Standard Aircraft Characteristics

F-89C
SCORPION
Northrop

TWO J35-A-21B
ALLISON

F-89C
(-21B ENGINES)
F-89C
(-21B ENGINES)
POWER PLANT
No. & Model... *(2) J35-A-21B
Mfr. ... Allison
Engine Spec No. ... 284 A
Type. ... Axial
Length ... 193.5"
Diameter ... 37.0"
Weight (Dry)... 2635 lb
Tailpipe ... Auto, Two-Position
Augmentation ...... Afterburning

*See page 6, note (c)

ENGINE RATINGS
S.L. Static LB RPM MIN
Max: ... *6800 - 7000 - 5
Mil: ... 5100 - 7000 - 10
Nor: ... 4400 - 7000 - Cont.

*With afterburner operating

NOTE: Values are for engine with fixed inlet screens

DIMENSIONS
Wing
Span* ... 56.0'
Incidence (root) ... 10°
(tip) ... 15°
Dihedral ... 4°
Sweepback (LE) ... 60°
Length ... 53.5'
Height ... 17.5'
Tread ... 21.9'

*Includes non-jettisonable tip tanks.

Mission and Description
Navy Equivalent: None

The principal mission of the F-89C is the interception and destruction of hostile aircraft by day or night, under all weather conditions.

This airplane carries a crew of two (pilot and radar operator) seated in tandem in a cabin having selective automatically controlled heating and pressurization facilities. It is equipped with a full power control system yaw stabilizer, all-weather interception radar, Instrument Landing System, Zero Reader, thermal anti-icing, split alleron type speed brakes, double slotted wing flaps, ejection seats and anti-G suit provisions. An E-1 Fire Control System is utilized.

Development

The F-89C is similar to the F-89B except for the addition of tip tank fuel dumping system, selective cabin air conditioning and pressurizing system, and aerodynamically balanced elevators.

First Flight (XF-89) ... Aug 48
First Flight Prototype (YP-89A) ... Nov 49
First Acceptance (F-89C with J35-21B engine) ... Sep 51
Production Completed ... Jan 52

WEIGHTS
Loading LB L.F.
Empty ... 24,857(A)
Basic ... 26,299(A)
Design ... 35,636 ... 5.67
Combat (Point) ... 32,878 ... 5.67
Combat (Area) ... 32,310 ... 5.67
Max. T.O. ... 37,584 ... 3.67
Max. Land ... 33,658
(A) Actual
† For Basic Mission
† Limited by mission
† Limited by sinking speed

FUEL
Location No. Tanks Gal
Wg, inbd ... 2 ... 214
Wg, outbd ... 2 ... 535
Fuel* ... 2 ... 202
Wg, ext ... 2 ... 608
Total ... 1593
Grade ... JP-4
Specification ... MIL-F-5624A

OIL
Fus, eng ... 2 ... (tot) 10.6
Grade ... 1010
Specification ... MIL-O-6681

*Self-Sealing

GUNS
No. Type Size Rds ea Location
6 M-24A-1 20mm 200 Fus, none

ROCKETS
NONE

BOMBS
NONE

ELECTRONICS
UHF Command ... AN/ARC-27
VHF Command ... AN/ARC-3
VHF Navigation ... AN/ARN-14
Glide Path ... AN/ARN-5B
Radio Compass ... AN/ARN-6
Radio Ranging ... AN/APG-33
IFF ... AN/APX-6
Interphone ... AN/AIC-2
Marker Beacon ... AN/ARN-12

† Installed in aircraft AF 50-741 thru 50-759.
### Loading and Performance—Typical Mission

#### Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Point Intercept</th>
<th>Area Intercept</th>
<th>Escort</th>
<th>Ferry Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Take-off Weight</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel at 6.5 lb/gal. (JP-4) (lb)</td>
<td>37,584</td>
<td>37,584</td>
<td>37,584</td>
<td>36,834</td>
</tr>
<tr>
<td>Payload (ammunition) (lb)</td>
<td>10,075</td>
<td>10,075</td>
<td>10,075</td>
<td>10,075</td>
</tr>
<tr>
<td>Wing loading (lb/sq ft)</td>
<td>58.9</td>
<td>58.9</td>
<td>58.9</td>
<td>57</td>
</tr>
<tr>
<td>Stall speed (power off) (kn)</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>111</td>
</tr>
<tr>
<td>Take-off ground run at S.L. (ft)</td>
<td>2550</td>
<td>2550</td>
<td>2550</td>
<td>2440</td>
</tr>
<tr>
<td>Take-off to clear 50 ft (ft)</td>
<td>3580</td>
<td>3580</td>
<td>3580</td>
<td>3430</td>
</tr>
<tr>
<td>Rate of climb at S.L. (fpm)</td>
<td>9460</td>
<td>4220</td>
<td>4000</td>
<td>4190</td>
</tr>
<tr>
<td>Rate of climb at S.L. (one engine out) (fpm)</td>
<td>2380</td>
<td>2380</td>
<td>2300</td>
<td>2370</td>
</tr>
<tr>
<td>Time: S.L. to 40,000 ft (min/ft)</td>
<td>9.3</td>
<td>34.5</td>
<td>7.0/20,000</td>
<td>6.8/20,000</td>
</tr>
<tr>
<td>Time: S.L. to 50,000 ft (min/ft)</td>
<td>26.1</td>
<td>13.8/30,000</td>
<td>13.4/30,000</td>
<td></td>
</tr>
<tr>
<td>Service ceiling (100 fpm) (ft)</td>
<td>50,000</td>
<td>39,600</td>
<td>37,400</td>
<td>37,800</td>
</tr>
<tr>
<td>Service ceiling (one engine out) (ft)</td>
<td>27,600</td>
<td>27,600</td>
<td>27,600</td>
<td>28,200</td>
</tr>
</tbody>
</table>

#### Combat Range

<table>
<thead>
<tr>
<th>Distance (n.mi.)</th>
<th>Point Intercept</th>
<th>Area Intercept</th>
<th>Escort</th>
<th>Ferry Range</th>
</tr>
</thead>
</table>

#### Combat Radius

- **Average speed** (kn) | 294 | 201 |
- **Initial cruising altitude** (ft) | 34,600 | 34,600 |
- **Final cruising altitude** (ft) | 37,900 | 37,900 |
- **Total mission time** (hr) | 1.51 | 1.33 | 1.76 |
- **Total Mission Time** (hr) | 1.56 |

#### Combat Weight

<table>
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<th>Distance (ft)</th>
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#### LANDING WEIGHT

<table>
<thead>
<tr>
<th>Distance (ft)</th>
<th>Point Intercept</th>
<th>Area Intercept</th>
<th>Escort</th>
<th>Ferry Range</th>
</tr>
</thead>
</table>

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**NOTES**

1. Max power
2. Military power
4. Includes 1.5 minutes for take-off and acceleration to best climb speed.
5. Allows for weight reduction during ground operation and climb.
6. Time is to service ceiling.
7. See note(b) page 6.

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**PERFORMANCE BASIS:**

(a) Data source: Based on flight tests of F-89A.

(b) Performance is based on powers shown on page 3.

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**F-89C**

(-21B ENGINES)
NOTES

FORMULA: POINT INTERCEPT MISSION I

Take-off, accelerate to best climb speed, climb to combat ceiling at maximum power, combat for 5 minutes at maximum power at combat ceiling, and loiter for the maximum available time at 35,000 ft at speeds for maximum endurance. Allowances include 2 minutes at normal power and 1 minute at maximum power at sea level for start and take-off, and 20 minutes at maximum endurance speed at sea level for reserve and landing.

FORMULA: AREA INTERCEPT MISSION II

Take-off, climb on course to cruise ceiling at military power, cruise on course at long range speed at cruise ceiling, climb on course to combat ceiling at maximum power, combat for 5 minutes, and cruise back to base at long range speed at cruise ceiling. Range free allowances include 2 minutes at normal power and one minute at maximum power at sea level for start and take-off, 5 minutes at maximum power at combat ceiling for combat, and 5% of initial fuel and 20 minutes at maximum endurance speed at sea level for reserve and landing.

FORMULA: RADIUS MISSION III

Take-off, climb on course to cruise ceiling at military power, cruise on course at long range speed at cruise ceiling, combat for 20 minutes, cruise to base at long range speed at cruise ceiling. Range free allowances include 5 minutes at normal power and one minute at maximum power at sea level for start and take-off, 5 minutes at maximum power and 15 minutes at military power at 35,000 ft. for combat, and 5% of initial fuel and 20 minutes at maximum endurance speed at sea level for reserve and landing.

FORMULA: RANGE MISSION IV

Take-off, climb on course to cruise ceiling at military power and cruise to destination at long range speed at cruise ceiling. Range free allowances include 5 minutes at normal power and one minute at maximum power at sea level for start and take-off, and 9% of initial fuel and 20 minutes at maximum endurance speed at sea level for reserve and landing.

GENERAL NOTES:

(a) For detailed planning refer to Technical Order, AN 01-15FDC-1 and other applicable technical orders.

(b) Below 20,000 ft, limit IAS - 470 kn or 0.9 Mach whichever is less. (Airplane is temporarily restricted by interim T.O., 01-15FD-173, 4 March 53 to 425 kn IAS or 0.9 Mach, which ever is less below 20,000 ft, pending structural demonstrations).

(c) This brochure covers airplanes AF 50-741 thru 50-804. Later F-89C's (AF 51-5757 thru 51-5858) have J35-A-33 or -35A engines installed.

PERFORMANCE REFERENCE:


REVISION BASIS:

Initial Issue