Standard Aircraft Characteristics

NAVY MODEL
CH-46D/UH-46D/HH-46D
AIRCRAFT

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PUBLISHED BY THE DIRECTION OF THE COMMANDER
OF THE NAVAL AIR SYSTEMS COMMAND

AUGUST 1985
NAVAIR 00-110 AH46-2

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( X ) SUPERCEDES IN ITS ENTIRETY

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STANDARD AIRCRAFT CHARACTERISTICS

CH-46D/UH-46D/HH-46D
"SEA KNIGHT"

BOEING-VERTOL

AUGUST 1985
Disc Area (Swept) ... 3925 sq ft
Blade Area (each) ... 37.50 sq ft
Blade Area (total) ... 225 sq ft

Engine/Rotor Gear Ratio ... 73.772:1
Airfoil Section ... NASA 0012 (Mod)
Blade Chord ... 18 inches

FUEL

OIL
## POWER PLANT

<table>
<thead>
<tr>
<th>No. &amp; Model</th>
<th>(2) T58-GE-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>General Electric</td>
</tr>
<tr>
<td>Rotor Gear Ratio</td>
<td>73.72:1</td>
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</tbody>
</table>

## MISSION AND DESCRIPTION

The primary mission of this aircraft is to rapidly disperse combat troops, support equipment and supplies from amphibious assault landing ships and established airfields to advanced bases in undeveloped areas with limited maintenance and logistic support under all-weather conditions, day or night.

The Sea Knight is a twin turbine, tandem-rotor helicopter with an all-metal fuselage of semi-monocoque stressed skin construction. The engines drive two three-blade fully articulated partially overlapping rotors, which are synchronized by positive gearing and an interconnecting drive shaft. The all-metal rotor blades are interchangeable and have provisions for electrically heated deicing boots. Automatic blade folding within 60 seconds under 45 knot wind conditions is another feature included in the rotor system design.

By sealing the fuselage during assembly, inherent flotation capability is achieved in the normal configuration for emergency water landings and take-offs. A rear loading ramp provides access to the unobstructed payload space for rapid straight-in loading and unloading of personnel, supplies, equipment and vehicles. The ramp is capable of being operated both on the ground and in flight.

For instrument flight capabilities, a dual Stability Augmentation System (SAS) is included as standard equipment. It is a normal and integral part of the control system, and provides positive dynamic stability about the yaw, pitch and roll axes throughout the entire speed range from hover to maximum forward speed.

Data shown are for CH-46D. UH-46D and HH-46D are similar except for small weight differences.

## DEVELOPMENT

FIRST FLIGHT: Sept. 1965
SERVICE USE: Oct. 1966

## DIMENSIONS

- **Disc Area:** 408.6 sq. ft (swep)
- **No. of Blades:** 6 (2 rotors)
- **Total Blade Area:** 239 sq. ft.
- **Rotor Diameter:** 51 ft.
- **Length (Blades Folded):** 45'-7.5"
- **Length (Blades Turning):** 81'4"
- **Height (Blades Folded):** 16'-8"
- **Height (Blades Turning):** 16'-11.6"
- **Width (Blades Folded):** 14'-9"

*Projected* 3614

## WEIGHS

<table>
<thead>
<tr>
<th></th>
<th>Lbs.</th>
<th>L.F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty</td>
<td>13649</td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>13695</td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>20800</td>
<td>2.50</td>
</tr>
<tr>
<td>Max T. O.</td>
<td>23000</td>
<td>2.26</td>
</tr>
<tr>
<td>Max Landing</td>
<td>23000</td>
<td></td>
</tr>
</tbody>
</table>

## FUEL AND OIL

**FUEL**

<table>
<thead>
<tr>
<th>Tanks</th>
<th>Gals</th>
<th>Left and Right Stub Wings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>190</td>
<td></td>
</tr>
</tbody>
</table>

**Fuel Grade**


**Fuel Space**

- MIL-T-5624L/83133A

**OIL**

<table>
<thead>
<tr>
<th>Capacity (Gals)</th>
<th>Engine</th>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>14.4</td>
<td></td>
</tr>
</tbody>
</table>

**OIL Spec**

- MIL-L-23699/7808

## ACCOMMODATIONS

- **Crew:** 3
- **Troops (Combat Equipped):** 23
- **Litters:** 13
- **Attendants:** 2
- **Cargo Compartments:** 1023 cu. ft.
  - **(Including Ramp Area):**
    - Dimensions: 6' x 6' x 10'2"
    - External Cargo Hook Capacity: 10,000 lbs
- **Floor Area:** 180 sq ft
  - **(Including Ramp):**
- **Floor Limit Loads:**
  - Roller Beams for 3000 lb
  - Pallet 40" x 60"
  - Wheel Load (3) psi Tire Pressure
  - Remaining Floor Area: 300 lb/sq ft

**ORDNANCE**

- Provisions for two (2)
  - 50 Cal. Guns

**SERVICE**

- CH-46D/UH-46D/HH-46D

**AUGUST 1985**
## PERFORMANCE SUMMARY

<table>
<thead>
<tr>
<th>TAKE-OFF WEIGHT</th>
<th>ASSAULT MISSION</th>
<th>EXTERNAL CARGO DELIVERY (A)</th>
<th>INTRAREGIONAL MISSION (A)</th>
<th>PERRY MISSION (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lb.</td>
<td>21599</td>
<td>23000</td>
<td>17279</td>
<td>22827</td>
</tr>
<tr>
<td>Fuel internal/external (gal)</td>
<td>2584/0</td>
<td>2584/0</td>
<td>2584/0</td>
<td>2584/4956</td>
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<tr>
<td>Payload</td>
<td>4320</td>
<td>6021</td>
<td>6839</td>
<td>0</td>
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<tr>
<td>Disc loading (C)</td>
<td>5.98</td>
<td>6.36</td>
<td>4.78</td>
<td>6.32</td>
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<tr>
<td>Vertical rate of climb at S.L. (D)</td>
<td>570</td>
<td>40</td>
<td>2125</td>
<td>100</td>
</tr>
<tr>
<td>Absolute hovering ceiling (OGC) (E)</td>
<td>46000</td>
<td>400</td>
<td>11700</td>
<td>1200</td>
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<tr>
<td>Max. rate of climb at S.L. (E)</td>
<td>1370</td>
<td>1320</td>
<td>2380</td>
<td>1350</td>
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<tr>
<td>Service ceiling (E) (F)</td>
<td>12500</td>
<td>10000</td>
<td>14000</td>
<td>10250</td>
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<tr>
<td>Speed at S.L. (E)</td>
<td>135</td>
<td>129</td>
<td>140</td>
<td>130</td>
</tr>
<tr>
<td>Max speed/altitude (E)</td>
<td>135/SL</td>
<td>129/SL</td>
<td>144/6000</td>
<td>130/SL</td>
</tr>
<tr>
<td>O.E.I. Service ceiling (G)</td>
<td>--</td>
<td>--</td>
<td>92/30</td>
<td>--</td>
</tr>
<tr>
<td>Min. speed (O.E.I.) (E)</td>
<td>--</td>
<td>--</td>
<td>50</td>
<td>--</td>
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<tr>
<td>Max. speed (O.E.I.) (E)</td>
<td>--</td>
<td>--</td>
<td>101</td>
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<tr>
<td>Combat radius n. mi.</td>
<td>88</td>
<td>78</td>
<td>78</td>
<td>--</td>
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<tr>
<td>Mission time hrs.</td>
<td>1.39</td>
<td>1.58</td>
<td>1.39</td>
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<tr>
<td>Average cruising speed kn.</td>
<td>135</td>
<td>111</td>
<td>111</td>
<td>--</td>
</tr>
<tr>
<td>Cruising altitude ft.</td>
<td>135</td>
<td>SL</td>
<td>SL</td>
<td>--</td>
</tr>
<tr>
<td>Range n. mi.</td>
<td>188</td>
<td>158</td>
<td>210</td>
<td>737</td>
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<tr>
<td>Average cruising speed kn.</td>
<td>130</td>
<td>100</td>
<td>126</td>
<td>131</td>
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<tr>
<td>Cruising altitude ft.</td>
<td>5L</td>
<td>5L</td>
<td>5L</td>
<td>6000-10000</td>
</tr>
<tr>
<td>Maximum endurance hrs.</td>
<td>1.94</td>
<td>1.72</td>
<td>2.16</td>
<td>7.03</td>
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<tr>
<td>Endurance speed kn.</td>
<td>70</td>
<td>70</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Endurance altitude ft.</td>
<td>5L</td>
<td>5L</td>
<td>6000-10000</td>
<td>--</td>
</tr>
</tbody>
</table>

### NOTES

(A) 26 sq. ft. external loads.
(B) With three internal auxiliary tanks (243 gal); Fourth crewman not carried.
(C) Disc loading based on projected area of 3614 sq. ft.
(D) At military power except when limited by 2600 hp transmission limit.
(E) At normal power.
(F) Limited by aircraft operating envelope.
(G) All data for standard day except as noted.
(H) Data base flight test/NATO PS.
(I) Mission time excludes engine start and takeoff allowance and reserve.
NOTES
MISSION DEFINITIONS

ASSAULT MISSION
1. Engine start and takeoff: 5 min MCP at sea level.
2. Cruise out at MCP at sea level.
3. Land and unload troops.
4. Takeoff: 5 min MCP at sea level.
5. Cruise back at MCP at sea level.
6. Land with fuel for 20 min at best range speed at sea level.

EXTERNAL CARGO DELIVERY
1. Engine start and takeoff: 5 min MCP at sea level.
2. Cruise out with 26 sq. ft. external load at speed for maximum range at sea level.
3. Hover 10 min at sea level OGE.
4. Deposit load.
5. Cruise back at speed for maximum range at sea level.
6. Land with fuel for 20 min at speed for maximum range at sea level.

RETRIEVAL MISSION
1. Engine start and takeoff: 5 min MCP at sea level.
2. Cruise out at speed for best range at sea level.
3. Hover 10 min at sea level OGE.
4. Pick up maximum external payload.
5. Cruise back at speed for maximum range at sea level.
6. Hover 5 min at sea level with payload OGE.
7. Land with fuel for 20 min at speed for maximum range at sea level with load.

FERRY MISSION
1. Engine start and takeoff: 5 min MCP at sea level Standard Day
2. Cruise climb at 10,000 ft.
3. Cruise out at speed for maximum range.
4. Land with 10% initial fuel.

RANGE MISSION
1. Engine start and takeoff: 5 min MCP at sea level.
2. Cruise out at speed for best range.
3. Land with fuel for 20 min at best range speed at sea level.

ENDURANCE MISSION
1. Engine start and takeoff: 5 min MCP at sea level.
2. Climb to loiter altitude.
3. Loiter at speed for minimum fuel flow.
4. Land with fuel for 20 min at best range speed at sea level.

LOADING CONDITION COLUMN NUMBER