

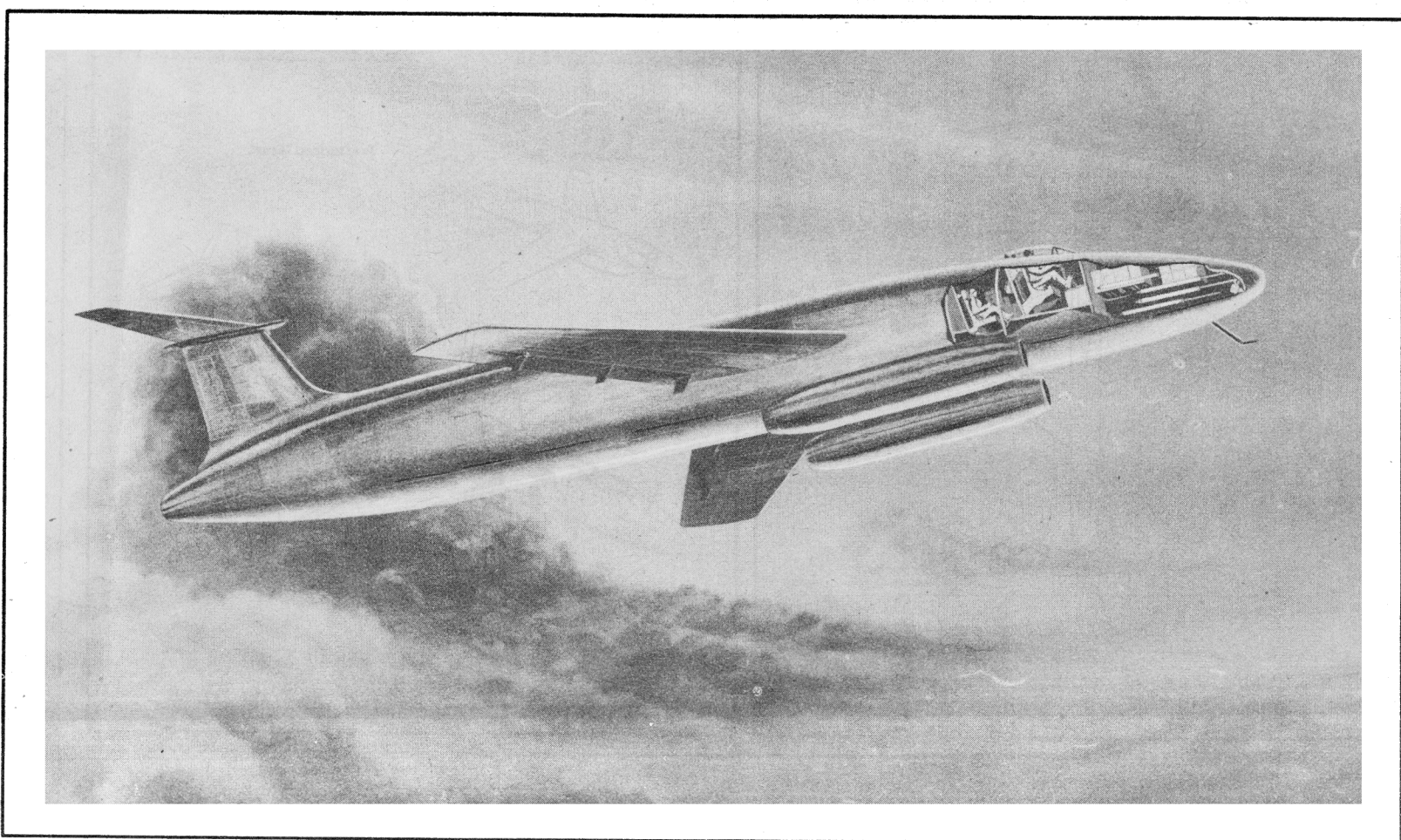
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listed 3rd Ed; Hold 11/16/12, 54  
omitted 1/14/51

Unclassified  
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A-1  
(X) B-51 Khan  
(Security Information)

EXPERIMENTAL

Classification cancelled  
or changed to Unclassified  
AUG 11 AFSC AF AC Sec Class. Grade 1 Jan 64  
BY A. R. Lonsborn Deputy DoD Div 5600-10  
Signature and Grade 10 Feb 67



# Standard Aircraft Characteristics

BY AUTHORITY OF  
COMMANDING GENERAL  
WRIGHT AIR DEVELOPMENT CENTER  
U. S. AIR FORCE

## XB-51

Martin

THREE J47-GE-13

GENERAL ELECTRIC

11 JULY 1952

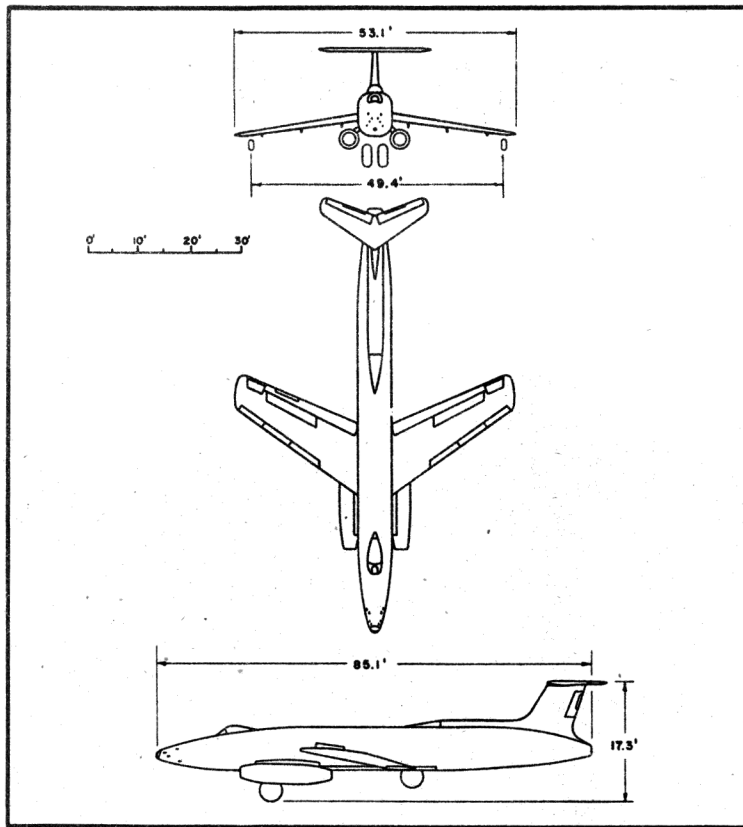
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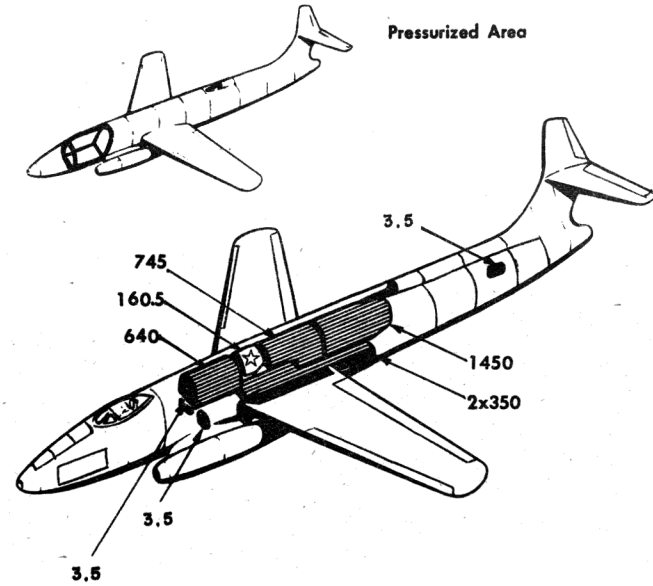
Volume One 13 March 1953

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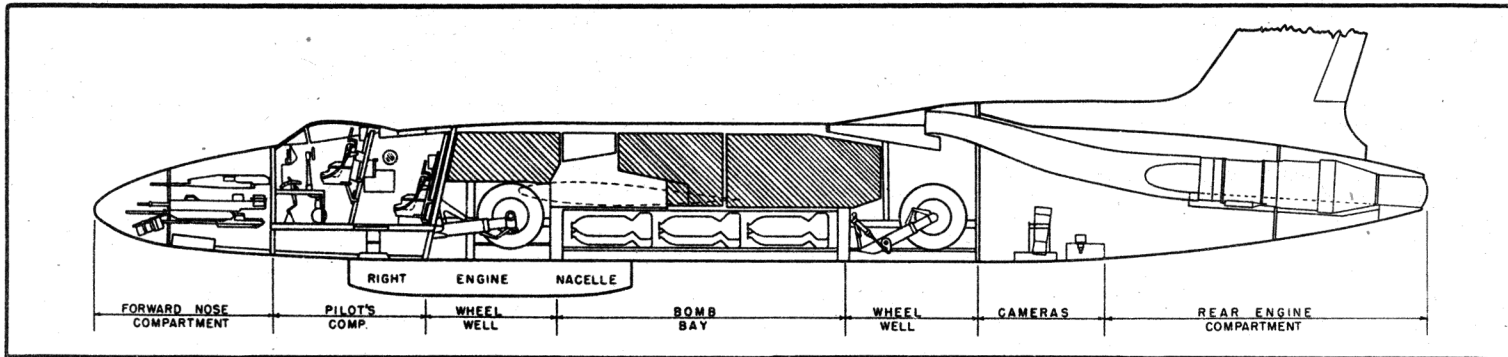
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Wing Area ..... 548.0 sq ft      Wing Section .... NACA 63-A-010  
 Aspect Ratio ..... 5.15              M.A.C. .... 130.7''



▨ Fuel (Gal)      ☆ Water/Alcohol (Gal)      ■ Oil (Gal)



XB-51

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## Loading and Performance—Typical Mission

C O N D I T I O N S			BASIC MISSION	ATTACK MISSION	HIGH ALTITUDE		FERRY RANGE
					RADIUS	RADIUS	
TAKE-OFF WEIGHT	⑤	(lb)	57,874	56,210	57,874	62,452	58,424
Fuel at 6.5 lb/gal (grade JP-3)		(lb)	18,428	18,428	18,428	16,606	22,978
Payload (Bombs)		(lb)	4000	—	4000	10,400	None
Payload (Rockets)		(lb)	—	1120	—	—	None
Wing loading		(lb/sq ft)	105.6	102.6	105.6	114	106.6
Stall speed (power off)	⑦	(kn)	132	130	132	134	132
Take-off ground run at SL	①	(ft)	4225	4100	4225	4560	4270
Take-off ground run with ATO	①	(ft)	3070	2840	3070	4080	3150
Take-off to clear 50 ft	①	(ft)	5760	5325	5760	7050	5820
Take-off to clear 50 ft with ATO	①	(ft)	4620	4275	4620	5750	4750
Rate of climb at SL	③	(fpm)	3660	3800	3660	3200	3600
Rate of climb at SL(one engine out)	②	(fpm)	2025	2150	2025	1750	1975
Time: SL to 20,000 ft	③	(min)	6.7	6.3	6.7	7.4	6.9
Time: SL to 30,000 ft	③	(min)	14	12.8	14	16.3	14.8
Service ceiling (100 fpm)	③	(ft)	31,800	32,800	31,800	29,400	31,800
Service ceiling (one engine out)	②	(ft)	18,000	19,100	18,000	15,300	17,700
COMBAT RANGE	④	(n. mi.)	—	—	—	—	1255
COMBAT RADIUS	④	(n. mi.)	408	400	448	372	—
Average speed		(kn)	470	468	470	469	470
Initial cruising altitude		(ft)	31,500	32,750	31,500	28,000	31,500
Target speed		(kn)	560	560	483	475	—
Target altitude		(ft)	S. L.	S. L.	35,000	30,000	—
Final cruising altitude		(ft)	41,500	40,500	40,750	41,000	40,650
Total mission time		(hr)	1.86	1.85	1.94	1.64	2.69
COMBAT WEIGHT	④	(lb)	44,000	45,180	43,000	42,000	37,600
Combat altitude		(ft)	S. L.	S. L.	35,000	30,000	40,650
Combat speed	②	(kn)	560	560	503	517	488
Combat climb	②	(fpm)	6500	6275	1250	2100	550
Combat ceiling (500 fpm)	②	(ft)	37,700	37,200	38,200	38,700	40,800
Service ceiling (100 fpm)	②	(ft)	39,400	38,900	39,800	40,300	42,400
Service ceiling (one engine out)	②	(ft)	29,400	28,400	30,000	30,800	34,300
Max rate of climb at SL	②	(fpm)	6500	6275	6675	6875	7750
Max speed at S. L. altitude	②	(kn/ft)	560	560	560	560	560
Basic speed at 35,000 ft		(kn)	502	501	503	504	507
LANDING WEIGHT		(lb)	36,562	37,780	37,372	37,280	37,600
Ground roll at SL		(ft)	2550	2680	2620	2620	2660
Ground roll (auxiliary brake)		(ft)	⑥	⑥	⑥	⑥	⑥
Total from 50 ft		(ft)	3410	3515	3480	3480	3500
Total from 50 ft (auxiliary brake)		(ft)	2500	2565	2540	2540	2555

NOTES

- ① Take-off power  
 ② Max power  
 ③ Normal power  
 ④ Detailed descriptions of RADIUS and RANGE missions given on page 6.

- ⑤ All T. O. weights include 1275 lb water/alcohol for T. O.  
 ⑥ Data unavailable.  
 ⑦ Automatic leading edge slats extended.

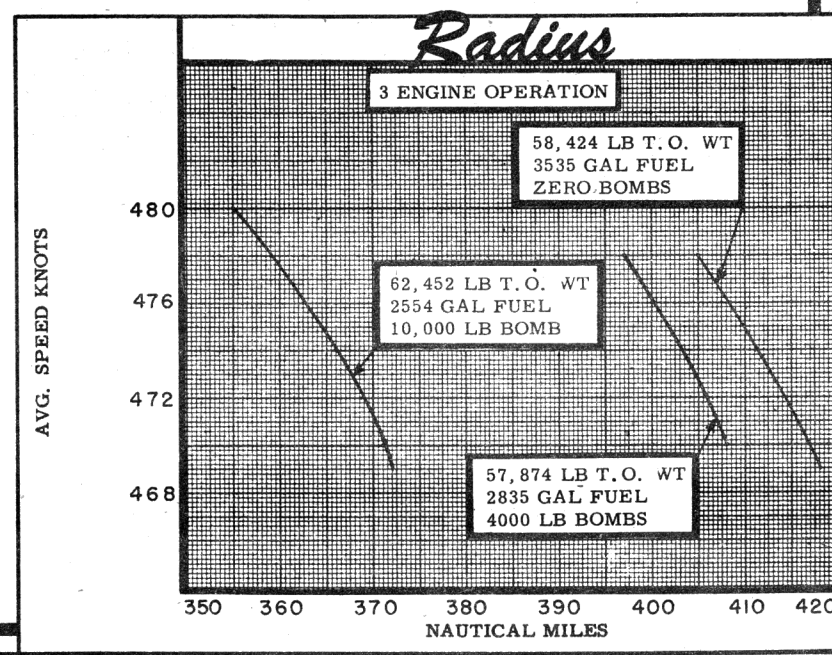
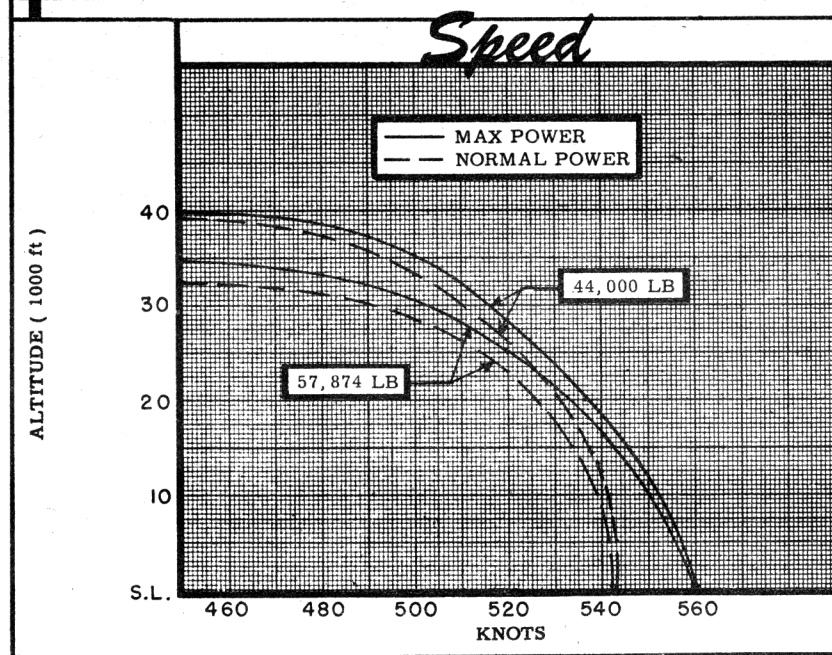
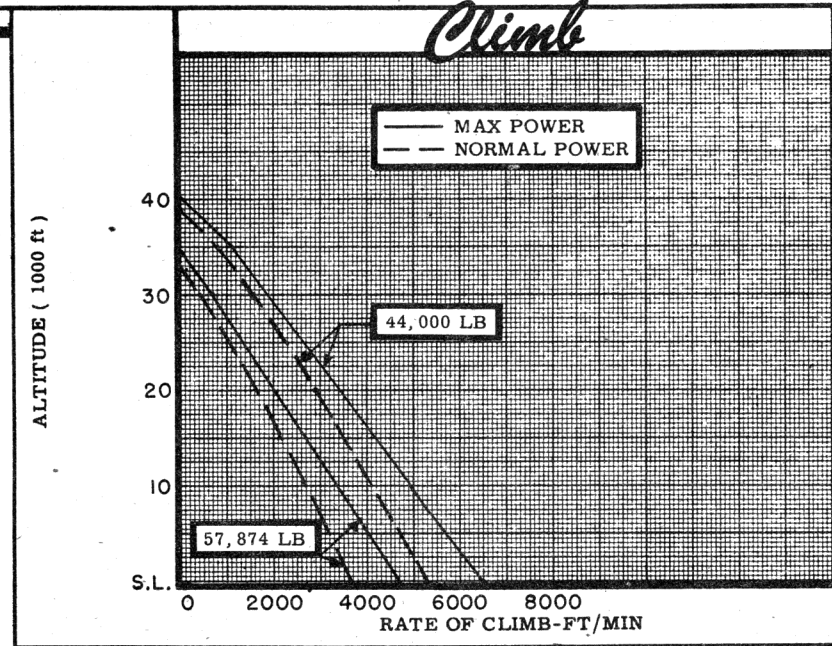
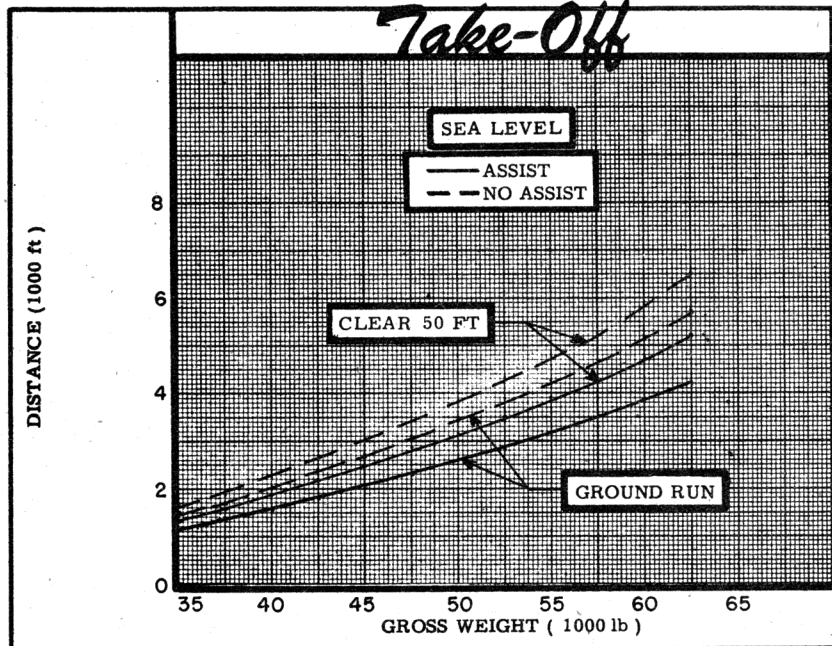
## PERFORMANCE BASIS:

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



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11 JULY 1952

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XB-51

**N O T E S**

FORMULA: RADIUS MISSION I

Take-off, climb on course to 31,500 feet with maximum power, cruise at long range speeds at altitude for best range utilizing a cruising climb, descend to sea level (no distance credit), drop bombs, conduct a five minute combat periods with military power (no distance credit) at sea level, climb on course to altitude for best range, cruise at long range speeds, arriving over home base at 41,500 feet altitude. Range free allowances are 5 minutes normal power fuel consumption for starting engines and take-off, 5 minutes combat at sea level plus 5% of initial fuel and 20 minutes at speeds for maximum endurance at sea level for reserve and landing. All operations conducted with 3 engines operating.

FORMULA: RADIUS MISSION II

Same as I except rockets are carried in lieu of bombs and initial & final cruising altitudes have changed slightly.

FORMULA: RADIUS MISSION III

Take-off, climb on course to 31,500 feet with maximum power, cruise at long range speeds at altitude for best range utilizing a cruising climb, climb on course to reach cruising ceiling fifteen minutes before bomb drop, cruise in level flight to target (including a fifteen minute bomb run with normal power), drop bombs, conduct (2) minutes evasive action with normal power at combat altitude (no distance credit), credit for distance is taken for a period of 8 minutes for escape with normal power, cruise at long range speeds at altitude for best range utilizing a cruising climb arriving over home base at 40,750 feet. Range free allowances include: 5 minutes fuel consumption at normal power for starting engines and take-off, 2 minutes evasive action at normal power plus 5% of initial fuel load and 30 minutes at speed for max endurance at sea level for reserve and landing. All operations conducted with 3 engines operating.

FORMULA: RADIUS MISSION IV

Same as III except a bomb load of 10,400 lb is carried and initial and final cruising altitudes are slightly different.

FORMULA: FERRY RANGE V

Take-off, climb on course to 31,500 feet at maximum power. Remainder of flight is made at long range speeds utilizing cruising climb. Range free allowances are 5 minutes normal power fuel consumption for starting engines and take-off, plus 5% of initial fuel load and 30 minutes at speed for max endurance at sea level for reserve and landing.

GENERAL DATA:

(a) Engine ratings on page 3 are manufacturer's guaranteed ratings. Power values used for performance calculations are as follows:

(3) J47-GE-13			
	LB	RPM	ALT
T. O:	*6000	7900	S. L.
Max:	5200	7900	S. L.
Nor:	4800	7330	S. L.
*Wet			

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EXPERIMENTAL

**SUPPLEMENTAL***Loading and Performance - Typical Mission*

C O N D I T I O N S			BASIC MISSION	
TAKE-OFF WEIGHT	④	(lb)	57,874	<p>1. Military Specification MIL-C-5011A dated 5 November 1951 redefines the combat radius to ground rules coordinated by the major USAF Air Commands and the Bureau of Aeronautics, U. S. Navy. Although in most cases the mission radius is reduced, this was considered to be more realistic based on Mission Profiles and Allowances proven in actual operation.</p> <p>2. The combat radius for MIL-C-5011A is different from that based on MIL-C-5011 in that:</p> <p>a. Ground support bomber under MIL-C-5011A drops bombs immediately after descending to S. L. and then conducts 5 minutes evasive or combat action at sea level at maximum power.</p> <p>b. Reserves are changed from a constant percentage of initial fuel as in MIL-C-5011 to a value equal to 5% of initial fuel load plus fuel for a specified period of 20 minutes max endurance at sea level.</p> <p>c. Combat range values are not quoted in MIL-C-5011A.</p> <p>3. Certain items of performance quoted for MIL-C-5011A are different from those based on MIL-C-5011 in that:</p> <p>a. Time to climb values consider the effects of weight reduction during ground operation and climb.</p> <p>b. Average cruising speed does not include time and distance in climbs or target operation at normal power.</p> <p>c. Combat altitude is the altitude at which the actual target run is conducted.</p> <p>d. Basic speed is the maximum level flight speed within all operating limitations at the combat weight and at a specified altitude. This basic speed is quoted as a means of direct comparison of aircraft of similar type.</p>
Fuel at 6.0 lb/gal (grade JP-3)		(lb)	18,428	
Payload (bombs)		(lb)	4000	
Wing loading		(lb/sq ft)	105.6	
Stall speed (power off)		(kn)	132	
Take-off ground run at SL	①	(ft)	4765	
Take-off ground run with ATO	①	(ft)	3540	
Take-off to clear 50 ft	①	(ft)	5660	
Take-off to clear 50 ft with ATO	①	(ft)	4360	
Rate of climb at SL	②	(fpm)	4650	
Rate of climb at SL (one engine out)	②	(fpm)	2025	
Time: SL to 20,000 ft	②	(min)	6.2	
Time: SL to 30,000 ft	②	(min)	14	
Service ceiling (100 fpm)	②	(ft)	31,800	
Service ceiling (one engine out)	②	(ft)	18,000	
COMBAT RADIUS		(n. mi.)	430	
Average speed		(kn)	470	
Initial cruising altitude		(ft)	31,500	
Target speed	③	(kn)	542	
Target altitude		(ft)	S. L.	
Final cruising altitude		(ft)	41,750	
Total mission time		(hr)	1.95	
COMBAT WEIGHT	⑥	(lb)	43,550	
Combat altitude		(ft)	S. L.	
Combat speed	②	(kn)	560	
Combat climb	②	(fpm)	6600	
Combat ceiling (500 fpm)	②	(ft)	38,000	
Service ceiling (100 fpm)	②	(ft)	39,700	
Service ceiling (one engine out)	②	(ft)	29,700	
Max rate of climb at SL	②	(fpm)	6600	
Max speed at optimum altitude	②	(kn/ft)	560/S. L.	
LANDING WEIGHT		(lb)	36,014	
Ground roll at SL		(ft)	2380	
Ground roll (auxiliary brake)		(ft)	⑤	
Total from 50 ft		(ft)	3245	
Total from 50 ft (auxiliary brake)		(ft)	⑤	

NOTES

- ① Take-off power  
 ② Max power  
 ③ Normal power

- ④ Take-off weight includes 1275 lb water  
 ⑤ No data available  
 ⑥ For Radius Mission

## PERFORMANCE BASIS:

- (a) Data source: Contractor's estimated data

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