refueling altitude: 35,000 ft or best cruise altitude with full internal fuel, whichever is less (no fuel used, no distance gained).

RENDEZVOUS: 15 minutes at maximum endurance airspeeds.

FUEL TRANSFER: No fuel used, no distance gained.

REFUEL POINT: Limited to return of aircraft to base with normal reserve if contact for refueling is not made or refuel point not to exceed 80% of total radius.

CRUISE: Continue cruise-out at altitudes and speeds for maximum range.

The remainder of the problem is the same as the General Purpose Fighter Problem.

COMBAT AIR PATROL

WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust and 1 minute with maximum thrust at sea level.

CLIMB: On course to cruise altitude with military rated thrust.

CRUISE: To a point 150 nautical miles from base at altitudes and speed for maximum range.

DESCEND: To 35000 ft, no fuel used, no distance gained.

LOITER: On station at speed for maximum endurance at 35000 ft altitude.

COMBAT FUEL ALLOWANCE: Accelerate with maximum thrust at 35000 feet from loiter speed to 1.5 M. 2 minutes at maximum thrust at 1.5 M at 35000 feet. (No distance credited)

CRUISE-BACK: 150 nautical miles to base at altitudes and speeds for maximum range.

RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 per cent initial fuel load.

CLOSE AIR SUPPORT

WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust and 1 minute with maximum thrust at sea level.

CLIMB: On course to cruise altitude with military-rated thrust.

CRUISE-OUT: At altitudes and speeds for maximum range.

DESCEND: To 5000 ft, no fuel used, no distance gained.

LOITER: One hour on station at speed for maximum endurance at 5000-FT altitude. Drop stores at end of loiter.

CRUISE-BACK: At altitudes and speeds with military-rated thrust.

RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 per cent initial fuel load.

LOADING CONDITION COLUMN NUMBER
NOTES

HI-LO-LO-HI
WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust and 1 minute with maximum thrust at sea level.
CLIMB: On course to cruise altitude with military rated thrust.
CRUISE-OUT: At altitudes and speeds for maximum range.
DESCEND: To sea level (no fuel used, no distance gained).
RUN IN: 100 n.mi. at sea level at speed for maximum range.
COMBAT: 5 minutes at military rated thrust (stores on, no distance gained). Drop stores.
RUN OUT: 100 n.mi. at sea level at speed for maximum range.
CLIMB: On course to cruise altitude with military rated thrust.
CRUISE-BACK: At altitudes and speeds for maximum range.
RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 percent initial fuel load.

HI-HI-HI
WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust and 1 minute with maximum thrust at sea level.
CLIMB: On course to cruise altitude with military rated thrust.
CRUISE-OUT: At altitudes and speeds for maximum range.
DESCEND: To altitude for maximum military thrust Mach number (no fuel used, no distance gained).
COMBAT: 5 minutes at military rated thrust at altitude for maximum Mach number (stores on, no distance gained). Drop stores. Gums are not fired.
CLIMB: On course to cruise altitude with military rated thrust.
CRUISE-BACK: At altitudes and speeds for maximum range.
RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 percent initial fuel load.

LO-LO-LO
WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust and 1 minute with maximum thrust at sea level.
CLIMB: On course to cruise altitude with military rated thrust.
CRUISE-OUT: At sea level at speed for maximum range.
COMBAT: 5 minutes at military rated thrust (stores on, no distance gained). Drop stores.
CRUISE BACK: At sea level at speed for maximum range.
RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 percent initial fuel load.

HI-LO-HI
WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust and 1 minute with maximum thrust at sea level.
CLIMB: On course to cruise altitude with military rated thrust.
CRUISE-OUT: At altitudes and speeds for maximum range.
DESCEND: To sea level (no fuel used, no distance gained).
RUN IN: 100 n.mi. at sea level at speed for maximum range.
COMBAT: 5 minutes at military rated thrust (stores on, no distance gained). Drop stores.
CLIMB: On course to cruise altitude with military rated thrust.
CRUISE-BACK: At altitudes and speeds for maximum range.
RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 percent initial fuel load.