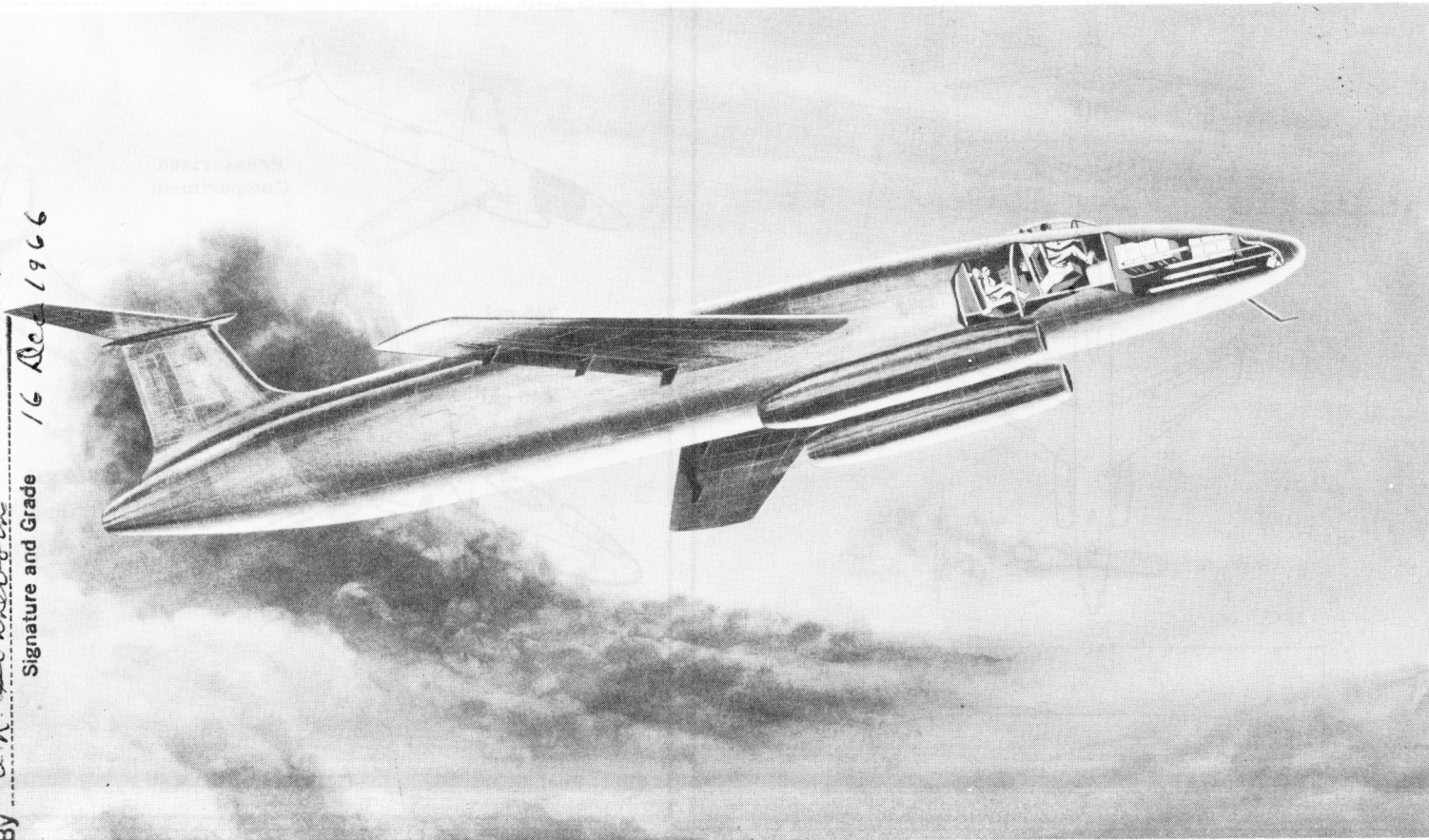


A-1
(X) B-51/char

Classification cancelled

or changed to *Unclassified*
AUTH: *A-1 AFSC AFM1C Sec Class Grade 1 Feb 64*
By *A. R. Lonsborn* .D.O. Dir 5300.10

Signature and Grade 16 Dec 1966



Standard Aircraft Characteristics

BY AUTHORITY OF
COMMANDING GENERAL
AIR MATERIEL COMMAND
U. S. AIR FORCE

XB-51

Martin

THREE J47-GE-13

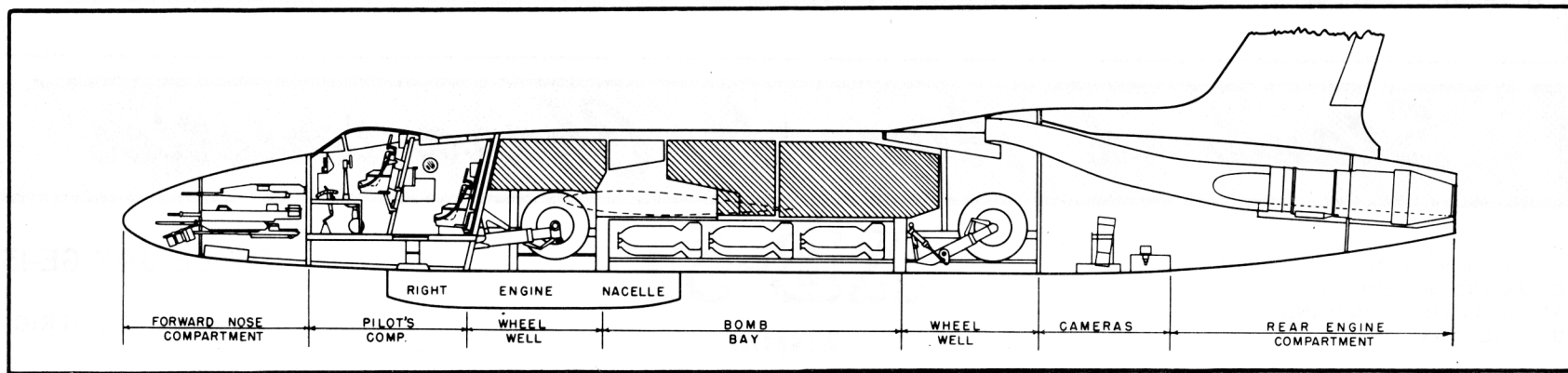
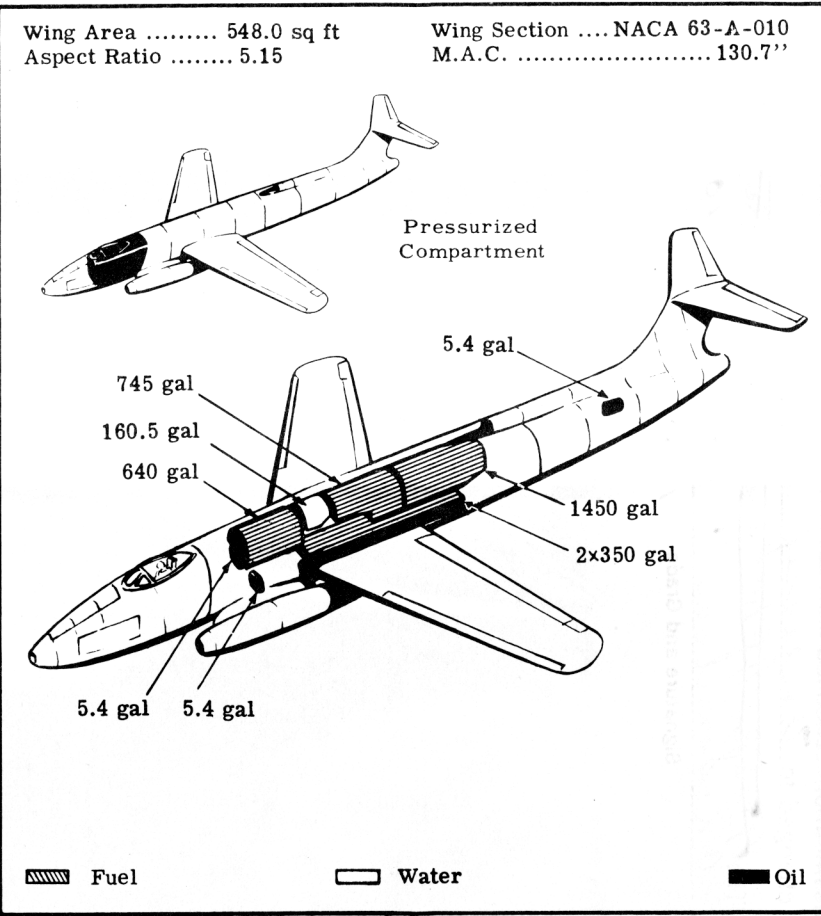
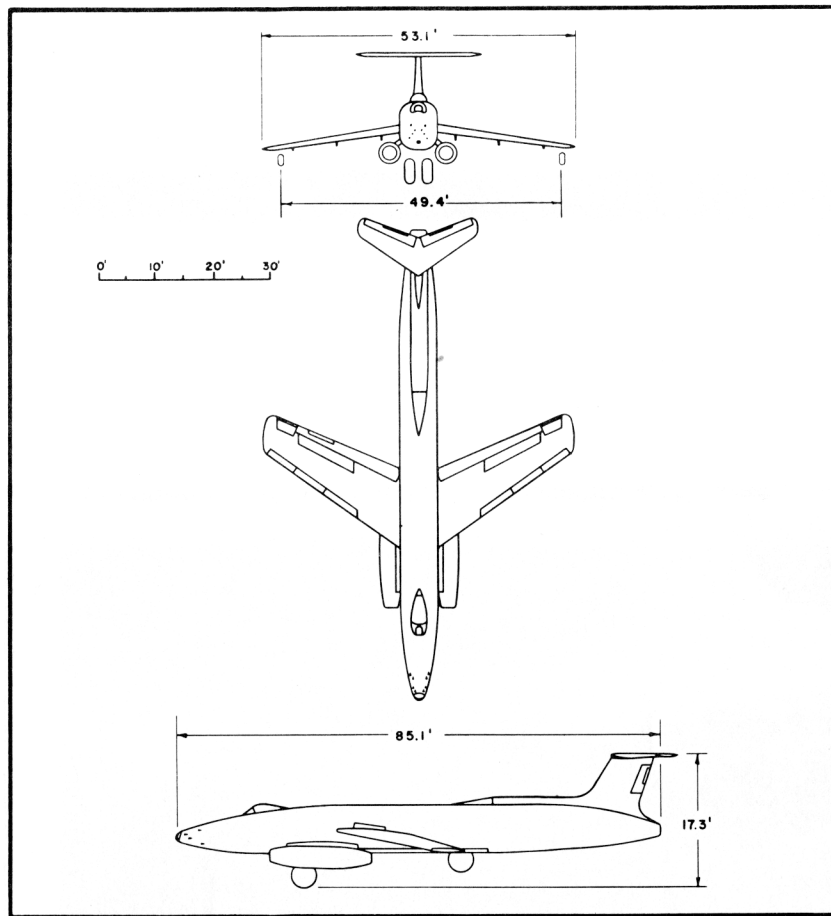
GENERAL ELECTRIC

19 MAY 1950

SECRET

Unclassified

XB-51



POWER PLANT

No. & Model (3)J47-GE-13
Mfr General Electric
Engine Spec. No. E581-A
Type Axial Flow
Length 144"
Diameter 37"
Weight (dry) 2525 lb
Augmentation: Fluid Injection

ATO

No. & Model (4) 14AS1000-D4
Mfr Aerojet
Weight (loaded) 200 lb ea

ENGINE RATINGS

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

ATO

Thrust 4x1000 lb
Duration (sec) 14

Mission and Description

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-alcohol thrust 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

Design Initiated: 1 February 1947
First flight: 28 October 1949
First acceptance (1st.art.) Sep 1951 (est), (2nd.art.) Mar 1952 (est)

WEIGHTS

Loading	Lb	L. F.
Empty	29,584 (E)	
Basic	54,648 (E)	3.56
Design	53,000	3.67
Combat	*41,457	3.67
Max T.O.	**62,452	2.0
Max Land	+57,067	1.6

(E) Estimated

* For Basic Mission

** Limited by strength

+ Limited to landing without external bombs and water

FUEL

Location	No. Tanks	Gal
Fuselage*	3	2835
Bomb bay	2	700
*Self-sealing	Total	3535

Grade JP-3
Water/Alcohol(gal) 160.5

OIL

Capacity (gal) 16.2

DIMENSIONS

Wing
Span 53.1'
Incidence-Normal Flight Attitude
Root 3°
Tip 1°
Incidence-Take-off & Land Attitude
Root 7°30'
Tip 5°30'
Cathedral 6°
Sweepback (LE) 35°
Length 85.1'
Height 17.3'
Tread 49.4'

BOMBS

No.	Size	Type
1	*4000	L.C.
2	2000(int)	G.P.
2	2000(ext)	G.P.
4	1600(int)	A.P.
2	1600(ext)	A.P.
4	1000	G.P.
9	500	G.P.

Max Bomb Load: 10,400 lb
Max Bomb Size: 4000 lb
*In special door

GUNS

No.	Cal	Rds ea.	Location
8	20mm	160	Nose

ROCKETS

No.	Size	Type	Location
8	5"	HVAR	Bomb bay

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 RC-103
Glide Path AN/ARN-5B
Marker Beacon AN/ARN-12
Radar Beacon AN/APW-11
Shoran AN/APN-3
RCM AN/APT-16
IFF SCR-695B
Interphone AAF Combat

Loading and Performance - Typical Mission

C O N D I T I O N S	BASIC MISSION			ATTACK MISSIONS		HIGH ALTITUDE MISSIONS		FERRY
	I	II	III	IV	V	VI	VII	
TAKE-OFF WEIGHT (lb) ⑦	55,923	55,923	54,137	55,923	58,238	62,452	56,662	
Fuel & Oil (gal)	2835/12	2835/12	2835/12	2835/12	2835/12	2835/12	3535/16.2	
Military Load (lb)	4000	4000	1120 ⑨	4000	6384	10,494	None	
Total Ammunition (rds/cal)	1280/20mm	1280/20mm	1280/20mm	1280/20mm	1280/20mm	1280/20mm	1280/20mm	
Wing Loading (lb/sq ft)	101.7	101.7	98.4	101.7	105.9	113.6	103.1	
Stall Speed -(power off) (kn)	133	133	131	133	136	140	134	
TAKE-OFF DISTANCE SL								
Ground Run (no wind) (ft) ① ④	4340	4340	4010	4340	4790	5965	4480	
To Clear 50ft Obst (ft) ① ④	5590	5590	5190	5590	6200	7835	5790	
CLIMB FROM SL								
Rate Of Climb at SL (fpm) ② ⑧	5100	5100	5340	5100	4890	3960	5030	
Time To 10,000 Feet (min) ②	2.2	2.2	2.1	2.2	2.4	3.0	2.3	
Time To 20,000 Feet (min) ②	5.4	5.4	5.3	5.4	5.7	6.3	5.6	
Service Ceiling (100 f.p.m.) (ft) ②	32,900	32,900	33,700	32,900	31,600	27,200	32,500	
COMBAT RANGE (n.mi)	934	1044	1044	1044	1044	1044	1401	
COMBAT RADIUS (n.mi)	378	331	332	516	502	446	446	
Avg. Cruising Speed (kn) ⑥	463	440	440	466	466	463	467	
Total Mission Time (hr) ⑥	1.82	1.68	1.70	2.40	2.33	2.12	3.08	
Cruising Altitude (1000 ft) (ft) ⑥	32.8 to 43.2	10.0	10.0	32.9 to 43.2	31.7 to 43.3	27.6 to 43.2	32.8 to 43.0	
COMBAT WEIGHT (lb)								
Combat Altitude (ft)	41,457	41,958	43,118	40,747	40,571	40,289	—	
SPEED								
Max Speed (combat alt) (kn) ②	560	552	552	503	506	519	—	
Max Speed At S.L. Ft (kn) ②	560	560	560	560	560	560	—	
CLIMB								
Rate Of Climb (combat alt) (fpm) ②	6980	5270	5080	1360	1600	2350	—	
Rate Of Climb At SL (fpm) ②	6980	6900	6650	7130	7160	7190	—	
CEILING								
Combat Ceiling (ft) ②	38,900	38,600	38,100	39,200	39,300	39,400	—	
Service Ceiling (ft) ②	40,500	40,300	39,800	40,900	41,000	41,100	—	
Service Ceiling (ft) ③	39,900	39,700	39,100	40,200	40,300	40,400	—	
LANDING WEIGHT SL (lb) ⑥								
Ground Roll (ft) ④	34,267	34,267	35,361	34,267	34,198	34,302	34,962	
From 50' Obst (ft) ④	2355	2355	2425	2355	2350	2360	2400	
	3240	3240	3325	3240	3235	3245	3295	

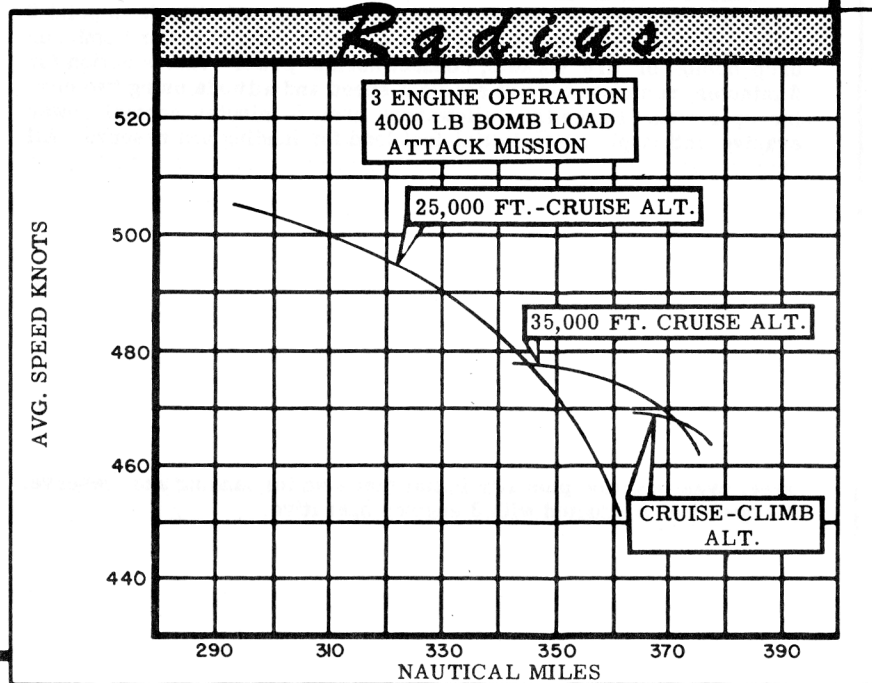
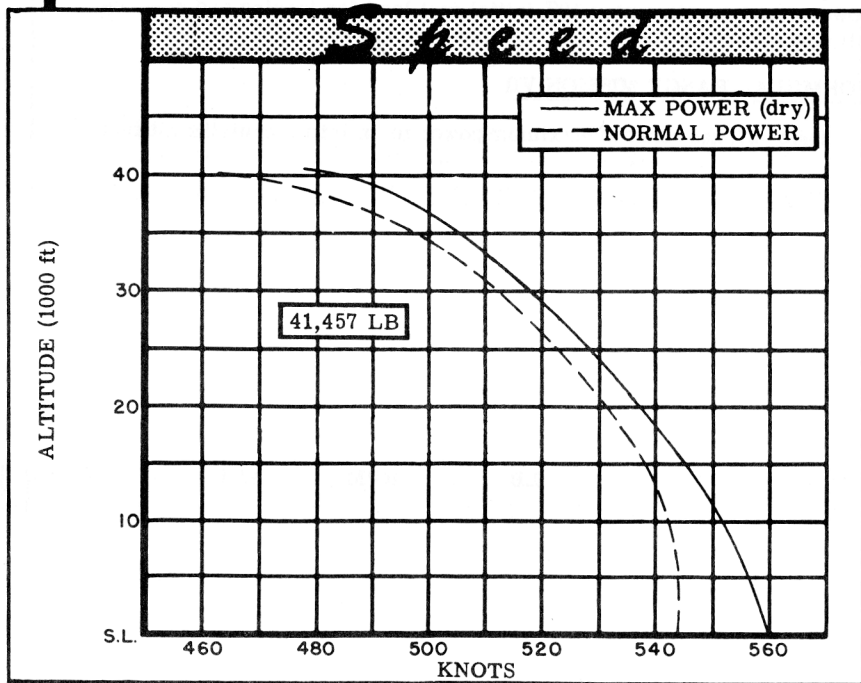
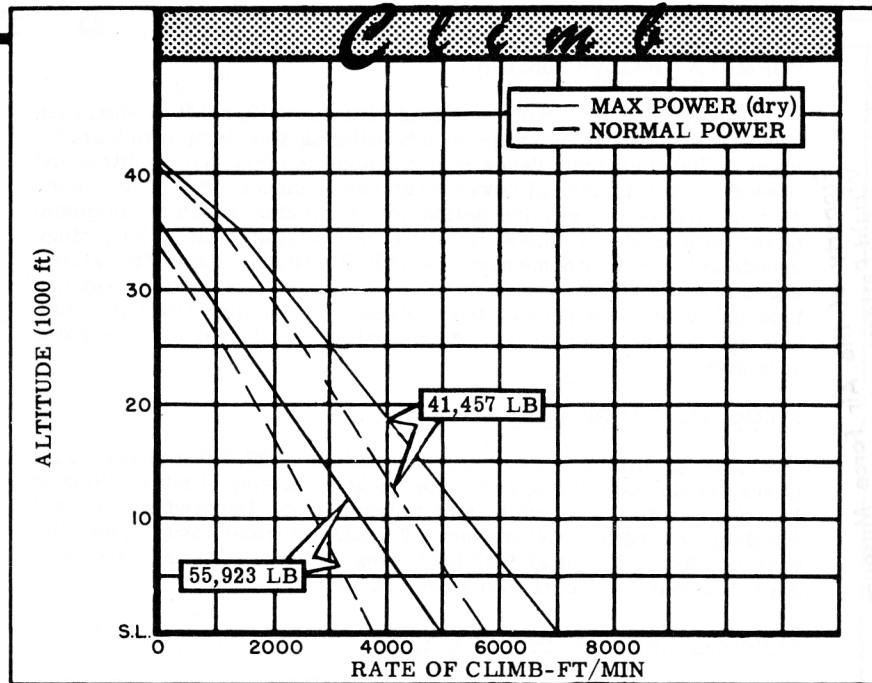
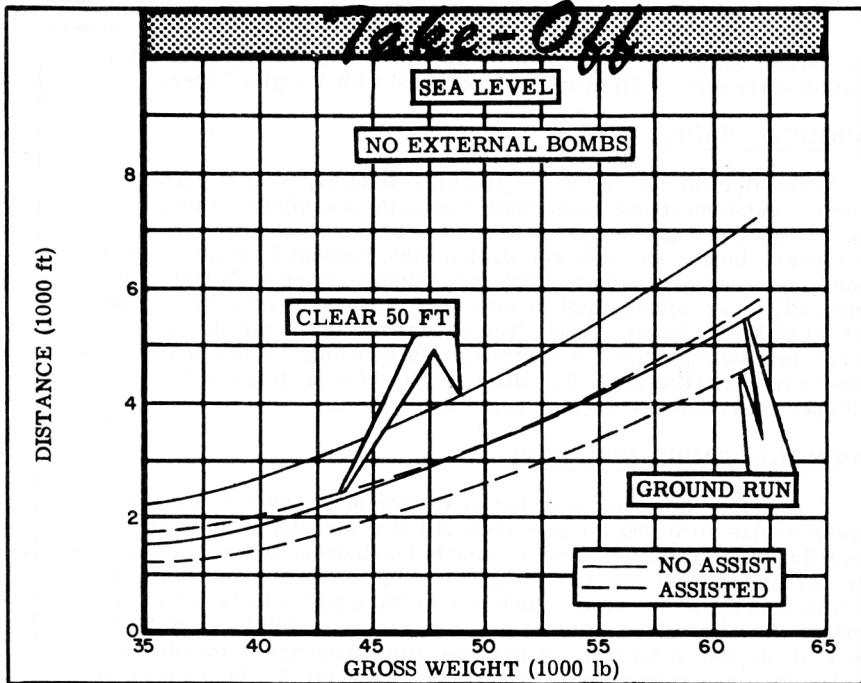
NOTES

① Take-off power
 ② Max power
 ③ Normal power
 ④ Take-off and landing distances are obtainable at sea level using normal technique. For airport planning, distances should be increased by appropriate factors to determine runway requirements.

⑤ Detailed descriptions of the Radius & Range missions are given on page 6.
 ⑥ Radius mission if Radius is shown
 ⑦ All T.O. weights include 1275 lb water/alcohol for T.O. (1 minute)
 ⑧ T.O. gross wt less T.O. water and fuel for 5 min. at N.R.P.
 ⑨ 8x5" HVAR rockets

CONDITIONS:

(a) Performance Basis: Estimated data
 (b) In computing Radius and Range, specific fuel consumptions have been increased 5% to allow for variation of fuel flow in service aircraft.
 (c) Performance is based on powers shown on page 6.



N O T E S

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432433

FORMULA: RADIUS MISSION I

Take-off, climb on course to initial altitude of 32,800 ft at maximum power, cruise out at long range speeds utilizing a cruising climb arriving at 34,500 ft altitude, descend to sea level (no distance credited) and conduct a 6 minute normal power bomb run to target, drop bombs, conduct normal power evasive action for 6 minutes, climb at maximum power to altitude of 40,900 ft, utilize a cruising climb at long range speeds arriving over home base at 43,200 ft altitude. Range free allowances are: 5 minutes normal power fuel consumption for warm-up and take-off, 6 minutes normal power evasive action plus 10% initial fuel load for landing and reserve. All operations conducted with 3 engines operative.

FORMULA: RANGE MISSION I

Take-off, climb on course to initial altitude of 32,800 ft at maximum power, cruise out at long range speeds at a cruising climb arriving at 38,800 ft altitude 6 minutes prior to bomb drop. Descend to sea level (no distance credited) and conduct a 6 minute, normal power bomb run, drop bombs. 10% initial fuel load remains for landing and reserve. All operations conducted with 3 engines operative.

FORMULA: RADIUS MISSION II & III

Take-off, climb on course to 10,000 ft altitude at maximum power, conduct a two engine cruise at constant speed and altitude to point 6 minutes prior to bomb drop, conduct a 6 minute normal power bomb run drop bombs or fire rockets, conduct normal power evasive action for 6 minutes, return to base at constant speed and altitude using two engine operation. Range free allowances are: 5 minutes normal power evasive action plus 10% initial fuel load for landing and reserve. All operations conducted with 3 engines operative except constant speed cruises (434 knots) to and from target at 10,000 feet.

FORMULA: RADIUS MISSION IV

Take-off, climb on course to initial altitude of 32,800 ft at maximum power, cruise out at long range speeds utilizing a cruising climb arriving at 35,600 ft altitude 6 minutes prior to bomb drop, conduct a 6 minute normal power bomb run to target, drop bombs, conduct 6 minute normal power evasive action, climb at maximum power to 39,250 ft altitude cruise climb at long range speeds so as to arrive over home base at 43,200 ft altitude. Range free allowances are: 5 minutes normal power fuel consumption for warm-up and take-off, 6 minutes normal power evasive action plus 10% initial fuel load for landing and reserve. All operation conducted with 3 engines operative.

FORMULA: RANGE MISSION IV

Take-off, climb on course to initial altitude of 32,800 ft at maximum power, cruise out at long range speeds in a cruising climb arriving at 39,800 ft altitude 6 minutes prior to bomb drop, conduct a 6 minute nor-

mal power bomb run, drop bombs. 10% initial fuel load remains for landing and reserve. All operation conducted with 3 engines operative.

FORMULA: RADIUS MISSION V

Take-off, climb on course to initial altitude of 31,700 ft at maximum power, cruise out at long range speeds utilizing a cruising climb arriving at 34,300 ft 6 minutes prior to bomb drop, conduct a 6 minute normal power bomb run to target, drop bombs, conduct 6 minute normal rated power evasive action, climb at maximum power to 39,400 ft altitude, utilize a cruising climb at long range speeds arriving over home base at 43,300 ft altitude. Range free allowances are: 5 minutes normal power fuel consumption for warm-up and take-off, 6 minutes normal power evasive action plus 10% initial fuel load for landing and reserve. All operations conducted with 3 engines operative.

FORMULA: RADIUS MISSION VI

Take-off, climb on course to initial altitude of 27,600 ft at maximum power, cruise out at long range speeds utilizing a cruising climb arriving at 29,700 ft altitude 6 minutes prior to bomb drop, conduct a 6 minute normal power bomb run to target, drop bombs, conduct 6 minute normal power evasive action, climb at maximum power to 40,000 ft altitude, utilize a cruising climb at long range speeds arriving over home base at 43,200 ft altitude. Range free allowances are: 5 minutes normal power fuel consumption for warm-up and take-off, 6 minutes normal power evasive action plus 10% initial fuel load for landing and reserve. All operations conducted with 3 engines operative.

FORMULA: RANGE MISSION VII

Take-off, and climb at maximum power to an initial cruising altitude of 32,800 ft. Remainder of flight is made at long range speeds using cruising climb technique. Range free allowances are 5 minutes normal power fuel consumption for warm-up and take-off plus 10% of initial fuel load as landing and endurance reserve.

GENERAL DATA:

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

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