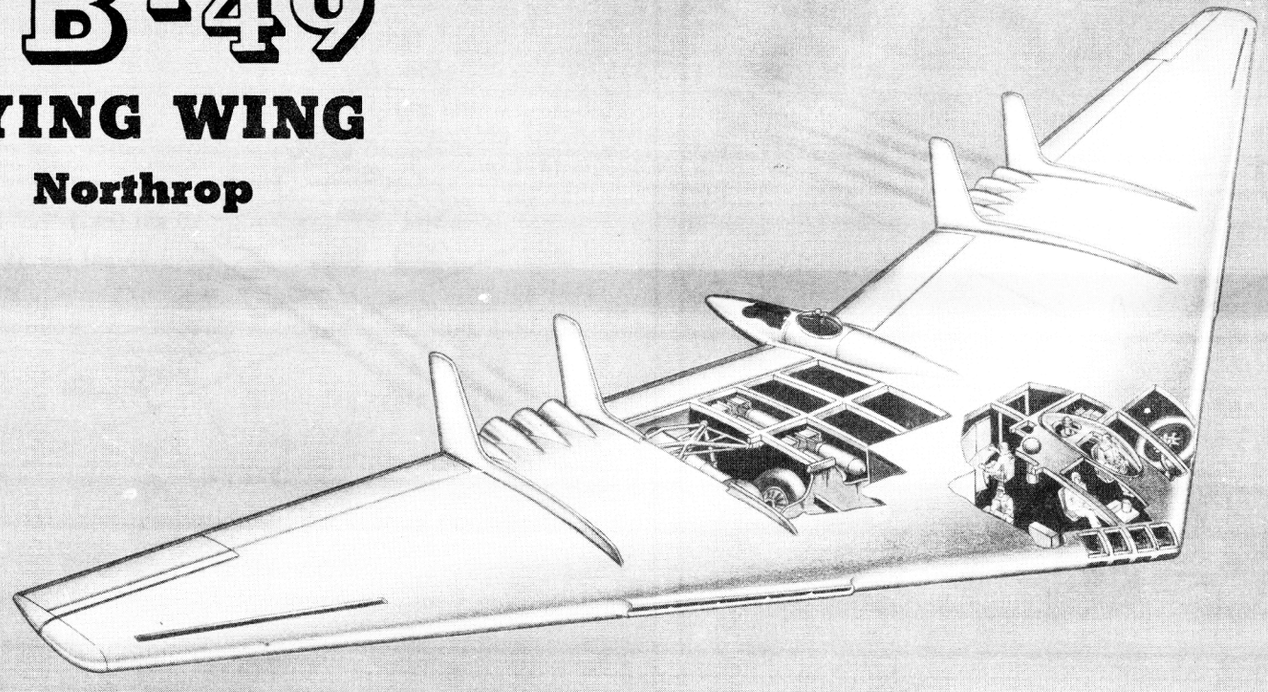
YB-49

FLYING WING

Northrop

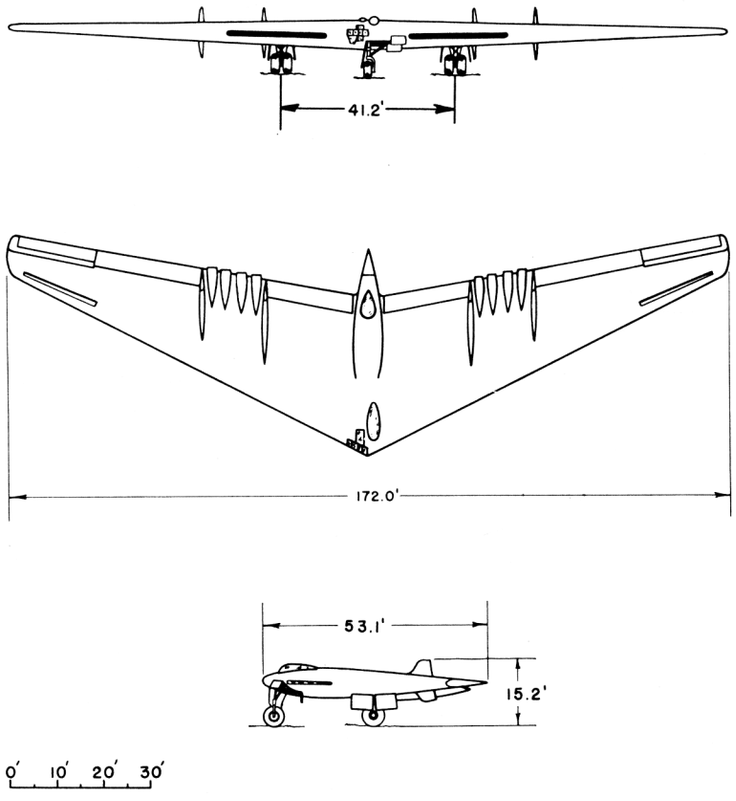


Standard Aircraft Characteristics

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

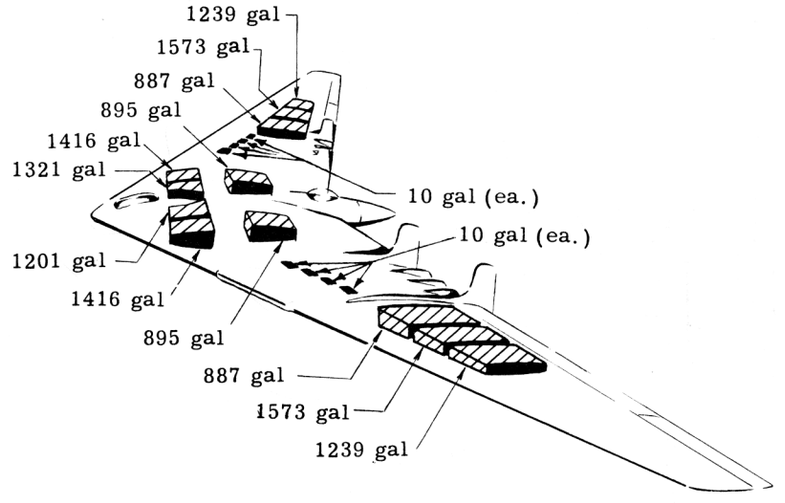
EIGHT J35-A-15

ALLISON



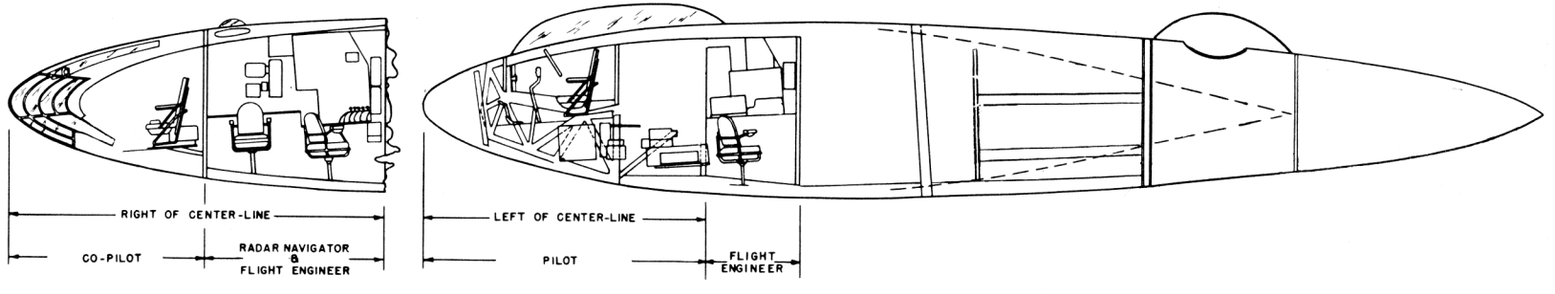
Wing Area ..... 4000 sq ft
Aspect Ratio..... 7.4
M.A.C. ..... 315 in.

Wing Section:
Root..... NACA 65.3-019
Tip..... NACA 65.3-018



Fuel

Oil



POWER PLANT

No. & Model	(8) J35-A-15
Mfr.	Allison
Engine Spec. No.	E-571
Type & Stages	Axial Flow (11)
Length	168"
Diameter	40"
Weight(dry)	2400 lb

ENGINE RATINGS

S. L. Static	LB - RPM
Max:	3750 - 7700
Mil:	3750 - 7700
Nor:	3270 - 7400

Mission and Description

The mission of the YB-49 is to further explore and develop the potentialities of "flying wing type" aircraft.

The crew consists of a pilot; co-pilot, navigator, bombardier, radio operator and engineer.

The aircraft is a modification of the YB-35 and YB-35A aircraft (reciprocating engines) to accommodate eight turbo jet type engines and is of "pure" flying wing configuration using elevons - combination elevators and ailerons - and split type wing tip drag rudders for control. Four vertical fins are installed to improve directional stability.

The electrically operated landing gear is of the tricycle type with steerable nose wheel.

Two auxiliary power units installed in bomb bays 3 and 6 provide AC power. Fuel tanks for the APU's are installed in bomb bay 5.

The crew compartment is pressurized to maintain an equivalent of 5000 ft altitude up to 28,000 feet and a constant differential pressure above 28,000 feet. Window defrosting, air conditioning, dust protection and sound proofing is provided.

Development

Authorization for conversion from YB-35's to YB-49: June 1945
First flight: October 1947
Two service articles completed
First article acceptance, June 1948; Second article: May 1949

WEIGHTS

Loading	Lb	L. F.
Empty	88,442(A)	
Basic	90,173(A)	
Design	213,552	2.0
Combat	*133,569	
Max. T. O.	†193,938	
Max Land.	146,550	

(A) Actual
* For basic mission
† Limited by space

FUEL

Location	No. Tanks	Gal.
Main*	4	5000
Aux.	6	7752
Bomb bay	2	1790
*Self-sealing	Tot.	14,542

Spec. AN-F-32
Grade JP-1

OIL

Capacity (gal) 80
Spec. AN-0-9
Grade 1010

DIMENSIONS

Span	172.0'
Length	53.1'
Height	15.2'
Tread	41.2'

BOMBS

No.	Size	Type
2	4000	G.P.
5	2000	G.P.
10	1600	A.P.
10	1000	G.P.
30	500	G.P.

Max Bomb Load: 16,000 lb

GUNS

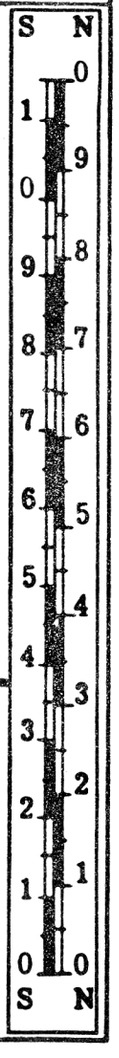
NO PROVISIONS

ELECTRONICS

VHF Command	AN/ARC-3
Liaison	AN/ARC-8
Interphone	AN/AIC-2
Radio Compass	AN/ARN-7
Marker Beacon	RC-193
Localizer	RC-103
Glide Path	AN/ARN-5
IFF	SCR-695
Range Recvr	SCR-274N

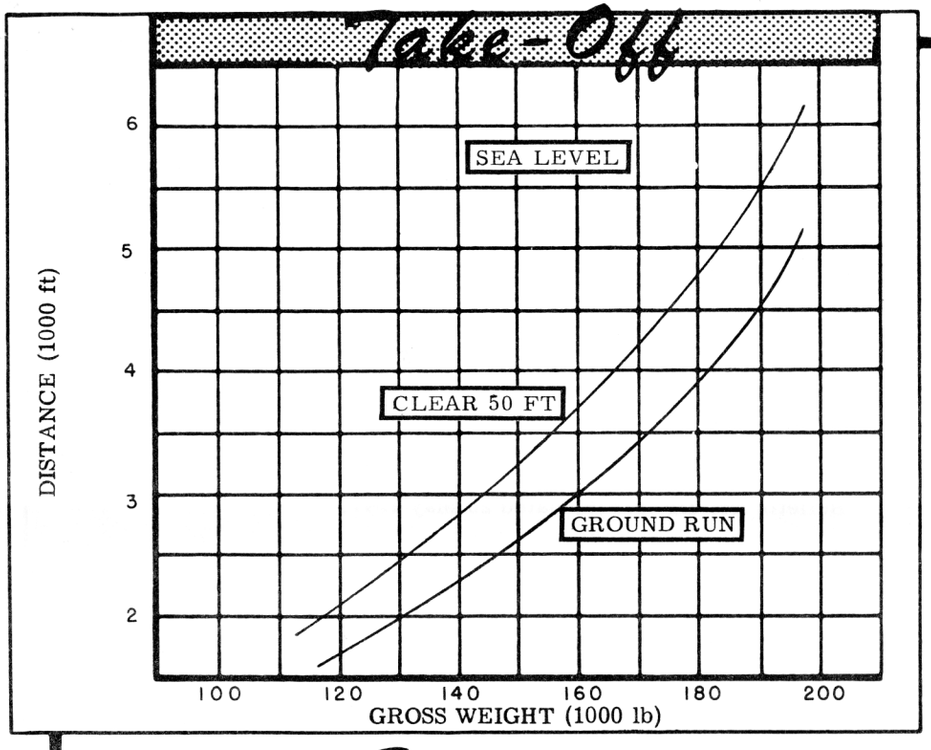
Loading and Performance - Typical Mission

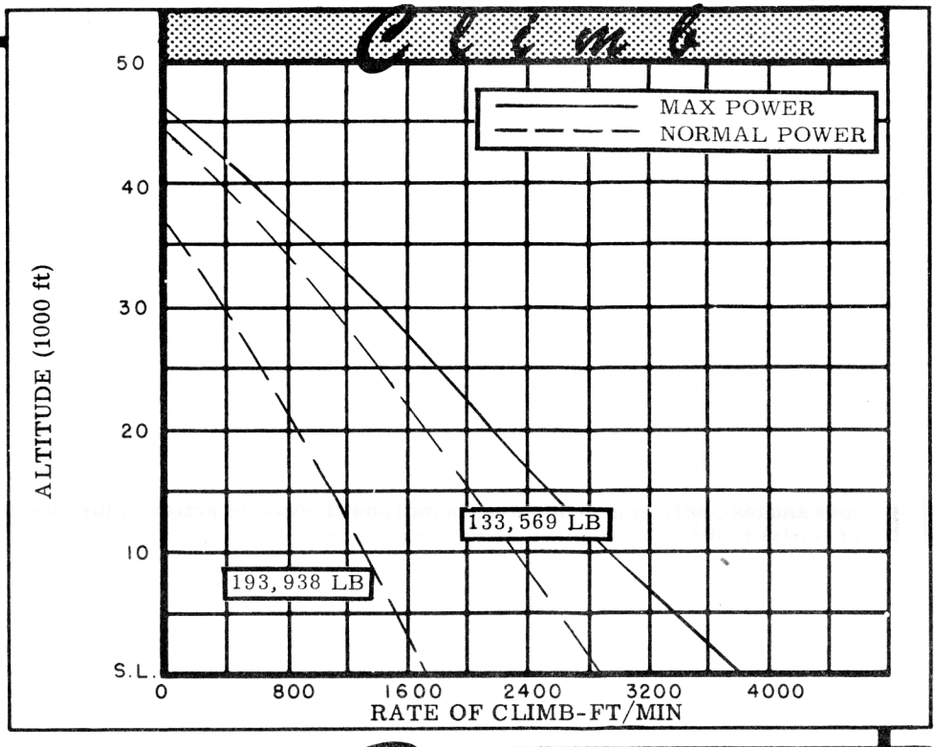
CONDITIONS			BASIC MISSION I	MAX. BOMB MISSION II	FERRY RANGE III
TAKE-OFF WEIGHT		(lb)	193,938	193,539	190,284
Fuel at 6.7 lb/gal		(lb)	91,442	85,438	97,431
Military load (Bombs)		(lb)	10,000	16,000	None
Wing loading		(lb/sq ft)	48.5	48.4	47.6
Stall speed (power off)		(kn)	90	90	89
Take-off ground run at SL	①④	(ft)	4850	4780	4530
Take-off to clear 50 ft	①④	(ft)	5850	5775	5470
Rate-of-climb at SL	②	(fpm)	2480	2470	2530
Time: SL to 20,000 ft	②	(min)	11.9	11.8	11.4
Time: SL to 30,000 ft	②	(min)	22.0	21.8	21.0
Service ceiling (100 fpm)	②	(ft)	37,400	37,500	37,900
COMBAT RANGE	⑤	(n. mi)	2828	2520	3105
Avg cruising speed		(kn)	365	364	365
Cruising altitude (s)		(ft)	33,800-44,600	33,900-43,700	34,500-46,000
Total mission time		(hr)	7.84	7.00	8.59
COMBAT RADIUS	⑤	(n. mi)	1403	1322	———
Avg cruising speed		(kn)	365	365	———
Cruising altitude (s)		(ft)	33,800-46,200	33,900-46,400	———
Total mission time		(hr)	7.87	7.42	———
COMBAT WEIGHT	⑥	(lb)	133,569	129,870	102,596
Combat altitude		(ft)	35,000	41,600	46,000
Combat speed	②⑦	(kn)	403	403	403
Combat climb	②	(fpm)	1010	480	540
Combat ceiling (500 fpm)	②	(ft)	40,700	41,300	46,000
Service ceiling (100 fpm)	②	(ft)	45,200	45,700	49,700
Max rate-of-climb at SL	②	(fpm)	3785	3900	4980
Max speed at_____ ft	②⑦	(kn/alt)	428/20,800	430/20,000	433/18,000
LANDING WEIGHT		(lb)	101,640	100,645	102,596
Ground roll at SL	④	(ft)	2000	1950	2025
Total from 50 ft	④	(ft)	3875	3850	3920

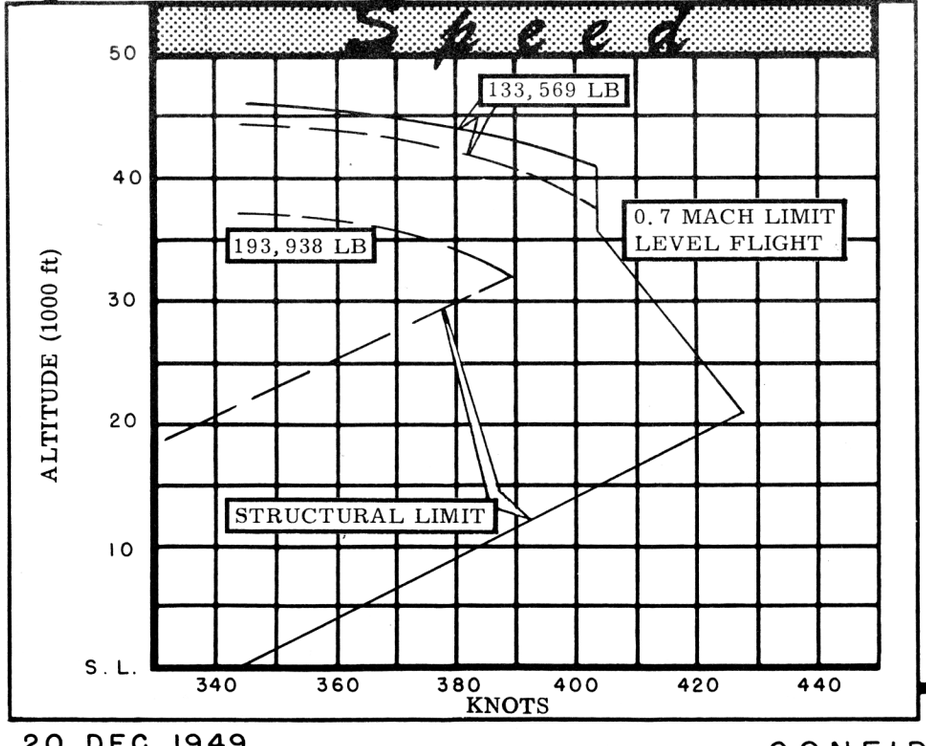


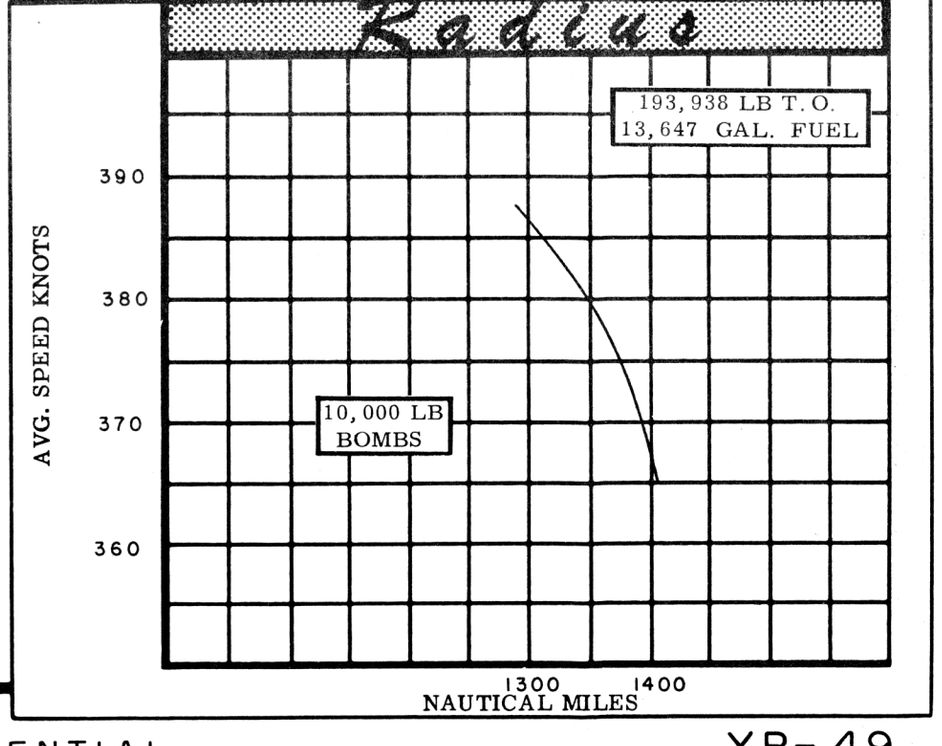
NOTES
① Take-off power
② Max power
③ Normal power
④ Take-off and landing distances are obtainable at sea level using normal technique. For airport planning add 25% to distances shown.
⑤ Detailed descriptions of the RADIUS & RANGE missions are given on page 6.
⑥ Radius mission if radius is shown
⑦ Mach number limitation

CONDITIONS
(a) Performance Basis: Calculated data based on manufacturer's flight test and wind tunnel test.
(b) In computing Radius and Range, specific fuel consumptions have been increased 5% to allow for variations of fuel flow in service aircraft
(c) Performance is based on powers shown on page 6.


Take-Off
DISTANCE (1000 ft)
6
5
4
3
2
SEA LEVEL
CLEAR 50 FT
GROUND RUN
100
120
140
160
180
200
GROSS WEIGHT (1000 lb)


Climb
ALTITUDE (1000 ft)
50
40
30
20
10
S.L.
MAX POWER
NORMAL POWER
133,569 LB
193,938 LB
0
800
1600
2400
3200
4000
RATE OF CLIMB-FT/MIN


Speed
ALTITUDE (1000 ft)
50
40
30
20
10
S.L.
133,569 LB
193,938 LB
0.7 MACH LIMIT
LEVEL FLIGHT
STRUCTURAL LIMIT
340
360
380
400
420
440
KNOTS


Radius
AVG. SPEED KNOTS
390
380
370
360
193,938 LB T.O.
13,647 GAL. FUEL
10,000 LB
BOMBS
1300
1400
NAUTICAL MILES

N O T E S

FORMULA: RADIUS MISSION I

Warm-up, take-off and climb on course to 33,800 ft altitude at maximum power and maximum rate of climb, cruise out at long range speeds increasing altitude with decreasing airplane weight, make 6 minute normal power bomb-run to target, drop bombs, conduct normal power evasive action for 6 minutes, start cruise to home base at 41,100 ft altitude arriving over home base at 46,200 ft altitude. Range free allowances are: 5 minutes normal power fuel consumption for starting engines and take-off, plus 6 minutes normal power evasive action, plus 10% of initial fuel for landing and endurance reserve.

FORMULA: RANGE MISSION I

Same as the outbound leg of the Basic Radius formula continued until 90% of the initial fuel has been used at 44,600 ft altitude, leaving 10% fuel reserve for combat evasive action, landing reserve or other consideration for which no distance credit is allowed.

FORMULA: RADIUS MISSION II

Same as the Basic Radius formula, initial altitude for start of cruise out is 33,900 ft and final altitude over the home base is 46,400 ft. Range free allowances are the same as for the Basic Radius formula.

FORMULA: RANGE MISSION III

Same as the Basic Range formula; initial altitude for start of cruise out is 34,500 ft and final altitude is 46,000 ft. Range free allowances are the same as for the Basic Range formula.

GENERAL NOTES

(a) Airplane performance based on engine performance from G. E. Bulletin No. DF-81576, dated 26 May 1947.

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

J35-A-15	
S. L. Static	LB - RPM
T. O.	4000 - 7700
Max:	4000 - 7700
Nor:	3500 - 7400