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THE FOLLOWING PREVIEW IS PRESENTED TO INTRODUCE THE EFFECTIVE FLYING AND FIGHTING QUALITIES OF THE DOUGLAS B-42 AIRPLANE AND ITS IMPORTANT CAPABILITIES IN LONG-RANGE AERIAL WARFARE
In this global war, the ability to overcome huge distances is a predominant factor in the success or defeat of a military operation. Long-range bombing, strafing, and reconnaissance, delivered by hard-hitting aircraft capable of flying thousands of miles to an objective, have proved to be essential.

The Douglas Company has overcome the handicap of distance by creating a long-range bomber — the B-42 — in a small machine. Although much smaller than present long-range bombing aircraft, reduced drag has supplanted size in the B-42 with resultant greater speed, bomb load, and maneuverability. Precision-gauged body-sealed streamlining, laminar-flow wings unobstructed by bulky engine nacelles, and pusher-type counter-rotating propellers make for additional performance and stability and enable the B-42 to compete with and prove superior to, the best long-range bombing aircraft.

Vulnerability is reduced over the target in the B-42 because of its reduced size and resultant smaller target combined with an inherent extremely high operational speed which can be actually used because of the provision of "snap-action" bomb bay doors. The use of such doors results in a reduction of high speed of less than 1 MPH at the time bombs are dropped over the target. Range equal to or better than that of the largest heavy bomber, operational speed essentially that of pursuit aircraft, together with properly disposed defensive firepower, enable the B-42 to meet successfully the demands of the most extensive long range missions required in modern warfare.
Attu to Chungking via Tokyo—4,000 miles. Purposely designed for long-range operation, the B-42 has a maximum range of 5,333 miles while carrying 2,000 pounds of bombs, and a speed of 470 miles per hour. The B-42 requires only a three-man crew as compared with the twelve-man crew of the heavy bomber. Dynamic offensive and defensive firepower, make this airplane virtually immune to fighter or anti-aircraft opposition, particularly as the extreme speed and maneuverability of the B-42 are retained over the target, and during the bombing run by the use of "snap-action" bomb doors that reduce speed loss to negligible quantities while dropping bombs.
ALITIES

Heretofore highly vulnerable to enemy interception, aerial reconnaissance has been limited in both distance and results. Designed for a maximum cruising range of over 6000 miles and equipped with six .50-caliber machine guns and 2400 rounds of ammunition, the B-42’s performance is thereby unhindered by handicaps of former reconnaissance airplanes. Aerial cameras completely enclosed in the airplane, allow increased speed and range due to the elimination of the drag deficiency of standard bomb bay installations. Extreme maneuverability prepares the B-42 to fulfill satisfactorily any long-range reconnaissance mission.
**DOUGLAS MODEL B-42 BOMBER**

**DIMENSIONS**

- **SPAN** ........................................... 70' 6”
- **OVERALL LENGTH** ............................ 53' 7.6”
- **HEIGHT (VERTICAL STABILIZER)** ........... 18' 9.4”

**AREAS**

- **WING (TOTAL)** ................................. 554.63 SQUARE FEET
- **HORIZONTAL TAIL (TOTAL, INCLUDING FUSELAGE AREA)** 139.28 SQUARE FEET
- **VERTICAL TAIL (TOTAL, INCLUDING FUSELAGE AREA)** 82.89 SQUARE FEET

**POWER (TWO ALLISON V-1710-103 ENGINES)**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>POWER</th>
<th>R. P. M.</th>
<th>ALTITUDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL</td>
<td>1150</td>
<td>2700</td>
<td>SEA LEVEL</td>
</tr>
<tr>
<td></td>
<td>1100</td>
<td>2700</td>
<td>21,000 FEET</td>
</tr>
<tr>
<td></td>
<td>750</td>
<td>2700</td>
<td>30,000 FEET</td>
</tr>
<tr>
<td>WAR EMERGENCY</td>
<td>2100</td>
<td>3200</td>
<td>SEA LEVEL</td>
</tr>
<tr>
<td></td>
<td>1720</td>
<td>3200</td>
<td>21,000 FEET</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>3200</td>
<td>30,000 FEET</td>
</tr>
<tr>
<td>MILITARY</td>
<td>1425</td>
<td>3200</td>
<td>SEA LEVEL</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>3200</td>
<td>30,000 FEET</td>
</tr>
</tbody>
</table>

**TYPICAL WEIGHTS (DESIGN GROSS WEIGHT—33,000 POUNDS)**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>AMMUNITION</th>
<th>BOMBS</th>
<th>FUEL</th>
<th>WEIGHT EMPTY</th>
<th>USEFUL LOAD</th>
<th>GROSS WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bomber:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 - .50 Caliber Forward Firing</td>
<td>Machine Guns</td>
<td>1000 Rds.</td>
<td>1400 Rds.</td>
<td>2000 # (Internal)</td>
<td>660</td>
<td>21,162</td>
</tr>
<tr>
<td>4 - .50 Caliber Rearward Firing</td>
<td>Turret Guns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bomber:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 - .50 Caliber Forward Firing</td>
<td>Machine Guns</td>
<td>1000 Rds.</td>
<td>1400 Rds.</td>
<td>2000 # (With Drop Tanks and 3 Bomb Bay Tanks)</td>
<td>2085</td>
<td>21,162</td>
</tr>
<tr>
<td>4 - .50 Caliber Rearward Firing</td>
<td>Turret Guns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ferry, (or Reconnaissance):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 - .50 Caliber Forward Firing</td>
<td>Machine Guns</td>
<td>1000 Rds.</td>
<td>1400 Rds.</td>
<td>— (With Drop Tanks and 4 Bomb Bay Tanks)</td>
<td>2360</td>
<td>21,162</td>
</tr>
<tr>
<td>4 - .50 Caliber Rearward Firing</td>
<td>Turret Guns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Attack:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 75 mm. Forward Firing Cannon</td>
<td>1000 Rds.</td>
<td>1400 Rds.</td>
<td>—</td>
<td>660 (Internal)</td>
<td>21,178</td>
<td>7490</td>
</tr>
<tr>
<td>2 - .50 Caliber Forward Firing</td>
<td>Machine Guns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - .50 Caliber Rearward Firing</td>
<td>Turret Guns</td>
<td>20 Rds.</td>
<td>75 mm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Attack:</strong></td>
<td>Machine Guns</td>
<td>5500 Rds.</td>
<td>1400 Rds.</td>
<td>— (With Drop Tanks and 2 Bomb Bay Tanks)</td>
<td>1810</td>
<td>21,373</td>
</tr>
<tr>
<td>4 - .50 Caliber Rearward Firing</td>
<td>Turret Guns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WING LOADING (DESIGN GROSS WEIGHT 33,000 POUNDS)** ........................................... 63.0 LBS./SQ. FT.

**POWER LOADING (DESIGN GROSS WEIGHT AND WAR EMERGENCY POWER)** ................................... 8.7 LBS./HP.
AERODYNAMIC EFFICIENCY

The Douglas B-42 airplane is the cleanest aerodynamic design evolved to date. Laminar flow wings without nacelles are combined with counterclockwise separately driven pusher propellers to provide the lowest possible drag together with the best stability and maneuverability in a compact long range airplane.

RANGE

The B-42 has a maximum fuel capacity of 2,360 gallons, with drop tanks. This feature combined with the inherent low drag characteristics make it capable of meeting the range of the heavy bomber when carrying 2,000 pounds of bombs. The B-42 has a capacity bomb load of 8,000 pounds at reduced fuel loads.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Maximum Range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Pursuit—Maximum Range</td>
<td>1,500 miles</td>
<td></td>
</tr>
<tr>
<td>Douglas B-42—Maximum Range</td>
<td>5,333 miles</td>
<td></td>
</tr>
<tr>
<td>2,085 Gallons of fuel + 2,000 lbs. of bombs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Bomber—Maximum Range</td>
<td>5,333 miles</td>
<td></td>
</tr>
<tr>
<td>7,000 Gallons of fuel + 2,000 lbs. of bombs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPEED

The high speed of the B-42 is approximately 470 miles per hour at an altitude of 25,000 ft.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Maximum Pursuit Speed</td>
<td>500 m.p.h.</td>
</tr>
<tr>
<td>Maximum Speed of B-42</td>
<td>470 m.p.h.</td>
</tr>
<tr>
<td>Average Maximum Heavy Bomber Speed</td>
<td>390 m.p.h.</td>
</tr>
</tbody>
</table>
PROPELLERS

Capable of reducing speed from 400 miles per hour to 200 miles per hour in approximately eight seconds, the reversible, counter-rotating propellers allow extreme maneuverability with the aircraft. The "pusher" feature increases aerodynamic cleanliness by decreasing over-all airplane drag to approximately 70 per cent of that of a comparable twin engined tractor airplane.

DOUBLE-SLOTTED FLAP

The newly perfected Douglas vane-type flap allows higher wing loading, while retaining take-off and landing characteristics comparable to those available with other flap types at lower loadings. The uninterrupted flap span allows the highest possible flap efficiency.

LOAD AND STRENGTH

Primarily designed as a long-range bomber, the normal gross weight of the B-42 is 35,000 pounds at a limit load factor of 2.67. For missions accomplished at lesser weights, the airplane is designed for an alternate weight of 25,000 pounds at a limit load factor of 4.
The following table outlines the performance characteristics of the Douglas B-42 for several typical loading conditions. Condition numbers correspond to loading condition numbers on the next page.

<table>
<thead>
<tr>
<th>CONDITION NUMBER</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOADING CONDITION</td>
<td>ATTACK</td>
<td>ATTACK</td>
<td>FERRY</td>
<td>BOMBER</td>
<td>BOMBER</td>
<td>BOMBER</td>
</tr>
<tr>
<td>Crew</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Guns</td>
<td>6</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>.50 caliber</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>75 mm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammunition</td>
<td>(rds.)</td>
<td>2,400</td>
<td>6,900</td>
<td>2,400</td>
<td>2,400</td>
<td>2,400</td>
</tr>
<tr>
<td>.50 caliber</td>
<td>(rds.)</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>75 mm.</td>
<td>(gal.)</td>
<td>660</td>
<td>1,810</td>
<td>2,360</td>
<td>660</td>
<td>2,085</td>
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<tr>
<td>Fuel</td>
<td>(lb.)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bombs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PERFORMANCE**

- **Absolute Range** (mi.)
  - (lb.) | 2,100 | 4,700 | 6,270 | 1,900 | 5,530 | 3,300 |

- **At Target Weight** (with Half Fuel)
  - (lb.) | 26,708 | 31,555 | 31,885 | 33,665 | 32,840 | 35,505 |
  - (mph) | 470 | 467 | 472 | 471 | 471 | 469 |
  - (mph) | 442 | 433 | 437 | 432 | 435 | 427 |

- **Two Engine Service Ceiling with Military Power** (ft.)
  - (ft.) | 40,800 | 38,200 | 38,000 | 37,000 | 37,500 | 36,000 |

- **Two Engine Service Ceiling with Rated Power** (ft.)
  - (ft.) | 34,100 | 30,400 | 30,200 | 28,800 | 29,500 | 27,500 |

- **One Engine Service Ceiling with Military Power, No Bombs** (ft.)
  - (ft.) | 24,300 | 12,900 | 12,000 | 26,400 | 14,800 | 22,600 |

- **One Engine Service Ceiling with Rated Power, No Bombs** (ft.)
  - (ft.) | 11,200 | 14,300 | 8,800 |

- **Ultimate Load Factor** (g)
  - (g) | 5.62 | 4.76 | 4.71 | 4.45 | 4.57 | 4.23 |

- **At Take-off Weight** (lb.)
  - (lb.) | 28,668 | 37,375 | 39,355 | 35,645 | 39,485 | 39,675 |

- **Take-off Distance over 50 Ft. Obstacle with War Emergency Power** (ft.)
  - (ft.) | 3,170 | 6,220 | 7,200 | 5,450 | 7,250 | 7,350 |

- **At Landing Weight** (Including 20% Initial Fuel) (lb.)
  - (lb.) | 25,500 | 28,300 | 27,700 | 24,500 | 27,100 | 25,200 |

- **Landing Distance over 50 Ft. Obstacle** (ft.)
  - (ft.) | 2,140 | 2,340 | 2,290 | 2,080 | 2,260 | 2,130 |
The chart below may be used to determine the performance of the B-42 at any condition of loading. Each item of performance is plotted against the gross weight and can be determined by reading up from the weight scale to the point of its intersection with each performance curve, then by reading across to each of the performance scales.

<table>
<thead>
<tr>
<th>LOADING CONDITION</th>
<th>TAKE-OFF WEIGHT</th>
<th>TARGET WEIGHT</th>
<th>LANDING WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ULTIMATE LOAD FACTOR**

<table>
<thead>
<tr>
<th>LOAD FACTOR</th>
<th>(ML)</th>
<th>(FT)</th>
<th>(MPH)</th>
<th>(FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>10000</td>
<td>10000</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>8000</td>
<td>8000</td>
<td>400</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>6000</td>
<td>6000</td>
<td>300</td>
<td>3000</td>
</tr>
<tr>
<td>4</td>
<td>4000</td>
<td>4000</td>
<td>200</td>
<td>2000</td>
</tr>
<tr>
<td>5</td>
<td>2000</td>
<td>2000</td>
<td>100</td>
<td>10000</td>
</tr>
</tbody>
</table>

**CONSISTENT WITH EXPECTED PERFORMANCE OF PRODUCTION AIRPLANE.**

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MILITARY

COMPARATIVE SIZE OF MODERN HEAVY

TYPICAL MISSION

AIRPLANE

BOMB LOAD AND RANGE

2000 LBS. FOR 5333 MILES

FUEL (Each Barrel — 1000 gals.)

UTILIZATION

AIRPLANE

REPAIR TIME (Elapsed)

VULNERABILITY (% Battle Damage)

COSTS (Per Airplane)

AIRPLANE

MAN HOURS (Each Man — 5000 hrs.)

DECLASSIFIED
Authority 9/7/44
By NARA Date 10/31/49
EFFICIENCY VS. SIZE

Design studies show that airplane range increases only slowly with size. An increase of gross weight by a factor of 3 results in an increase in maximum design operational range of only 20%.

Conversely, an increase of maximum design operational range of 20% for a given size aircraft may be accomplished by a decrease of drag to 70% of that of the conventional aircraft. This has been done in the case of the B-42 by the unique basic design.

As a result, this type of airplane—B-42—is capable of the same bomb load at maximum range as an airplane of 3 times its weight — the heavy bomber.

CREW

Crew requirements are held to a minimum. Three men for the B-42, twelve men for the heavy bomber.

FUEL

Fuel requirements, particularly important in all out war, are substantially reduced. To carry 2,000 lbs. of bombs 5,333 miles costs approximately 2,000 gals. for the B-42, 7,000 gals. for the heavy bomber.

TOTAL PLANES AVAILABLE

With the smaller airplane having a production rate of four times that of the heavy bomber, more airplanes will be available for combat from the same plant facilities. Combined with the higher utilization nine times as many total combat missions can be performed by B-42 production as by heavy bomber production from the same factories.

CONSTRUCTION MAN HOURS

The smaller airplane will simplify and reduce construction time. For equal numbers of machines produced the B-42 requires only 40% of the construction man hours necessitated by the heavy bomber.

PLANT FACILITIES

Higher production rates are made possible by the smaller airplane. In the same period of time given plant facilities will produce at least four times as many B-42 airplanes as heavy bombers.
ECONOMY

DOLLAR COST

The smaller airplane will cost the taxpayer less money. For equal numbers of machines produced the B-42 costs one-third as much as the heavy bomber.

DIRECT MAINTENANCE CREW

The smaller and therefore simpler airplane will require fewer men for direct maintenance. It is estimated that the ground crew will be seven men for the B-42, fifteen men for the heavy bomber.

REPAIR TIME

The smaller airplane with its simpler installations and reduced number of parts will require less time for repairs. Quick change provisions for engines (and only two engines), cooling system, and fuel tanks assist. Superior protection of engines, oil systems, crew, and fuel systems also assist. It is estimated that elapsed time for repairs for the B-42 will be about one-half that for the heavy bomber.

VULNERABILITY

The smaller and more efficient airplane, with speeds approaching those of enemy pursuits, smaller bulk allowing closer formations, higher maneuverability allowing evasive action, and with adequate firepower in the only attack areas open to the pursuits, will have reduced vulnerability. It is estimated that the B-42 will be about two-thirds as vulnerable to enemy action as the heavy bomber.

COMBAT MISSIONS

Per airplane: Analysis of available data on effect of reduction of repair time on utilization of airplanes for combat indicates that during a given period of time the B-42 will be able to perform about 2 ¼ times as many missions as the heavy bomber.
One 8000-pound British Bomb

OR

Two 4000-pound British Bombs
or
One 4000-pound U. S. Bomb

OR

Four 2000-pound Bombs

OR

Six 1000-pound Bombs

OR

Twelve 500-pound Bombs

OR
Capacities

Twelve 250-pound Bombs

OR

Forty 100-pound Bombs

OR

Two MK. 13 Torpedoes

OR

Six 325-pound Depth Charges

OR

Four 275-gallon Leak-proof Droppable Fuel Tanks

Each tank occupies the same bomb bay space as a 2000-pound bomb and may be alternated with any equivalent bomb combinations
Protection of crew members from enemy gunfire is provided by ½ inch steel armor plate and ¼ inch aluminum alloy deflection plate to protect crew members. Aluminum alloy deflection plates ¼ inch thick protect engines and their accessory equipment. Bullet-proof glass is installed in the bomb sight window to safeguard the bombardier and bombing equipment.

Permanently installed leakproof fuel tanks have a capacity of 660 gallons. In addition, four leakproof bomb bay tanks with a capacity of 275 gallons each, as well as two external drop tanks with a capacity of 300 gallons each, may be installed. Thus the fuel capacity may be increased to 1,760 gallons leakproof internal, 2,360 gallons with drop tanks, or 2,085 gallons with drop tanks and one 2,000 lb. bomb.
AND ARMAMENT

Two remotely controlled turrets are provided in the trailing edge of the wings, each mounting two .50-caliber machine guns with 350 rounds per gun operated by the gunner from the flight compartment. The turrets cover a pyramid 25 degrees to either side of the rear, 30 degrees above and 15 degrees below the horizontal and will cover a point 25 yards behind the airplane.

Defense against frontal attack is obtained by the installation of two fixed forward-firing .50-caliber machine guns, one located on either side of the fuselage nose section. Each machine gun is furnished with 500 rounds of ammunition and is controlled by the pilot from the flight compartment. These forward firing guns are accessible in flight when necessary. Extra ammunition may be carried in the bombardier's compartment for use when desired.
For reconnaissance missions the B-42 may be equipped with metrogonic and telephoto cameras as desired, installed internally in the nose and aft of the bomb bay. The wing turrets and fixed forward firing guns, together with the extremely high speed available with the B-42, provide for defense and evasion in case of interception by the enemy. The extremely long available range (over 6,000 miles) for this duty allows reconnaissance of enemy territory heretofore completely inaccessible.
The 75 mm. Aircraft cannon with 20 rounds of ammunition plus two .50-caliber machine guns with 1,000 rounds of ammunition combine to form a large-caliber rapid-fire installation. Combined with its extremely long range, the B-42 with this installation is suitable to perform long range attack missions against relatively heavy materiel.

Two automatic, high velocity, 37 mm. cannon with a total of 150 rounds of ammunition plus two .50-caliber machine guns with 1,000 rounds of ammunition can be used for any operation requiring a large-caliber rapid-fire installation. Attacks on light materiel targets are possible with this installation up to great distances behind enemy lines.

Eight fixed, forward firing, .50-caliber machine guns incorporating a total capacity of 5,500 rounds of ammunition can concentrate fire-power on any enemy ground or aerial opposition. Combined with the B-42's high speed, long range, and maneuverability, this installation may be used to furnish escort support for long-range bombing missions.
Reduction of repair and maintenance time of aircraft on the fighting front is equivalent to a higher rate of production on the factory front.

The structural design of the Douglas B-42 provides snap fastened access doors for all sections of the airplane, facilitating rapid accessibility for servicing and maintaining vital parts.

Access to the engines is obtained through hinged hoods of deflection plating extending the full length of the engine compartment. Each engine is attached separately to the fuselage structure by only four bolts, permitting a complete engine change within forty-five minutes.

Large removable panels permit the rapid removal of the engine coolant radiators and wing fuel tanks. Similar access provisions are provided aft of the engine compartment for fuel and oil tanks as well as radio equipment.

Access is gained to all bombing equipment, hydraulic units, the underside of the engines, fuel tank and equipment compartments through the extensive uninterrupted bomb bay.

All instruments, hydraulic, fuel, and oil connections and radio and electrical wiring throughout the airplane are within easy reach of maintenance personnel.
The propeller gear reduction box at the tail of the airplane incorporates an individual oil cooling system to eliminate routing of lines through the fuselage and is easily accessible.

The batteries, electrical wiring and hydraulic lines are readily accessible in the main landing gear wheel well.

Engine and flight controls are operated by cables. Bellcranks eliminate the necessity for pulleys — with resultant improvement in control, safety, and serviceability.

Turret gun ammunition is loaded through readily removable panels in the wings. Removable nose fairing in the attack versions of the B-42 cuts time for loading and servicing guns to a minimum. Ammunition for fixed guns is loaded through the crew entrance door.

Because of the many well-planned access areas throughout the airplane, all maintenance personnel can work simultaneously, reducing the time for complete servicing of the airplane.

Only airplanes in the air can harm the enemy. Everything has been done to see that the B-42 will be in the air a maximum number of hours per month.
The relative action of the Douglas B-42 and a fighter, after interception has taken place, is illustrated above.

Available information indicates that maximum limitation on fighter action permits the fighter to start firing at 500-yard range at an acceleration of 3.5 g. Thus when in pursuit of a bomber with the 480 mph speed of the B-42, the fighter’s chase can begin at an angle of 22° or less from dead astern. The fighter which is assumed to intercept at 500 mph is also assumed to operate at 520 mph in the attack dive.

As shown, any time that the fighter is in position to fire on the B-42 it is being covered by four caliber .50 guns.

Further advantages in the high operational speed of the B-42 as compared to the heavy bomber also accrue as follows:

When action is taken by the fighter against the 390 mph heavy bomber, the fighter is under fire from the bomber for about 7 seconds only in each pass, and can make a pass at the bomber every 3 minutes. This is possible because of the 110 to 130 mph excess speed of the fighter over the heavy bomber.

When action is taken by the fighter against the 470 mph B-42, the fighter is under fire from the B-42 for at least 18.4 seconds in each pass, and can make a pass at the B-42 only every 8.3 minutes because, in this case, the fighter has only 30 to 50 mph excess speed over the B-42.

It is seen, therefore, that the high operational speed not only results in reduced vulnerability of the B-42 to interception, but also in reduced vulnerability after interception, with a minimum of armament required for complete protection.
The limits of penetration of the heavy bomber and the B-42 before interception by fighter planes are indicated above. The penetration limits of the bombers are shown as curved shaded areas running from C to D across the 100-mile block.

The importance of high operation speed on interception by fighters as shown is summarized in the following table:

<table>
<thead>
<tr>
<th></th>
<th>HEAVY BOMBER</th>
<th>DOUGLAS B-42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed of Bomber</td>
<td>390 mph</td>
<td>470 mph</td>
</tr>
<tr>
<td>Speed of Fighter</td>
<td>500 mph</td>
<td>500 mph</td>
</tr>
<tr>
<td>Advance Warning for Fighter Take-off</td>
<td>100 mi.</td>
<td>0 mi.</td>
</tr>
<tr>
<td>Bomber Course to Side of Fighter Base</td>
<td>50 mi.</td>
<td>50 mi.</td>
</tr>
<tr>
<td>Interception Distance from Base</td>
<td>40 mi.</td>
<td>92 mi.</td>
</tr>
<tr>
<td>Time from Fighter Take-off to Interception of Bomber</td>
<td>In front of Base</td>
<td>9 min.</td>
</tr>
<tr>
<td>Additional Penetration Distance of B-42</td>
<td>10 mi.</td>
<td>175 mi.</td>
</tr>
</tbody>
</table>

Thus, the high operational speed of the B-42, approaching fighter speed, permits considerably more penetration toward the target area before interception than is possible with the heavy bomber. It should be noted that the longer interception time required for a stern chase of the B-42 calls for increased fighter range resulting in a larger and more powerful airplane to counteract the B-42 than the heavy bomber.
BOMB LOADING

The ever-increasing pace of modern warfare requires instantaneous servicing of armament installations. Rapid loading of bombs in the B-42 is facilitated by an exceptionally large bomb bay and high tricycle landing gear that provides a maximum of ground clearance. The large 8,000 pound bomb on its carriage may be rolled directly beneath the airplane and into the bomb bay, unhampered by any obstruction.

BUG EYES

Two streamlined transparent "Bug Eyes," constructed of formed Plexiglas and semi-tempered laminated glass panels, permit unobstructed 360-degree vision for both pilot and gunner. This newly developed Douglas design reduces the operators' blind area as well as his vulnerability to enemy attack because armor protection may be closer and more complete.

SLOW-DOWN FEATURE

The reversible pitch propellers provide exceptionally efficient air brakes, permitting a speed reduction from 400 to 200 m.p.h. in eight seconds. This feature, giving such definite speed control to the pilot increases deception during a glide bombing or torpedo run and together with the high maximum speed makes it virtually impossible for enemy aircraft to successfully strike from the rear.
FEATURES

GROUND HEATING

With the engines of the Douglas B-42 completely enclosed within the fuselage, ground heating required by cold weather operations in the various theaters of war is available not only for the engines, but also for related accessories and the crew compartments. The controls for this installation are entirely automatic.

COCKPIT CONTROLS

All cockpit controls have been located in the most advantageous positions, free from obstructions and arranged in groups for ease in operation. A newly designed “dash” type control wheel eliminates the necessity of straddling a control column as in other types of aircraft. All control rods and cables are installed beneath the floor, providing a clean, unobstructed cockpit.

PROPELLER BLOW-OFF

Because the exceptional flight characteristics of the B-42 are centered around the unusual propeller installation, provisions are made for the destruction of this precision equipment should abandonment of the aircraft be necessary over enemy territory. Detonator switches are well guarded to prevent accidental contact, while the destroyer is located in the fuselage tail cone adjacent to the propellers.
LONG-RANGE BOMBING

With a maximum operational range of 5,333 miles, carrying 2,000 pounds of bombs at high speed, the Douglas B-42 equals or betters the long range design load of heavy bombers now in production. Equipped with snap-action bomb doors, no advance visible indication is given to fighter or anti-aircraft opposition that bombs are to be released and speed is maintained during the bombing run.
LONG-RANGE RECONNAISSANCE

Amply protected by its superior defensive armament, speed, and maneuverability, equipped with metrogonic and telephoto cameras, and designed for a range never before successfully attained in reconnaissance, the Douglas B-42 can be a dominating factor in procuring vital military information over long distances.
TORPEDO ATTACK

The feature of deception in speed, available from the extreme slow-down ability of its "pusher" type propeller installation, coupled with the ability to house completely two 2000-pound torpedoes side-by-side in an expansive bomb bay and with high speed maneuverability in eluding anti-aircraft fire at the completion of a torpedo run, make the Douglas B-42 a more formidable weapon than any heretofore developed.
ATTACK

Overwhelming firepower developed by any one of its three potential armament installations, and a bomb bay capable of carrying 8,000 pounds of high explosives, combined with its ability to strike fast and decisively at an adversary, produce a devastating weapon for any desired type of mission—the Douglas B-42.