The HO3S-1 was the first Navy helicopter to replace fixed wing aircraft operating with the fleet. From the 1920s on, seaplanes were the aircraft carried aboard battleships and cruisers. In 1948 Sikorsky's newest production helicopter began to "supplement" the Curtiss SC-1s (*NANews*, August 1975) on board fleet cruisers. Before long, supplement became replace. By late 1949, the HO3S-1 had taken over; the seaplanes were gone.

Based on WW II experience with its initial R-4 (HNS-1) and the later R-5 (HO2S-1) and R-6 (HOS-1) helicopters, Sikorsky developed its first S models, S-51s, for commercial use in 1946. These were based on the R-5s, but were four-place rather than two-place, with a bench seat for three passengers behind the pilot's seat. The P&W R-985 Wasp Jr. was retained for power; the general configuration was similar but many improvements were incorporated.

In September 1946 with Operation *High Jump* (the first postwar Antarctic expedition) coming up, four S-51s were ordered, to be used from *High Jump* ships. Only minor changes were made, principally the incorporation of an external auxiliary fuel tank and some cold-weather modifications.

By January 1947, two had been ditched at sea but their overall effectiveness justified ordering two replacements in February. In April, procurement of 20 more was authorized for general fleet use, with changes to meet fleet requirements. Blade folding, an externally mounted hoist, and Navy radio gear were to be incorporated in production. Before deliveries began, 20 more were ordered. Ultimately, a total of 91 were delivered for Navy and Marine Corps use.

By the end of the year deliveries were being made to squadrons on both coasts and, following training, shipboard operations were under way in 1948. The concept of established squadrons furnishing one or two-plane detachments to the operating ships was soon standard.

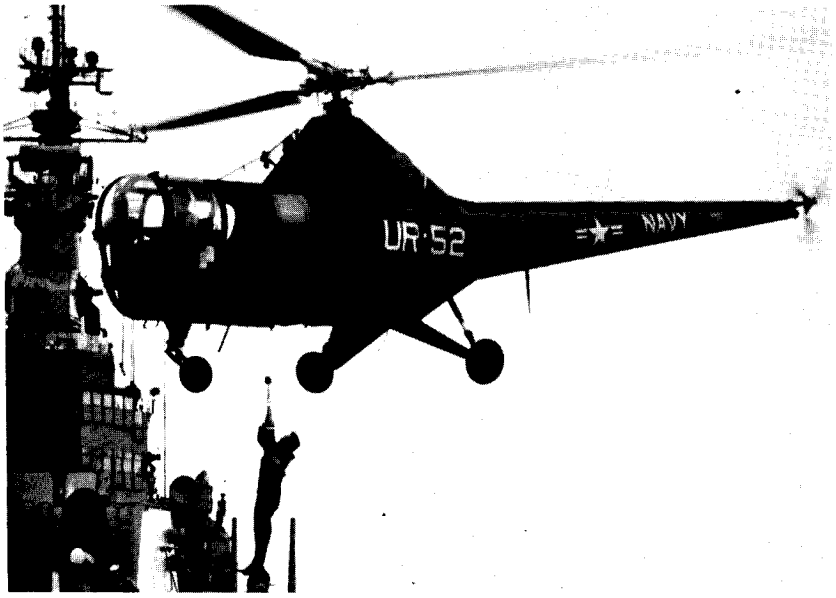
While the HO3S-1 retained its observation designation, its fleet use was almost entirely in the utility role, with early recognition of its value as a plane guard for carrier operations. By 1950, fleet use of the helicopter was well established and improved models were being developed.

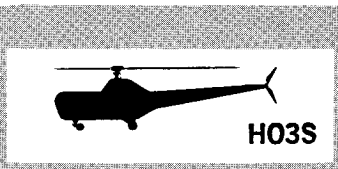
With the outbreak of war in Korea, the HO3S-1 assumed a new role as a combat rescue helicopter. While newer helicopters were coming on the scene, Marine HO3S-1s (and the Air Force H-5 series "twins") successfully undertook the rescue of both downed aircrew and injured ground personnel.

Because of the deficiencies in the HO3S-1, an improved prototype, the XHO3S-2, was developed during 1950. However, many of its improvements (such as all-metal, constant-chord rotor blades replacing the tapered wood and metal ones) were derived from newer models, and production turned to these, with no more HO3Ss being built. Even so, the HO3Ss soldiered on with the fleet through most of 1954, and the last in shore-based service was not stricken until 1957.

HO3S

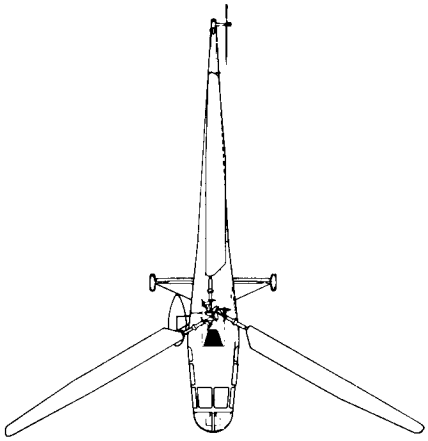
S-51

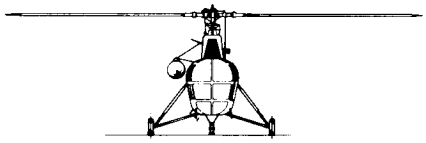


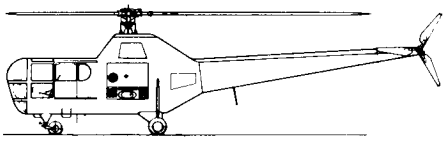


HO3S

Rotor diameter	48' 0"
Length	57' 0"
Height	13' 0"
Engine	P&W R-985-AN-5 450 hp
Max speed	94 knots
Max range (ext tank)	364 nm
Service ceiling	14,800'
Hover ceiling	5,300'
Crew	1
Passengers	3





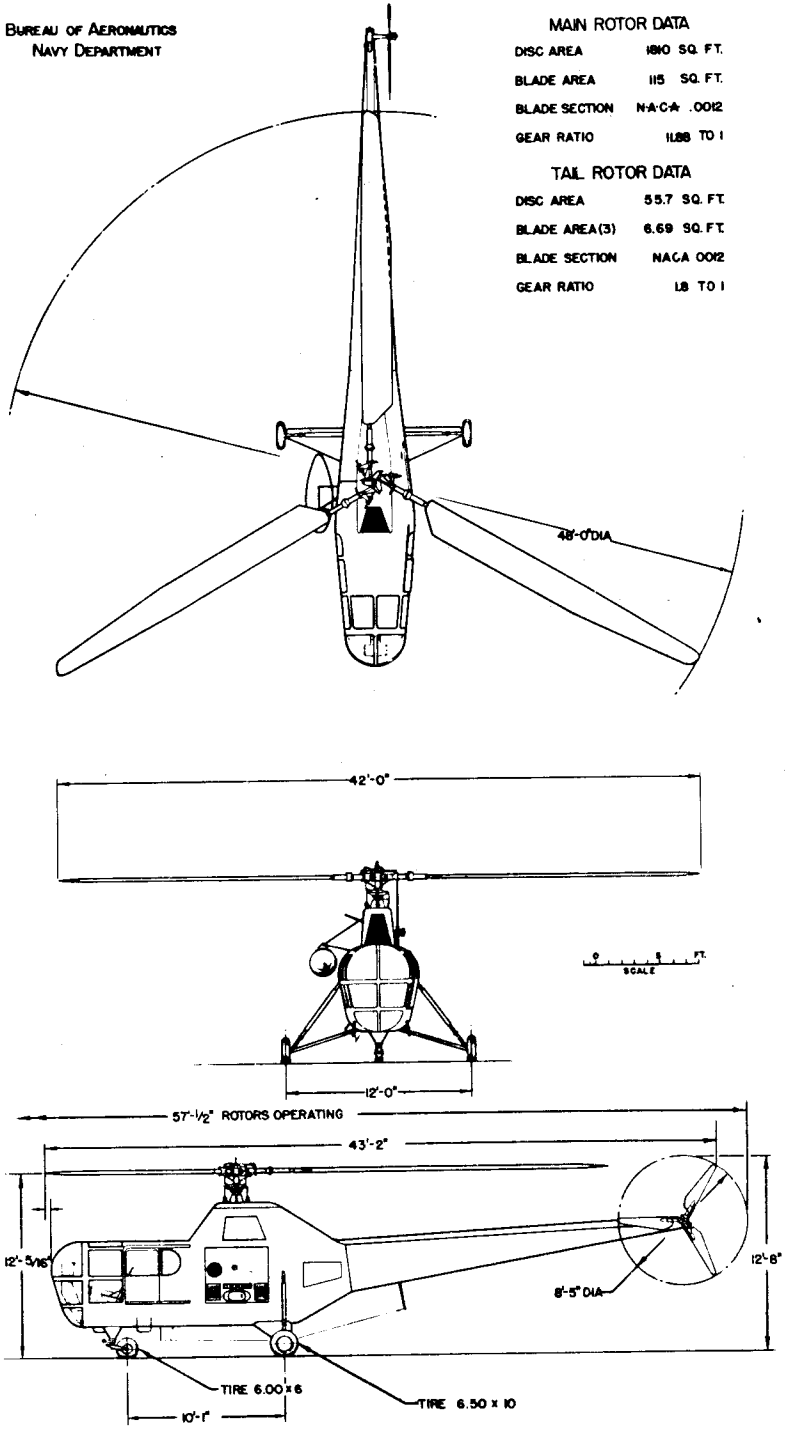


STANDARD AIRCRAFT CHARACTERISTICS

HO3S-1

DECLASSIFIED

BUREAU OF AERONAUTICS
NAVY DEPARTMENT



MAIN ROTOR DATA

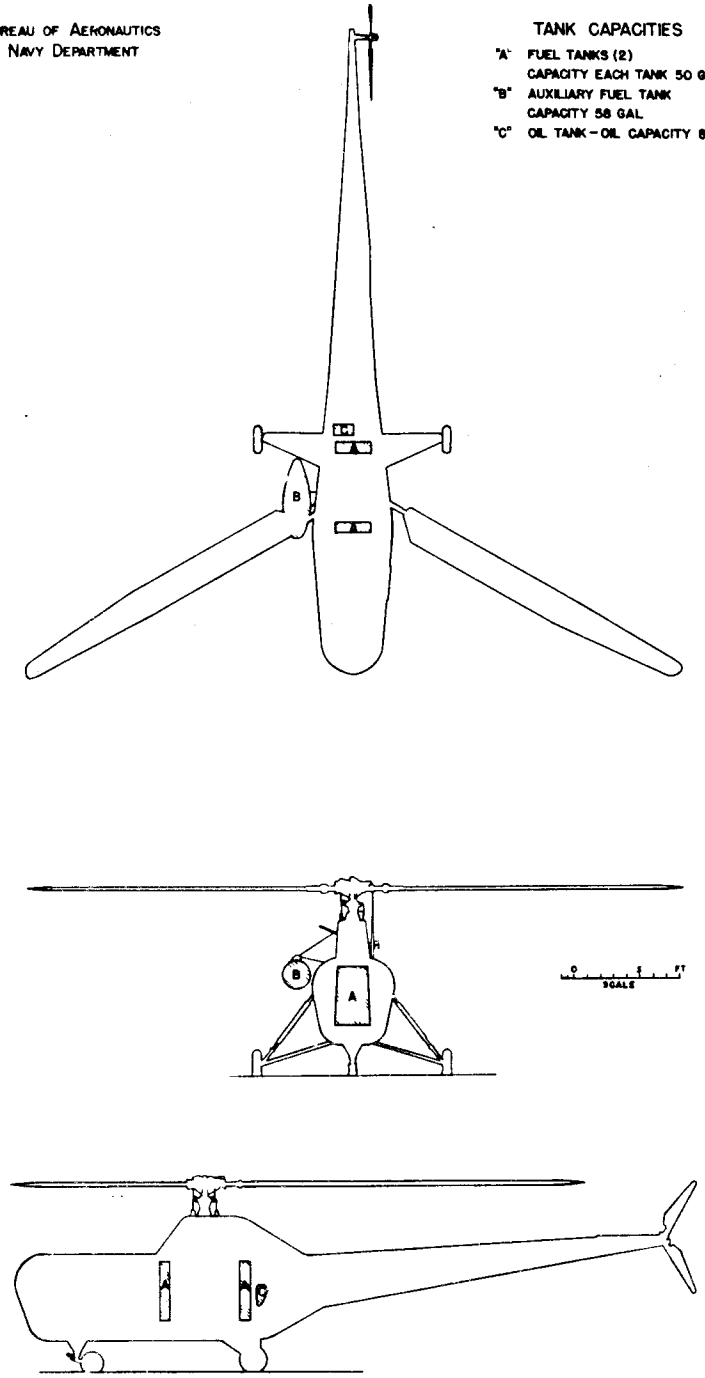
DISC AREA	1810 SQ. FT.
BLADE AREA	115 SQ. FT.
BLADE SECTION	N.A.C.A. .0012
GEAR RATIO	11.88 TO 1

TAIL ROTOR DATA

DISC AREA	55.7 SQ. FT.
BLADE AREA (3)	6.69 SQ. FT.
BLADE SECTION	NACA 0012
GEAR RATIO	1.8 TO 1

DESCRIPTIVE ARRANGEMENT

BUREAU OF AERONAUTICS
NAVY DEPARTMENT



TANK CAPACITIES

"A" FUEL TANKS (2)
CAPACITY EACH TANK 50 GAL
"B" AUXILIARY FUEL TANK
CAPACITY 58 GAL
"C" OIL TANK – OIL CAPACITY 8 GAL

TANKAGE INSTALLATION

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MISSION AND DESCRIPTION

The primary mission of the HO3S-1 helicopter is utility.

The HO3S-1 is the Navy version of Sikorsky Model S-51, which in turn is a development of the A.A.F. R-5.

Main rotor blades may be folded or removed for storage. Amphibious floats are under development. Emergency flotation gear is installed. A hydraulically operated hoist is provided for use in flight. Instruments provided are suitable for contact flight only.

WEIGHTS

Loadings	Lbs.	L.F.
EMPTY	3788	
BASIC	4026	
DESIGN	4985	3.1
MAX.T.O	4985	3.1
MAX.LAND	4985	

All weights are actual.

POWER PLANT

NO. & MODEL.....(1) R-985-AN-5
MFGR.....Pratt & Whitney
SUPERCH.....1 Stage, 1 Speed
ROTOR GEAR RATIO.....0.084

RATINGS

	Bhp	@ Rpm	@ Alt.
T.O.	450	2300	S.L.
NORM.	450	2300	2300'

SPEC. AN-2036

FUEL AND OIL

Gal.	No. Tanks	Location
100	2	Fuselage
89	1	External

FUEL GRADE.....91/98
FUEL SPEC.....AN-F-48

OIL

CAPACITY (gals.).....8
GRADE.....1100-1120
SPEC.....AN-O-8

ACCOMODATIONS

CREW.....1
PASSENGERS.....3
BAGGAGE.....145 lbs.
HOIST CAPACITY.....300 lbs.

DIMENSIONS

DISC. AREA.....1810 sq. ft.
BLADE AREA.....115 sq. ft.
BLADE DIA.....48'-0"
LENGTH.....57'-0"
HEIGHT.....13'-0"
TREAD.....12'-0"

ELECTRONICS

VHF TRANSCEIVER.....AN/ARC-1
RANGE REC.....AN/ARC-5
RECEIVER.....AN/ARR-2

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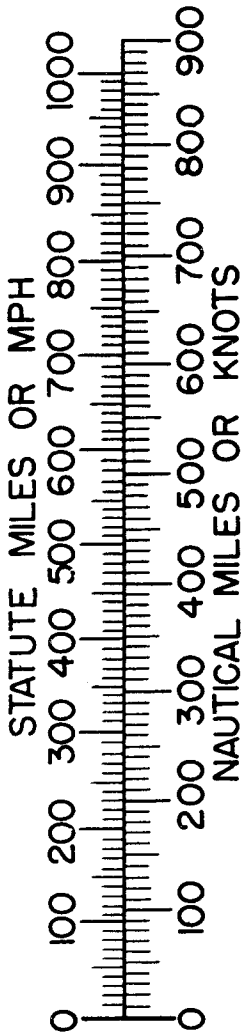

PERFORMANCE SUMMARY

LOADING CONDITION		(1) UTILITY 4 Places	(2) UTILITY 3 Places	(3) UTILITY 1 Place 1 Ext. Tank	
TAKE-OFF WEIGHT	LBS.	4,985	4,985	4,985	
FUEL	LBS.	420	600	600/300	
PAY LOAD	LBS.				
ENGINE POWER	BHP/RPM	450/2,300	450/2,300	450/2,300	
DISC LOADING	LBS/SQ.FT.	2.75	2.75	2.75	
POWER LOADING	LBS/BHP.	11.08	11.08	11.08	
MAXIMUM SPEED-SEA LEVEL	KN.	90	90	89	
MAXIMUM SPEED/ALT.	KN/FT.	94/3,750	94/3,750	93/3,750	
RATE OF CLIMB-SEA LEVEL	KN.	1,240	1,240	1,240	
BEST RATE OF CLIMB SPEED-SEA LEVEL	KN.	45	45	45	
TIME TO 5,000 FT.	MIN.	4.3	4.3	4.3	
TIME TO 10,000 FT.	MIN.	11.0	11.0	11.0	
SERVICE CEILING	FT.	14,800	14,800	14,800	
VERTICAL RATE OF CLIMB	FT/MIN.	480	480	480	
ABSOLUTE HOVERING CEILING	FT.	5,300	5,300	5,300	
COMBAT RANGE/V.AV. 1,500 FT	N.M./KN.	162/70	238/70	364/70	
MAXIMUM ENDURANCE/V.AV. 1,500 FT.	HR/KN.	2.7/50	4.0/50	6.1/50	

NOTES

All performance figures are based on actual flight tests reduced to standard atmospheric conditions with no wind. Sea level data do not include ground effect. All performance, particularly hovering and climb, are adversely affected by increased temperature and relative humidity. Hovering and climb performance are improved by ground effect (at altitudes less than one rotor diameter above the ground). Hovering and vertical climb performance are also materially improved by light horizontal winds of the order of 5-10 knots.

Combat range is based on flight tests and engine manufacturer's fuel consumption data.

Fuel consumption data are increased by 5%.

External tank and hoist have no appreciable effect on performance.

Maximum endurance is based on fuel remaining after allowance for warm-up, take-off, and reserve.

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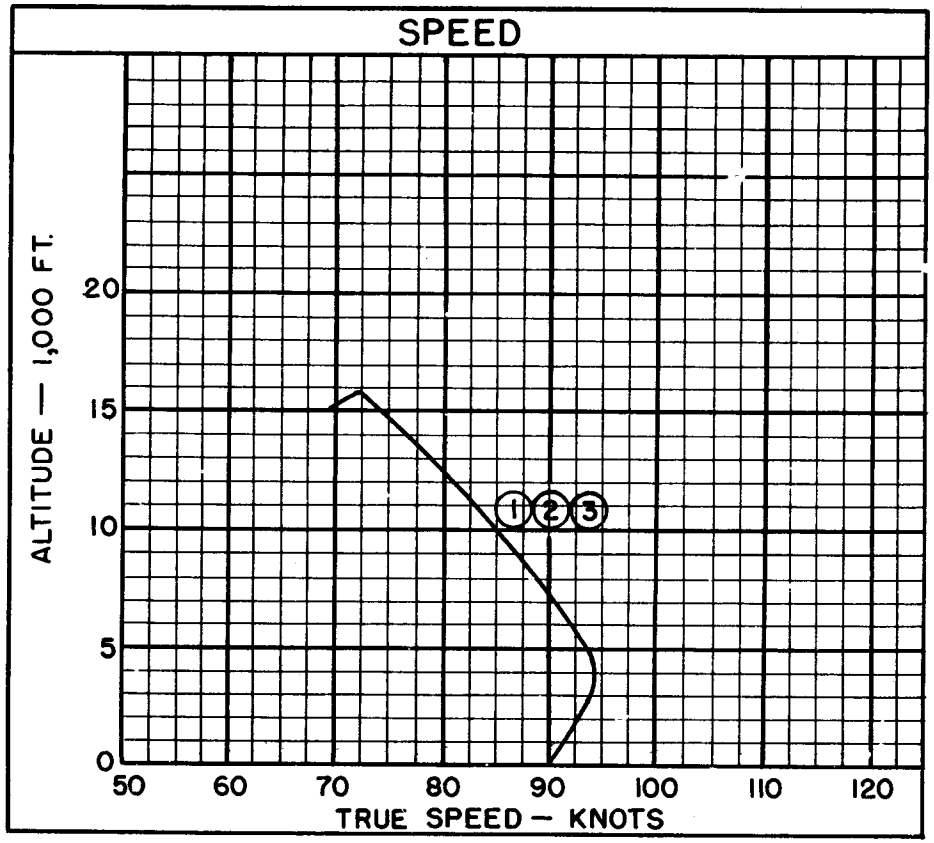

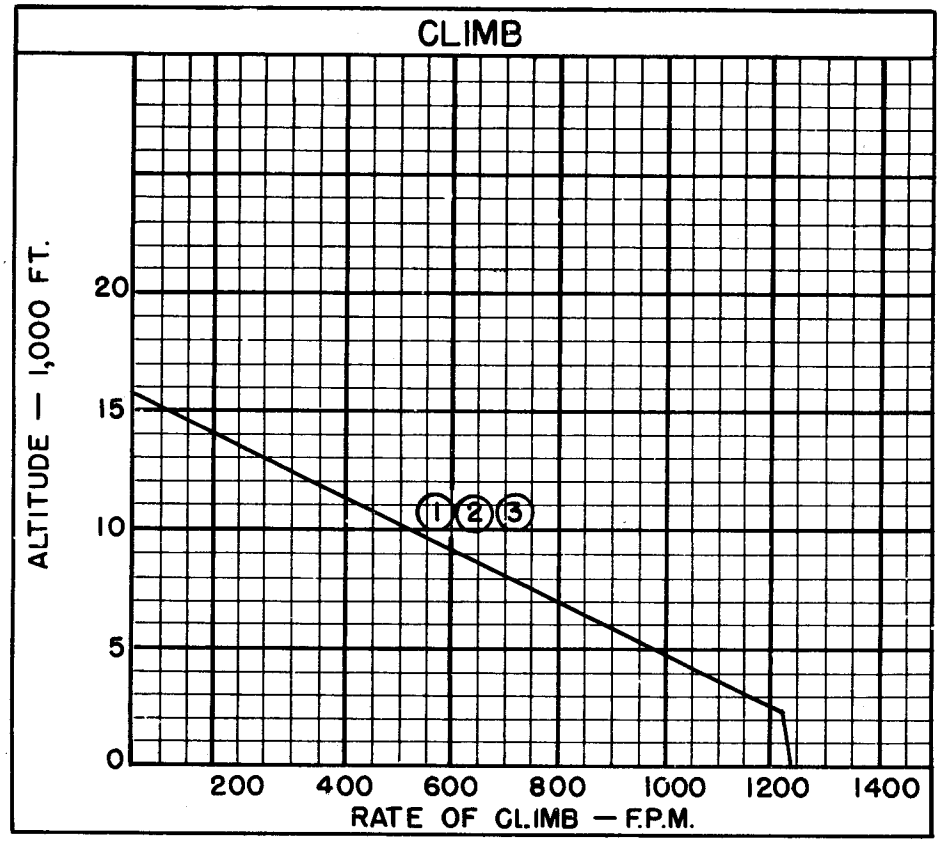

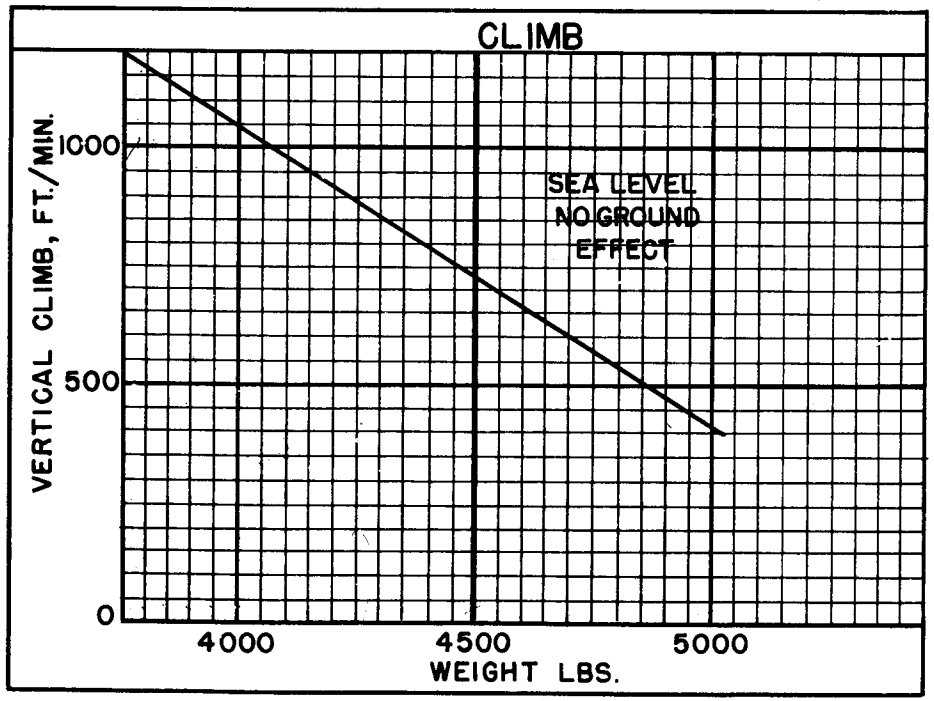

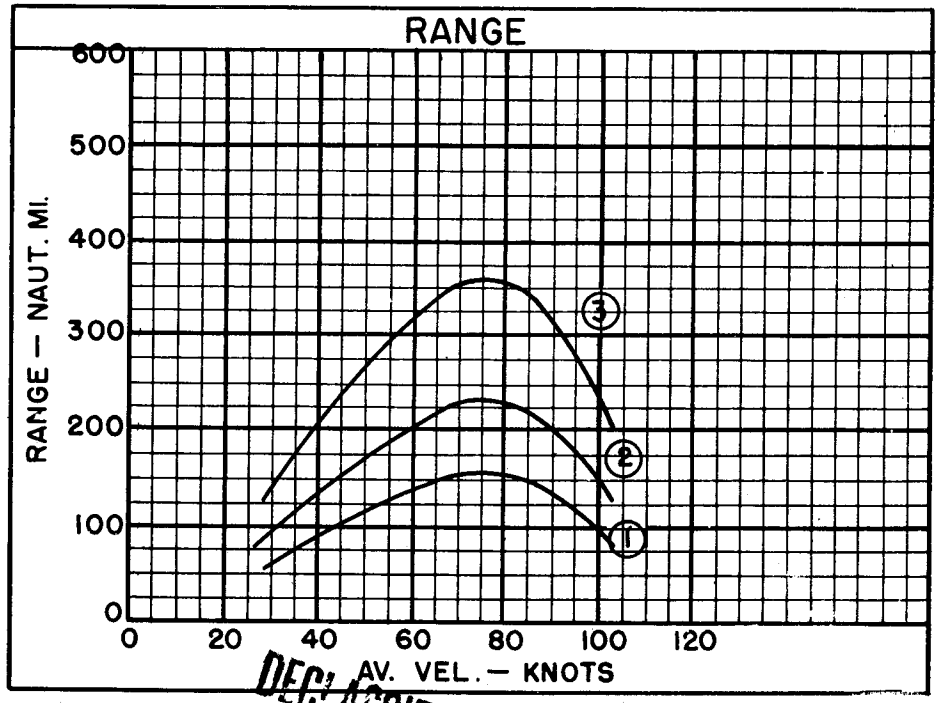

LOADING CONDITION COLUMN NUMBER

DECLASSIFIED