STANDARD AIRCRAFT CHARACTERISTICS

HSL-1

BELL

1 SEPTEMBER 1952
POWER PLANT

No. & Model..........(1) R-2800-50
Mfr............Pratt and Whitney
Supercharger.....1 Stage, 1 speed
Rotor Gear Ratio.....0.117

RATINGS

Bhp  Rpm  Alt
T.O.  1,900  2,600  7,000'
Normal  1,900  2,600  7,000'

Spec. No. H-8143

MISSION AND DESCRIPTION

The primary mission of the HSL-1 helicopter is to detect, identify, track, and/or destroy enemy submarines in ocean areas. It may also be used for ship-to-ship, ship-to-shore liaison and general utility. This helicopter is designed for operation from shipboard under all weather conditions.

As a search helicopter, it will be capable of carrying electronic, radio and safety equipment, with a crew of three on flights which involve repeated hovering stops a few feet above the water in order to detect the presence of submarines.

As an attack helicopter it will be capable of carrying a mine or similar weapon weighing approximately 500 lbs, with a crew of two, plus electronic, radio, and safety equipment.

Design features include rotor blades of all metal bonded construction, gyroscopic action stabilizer bars, rotor blade restrainers, hydraulically operated servo controls, windshield anti-icing, and rotor blade de-icing.

DEVELOPMENT

First flight ——— January 1953
Service use ——— August 1953

WEIGHTS

Loadings  Lbs.  L.P.
Empty........12,450
Basic........12,613
Design........14,118
Max.T.O. 20,000
Max.Land 30,000

All weights are estimated.

FUEL AND OIL

Gal. No. Tanks Location
450 1 Fuselage
Fuel Grade.....115-145
Fuel Spec.....MIL-F-5572

OIL

Capacity (gals).....30
Grade.............1100
Spec.............MIL-O-6082

ELECTRONICS

Main Trans-Receiver, AN/ARC-2
UHF Trans-Receiver, AN/ARC-27
Intercomm........AN/AI-1A
Radio Altimeter.....AN/AF-1
Homing Receiver.....AN/ARR-2A
Receiver........R-114
IFF.............AN/APX-6
Sonar...........AN/AQS-1A

DIMENSIONS

Disc Area.....3,830 sq. ft.
Rotor Dia.....51' - 6"
Length**.....39' - 11"
Height.........14' - 6"
Tread........11' - 8"
Stabilizer Area...25 sq. ft.
Blade Area....128 sq. ft.
Tip Area......32 sq. ft.

* Projected
** Blades folded
## PERFORMANCE SUMMARY

<table>
<thead>
<tr>
<th>TAKE-OFF LOADING CONDITION</th>
<th>(1) ASW SEARCH&lt;br&gt;Crew - 3&lt;br&gt;An/AQS-4 Sonar</th>
<th>(2) ASW ATTACK&lt;br&gt;Crew - 8&lt;br&gt;An/AQS-4 Sonar 1 Mt., 24 Mines</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAKE-OFF WEIGHT</td>
<td>lb.</td>
<td>15,963</td>
</tr>
<tr>
<td>Fuel</td>
<td>lb.</td>
<td>2,535</td>
</tr>
<tr>
<td>Payload</td>
<td>lb.</td>
<td>--</td>
</tr>
<tr>
<td>Disc loading</td>
<td>lb. / sq. ft.</td>
<td>4.2</td>
</tr>
<tr>
<td>Vertical rate of climb at S/L (A/B) / fps.</td>
<td>1,140/1,140</td>
<td>1,140/1,140</td>
</tr>
<tr>
<td>Absolute hovering ceiling (A/B) / ft.</td>
<td>9,900</td>
<td>9,900</td>
</tr>
<tr>
<td>Max. rate of climb at S/L (A) / fps.</td>
<td>1,640</td>
<td>1,620</td>
</tr>
<tr>
<td>Service ceiling (100 fps) (A) / ft.</td>
<td>15,500</td>
<td>15,000</td>
</tr>
<tr>
<td>Speed at S/L (A) / km.</td>
<td>135</td>
<td>135</td>
</tr>
<tr>
<td>Max. speed/altitude (A) / km. / fps.</td>
<td>135/5,5</td>
<td>135/5,5</td>
</tr>
<tr>
<td>Combat range</td>
<td>n.m.</td>
<td>405</td>
</tr>
<tr>
<td>Average cruising speed</td>
<td>km.</td>
<td>98</td>
</tr>
<tr>
<td>Cruising altitude (A) / ft.</td>
<td>1,500</td>
<td>1,500</td>
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<tr>
<td>Combat radius</td>
<td>n.m.</td>
<td>--</td>
</tr>
<tr>
<td>Average cruising speed</td>
<td>km.</td>
<td>--</td>
</tr>
<tr>
<td>Search endurance sea level.</td>
<td>3,1</td>
<td>--</td>
</tr>
</tbody>
</table>

## NOTES

(A) Normal power  
(B) Take-off power

Performance is based on calculations

Range, endurance, and radius are based on optimum RPM, engine specification fuel consumption increased by 5%.

Sonar gear weighing 603 pounds considered part of weight empty.
NOTES

ASW SEARCH ENDURANCE PROBLEM

WARM-UP AND TAKE-OFF: 5 min. at NRP
CRUISE: At 100 knots 40% of time at sea level
HOVER: Out of ground effect 60% of time at sea level
RESERVE: 10% of initial fuel load

SEARCH ENDURANCE = CRUISE TIME + HOVER TIME

ASW COMBAT RADIUS PROBLEM

WARM-UP AND TAKE-OFF: 5 min. at NRP
CRUISE TO TARGET: At 100 knots at sea level
DROP MINE
RETURN CRUISE: At speed for maximum range at sea level
RESERVE: 10% of initial fuel load.

COMBAT RADIUS = CRUISE DISTANCE FROM START OF CRUISE TO TARGET