NAVAL AIRCRAFT

AVE

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.*

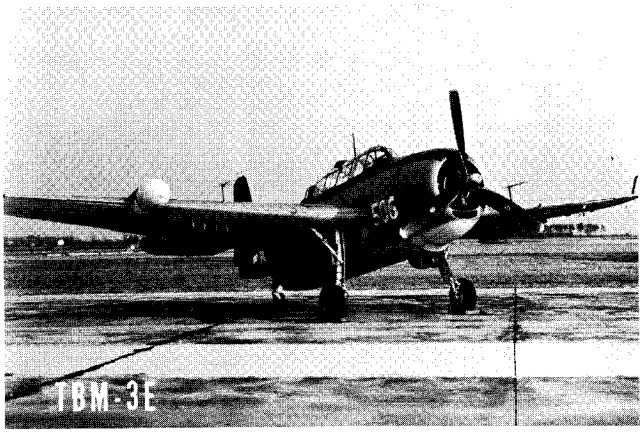
In December 1940, one year before U.S. entry into WW II, a production contract was ordered and TBF-1s began rolling off Grumman's assembly lines soon after. Among these early models were some assigned to Torpedo Squadron Eight. Though they did not reach the Pacific in time to join VT-8's TBDs on *Hornet*,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

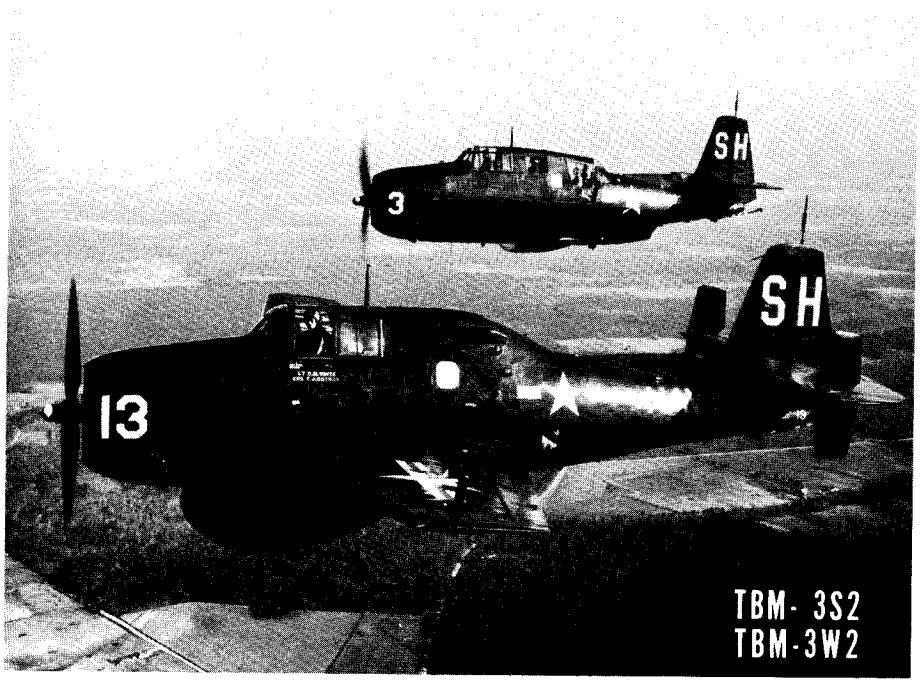

TBM-3E

TBM-3R

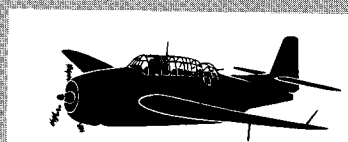
TBF-1

NGER

TBM-3

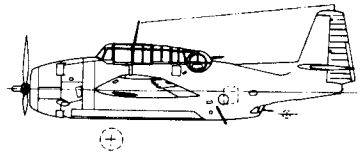


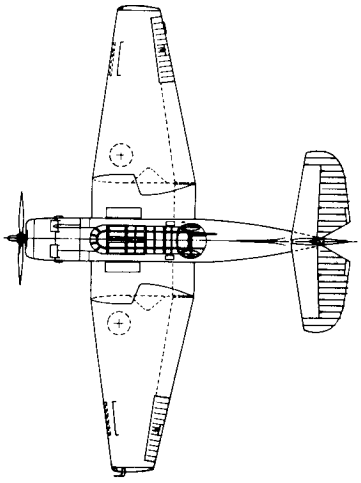
TBM- 3S2
TBM-3W2

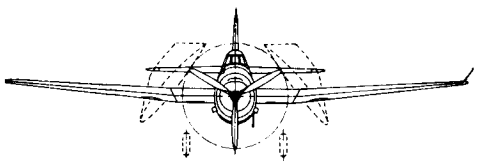


TBF/TBM

Length	40'11½"
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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MAR 16 1992
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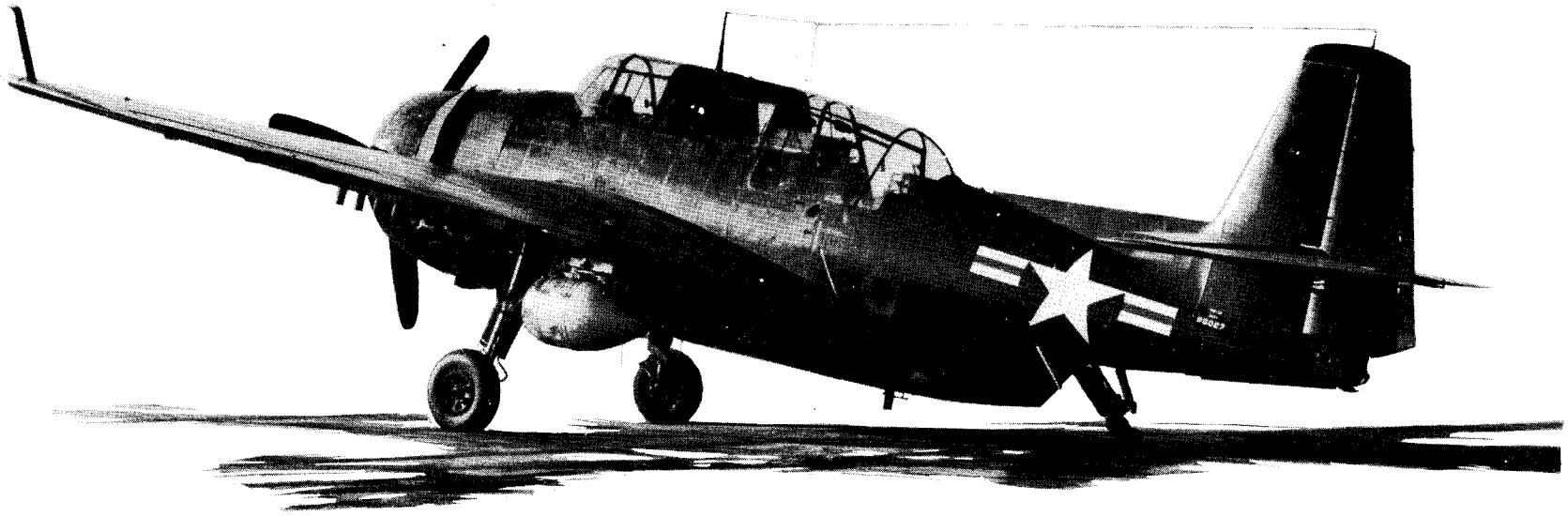
NAVAL AIR SYSTEMS COMMAND

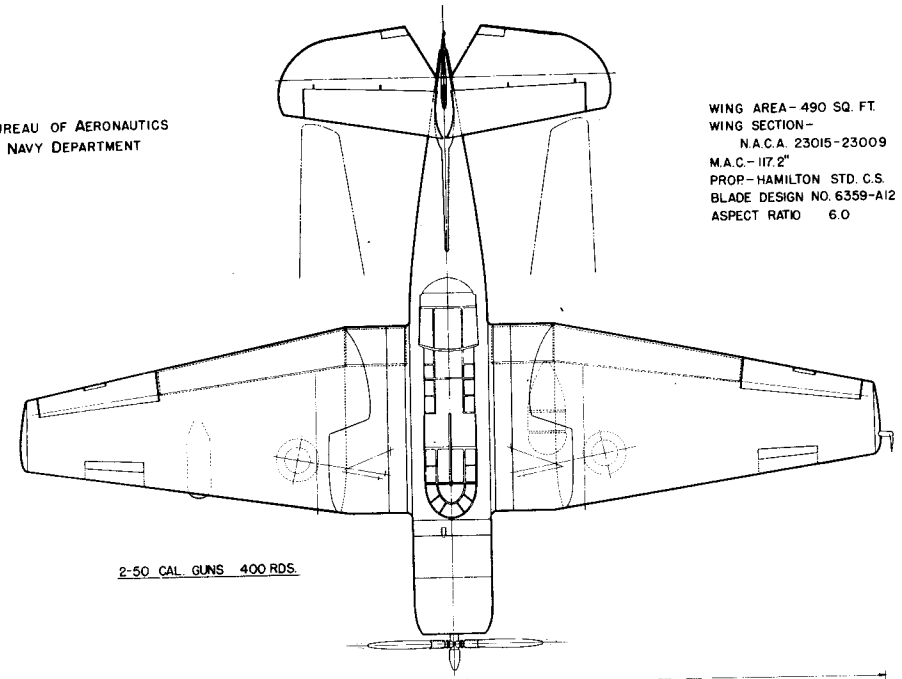


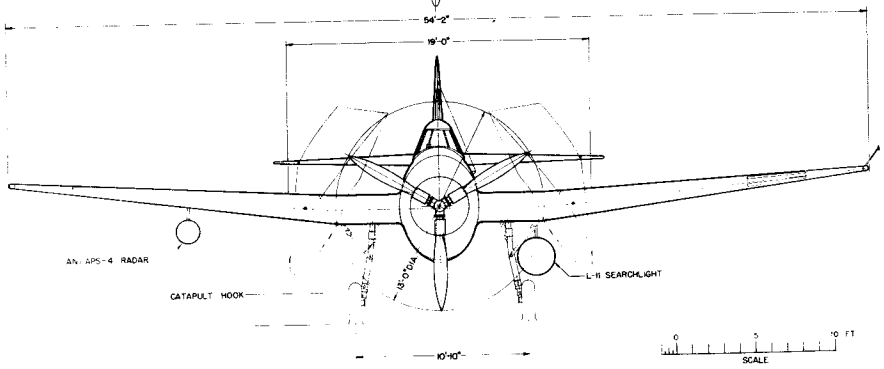
STANDARD AIRCRAFT CHARACTERISTICS

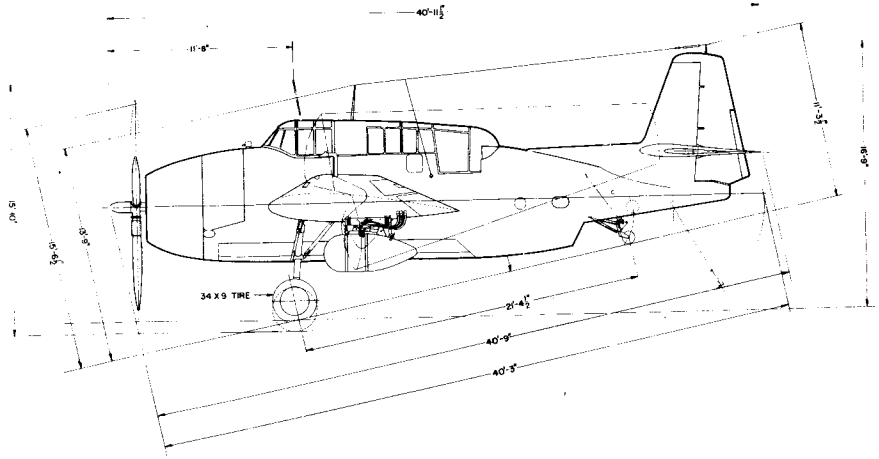
TBM-3S "AVENGER"

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.

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	

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

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

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

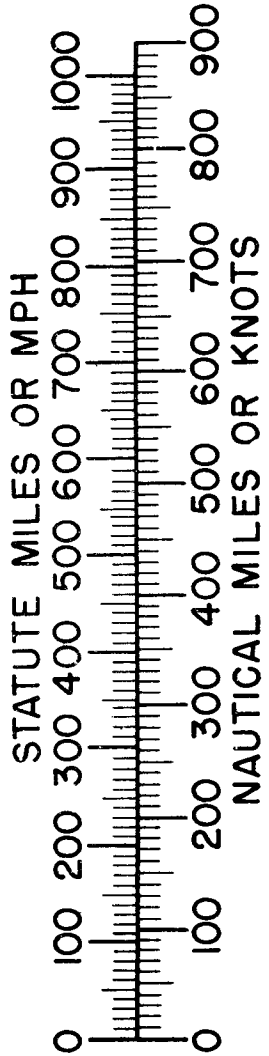
MK. 23-6 Bombsight
MK. 41-1 Aircraft Periscope
Camera K-25
2 Sonobuoys, D
12 Sonobuoys, N.D.
18 Float lights, MK.5
2 Flares MK.6

DIMENSIONS

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

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



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	lbs	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		

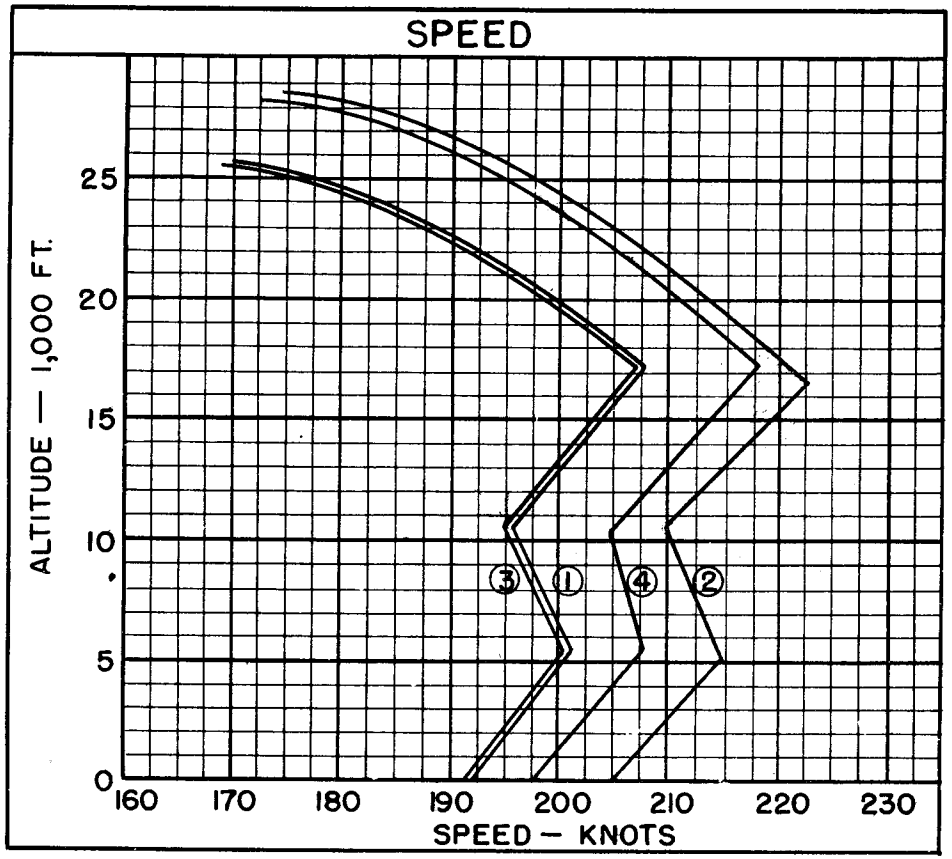
NOTES

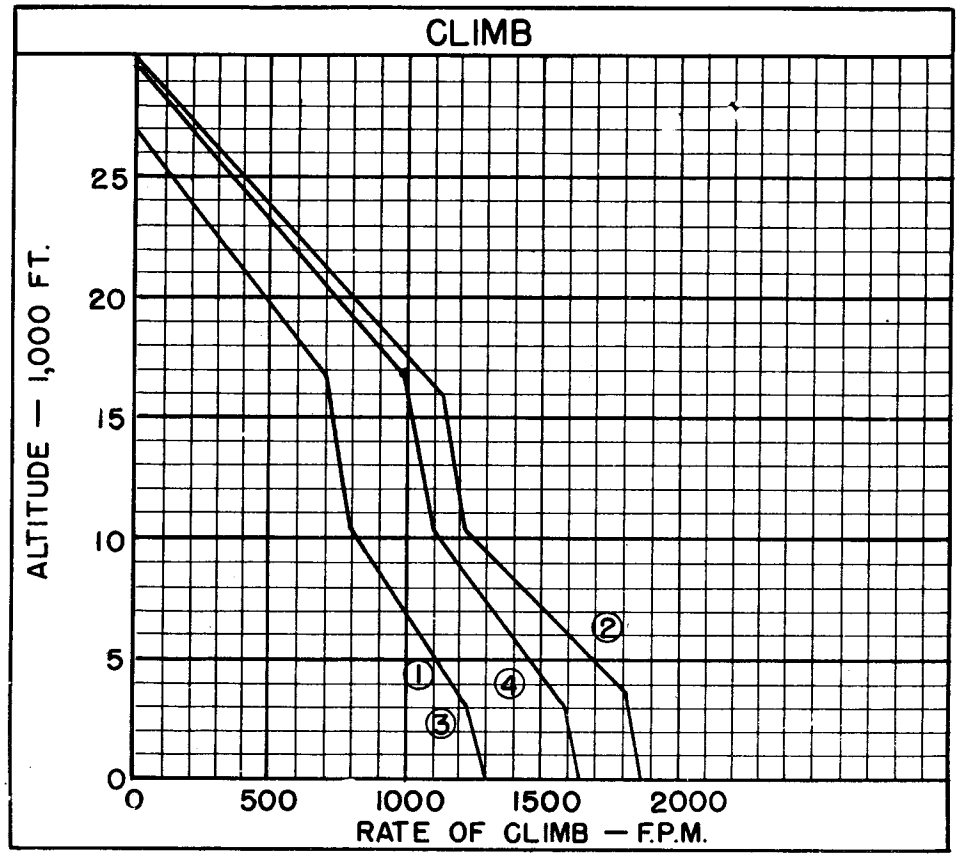
(A) BHP at Maximum Critical Altitude
(B) Normal BHP

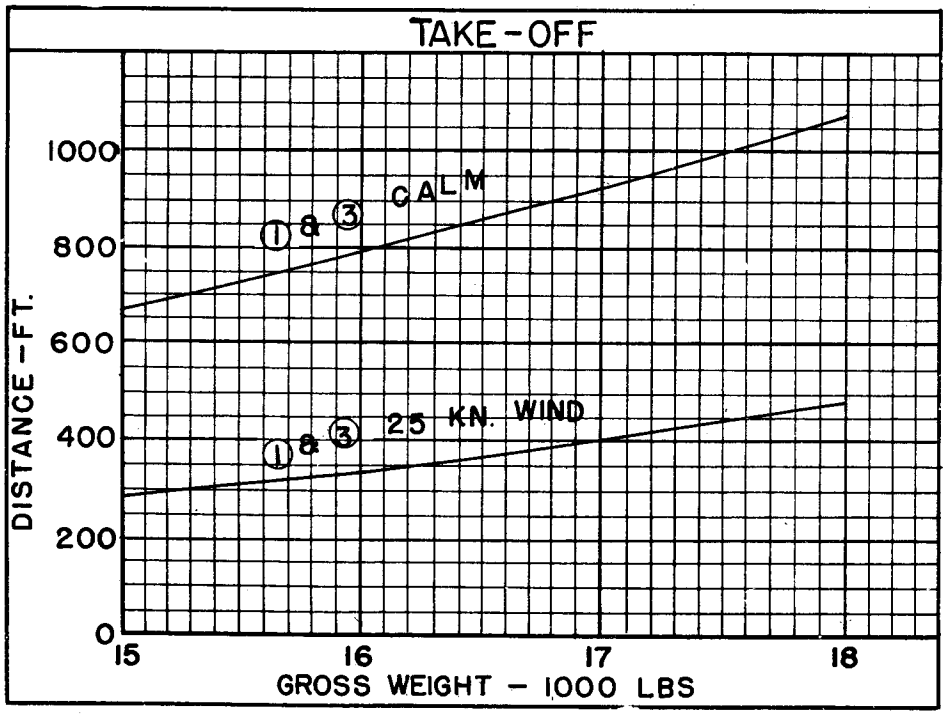
Performance is based on flight test of the TBM-3 airplane.
Range and radius are based on flight test fuel consumption of the TBM-3 airplane increased by 5%.

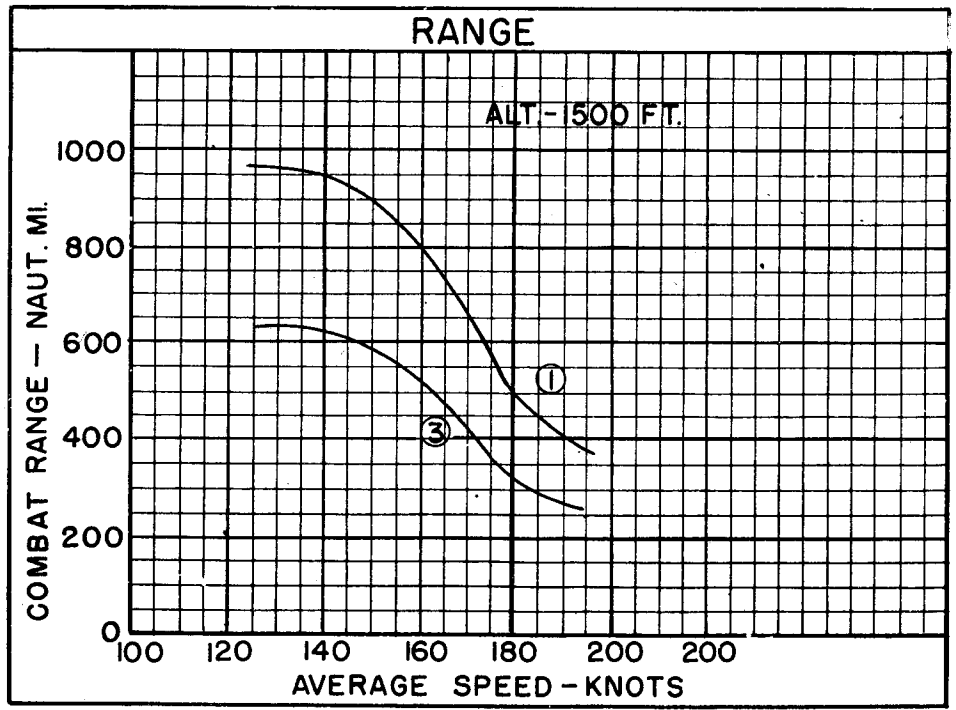
Rocket launchers, AN/APS-4, searchlight, and camera aboard in all conditions, sway bracing and rack installed only when drop tank is carried.

NOTES CONTINUED ON LAST PAGE


SPEED
ALTITUDE — 1,000 FT.
0
5
10
15
20
25
160
170
180
190
200
210
220
230
SPEED — KNOTS
③
①
④
②


CLIMB
ALTITUDE — 1,000 FT.
0
5
10
15
20
25
0
500
1000
1500
2000
RATE OF CLIMB — F.P.M.
②
①
④
③


TAKE-OFF
DISTANCE-FT.
0
200
400
600
800
1000
15
16
17
18
GROSS WEIGHT — 1000 LBS
① & ③ CALM
① & ③ 25 KN. WIND


RANGE
ALT.-1500 FT.
COMBAT RANGE — NAUT. MI.
0
200
400
600
800
1000
100
120
140
160
180
200
200
AVERAGE SPEED-KNOTS
①
③

NOTES

Spotting: 200 ft. 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:

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