



Standard Aircraft Characteristics NAVAER 1395A (REV. 1-49)

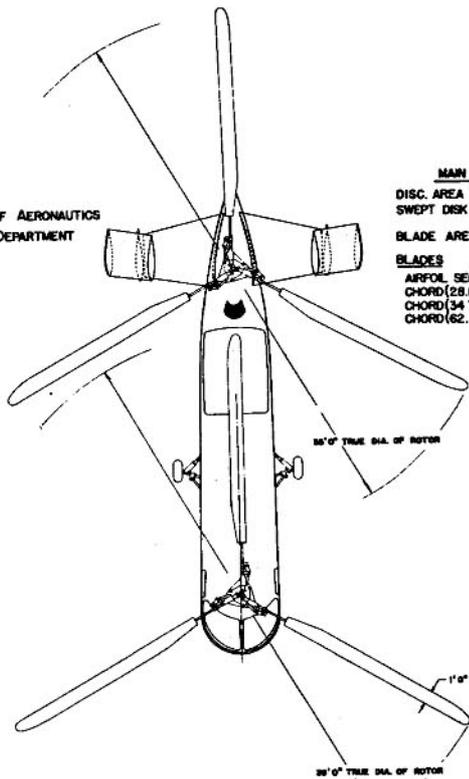
STANDARD AIRCRAFT CHARACTERISTICS

HUP-1

PIASECKI

SERVICE

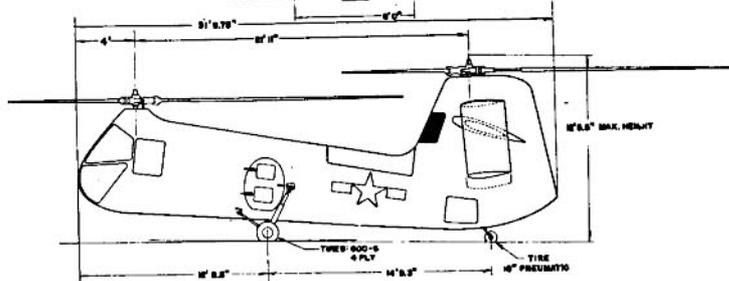
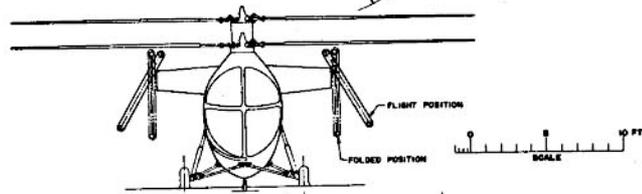
BUREAU OF AERONAUTICS
NAVY DEPARTMENT



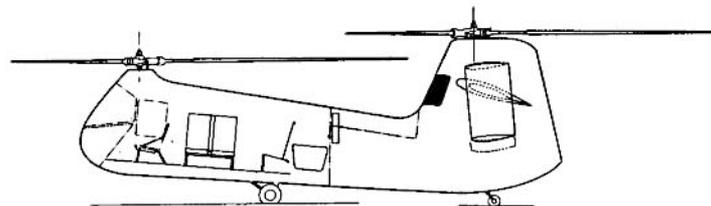
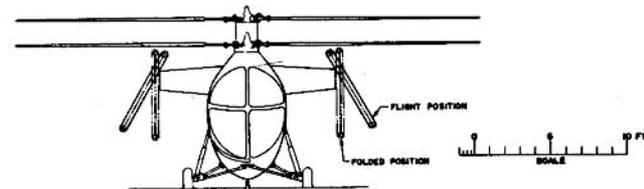
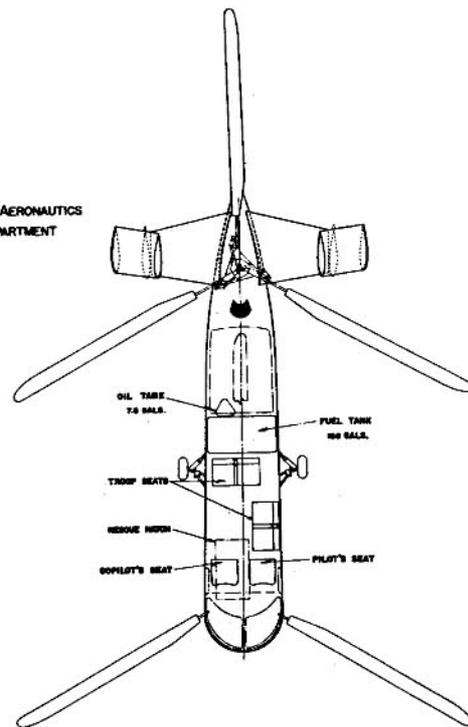
MAIN ROTOR DATA
DISC AREA (PROJECTED) 1670 SQ. FT.
SWEEP DISK AREA PER ROTOR - 960 SQ. FT.
BLADE AREA (6x17.5 SQ. FT.) - 105 SQ. FT.

BLADES
AIRFOIL SECTION BASIC N.A.C.A. 00--SERIES
CHORD (28.5 TO 34 % SPAN) N.A.C.A. 0014.9
CHORD (34 TO 62.5 % SPAN) N.A.C.A. 0013.4
CHORD (62.5 % SPAN TO TIP) N.A.C.A. 0012.0

GEAR RATIO 8.6 TO 1



BUREAU OF AERONAUTICS
NAVY DEPARTMENT



ARMAMENT & TANKS

Standard Aircraft Characteristics NAVAER 1335B (REV. 1-49)

MISSION AND DESCRIPTION

The HUP-1 was designed as a 3-place search and rescue type and a 2-place utility-cargo type helicopter. In the search and rescue configuration the helicopter is used primarily for carrier plane guard duty, but may also be used for ship-to-ship, ship-to-shore liaison and general utility. In the utility-cargo configuration the HUP-1 carries a 2 man crew and performs transport duties. It is also proposed to incorporate provisions so that the HUP-1 may be utilized as an interim ASW helicopter.

The basic configuration features the twin rotor tandem arrangement with the rotors overlapped, thus reducing the helicopter to a minimum size. It is specifically designed to fit the elevators of the smallest aircraft carriers in Naval service without the necessity of folding of the rotor blades. However, when the rotor blades are folded, the helicopter is small enough to be accommodated by cruiser elevators.

The internal arrangement of the helicopter features side-by-side seating of the pilot and co-pilot with dual controls installed. A rescue hatch and an internally mounted rescue hoist is provided for hoisting equipment, personnel or litters into the cabin from a hovering position. First flight — August 1950; Service use to start — November 1950.

DIMENSIONS

DISC AREA.....1,670 sq. ft.
BLADE AREA.....105 sq. ft.
ROTOR DIA.....35' - 0"
LENGTH*.....31' - 10"
HEIGHT.....12' - 6"
TREAD.....8' - 0"

* Blades Folded

WEIGHTS

Loadings	Lbs.	L.F.
EMPTY.....	4,214.....	
BASIC.....	4,323.....	
DESIGN.....	5,450.....	2.75
MAX.T.O.....	6,000.....	2.50
MAX.LAND.....	6,000.....	

All weights are estimated for Search and Rescue configuration.

FUEL AND OIL

Gals.	No. Tanks	Location
100	1	Fuselage

FUEL SPEC...MIL-F-5572
FUEL GRADE....100/130

OIL

CAPACITY (Gals.).....7
SPEC.....MIL-O-6082
GRADE.....1100/1120

ELECTRONICS

VHF HOMING REC.....AN/ARR-2A
ADF RADIO COMPASS...AN/AFN-6A
INTERPHONE.....AN/AIC-4A
IFF IDENTIFICATION...AN/APX-6
VHF TRANS. & REC....AN/ARC-1
MHF TRANS. & REC....AN/ARC-2

Provisions only for:
UHF TRANS.....AN/ARC-27
RADIO ALTIMETER.....AN/APN-1
SONAR.....AN/AQS-4

POWER PLANT

NO. & MODEL.....(1) R-975-34
MFR.....Continental
SUPERCH.....1 Stage, 1 Speed
ROTOR GEAR RATIO.....0.116

RATINGS

Bhp @ Rpm @ Alt.

T. O.	525	2,300	2,200'
NORMAL	500	2,500	6,700'
ALTER.	500	2,100	S. L.

SPEC. NO. 2008-C

ACCOMMODATIONS

CREW.....3
PASSENGERS.....4
LITTERS.....2
RESCUE HATCH.....48" x 26"
HOIST CAPACITY.....400 lbs.



PERFORMANCE SUMMARY

LOADING CONDITION		(1) SEARCH AND RESCUE (1 Passenger)	(2) UTILITY- CARGO	(3) SEARCH AND RESCUE (3 Passengers)	(4) SEARCH AND RESCUE (Full Fuel)
TAKE-OFF WEIGHT	lbs.	5,450	5,450	5,736	5,375
Fuel	lbs.	485	600	380	600
Pay Load	lbs.	200	501	600	--
Engine Power	bhp/rpm.	500/2,500	500/2,500	500/2,500	500/2,500
Disc Loading	lbs./sq.ft.	3.3	3.3	3.4	3.2
Power Loading	(A) lbs./bhp.	10.9	10.9	11.5	10.7
Maximum Speed-S.L.	(B) kn.	104	104	100	105
Maximum Speed/Alt.	(B) kn./ft.	105/3,800	105/3,800	101/3,000	106/4,100
Rate of Climb--S.L.	(B) ft./min.	1,170	1,170	1,030	1,220
Speed for Rate of Climb--S.L.	(B) kn.	61	61	62	61
Time-to-Climb 5,000 ft.	(B) min.	4.5	4.5	5.2	4.3
Time-to-Climb 10,000 ft.	(B) min.	10.0	10.0	12.1	9.4
Service Ceiling	(B) ft.	12,700	12,700	11,400	13,200
Vertical Rate of Climb--S.L.(B/C)ft./min.		430/850	430/850	40/450	510/930
Abs. Hover Ceil. No Grd. Effect (B/C) ft.		8,400/7,000	8,400/7,000	1,600/4,000	9,000/7,800
Abs. Hover Ceil. In Grd. Effect (B/C) ft.		9,700/8,300	9,700/8,300	3,100/5,500	10,200/9,000
Combat Range/Vav 1,500 ft.	n.mi./kn.	195/75	240/75	125/65	245/78
Max. Endur./Vav 1,500 ft.	hr./kn.	2.7/56	3.5/56	1.8/50	3.6/58

NOTES

- (A) BHP at Maximum Critical Altitude
 (B) Normal BHP
 (C) Take-Off Power

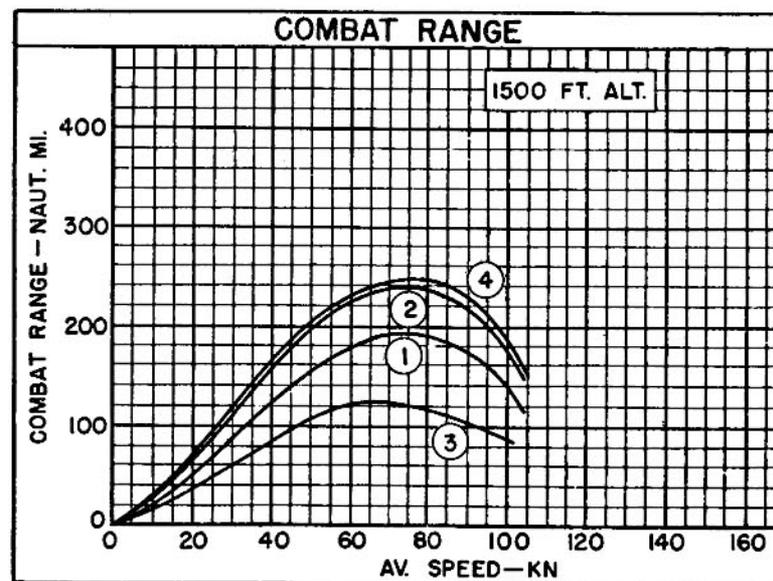
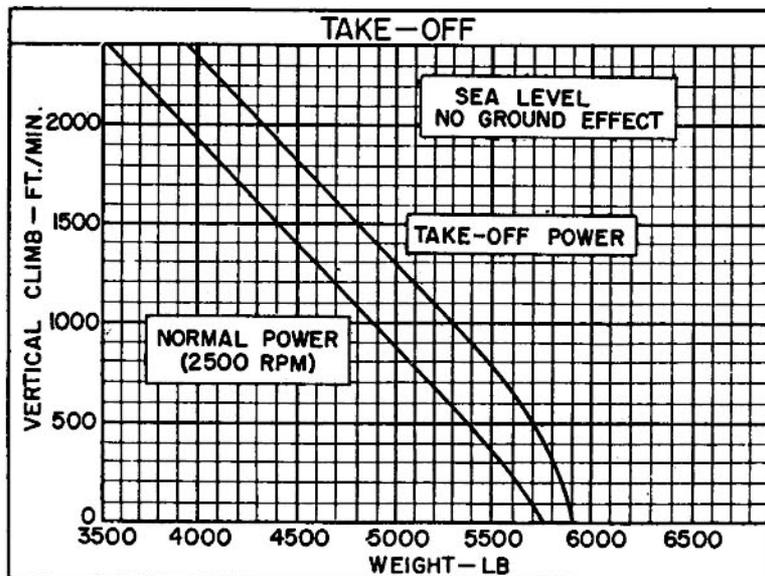
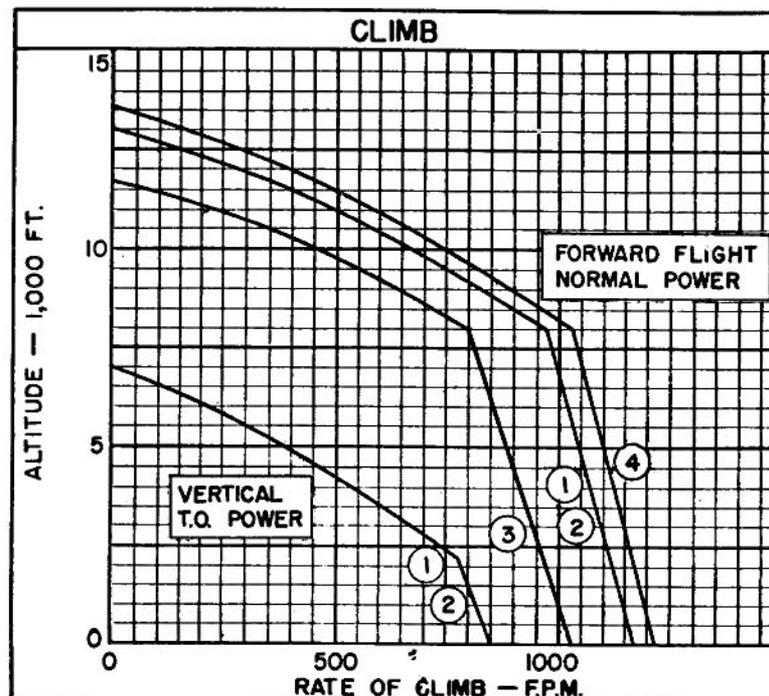
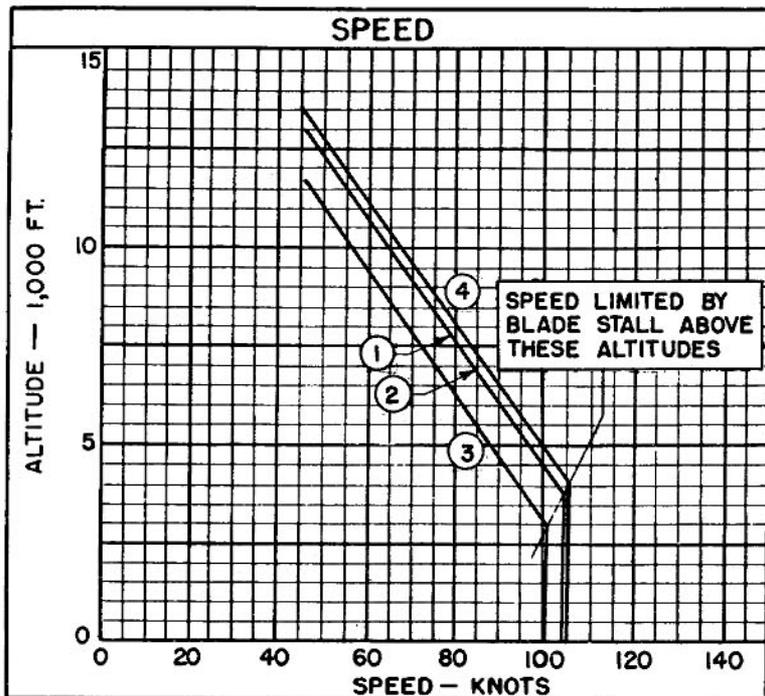
Performance is based on flight test of XHJP-1 helicopter.

Due to engine structural limitations, take-off power is restricted to 2,300 RPM. As a result, NRP at 2,500 RPM is greater than take-off power above 3,500 feet.

Sea level data do not include ground effect. Performance in ground effect is based on the assumption that average height of rotor discs is one radius above ground.

All performance items at NRP are quoted at 2,500 RPM.

Combat range and maximum endurance are quoted at optimum RPM. Fuel consumption for range and endurance is based on flight test fuel consumption data increased 5% and allowing fuel for warm-up and take-off and a 10% fuel reserve.



○ LOADING CONDITION COLUMN NUMBER

Standard Aircraft Characteristics NAVAER 1395E (REV. 2-50)

NOTES

The following items included in the Search and Rescue empty weight are removed when the helicopter is used in the Utility-Cargo configuration:

Anti-coning blade dampers
 AN/ARN-6 receiver
 AN/ARR-2A homing
 AN/ARC-2 MHF transceiver
 AN/AIC-4 interphone
 Life raft

Troop seats
 Litter stowage straps
 Heater
 Cabin insulation
 Flotation gear
 Hoist

Total weight of above items is 375 pounds.

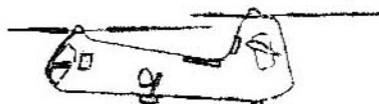
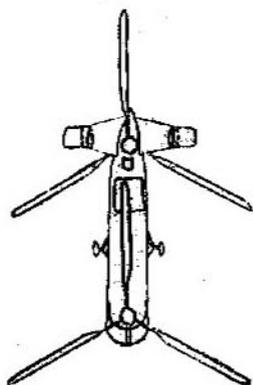
 Performance as quoted is with untwisted blades. It is planned to change to twisted blades during HUP-1 production program. Preliminary flight tests by the contractor indicate that twisted blades improve vertical flight performance in flight regimes near hover ceiling but have little effect on vertical flight performance under conditions resulting in high vertical rates of climb. Effect of twisted blades on V_{max} will be to increase altitude at which V_{max} is limited by blade stall. Rate of descent in autorotation is expected to be slightly higher with twisted blades. Forward flight rate-of-climb should be slightly improved with twisted blades.

CHARACTERISTICS SUMMARY

UTILITY HELICOPTER

HUP-1

PIASECKI



DISC AREA 1,670 sq. ft. (projected)
 ROTOR DIA. 35' - 0"

LENGTH 31' - 10"
 HEIGHT 12' - 6"

AVAILABILITY			PROCUREMENT			
NUMBER AVAILABLE			NUMBER DELIVERED			
			IN FISCAL YEARS			
ACTIVE	RESERVE	TOTAL				

STATUS

First Flight - - - - - August 1950
 Service Use to Start - - - - - November 1950

ENGINES
1 Continental R-975-34
T.O. 525/2,300/2,200'
NORM. 500/2,500/6,700'
ALT. 500/2,100/S.L.

FEATURES
Crew - 3
Passengers - 4
Litters - 2
Folding Rotor Blades
IFF Equipment
100 gal. fuel, maximum capacity

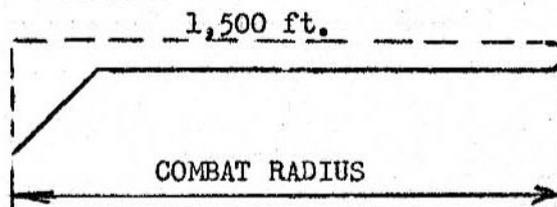
ARMAMENT
- - - - - None - - - - -
Hoist Capacity 400 lbs
Rescue Hatch 48" x 26"

NAVAER 1519 A (REV. 1-49)

CHARACTERISTICS SUMMARY

BASIC MISSION

HUP-1



PERFORMANCE

MAX. ENDURANCE	COMBAT RANGE	COMBAT RADIUS
3.3 hours	195 naut. mi.	80 naut. mi.
56 knots avg.	75 knots avg.	70 knots avg. 1,500 alt
1,500 ft. alt.	2.6 hours	COMBAT SPEED
	1,500 ft. alt.	104 knots at 1,500 ft., Maximum Power
CLIMB	CEILING	MAXIMUM SPEED
1,250 ft./min. (forward flight) Sea Level, T. O. wt. Normal Power	13,200 ft. (forward flight) 100 ft./min., T. O. wt. Normal Power	105 knots at 3,800 ft. Maximum Power
850 ft./min. (vertical) Sea Level, T.O. Wt. T.O. Power	4,300 ft. Absolute Hover ceiling T.O. Wt. Normal Power	TAKE OFF
		Vertical
LOAD	WEIGHTS	
Fuel 81 gal.	Empty 4,214 lbs.	
fixed 81 drop - -	Combat lbs.	
Pay Load 200 lbs.	Take-off 5,450 lbs.	

NOTES

Performance is based on flight test of HUP-1 helicopter. Combat range and maximum endurance are quoted at optimum RPM. Fuel consumption for range and endurance is based on flight test fuel consumption data increased 5% and allowing fuel for warm-up and take-off and a 10% fuel reserve.

All performance is out of ground effect.