Standard Aircraft Characteristics

KB-50

Boeing (Hayes Aircraft)

BY AUTHORITY OF THE SECRETARY OF THE AIR FORCE

FOUR R-4360-35
PRATT & WHITNEY

KB-50
POWER PLANT
Nr & Model .... (4) R-4360-35
Mfr .... Pratt & Whitney
Engine Spec Nr .... A-7051-F
Superch .... 4 sig, 1 spd
Turbo Superch .... (3) CH-7-B1
Turbo Mfr .... General Electric
Red. Gear Ratio .... 0.375
Prop Mfr .... Curtiss
Blade Design Nr .... 1052-20C4-30
Prop Types Elect, C3, FF, Revr
Nr Blades .... 4
Prop Dia .... 16.08
Augmentation .... Water/Acohol

ENGINE RATINGS
BHP- RPM - ALT - MIN
T. O .... 3500 - 2700 - S.L. - 5
2500 - 2700 - S.L. - 5
Mib .... 3500 - 2700 - Turbo - 30
2500 - 2700 - Turbo - 30
Nor .... 2500 - 2550 - Turbo - Cont

DIMENSIONS
Wing
Span .... 141.2
Incidence [root] .... 4
Dihedral .... 4.0
Sweepback (LE) .... 7.1
Length .... 90.2
Height .... 33.6
Height (fin folded) .... 20.6
Trend .... 30.3
Prop Grd Clearance .... 17

PERSONNEL
Crew (normal) .... 6
Pilot
Co-Pilot
Engineer
Radar-Navigator
Refueling Operators (2)

REFUEL EQUIP.
(3) Type A-12B-1 Flight Refueling Reels
Type MA-2 Reception Coupling
27 1/2" Dia, Drogue
65' Approx, usable length of hose

MISSION AND DESCRIPTION
Navy Equivalent: None
Mfr's Model: ----

This principal mission of the KB-50 airplane is the simultaneous
aerial refueling of three fighter type aircraft by the probe and drogue
method.
The airplane is equipped with A-12B-1 refueling reels installed in
pylon mounted pods near each wing tip and in the aft tail section of
the fuselage. The two refueling operator's control stations are located in
the aft pressurized section at the side blisters.
Two jettisonable bomb bay fuel tanks are equipped with an automatic
CG control system.
The fuel system has a capability of transferring 287 gallons per minute
at 50 psi drogue pressure to each of three receivers simultaneously.
Transfer volume can be increased to 327 gallons per minute per receiver
when low pressure drop fuel systems are utilized.
The fuel jettison system is capable of discharging 1075 gallons per
minute through an outlet in the tail of the airplane.
Other features incorporated in the airplane, are heating, ventilating
and pressurization, two single-point, refueling receptacles, one for
servicing all tanks carrying JP-4 fuel and one for servicing all tanks
carrying gasoline.

DEVELOPMENT
In the modification of B-50 aircraft to the KB-50 configuration all
defensive armament is removed; the fuselage aft tail section is completely
replaced; the outer wing panels are extensively reinforced for overall
strength.
First Flight .... Dec 55
First Acceptance .... Jan 56
Production Completion (134 aircraft) .... Aug 57 (est)

WEIGHTS
Loading 

Lb 

L.F.
Empty .... 85,401
Basic .... 90,279
Design .... 173,000
Combat .... 107,511
Max T.O. .... 173,000
Max Land .... 160,000

(C) Calculated
* For Basic Mission
** Limited by strength

FUEL

Location Nr Tanks Gal
Wg. outbd .... 2 .... 3382
Wg. indb* .... 2 .... 2832
Fus. aft .... 1 .... 1071
Total .... 115,145
Specification .... MIL-F-5572

Grade .... 115,145
Specification .... MIL-F-5572

Grade .... 115,145
Specification .... MIL-F-5624

Nacelles (Tot) 420
Grade .... 1100
Specification .... MIL-L-6082

WATER/ALCOHOL
Wg. indb* .... 2 .... (Tot) 60

ELECTRONICS
UHF Command .... AN/ARC-27A
VHF Command .... AN/ARC-36
UHF Direction Finder, AN/AAR-25
Radio Compass .... AN/ARN-5
Markor Beacon .... AN/ARN-12
Omni Range .... AN/ARN-14
Glide Path .... AN/ARN-18
Dist, Measuring Equip. AN/ARN-21
Interphone .... AN/AIC-10
Loran .... AN/APN-70
Radar .... AN/APS-23A
IFF Transponder .... AN/APX-25
IFF Interr, Responder, AN/APX-29
Radar Altimeter .... SCR-718C
Radio Range Recvr's .... BC-4531
HF Transceiver .... Collins 61B S-1
Emergency Keyer .... AN/AAR-26

UNCLASSIFIED

KB-50

15 FEB 57
## Loading and Performance—Typical Mission

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Basic Mission</th>
<th>Max Refuel II</th>
<th>Max Radius III</th>
<th>Ferry Range IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take-off weight (lb)</td>
<td>173,000</td>
<td>173,000</td>
<td>173,000</td>
<td>173,000</td>
</tr>
<tr>
<td>Fuel at 6.0 lb/gal (Grade 115/145) (lb)</td>
<td>36,944</td>
<td>48,100</td>
<td>21,281</td>
<td>100.5</td>
</tr>
<tr>
<td>Payload (transfer fuel @ 6.5 lb/gal) (lb)</td>
<td>30,226</td>
<td>40,500</td>
<td>21,300</td>
<td>100.5</td>
</tr>
<tr>
<td>Wing loading (lb/sq ft)</td>
<td>100.5</td>
<td>100.5</td>
<td>100.5</td>
<td>100.5</td>
</tr>
<tr>
<td>Stall Speed (power off) (kn)</td>
<td>114</td>
<td>114</td>
<td>114</td>
<td>114</td>
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<tr>
<td>Take-off ground run at S.L. (ft)</td>
<td>6350</td>
<td>6350</td>
<td>6350</td>
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<tr>
<td>Take-off to clear 50 ft (ft)</td>
<td>7940</td>
<td>7940</td>
<td>7940</td>
<td>7940</td>
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<tr>
<td>Rate of climb at S.L. (fpm)</td>
<td>600</td>
<td>608</td>
<td>608</td>
<td>608</td>
</tr>
<tr>
<td>Rate of climb at S.L. (one engine out) (fpm)</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Time: S.L. to 10,000 ft (min)</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
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<tr>
<td>Time: S.L. to 20,000 ft (min)</td>
<td>40</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Service ceiling (100 fpm) (ft)</td>
<td>23,250</td>
<td>23,250</td>
<td>23,250</td>
<td>23,250</td>
</tr>
<tr>
<td>Service ceiling (one engine out) (ft)</td>
<td>12,600</td>
<td>12,600</td>
<td>12,600</td>
<td>12,600</td>
</tr>
<tr>
<td>Combat range (n. mi)</td>
<td>—</td>
<td>629</td>
<td>610</td>
<td>668</td>
</tr>
<tr>
<td>Average cruising speed (kn)</td>
<td>200</td>
<td>229</td>
<td>232</td>
<td>232</td>
</tr>
<tr>
<td>Initial cruising altitude (ft)</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
<td>5000</td>
</tr>
<tr>
<td>Refuel speed (kn)</td>
<td>302</td>
<td>307</td>
<td>305</td>
<td>305</td>
</tr>
<tr>
<td>Refuel altitude (ft)</td>
<td>26,500</td>
<td>24,000</td>
<td>30,500</td>
<td>30,500</td>
</tr>
<tr>
<td>Final cruising altitude (ft)</td>
<td>26,500</td>
<td>24,000</td>
<td>30,500</td>
<td>30,500</td>
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<tr>
<td>Total mission time (hr)</td>
<td>10.8</td>
<td>15.1</td>
<td>29.7</td>
<td>29.7</td>
</tr>
<tr>
<td>Combat weight (lb)</td>
<td>107,511</td>
<td>103,105</td>
<td>115,100</td>
<td>99,530</td>
</tr>
<tr>
<td>Combat altitude (ft)</td>
<td>26,500</td>
<td>24,000</td>
<td>30,500</td>
<td>30,500</td>
</tr>
<tr>
<td>Combat speed (kn)</td>
<td>344(327)</td>
<td>344(326)</td>
<td>348(330)</td>
<td>288</td>
</tr>
<tr>
<td>Combat climb (fpm)</td>
<td>1410</td>
<td>1020</td>
<td>830</td>
<td>2390</td>
</tr>
<tr>
<td>Combat ceiling (500 fpm) (ft)</td>
<td>34,000</td>
<td>34,300</td>
<td>33,000</td>
<td>34,500</td>
</tr>
<tr>
<td>Service ceiling (100 fpm) (ft)</td>
<td>35,800</td>
<td>40,300</td>
<td>39,570</td>
<td>40,750</td>
</tr>
<tr>
<td>Service ceiling (one engine out) (ft)</td>
<td>34,900</td>
<td>36,400</td>
<td>32,150</td>
<td>37,500</td>
</tr>
<tr>
<td>Max rate of climb at S.L. (fpm)</td>
<td>2210</td>
<td>2320</td>
<td>1980</td>
<td>2430</td>
</tr>
<tr>
<td>Max speed at 30,500 ft (kn)</td>
<td>353(334)</td>
<td>353(337)</td>
<td>343(330)</td>
<td>354</td>
</tr>
<tr>
<td>Basic speed at 5000 ft (kn)</td>
<td>287</td>
<td>288</td>
<td>288</td>
<td>288</td>
</tr>
<tr>
<td>Landing weight (lb)</td>
<td>97,812</td>
<td>97,313</td>
<td>96,610</td>
<td>99,530</td>
</tr>
<tr>
<td>Ground roll at S.L. (ft)</td>
<td>2155</td>
<td>2150</td>
<td>2175</td>
<td>2190</td>
</tr>
<tr>
<td>Ground roll (auxiliary brake) (ft)</td>
<td>1045</td>
<td>1045</td>
<td>1100</td>
<td>1100</td>
</tr>
<tr>
<td>Total from 90 ft (ft)</td>
<td>2940</td>
<td>2940</td>
<td>2960</td>
<td>2960</td>
</tr>
<tr>
<td>Total from 90 ft (auxiliary brake) (ft)</td>
<td>1878</td>
<td>1878</td>
<td>1878</td>
<td>1878</td>
</tr>
</tbody>
</table>

### Performance Basis
(a) Data source: Calculated data based on AF flight test of B-50D and KB-50 aircraft.
(b) Performance is based on powers shown on page 6.

### Notes
1. Take-off power
2. Maximum power
3. Normal power
5. With full reverse thrust on all 4 engines.

KB-50 U N C L A S S I F I E D

15 Feb 57
NOTES

FORMULA: RADIUS MISSION I

Take-off and climb on course to 5000 feet at normal power, cruise out at long range speeds. Climb so as to arrive at refuel altitude (cruise ceiling) immediately prior to rendezvous (one hour at long range speeds for rendezvous and hook-up, no distance credit). Transfer fuel at the rate of 0.99 gallons per minute while proceeding toward bomber target at normal rated power, disengage and return to base at refuel altitude and long range speeds. Mission is planned so that radius at the end of transfer is 1000 nautical miles. Range free allowances include 10 minutes normal power fuel consumption for starting engines and take-off, one hour long range fuel consumption at refuel altitude for rendezvous and 30 minutes long range fuel consumption at sea level plus 5% initial fuel load for landing and endurance reserve.

FORMULA: RADIUS MISSION II & III

Same as for Radius Mission I, except that the refuel radius is limited by tanker fuel capacity.

FORMULA: RANGE MISSION IV

Take-off and climb on course to 5000 feet at normal power, cruise out at long range speeds until all usable fuel is consumed. Range free allowances are the same as for Radius Mission I, except for omission of rendezvous.

GENERAL DATA:

(a) Calculated data is based on B-50D and KB-50 flight tests.

(b) Due to the airplane gross weight limitation of 173,000 lb, all fuel tanks may not be filled to capacity simultaneously. For a Max Radius Mission, JP-4 fuel load in the bomb bay tanks is reduced. For a Max Transfer Fuel Mission gasolene load in the wing tanks is reduced.

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

<table>
<thead>
<tr>
<th>(d) R-4360-35</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSHP</td>
</tr>
<tr>
<td>T.O.</td>
</tr>
<tr>
<td>MAX</td>
</tr>
<tr>
<td>NOR.</td>
</tr>
</tbody>
</table>

* Wet
** Level flight critical altitude

(d) Radius Block - Page 5

Any intermediate configuration between the 21,281 lb and zero lb condition would be at less than 173,000 lb gross weight.

(e) For detailed planning refer to T.O. 1B-50K-1.

PERFORMANCE REFERENCE:

Hayes Report No. 142 and 199, dated 6 June 1956 and 15 December 1956, respectively.

REVISION BASIS:

To reflect production fuel capacities and aircraft weight data; also revised performance figures.