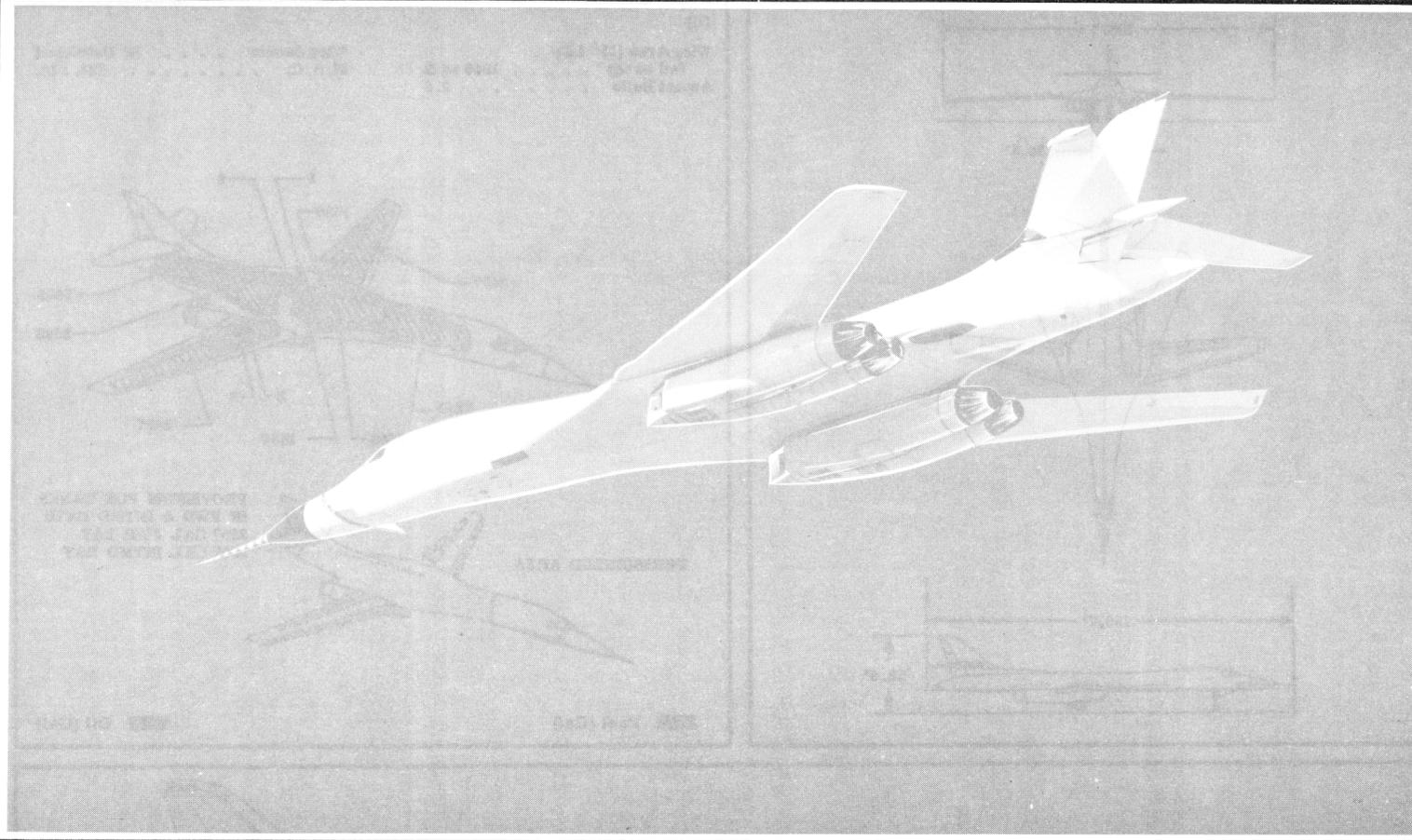


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*A1 (Rockwell-International)
B-1A/Char*

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Standard Aircraft Characteristics

BY AUTHORITY OF
THE SECRETARY
OF THE AIR FORCE

B-1A

FOUR F101-GE-100
GENERAL ELECTRIC

ROCKWELL INTERNATIONAL

CLASSIFIED BY B-1A SEC. CLASS. GUIDE
DECLASSIFY 31 DEC 1987

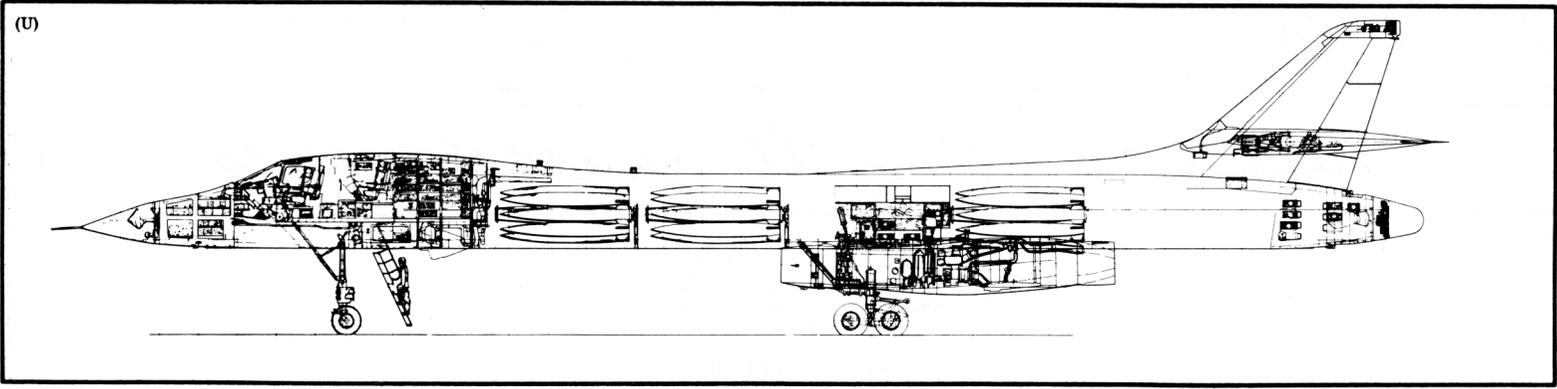
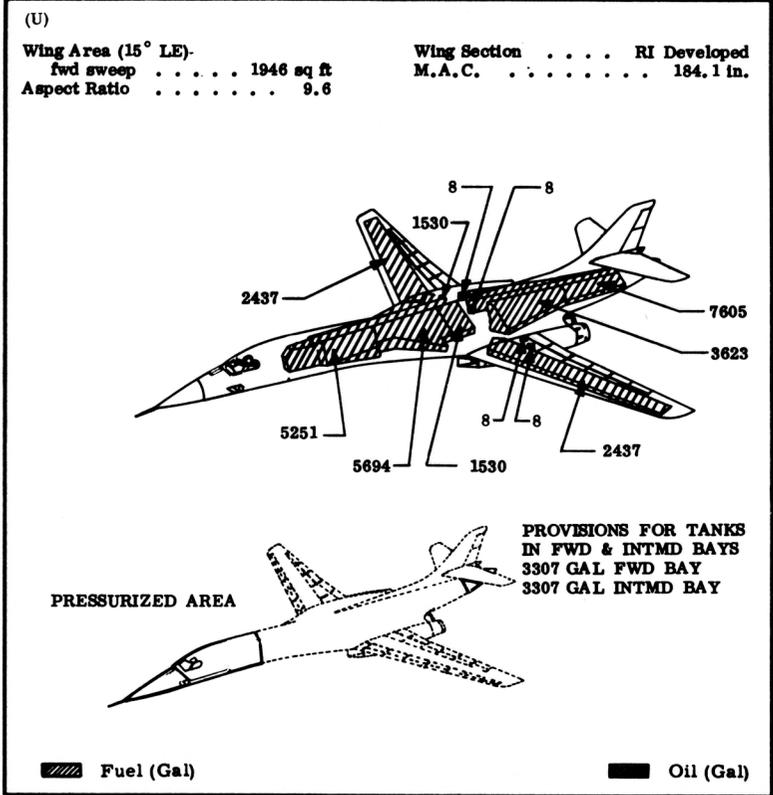
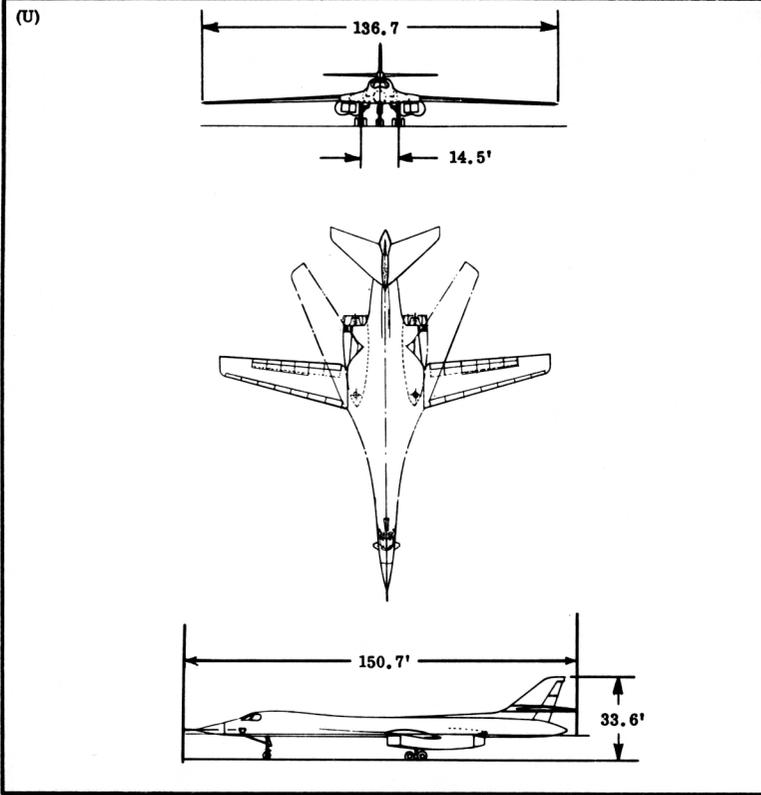
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(U) POWER PLANT

Nr & Model (4) F101-GE-100
 Mfr General Electric
 Engine Spec Nr CP45-B0002
 Type Axial Turbofan
 Length 180.7"
 Diameter 55.2"
 Weight (Dry) 4165 lb
 Tail Pipe Auto, Variable Area
 Augmentation Afterburner

(U) ENGINE RATINGS

S, L, S. LB - †RPM - MIN
 Max: *29,850 - 14,820/8115 - Cont
 Intermed: 16,150 - 14,850/8115 - Cont

* Afterburner operating
 † HP Rotor/LP Rotor

(U) DIMENSIONS

Wing
 *Span 136.7'
 Incidence (Butt Line 163.5) 2°
 (Tip) 0°0'
 †Dihedral -1°56'
 Sweepback (Variable) 15° to 67 1/2°
 Length 150.7'
 Height 33.6'
 Tread 14.5'

*Most fwd sweep position (15° 0')
 †At 40% chord line

(U) Mission and Description

Navy Equivalent: None

The principal mission of the B-1 is to deliver a 50,000 pound payload at supersonic speed at sea level or a 25,000 pound payload at supersonic speed and high altitude to a distant target.

The crew consists of aircraft commander (pilot), co-pilot and two subsystems operators, one for offensive systems and the second for defensive systems.

The B-1 is a variable sweep low-wing, trailing-tail air vehicle with the blended wing-body concept, structural mode control vanes for low-level high speed penetration, external compression inlet and rotary missile launchers.

Other features include single-slotted flaps with a fowler action extension, leading-edge slats, rolling panel tail, spoilers, power-operated controls, automatic pilot and single-point ground and air refueling provisions.

The crew escape system consists of four ejection seats for emergency use by the crewmen. In addition, provisions are made for two instructors to bailout from the bottom of the crew compartment in case of emergency.

Development

Date of Contract Jun 70
 First Flight Dec 74

(U) WEIGHTS

Loading	Lb	L, F.
Empty	173,000 (E)	
Basic	176,423 (E)	
Combat	*229,709	3.0 (1)
Max Taxi	†395,000	
Max T.O.	389,800	1.88 (2)
Max in Flt	422,000	1.87 (3)
	422,000	2.86 (4)
Max Land	†346,500	

(E) Estimated
 * For Basic Mission
 † Limited by gear strength
 ‡ 8 fps rate of sink
 (1) Wg Sweep = 65°
 (2) Wg Sweep = 15°
 (3) Wg Sweep = 15° to 65°
 (4) Wg Sweep = 65° to 67 1/2°

(U) F U E L

Location	Nr Tanks	Gal
Wing	2	4874
Fuselage	6	25,233
Max Internal	(Total)	30,107
Weapon bay	2	6614
	Total	36,721
Grade		JP-4
Specification		MIL-T-5624

OIL

Nacelles	4	32
Grade		Synthetic
Specification		MIL-L-7808

(U) MISSILES

Nr	Type	Designation
24 (Internal)	SRAM	AGM-69A
8 (External)	SRAM	AGM-69A

(U) B O M B S

Nr	Type
84	MK-82 or MK-82 (Snakeye)
30	M117 or M117R
30	SUU-30H/B
24	MK-84
24	B-61 or B-77
12	B-43
Max Bomb Load (Int)	75,000 lb

(C) ELECTRONICS

OFFENSIVE AND DEFENSIVE AVIONICS

A quick reaction and low altitude penetration capability is provided by the Offensive system using existing forward-looking (AN/APQ-144), doppler (AN/APN-200), terrain following (AN/APQ-146), and altitude (AN/APN-194) radar and dual inertial memory (AN/AJN-17) units which are adapted to operate with real-time digital control. These elements provide accurate navigation, free-fall weapon delivery, and SRAM launch. The Defensive system is tailored to only the major threats to low altitude penetration. It consists of radio frequency surveillance and electromagnetic countermeasures equipment, again adapted to operate with the digital control system. Mission and Traffic Control is provided by a standard complement of equipment:

UHF Radio	AN/ARC-109	IIS	AN/ARN-108
HF Radio	AN/ARC-123	Direction Finder	AN/ARA-50
Intercom	AN/AIC-27	IFF	AN/APX-64
TACAN	AN/ARN-91	Rescue Beacon	AN/PRC-90

(C)

Loading and Performance—Typical Mission

C O N D I T I O N S	I		II		III	
	BASIC MISSION		SUPERSONIC MISSION		FERRY MISSION	
TAKEOFF WEIGHT	(lb)		395,000	395,000	395,000	
Fuel at 6.5 lb/gal (JP-4)	(lb)		165,769	190,769	215,769	
Payload (Internal)	(lb)		50,000 ⑥	25,000 ⑦	None	
Wing loading	(lb/sq ft)		203	203	203	
Stall speed (Power off)	(kn)		158	158	158	
Takeoff ground run at SL	(ft)		5840	5840	5840	
Takeoff to clear 50 ft	(ft)	①	7500	7500	7500	
Rate of climb at SL	(fpm)	②	2600	2600	2600	
Rate of climb at SL (one engine out)	(fpm)	①	5400	5400	5400	
Time: SL to initial cruise alt.	(ft)	②	21	21	21	
Service ceiling (100 fpm)	(ft)	②	24,600	24,600	24,600	
Service ceiling (one engine out)	(ft)	① ⑤	28,000	28,000	28,000	
REFUELED WEIGHT	(lb)		422,000	422,000	----	
Transferred fuel	(lb)		103,154	103,154	----	
Wing loading	(lb)		217	217	----	
Service ceiling (100 fpm)	(ft)	②	23,000	23,000	----	
Service ceiling (one engine out)	(ft)	① ⑤	26,000	26,000	----	
COMBAT RANGE	(n. mi)	③	5675	4610	6242	
Penetration distance	(n. mi)		1575	510	----	
Penetration speed	(M/kn)		.85/562	2.1/1205	----	
Target speed	(M/kn)	④	.85/562	2.1/1205	----	
Target altitude	(ft)		200	50,900	----	
Average cruise speed outside penetration zone	(kn)		440	440	417	
Initial cruising altitude	(ft)		20,800	20,800	20,800	
Final cruising altitude	(ft)		35,000	34,900	35,000	
Total mission time	(hr)		12.7	9.6	15.0	
COMBAT WEIGHT	(lb)		229,709	225,925	195,196	
Combat altitude	(ft)		200	53,000	35,000	
Combat speed	(M/kn)	①	.95/628	2.1/1205	2.1/1205	
Combat climb	(fpm)	①	22,600	350	14,000	
Combat ceiling (500 fpm)	(ft)	①	52,800	53,000	55,000	
Service ceiling (100 fpm)	(ft)		35,000 ②	53,500 ①	37,300 ②	
Service ceiling (one engine out)	(ft)	② ⑤	30,000	31,000	33,000	
Maximum rate of climb at SL	(fpm)	①	22,600	23,000	32,000	
Maximum speed at optimum altitude	(M/kn/ft)	①	2.2/1262/53,000	2.2/1262/53,200	2.2/1262/54,000	
LANDING WEIGHT	(lb)		192,680	194,375	195,195	
Ground roll at SL	(ft)		2630	2650	2660	
Total from 50 ft	(ft)		3680	3700	3710	

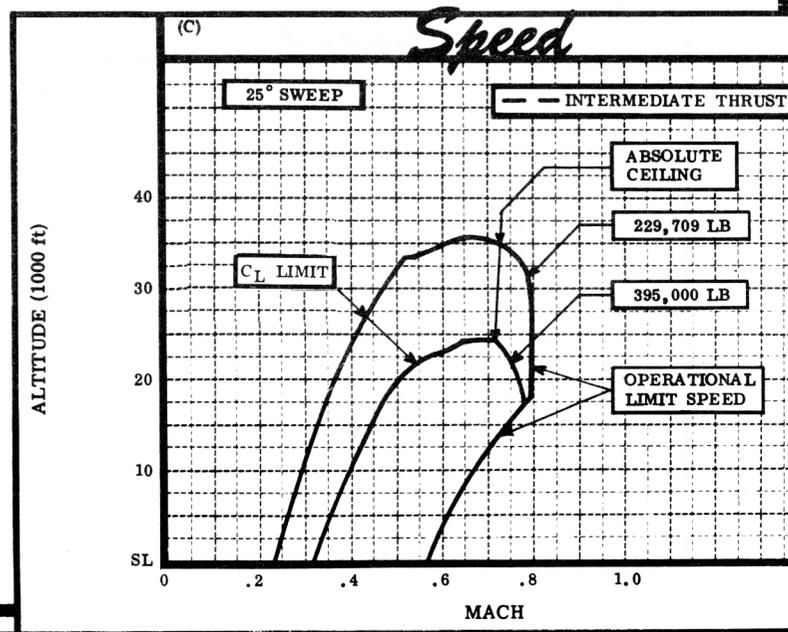
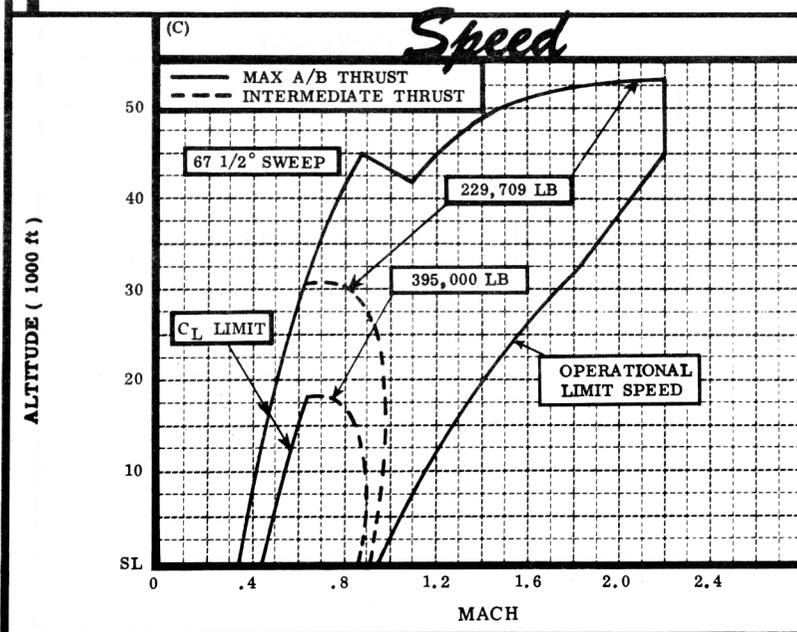
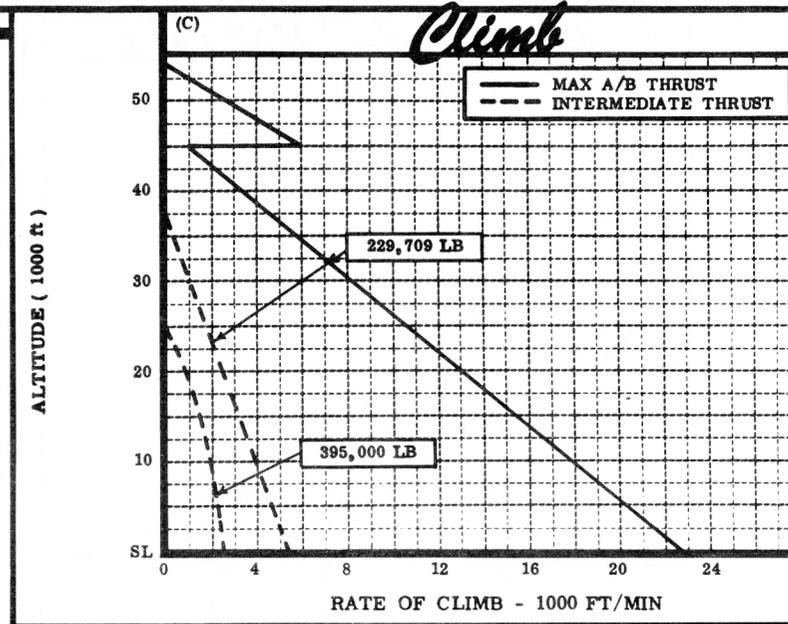
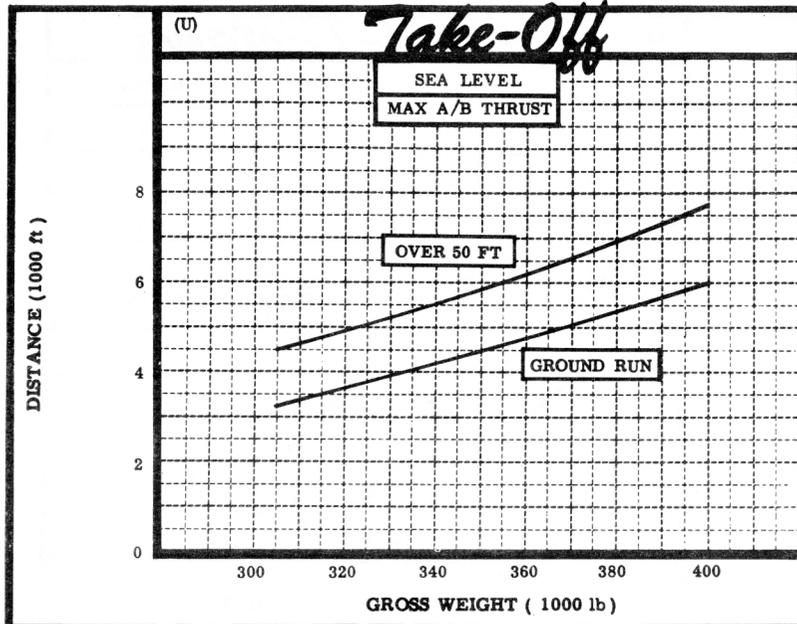
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S

- ① Maximum afterburner thrust
 ② Intermediate thrust
 ③ Detailed description of RANGE missions are given on page 7.
 ④ Cruise thrust

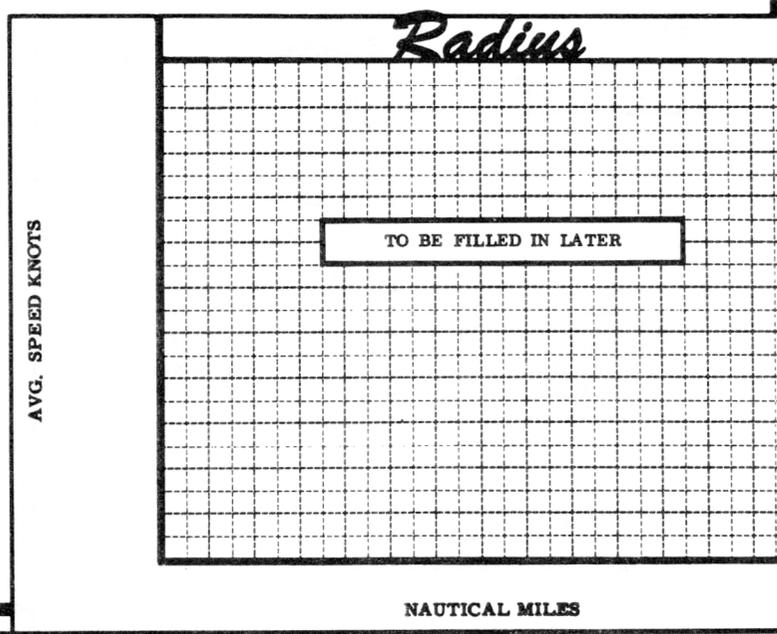
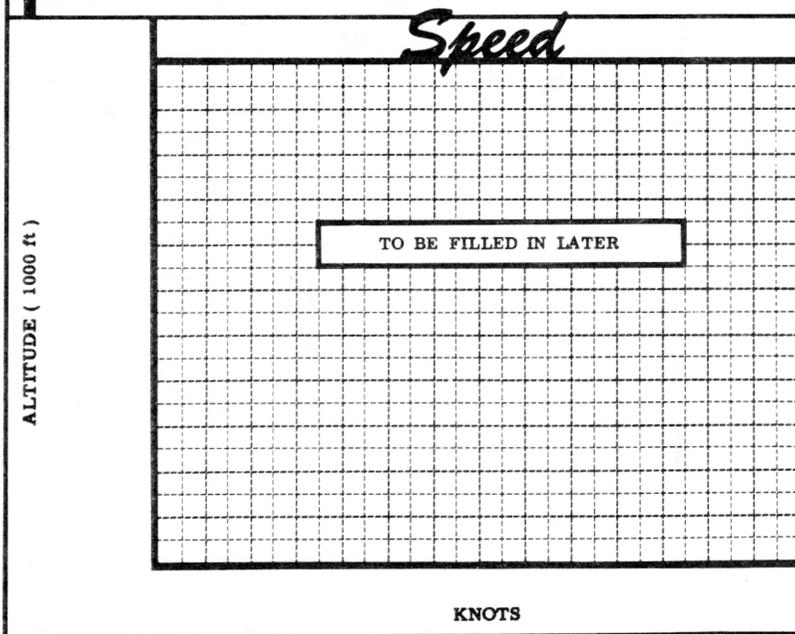
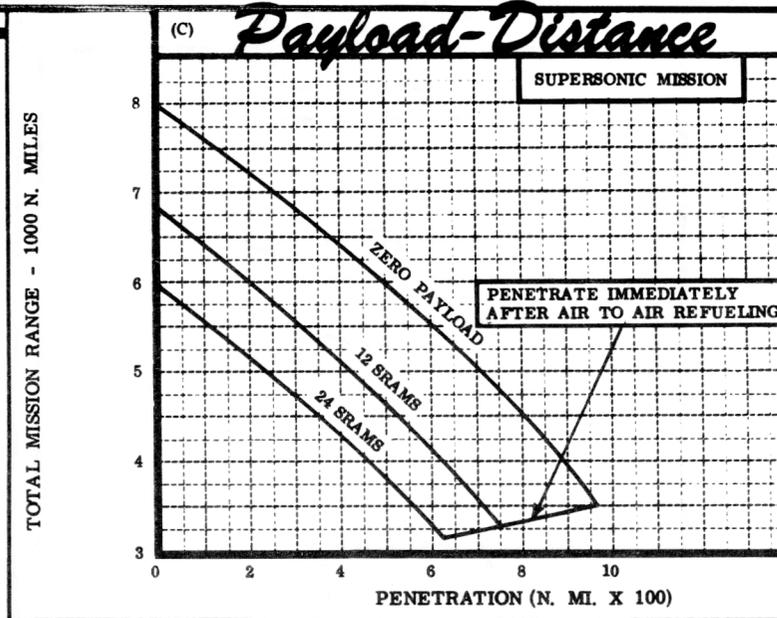
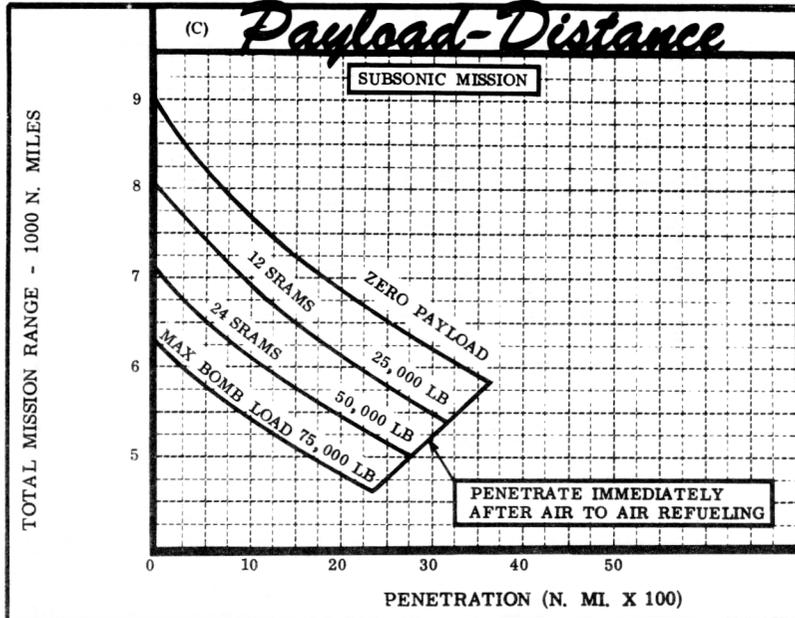
- ⑤ All one engine out ceilings are subsonic ceilings
 ⑥ 24 SRAM missiles
 ⑦ 12 SRAM missiles

PERFORMANCE BASIS:

- (a) Data source: Wind tunnel data and engine contractor fuel flows.
 (b) Performance is based on powers shown on page 3.



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(C)

NOTES

FORMULA: RANGE MISSION I

Take-off and accelerate to climb speed with maximum afterburner thrust, climb on course with intermediate thrust to best cruise altitude. Buddy cruise at max range speed and best cruise altitude with a KC-135 tanker (301,600 lb start engine weight) to refuel point. Descend to refuel altitude (19,600 ft). Hook-up and refuel on course to point where the KC-135 has a recovery distance of 1000 n. miles and the B-1 is refueled to max in-flight weight. Descend to best cruise altitude and cruise at max range speed and best cruise altitude to the 3600 n. mile total pre-penetration distance. Descend to 200 ft, accelerating to inbound dash speed ($M = .85$) (No distance credited or fuel used). Dash 1050 n. miles at 0.85 mach, extend electro-visual system pod last 16 minutes inbound, deliver 50,000 lb payload on target, withdraw 525 n. miles at 0.55 mach at 200 ft. Climb on course with intermediate thrust to best cruise altitude. Cruise at max range speed and best cruise altitude for a total recovery distance of 500 n. miles. Range free allowances include 5 minutes at intermediate thrust plus 1 minute at max afterburner thrust at sea level static for starting engines, taxi, take-off and acceleration to climb speed, 5% of fuel used prior to refuel for hook-up and contingency allowance and a landing reserve of 30 minutes at maximum endurance speed at sea level plus 5% of initial fuel load.

FORMULA: RANGE MISSION II

Take-off, initial climb, buddy cruise and refuel portions are same as for Range Mission I. After refuel, descend to best cruise altitude and cruise at max range speed and best cruise altitude. Climb and accelerate with maximum afterburner thrust to arrive at Mach 2.1 penetration speed and altitude at 3600 n. mile total pre-penetration distance. Cruise at best altitude at Mach 2.1 for 340 n. miles, deliver 25,000 lb payload on target, cruise at best altitude at Mach 2.1 for 170 n. miles. Descend to best cruise altitude, cruise at max range speed and best cruise altitude for a total recovery distance of 500 n. miles. Range free allowances include 5 minutes at intermediate thrust plus 1 minute at max afterburner thrust at sea level static for starting engines, taxi, take-off and acceleration to climb speed, 5% of fuel used for hook-up and contingency allowance and a landing reserve of 30 minutes at maximum endurance speed at sea level plus 5% of initial fuel load.

FORMULA: RANGE MISSION III (FERRY)

Take-off and accelerate to climb speed with maximum afterburner thrust, climb on course with intermediate thrust to best cruise altitude, cruise out at max range speed and best altitude until only landing reserve fuel remains. Range free allowances include 5 minutes at intermediate thrust plus 1 minute at max afterburner thrust at sea level static for starting engines, taxi, take-off and acceleration to climb speed and a landing reserve of 30 minutes at maximum endurance speed at sea level plus 5% of initial fuel load.

GENERAL NOTES:

- (a) No distance credited or fuel used during descents.

PERFORMANCE REFERENCE:

Wind tunnel data plus engine contractor's fuel flow data.

REVISION BASIS:

Update security classification marking.

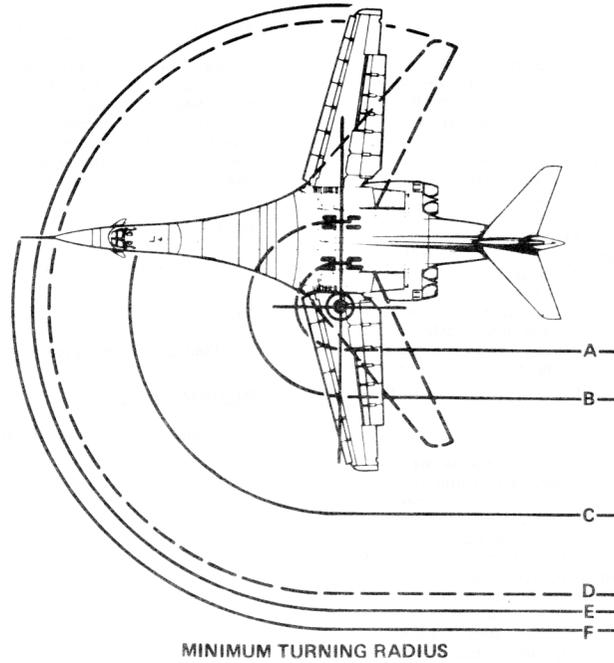
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(U)



PIVOT POINT

73 DEGREE TURN - 10 FEET FROM NEAREST GEAR
30 DEGREE TURN - 92 FEET FROM NEAREST GEAR

(U) MODE	MAXIMUM TURNING SPEED - KNOTS	MINIMUM RADIUS (FT)						MINIMUM TURN SURFACE WIDTH (FEET)
		MAIN GEAR		NOSE GEAR	WING TIP		BOOM	
		A	B	C	D*	E	F	
TAXI (73 DEGREES)	2	10	24.5	60.4	82	86.2	97.8	100
TAKEOFF/LANDING (30 DEGREES)	16.5	92.2	106.7	115.1	163	168.1	138.4	240
TOW (90 DEGREES)	5	7.25	7.25	57.5	58	68.34	86.5	72