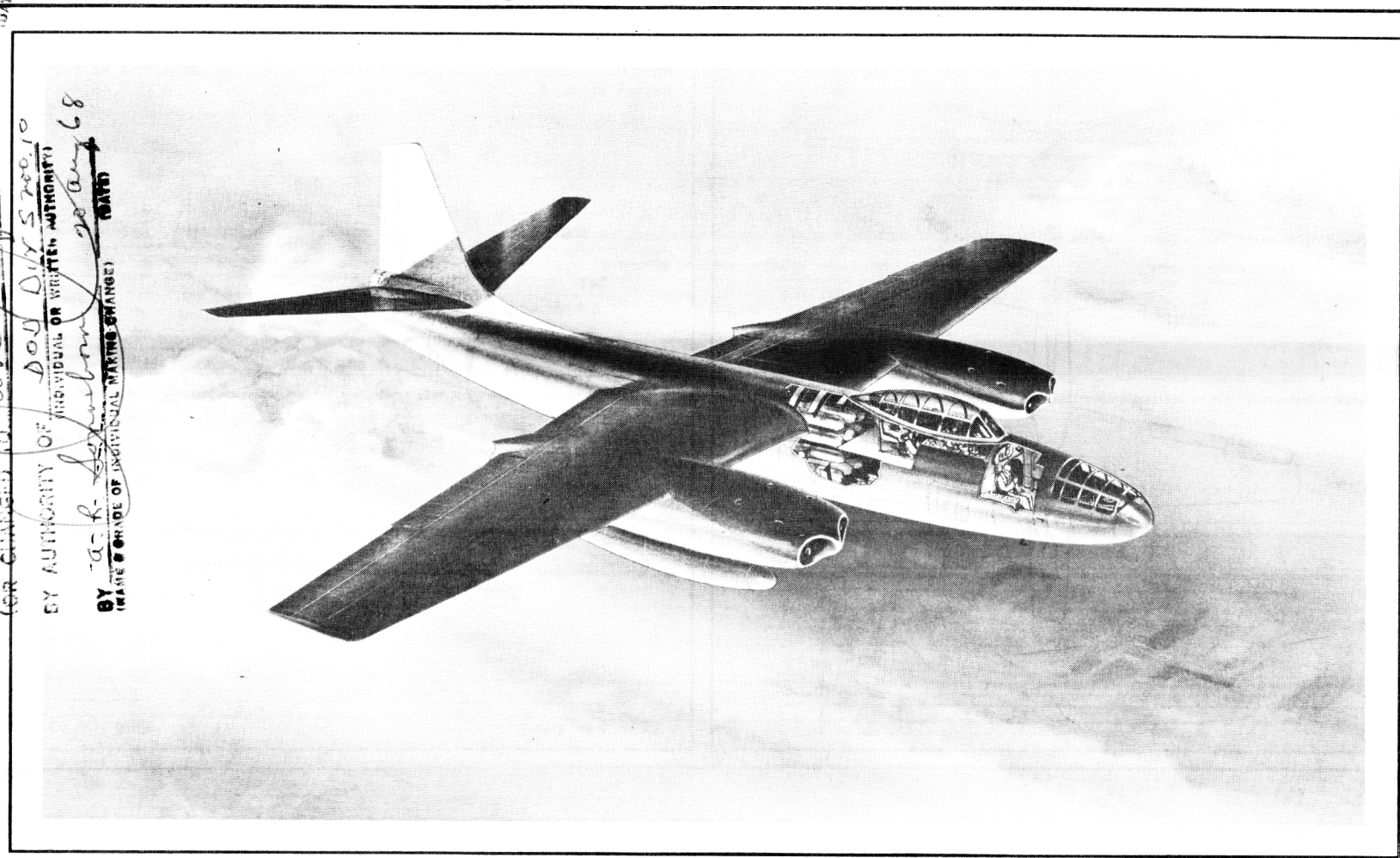


*Classification cancelled
or changed to Unclassified
AUTH: AFSC AFDC, the class Guide 1 Jan 64
By A R Johnson 1 Apr 64
Signature and Grade*

*CLASSIFICATION CANCELLED
(OR CHANGED TO Unclassified)
BY AUTHORITY OF DOD DIV 5700.10
(NAME & GRADE OF INDIVIDUAL MAKING CHANGE) DATED*



Standard Aircraft Characteristics

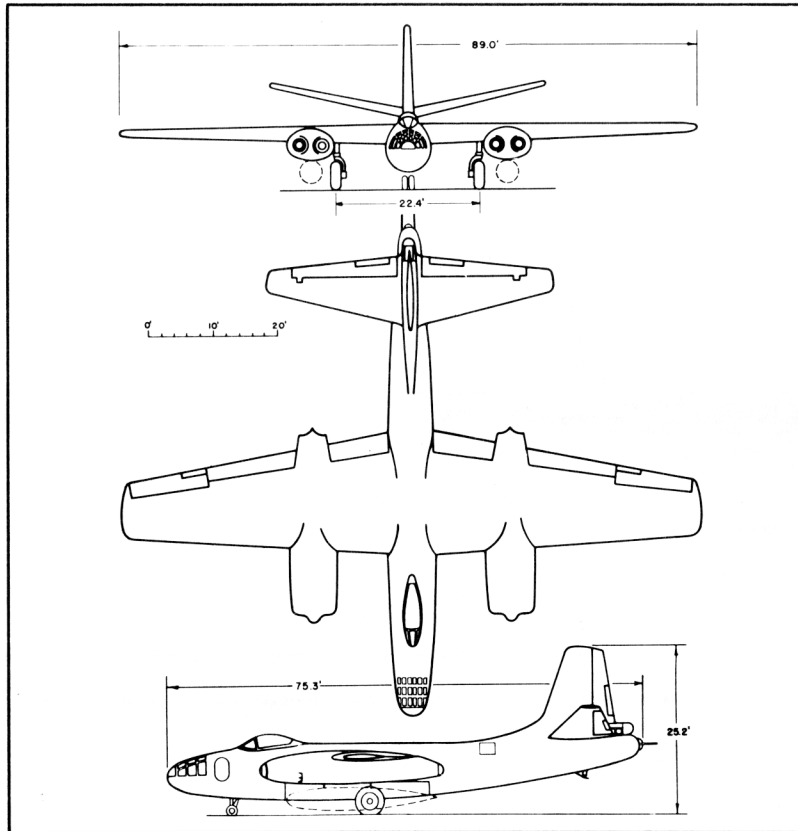
BY AUTHORITY OF
THE SECRETARY
OF THE AIR FORCE

B-45A (BACK BREAKER)
TORNADO
North American

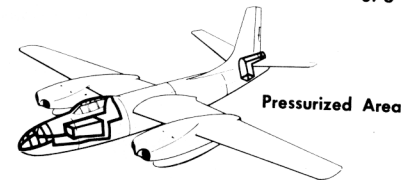
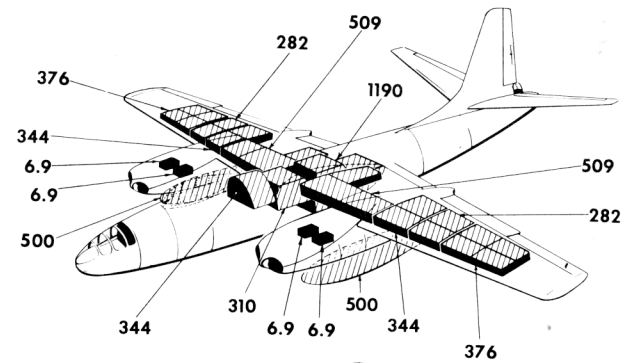
TWO J47-GE-7 OR-13
AND
TWO J47-GE-9 OR-15
GENERAL ELECTRIC

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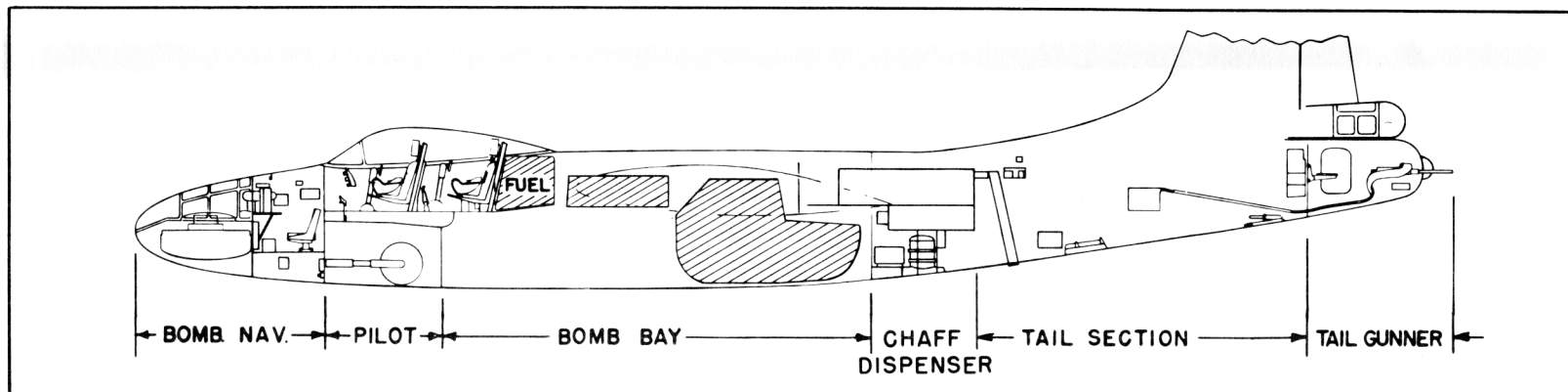


Wing Area	1175 sq ft	Wing Section	
M. A. C	168, 18 in	Root	N. A. C. A. 66, 2-215
Aspect Ratio	6.74	Tip	N. A. C. A. 66, 1-212



Fuel (Gal)

Oil (Gal)



POWER PLANT

Nr & Model (2) J47-GE-7 or -13 and
 (2) J47-GE-9 or -15
 Mfr General Electric
 Engine Spec Nr E-581 & E-582
 Type Axial
 Length 144"
 Diameter 39"
 Weight(dry) 2525 lb
 Tail Pipe Fixed Area
 Augmentation Water/Alcohol
 ATO

Nr & Model (2) XLR13-AJ-1
 Mfr Aerojet
 Engine Spec No S60ALD-4000
 Weight(dry) 800 lb ea

ENGINE RATINGS

S. L. S.	LB - RPM - MIN
Max:(wet)	*6000 - 7950 - 5
(wet)	**5820 - 7950 - 5
Mil:	*5200 - 7950 - 30
	**5000 - 7950 - 30
Nor:	*4320 - 7370 - Cont.
	**4250 - 7370 - Cont.

*-13 and -15 engines
 **-7 and -9 engines
 (Water injection not utilized in
 B-45 aircraft)
 ATO

Thrust(lb) 2x4000
 Duration (sec.) 60

DIMENSIONS

Wing
 Span 89.0'
 Incidence (root) 3°
 (tip) 0°30'
 Dihedral 1°
 Sweepback(LE) 3°30'
 Length 75.3'
 Height 25.2'
 Tread 22.4'

Mission and Description

Navy Equivalent: None Mfr's Designation: NA-147

The primary mission of the B-45A "Back Breaker" airplane is the destruction by bombs of land or naval materiel objectives.

The crew of four consists of the pilot, co-pilot-radio operator, bombardier-navigator and tail gunner.

Major differences over the B-45A are the installation of a type A-6 chaff dispenser, fuel flow totalizer, redesigned bomb bays to allow loading of special bombs and an Emerson-General Electric combination fire control system.

Development

Nine aircraft originally modified to trainers re-modified to "Back Breaker" type aircraft. An additional thirty two initial combat aircraft being modified to the "Back Breaker" configuration.

WEIGHTS

Loading	Lb	L. F.
Empty	47,022(E)	
Basic	47,500(E)	
Operating	51,045	
Design	82,600	3.00
Combat	*67,820	
Max T. O.	† 92,745	
Max Land	‡ 90,428	2.00

(E) Estimated
 * For Basic Mission
 † Limited by Mission
 ‡ Limited by gear strength

F U E L

Location	Nr	Tanks	Gal
Wings*	8		3022
Fus*	1		344
Bomb Bay	2		1500
Nacelle Drop	2		1000
		Total	5866
Grade			JP-4
Specification			MIL-F-5624

OIL

Nacelle 4 (tot) 27.6
 Grade 1010
 Specifications Mil-L-6081A
 *Self-Sealing

B O M B S

Special Bombs

(27)M38A2 100 lb
 Max Bomb Size 22,000 lb

G U N S

Nr	Size	Rds. ea.	Location
2(M3)	.50	600	Tail, tur

ELECTRONICS

UHF Command AN/ARC-27
 Liaison AN/ARC-8
 Radar Beacon AN/APW-11
 *Bomb-Nav-Radar AN/APQ-24
 IFF AN/APX-6
 Shoran AN/APN-3
 Tail Warning Radar AN/APG-30
 Chaff Dispenser E-6
 *On some airplanes

Loading and Performance—Typical Mission

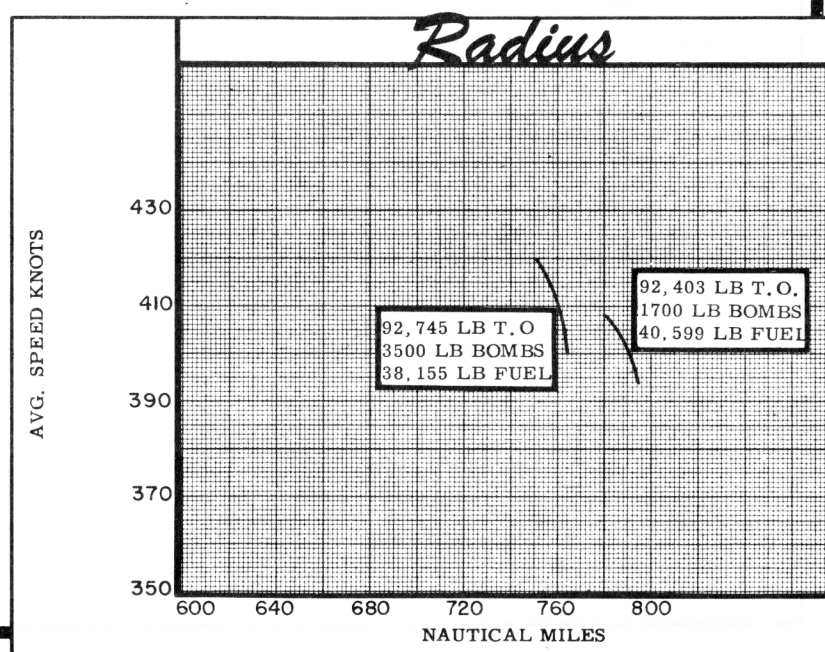
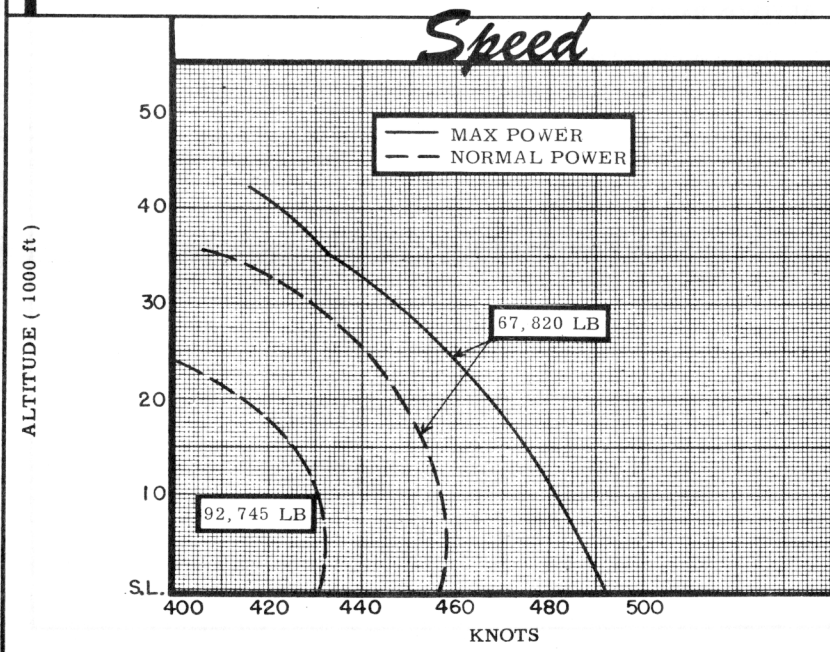
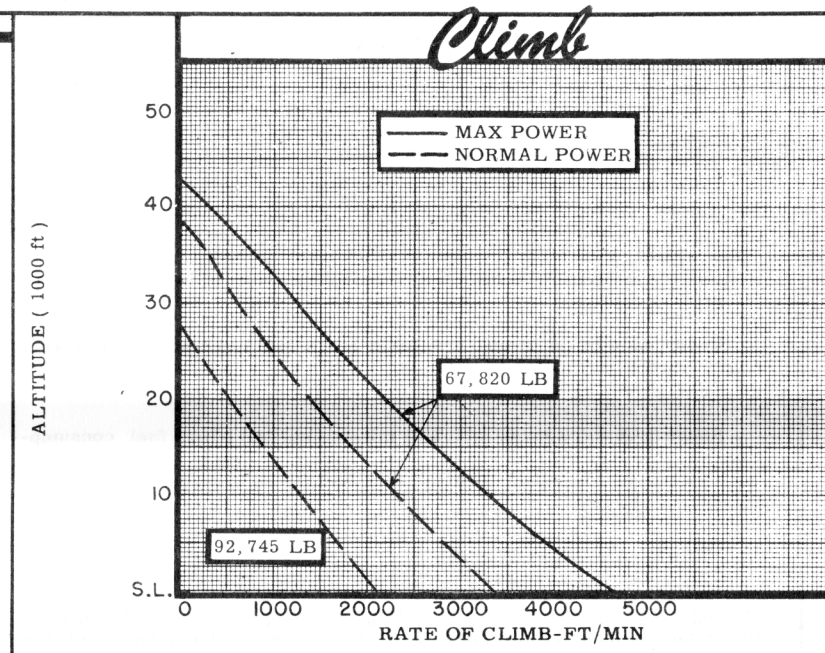
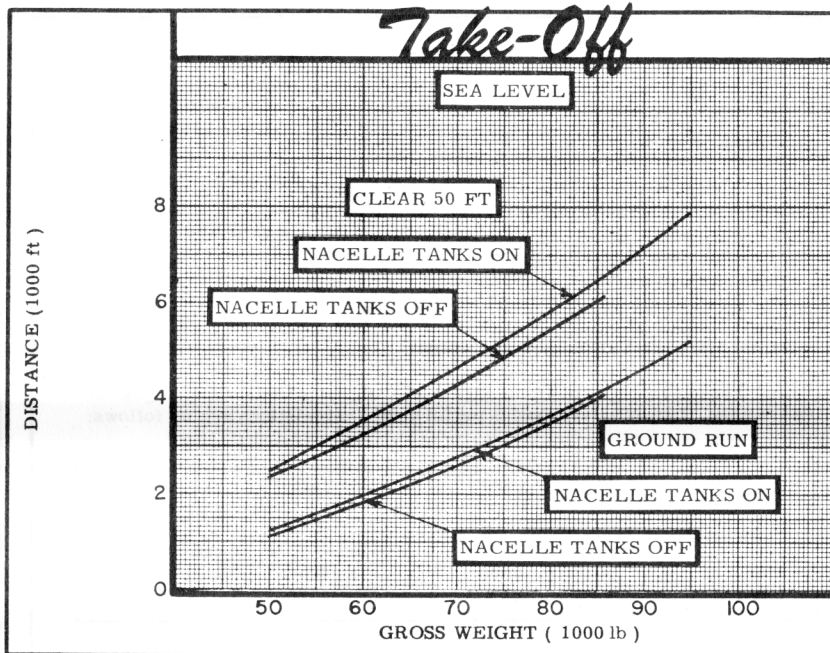
C O N D I T I O N S		BASIC MISSION	INTERNAL FUEL	EXTERNAL STORES	FERRY RANGE
TAKE-OFF WEIGHT	(lb)	92,745	85,545	92,403	94,842
Fuel at 6.5 lb/gal (grade JP-4)	(lb)	38,155	31,655	40,599	43,849
Payload (bombs)	(lb)	3500	3500	1700	None
Wing loading	(lb/sq ft)	78.93	72.8	78.64	80.7
Stall speed (power off)	(kn)	113.6	109.1	113.3	115
Take-off ground run at S. L.	① (ft)	4950	4100	4890	5200
Take-off to clear 50 ft	① (ft)	7570	6180	7490	7900
Rate of climb at S. L.	① (fpm)	2950	3480	2970	2800
Time: SL to 20,000 ft	① (min)	10.3	8.05	10.25	12.0
Time: SL to 30,000 ft	① (min)	21.8	17.05	21.60	23.0
Service ceiling (100 fpm)	① (ft)	32,500	36,400	32,700	32,000
COMBAT RANGE	③ (n. mi.)	—	—	—	1807
COMBAT RADIUS	③ (n. mi.)	764	627	795	—
Average speed	(kn)	401	401	391	401
Initial cruising altitude	(ft)	27,000	31,000	25,750	24,500
Target speed	② (kn)	415	415	400	—
Target altitude	(ft)	35,000	35,500	34,000	—
Final cruising altitude	(ft)	41,500	42,000	42,000	41,750
Total mission time	(hr)	3.9	3.2	4.2	4.5
COMBAT WEIGHT	(lb)	67,820	64,930	67,895	55,985
Combat altitude	(ft)	35,000	35,500	34,000	41,750
Combat speed	① (kn)	434	435	435	433
Combat climb	① (fpm)	800	850	850	710
Combat ceiling (500 fpm)	① (ft)	38,000	39,000	38,000	42,500
Service ceiling (100 fpm)	① (ft)	41,700	42,600	41,700	45,750
Max rate of climb at SL	① (fpm)	4300	4420	4300	5750
Max speed at optimum altitude	① (kn/ft)	492/S. L.	492/S. L.	492/S. L.	493/S. L.
Basic speed at 35,000 ft	(kn)	434	435	434	440
LANDING WEIGHT	(lb)	55,012	54,687	54,285	55,985
Ground roll at SL	(ft)	2500	2450	2450	2500
Total from 50 ft	(ft)	4900	4800	4800	4900

NOTES

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

PERFORMANCE BASIS:

- (a) Data source: Contractor estimates
 (b) Performance is based on powers shown on page 6



N O T E SFORMULA: RADIUS MISSION I, II, & III

Take-off and climb on course at max power to cruise ceiling (see note b). Cruise at long range power at cruise ceiling; 15 minutes prior to target, power is increased to normal power and bomb run is made to target. Drop bombs, conduct 2 minutes evasive action followed by 8 minute normal power run out from target. Continue flight to base at long range speeds at cruise ceiling.

Under nacelle tanks and droppable bomb bay tanks are dropped when empty except in Mission III when one under nacelle tank is carried to target to balance drag of the external load under the other nacelle.

Range free allowances include 5 minutes normal power fuel consumption for starting engines and take-off, 2 minutes evasive action and landing reserve of 5% initial fuel load plus fuel for 30 minutes maximum endurance at sea level.

FORMULA: RANGE MISSION IV

Take-off and climb on course to cruise ceiling at max power. Cruise at long range speeds at cruise ceiling until only reserve fuel remains. Under nacelle tanks are dropped when empty, however bomb bay droppable tanks are carried the entire distance.

Range free allowances are the same as for radius missions except allowance for evasive action is not made.

GENERAL NOTES:

(a) These data are based upon the contractor's estimated drag for Back Breaker modification contained in North American Aviation report NA-51-3 Appendix II entitled "Estimated Performance of B-45A Modification Project Back Breaker" dated 11 Dec 1951.

(b) Cruise ceiling is defined as that altitude at which the aircraft has the performance potential of making a 300 feet per minute rate of climb using normal thrust at momentary weight.

(c) Engine ratings shown on page 3 are engine manufacturer's guaranteed ratings. Power values used in performance calculations are as follows:

(2) J47-GE-7 or -13 and (2) J47-GE-9 or -15			
S. L. STATIC	LB	RPM	MIN
Max:	5000	7950	30
Normal:	4300	7370	Cont

REVISION BASIS:

Data coordinated this date.

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 Wright-Patterson Air Force Base
 Ohio 45433