Standard Aircraft Characteristics

NAVIS MODEL
F-11A
AIRCRAFT

(TITLE UNCLASSIFIED)

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1 MAY 1955 IN PART AND ALL ADDENDA THERETO

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1 JULY 1967
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STANDARD AIRCRAFT CHARACTERISTICS

F-11A TIGER

GRUMMAN
POWER PLANT

NO. & MODEL: (1) J65-J-18
MFR: Wright Aeronautical Corp.
TYPE: Axial Flow
LENGTH: 13ft 4.5in
DIAMETER: 30in
AUGMENTATION: Afterburner

RATINGS

<table>
<thead>
<tr>
<th>Loss</th>
<th>h.u.</th>
<th>Alt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX</td>
<td>10,500</td>
<td>6,300</td>
</tr>
<tr>
<td>T.O.</td>
<td>7,400</td>
<td>6,300</td>
</tr>
<tr>
<td>NORM</td>
<td>6,470</td>
<td>6,000 max.</td>
</tr>
</tbody>
</table>

SPEC. NO. 8-927-8

MISSION AND DESCRIPTION

The F105-1 is a single-seat jet propelled day fighter designed for land and carrier operations. The primary mission is the destruction of enemy aircraft.

The cockpit is pressurized for high altitude flight and a pilot ejection seat is provided. High lift devices are slotted flaps and leading edge slats. Speed brakes are located on the bottom of fuselage.

Control about all three axes is achieved by irreversible hydraulically actuated rudders, the two operating independently systems of equal power supply pressure to tandem cylinders. Longitudinal control is effected by an all-servable stabilizer in flaps-up configuration and augmented by a geared elevator when flaps are down. Lateral control is provided by rudder pedals, while a conventional rudder is used for directional control.

Wing folding is manual. The engine may be serviced or removed by removal of tail section of fuselage.

A short nose boom is provided for in-flight refueling.

DEVELOPMENT

First Flight: 30 July 1954
Service Use: March 1957

WEIGHTS

<table>
<thead>
<tr>
<th>LOADING</th>
<th>WGT.</th>
<th>L.F.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMPTY</td>
<td>13,307</td>
<td></td>
</tr>
<tr>
<td>BASIC</td>
<td>13,810</td>
<td></td>
</tr>
<tr>
<td>BEGINNIN</td>
<td>18,375</td>
<td></td>
</tr>
<tr>
<td>COMBAT</td>
<td>18,375</td>
<td></td>
</tr>
<tr>
<td>MAX. T.O. (Field)</td>
<td>23,659</td>
<td></td>
</tr>
<tr>
<td>(Cat.)</td>
<td>23,659</td>
<td></td>
</tr>
<tr>
<td>MAX.LAND. (Field)</td>
<td>20,660</td>
<td></td>
</tr>
<tr>
<td>( Arrest)</td>
<td>12,715</td>
<td></td>
</tr>
</tbody>
</table>

All weights are actual.

FUEL AND OIL

<table>
<thead>
<tr>
<th>No. Tanks</th>
<th>Total Gall.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>722</td>
<td>Fuselage</td>
</tr>
<tr>
<td>4</td>
<td>59</td>
<td>Fuel tank</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>Vert. tail</td>
</tr>
<tr>
<td>2</td>
<td>192</td>
<td>Wings</td>
</tr>
</tbody>
</table>

Fuel Grade: JP-4
Fuel Spec.: applicable MIL-F-5624

OIL

<table>
<thead>
<tr>
<th>CAPACITY (gals.)</th>
<th>16.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPEC.</td>
<td>applicable MIL-L-7808</td>
</tr>
</tbody>
</table>

ELECTRONICS

<table>
<thead>
<tr>
<th>No.</th>
<th>Size</th>
<th>Location</th>
<th>Rad.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>20cm</td>
<td>Fuselage</td>
<td>500</td>
</tr>
</tbody>
</table>

FIRE CONTROL

RANING RADAR: AN/AOG-30
APG: MK-16, MK-2

EXTERNL STORRS

Provisional
(1) Sidewinder
(2) 150 gal. drop tank (CPE)
(3) Aero 7R Rocket Package
(4) Aero 6A Rocket Package
### PERFORMANCE SUMMARY

#### TAKE-OFF LOADING CONDITION

<table>
<thead>
<tr>
<th></th>
<th>(1) GENERAL PURPOSE FIGHTER</th>
<th>(2) GENERAL PURPOSE FIGHTER</th>
<th>(3) GENERAL PURPOSE FIGHTER</th>
<th>(5) GENERAL PURPOSE FIGHTER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GNS + FULL INTERNAL FUEL</td>
<td>2-150 GAL. DROP TANKS</td>
<td>2-SIDEBINDERS + GNS</td>
<td>4-SIDEBINDERS</td>
</tr>
<tr>
<td>TAKE-OFF WEIGHT</td>
<td>21,035</td>
<td>21,935</td>
<td>21,935</td>
<td>21,935</td>
</tr>
<tr>
<td>Fuel</td>
<td>6,650</td>
<td>6,650</td>
<td>6,650</td>
<td>6,650</td>
</tr>
<tr>
<td>Jayload</td>
<td>790</td>
<td>790</td>
<td>790</td>
<td>790</td>
</tr>
<tr>
<td>Wing loading</td>
<td>84.4</td>
<td>84.4</td>
<td>84.4</td>
<td>84.4</td>
</tr>
<tr>
<td>Stall speed - power-off</td>
<td>1324</td>
<td>1324</td>
<td>1324</td>
<td>1324</td>
</tr>
<tr>
<td>Take-off run at S.L. - cala</td>
<td>4,750</td>
<td>4,750</td>
<td>4,750</td>
<td>4,750</td>
</tr>
<tr>
<td>Take-off run at S.L. - 25 km. wind</td>
<td>3,100</td>
<td>3,100</td>
<td>3,100</td>
<td>3,100</td>
</tr>
<tr>
<td>Take-off to clear 50 ft. - cala</td>
<td>6,900</td>
<td>6,900</td>
<td>6,900</td>
<td>6,900</td>
</tr>
<tr>
<td>Max. speed/altitude</td>
<td>(km./m.)</td>
<td>568/16,000</td>
<td>542/26,000</td>
<td>553/25,000</td>
</tr>
<tr>
<td>Rate of climb at S.L.</td>
<td>(m./min.)</td>
<td>5,700</td>
<td>4,950</td>
<td>4,950</td>
</tr>
<tr>
<td>Time: S.L. to 40,000 ft.</td>
<td>4.7</td>
<td>7.2</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Time: S.L. to 30,000 ft.</td>
<td>4.2</td>
<td>13.7</td>
<td>13.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Service ceiling (100 fpm)</td>
<td>45,000</td>
<td>35,000</td>
<td>37,000</td>
<td>37,000</td>
</tr>
<tr>
<td>Combat range</td>
<td>1,108</td>
<td>1,146</td>
<td>784</td>
<td>784</td>
</tr>
<tr>
<td>Average cruising speed</td>
<td>466</td>
<td>484</td>
<td>484</td>
<td>484</td>
</tr>
<tr>
<td>Cruising altitude(s)</td>
<td>30,000/42,800</td>
<td>25,500/32,100</td>
<td>30,000/35,000</td>
<td>30,000/35,000</td>
</tr>
<tr>
<td>Combat radius/Max Time</td>
<td>285</td>
<td>285</td>
<td>285</td>
<td>285</td>
</tr>
<tr>
<td>Average cruising speed</td>
<td>479</td>
<td>479</td>
<td>479</td>
<td>479</td>
</tr>
<tr>
<td>SFL - Loiter Altitude/Loiter Time/Max Time</td>
<td>2,159/262/1.56</td>
<td>2,500/250/2.18</td>
<td>2,600/250/2.42</td>
<td>2,600/250/2.42</td>
</tr>
<tr>
<td>IFR - Radius/Max Time</td>
<td>30,500/422/1.96</td>
<td>28,500/1.08/1.85</td>
<td>28,500/1.08/1.85</td>
<td>28,500/1.08/1.85</td>
</tr>
<tr>
<td></td>
<td>n.m./hr.</td>
<td>n.m./hr.</td>
<td>n.m./hr.</td>
<td>n.m./hr.</td>
</tr>
<tr>
<td></td>
<td>310/1.57</td>
<td>420/2.11</td>
<td>285/1.43</td>
<td>285/1.43</td>
</tr>
<tr>
<td></td>
<td>504</td>
<td>476</td>
<td>479</td>
<td>479</td>
</tr>
</tbody>
</table>

#### COMBAT LOADING CONDITION

<table>
<thead>
<tr>
<th></th>
<th>(2) CLEAR</th>
<th>(4) CLEAR + 2-SIDEBINDERS + 2-PILOTS</th>
<th>(6) CLEAR + 4-SIDEBINDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18,375</td>
<td>19,295</td>
<td>18,835</td>
</tr>
<tr>
<td>Engine power</td>
<td>Maximum</td>
<td>Maximum</td>
<td>Maximum</td>
</tr>
<tr>
<td></td>
<td>5,900</td>
<td>5,900</td>
<td>5,900</td>
</tr>
<tr>
<td></td>
<td>3,900</td>
<td>3,900</td>
<td>3,900</td>
</tr>
<tr>
<td>Combat speed/comp alt</td>
<td>628/35,000</td>
<td>593/35,000</td>
<td>632/35,000</td>
</tr>
<tr>
<td>Rate of climb/comp alt</td>
<td>528/35,000</td>
<td>528/35,000</td>
<td>528/35,000</td>
</tr>
<tr>
<td>Combat radius (500 fpm)</td>
<td>49,000</td>
<td>47,500</td>
<td>47,500</td>
</tr>
<tr>
<td>Rate of climb at S.L.</td>
<td>2,600</td>
<td>11,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Max. speed at S.L.</td>
<td>654</td>
<td>642</td>
<td>650</td>
</tr>
<tr>
<td>Max. speed/altitude</td>
<td>654/5,150</td>
<td>642/5,150</td>
<td>650/5,150</td>
</tr>
</tbody>
</table>

#### NOTES

- **(A) MILITARY RATED THRUST.**
- **(B) COMBAT AIR PATROL (CAP) - 150 n. mi. radius.**
- **(C) INFLIGHT REFUELING (IFR) - Outbound only.** Transfer 4,600 lb at 455 nautical miles out. Radius is reduced 20 nautical miles and refuel allowance is increased 5 minutes for each additional aircraft up to a total of 3 aircraft.
- **(D) MINIMUM CONTROL SPEED.**
- **(E) No. Provisions for Pilot Pressure Suit.**
- **PERFORMANCE BASIS: Calculations.**
- **RANGE AND RADIUS are based on engine specification fuel consumption and increased by 25.**

Aircraft weights for the above date are for Contract No. 55-101. Aircraft for Contract 55-107 have increased 244 lb. in the clean configuration.
NOTES

SPOTTING: A total of 80 airplanes can be accommodated in a landing spot on the flight and hangar decks of a CVA-19 class angled deck carrier.

(Flight deck 45; hangar deck 30 airplanes)

GENERAL PURPOSE AND FIGHTER RECOGNITION

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., 15 minutes at military rated thrust plus 5 minutes at maximum thrust.
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.

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-Out: 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 VMU with maximum thrust and VMX with military thrust plus 15 minutes at VMX 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 per cent of initial fuel load.

GENERAL PURPOSE FIGHTER WITH INFLIGHT REFUELING

(130-2 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.
CLIMB: To 35,000 ft. refueling altitude with military rated thrust.
ALLOTTANCE FOR RESERVING, HOOD-UP, AND FLIGHT CONTINGENCIES: 15 minutes at maximum endurance airspeeds. (Assume no fuel used, no distance gained during transfer of fuel.)
REFUEL POINTS: Limited to return of aircraft to base with normal reserve if conflict for refueling is not made.
Cruise-Out: Continue cruise-out at altitudes and speeds for maximum range.
CLIMB: To combat altitude 35,000 ft.

The remainder of problem is the same as the general purpose fighter problem of loading condition column number 3.

If JP-5 fuel is used, the following are applicable:

1. General purpose fighter; clean.
2. General purpose fighter; 2 sidewinders + 2 250 gal. tanks.
3. Combat air patrol; 2 sidewinders + 2 150 gal. tanks.
4. General purpose fighter - inflight refueling; 2 sidewinders + 2 150 gal. tanks.

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>RANGE</th>
<th>RADIUS</th>
<th>MISSION TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>+300 lb.</td>
<td>+78 n. mi.</td>
<td>+39 n. mi.</td>
<td>+1.14 hrs.</td>
</tr>
<tr>
<td>+396 lb.</td>
<td>+81 n. mi.</td>
<td>+40 n. mi.</td>
<td>+1.17 hrs.</td>
</tr>
<tr>
<td>+396 lb.</td>
<td>- - -</td>
<td>- - -</td>
<td>+1.15 hrs.</td>
</tr>
<tr>
<td>+396 lb.</td>
<td>- - -</td>
<td>+56 n. mi.</td>
<td>+1.12 hrs.</td>
</tr>
</tbody>
</table>