



# STANDARD AIRCRAFT CHARACTERISTICS

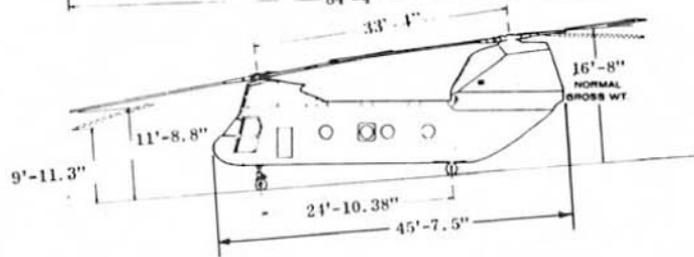
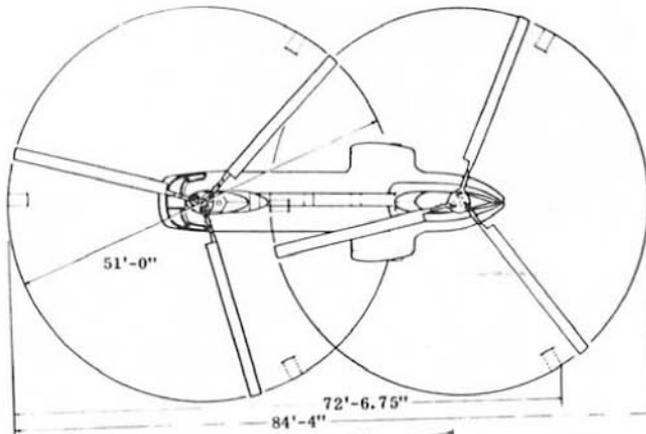
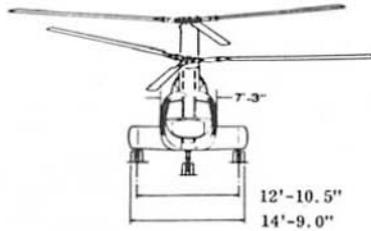
CH-46D "SEA KNIGHT"

BOEING-VERTOL

BUREAU OF NAVAL WEAPONS  
NAVY DEPARTMENT

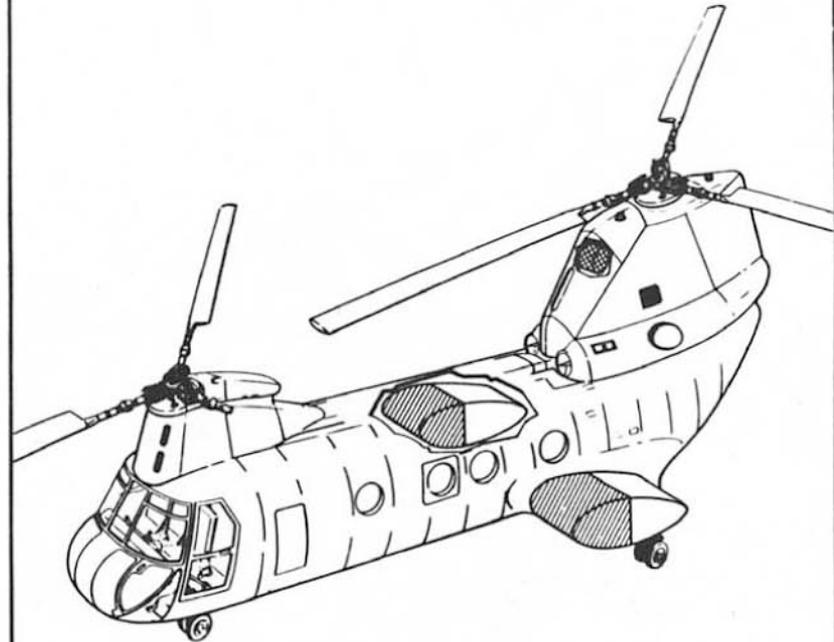
Disc Area (Swept) . . . . . 4085.6 sq ft  
Blade Area (each) . . . . . 39.84 sq ft  
Blade Area (total) . . . . . 239.0 sq ft

Engine/Rotor Gear Ratio . . . . . 73.772:1  
Ames Modified Droop Nose . . . . . 0012 (Mod)  
Blade Chord . . . . . 18.75 inches



DESCRIPTIVE ARRANGEMENT

BUREAU OF NAVAL WEAPONS  
NAVY DEPARTMENT



FUEL



OIL



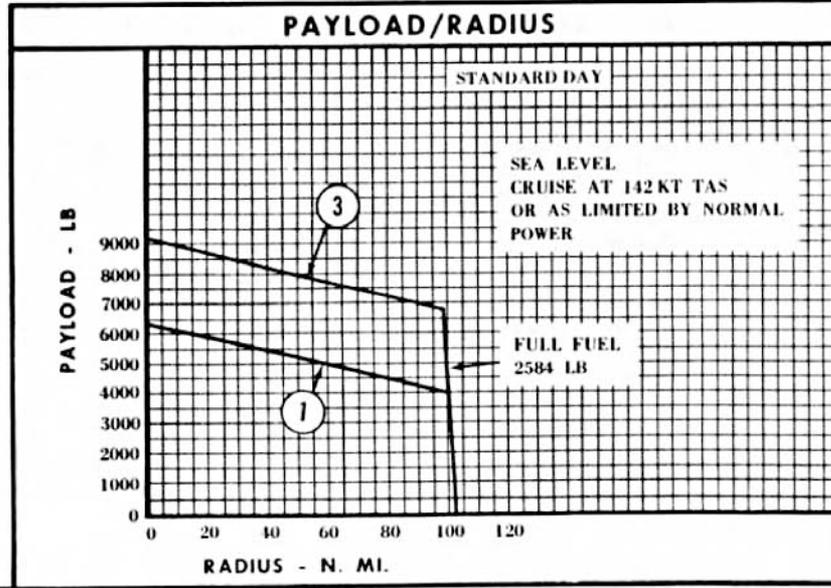
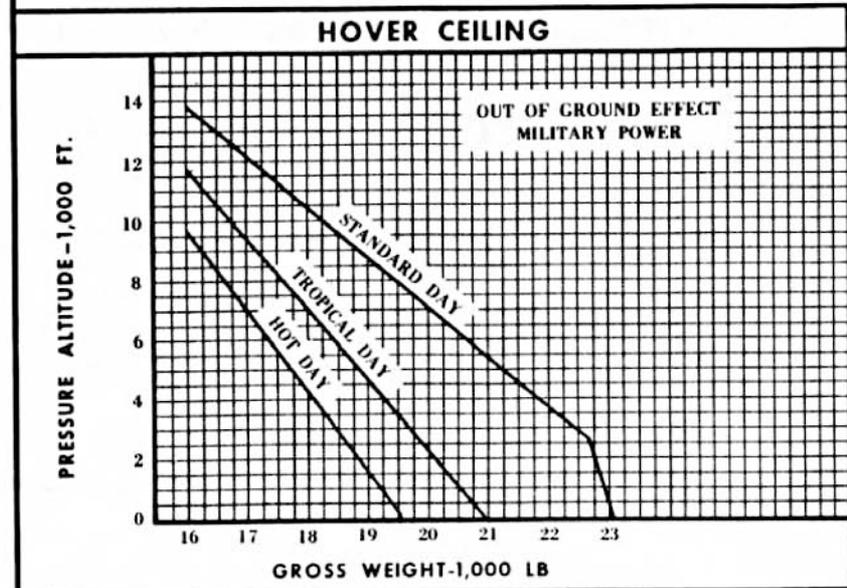
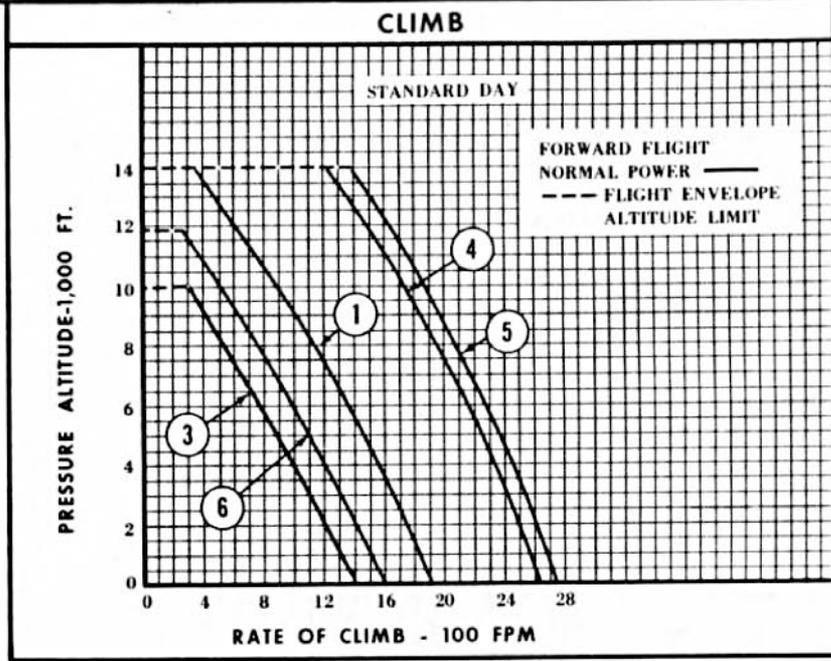
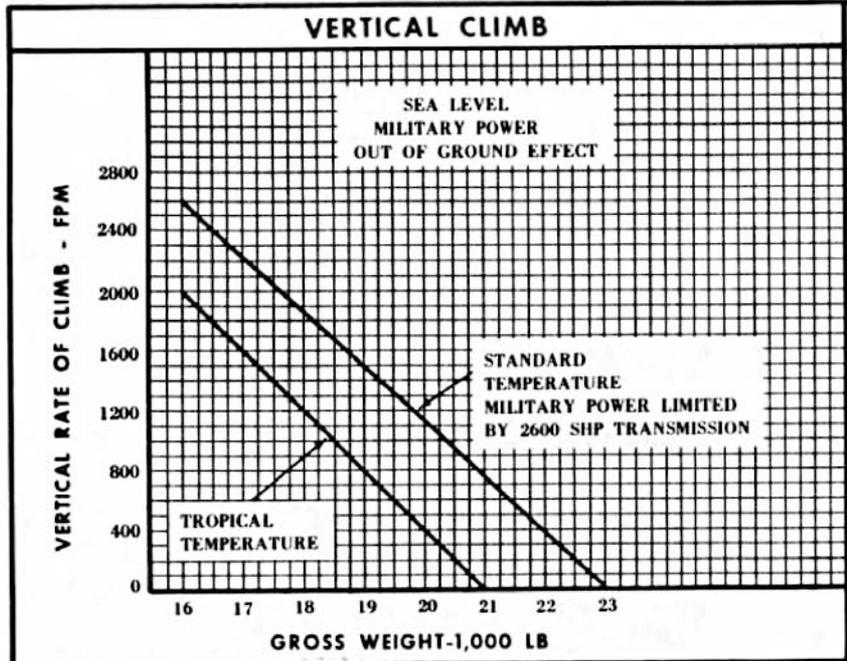
ARMAMENT AND TANKAGE

POWER PLANT	MISSION AND DESCRIPTION	WEIGHTS																												
<p>No. &amp; Model (2) T58-GE-10                      Manufacturer General Electric Co.                      Rotor Gear Ratio 73.772:1</p> <p><b>RATINGS</b></p> <p>SHP/RPM/ALT</p> <p>Military 1400/19500/SSL                      Normal 1250/19500/SSL</p> <p>Engine Spec. No. E-1081</p> <p>16 August 1963</p>	<p>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.</p> <p>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-bladed fully articulated partially overlapping rotors, which are synchronized by positive gearing and an interconnecting drive shaft. The all-metal steel-spar 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.</p>	<table border="0"> <tr> <td></td> <td>Lbs.</td> <td>L. F.</td> </tr> <tr> <td>Empty:</td> <td>13112</td> <td></td> </tr> <tr> <td>Basic:</td> <td>13134</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> </table> <p>Weights are actual.</p>		Lbs.	L. F.	Empty:	13112		Basic:	13134		Design:	20800	2.50	Max. T.O.:	23000	2.26	Max. Landing:	23000											
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<p><b>ELECTRONICS</b></p>	<p>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.</p> <p>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.</p>	<p><b>FUEL AND OIL</b></p> <table border="0"> <tr> <td>Tanks</td> <td>Gals</td> <td></td> </tr> <tr> <td>2</td> <td>190</td> <td></td> </tr> </table> <p>Left and Right Stub Wings</p> <p>Fuel Grade JP-4 or JP-5                      Fuel Spec Mil-F-5624C</p> <p><b>OIL</b></p> <table border="0"> <tr> <td>Capacity (Gals)</td> <td></td> </tr> <tr> <td>Engine</td> <td>2.1</td> </tr> <tr> <td>Transmission</td> <td>14.4</td> </tr> <tr> <td>Oil Spec</td> <td>Mil-L-23699</td> </tr> </table>	Tanks	Gals		2	190		Capacity (Gals)		Engine	2.1	Transmission	14.4	Oil Spec	Mil-L-23699														
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<p>Radio Set (UHF) AN/ARC-51A                      Radar Ident. Set AN/APX-6B                      ICS AN/AIC-14                      ADF AN/ARN-59                      TACAN AN/ARN-52                      Radio Finder Group AN/ARN-25A                      Radar Altimeter AN/APN-171                      Coder AN/APA-89                      FM Liaison AN/ARC-54                      Compass MA-1                      Attitude Gyro MD-1                      "X" Band Beacon AN/APN-154                      HF Radio AN/ARC-94</p> <p>July 1968                      SCNS (MIAS) AN/AS-2-105</p>	<p><b>DEVELOPMENT</b></p> <p>FIRST FLIGHT . . . . . Sept. 1965                      SERVICE USE . . . . . Oct. 1966</p>	<p><b>ORDNANCE</b></p> <p>Cargo Compartment 1023 cu ft (including Ramp Area)                      Dimensions 6' x 6' x 24' 2"                      External Cargo Hook Capacity 10,000 lbs                      Floor Area 180 sq ft (incl. Ramp)                      Floor Limit Loads                      Roller Beams for 3000 lb                      Pallet 40" x 48"                      Wheel Tread 1000 Dead Weight                      Wheel Load @33 psi Tire Pressure                      Remaining Floor Area 300 lb/sq ft</p>																												
<p><b>ORDNANCE</b></p>	<p><b>DIMENSIONS</b></p> <table border="0"> <tr> <td>Disc Area:</td> <td>4085.6 sq ft (swept)</td> </tr> <tr> <td>No. of Blades:</td> <td>6 (2 rotors)</td> </tr> <tr> <td>Total Blade Area:</td> <td>239 sq ft</td> </tr> <tr> <td>Rotor Diameter:</td> <td>51 ft</td> </tr> <tr> <td>Length (Blades Folded):</td> <td>45'-7.5"</td> </tr> <tr> <td>Length (Blades Turning):</td> <td>81'-1"</td> </tr> <tr> <td>Height (Blades Folded):</td> <td>16'-8"</td> </tr> <tr> <td>Height (Blades Turning):</td> <td>16'-11.6"</td> </tr> <tr> <td>Width (Blades Folded):</td> <td>14'-9"</td> </tr> </table>	Disc Area:	4085.6 sq ft (swept)	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'-1"	Height (Blades Folded):	16'-8"	Height (Blades Turning):	16'-11.6"	Width (Blades Folded):	14'-9"	<p><b>ACCOMMODATIONS</b></p> <table border="0"> <tr> <td>Crew</td> <td>3</td> </tr> <tr> <td>Troops (Combat Equipped)</td> <td>17</td> </tr> <tr> <td>or</td> <td></td> </tr> <tr> <td>Litters</td> <td>15</td> </tr> <tr> <td>Attendants</td> <td>2</td> </tr> </table>	Crew	3	Troops (Combat Equipped)	17	or		Litters	15	Attendants	2
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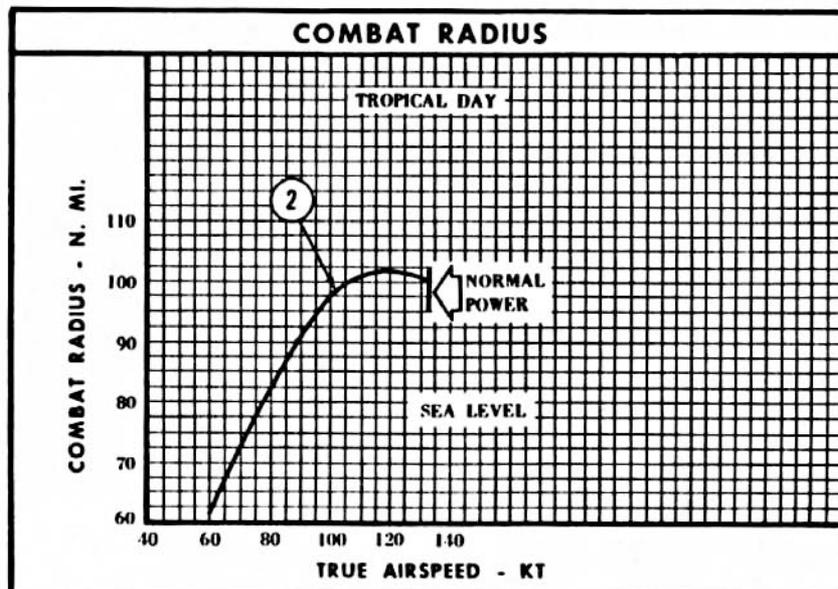
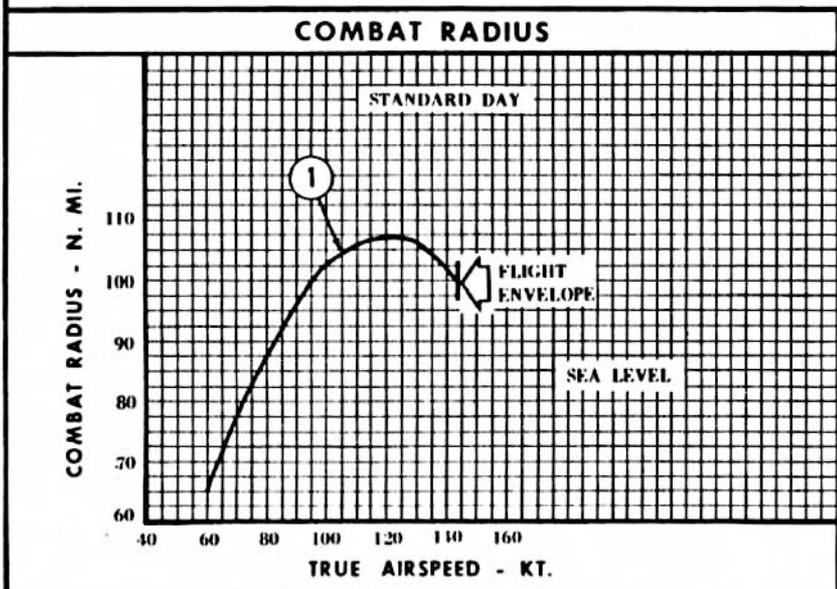
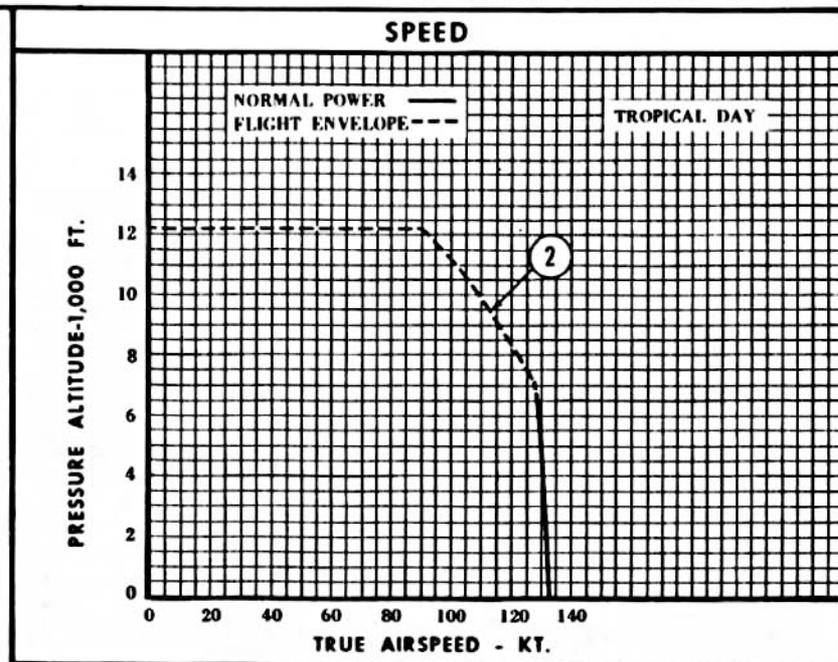
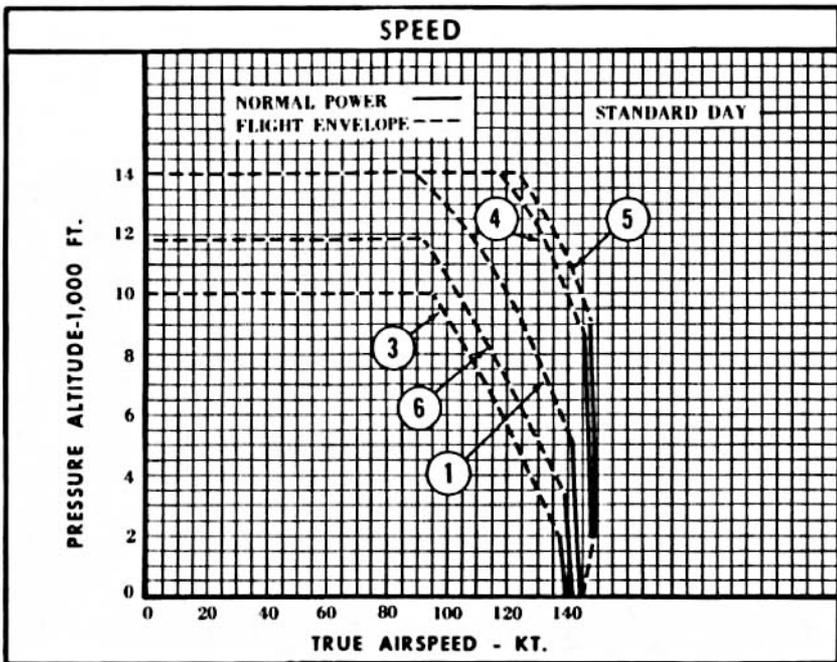
		PERFORMANCE SUMMARY					
TAKEOFF LOADING CONDITION		① DESIGN MISSION (PRIMARY)	② DESIGN MISSION TROPICAL DAY	③ DESIGN MISSION (OVERLOAD WEIGHT)	④ RESCUE MISSION	⑤ RETRIEVAL MISSION (EXTERNAL LOAD)	⑥ FERRY MISSION
TAKEOFF WEIGHT	LB	20284	20141	23000	16792	16304	22056
FUEL	LB	2564	2421	2584	2584	2584	7541
PAYLOAD	LB	4000	4000	6696	2700	7844	—
DISC LOADING	PSF	4.97	4.92	5.63	4.11	3.99	5.40
VERTICAL RATE OF CLIMB @ SL (4)	FPM	1020 (6)	340 (3)	0	2305 (6)	2490 (6)	360 (6)
ABSOLUTE HOVER CEILING (3,4)	FT	8370 (1)	4370 (1)	400	12520	13380	3700
MAX. RATE OF CLIMB @ SL (2)	FPM	1900	1180	1400	2615	2730	1570
SERVICE CEILING	FT	14000 (5)	12350	10000 (5)	14000 (5)	14000 (5)	11700 (5)
SPEED @ SL	KT	144 (2)	133 (2)	139 (2)	144 (7)	144 (7)	141 (2)
MAX. SPEED / ALTITUDE	KT/FT	144/SL (2)	133/SL (2)	139/SL (2)	147/1650 (2)	148/2000 (2)	141/SL (2)
COMBAT RANGE	N. MI.	206	—	—	—	—	774 (10)
AVERAGE CRUISING SPEED	KT	142	—	—	—	—	128
CRUISING ALTITUDE	FT	SL	SL	SL	SL	SL	10000
COMBAT RADIUS	N. MI.	100	100	99	102	91	—
AVERAGE CRUISING SPEED	KT	142	132	141	142	118	—

## NOTES

- (1) TAKEOFF GROSS WEIGHT LESS 40% INITIAL FUEL
- (2) NORMAL RATED POWER
- (3) MILITARY POWER
- (4) OUT-OF-GROUND-EFFECT
- (5) MAXIMUM ALTITUDE FLIGHT ENVELOPE
- (6) TRANSMISSION LIMIT = 2600 SHP @ 100% RPM
- (7) FLIGHT ENVELOPE SPEED,  $V_{II}$
- (8) PERFORMANCE SHOWN FOR STANDARD DAY UNLESS NOTED OTHERWISE
- (9) EXTERNAL CARGO EQUIVALENT DRAG + 26 FT<sup>2</sup>, 23000 LB GROSS WEIGHT AT RETRIEVAL SITE
- (10) WITH THREE CURRENTLY AVAILABLE KC 97AUXILIARY TANKS (729 GAL); INSTALLATION OF BLADDER TYPE TANKS (932 GAL) WILL PROVIDE 910 NMI RANGE CAPABILITY.



○ LOADING CONDITION COLUMN NUMBER



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## NOTES

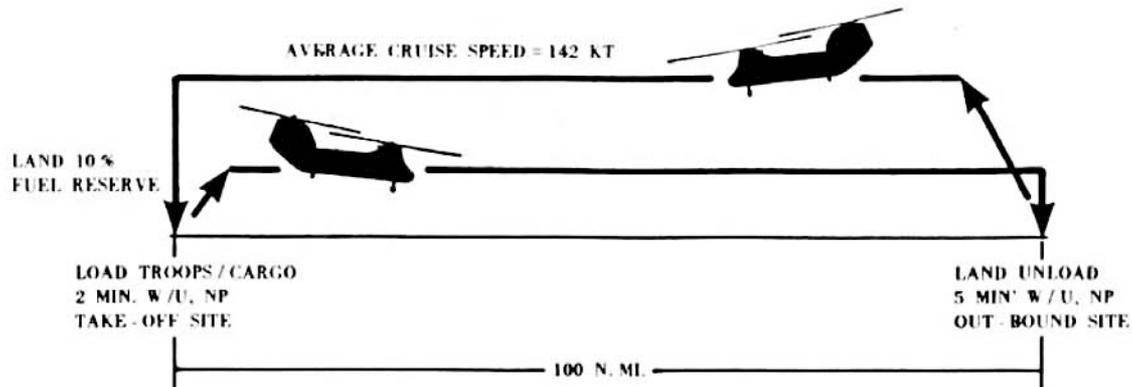
## MISSION DEFINITIONS

- (1) PRIMARY DESIGN MISSION (GW = 20284 LB)
1. WARMUP 7 MINUTES @ NRP (ALLOWS FOR WARMUP AT REMOTE BASE).
  2. TAKEOFF AND CRUISE OUT 100 N. MI. AT 142 KT AT SEA LEVEL.
  3. LAND AND UNLOAD CARGO OR TROOPS.
  4. TAKEOFF, CRUISE IN 100 N. MI. AT 142 KT AT SEA LEVEL.
  5. LAND WITH 10% OF INITIAL FUEL IN RESERVE.
- (2) DESIGN MISSION (GW = 20141 LB) USE TROPICAL DAY
1. WARMUP 7 MINUTES @ NRP (ALLOWS FOR WARMUP AT REMOTE BASE).
  2. TAKEOFF, CRUISE OUT 100 N. MI. AT 132 KT AT SEA LEVEL.
  3. LAND AND UNLOAD CARGO OR TROOPS.
  4. TAKEOFF, CRUISE IN 100 N. MI. AT 132 KT AT SEA LEVEL.
  5. LAND WITH 10% OF INITIAL FUEL IN RESERVE.
- (3) DESIGN MISSION (OVERLOAD GW = 23000 LB)
1. WARMUP 7 MINUTES @ NRP (ALLOWS FOR WARMUP AT REMOTE BASE).
  2. TAKEOFF, CRUISE OUT 99 N. MI. AT 140 KT AT SEA LEVEL.
  3. LAND AND UNLOAD CARGO OR TROOPS.
  4. TAKEOFF, CRUISE IN 99 N. MI. AT 142 KT AT SEA LEVEL.
  5. LAND WITH 10% OF INITIAL FUEL IN RESERVE.
- (4) RESCUE MISSION (GW = 16792 LB)
1. WARMUP 7 MINUTES @ NRP (ALLOWS FOR WARMUP AT REMOTE BASE).
  2. TAKEOFF CRUISE OUT 102 N. MI. AT 142 KT AT SEA LEVEL.
  3. LAND AND PICK UP 15 LITTER PATIENTS.
  4. TAKEOFF CRUISE IN 102 N. MI. AT 142 KT AT SEA LEVEL.
  5. LAND WITH 10% OF INITIAL FUEL IN RESERVE.
- (5) RETRIEVAL MISSION (GW = 16304 LB)
1. WARMUP 7 MINUTES @ NRP (ALLOWS FOR WARMUP AT REMOTE BASE).
  2. TAKEOFF, CRUISE OUT 91 N. MI. AT NRP/V<sub>II</sub>.
  3. LAND, PICK UP PAYLOAD (EXTERNAL).
  4. CRUISE IN AT 100 KT.
  5. LAND WITH 10% FUEL IN RESERVE.
- (6) FERRY MISSION (GW = 22056 LB)
1. WARMUP 2 MINUTES AT NRP.
  2. TAKEOFF, CLIMB TO 8000 FT. AT BEST CLIMB SPEED.
  3. CRUISE-CLIMB FROM 8000 FT. TO 10000 FT. AT 116 KT (AVERAGE CRUISE SPEED).
  4. CRUISE OUT AT 10000 FT. AT 127 KT (AVERAGE CRUISE SPEED).
  5. LAND WITH 10% INITIAL FUEL IN RESERVE.

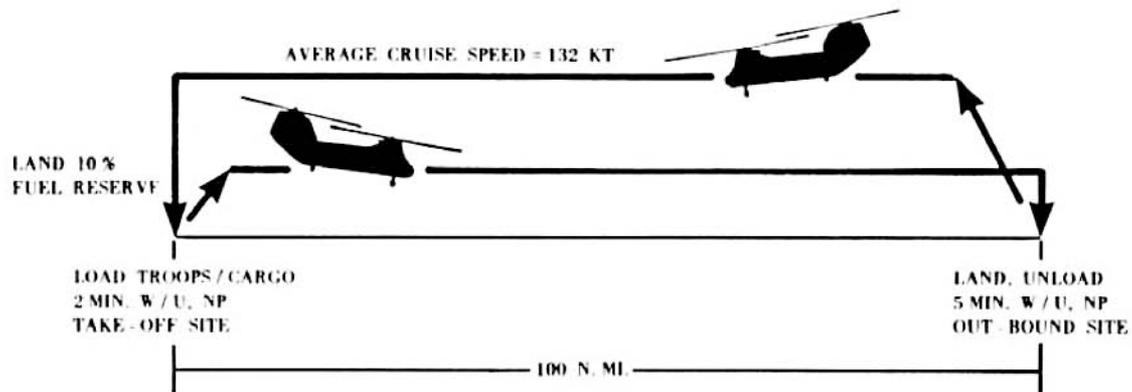
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## MISSION PROFILE

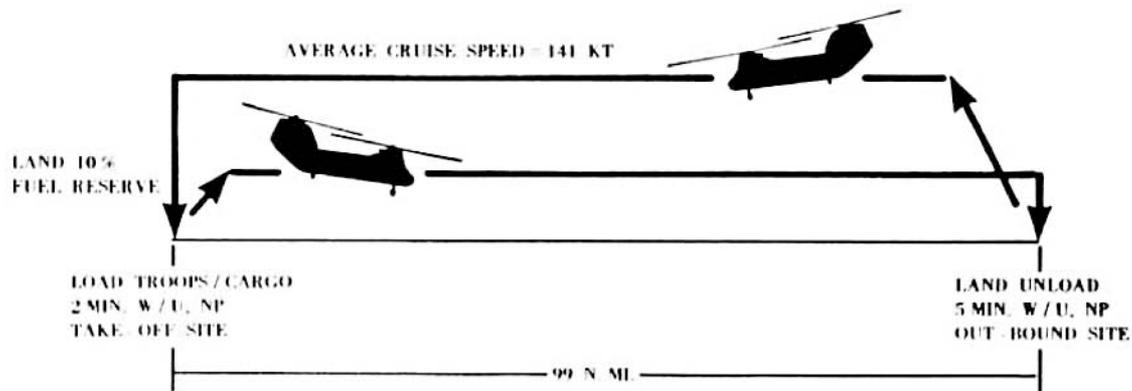
① DESIGN MISSION TO GW = 20284 LB  
SEA LEVEL.



② DESIGN MISSION TO GW = 20141 LB  
SEA LEVEL / TROPICAL DAY

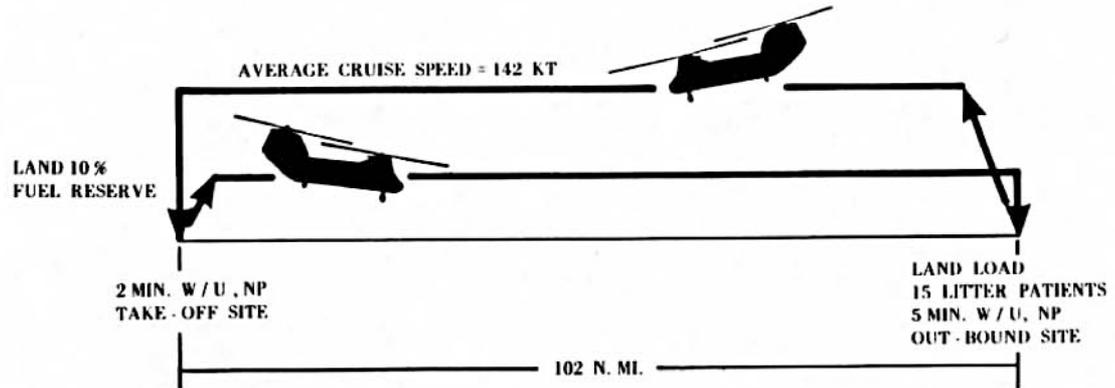


③ DESIGN MISSION TO GW = 23000 LB  
(OVERLOAD)  
SEA LEVEL.

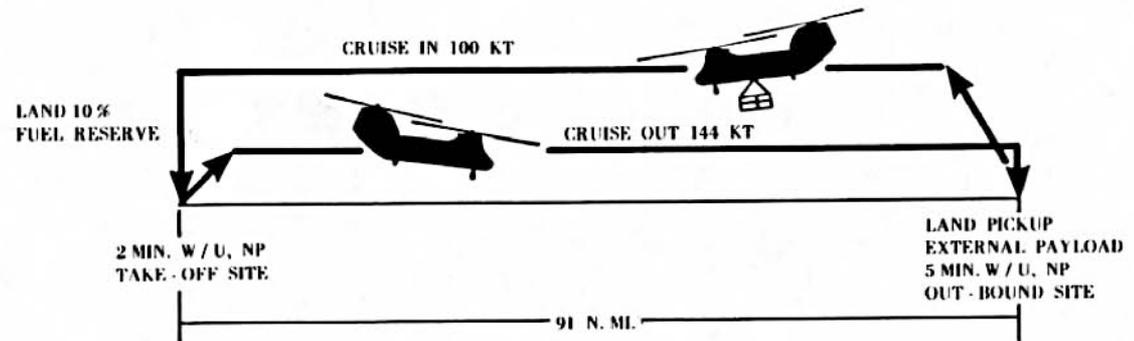


# MISSION PROFILE

④ RESCUE MISSION GW = 16792 LB  
SEA LEVEL



⑤ RETRIEVAL MISSION GW = 16304 LB  
SEA LEVEL  
EXTERNAL PAYLOAD  
EQUIVALENT DRAG 26 FT.<sup>2</sup>



⑥ FERRY MISSION GW = 22056 LB  
OPTIMUM ALTITUDE

