

STANDARD AIRCRAFT CHARACTERISTICS

CH-53E SUPER STALLION

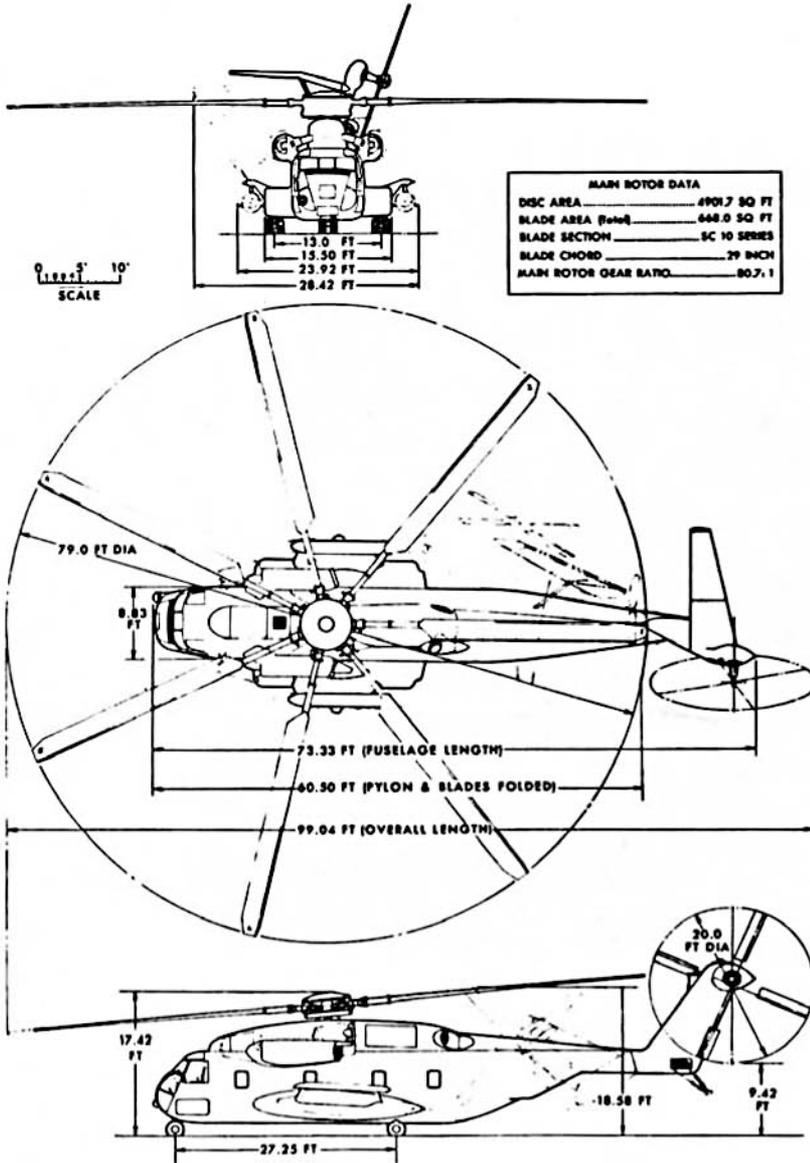
SIKORSKY AIRCRAFT

NOTE:

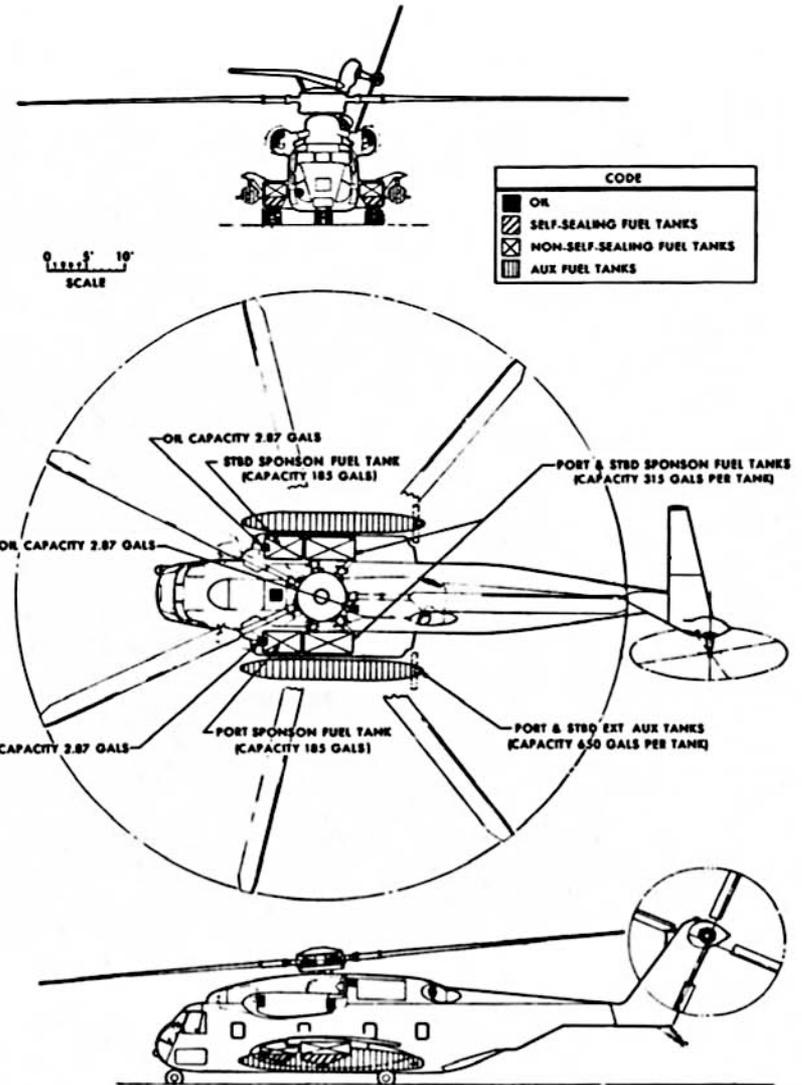
ALL INQUIRES CONCERNING DATA
IN THIS CHART SHOULD BE DIRECTED
TO NAVAIR, CODE 53012

NAVAL AIR SYSTEMS COMMAND
NAVY DEPARTMENT

NAVAL AIR SYSTEMS COMMAND
NAVY DEPARTMENT



DESCRIPTIVE ARRANGEMENT



ARMAMENT AND TANKAGE

POWER PLANT	MISSION AND DESCRIPTION	WEIGHTS																																																
<p>No. And Model: (3) T64-GE-415 Manufacturer: General Electric Engine Spec. No: E1190A (Apr.1,1973) Type: Axial Length: 78.8 Inches Diameter: 23.8 Inches Gear Ratio (Eng/Rotor): 79.8 to 1 See note performance summary page for transmission ratings.</p> <p style="text-align: center;">RATINGS</p> <table border="1" data-bbox="112 406 548 505"> <thead> <tr> <th>S.L. STATIC</th> <th>SHP</th> <th>RPM</th> <th>MIL.</th> </tr> </thead> <tbody> <tr> <td>Maximum</td> <td>4380</td> <td>14280</td> <td>10</td> </tr> <tr> <td>Intermediate</td> <td>4145</td> <td>14280</td> <td>30</td> </tr> <tr> <td>Max. Cont.</td> <td>3696</td> <td>14280</td> <td>Cont.</td> </tr> </tbody> </table>	S.L. STATIC	SHP	RPM	MIL.	Maximum	4380	14280	10	Intermediate	4145	14280	30	Max. Cont.	3696	14280	Cont.	<p>The CH-53E has the dual role of being able to perform high speed transport and heavy lift type missions.</p> <p>The CH-53E helicopter is derived from H-53D helicopters currently in service. Structural modifications have been made to the airframe to incorporate the 79 foot diameter main rotor, a third engine, larger sponsons, and a canted tail rotor. Other features include main rotor and tail pylon folding, a hydraulically operated rear loading ramp door for wheeled vehicles and pallet loads, emergency water alighting capabilities, and BIM (R) to reduce blade maintenance and assure mission reliability. The three T64-GE-415 engines are updated revisions of the engines currently used on production RH-53D helicopters. The aircraft is equipped with Engine Air Particle Separators (EAPS) and a refueling probe.</p>	<table border="1" data-bbox="1367 181 1800 381"> <thead> <tr> <th>LOADING</th> <th>POUNDS</th> <th>L.F.*</th> </tr> </thead> <tbody> <tr> <td>EMPTY</td> <td>32876</td> <td></td> </tr> <tr> <td>BASIC</td> <td>34134</td> <td></td> </tr> <tr> <td>DESIGN</td> <td>46500</td> <td>3.0</td> </tr> <tr> <td>DESIGN ALT. INT. LOAD</td> <td>69750</td> <td>2.2</td> </tr> <tr> <td>DESIGN ALT. EXT. LOAD</td> <td>73500</td> <td>2.09</td> </tr> <tr> <td>COMBAT (BASIC MISSION)</td> <td>39735</td> <td></td> </tr> <tr> <td>TAKE-OFF (BASIC MISSION)</td> <td>73500</td> <td></td> </tr> </tbody> </table>	LOADING	POUNDS	L.F.*	EMPTY	32876		BASIC	34134		DESIGN	46500	3.0	DESIGN ALT. INT. LOAD	69750	2.2	DESIGN ALT. EXT. LOAD	73500	2.09	COMBAT (BASIC MISSION)	39735		TAKE-OFF (BASIC MISSION)	73500									
S.L. STATIC	SHP	RPM	MIL.																																															
Maximum	4380	14280	10																																															
Intermediate	4145	14280	30																																															
Max. Cont.	3696	14280	Cont.																																															
LOADING	POUNDS	L.F.*																																																
EMPTY	32876																																																	
BASIC	34134																																																	
DESIGN	46500	3.0																																																
DESIGN ALT. INT. LOAD	69750	2.2																																																
DESIGN ALT. EXT. LOAD	73500	2.09																																																
COMBAT (BASIC MISSION)	39735																																																	
TAKE-OFF (BASIC MISSION)	73500																																																	
ELECTRONICS	DEVELOPMENT	<p style="text-align: center;">FUEL AND OIL</p> <table border="1" data-bbox="1367 554 1850 733"> <thead> <tr> <th>LOCATION</th> <th>NO. OF TANKS</th> <th>CAPACITY (GALLONS)</th> </tr> </thead> <tbody> <tr> <td>SPONSONS*</td> <td>2</td> <td>500 EACH</td> </tr> <tr> <td>EXT. AUX. TANKS</td> <td>2</td> <td>650 EACH</td> </tr> <tr> <td>CABIN**</td> <td>6</td> <td>308 EACH</td> </tr> <tr> <td colspan="2" style="text-align: right;">TOTAL</td> <td>4148</td> </tr> </tbody> </table> <p>GRADE SPECIFICATION JP-4, JP-5 MIL-J-5624D</p> <p>*BOTTOM 1/3 SELF-SEALING **AUXILIARY TANKS FOR RANGE EXTENSION</p> <p style="text-align: center;">OIL</p> <p>ENGINES SPECIFICATION 3 (TOTAL 8.7 GAL) MIL-L-23699</p>	LOCATION	NO. OF TANKS	CAPACITY (GALLONS)	SPONSONS*	2	500 EACH	EXT. AUX. TANKS	2	650 EACH	CABIN**	6	308 EACH	TOTAL		4148																																	
LOCATION			NO. OF TANKS	CAPACITY (GALLONS)																																														
SPONSONS*	2	500 EACH																																																
EXT. AUX. TANKS	2	650 EACH																																																
CABIN**	6	308 EACH																																																
TOTAL		4148																																																
<p>AN/APX-72 IFF Transponder Set AN/AIC-14 Interphone System AN/APN-171(V) Radar Altimeter AN/ARC-159(V)-1 Radio Set AN/ARN-84(V) Radio Set (TACAN) AN/ARC-114A Radio Set (VHF/FM) AN/ARN-59 Automatic Direction Finder AN/ARA-50 Direction Finder Group AN/ARC-94 Radio Set AN/APN-154 Radar Beacon Set</p>	DIMENSIONS	ACCOMMODATIONS																																																
	<table border="1" data-bbox="687 1164 1251 1449"> <thead> <tr> <th colspan="2">MAIN ROTOR</th> </tr> </thead> <tbody> <tr> <td>DIAMETER:</td> <td>79'0"</td> </tr> <tr> <td>DISC AREA:</td> <td>4901.7 sq. ft.</td> </tr> <tr> <td>BLADE AREA (EACH):</td> <td>95.4 sq. ft.</td> </tr> <tr> <td>NO. OF BLADES, MAIN:</td> <td>7</td> </tr> <tr> <th colspan="2">LENGTH</th> </tr> <tr> <td>MAXIMUM:</td> <td>99'½"</td> </tr> <tr> <td>BLADES AND PYLON FOLDED:</td> <td>60'6"</td> </tr> <tr> <th colspan="2">HEIGHT</th> </tr> <tr> <td>MAXIMUM:</td> <td>29'5"</td> </tr> <tr> <td>BLADES AND PYLON FOLDED:</td> <td>18'7"</td> </tr> <tr> <th colspan="2">WIDTH</th> </tr> <tr> <td>BLADES AND PYLON FOLDED:</td> <td>28'5"</td> </tr> <tr> <td>TREAD:</td> <td>13'0"</td> </tr> </tbody> </table>	MAIN ROTOR		DIAMETER:	79'0"	DISC AREA:	4901.7 sq. ft.	BLADE AREA (EACH):	95.4 sq. ft.	NO. OF BLADES, MAIN:	7	LENGTH		MAXIMUM:	99'½"	BLADES AND PYLON FOLDED:	60'6"	HEIGHT		MAXIMUM:	29'5"	BLADES AND PYLON FOLDED:	18'7"	WIDTH		BLADES AND PYLON FOLDED:	28'5"	TREAD:	13'0"	<table border="1" data-bbox="1352 1170 1850 1386"> <tbody> <tr> <td>CREW (NORMAL)</td> <td>3</td> </tr> <tr> <td>CARGO HOOK CAPACITY</td> <td>36,000 LB.</td> </tr> <tr> <td>TROOP CAPACITY</td> <td>55</td> </tr> <tr> <td>LITTER CAPACITY</td> <td>24</td> </tr> <tr> <th colspan="2">CABIN SIZE CLEARANCE:</th> </tr> <tr> <td>LENGTH</td> <td>30'0"</td> </tr> <tr> <td>WIDTH</td> <td>6'6"</td> </tr> <tr> <td>HEIGHT</td> <td>7'6"</td> </tr> <tr> <td>CABIN VOLUME</td> <td>1462.5 CU.FT.</td> </tr> <tr> <td>MAX. FLOOR LOADING</td> <td>300 psf</td> </tr> </tbody> </table>	CREW (NORMAL)	3	CARGO HOOK CAPACITY	36,000 LB.	TROOP CAPACITY	55	LITTER CAPACITY	24	CABIN SIZE CLEARANCE:		LENGTH	30'0"	WIDTH	6'6"	HEIGHT	7'6"	CABIN VOLUME	1462.5 CU.FT.	MAX. FLOOR LOADING	300 psf
MAIN ROTOR																																																		
DIAMETER:	79'0"																																																	
DISC AREA:	4901.7 sq. ft.																																																	
BLADE AREA (EACH):	95.4 sq. ft.																																																	
NO. OF BLADES, MAIN:	7																																																	
LENGTH																																																		
MAXIMUM:	99'½"																																																	
BLADES AND PYLON FOLDED:	60'6"																																																	
HEIGHT																																																		
MAXIMUM:	29'5"																																																	
BLADES AND PYLON FOLDED:	18'7"																																																	
WIDTH																																																		
BLADES AND PYLON FOLDED:	28'5"																																																	
TREAD:	13'0"																																																	
CREW (NORMAL)	3																																																	
CARGO HOOK CAPACITY	36,000 LB.																																																	
TROOP CAPACITY	55																																																	
LITTER CAPACITY	24																																																	
CABIN SIZE CLEARANCE:																																																		
LENGTH	30'0"																																																	
WIDTH	6'6"																																																	
HEIGHT	7'6"																																																	
CABIN VOLUME	1462.5 CU.FT.																																																	
MAX. FLOOR LOADING	300 psf																																																	

PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION	① CLEAN	② BASIC	③ TROOP TRANSPORT	④ DUD RETRIEVAL	⑤ FERRY
TAKE-OFF WEIGHT lb.	40662	73500	53335	40672	66136
Fuel internal/external (JP-5) lb./lb.	6800/0	5241/0	6800/0	6342/0	19366/8840
Payload (Out/Back) lb.	0/0	34375/0	12375/0	0/35028	0/0
Disc loading lb./sq. ft.	8.52	15.41	11.18	8.53	13.86
Vertical rate of climb at S.L. (A/B) fpm.	3300/4120	0/0	1770/2850	3270/4100	0/1170
Absolute hovering ceiling (OGE) (C) ft.	17100	-	10660	17000	4520
Max. rate of climb at S.L. (B) fpm.	4230	1730	3020	4210	2120
Service ceiling (100 FPM) (D) ft.	28400	14500	23300	28400	18600
Speed at S.L. (A,E,F) kn.	170	100	170	170	168
Max speed/altitude (A,E,F) kn./ft.	170/10000	100/S.L.	170/S.L.	170/3000	145/10000
O.E.I. Service ceiling (G) ft.	21100	6700	15600	10000	10100
Min. speed (O.E.I.) At S.L. (G) kn.	0	53	0	0	38
Max. speed (O.E.I.) At S.L. (G) kn.	160	130	152	160	141
Combat radius n. mi.	127	50	88.6	56.1	-
Mission time hrs.	2.15	1.15	1.16	1.35	-
Average cruising speed kn.	128	112	170	113	-
Cruising altitude ft.	10000	0	0	3000	-
Range n. mi.	262	134	205	-	989
Average cruising speed kn.	128	100	132	-	124
Cruising altitude ft.	10000	0	0	-	10000
Maximum endurance hrs.	2.5	1.4	1.9	-	9.8
Endurance speed kn.	81	88	79	-	89
Endurance altitude ft.	10000	0	0	-	10000

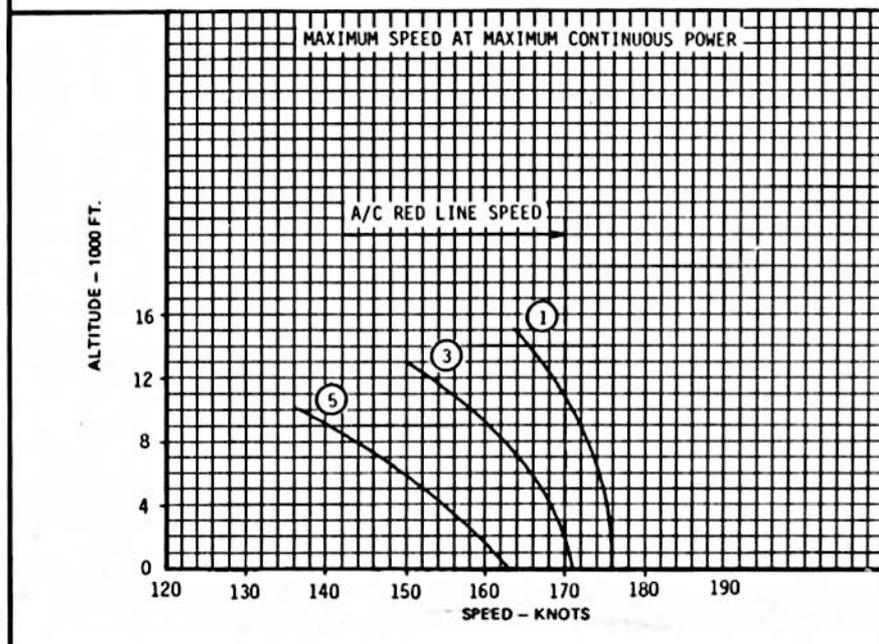
NOTES

- NOTES:
- (A) Maximum continuous transmission rating.
 - (B) Take-off transmission rating.
 - (C) Maximum power, 3 engines operating.
 - (D) Maximum continuous power, 3 engines operating.
 - (E) Aircraft red line airspeed is 170 knots I.A.S.
 - (F) Airspeed dependent on external load stability.
 - (G) Intermediate power, one engine inoperative.

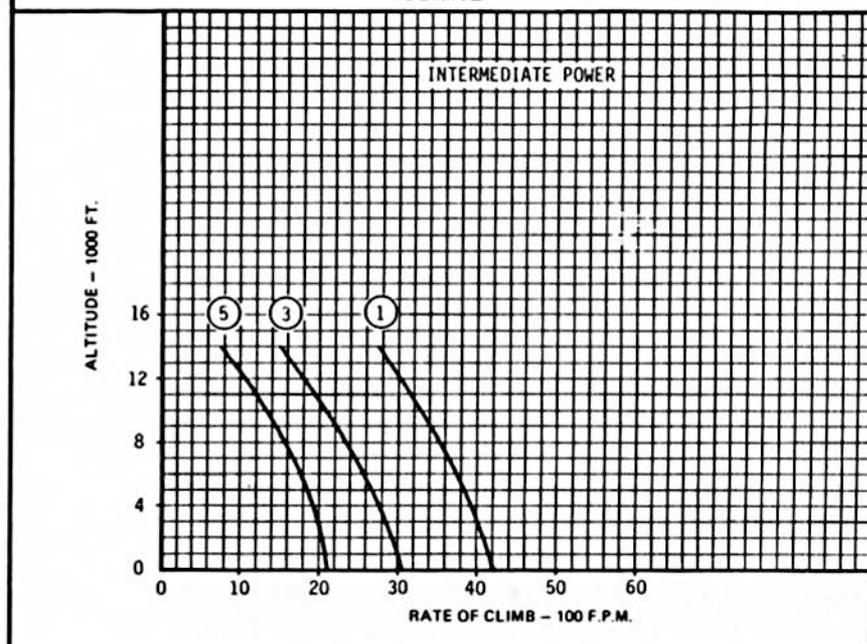
PERFORMANCE BASIS:

- (1) Flight test.
- (2) ICAO standard conditions, no wind, no ground effect.
- (3) Range and radius based on General Electric specification fuel consumption data using fuel grade JP-5.
- (4) Fuel consumption data are increased 5% above engine specification values.
- (5) Transmission ratings are 9600 HP maximum continuous and 11570 HP take-off.

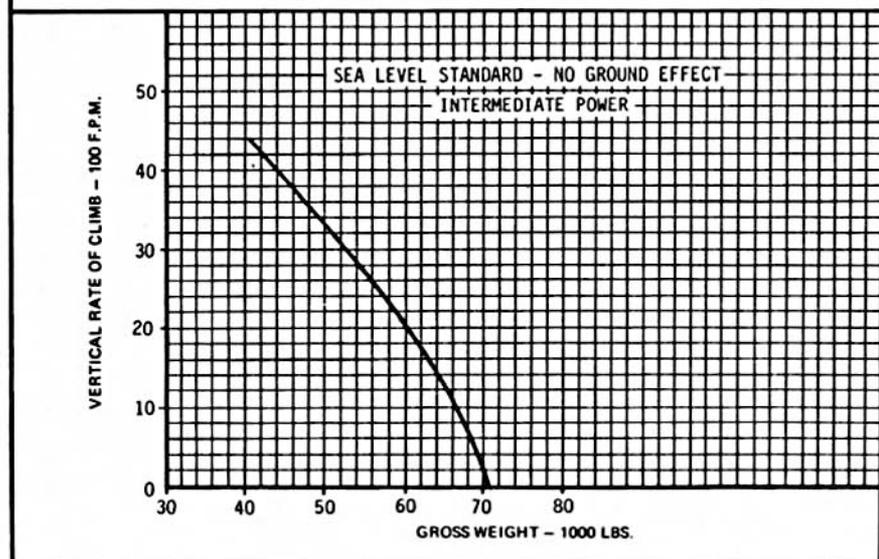
SPEED



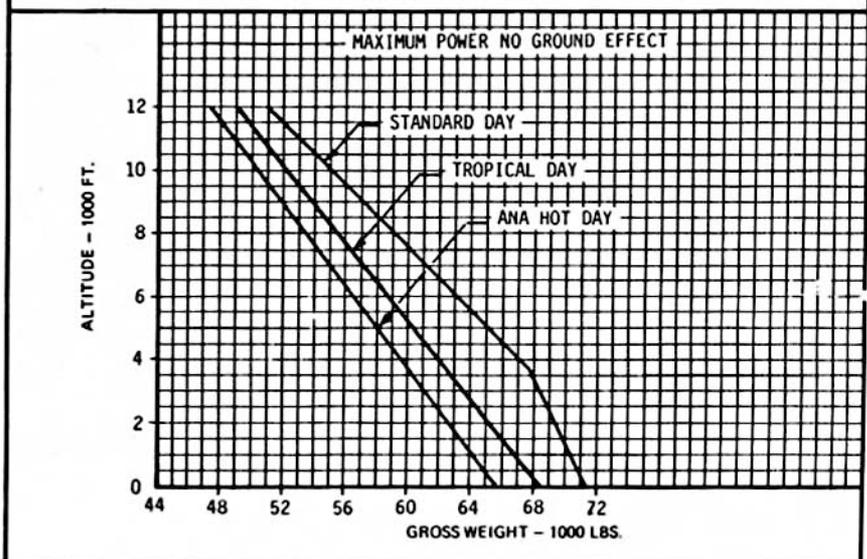
CLIMB



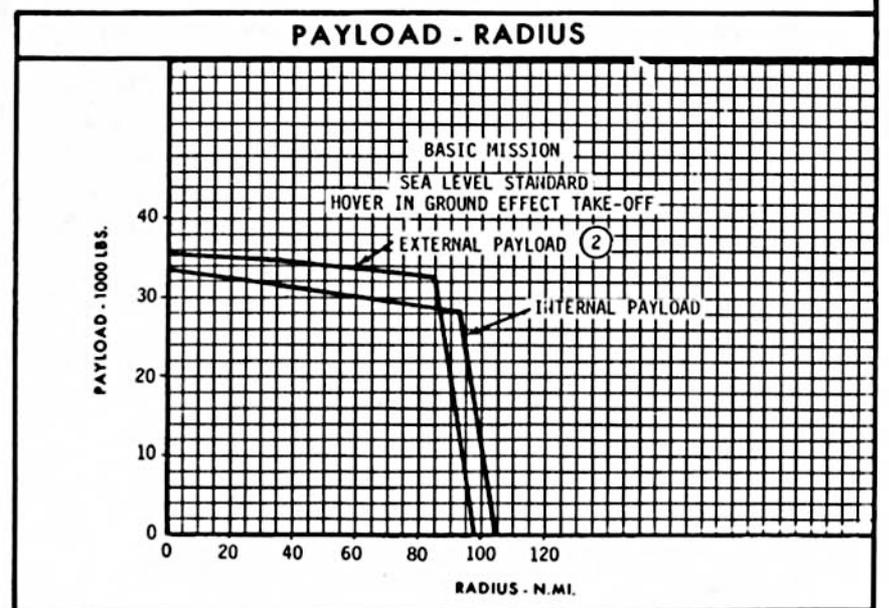
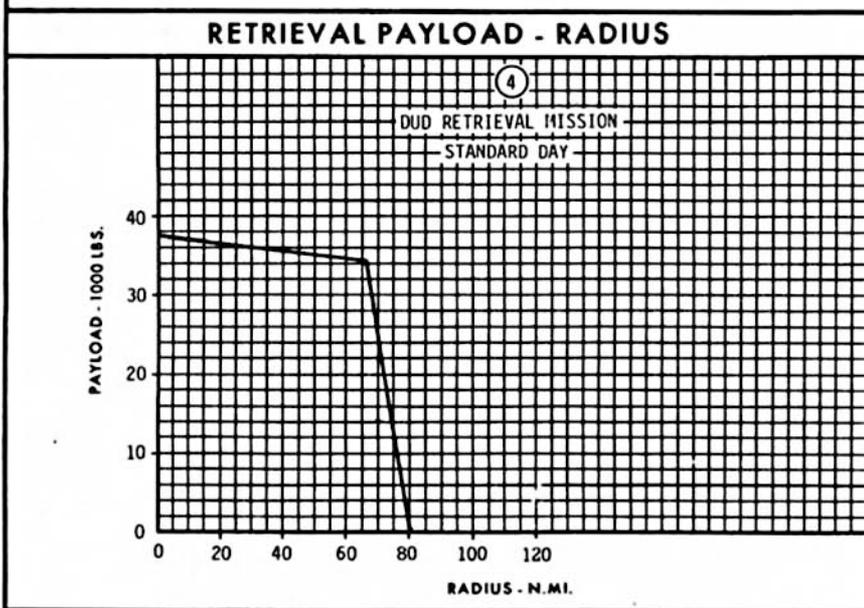
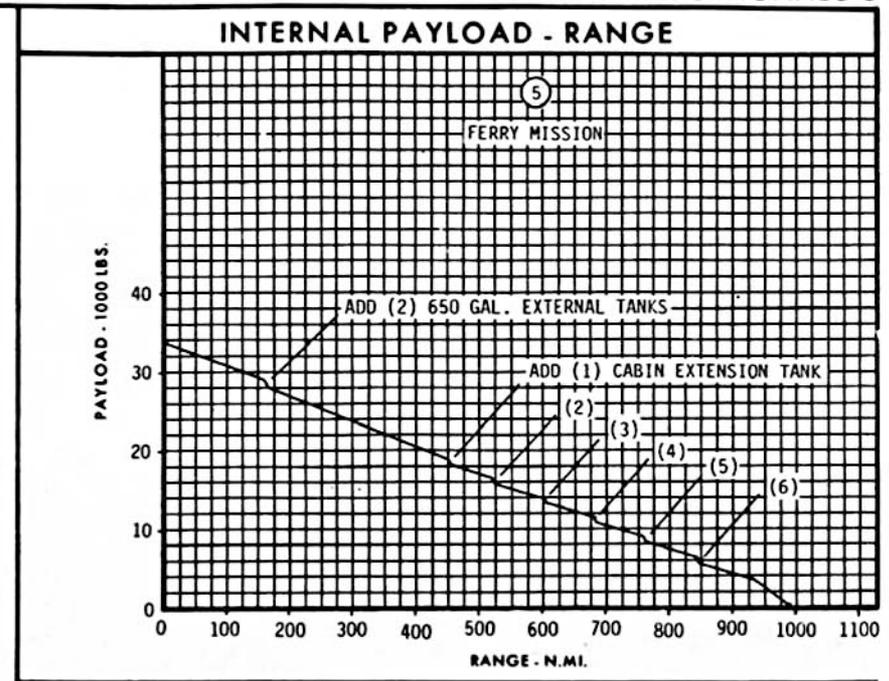
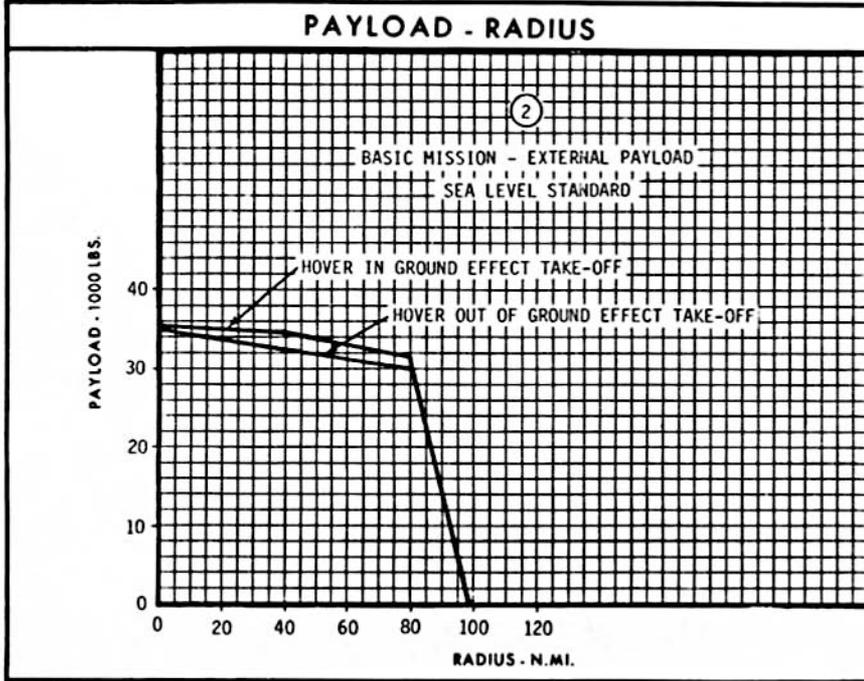
VERTICAL RATE OF CLIMB



HOVER CEILING



LOADING CONDITION COLUMN NUMBER



○ LOADING CONDITION COLUMN NUMBER

NOTES

CLEAN MISSION

Engine start, taxi, take-off and accelerate: 5 min at S.L. Max. Cont. Power.
 Climb: At BROOC, Intermediate Power, to altitude for best range, not to exceed 10,000 ft.
 Cruise Out: At speed for best range, at altitude for best range, not to exceed 10,000 ft.
 Hover: 5 min. at Hover Ceiling, not to exceed 10,000 ft.
 Cruise Back: at speed for best range, at altitude for best range, not to exceed 10,000 ft.
 Descend: To sea level (no fuel used, no distance gained).
 Reserve: 10% of initial fuel or 20 min. at speed for best range at sea level, whichever is greater.

BASIC MISSION

Engine start, taxi, take-off and accelerate: 5 min at S.L. Max. Cont. Power.
 Cruise Out: At 100 knots at sea level 50 n.mi. with external payload ($\Delta f = 50 \text{ ft}^2$).
 Hover: 5 min. out of ground effect at S.L. with payload.
 Release Payload.
 Cruise Back: At speed for best range at sea level, 50 n.mi. without payload.
 Reserve: 10% of initial fuel or 20 min. at speed for best range at sea level, whichever is greater.

TROOP TRANSPORT MISSION

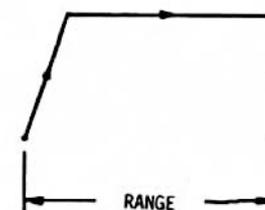
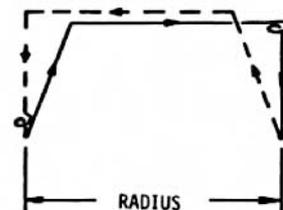
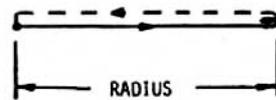
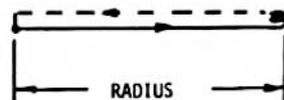
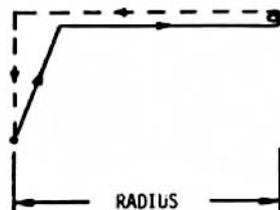
Engine start, taxi, take-off and accelerate: 5 min at S.L. Max. Cont. Power.
 Cruise Out: At maximum continuous power at sea level.
 Land and Unload Troops: 2 min. at S.L. Maximum continuous power.
 Cruise Back: At maximum continuous power at sea level.
 Reserve: 10% of initial fuel or 20 min. at speed for best range at sea level, whichever is greater.

DUD RETRIEVAL MISSION

Engine start, taxi, take-off and accelerate: 5 min at S.L. Max. Cont. Power.
 Climb: At BROOC, Intermediate Power, to 3000 ft.
 Cruise Out: At speed for best range at 3000 ft.
 Hover: 10 min. out of ground effect at 3000 ft.
 Descend: To sea level (no fuel used, no distance gained).
 Pick Up: Maximum external payload.
 Climb: At BROOC, Intermediate Power, to 3000 ft.
 Cruise Back: At 100 knots at 3000 ft. with external payload ($\Delta f = 65 \text{ ft}^2$).
 Descend: To sea level (no fuel used, no distance gained).
 Hover: 5 min. out of ground effect at sea level with payload.
 Reserve: 10% of initial fuel or 20 min. at speed for best range at sea level, whichever is greater.

FERRY RANGE

Engine start, taxi, take-off and accelerate: 5 min at S.L. Max. Cont. Power.
 Climb: At BROOC, Intermediate Power, to altitude for best range, not to exceed 10,000 ft.
 Cruise Out: At speed for best range, at altitude for best range, not to exceed 10,000 ft.
 Descend: To sea level (no fuel used, no distance gained).
 Reserve: 10% of initial fuel or 20 min. at speed for best range at sea level, whichever is greater.



○ LOADING CONDITION COLUMN NUMBER