

**CONFIDENTIAL**

*Unclassified*

*A-1  
F-108A/chan*

**SECRET**

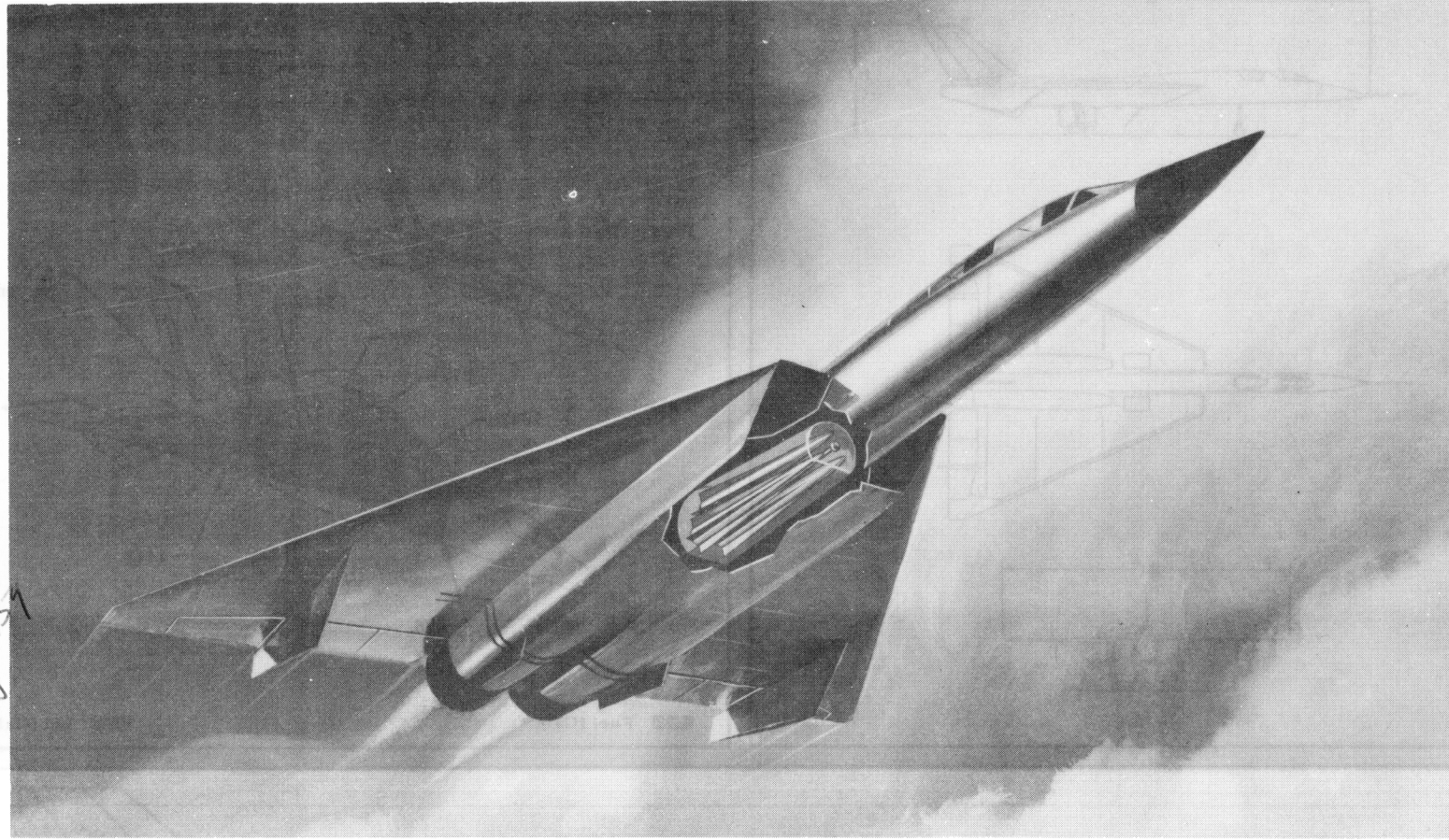
PRE-MOCKUP

DOWNGRADED AT 3 YEAR INTERVALS;  
DECLASSIFIED AFTER 12 YEARS.

DOD DIR 5200.10

*30 Dec 70  
A. R. Jernholm 317mm67*

*Revised to reflect  
final configuration  
Mock up for  
15 Nov 58*



# Standard Aircraft Characteristics

BY AUTHORITY OF  
THE SECRETARY  
OF THE AIR FORCE

**F-108 A**  
**LONGE RANGE INTERCEPTOR**  
**North American**

TWO J93-GE-1  
GENERAL ELECTRIC

1 OCT 58

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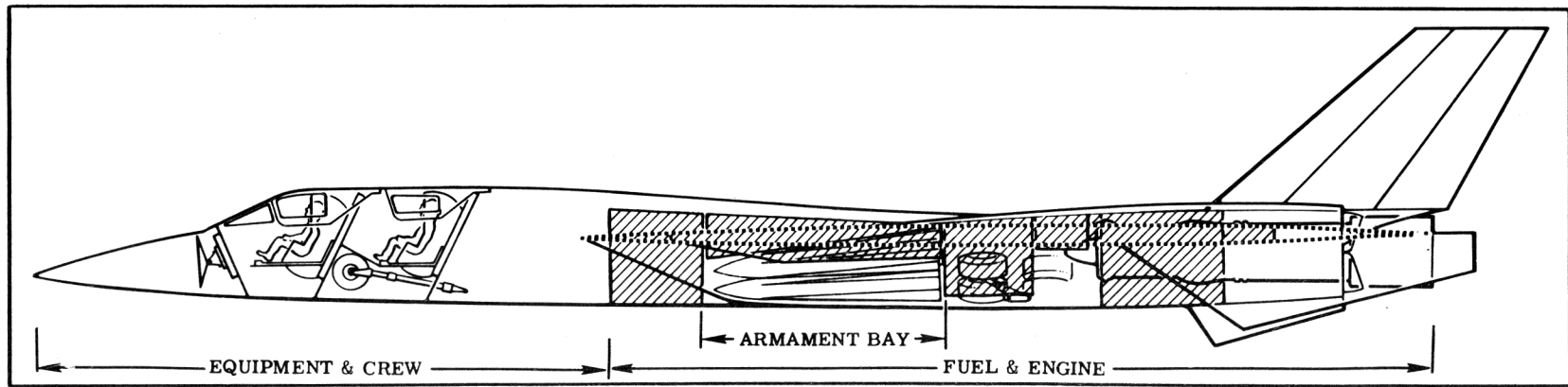
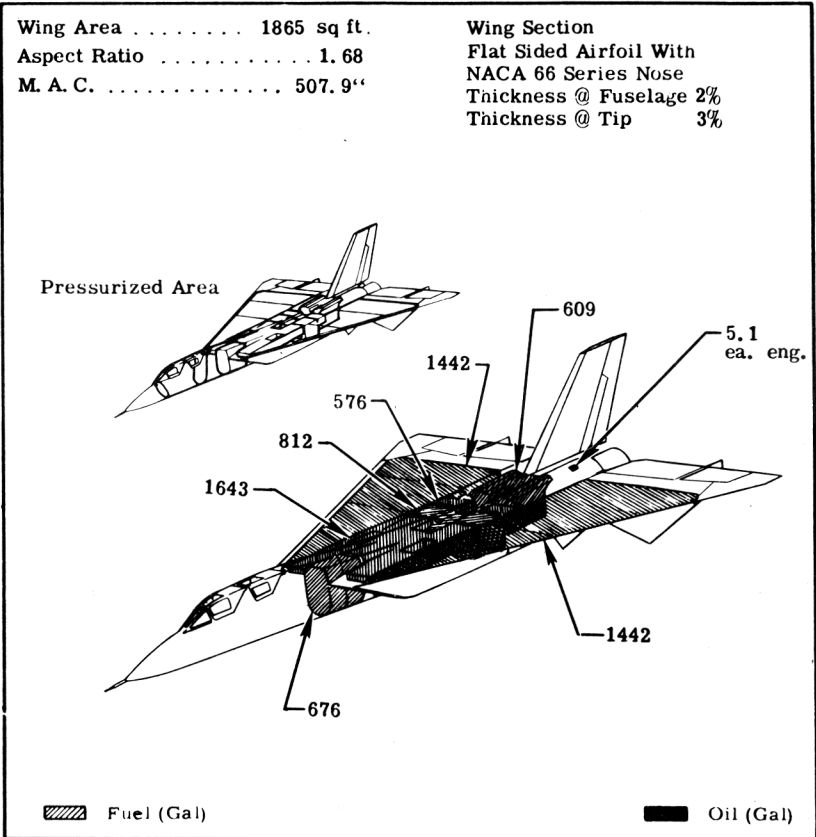
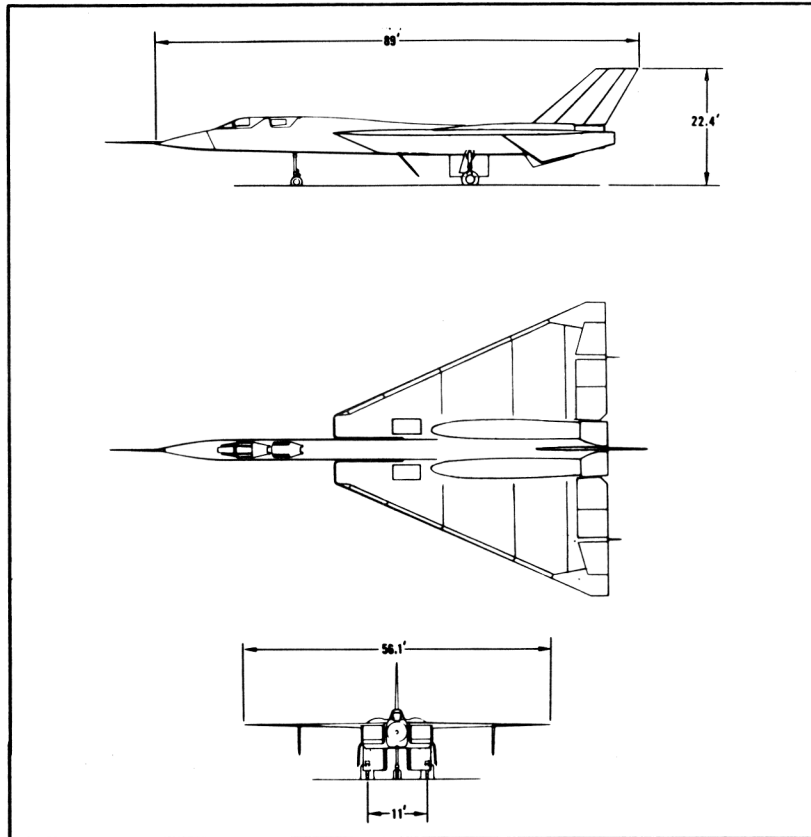
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*Green Book*

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57WC-4984



F-108A

**POWER PLANT**

Nr & Model . . . . . (2) J93-GE-1  
 Mfr . . . . . General Electric  
 Engine Spec Nr . . . . . E-734  
 Type . . . . . Turbo Jet  
 Length . . . . . 233.8"  
 Max Diameter . . . . . \*56.0"  
 Weight (dry) . . . . . \*4875 lb  
 Jet Nozzle . . . . . Convergent-Divergent  
 Augmentations . . . . . Afterburner

\*With thrust reverser

**ENGINE RATINGS**

| S. L. S. | LB     | RPM    | MIN    |
|----------|--------|--------|--------|
| Max:     | 24,800 | - 6650 | - Cont |
| Mil:     | 16,900 | - 6650 | - Cont |
| Nor:     | 15,900 | - 6650 | - Cont |

**DIMENSIONS**

Wing  
 Span . . . . . 56.1'  
 Incidence (root) . . . . . 0°  
 (tip) . . . . . 0°  
 Dihedral . . . . . 0°  
 Sweepback (25% chord) . . . . . 58.0°  
 Length . . . . . 89.0'  
 Height . . . . . 22.4'  
 Tread . . . . . 11.0'

*Mission and Description*

Navy Equivalent: None Mfr's Model: NA-257

The principal mission of this two-man long range interceptor is the interception and destruction of hostile aircraft in flight during day or night and in all types of weather.

All fuel is carried internally in a pressurized fuel system with nitrogen purging.

The airplane features variable geometry inlet ducts, a canard, elevons, speed brakes, reverse thrust for icy runway conditions, and nose wheel steering.

The cockpit is provided with airconditioning, liquid oxygen, pressurization, encapsulated seats and an automatic flight control system.

The fire control system provides primary and auxiliary navigation, target search and detection, and missile guidance in all weather, all altitude operation against heavy enemy countermeasures, operating under SAGE or lesser ground control environment.

*Development*

Date of contract (letter contract) . . . . . Jun 57  
 Mock-up . . . . . (est) Jan 59  
 First flight . . . . . (est) Mar 61

**WEIGHTS**

| Loading            | Lb                 | L. F. |
|--------------------|--------------------|-------|
| Empty . . . . .    | 49,796(E)          |       |
| Basic . . . . .    | 50,160(E)          |       |
| Design . . . . .   | 73,436 . . . . .   | 5.33  |
| Combat . . . . .   | *75,145 . . . . .  | 5.33  |
| Max T.O. . . . .   | †101,800 . . . . . | 3.00  |
| Max Lndg . . . . . | † 96,285           |       |

(E) Estimated  
 \* For Basic Mission  
 † Limited by structure

**F U E L**

| Location                | Nr. Tanks   | Gal         |
|-------------------------|-------------|-------------|
| Wing . . . . .          | 2 . . . . . | 2884        |
| Fuselage . . . . .      | 5 . . . . . | 4316        |
|                         | Total       | 7200        |
| Grade . . . . .         |             | JP-6        |
| Specification . . . . . |             | MIL-F-25656 |

**OIL**

|                         |                   |            |
|-------------------------|-------------------|------------|
| Fuselage . . . . .      | 2 . . . . . (tot) | 10.2       |
| Specification . . . . . |                   | MIL-L-9236 |

**B O M B S**

None

**R O C K E T S**

None

**G U N S**

None

**MISSILES**

| Nr          | Type            | Location |
|-------------|-----------------|----------|
| 3 . . . . . | GAR-9 . . . . . | Fuselage |

NOTE

For detailed characteristics and performance of GAR-9 refer to Missile Section.

**ELECTRONICS**

UHF Command  
 UHF Emergency  
 HF Command (voice plus digital)  
 Intercom  
 BROFICON  
 Marker Beacon  
 Localizer  
 Glide Slope  
 UHF Data Link (receiver)  
 TACAN  
 Identification Air-to-Air  
 Identification Air-by-Ground

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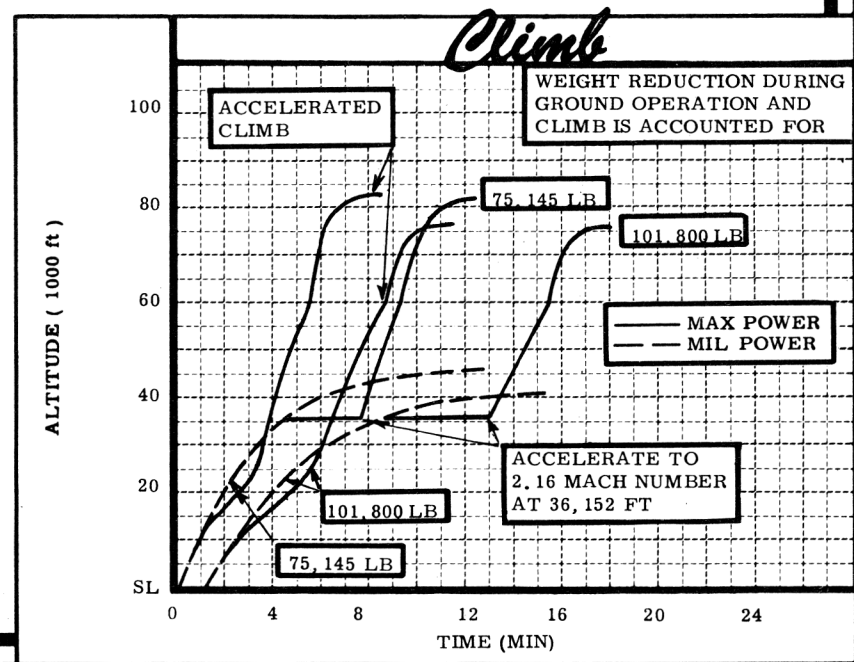
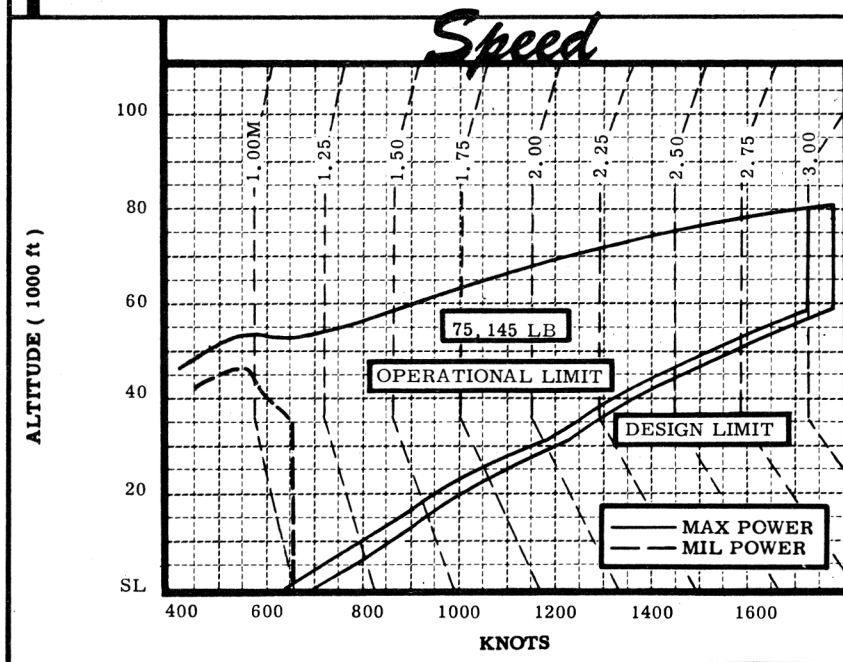
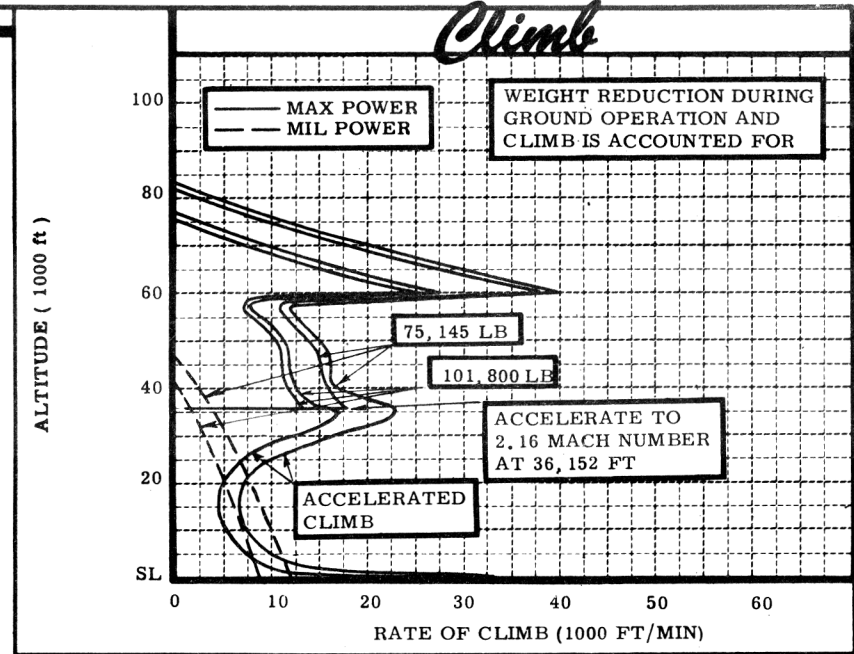
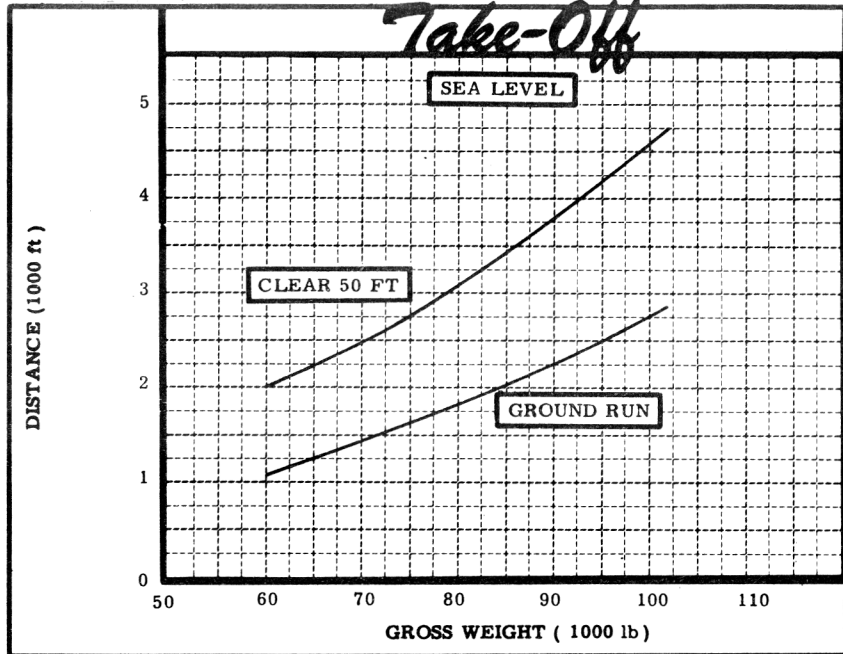
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# Loading and Performance - Typical Mission

| C O N D I T I O N S             |           | INTERCEPTOR MISSIONS |             |             |             |             | FERRY RANGE |
|---------------------------------|-----------|----------------------|-------------|-------------|-------------|-------------|-------------|
|                                 |           | BASIC                |             | ALTERNATE   |             |             |             |
|                                 |           | AREA                 | POINT       | DESIGN      | DASH        | LOITER      |             |
|                                 |           | I                    | II          | III         | IV          | V           | VI          |
| TAKE-OFF WEIGHT                 | (lb)      | 101,800              | 101,800     | 101,800     | 83,040      | 101,800     | 99,640      |
| Fuel at 6.7 lb/gal (grade JP-6) | (lb)      | 48,420               | 48,240      | 48,240      | 29,480      | 48,240      | 48,240      |
| Payload (missiles)              | (lb)      | 2160                 | 2160        | 2160        | 2160        | 2160        | None        |
| Wing loading                    | (psf)     | 54.6                 | 54.6        | 54.6        | 44.5        | 54.6        | 53.4        |
| Stall speed (power off)         | (kn)      | 119.0                | 119.0       | 119.0       | 107.0       | 119.0       | 117.7       |
| Take-off ground roll at SL      | ① (ft)    | 2880                 | 2880        | 2880        | 1950        | 2880        | 2750        |
| Take-off to clear 50 ft         | ① (ft)    | 4750                 | 4750        | 4750        | 3290        | 4750        | 4560        |
| Rate of climb at SL             | ① (fpm)   | 25,100               | 25,100      | 25,100      | 31,100      | 25,100      | 25,600      |
| Time: SL to 40,000 ft           | ①④ (min)  | 6.7 ⑥                | 6.7 ⑥       | 6.7 ⑥       | 5.2 ⑤       | 6.7 ⑥       | 6.6 ⑥       |
| Time: SL to 50,000 ft           | ①④ (min)  | 7.6 ⑥                | 7.6 ⑥       | 7.6 ⑥       | 5.8 ⑤       | 7.6 ⑥       | 7.5 ⑥       |
| Service ceiling (100 fpm)       | ① (ft)    | 73,350               | 73,350      | 73,350      | 77,800      | 73,350      | 73,850      |
| COMBAT RANGE                    | ③ (n mi)  | —                    | —           | —           | —           | —           | 2281        |
| COMBAT RADIUS                   | ③ (n mi)  | 883                  | —           | 1005        | 350         | 657         | —           |
| Average speed                   | (kn)      | 1721                 | —           | 1721        | 1721        | 1260        | 553         |
| Initial cruising altitude       | (ft)      | 69,200               | —           | 69,200      | 73,500      | 36,152      | 35,900      |
| Final cruising altitude         | (ft)      | 76,000               | —           | 76,000      | 76,350      | 76,000      | 45,900      |
| Total mission time              | (hr)      | 1.26                 | —           | 1.48        | 0.705       | 2.38        | 4.12        |
| TOTAL MISSION TIME              | ③ (hr)    | —                    | 3.21        | —           | —           | —           | —           |
| Interception altitude           | (ft)      | —                    | 77,000      | —           | —           | —           | —           |
| COMBAT WEIGHT                   | (lb)      | 75,145               | 82,485      | 73,436      | 64,920      | 70,405      | 57,162      |
| Combat altitude                 | ① (ft)    | 78,950               | 77,000      | 72,200      | 74,400      | 72,900      | 45,900 ②    |
| Combat speed                    | ① (kn)    | 1721                 | 1721        | 1721        | 1721        | 1440        | 1440        |
| Combat climb                    | ① (fpm)   | 500                  | 500         | 11,800      | 12,600      | 12,200      | 68,600      |
| Combat ceiling (500 fpm)        | ① (ft)    | 78,950               | 77,000      | —           | —           | —           | 84,300      |
| Combat ceiling (1.2g)           | ① (ft)    | —                    | —           | 75,800      | 78,400      | 76,650      | —           |
| Service ceiling (100 fpm)       | ① (ft)    | 79,200               | 77,300      | 79,700      | 82,200      | 80,500      | 84,600      |
| Max rate of climb at SL         | ① (fpm)   | 33,400               | 30,400      | 34,300      | 39,300      | 35,900      | 44,900      |
| Max speed at optimum altitude   | ① (kn/ft) | 1721/75,250          | 1721/73,400 | 1721/75,800 | 1721/78,400 | 1721/76,650 | 1721/81,000 |
| Basic speed at 50,000 ft        | ① (kn)    | 1526                 | 1526        | 1526        | 1526        | 1526        | 1526        |
| LANDING WEIGHT                  | (lb)      | 59,462               | 56,970      | 57,702      | 56,749      | 57,702      | 57,162      |
| Ground roll at SL               | ⑦ (ft)    | 1880                 | 1790        | 1820        | 1790        | 1820        | 1800        |
| Total from 50 ft                | ⑦ (ft)    | 3175                 | 3060        | 3100        | 3050        | 3100        | 3070        |

|                  |   |   |
|------------------|---|---|
| <b>N O T E S</b> | ① Maximum power<br>② Military power<br>③ Detailed descriptions of RADIUS and RANGE missions given on page 6<br>④ Allows for weight reduction during ground operations and climb | ⑤ Allows 0.8 min for take-off and acceleration to best climb speed<br>⑥ Allows 1.2 min for take-off and acceleration to best climb speed<br>⑦ With 40% military thrust reverser |
|------------------|---|---|

**PERFORMANCE BASIS:**  
 (a) Data source: Estimated data  
 (b) Performance is based on powers shown on page 6.



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**N O T E S**

FORMULA: AREA INTERCEPT MISSION I

Take-off and accelerate to climb speed with maximum power, climb to 36,152 ft. with military power, accelerate with maximum thrust to 2.16M at 36,152 ft., accelerate and climb with maximum power to 3.0M best cruise altitude, cruise out at 3.0M best cruise altitude, climb at 3.0M to combat ceiling (R/C - 500FPM) with maximum power, combat allowance for 5 minutes at 50,000 ft. and 2.66M, cruise back at 3.0M best cruise altitude. Fuel allowances for which distance is not credited include 2 minutes sea level static normal power for starting engines and taxiing, 1 minute sea level static maximum power for take-off and acceleration to climb speed, 5 minutes combat with fuel flow based on power required at 50,000 ft. to maintain operational limit speed (2.66M), and a reserve of 20 minutes loiter at sea level at speeds for maximum endurance plus 5% of initial fuel load.

FORMULA: POINT-INTERCEPT MISSION II

Take-off and accelerate to climb speed with maximum power, accelerate and climb with maximum power to 3.0M combat ceiling (R/C - 500FPM), combat allowance for 5 minutes at 50,000 ft. and 2.66M, loiter at 35,000 ft. at speeds for maximum endurance for maximum time. Reserve is the fuel required to loiter for 20 minutes at sea level at speeds for maximum endurance. Total mission time does not include time required to start engines, warm up and taxi, or reserve.

FORMULA: ALTERNATE DESIGN MISSION III

Take-off and accelerate to climb speed with maximum power, climb to 36,152 ft. with military power, accelerate with maximum power to 2.16M at 36,152 ft., accelerate and climb with maximum power to 3.0M best cruise altitude, cruise out at 3.0M best cruise altitude, combat for 5 minutes at 3.0M, cruise back at 3.0M best cruise altitude, decelerate and descend with idle thrust to best loiter altitude and speed. Fuel allowances for which distance is not credited include 2 minutes sea level static normal power for starting engines and taxiing, 1 minute sea level static maximum power for take-off and acceleration to climb speed, 5 minutes combat with fuel flow based on power setting required to maintain 3.0M level flight at 70,000 ft., a reserve of 10 minutes loiter at sea level at speeds for maximum endurance plus 5% of initial fuel load.

FORMULA: ALTERNATE DASH MISSION IV

Take-off and accelerate to climb speed with maximum power, accelerate and climb with maximum power to 3.0M best cruise altitude, cruise out at 3.0M best cruise altitude, combat for 10 minutes at 3.0M, cruise back at 3.0M best cruise altitude, decelerate and descend with idle thrust to best loiter altitude and speed. Fuel allowances for which distance is not credited include 2 minutes sea level static normal power for starting engines and taxiing, 1 minute sea level static maximum power for take-off and acceleration, 10 minutes combat with fuel flow based on power setting required to maintain level flight at 3.0M 1.2g ceiling, a reserve of 10

minutes loiter at altitudes and speeds for maximum endurance, a reserve of 10 minutes loiter at sea level at speeds for maximum endurance plus 5% of initial fuel load.

FORMULA: ALTERNATE LOITER MISSION V

Take-off and accelerate to climb speed with maximum power, climb to 36,152 ft. with military power, cruise out at .94M at 36,152 ft. to a point 250 N.Mi. from base, loiter for 60 minutes at .94M at 36,152 ft., accelerate with maximum power to 2.16M, accelerate and climb with maximum power to 3.0M best cruise altitude, cruise out at 3.0M best cruise altitude, combat for 10 minutes at 3.0M, cruise back to 3.0M best cruise altitude, decelerate and descend with idle thrust to best loiter altitude and speed. Fuel allowances for which distance is not credited include 2 minutes sea level static normal power for starting engines and taxiing, 1 minute sea level static maximum power for take-off and acceleration, 10 minutes combat with fuel flow based power setting required to maintain 3.0M level flight at 70,000 ft., a reserve of 10 minutes loiter at altitudes and speeds for maximum endurance, a reserve of 10 minutes loiter at sea level at speeds for maximum endurance plus 5% of initial fuel load.

FORMULA: FERRY MISSION VI

Take-off and accelerate to climb speed with maximum power, climb on course to subsonic best cruise altitude with military power, cruise out at subsonic best cruise altitude at long range speeds to remote base. Fuel allowances for which distance is not credited include 5 minutes sea level static normal power for starting engines and taxiing, 1 minute sea level static maximum power for take-off and acceleration, a reserve of 20 minutes loiter at sea level at speeds for maximum endurance plus 5% of initial fuel load.

GENERAL DATA:

(a) Engine ratings shown on page 3 are guaranteed values. Installed values used in the performance calculations are as follows:

| (2) J93-GE-1 |        |      |
|--------------|--------|------|
| S, L, STATIC | LB     | RPM  |
| Max:         | 22,150 | 6650 |
| Mil:         | 15,100 | 6650 |
| Nor:         | 14,100 | 6650 |

PERFORMANCE BASIS:

North American Report Nr. NA-58-84 "Performance Substantiation for the F-108A Primary Air Vehicle Weapon System 202A Contract AF33 (600)-33605", dated 7 March 1958, revised 1 Aug 58.

REVISION BASIS:

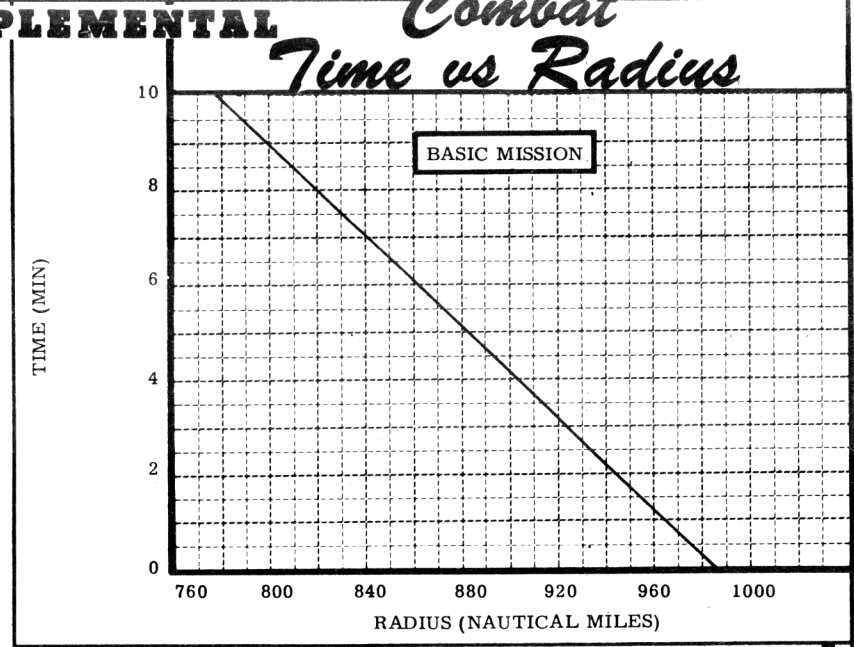
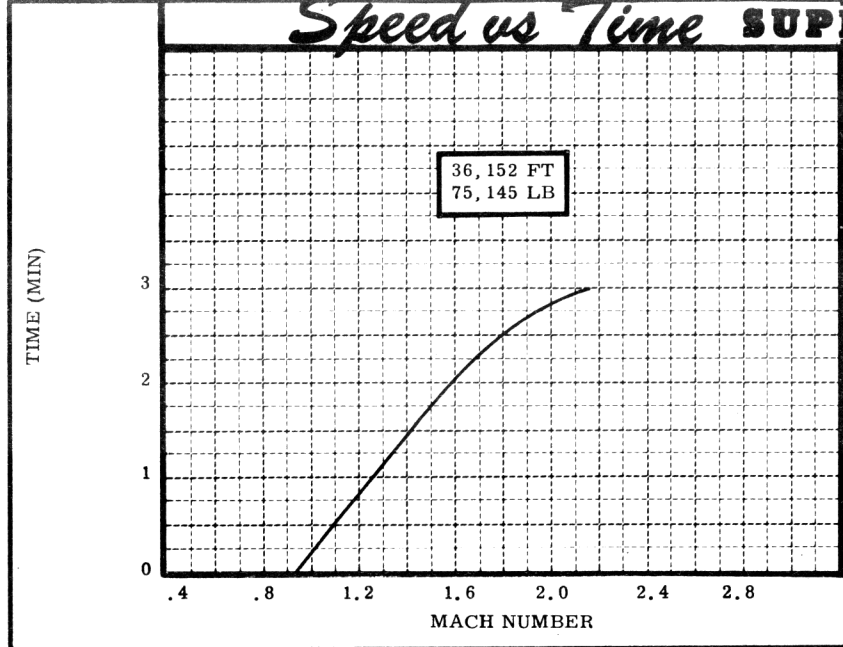
To reflect configuration changes.

(1 AUG 58)

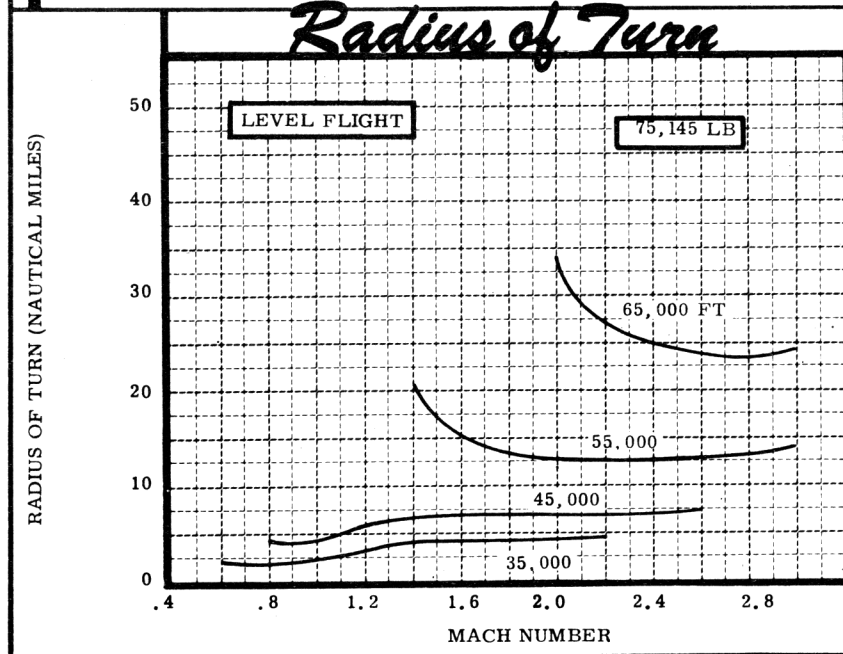
# Speed vs Time

## SUPPLEMENTAL

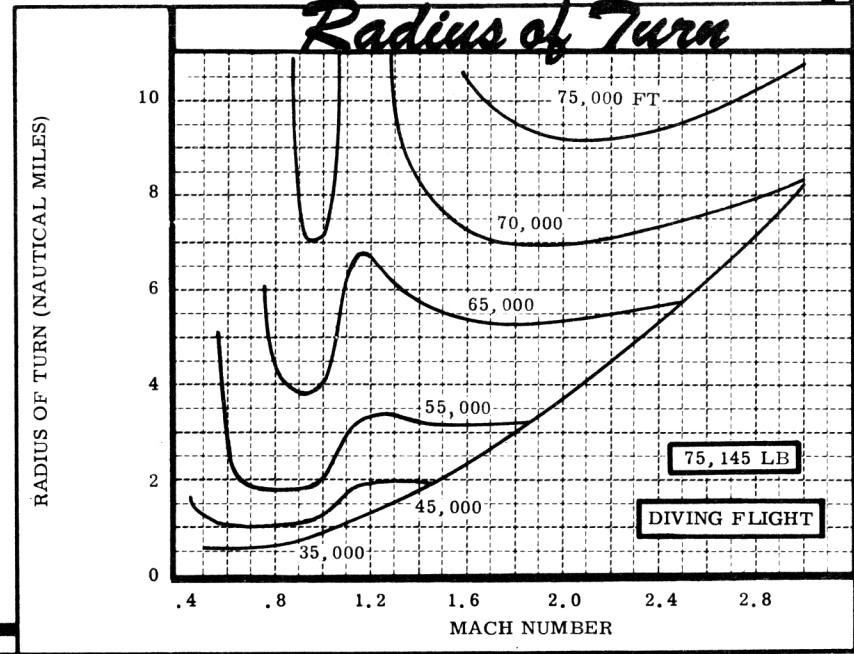
# Combat Time vs Radius



# Radius of Turn



# Radius of Turn



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