

NAVAL AIRCRAFT

AVENGER

The TBF was designed in response to a Navy invitation for new designs for a torpedo bomber to replace the TBD *Devastator*. In April 1940, a contract was issued for two prototype XTBF-1s. First flight was August 7, 1941. The first public look at the plane was scheduled for December 7. That day's events led to naming the new aircraft *Avenger*.

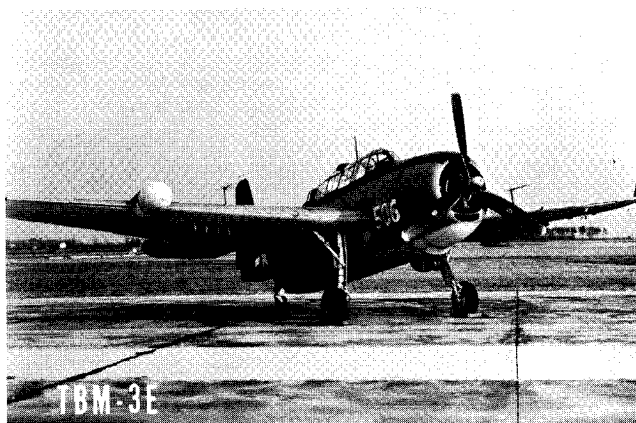
In December 1940, one year before U.S. entry into WW II, a production contract was ordered and TBF-1s began rolling off Grumman's assembly lines soon after. Among these early models were some assigned to Torpedo Squadron Eight. Though they did not reach the Pacific in time to join VT-8's TBDs on *Hornet*, six participated in the Battle of Midway from that island's airfield.

In November 1942, Eastern Aircraft, a division of General Motors, began delivering the first TBM-1s, supplementing *Avenger* production, and, in December 1943, Grumman discontinued building TBFs to concentrate on producing the F6F *Hellcat*.

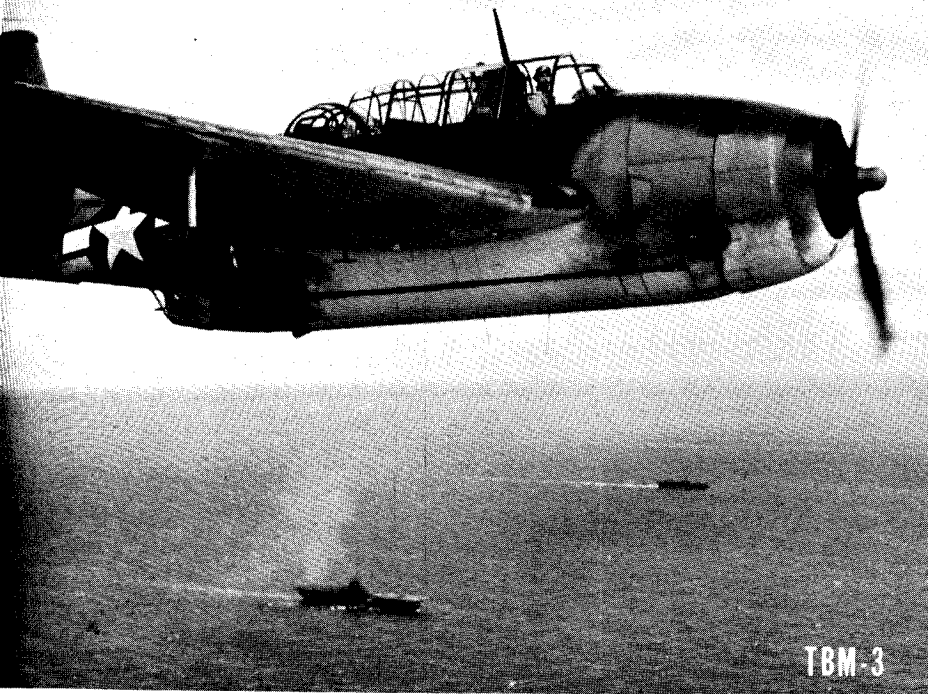
The *Avenger* was produced in many versions, the most numerous being the TBF-1 and TBM-1. Other models included the TBF-1C and TBM-1C with two wing-mounted .50 cal. guns; followed by versions with special radar; with cameras for photo recon and with searchlights for ASW. The TBM-3 with more powerful engines replaced the -1 series in production. Versions were built or modified including -3Es with improved radar; the first carrier AEW airplane; and ASW, utility, ECM and COD models.

The *Avenger* made its name in WW II as a rugged torpedo plane used effectively against surface vessels in the Pacific and from CVEs in the Atlantic as an ASW attack plane.

Avengers also served with the Royal Navy, Royal New Zealand Air Force and French Navy. Ironically, the last TBMs to be retired from active service, in 1962, were flown by the Japanese Maritime Self Defense Force.



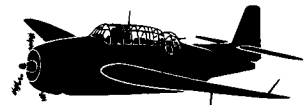
INGER



TBM-3

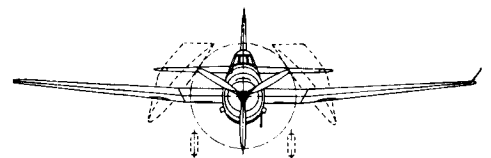
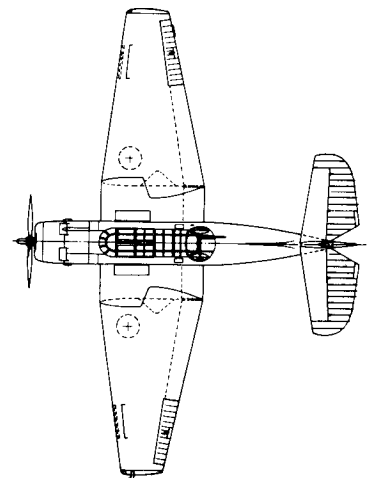
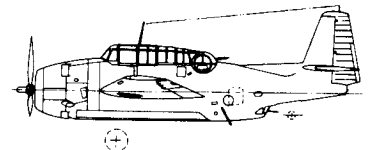


TBM-3S2
TBM-3W2



TBF/TBM

Length	40'11 1/2"
Height	16'5"
Wing span	54'2"
Power plant	
TBF-1	R-2600-8 1,700 hp
TBM-3E	R-2600-20 1,900 hp
Maximum speed	
TBF-1	232 kts
TBM-3E	220 kts
Cruising speed	
TBF-1	126 kts
TBM-3E	125 kts
Service ceiling	
TBF-1	22,400'
TBM-3E	27,100'
Maximum range	
TBF-1	1,055 nm
TBM-3E	880 nm
Armament	
TBF-1	one fixed cowl-mounted .30 cal., one dorsal .50 cal., one ventral .30 cal., 1,600 lbs. in bomb bay
TBM-3E	two fixed wing .50 cal., one dorsal .50 cal., one ventral .30 cal., 2,000 lbs. in bomb bay
Crew	pilot, gunner, radar operator

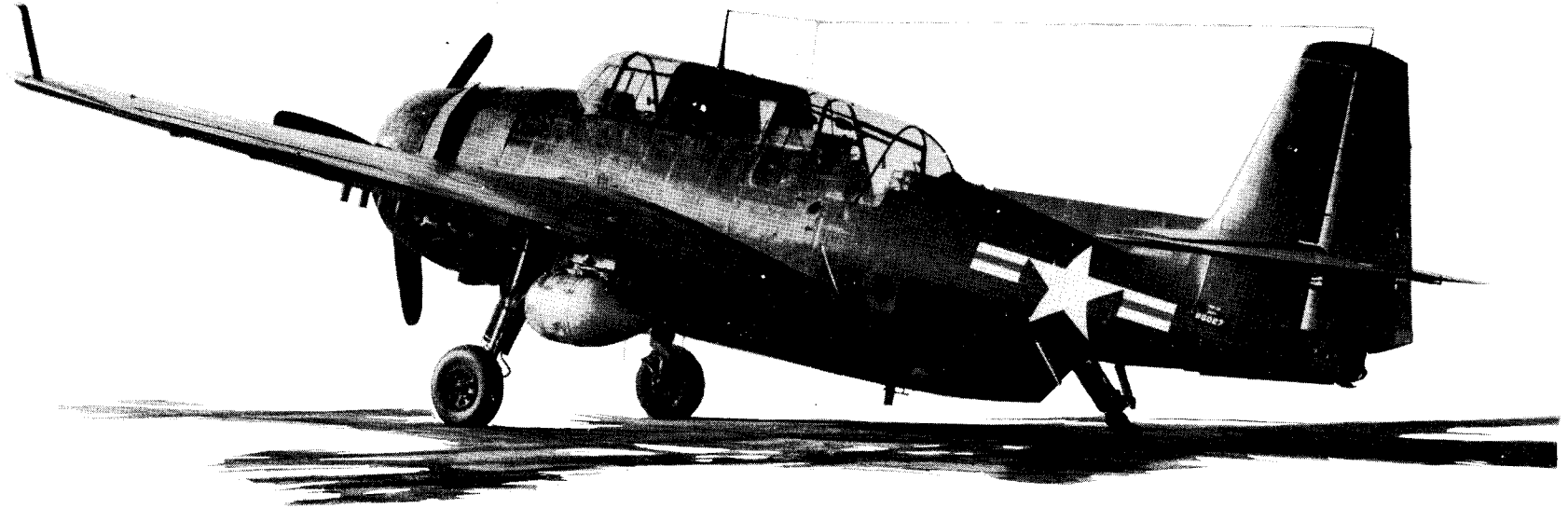


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R. C. Copeland

MAR 16 1992

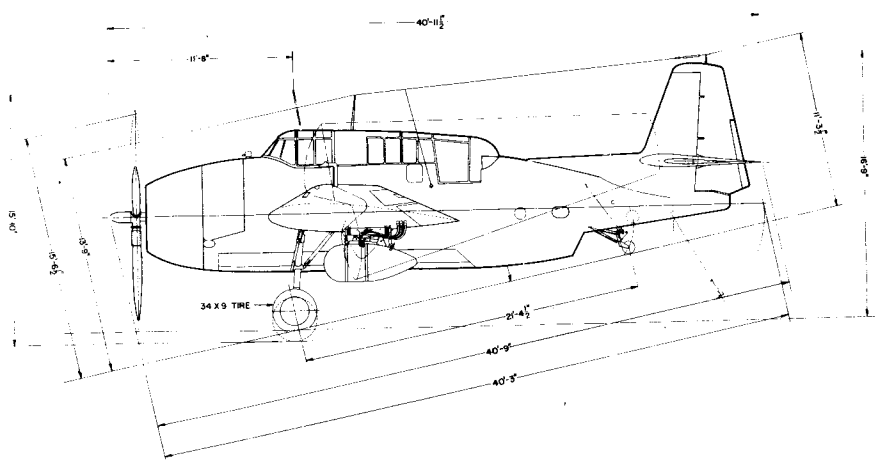
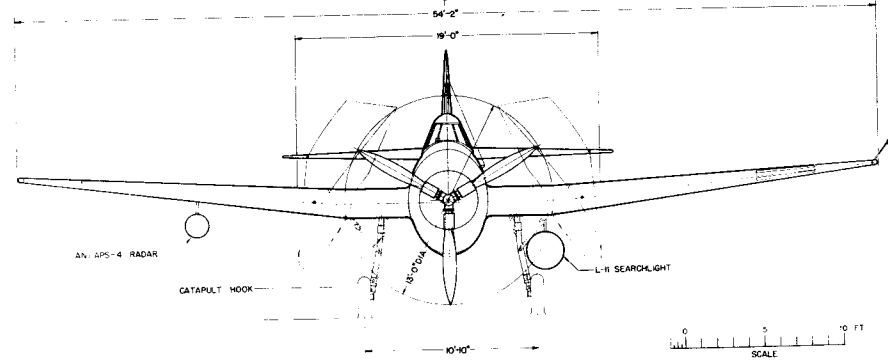
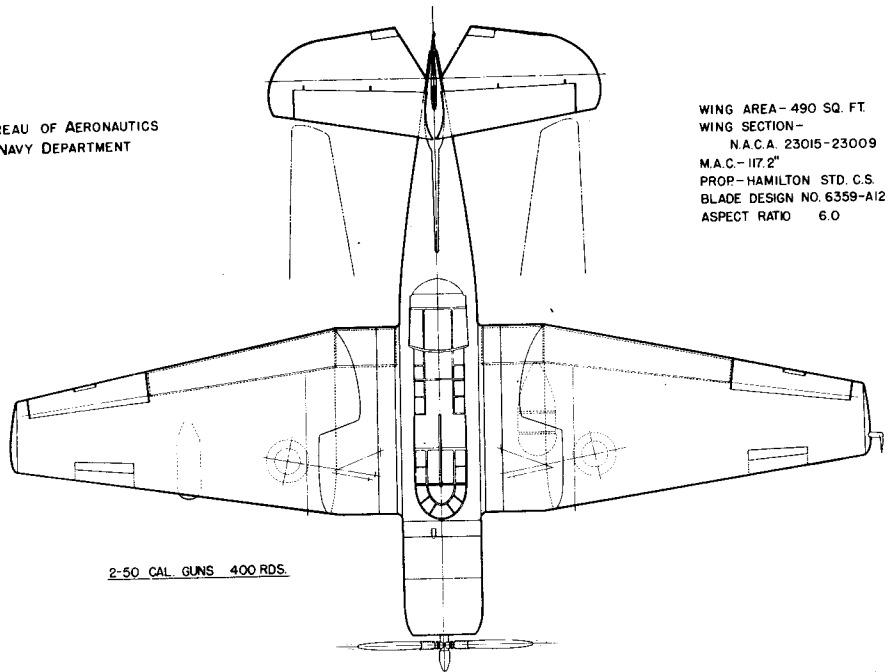
CONGRESSIONAL AND
PUBLIC AFFAIRS OFFICE
NAVAL AIR SYSTEMS COMMAND



STANDARD AIRCRAFT CHARACTERISTICS
TBM-3S "AVENGER"

BUREAU OF AERONAUTICS
NAVY DEPARTMENT

WING AREA-490 SQ. FT.
WING SECTION-
N.A.C.A. 23015-23009
M.A.C.-117.2"
PROP-HAMILTON STD. C.S.
BLADE DESIGN NO. 6359-A12
ASPECT RATIO 6.0



DESCRIPTIVE ARRANGEMENT

MISSION AND DESCRIPTION

This is a carrier based anti-submarine modification of the TBM-3E which has had wide service use as a torpedo bomber. The TBM-3S is basically similar to the TBM-3E and has the addition of electronic gear to adapt it to anti-submarine warfare. The plane is presently being evaluated and is planned as an interim ASW aircraft for use until replaced by the AF-1S and -2S.

Structure is conventional, using single spar wing, hydraulically or manually folded, carrying a split flap of 62.5 sq. ft. area.

DIMENSIONS

SPAN.....54'-2"
 LENGTH.....41'-0"
 HEIGHT.....15'-7"
 WING AREA.....490 sq. ft.
 M.A.C.....117.2"
 TREAD.....10'-10"

WEIGHTS

Loadings	Lbs.	L.F.
EMPTY.....	11055.....	
BASIC.....	11870.....	
DESIGN.....	14500.....	4.0
COMBAT.....	15097.....	3.7
MAX.T.O.....	17600.....	2.8
MAX.LAND....	16000.....	

FUEL AND OIL

Gals. - No. Tanks - Location
 335.....3..Fuselage(protect.
 150.....1..Wing (drop)
 FUEL GRADE.....100/130
 FUEL SPEC.....AN-F-48

OIL

CAPACITY (Gals.).....32
 SPEC.....AN-O-8
 GRADE.....1120

ELECTRONICS

SEARCH RADAR.....AN/APR-1
 SONOBUOY REC.....AN/APR-16B
 RCM.....AN/APA-70
 RANGE RECEIVER.....AN/ARC-5
 VHF COMMAND.....AN/ARC-1
 HOMING.....AN/ARR-2
 IFF.....AN/APX-2
 RADAR.....AN/APS-4
 ALTIMETER.....AN/APN-1
 SEARCHLIGHT.....L-11
 HF LIAISON.....AN/ART-13

POWER PLANT

NO. & MODEL....(1) R-2600-20
 MFR.....WAC
 SUPERCH.....1 Stage, 2 Speed
 PROP.GEAR RATIO.....16:9
 PROP. MFR.....Ham. Std.
 PROP.DES.NO.....6359-A12
 NO.BL./DIA.....3/13'-0"

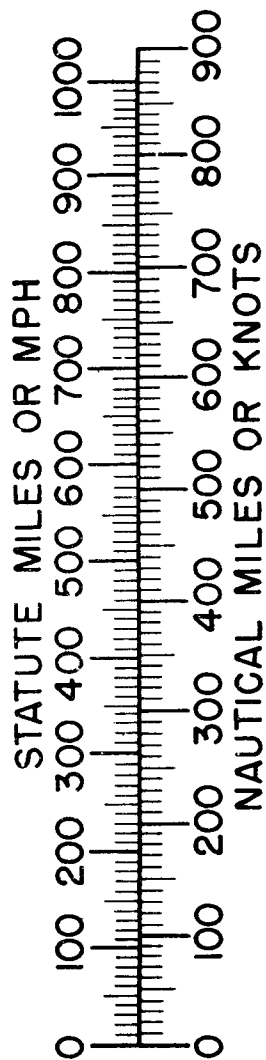
RATINGS

	Bhp. @ Rpm.	@ Alt.
T.O.	1900 2800	S.L.
	or 1800 2600	S.L.
MIL.	1750 2600	3200'
	1450 2600	15000'
NORMAL	1600 2400	5000'
	1350 2400	14800'

SEE NOTE
 SPEC NO. N-776-B

ORDNANCE

GUNS			
No.	Size	Location	Rds.
2	.50 Cal.	Wing	400
MK. 8 Illum. - Sight			
BOMBS & ROCKETS			
Type	Size	Location	No.
Torp.	Mk. 34	B.B.	1
HVAR	5"	Wing	8
MK. 23-6 Bombsight			
MK. 41-1 Aircraft Periscope			
Camera K-25			
2 Sonobuoys, D			
12 Sonobuoys, N.D.			
18 Float lights, MK.5			
2 Flares MK.6			



PERFORMANCE SUMMARY

LOADING CONDITION		(1) Torpedo 1-MK. 34 Torp. 1-150 Gal. Ext. Tank	(3) Rocket-Torp. 8-5" HVAR 1 MK34 Torp.
TAKE-OFF WEIGHT	lbs	17280	17377
Fuel	Fixed/Drop	2010/900	2010
Bombs	lbs	1160	1160
	lbs		
Wing/Power Loading (A)	lbs/sq.ft. lbs/ bhp	35.3/11.9	35.5/12.0
Stall Speed--Power off	kn	70.8	71.0
Stall Speed--Power off - No Fuel	kn	64.6	66.8
Stall Speed--Power on	kn	68.4	68.6
Maximum Speed/Alt (B)	kn/ft	208/17300	207/17300
Take-off Distance, deck -- calm	ft	964	978
Take-off Distance, deck 25 kn.	ft	423	430
Take-off Distance, Airport	ft		
Rate of climb -- sea level (B)	ft/min	1395	1295
Service Ceiling (B)	ft	25600	25500
Time-to-climb 10000 ft. (B)	min	9.0	9.1
Time-to-climb 20000 ft. (B)	min	23.9	24.0
Combat Range/V av 1500	ft. n.mi/kn	965/124	630/126
Combat Radius/V av 1500	ft. n.mi/kn	385/124	250/126
LOADING CONDITION		(2) Combat	(4) Combat
GROSS WEIGHT	lbs	15097	15097
Engine power		Military	Normal
Fuel	lbs	2010	2010
Bombs/Tanks			
Max. speed at sea level	kn	205	198
Max. speed/ACA ft.	kn	223/16400	218/17400
Combat speed/Alt.	kn/ft	208/1500	200/1500
Rate of climb SL	ft/min	1860	1645
Ceiling for 500 fpm R/C	ft	23700	23100
Time-to-climb/Alt.	min/ft	15.4/20000	17.1/20000

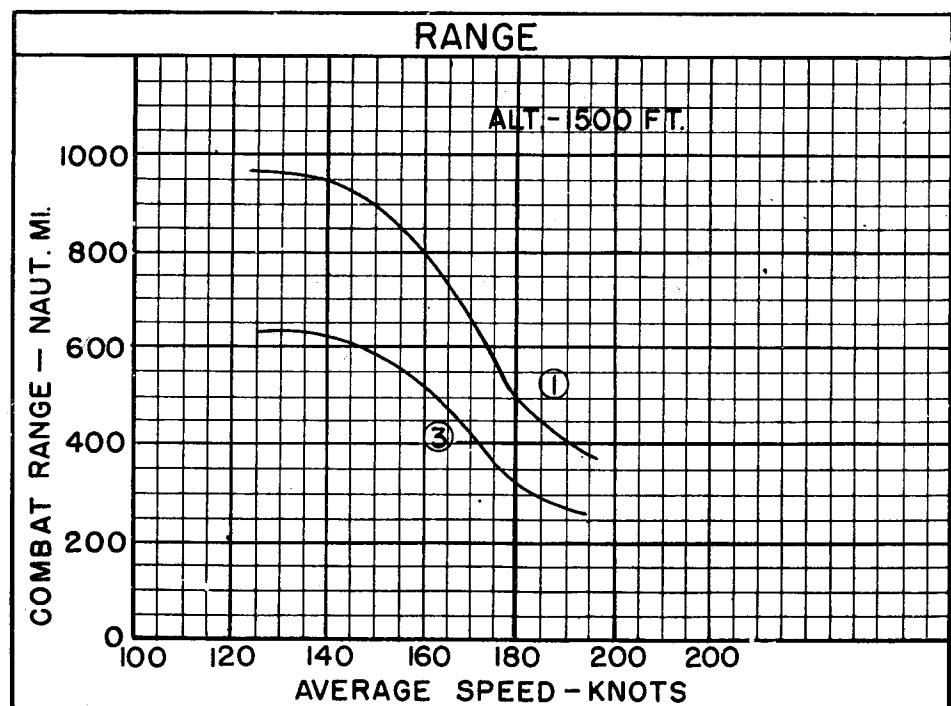
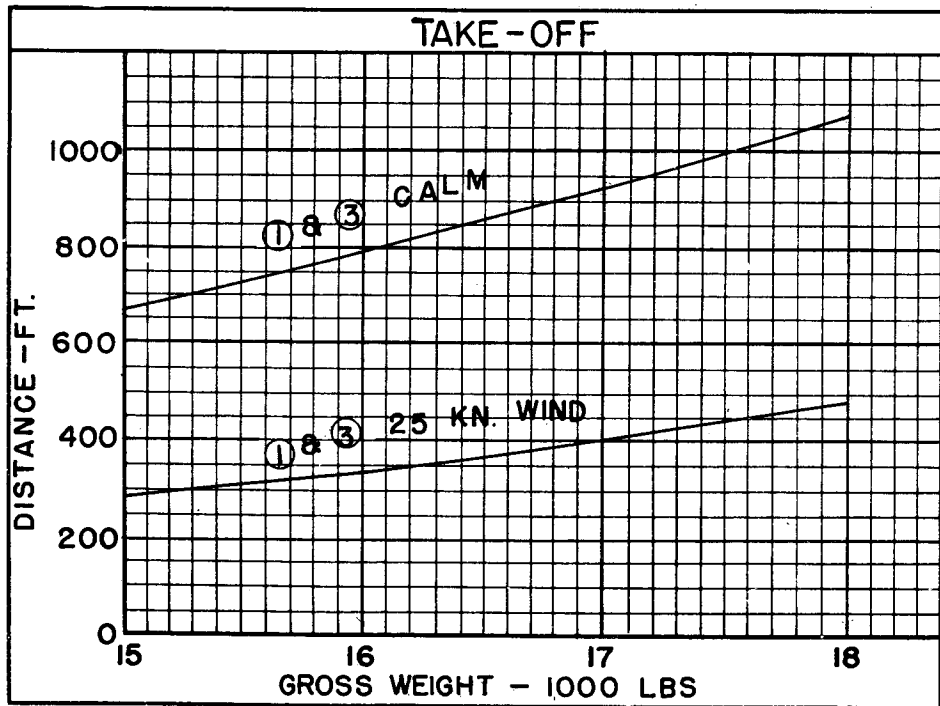
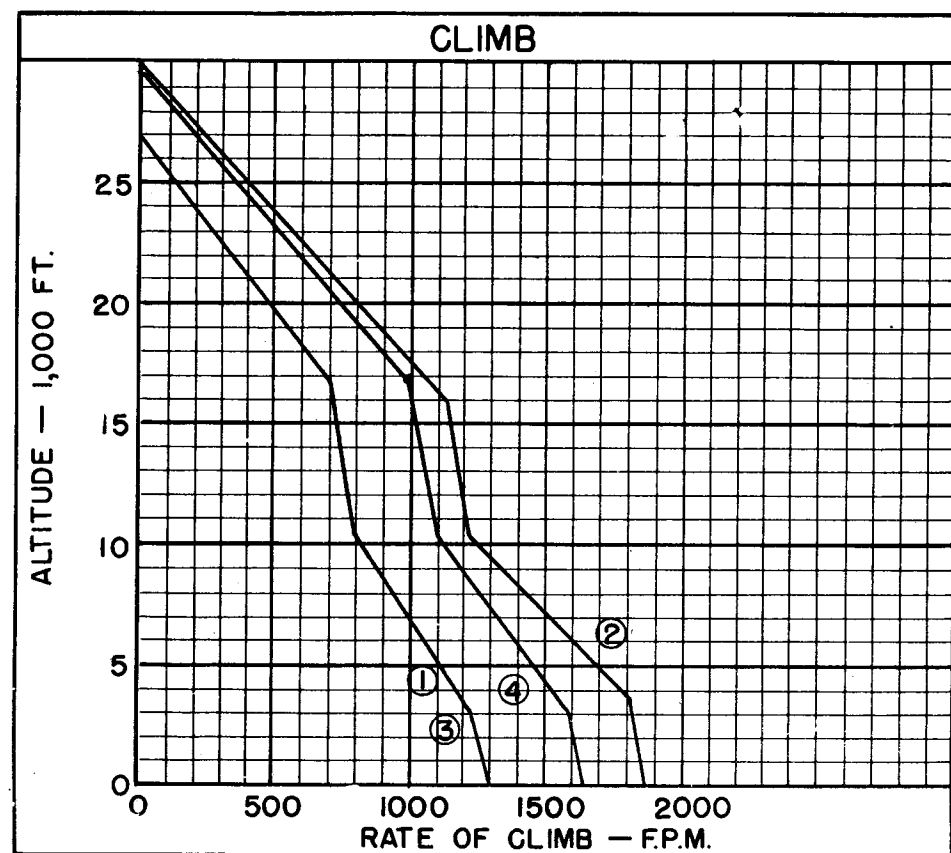
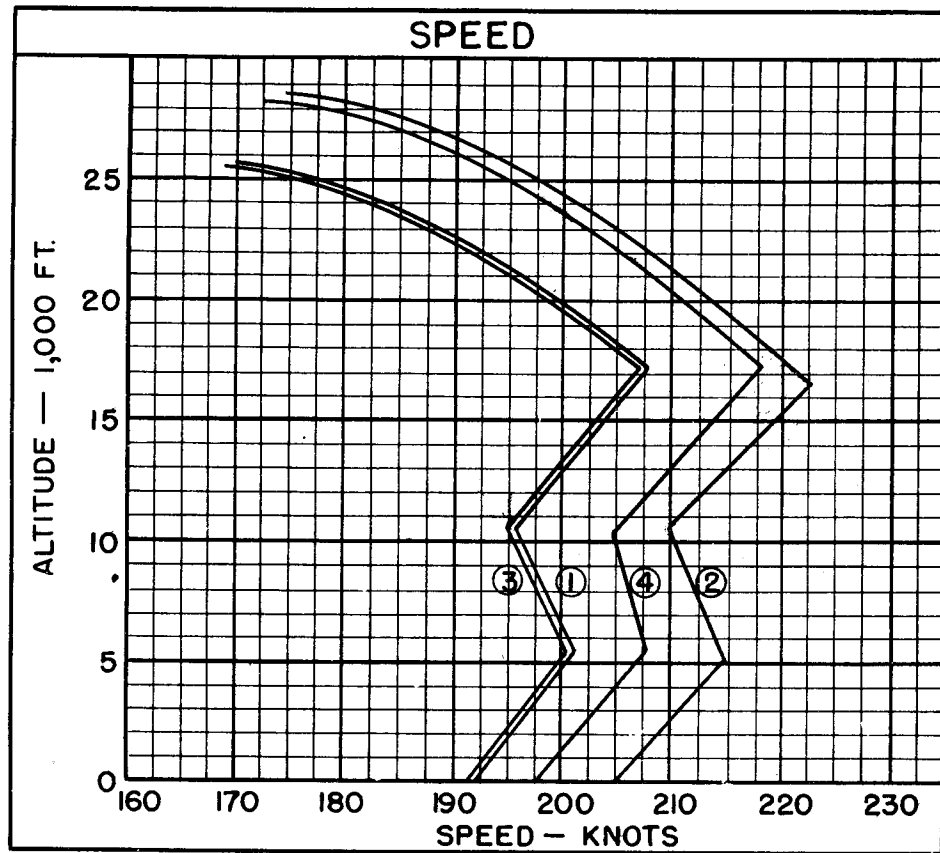
NOTES

- (A) BHP at Maximum Critical Altitude
 (B) Normal BHP

Performance is based on flight test of the TEM-3 airplane.

Range and radius are based on flight test fuel consumption of the TEM-3 airplane increased by 5%.

 Rocket launchers, AN/APS-4, searchlight, and camera aboard in all conditions, sway bracing and rack installed only when drop tank is carried.



NOTES

Spotting: 200ft. length is required to spot 25 airplanes on the 96 ft. wide deck immediately aft of the forward ramp on CV-9 Class carriers.

Combat Radius is .4 of maximum combat range at 1500 ft.

Engine ratings from Flight Test:

	<u>Bhp.</u>	<u>Rpm.</u>	<u>Alt.</u>
T.O.	1900	2800	S.L.
Mil.	1750	2600	3700
	1450	2600	15900
Norm.	1600	2400	4200
	1350	2400	16900