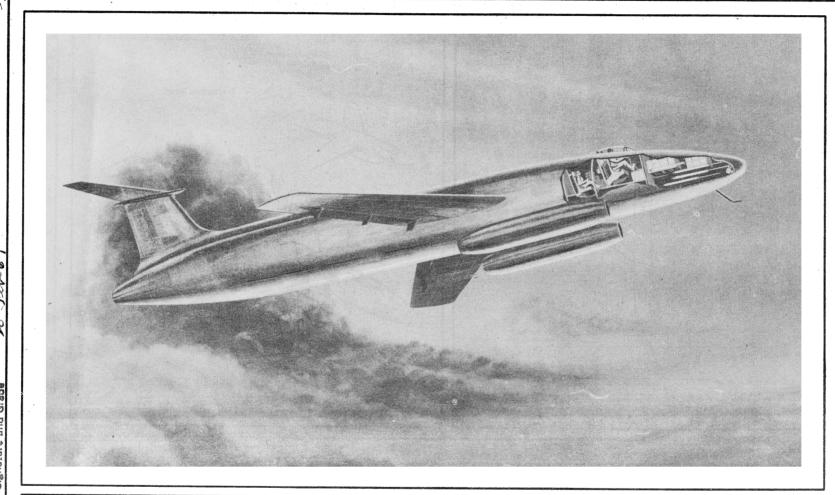
Unclassified SECRET A-1 (X) B-51 KhAN (Security Information)

EXPERIMENTAL



# Standard Aircraft Characteristics

BY AUTHORITY OF COMMANDING GENERAL WRIGHT AIR DEVELOPMENT CENTER U.S. AIR FORCE XB-51

Martin

THREE J47-GE-I3

GENERAL ELECTRIC

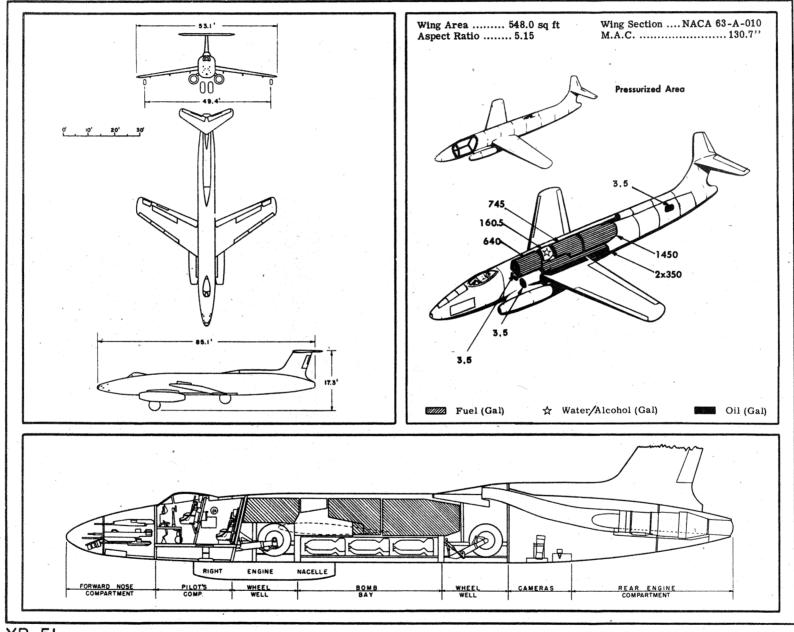
11 JULY 1952

SECRET

XB-51

Volume One 13 march 1953

# SECORE



### SEGRET

# POWER PLANT

No. & Model (3)J47-GE-13
Mfr General Electric
Engine Spec. No E581-A
Type Axial Flow
Length 144"
Diameter
Weight (dry)
Tail Pipe. Fixed Area, variable nozzle
Augmentation Water/Alcohol

### ATO

No.	&	Μo	d	el				. (	4)	14	1 A	S	10	00-D4
Mfr.					٠.		٠.						A	erojet
Type						•						٠.		Solid

# **ENGINE RATINGS**

S. L. Static	LB - RPM - MIN
Max:	*6000 - 7950 - 5
Mil:	5200 - 7950 - 30
Nor:	4320 - 7370 - Cont.
*Wet	

ATO

Thrust (lb) .						4x	1(	000
Duration (sec								

# Mission and Description

Navy Equivalent: None

Mfr's Model: 234

The primary mission of this aircraft is low level attack for destruction by bombs and guns of surface military targets in tactical support of ground and/or naval forces.

The primary mission requires only the pilot to operate this aircraft; however, an additional crew member is required for Shoran bombing. Both crew members are located in an air conditioned pressurized compartment forward in the fuselage and are afforded positive bailout-ejection seats.

This aircraft features sweptback surfaces having thermal anti-icing, variable wing incidence for take-off and landing, variable tail incidence for trim and dive recovery, full span single slotted flaps, spoiler aileron lateral control, partial span automatic wing leading edge slats and fuselage dive brakes for glide control.

The main landing gear is of the bicycle type located in the fuselage and lateral stability is provided by wing tip gears.

The power plant installation incorporates water-alcoholthrust augmentation for take-off, a variable area tail pipe, automatic tail pipe temperature control and continuous fuel tank purging.

Armament consists of pilot bombing facilities, A-1-B gun-bomb rocket sight with radar ranging rotary type bomb bay serving dual role of bomb carrier and bomb bay door with provisions to carry rockets, Shoran bombing system, 20mm strafing armament and passive defense consisting of engine flak protection and armor glass windshield.

Photographic facilities include a forward recording strike camera, a vertical high altitude strike and reconnaissance camera, and an aft recording camera for damage assessment of low altitude bombing and strafing.

Development

	1	•	v	~	w	v		~	7	- C					
Design Initiated:						٠. (	7.						٠.		. Feb 47
First Flight (1st Art.) First Flight (2nd Art.)											٠.			٠.	Oct 49
First Flight (2nd Art.	)														. Apr 50
First Acceptance (1st First Acceptance (2nd	Art.	٠.								-10					. Jan 52
First Acceptance (2nd	Art.	) :									 	٠			. Dec 51

No. Size

# WEIGHTS

	Loading	Lb	L.F.
П	Empty	30,906(A)	
	Basic	31,500(E)	,
	Design	53,000	3.67
	Combat	*44,000	3.67
	Max T. O. (o	v'ld)**62,452 .	2.0
		+.57,067	
1			

- (E) Estimated
- \* For Basic Mission
- \*\* Limited by strength
- + Limited to landing without external bombs and water

# u e l

Location No. Tanks Fuselage*3	
Bomb bay 2	3535 JP-4
Specification MIL-F-5	624A
OIL .	4

### 

WATER/ALCOHOL

# DIMENSIONS

Wing Span
Incidence-Normal Flight Attitude
Root 30
Tip
Incidence-Take-off & Land Atti-
tude
Root 7 <sup>0</sup> 30'
Tip5030
Cathedral6
Śweepback(LE) 35 <sup>0</sup>
Length
Height
Tread49.4'

# BOMBS

N	ο.				Lb	Type
2 2 4					*4000	G. P. G. P. A. P.
9					1000	G. P. G. P.

\* In special door

# G U N S

Rds ea.

8 . . . 20mm, . . 160 . . . . . Nose

Location

R	0	C	K	E	T	S	
No. 8	Size . 5"		T; . HV	ype AR.		ocati mb b	
Note:							

Rockets can be carried in bomb bay in lieu of internal bombs.

# ELECTRONICS

VHF Command AN/ARC-3
Radio Compass AN/ARN-6
Localizer
Glide Path AN/ARN-5B
Marker Beacon AN/ARN-12
Radar Beacon AN/APW-11
Shoran AN/APN-3
RCM AN/APT-16
IFF
Interphone AAF Combat

CONDITIO	N	8	BASIC	ATTACK		TITUDE	FERRY	
TAKE-OFF WEIGHT Fuel at 6.5 lb/gal (grade JP-3) Payload (Bombs) Payload (Rockets) Wing loading Stall speed (power off) Take-off ground run at SL Take-off ground run with ATO Take-off to clear 50 ft Take-off to clear 50 ft with ATO Rate of climb at SL Rate of climb at SL Rate of climb at SL(one engine out) Time: SL to 20,000 ft Time: SL to 30,000 ft Service ceiling (100 fpm) Service ceiling (one engine out) COMBAT RANGE COMBAT RADIUS Average speed Initial cruising altitude Target altitude Final cruising altitude Total mission time	@ <del>6000000000000000000000000000000000000</del>	(lb) (lb) (lb) (lb) (lb/sq ft) (kn) (ft) (ft) (ft) (ft) (fpm) (fpm) (min) (min) (ft) (ft) (n. mi.) (kn) (ft) (kn) (ft) (kn) (ft) (kn) (ft) (kn) (ft) (kn) (ft) (kn)	MISSION  57,874  18,428  4000  105,6  132  4225  3070  5760  4620  3660  2025  6.7  14  31,800  18,000  408  470  31,500  560  S. L.  41,500  1.86	11 56, 210 18, 428 1120 102.6 130 4100 2840 5325 4275 3800 2150 6.3 12.8 32, 800 19, 100 468 32, 750 560 S. L. 40, 500 1. 85	RADIUS  111 57,874 18,428 4000  105.6 132 4225 3070 5760 4620 3660 2025 6.7 14 31,800 18,000  448 470 31,500 483 35,000 40,750 1,94	RADIUS  IV 62,452 16,606 10,400  114 134 4560 4080 7050 5750 3200 1750 7.4 16.3 29,400 15,300  372 469 28,000 475 30,000 41,000 1.64	RANGE  V 58, 424 22, 978 None None 106.6 132 4270 3150 5820 4750 3600 1975 6.9 14.8 31, 800 17, 700 1255  470 31, 500  40, 650 2. 69	
COMBAT WEIGHT Combat altitude Combat speed Combat climb Combat ceiling (500 fpm) Service ceiling (100 fpm) Service ceiling (one engine out) Max rate of climb at SL Max speed at S. L. altitude Basic speed at 35,000 ft LANDING WEIGHT Ground roll at SL Ground roll (auxiliary brake) Total from 50 ft Total from 50 ft (auxiliary brake)	<b>@</b> @@@@@@@	(lb) (ft) (kn) (fpm) (ft) (ft) (ft) (fpm) (kn/ft) (kn) (lb) (ft) (ft) (ft) (ft)	44,000 S. L. 560 6500 37,700 39,400 29,400 6500 560 502 36,562 2550 (\$\mathbb{G}\$) 3410 2500	45, 180 S. L. 560 6275 37, 200 38, 900 28, 400 6275 560 501 37, 780 2680 ⑤ 3515 2565	43,000 35,000 503 1250 38,200 39,800 30,000 6675 560 503 37,372 2620 ⑤ 3480 2540	42,000 30,000 517 2100 38,700 40,300 30,800 6875 560 504 37,280 2620 (6) 3480 2540	37,600 40,650 488 550 40,800 42,400 34,300 7750 560 507 37,600 2660 ⑤ 3500 2555	

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

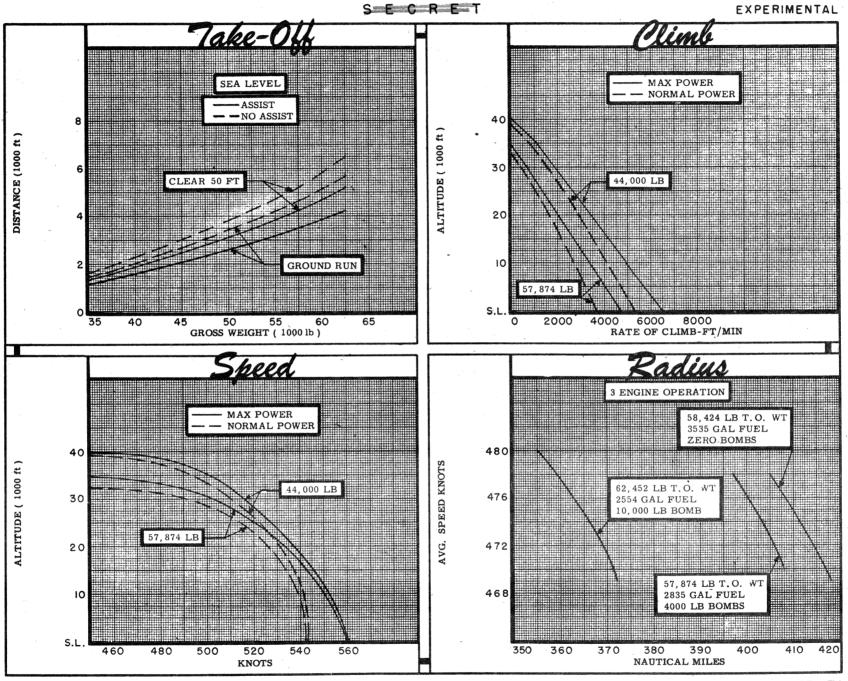
5 All T.O. weights include 1275 lb

water/alcohol for T.O.

Data unavailable.
 Automatic leading edge slats extended.

### PERFORMANCE BASIS:

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



### NOTES

### 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	· · · · · · · · · · · · · · · · · · ·		

CONDITIO	N	S	BASIC MISSION	
TAKE-OFF WEIGHT Fuel at 6.0 lb/gal (grade JP-3) Payload (bombs) Wing loading Stall speed (power off) Take-off ground run at SL Take-off ground run with ATO Take-off to clear 50 ft Take-off to clear 50 ft with ATO Rate of climb at SL Rate of climb at SL (one engine out) Time: SL to 20,000 ft Time: SL to 30,000 ft Service ceiling (100 fpm) Service ceiling (one engine out) COMBAT RADIUS Average speed Initial cruising altitude Target speed Target altitude Final cruising altitude	(1) (1) (1) (2)	(lb) (lb) (lb) (lb/sq ft) (kn) (ft) (ft) (ft) (ftm) (fpm) (min) (min) (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	57,874 I 18,428 4000 105.6 132 4765 3540 5660 4360 4650 2025 6.2 14 31,800 18,000 430 470 31,500 542 S. L. 41,750	<ol> <li>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.</li> <li>The combat radius for MIL-C-5011A is different from that based on MIL-C-5011 in that:         <ol> <li>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.</li> <li>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.</li> <li>Combat range values are not quoted in MIL-C-5011A.</li> </ol> </li> <li>Certain items of performance quoted for MIL-C-5011A are different from those based on MIL-C-5011 in that:</li> </ol>
Total mission time  COMBAT WEIGHT Combat altitude Combat speed Combat ceiling (500 fpm) Service ceiling (100 fpm) Service ceiling (one engine out) Max rate of climb at SL Max speed at optimum altitude ANDING WEIGHT Ground roll at SL Ground roll (auxiliary brake) Total from 50 ft Total from 50 ft (auxiliary brake)	6 9999999	(hr)  (lb) (ft) (kn) (fpm) (ft) (ft) (ftm) (kn/ft) (lb) (ft) (ft) (ft) (ft)	1. 95  43, 550 S. L. 560 6600 38, 000 39, 700 29, 700 6600 560/S. L. 36, 014 2380 ⑤ 3245 ⑥	<ul> <li>a. Time to climb values consider the effects of weight reduction during ground operation and climb.</li> <li>b. Average cruising speed does not include time and distance in climbs or target operation at normal power.</li> <li>c. Combat altitude is the altitude at which the actual target run is conducted.</li> <li>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.</li> </ul>