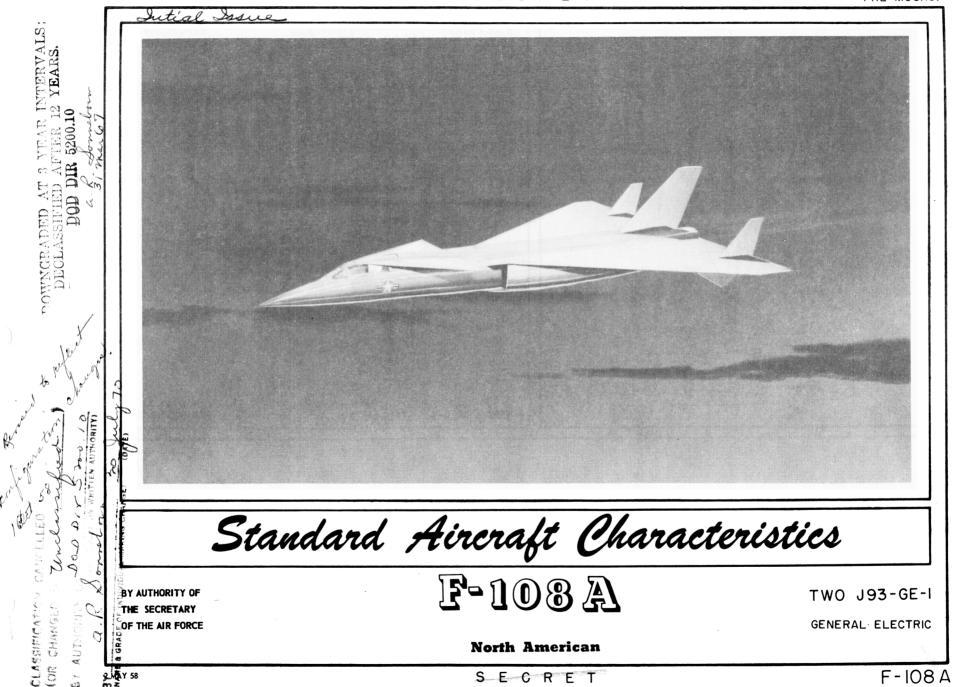
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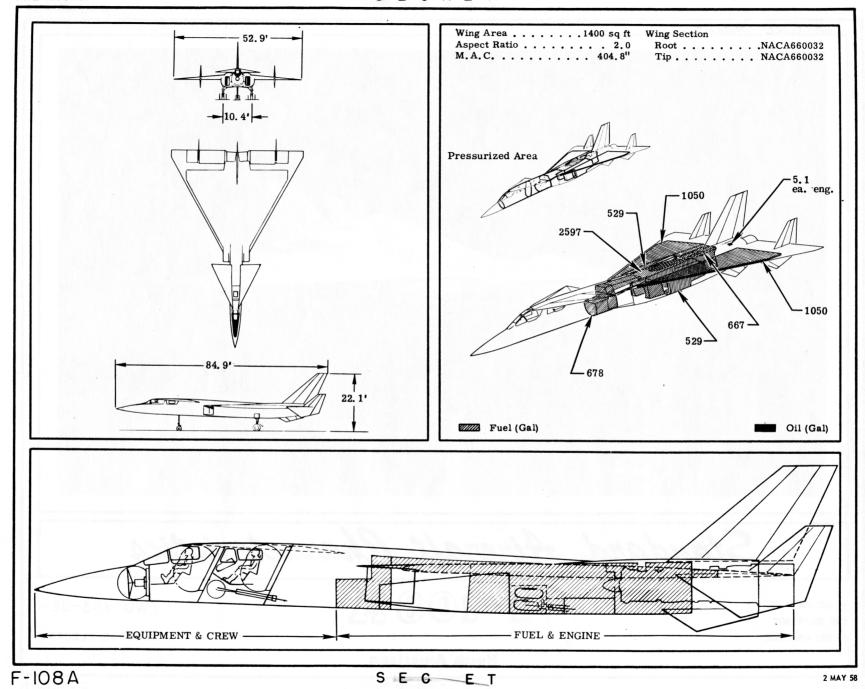
Unclusified SECRET A-1 F-108A /CHAP

PRE-MOCKUP



JUN 6 1958

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## **POWER PLANT**

\*With thrust reverser

## **ENGINE RATINGS**

S.L.S. LB - RPM - MIN

Max:

24.800 - 6625 - \*30

Mil:

16,900 - 6625 - Cont 15,900 - 6625 - Cont

Nor:

\*Continuous afterburning power

\*Continuous afterburning power settings are available for supersonic cruise

# 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 . . . 48, 193 (E)
Basic . . . 48, 552 (E)
Design . . . 71, 665 . . . . 5.33
Combat . . . \*73, 369 . . . . 5.33
Max T.O. . . †99, 400 . . . . 3.00
Max Lndg . . †94, 400

- (E) Estimated
- \* For basic mission
- † Limited by structure

## FUEL

 Location
 Nr. Tanks
 Gal

 Wing
 2
 2100

 Fuselage
 5
 5000

 Total
 7100

 Grade
 JP-6

 Specification
 MIL-F-25656

## OIL

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

## **DIMENSIONS**

Wing	
Span	52.91
Incidence (root)	1º
(tip)	4°
Dihedral	0°
Sweepback (25% chord)	53.5°
Length	
Height	
Tread	

## B O M B S

None

ROCKETS

None

G U N S

None

## **MISSILES**

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

## **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

Flare-out Altimeter

Section English Reports Extraord Marie Co.

F-108A

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CONDITIO	CONDITIONS		INTERCEPTOR MISSIONS								
			BAS			ALTERNATE					
			AREA	POINT	DESIGN	DASH	LOITER	RANGE			
TARE OF THE STATE			I	II	III	IV	V	VI			
TAKE-OFF WEIGHT		(1b)	99,400	99,400	99,400	80, 171	99,400	97,240			
Fuel at 6.7 $lb/gal$ (grade JP-6)		(1b)	47,570	47,570	47,570	28,341	47,570	47,570			
Payload (missile)		(1b)	2160	2160	2160	2160	2160	none			
Wing loading		(psf)	71.0	71.0	71.0	57.3	71.0	69.6			
Stall speed (power off)		(kn)	131.5	131.5	131.5	118.5	131.5	130.0			
Take-off ground roll at SL	1	(ft)	3100	3100	3100	2020	3100	2980			
Take-off to clear 50 ft		(ft)	5060	5060	5060	3420	5060	4860			
Rate of climb at SL	<u> </u>	(fpm)	24, 100	24, 100	24, 100	30,250	24, 100	24,700			
Time: SL to 40,000 ft	(1) (4 <sub>9</sub> )	(min)	6.2 (6)	6.2 (6)	6.2 (6)	4.9 (5)	6.2 (6)	6.0 6			
Time: SL to 50,000 ft	(1) (4) (1) (4)	(min)	7.1 (6)	7.1 (6)	7.1 6	5.6 5	7.1 6	6.9 6			
Service ceiling (100 fpm)	① <b>4</b> · · · · · · · · · · · · · · · · · · ·	(ft)	72,550	72,550	72,550	76,950	72,550	72,950			
COMBAT RANGE	<u>3</u>	(n mi)				,	12,000	1984			
COMBAT RADIUS	<u>3</u>	(n mi)	877		1002	350	604	1304			
Average speed	, •	(kn)	1721		1721	1721	1210	550			
Initial cruising altitude		(ft)	68,700		68,700	73, 100	36, 152				
Final cruising altitude		(ft)	75,600		75,700	76,000		33,200			
Total mission time		(hr)	1, 25		1, 49		75,700	45,400			
TOTAL MISSION TIME	3	(hr)	1.25	2,91	1.49	.70	2.31	3.61			
Interception altitude	<b>3</b>	(ft)			-	-					
micreoption attitude		(11)		76,300							
COMBAT WEIGHT		(lb)	73, 369	81,765	71,665	63,381	67,960	55,809			
Combat altitude	1	(ft)	78,600	76,300	71,800	74,000	72,800	45,400			
Combat speed	<b>(1)</b>	(kn)	1721	1721	1721	1721	1721	1415			
Combat climb	$\widecheck{f 1}$	(fpm)	500	500	13,400	13,800	13,550	65,500			
Combat ceiling (500 fpm)	$\widecheck{1}$	(ft)	78,600	76,300				83,700			
Combat ceiling (1.2g)	$\overset{\smile}{\mathbb{1}}$	(ft)			75,600	78,200	76,700				
Service ceiling (100 fpm)	$\widecheck{1}$	(ft)	78,850	76,550	79,350	81,900	80,400	84,000			
Max rate of climb at SL	$\widecheck{1}$	(fpm)	33, 250	29,700	34,000	38,700	36,000	44,000			
Max speed at optimum altitude	<u>(1)</u>	(kn/ft)	1721/75,100	1721/72,800	1721/75,600	1721/74,000	1721/76,700	1721/80,700			
Basic speed at 50,000 ft	Ď	(kn)	1525	1525	1525	1525	1525	1525			
	•	()	1020	1020	1020	1020	1020	1020			
LANDING WEIGHT		(1b)	58,059	55,580	56,109	55, 127	56,109	55,809			
Ground roll at SL	7	(ft)	1900	1800	1820	1790	1820	1810			
Total from 50 ft	<b>(7</b> )	(ft)	3200	3075	3100	3050	3100	3090			
				-							

N 1 Maximum power
O 2 Military power
T 3 Detailed descriptions of RADIUS and RANGE missions given on page 6
S 4 Allows for weight reduction during ground operations and climb

(5) Allows 0.8 min for take-off and acceleration to best climb speed

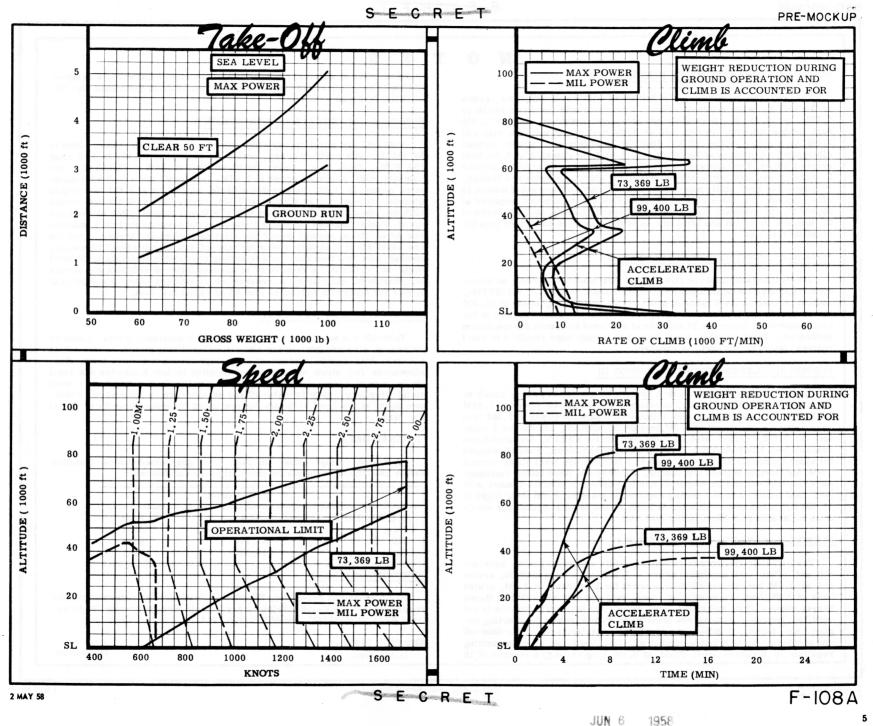
6 Allows 1.2 min for take-off and

acceleration to best climb speed (7) With 40% military thrust reverser PERFORMANCE BASIS:

(a) Data source: Estimated

A MAA.

(b) Performance is based on powers shown on page 6.



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## NOTES

#### 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 2.07M 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 2.07M 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 taxing, 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 2.07M, 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 taxing, 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:	<b>22</b> , 150	6650				
Mil:	15, 100	6650				
Nor:	14, 100	6650				

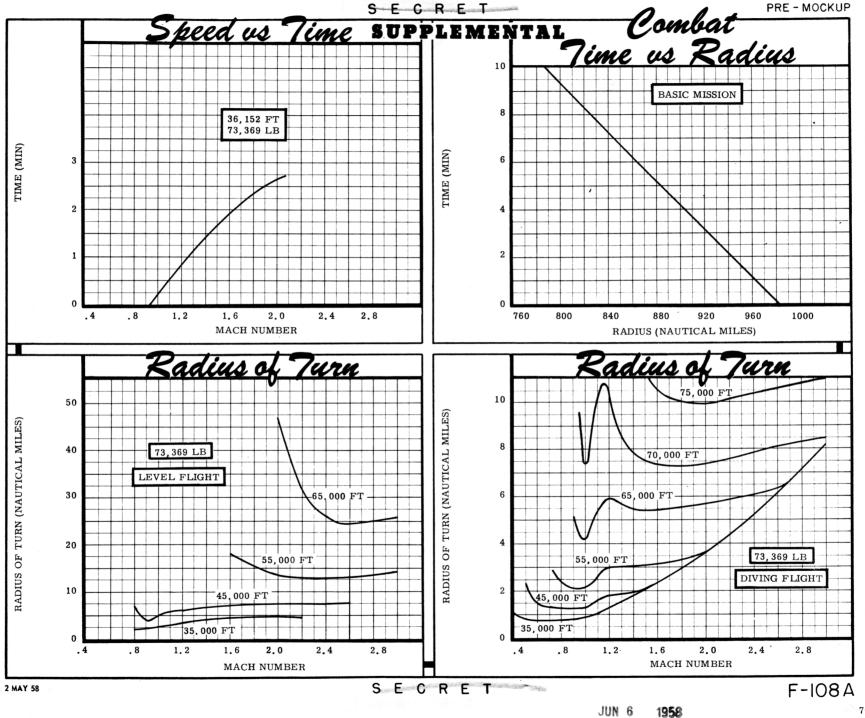
#### PERFORMANCE BASIS:

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

#### REVISION BASIS:

Initial issue

(1 MARCH 58)



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