POWER PLANT

No. & Model .... (1) Y175-P-3
Mfr. .... Pratt & Whitney
Engine Spec No. .... A-2601
Type .......... Two Spool Axial
Length ......... 258, 9"
Diameter ....... 43.6"
Weight (dry) .... 6175 lb
Tail Pipe . 2 Position Convergent & Republic Ram Air Ejector
Augmentation .... Afterburning

MISSION AND DESCRIPTION

Navy Equivalent: None
Mfr's Model: AP-63

The principal mission of the YF-105B is that of a fighter bomber.

This airplane is a thin mid-wing swept wing aircraft with a low position maneuvering stabilizer, spoiler type ailerons, full span leading edge flaps, and 3/4 span trailing edge flaps. The fuselage incorporates a bomb bay capable of housing either a bomb, special store, or an auxiliary fuel tank.

Other features include a supersonic, variable area wing root air inlet duct, cockpit pressurization, liquid oxygen system, hydraulic power-operated irreversible flight controls with artificial "feel" large speed brakes located at the aft end of the fuselage, integrated automatic flight control system, "probe-drogue" in-flight refueling provisions, single point refueling, nose wheel steering, and a braking parachute.

The XMA-8 Fire Control System, consisting of the K-19 modified sight in conjunction with the E-34 Radar Scanning System, a Toss Bomb Computer and Time of Flight Computer is provided. The T-145 Release System is provided for use with the special stores.

DEVELOPMENT

Same as the YF-105A except for J75 engine in lieu of J57 engine, engine ram air ejector and area control fuselage.
Mock-up Date (with J57 Eng) ............ Oct 53
First Flight ............................................. (est) May 56

ENGINE RATINGS

S. L. Static LB - RPM - MIN
Max: 25,500 - 6960/8830 - 5
Mil: 15,500 - 6940/8930 - 30
Nor: 13,700 - 6470/8570 - Cont
* With afterburner operating
† First figure represents RPM of the low pressure spool while the second that of the high pressure spool.

DIMENSIONS

Wing
Span .......... 34.9"
Incidence (root) .... 0.0° (1ip)
Cathedral ...... 9.3°
Sweepback (25% Chord) .... 45°
Length .......... 63.1"
Height .......... 17.9"
Tread .......... 17.3"

BOMBS

No. Internal External Class(lb)
4 .......... 4 .......... 500
4 .......... 4 .......... 750
5 .......... 1 .......... 1000
3 .......... 3 .......... 2000
2 .......... 2 .......... 3000
Special Stores
1 .......... 1 .......... 1700
Max Bomb Load ....... 8000 lb

GUNS

No. Type Size Rds ea Loc
1 .......... T171D 20mm .1130 Fus

ROCKETS

No. Size Type Loc
2 Pod . 2.75" FFAR . Outb. Pylons
2 Pod . 2.75" FFAR . Inbd. Pylons
1 Pod . 2.75" FFAR Ctr Pylon
Total ........ 5 Pods, 95 Rockets

WEIGHTS

Loading LB L. F.
Empty .......... 21,611(E)
Basic .......... 22,107(E)
Design .......... 26,450 6,67(7, 33)
Design .......... 28,499 7,33(7, 33)
Combat .......... 30,601
Max TO .......... 42,162 4.0
Max Landing .... 26,917 2.2
(E) Estimated
† For Basic Mission
No Stores
1 1700 lb store internal
$ Limited by Space
Note: Load factors in () are for supersonic maneuvers

FUEL

Location No. Tanks Gal
Fus .......... 7 ........ 1150
Fus, bom bay .. 1 ........ 350
Wgs, drop, ext. .. 2 ........ 900
Fus, drop, ext. .. 1 ........ 450
Total ........ 2550
Grade ............ JP-4
Specification .... MIL-L-5624A

OIL

Engine, Integral .... 1 ........ 4.5
Specification .... MIL-L-7808

ELECTRONICS

UHF Command .......... AN/ARC-34
Interphone .......... AN/AIC-10
Direction Finder ....... AN/ARA-25
IFF .......... AN/APX-25
Omni-Directional Range ........ AN/ARN-14
Data Link & Decoder .. AN/ARR-39
Course Computer ...... AN/ASN-6
Radar Beacon .......... AN/APW-11A
Radar Ranging ........ AN/APG-31E-34

SECRET

YF-105B
## Loading and Performance—Typical Mission

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>BASIC MISSION</th>
<th>DESIGN MISSION</th>
<th>GROUND SUPPORT</th>
<th>FERRY RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
<td>III</td>
<td>IV</td>
</tr>
<tr>
<td>TAKE-OFF WEIGHT</td>
<td>(lb)</td>
<td>(lb)</td>
<td>(lb)</td>
<td>(lb)</td>
</tr>
<tr>
<td>Fuel at 6.5 lb/gal (grade JP-4)</td>
<td>42,162</td>
<td>42,162</td>
<td>41,966</td>
<td>41,966</td>
</tr>
<tr>
<td>Payload (Ammunitions)</td>
<td>16,250</td>
<td>16,250</td>
<td>15,600</td>
<td>15,600</td>
</tr>
<tr>
<td>Payload (Bombs)</td>
<td>(lb)</td>
<td>(lb)</td>
<td>(lb)</td>
<td>(lb)</td>
</tr>
<tr>
<td>Wing loading</td>
<td>(lb/sq ft)</td>
<td>(lb/sq ft)</td>
<td>(lb/sq ft)</td>
<td>(lb/sq ft)</td>
</tr>
<tr>
<td>Stall speed (power off)</td>
<td>109.5</td>
<td>109.5</td>
<td>109.5</td>
<td>109.5</td>
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<tr>
<td>Take-off ground run at SL</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
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<tr>
<td>Take-off to clear 50 ft</td>
<td>3500</td>
<td>3500</td>
<td>3500</td>
<td>3500</td>
</tr>
<tr>
<td>Rate of climb at SL</td>
<td>4400</td>
<td>4400</td>
<td>4390</td>
<td>4390</td>
</tr>
<tr>
<td>Time: SL to 20,000 ft</td>
<td>6622</td>
<td>6622</td>
<td>6475</td>
<td>6475</td>
</tr>
<tr>
<td>Time: SL to 30,000 ft</td>
<td>5.6</td>
<td>5.6</td>
<td>6.3</td>
<td>6.3</td>
</tr>
<tr>
<td>Service ceiling (100 fpm)</td>
<td>37,750</td>
<td>37,750</td>
<td>37,810</td>
<td>37,810</td>
</tr>
<tr>
<td>COMBAT RANGE (n. mi.)</td>
<td>801</td>
<td>921</td>
<td>866</td>
<td>607</td>
</tr>
<tr>
<td>Average cruise speed (kn)</td>
<td>497</td>
<td>497</td>
<td>501</td>
<td>499</td>
</tr>
<tr>
<td>Initial cruising altitude (ft)</td>
<td>35,500</td>
<td>35,000</td>
<td>35,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Final cruising altitude (ft)</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Total cruising time (hr)</td>
<td>3.31</td>
<td>3.69</td>
<td>3.45</td>
<td>2.78</td>
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<tr>
<td>COMBAT WEIGHT (lb)</td>
<td>30,601</td>
<td>31,066</td>
<td>31,614</td>
<td>31,259</td>
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<tr>
<td>Combat altitude (ft)</td>
<td>5 L</td>
<td>43,850</td>
<td>42,800</td>
<td>5 L</td>
</tr>
<tr>
<td>Combat speed (kn)</td>
<td>755</td>
<td>767</td>
<td>724</td>
<td>755</td>
</tr>
<tr>
<td>Combat climb (fpm)</td>
<td>42,261</td>
<td>42,261</td>
<td>42,261</td>
<td>42,261</td>
</tr>
<tr>
<td>Combat ceiling (500 fpm) (ft)</td>
<td>53,590</td>
<td>53,650</td>
<td>52,770</td>
<td>52,920</td>
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<tr>
<td>Service ceiling (100 fpm) (ft)</td>
<td>46,000</td>
<td>45,380</td>
<td>45,550</td>
<td>46,090</td>
</tr>
<tr>
<td>Max rate of climb at SL (fpm)</td>
<td>42,261</td>
<td>41,550</td>
<td>40,700</td>
<td>40,250</td>
</tr>
<tr>
<td>Max speed at 35,000 ft (kn)</td>
<td>1129</td>
<td>1126</td>
<td>991</td>
<td>1126</td>
</tr>
<tr>
<td>Basic speed at S, L, ft (kn/ft)</td>
<td>755</td>
<td>755</td>
<td>755</td>
<td>755</td>
</tr>
<tr>
<td>LANDING WEIGHT (lb)</td>
<td>24,767</td>
<td>24,004</td>
<td>24,202</td>
<td>25,005</td>
</tr>
<tr>
<td>Ground roll at SL (ft)</td>
<td>3500</td>
<td>3480</td>
<td>3500</td>
<td>3620</td>
</tr>
<tr>
<td>Ground roll (auxiliary brake) (ft)</td>
<td>1960</td>
<td>1905</td>
<td>1920</td>
<td>1985</td>
</tr>
<tr>
<td>Total from 50 ft (ft)</td>
<td>5245</td>
<td>5090</td>
<td>5125</td>
<td>5290</td>
</tr>
<tr>
<td>Total from 50 ft (auxiliary brake) (ft)</td>
<td>3610</td>
<td>3500</td>
<td>3530</td>
<td>3650</td>
</tr>
</tbody>
</table>

### Notes
1. **Max power**
2. **Military power**
3. **Detailed descriptions of RADIUS and RANGE missions given on page 6.**
4. **2x1000 lb. bombs (external).**
5. **One 1700 lb. special store (internal).**
6. **With 20 ft. ribbon breaking chute.**
7. **With store aboard.**
8. **Reference Model Specification ES 335B, dated 15 March 54.**
9. **Missions 1 & V, 57 and 246 gallons of fuel are dropped with the tanks prior to combat.**
10. **Speed at end of 3 minute after-burner run-in to target.**

### Performance Basis
- **Data Source:** Estimated data not substantiated by WADC.
- **Performance is based on powers shown on page 6.**

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**SECRET**

**YF-105 B**
NOTES

FORMULA: RADIUS MISSION I

Take-off with maximum power, climb on course with military power to initial cruise altitude, cruise at cruise altitude at long range speeds, descend to sea level, expend bomb, combat for 5 minutes at military power, climb on course with military power to initial cruise home altitude, cruise to base at cruise altitude at long range speeds. Range-free allowances include 5 minutes at normal power and 1 minute at maximum power at sea level for starting engine and take-off, 5 minutes combat at sea level with military power, and a reserve of 20 minutes loiter at sea level at speeds for maximum endurance plus 5% of initial fuel load.

FORMULA: RADIUS MISSIONS II & III

Take-off with maximum power, climb on course with military power to initial cruise altitude, cruise at cruise altitude at long range speeds, at maximum power, fly at cruise altitude for 3 minutes inbound to target prior to bomb release, drop external tanks (if any) and dive bomb, leave target at sea level with military power for 2 minutes, climb on course with military power to initial cruise home altitude, cruise to base at cruise altitude at long range speeds. Range-free allowances include 5 minutes at normal power and 1 minute at maximum power at sea level for starting engine and take-off, dive bomb, and a reserve of 15 minutes loiter at cruise altitude at speeds for maximum endurance plus fuel to allow for one instrument approach and visual go around from airplane flare-out altitude.

FORMULA: RADIUS MISSIONS IV & V

Take-off with maximum power, climb on course with military power to initial cruise altitude, cruise at cruise altitude at long range speeds, descend to sea level and loiter for 10 minutes at speeds for maximum endurance, expend bombs, combat for 10 minutes at military power, climb on course with military power to initial cruise home altitude, cruise to base at cruise altitude at long range speeds. Range-free allowances include 5 minutes at normal power and 1 minute at maximum power at sea level for starting engine and take-off, 10 minutes loiter at sea level at speeds for maximum endurance, 10 minutes combat at sea level with military power, and a reserve of 20 minutes loiter at sea level at speeds for maximum endurance plus 5% of initial fuel load.

FORMULA: RANGE MISSION VI

Take-off with maximum power, climb on course with military power to initial cruise altitude, cruise at cruise altitude at long range speeds to remote base. Range-free allowances include 5 minutes at normal power plus 1 minute at maximum power for starting engine and take-off, and a reserve of 20 minutes loiter at sea level at speeds for maximum endurance plus 5% of initial fuel load.

GENERAL NOTES:

(a) Tanks dropped when empty unless otherwise specified.

(b) Cruise is performed in level flight increasing altitude by 5000 ft. increments when the cruising ceiling increases accordingly. All cruising climbs are at military power.

REVISION BASIS:

To reflect latest characteristics and performance data.

(15 SEP 54)