

NAVAIR 00-110AF8-4

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## Standard Aircraft Characteristics

### NAVY MODEL F-8D AIRCRAFT

(TITLE UNCLASSIFIED)

(F 8 D - 2 N)

THIS PUBLICATION SUPERSEDES NAVAIR 00-110A-1 DATED  
1 MAY 1955 IN PART AND ALL ADDENDA THERETO

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**PUBLISHED BY DIRECTION OF THE  
COMMANDER OF THE NAVAL AIR SYSTEMS COMMAND**

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1 JULY 1967

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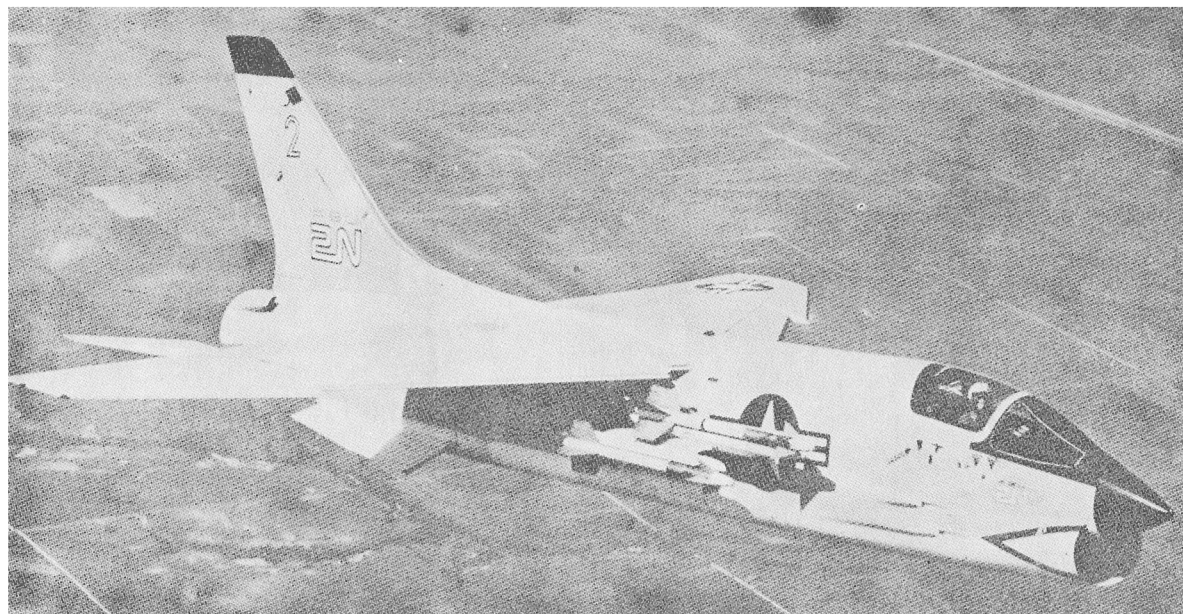
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## STANDARD AIRCRAFT CHARACTERISTICS

### F-8D CRUSADER

CHANCE VOUGHT

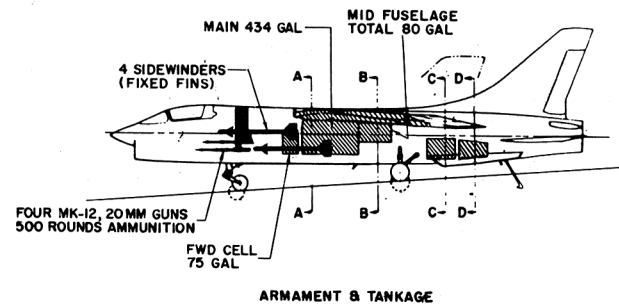
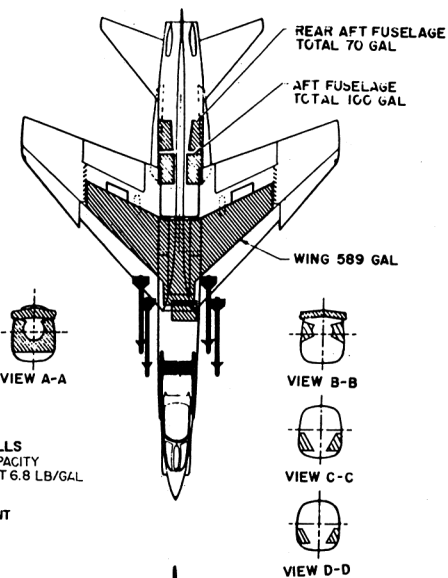
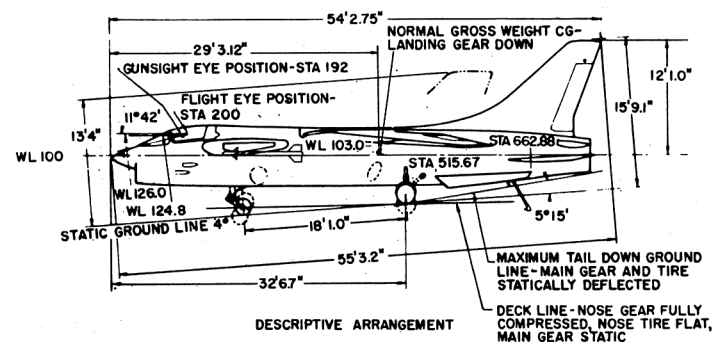
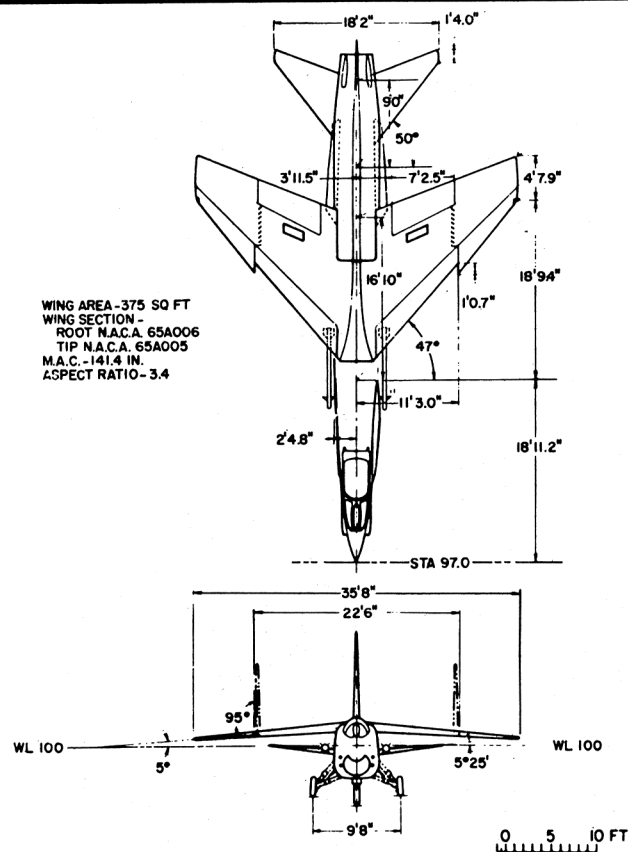
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**POWER PLANT**

NO & MODEL ..... (1)J57-P-20  
 AUGMENTATION .... AFTERBURNER  
 MFR. .... PRATT & WHITNEY  
 LENGTH ..... 269.52 INCHES  
 DIAMETER ..... 40.44 INCHES  
 TYPE ..... AXIAL FLOW

**RATINGS**

THRUST (SEA LEVEL STATIC)  
 MAXIMUM (A/B) 18,000 LBS  
 MILITARY 10,700 LBS  
 NORMAL 9,150 LBS

ENG. SPEC. NO. P&W N-1754

**ORDNANCE**

NO.	DESCRIPTION	LOCATION
4	20 MM AIRCRAFT GUNS, MK-12	FUSELAGE FRONT SECTION
500	ROUNDS OF 20 MM AMMUNITION	
20R4	SIDEWINDER AIR TO AIR MISSILES CARRIED EXTERNALLY ON PYRONS	EACH SIDE OF FUSELAGE

**MISSION AND DESCRIPTION**

THE F-8D IS A SINGLE-SEAT, CARRIER BASED JET FIGHTER DESIGNED TO MAINTAIN AIR SUPERIORITY DURING TAKE FORCE STRIKES WHEN THE ENEMY WILL MOUNT LARGE NUMBERS OF AIRCRAFT. THE AIRPLANE IS A NATURAL DEVELOPMENT OF THE F-8C BUT WITH IMPROVED PERFORMANCE AND WITH INCREASED ABILITY TO DETECT AND DESTROY TARGETS AT NIGHT AND IN FOUL WEATHER. THE PRIMARY IMPROVEMENTS DISTINGUISHING THE F-8D ARE: (1) THE J57-P-20 ENGINE (IMPROVED OVER THE J57-P-16) WHICH PROVIDES INCREASED PERFORMANCE; (2) THE AUTOPILOT, WHICH PROVIDES A THREE-AXIS ATTITUDE HOLD (AUXILIARY ALTITUDE HOLD AND BANK CONTROL FEATURES ARE ALSO PROVIDED); (3) THE APQ-83 ANGLE TRACKING RADAR FOR IMPROVED DETECTION AND ATTACK CAPABILITY; (4) THE 75 GALLONS OF ADDITIONAL FUEL FOR INCREASED RANGE; (5) COMPATIBILITY WITH MK-29 AND MK-30 SIDEWINDER MISSILES AND (6) PROVISIONS FOR MOUNTING FOUR MISSILES. EXTERNALLY THE F-8D IS THE SAME AS THE F-8C, INCLUDING THE LOW ASPECT RATIO VENTRAL FINS, AFTERBURNER COOLING AIR SCOOPS, EXTERNAL IFR FAIRING, AND FOUR MARK XII 20MM AIRCRAFT CANNON.

**DEVELOPMENT**

FIRST FLIGHT ..... FEBRUARY 1960  
 SERVICE USE ..... OCTOBER 1960

**DIMENSIONS**

WING  
 AREA ..... 375 SQ. FT.  
 SPAN ..... 35'8"  
 M.A.C. .... 141"  
 SWEEPBACK(1/4 CHORD) ... 42.0"  
 LENGTH ..... 54'-2.75"  
 HEIGHT ..... 15'-9.1"  
 TREAD ..... 9'-8"

**WEIGHTS**

LOADINGS	LBS.	L.F.
EMPTY	17,541	
BASIC	18,423	
DESIGN	26,000	6.4
COMBAT (GUNS ONLY)	24,482	
(2S/W)	25,098	
(4 S/W)	25,805	
MAX T.O. (FIELD)	29,500	
(CAT)	29,500	
MAX LAND (FIELD)	26,000	
(ARREST)	22,000	

**FUEL AND OIL**

GALS(TOTAL)	NO. TANKS	LOCATION
514	3	FUSELAGE, BLADDER MAIN SYSTEM
245	5	FUSELAGE, BLADDER, TRANSFER SYSTEM
589	1	WING INTEGRAL TRANSFER SYSTEM
FUEL CAPACITY (TOTAL) ..... 1348 GALLONS		
FUEL ..... MIL-F-5624C		
FUEL GRADE ..... <b>OIL</b> ..... JP-5		
CAPACITY(TOTAL) .... 8.5 GALS.		
(USABLE) .... 3.0 GALS.		
SPEC(APPLICABLE) .MIL-L-7808C		

**ELECTRONICS**

INTEGRATED ELECTRONIC CENTRAL  
 - ...AN/ASQ-17B  
 (CONTAINS FUNCTIONS OF AN/ARC-27A, AN/APX-6B & AN/ARA-25)  
 CODER GROUP ..... AN/APA-89  
 RADIO SET(TACAN) ... AN/ARN-21  
 GYRO STABILIZED MAGNETICALLY  
 SLAVED COMPASS ..... MA-1  
 ARMAMENT CONTROL SYSTEM .....  
 - .... AN/AWG-4  
 (INCLUDES AN/APQ-83, RADAR SET AND EX-16, AIRCRAFT FIRE CONTROL SYSTEM)

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PERFORMANCE SUMMARY						
TAKE-OFF LOADING CONDITION	(1) Fighter With Four Guns		(4) With Four Guns and Two MK-30 S/W		(7) With Four Guns and Four MK-30 S/W	
TAKE-OFF WEIGHT	lbs	28149	28765		29472	
Fuel	lbs	9167	9167		9167	
Payload <sup>1</sup>	lbs	163	573		983	
Wing Loading <sup>2</sup>	lbs/ft <sup>2</sup>	75.1	76.7		78.6	
Stall Speed - Power-Off	kts	138.5	141.5		144	
Take-Off Run at S.L. - Calm <sup>3</sup>	ft	5800	6300		6980	
Take-Off Run at S.L. - 25 Knot Wind <sup>3</sup>	ft	4200	4620		5160	
Take-Off to Clear 50 ft. - Calm <sup>3</sup>	ft	7500	8080		8850	
Max. Speed/Altitude <sup>3</sup>	kts/ft	614/S.L.	610/S.L.		589/5000	
Rate of Climb at S.L. <sup>3</sup>	fpm	7920	6920		5860	
Time: S.L. to 20000 ft <sup>4</sup>	min	3.2	3.6		4.2	
Time: S.L. to 30000 ft <sup>4</sup>	min	5.6	6.4		7.5	
Service Ceiling (100 FPM) <sup>3</sup>	ft	42900	42100		40550	
Combat Range	n.mi.	1509	1381		1263	
Average Cruising Speed	kts	495	495		495	
Cruising Altitude - Average	ft	41250	41350		39400	
Combat Radius/with IFR	n.mi.	394/868	374/831		355/787	
Average Cruising Speed/with IFR	kts	495/495	495/495		495/495	
Cycle Time <sup>5</sup> /with IFR	hrs	2.27/4.23	2.19/4.08		2.11/3.90	
Combat Air Patrol/with IFR	n.mi.	150	150		150	
Loiter Time <sup>6</sup> /with IFR	hrs	0.96/4.22	0.87/3.96		0.79/3.53	
Cycle Time <sup>6</sup> /with IFR	hrs	2.24/5.50	2.15/5.24		2.08/4.82	
COMBAT LOADING CONDITION	(2)	(3)	(5) MISSILES RETAINED	(6) MISSILES RETAINED	(8) MISSILES RETAINED	(9) MISSILES RETAINED
COMBAT WEIGHT <sup>1</sup>	lb	24482	24482	25098	25098	25805
Engine Power	Combat	Military	Combat	Military	Combat	Military
Fuel	lbs	5500	5500	5500	5500	5500
Combat Speed/Combat Altitude	kts/ft	1067/35000	560/35000	1037/35000	556/35000	996/35000
Rate of Climb/Combat Altitude	fpm/ft	14300/35000	3250/35000	13500/35000	2850/35000	12600/35000
Combat Ceiling (500 FPM)	ft	54050	44800	53400	43700	52750
Rate of Climb at S.L.	fpm	34650	9200	31950	8000	29200
Max. Speed at S.L.	kts	665	616	664	612	656
Max. Speed/Altitude	kts/ft	1067/35000	616/S.L.	1037/35000	612/S.L.	1005/35000
LANDING WEIGHT	lbs	20382		20998		21705
Fuel	lbs	1400		1400		1400
Stall Speed - Power - Off	kts	117.2		120.7		124
Stall Speed - with Approach Power	kts	111.7		115.7		119.4
Distance: Ground Roll/Over 50 Ft.	ft	5220/5940		5730/6480		6370/7130

NOTES:

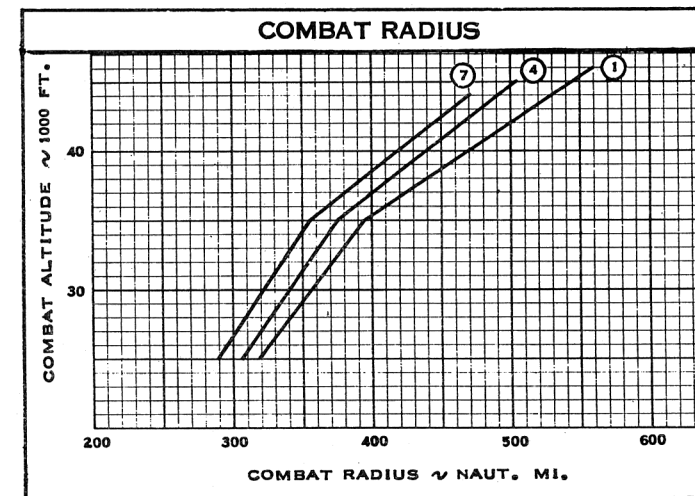
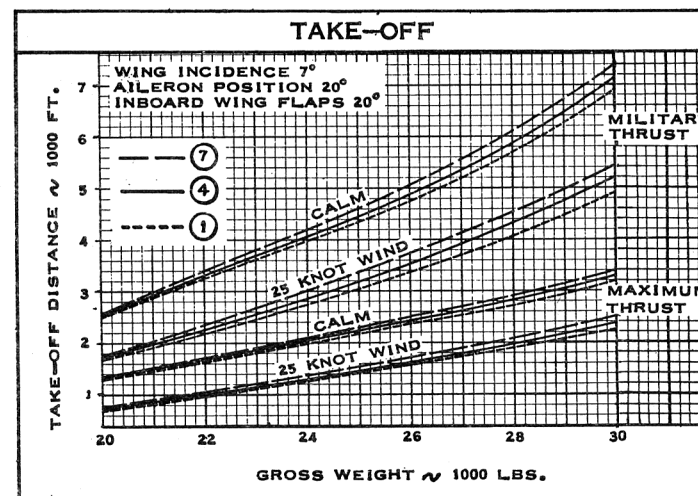
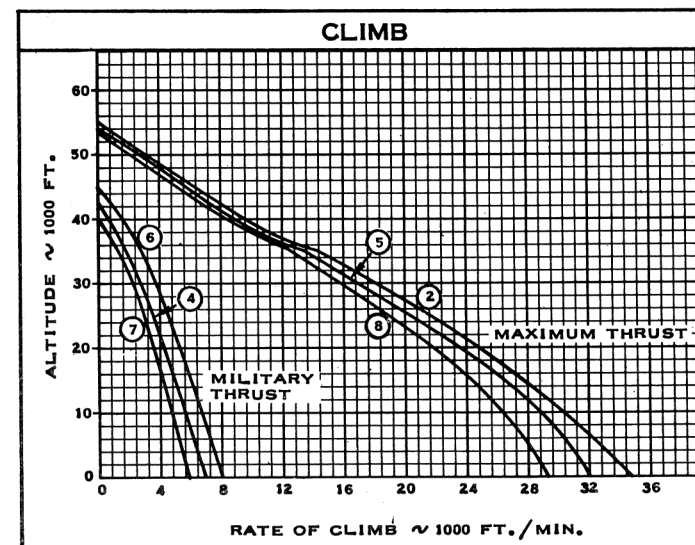
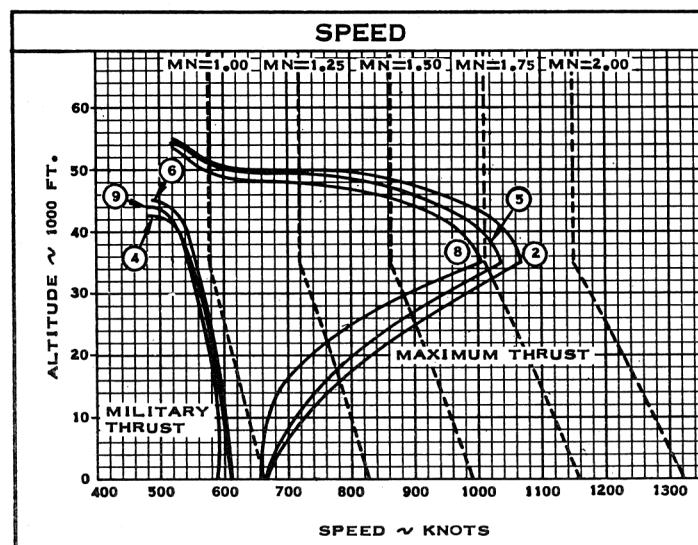
1. For fighter with guns only: 500 rounds ammunition; with guns and 2 external Sidewinders: 500 rounds ammunition and 2 Sidewinders (MK-30) air-to-air missiles; with guns and four external Sidewinders: 500 rounds ammunition and four Sidewinder (MK-30) air-to-air missiles.
2. Wing loading based on wing area of 375 sq. ft.
3. Military thrust.
4. Military thrust. - Times to climb consider weight reduction due to fuel used.
5. Cycle time includes 20 minutes loiter at sea level.
6. Time over station (150 nautical miles from base).
7. Performance basis: F8U-2N Phase I NPE Flight Test Data of NATESTCEN Report Project TED No. RA-27303 dated 23 November 1960.

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LOADING CONDITION COLUMN NUMBER

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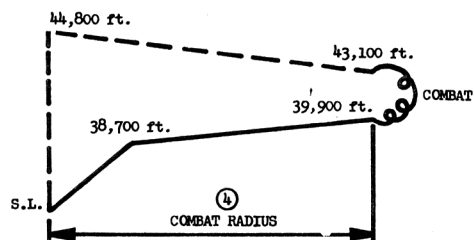
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# NOTES

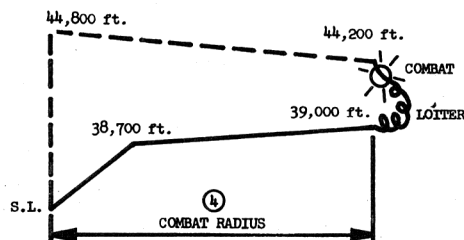
## GENERAL PURPOSE AND ESCORT FIGURE

1. WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust at sea level.
2. CLIMB: On course to cruise altitude with military rated thrust.
3. CRUISE-OUT: At altitudes and speeds for maximum range.
4. COMBAT FUEL ALLOWANCE: At 35,000 ft. for 5 minutes at maximum thrust at a velocity mid-way between  $V_{max}$  with maximum thrust and  $V_{max}$  with military thrust plus 15 minutes at  $V_{max}$  with military thrust.
5. CRUISE-BACK: At altitudes and speeds for maximum range.
6. RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 per cent of initial fuel load.



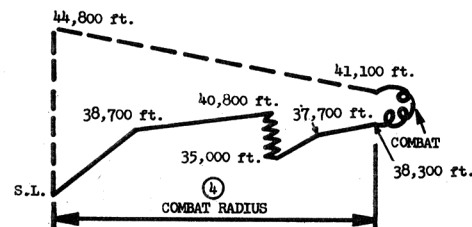
## COMBAT AIR PATROL

1. WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust at sea level.
2. CLIMB: On course to cruise altitude with military rated thrust.
3. CRUISE: To a point 150 nautical miles from base at altitudes and speed for maximum range.
4. LOITER: On station at speed for maximum endurance at approximate final cruise-out altitude.
5. COMBAT FUEL ALLOWANCE: At 35,000 ft. for 5 minutes at maximum thrust at a velocity mid-way between  $V_{max}$  with maximum thrust and  $V_{max}$  with military thrust plus 15 minutes at  $V_{max}$  with military thrust.
6. CRUISE-BACK: 150 nautical miles to base at altitudes and speeds for maximum range.
7. RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5 per cent of initial fuel load.



## GENERAL PURPOSE FIGHTER WITH IN-FLIGHT REFUELING (A3D-2 TANKER)

1. WARM-UP, TAKE-OFF, ACCELERATE: 5 minutes with normal thrust at sea level.
2. CLIMB: On course to cruise altitude with military rated thrust.
3. CRUISE-OUT: At altitudes and speeds for maximum range.
4. DESCEND TO 35,000 ft. REFUELING ALTITUDE: No fuel used, no distance gained.
5. ALLOWANCE FOR RENDEZVOUS, HOOK-UP, AND FLIGHT CONTINGENCIES: 15 minutes at maximum endurance airspeeds. (Assume no fuel used, no distance gained during transfer of fuel.)
6. REFUEL POINT: Limited to return of aircraft to base with normal reserve if contact for refueling is not made.
7. CLIMB: On course to cruise altitude with military rated thrust.
8. CRUISE: Continue cruise-out at altitudes and speeds for maximum range.
9. LOITER (AS MISSION 4)
10. COMBAT (MISSION 4)
11. CRUISE BACK
12. RESERVE



If JP 4 fuel is used, these decrements in performance are applicable:

- |   |  |
|---|--|
| ① | General Purpose Fighter; guns                            |
| ① | In-flight Refueling; guns                                |
| ④ | General Purpose Fighter; guns and 2 external Sidewinders |
| ④ | In-flight Refueling; guns and 2 external Sidewinders     |
| ⑦ | General Purpose Fighter; guns and 4 Sidewinders          |
| ⑦ | In-flight Refueling; guns and 4 Sidewinders              |

### Δ WEIGHT

-405 lbs.
-639 lbs.
-405 lbs.
-639 lbs.
-405 lbs.
-639 lbs.

### Δ RANGE

-78 n. mi.
-124 n. mi.
-72 n. mi.
-116 n. mi.
-70 n. mi.
-100 n. mi.

### Δ RADIUS

-39 n. mi.
-62 n. mi.
-36 n. mi.
-58 n. mi.
-35 n. mi.
-50 n. mi.

### Δ MISSION TIME

-0.24 hrs.
-0.25 hrs.
-0.22 hrs.
-0.23 hrs.
-0.20 hrs.
-0.19 hrs.

MISSION TIME EXCLUDES WARM-UP, TAKE-OFF AND RESERVE  
CYCLE TIME EXCLUDES WARM-UP AND TAKE-OFF FUEL

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