NEPTU

By now most VP personnel in fleet squadrons hardly remember that there were ever anything but P-3s in Navy VP squadrons. However, for many years their predecessors never knew that there were any land-based patrol planes other than P2V/P-2 *Neptunes*. And the P-2s have carried on in reserve squadrons and special service so that they are not forgotten among today's Naval Aviation personnel — and certainly not among more senior types from the VP aviation community.

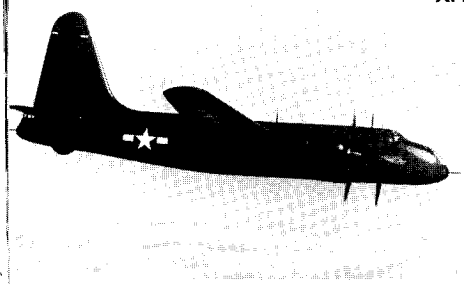
The *Neptune* enjoys the distinction of being the only designed-for-the-purpose, land-based patrol plane to see wide, general Navy service. All others to see general Navy service, including today's P-3s, were derived from other types designed for other purposes; both the P2V's predecessors, the PVs (*NANews*, August 1974) and successors, today's P-3s, being derived from commercial transport designs.

The *Neptune* traces its origins to Lockheed/Vega design studies starting in 1941 when the Navy first acquired land-based patrol aircraft. While types modified from other models served WW II needs, in 1944, two XP2V-1s were ordered, along with 15 production -1 models. These were designed to overcome the many problems of the redesigned types, providing ample space for crew and equipment, and adequate range in a straight-forward twin-engine design. First flight of the initial XP2V-1 took place on May 12, 1945; for the following 17 years, Lockheed's flight line was never without new P2V/P-2 aircraft.

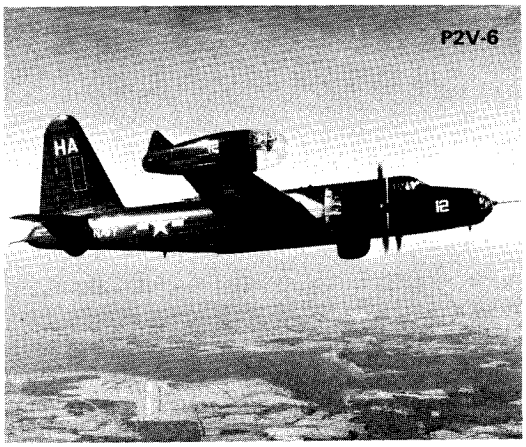
Powered by two 2,300-hp Wright R-3350 engines, and featuring nose, dorsal and tail turrets, the XP2V-1 featured clean lines that were to continue throughout the P2V series — though the aircraft was to grow all manner of electronic and other bumps, and the armament changed regularly.

The most famous *Neptune* was the *Truculent Turtle*, the third P2V-1, which set a world's distance record flying 11,236 miles from Perth, Australia, to Columbus, Ohio, September 29-October 1, 1947 (*NANews*, June 1977). Following initial trials, the first P2Vs went into service with VP-ML-2 in 1947. The -1s were followed by -2s with longer noses and no nose turrets, and subsequent -3s with improved engines. Both these models had variants, initiating a practice that continued throughout the P2V/P-2 series, and which continues in the P-3s today. A special ASW (-2S) and ski-equipped (-2N) P2V-2s were followed by carrier, command transport and radar search (-3C, -3Z and -3W) versions of the P2V-3. While takeoffs from carriers were performed, using JATO assist, the *Neptune* never landed aboard a carrier.

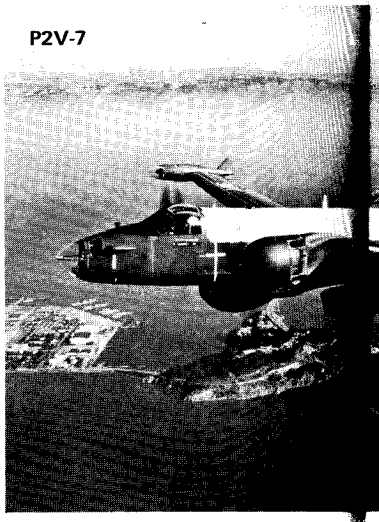
XP2V-1



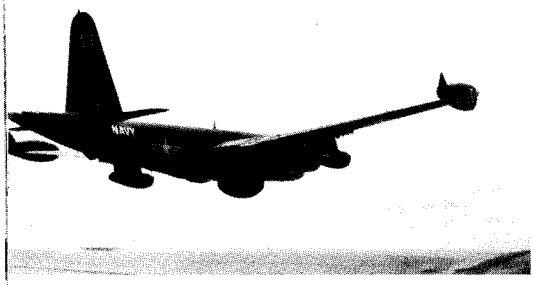
P2V-6



P2V-7

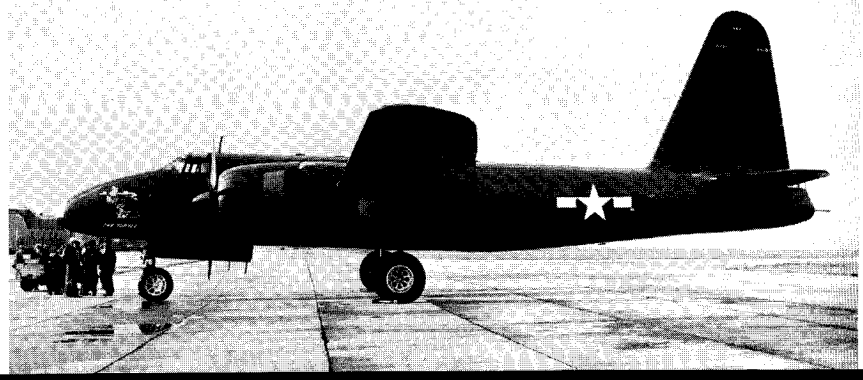


P2V-5F



P2V-7LP

Truculent Turtle



UNE

After the initial aircraft, the -4s introduced the turbo-compound R-3350 engine, had APS-20 radar as a standard feature and were fitted with tip tanks. The Korean War accelerated production of the -5, newly fitted with a nose turret and with larger tip tanks. P2V-5s were the first *Neptunes* to serve with foreign countries, to be followed by later models. P2V-6s featured more flexible armament provisions and reduced-capability radar.

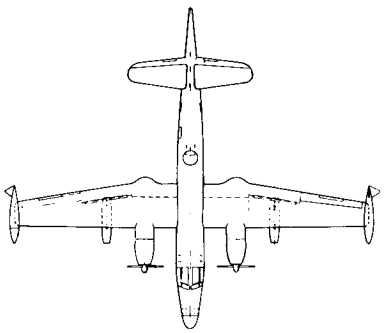
With the -7 the P2V reached its ultimate design. Westinghouse J-34s in wing pods added needed power, a MAD boom replaced the tail turret, nose armament was eliminated and the pilot's cabin redesigned. Many of these features were retrofitted on earlier -5 and -6 aircraft as the *Neptunes* underwent successive modifications for fleet use and for special duties, including some used by the Air Force as RB-69As.

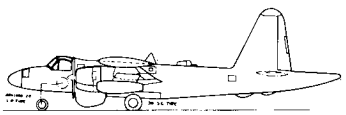
By the time the last of 1,036 *Neptunes* were delivered in 1962, the designation of the P2V-7Ss had changed to SP-2H, and all guns were deleted. Subsequent special versions for Southeast Asia added OP-2E and AP-2H to the list of P-2 modifications. As the P-3s filled out the fleet squadrons, the P-2s continued to fill reserve and support mission roles. By the mid-Seventies, they were being rapidly phased out, and only a few remain in service today.

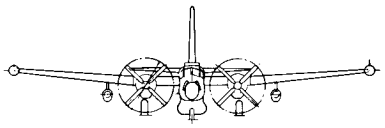
P2V

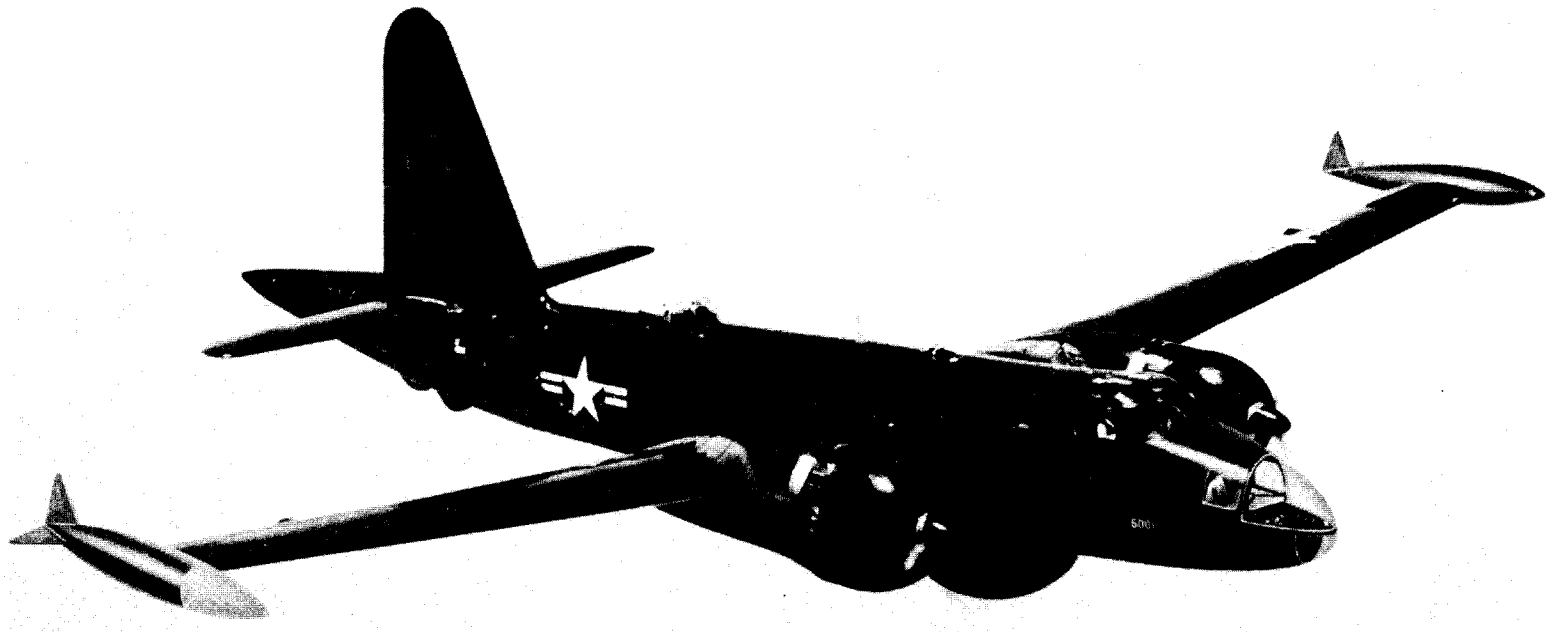
Span		
-1,-3		100'
-5		102'
-7		101'4"
Length		
-1		75'4"
-3		77'11"
-5		75'4"
-7		91'8"
Horsepower		
-1		2,300
-3		3,150
-5		3,700
-7		3,750
Engines		
-1	two	Wright R-3350-8
-3	two	Wright R-3350-26W
-5	two	Wright R-3350-30W
-7	two	Wright R-3350-32WA
	two	Westinghouse J34-WE-36 (with thrust of 3,400 lbs.)
Maximum speed		
-1,-3		276 kts
-5		286 kts
-7		350 kts
Service Ceiling		
-1		24,200'
-3		25,800'
-5		24,300'
-7		29,700'
Range		
-1		3,450 nm
-3		2,875 nm
-5		3,510 nm
-7		3,221 nm
Crew		
-1,-3		7
-5		8
-7		9
Armament		
-1		nose, deck, and tail each had two .50 machine guns
-3		nose – six 20mm cannon deck – two .50 machine guns tail – two 20mm cannons sixteen 5" HVAR
-5		same as -3 except nose had only two 20mm cannons
-7		eight 5" HVAR
		All models carried up to 8,000 pounds of bombs, mines, torpedoes

P2V-4









19

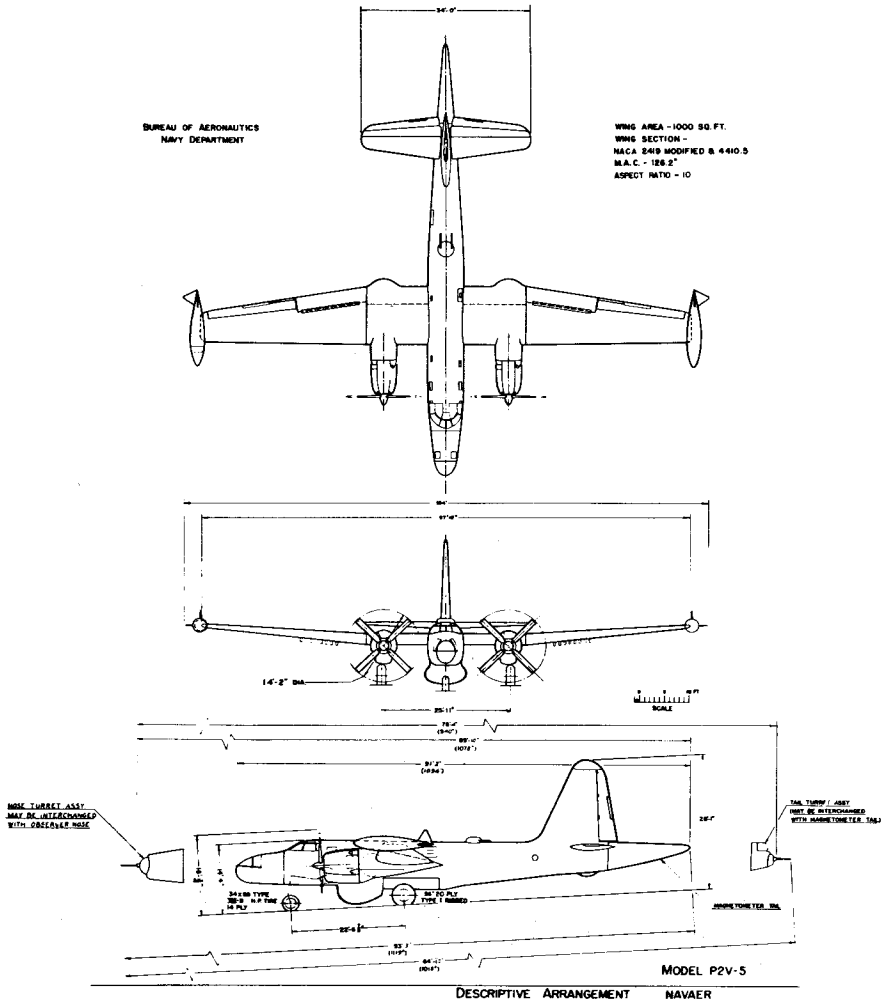
Standard Aircraft Characteristics NAVAER 1335A (REV. 1-49)

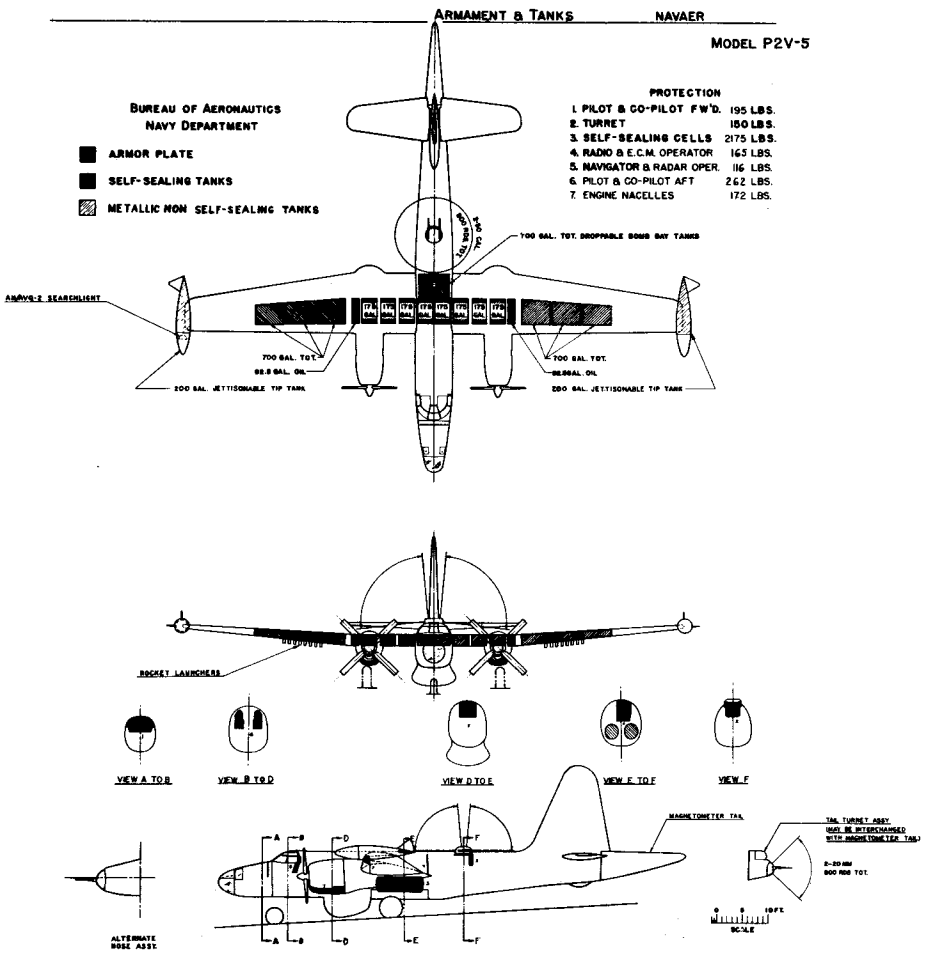
STANDARD AIRCRAFT CHARACTERISTICS

P2V-5 "NEPTUNE"

LOCKHEED

DECLASSIFIED





POWER PLANT

NO. & MODEL....(2) R-3350-30WA
MFR.....Wright
SUPERCH.....1 Stage, 2 Speed
RED.GEAR RATIO.....0.4375:1
PROP. MFR.....Ham. Std.
PROP.BL.DES.NO.....2J17C3-36S
NO.BL./DIA.....4/14' - 2"

RATINGS

	BHP	RPM	ALT.
T.O.	3250	2900	S.L.
MIL.	3250	2900	S.L. to 3400'
	2550	2600	11400'-15400'
NORM.	2600	2600	S.L. to 6500'
	2450	2600	9600' to 16600'

SPEC. NO. N-856-A

ORDNANCE

GUNS

NO.	SIZE	LOCATION	RDS.
		ASW	
2	.50 cal.	Deck Turret	800
		MINE LAYER	
2	20mm	Nose	800
2	20mm	Tail	800

FIRE CONTROL
MK. 18 Mod. 6

BOMBS AND ROCKETS

16-Aero 14B-2 rocket launcher (max.cap. 500 lbs.each) on alternate outer wing slats.

Torpedoes, Mines and Bombs carried in the fuselage.

Max.Load Capacity 12,000 lbs.

MISSION AND DESCRIPTION

The P2V-5 is designed for use as a long range anti-submarine airplane. It's secondary tactical mission is mine laying.

The airplane carries a crew of nine and features Fowler wing flaps, "varicam" stabilizer, wing and tail surface thermal anti-icing, electrical propeller deicing, droppable wing tip tanks, radar and searchlight equipment. As an alternate mine laying airplane, the MAD tail and observer nose are replaced by a 20 mm nose and tail turrets.

The P2V-5 has an all metal semi-monocoque fuselage with wings of conventional two-spar dural construction. This airplane is basically a P2V-4 modified to incorporate the R-3350-30WA engine and wing tip tanks of new design and capacity.

DEVELOPMENT

First Flight.....December 1951
Service Use.....September 1951

DIMENSIONS

WING
AREA.....1,000 sq. ft.
SPAN.....104' - 0"
MAC.....10' - 6"
LENGTH.....91' - 2"
HEIGHT.....28' - 1"
TREAD.....25' - 11"
PROP.GRD.CLEARANCE..0' - 9"

DECLASSIFIED

WEIGHTS

LOADINGS	LBS.	L.F.
EMPTY	43,000	
BASIC	44,900	
DESIGN	67,500	2.67
COMBAT(ASW)	61,320	2.95
MAX.T.O.	80,000	2.25
MAX.OVERLOAD LANDING	62,000	

All weights are actual

FUEL AND OIL

NO. TANKS	GALS.	LOCATION
4	2800	Wing
2	400	Wing Tip
2	700	Bomb Bay

FUEL GRADE.....115/145
FUEL SPEC.....MIL-F-5572

OIL

CAPACITY (GALS.).....165
GRADE.....1100
SPEC..... MIL-L-6082A

ELECTRONICS

Interphone.....AN/AIC-5B
Radio Transm.....AN/ART-13
Comm. Rec.....AN/ARC-5
Liaison Rec.....AN/ARP-15 A
UHF.....AN/ARC-27
VHF.....(P.S.I.) AN/ARC-1
Indicator.....AN/APA-81
Direct Finder.....AN/ARN-6
Radio Altimeter.....AN/APN-22
Marker Beacon.....AN/APN-12
Loran.....AN/APN-70

(Continued on NOTE Page)

21

PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION		(1) ASW PATROL 2 MK-41 Torps.	(3) MINELAYER 8 Mines			(5) FERRY
TAKE-OFF WEIGHT	lb.	71,400	80,000			73,170
Fuel	lb.	19,200	18,793			23,400
Payload Torpedoes/Mines	lb.	2,400	8,000			None
Wing loading	lb./sq.ft.	71.4	80.0			73.2
Stall speed - power-off	kn.	95.0	100.0			96.0
Take-off run at S.L. - calm	ft.	2,700	3,560			2,850
Take-off run at S.L. 25 kn. wind	ft.	1,600	2,300			1,725
Take-off to clear 50 ft. - calm	ft.	3,600	4,760			3,790
Max. speed/altitude (A)	kn./ft.	273/17,500	255/17,500			271/17,500
Rate of climb at S.L. (A)	fpm	1,030	760			980
Time: S.L. to 10,000 ft. (A)	min.	10.5	15.1			11.2
Time: S.L. to 20,000 ft. (A)	min.	27.8	49.0			30.5
Service ceiling (100 fpm) (A)	ft.	23,200	20,000			22,100
Combat range	n.mi.	2,775	2,290			3,375
Average cruising speed	kn.	180	170			175
Cruising altitude(s)	ft.	1,500	1,500			1,500
Combat radius	n.mi.	1,110	1,120			- -
Average cruising speed	kn.	180	170			- -
Mission Time	hrs.	15.6	12.69			
COMBAT LOADING CONDITION		(2)	(4)			
COMBAT WEIGHT	lb.	61,320	64,480			
Engine power		Military	Military			
Fuel	lb.	10,080	7,520			
Combat speed/combat altitude	kn./ft.	266/1,500	258/S.L.			
Rate of climb/combat altitude	fpm/ft.	1,800/1,500	1,640/S.L.			
Combat ceiling (500 fpm)	ft.	22,500	20,900			
Rate of climb at S.L.	fpm	1,820	1,640			
Max. speed at S.L.	kn.	263	258			
Max. speed/altitude	kn./ft.	281/16,400	273/16,400			
LANDING WEIGHT	lb.	53,402	54,456			51,168
Fuel	lb.	1,202	1,249			1,398
Stall speed - power-off	kn.	82.3	83.0			81.0
Stall speed - with approach power	kn.	73.7	74.2			72.5

NOTES

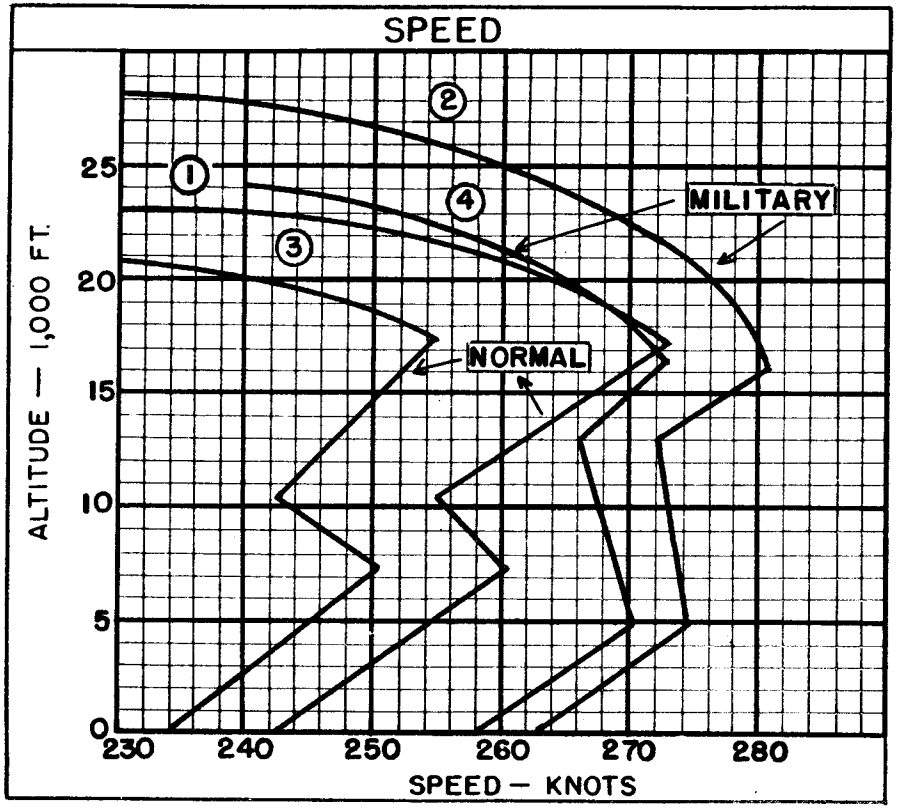
REASON FOR REVISION: Flight test data on the P2V-5 airplane and incorporation of APS-20B radome.

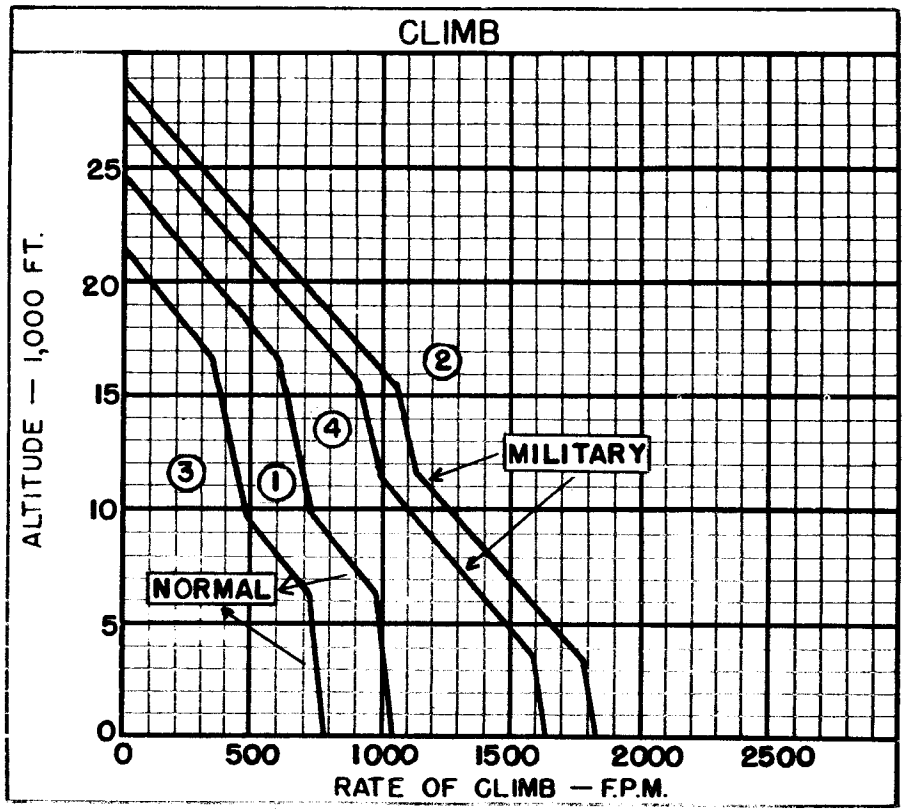
(A) Normal Rated Power

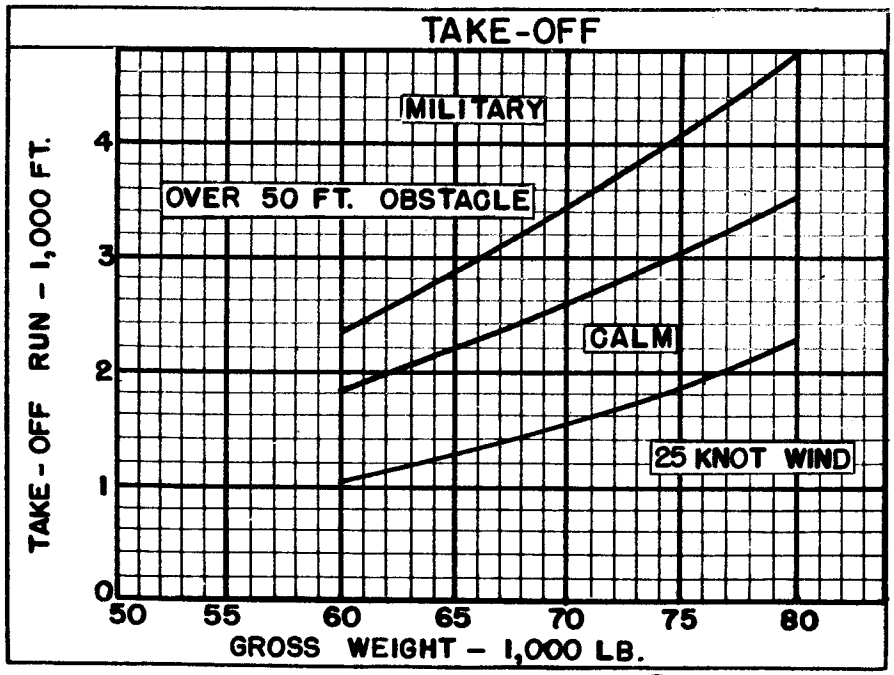
(B) Military Rated Power

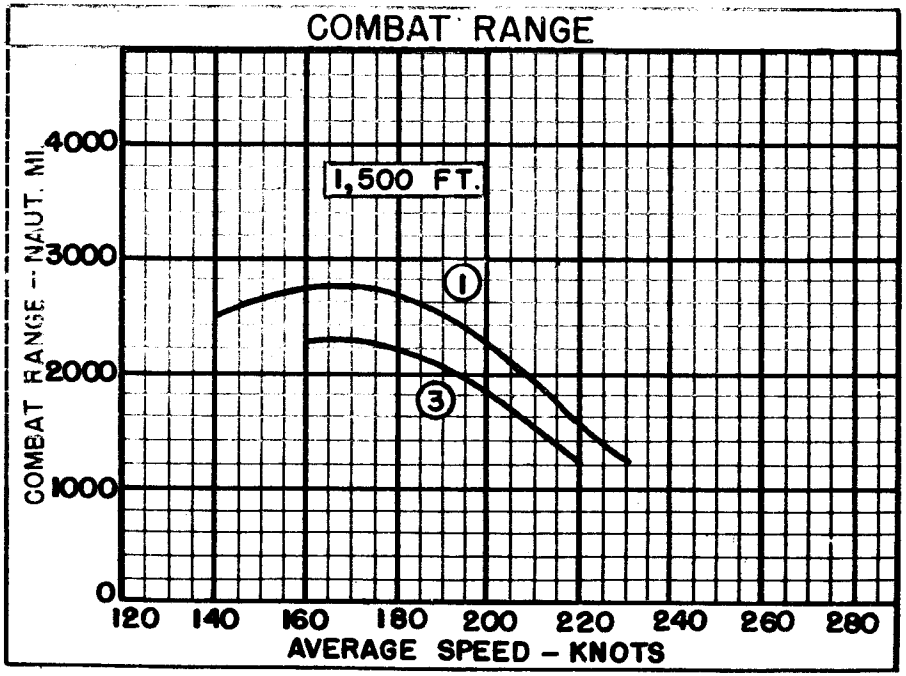
Performance Basis: Calculations and contractor flight test data on the P2V-5 airplane.

(Continued on NOTE Page)









◯ LOADING CONDITION COLUMN NUMBER

23

NOTES

UNCLASSIFIED

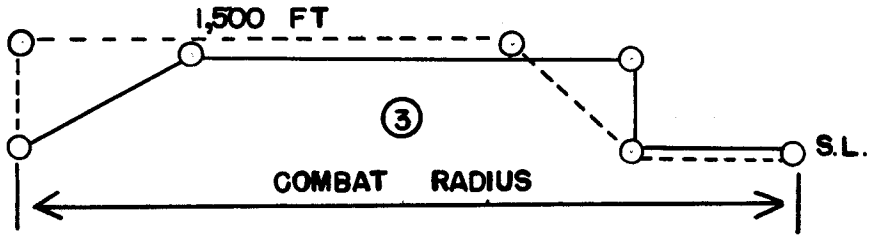
ASW FIXED WING AIRCRAFT

Combat Radius = 40% of combat range at 1,500 ft. altitude.

MINE LAYER

WARM-UP, TAXI, TAKE-OFF: 10 minutes at normal rated power at sea level.
CLIMB: To cruise altitude of 1,500 ft. at normal rated power.
CRUISE-OUT: At speed for long range at cruise altitude.
DESCEND: To sea level.
RUN-IN: 50 nautical miles at military rated power.
DROP MINES:
RUN-OUT: 50 nautical miles at military rated power.
CLIMB: To cruise altitude of 1,500 ft. at normal rated power.
CRUISE-BACK: At speed for long range at cruise altitude.
RESERVE: 20 minutes at speed for long range at sea level plus 5% of initial fuel load.

MISSION TIME = CLIMB + CRUISE-OUT + RUN-IN + RUN-OUT + CLIMB + CRUISE-BACK



Combat Radius (mine layer problem) is reduced approximately 6 nautical miles for each additional minute of military power operation.

Rate of climb at sea level, military rated power, one engine inoperative (propeller feathered), flaps and gear-up. (ASW Configuration)

Gross Weight - lbs.	Rate-of-climb - ft./min.
56,000	545
67,500	270
70,000	220
76,000	100

◯ LOADING CONDITION COLUMN NUMBER

24

NOTES

ELECTRONICS (Continued)

IFF Equip.....AN/APX-6
AN/APX-7
(in planes APS 20B & C only)
ECM.....AN/APA-9B
AN/APA-11

Sonobuoy Rec.....AN/ARR-26
Grd. Pos. Ind....AN/APA-57B
M.A.D.....AN/ASQ-8
D.M.E.....AN/ARN-21
Search Radar.....AN/APS-20B

ECM-Dir. Find.....AN/APA-69
Omn.-Dir.Find....AN/ARN-14A
(P.S.I.) AN/APS-20C-(P.S.I.) AN/APS-31
AN/APS-31 will be back fitted with AN/APS-20B
Radar Bomb.....AN/APS-16

PERFORMANCE SUMMARY (Continued)

Combat range and radius are based on engine specification fuel consumption data increased by 5%.

25 Oil capacity consists of 120 gals. in wing tanks and 36 gals. in fuselage tank. Later P2V-5 (R-3350-30WA) models have total wing tank oil capacity of 165 gals. and no fuselage oil tanks.

DECLASSIFIED