Standard Aircraft Characteristics

NAVY MODEL

F-8A  (F8U-1)

AIRCRAFT

(TITLE UNCLASSIFIED)

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COMMANDER OF THE NAVAL AIR SYSTEMS COMMAND

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STANDARD AIRCRAFT CHARACTERISTICS
F-8A CRUSADER

CHANCE VOUGHT
POWER PLANT
NO & MODEL..............................(1) J-57-P-4
MFR........................................Pratt & Whitney
TYPE.................................Axial Flow
LENGTH........................................250\^
DIAMETER......................................41\^A
ACCELERATION............................Afterburner

RATINGS
THrust..............................Lb.
MIL + A.R................................6,100..............S.S.L.
MIL......................................10,200..............S.S.L.
NORM......................................8,700..............S.S.L.

SPEC. NO. P&W K-1669-C

MISSION AND DESCRIPTION
The P51-5 Dayfighter is designed to maintain air superiority in daylight fair weather. It is a single-place, swept-wing airplane having a high variable-incidence wing and a low unit horizontal tail. The wing and tail arrangement permits use of a very short landing gear and results in a relatively low fuselage attitude for take-off and landing. The high wing position makes the wing readily adaptable to carrying missiles and other stores on the wing and for possible future flexible dorsal operations. The wing incorporates full span landing-edge droop and ailerons that are dropped as flaps when the wing is in the take-off and landing position.

DEVELOPMENT
First Flight.........................March 1955
Service Use........................March 1957

WEIGHTS
LOADING
BASIC......................................15,513
RADIO......................................16,171
DESIGN......................................31,440
COMBAT......................................24,995
MAX. T.O. (Field)..........................27,500
MAX. LANDING................................27,500

All weights are calculated.

FUEL AND OIL
NO. TANKS TOTAL GAL. LOCATION
3........................................214........Main Fuselage
2........................................170........10% Fuselage
1........................................589........Wing

FUEL GRADE..........................J-5-4
FUEL SPEC. applicable.............MIL-F-5624A

OIL
CAPACITY (gals)..............5.5
SPEC. applicable.............MIL-L-7808

ORDNANCE
NO. DESCRIPTION LOCATION RDL.
4........................................20mm aircraft Fuselage 500
Guns Mk.12
32........................................2.75 in. FFAR Fuselage Cl. (Internal)
Rockets
2........................................Sidewinder Wing (Internal)
Missiles

DIMENSIONS
WING
AREA....................................375 sq. ft.
SPAR....................................3\^-d\^6
Sweepback (w Chord)............32\^d\^6
LENGTH....................................50\^d\^6
HEIGHT.....................................15\^d\^6
THICK.....................................9\^d\^6

ELECTRONICS
UHF TRANSMITTER REC.............AN/ARN-27A
UHF DIRECTION FINDER.............AN/ARN-125
VHF NAVIGATION REC.............AN/ASN-146
(AN/ASN-29 ALTERNATE)
IFR TRANSMITTER.............AN/AFT-68
RADAR.....................................AN/AG-80A
COM.....................................AN/ARK-89
## PERFORMANCE SUMMARY

<table>
<thead>
<tr>
<th>TAKE-OFF LOADING CONDITION</th>
<th>(1) BASIC FIGHTER</th>
<th>(4) BASIC FIGHTER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 - 20mm GUNS</td>
<td>4 - 20mm GUNS</td>
</tr>
<tr>
<td></td>
<td>2 x 0.50 IN. PFEAR</td>
<td>2 x 0.50 IN. PFEAR</td>
</tr>
<tr>
<td>TAKE-OFF WEIGHT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>26.669</td>
<td>25.466</td>
</tr>
<tr>
<td></td>
<td>8.275</td>
<td>8.075</td>
</tr>
<tr>
<td>Payload</td>
<td>924</td>
<td>1,262</td>
</tr>
<tr>
<td>Wing loading</td>
<td>75.8</td>
<td>75.8</td>
</tr>
<tr>
<td>Stall speed - power-off</td>
<td>134.8</td>
<td>134.8</td>
</tr>
<tr>
<td>Take-off run at S.T. - calm (a) ft.</td>
<td>5,200</td>
<td>5,650</td>
</tr>
<tr>
<td>Take-off run at S.T. 45 km. wind (a) ft.</td>
<td>5,900</td>
<td>4,600</td>
</tr>
<tr>
<td>Take-off to clear 50 ft. - calm (a) ft.</td>
<td>5,120</td>
<td>6,510</td>
</tr>
<tr>
<td>Max. speed/altitude (a) km./ft.</td>
<td>590/2,000</td>
<td>570/3,500</td>
</tr>
<tr>
<td>Rate of climb at S.T. (a) fpm</td>
<td>3,950</td>
<td>3,950</td>
</tr>
<tr>
<td>Time: S.T. to 20,000 ft. (a) min.</td>
<td>4.2</td>
<td>4.2</td>
</tr>
<tr>
<td>Time: S.T. to 30,000 ft. (a) min.</td>
<td>6.8</td>
<td>8.2</td>
</tr>
<tr>
<td>Service ceiling (100 fpm) (a) ft.</td>
<td>41,100</td>
<td>41,100</td>
</tr>
<tr>
<td>Combat range</td>
<td>1,120</td>
<td>1,120</td>
</tr>
<tr>
<td>Average cruising speed km.</td>
<td>494</td>
<td>494</td>
</tr>
<tr>
<td>Cruising altitude (a) ft.</td>
<td>42,005</td>
<td>42,005</td>
</tr>
<tr>
<td>Combat radius/Mission Time n.mi./hr.</td>
<td>345/1.73</td>
<td>310/1.6</td>
</tr>
<tr>
<td>Average cruising speed km.</td>
<td>494</td>
<td>494</td>
</tr>
<tr>
<td>CAP altitude/Mission Time (b) hrs./mi.</td>
<td>771/1.72</td>
<td>730/1.40</td>
</tr>
<tr>
<td>OPR - radius/Mission Time (c) hrs./mi.</td>
<td>730/3.5</td>
<td>730/3.5</td>
</tr>
</tbody>
</table>

### COMBAT LOADING CONDITION

<table>
<thead>
<tr>
<th></th>
<th>(2) Rockets, G Shells</th>
<th>(3) Rockets, G Shells</th>
<th>(5) Rockets, G Shells</th>
<th>(6) Rockets, G Shells</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23,659</td>
<td>23,659</td>
<td>24,189</td>
<td>23,929</td>
</tr>
<tr>
<td>Engine power</td>
<td>6.960</td>
<td>6.960</td>
<td>4.960</td>
<td>4.960</td>
</tr>
<tr>
<td>Fuel</td>
<td>6.200</td>
<td>6.200</td>
<td>5.200</td>
<td>5.200</td>
</tr>
<tr>
<td>Combat speed/combat altitude km./ft.</td>
<td>880/35,000</td>
<td>593/35,000</td>
<td>989/35,000</td>
<td>875/35,000</td>
</tr>
<tr>
<td>Rate of climb/combat altitude fpm</td>
<td>10,760/35,000</td>
<td>3,000/35,000</td>
<td>9,800/35,000</td>
<td>2,500/35,000</td>
</tr>
<tr>
<td>Combat ceiling (500 fpm) ft.</td>
<td>49,200</td>
<td>49,200</td>
<td>49,200</td>
<td>49,200</td>
</tr>
<tr>
<td>Rate of climb at S.T. fpm</td>
<td>20,000</td>
<td>6,300</td>
<td>15,750</td>
<td>4,800</td>
</tr>
<tr>
<td>Max. speed at S.T. km.</td>
<td>639</td>
<td>579</td>
<td>579</td>
<td>579</td>
</tr>
<tr>
<td>Max. speed/altitude km./ft.</td>
<td>880/35,000</td>
<td>580/4,000</td>
<td>813/35,000</td>
<td>571/10,000</td>
</tr>
</tbody>
</table>

### NOTES

(A) Military Threat
(B) Combat Air Patrol - 150 n. mi. Radar
(C) Inflight Refueling = outbound only. Transfer 4,000 lbs. at 540 n. mi. out. Radius is reduced 16 n. mi. and refueling allowance is increased by 5 minutes for each additional aircraft up to a total of 4 aircraft.

**RANGE AND RADIUS:** Range and radius are based on engine specification fuel consumption increased 5%.

**SPOTTING:** A total of 21 aircraft can be accommodated in a landing spot on the flight and hangar decks of a CVA-41 class angled deck carrier (flight 4); hangar 30 airplanes.

**REASON FOR REBUILD:** Current loading and more complete flight test data.

**PERFORMANCE BASIS:** Flight test data plus wind tunnel drag for the 3 external hardpoints.


### NOTES

#### GENERAL PURPOSE AND BOCOFT FIGHTER
- **WARM-UP, TAKE-OFF, ACCELERATE**: 5 minutes with normal thrust at sea level.
- **Climb**: On course to cruise altitude with military rated thrust.
- **Cruise-Out**: At altitudes and speeds for maximum range.
- **Combat Fuel Allowance**: At 35,000 ft. for 5 minutes at maximum thrust at a velocity mid-way between WAX with maximum thrust and WAX with military thrust plus 15 minutes at WAX with military thrust.
- **Cruise-Back**: At altitudes and speeds for maximum range.
- **Reserve**: 20 minutes at speed for maximum endurance at sea level plus 5 percent of initial fuel load.

#### COMBAT AIR PATROL
- **WARM-UP, TAKE-OFF, ACCELERATE**: 5 minutes with normal 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 speeds for maximum range.
- **Loiter**: On station at speed for maximum endurance at approximate final cruise-out altitude.
- **Combat Fuel Allowance**: At 35,000 ft. for 5 minutes at maximum thrust at a velocity mid-way between WAX with maximum thrust and WAX with military thrust plus 15 minutes at WAX with military thrust.
- **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 percent of initial fuel load.

#### GENERAL PURPOSE FIGHTER WITH INFLIGHT REFUELING (A3D-2 TANKER)
- **WARM-UP, TAKE-OFF, ACCELERATE**: 5 minutes with normal thrust at sea level.
- **Climb**: On course to cruise altitude with military rated thrust.
- **Cruise-Out**: At altitudes and speeds for maximum range.
- **Refuel to 35,000 ft. Refueling Altitude**: No fuel used, no distance gained.
- **Allowance for Refueling, Hook-Up, and Flight Contingencies**: 15 minutes at maximum endurance airspeeds. (Assume no fuel used, no distance gained during transfer of fuel.)
- **Refuel Point**: Limited to return of aircraft to base with normal reserve if contact for refueling is not made.
- **Climb**: On course to cruise altitude with military rated thrust.
- **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 of loading condition column number 4.

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If JP fuel is used, the following are applicable:

1. General Purpose Fighter; guns and rockets
   - **Weight**: 382 lb.
   - **Range**: 41,000 ft.

2. Inflight Refueling; guns and rockets
   - **Weight**: 596 lb.
   - **Range**: 124,000 ft.

4. General Purpose Fighter; 2 external sidewinders
   - **Weight**: 382 lb.
   - **Range**: 76,000 ft.

4. Inflight Refueling; 2 external sidewinders
   - **Weight**: 596 lb.
   - **Range**: 112,000 ft.

**Loading Condition Column Number**

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