

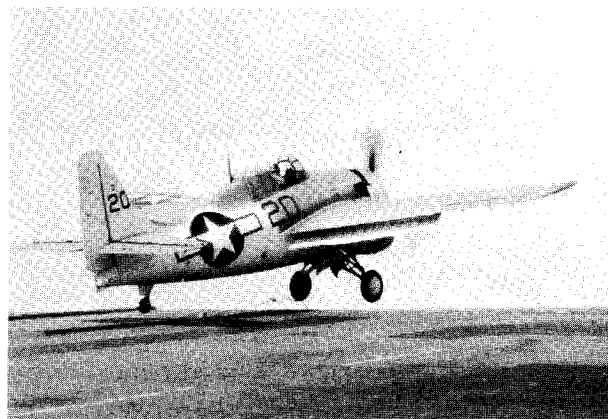
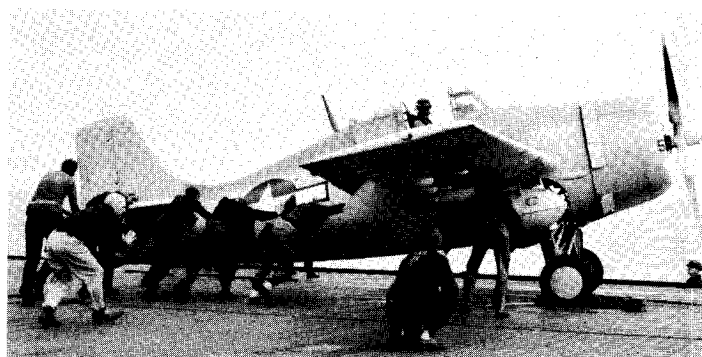
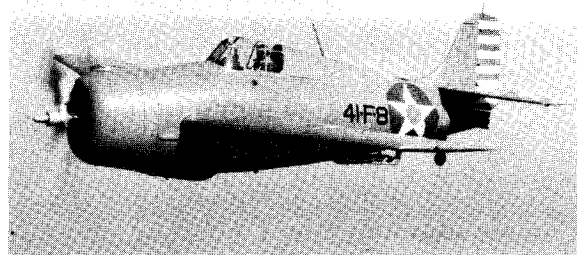
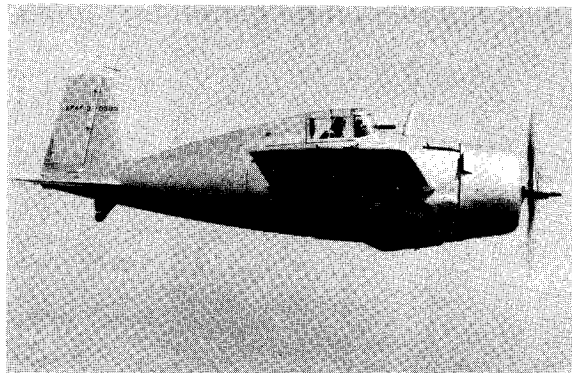
The Grumman F4F *Wildcat*, the only U.S. Navy fighter to serve throughout all of World War II, was first designed as a biplane in 1935. Designated the XF4F-1, this version soon showed that it could not compete with monoplane fighters and an alternate design was ordered in 1936. This was the XF4F-2, a mid-wing, all-metal monoplane with landing gear which retracted into the fuselage. In flight tests, it proved to be ten mph faster than its competitor, the F2A-1 *Buffalo*, which had earlier shown the F4F biplane design obsolete. Though the F2A won the fly-off tests in 1938, modifications to the *Wildcat* were pushed ahead and a new prototype, the XF4F-3, with increased wingspan, altered tail design and a more powerful engine, showed such promise that initial orders were placed for it in 1939. Other models followed, including F4F-4 and -7, and versions ordered by France and Britain.

The first *Wildcats* to be delivered to Navy squadrons went to VF-4 and VF-7 at NAS Norfolk, assigned to *Ranger* and *Wasp*, respectively. By the end of 1941, the Navy and Marine Corps had received 248 of the stubby little fighters. These suffered their first combat losses at the Marine air stations at Ewa, Hawaii, and Wake Island on December 7, 1941, during Japanese attacks, but soon revenged themselves against raiding bombers at Wake before being overcome by the vastly superior numbers of the attacking force. This was not the F4F's first taste of combat. In the Royal Navy as *Martlets* they had already seen action against the Luftwaffe off Britain's coast.

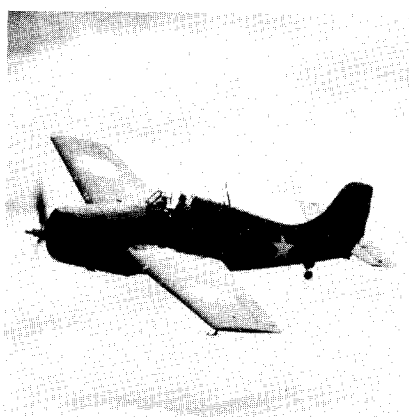
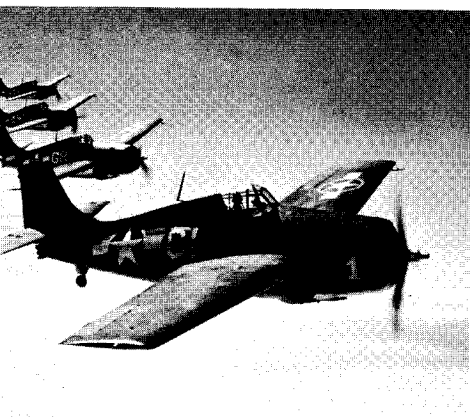
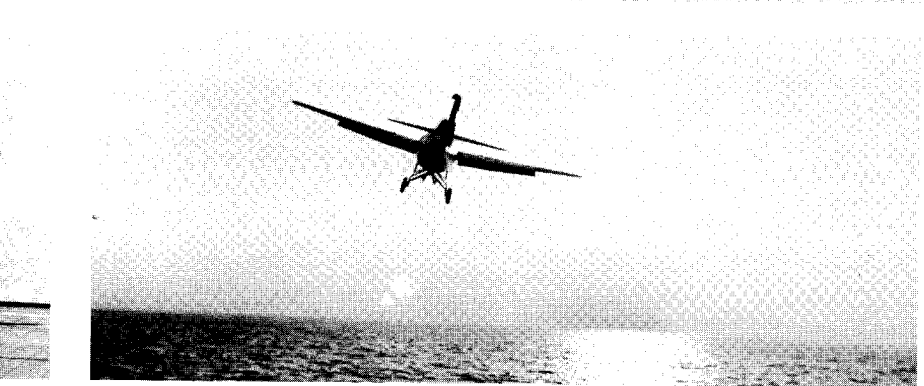
The F4F-4 introduced in 1941, added a new feature to the *Wildcat*: folding wings. Though manually operated, this alteration added to the planes' utility, particularly on the small flight decks of escort carriers where they soon appeared as teammates to another Grumman product, the TBF *Avenger*, as part of the ASW effort in the Atlantic. *Wildcats* participated in the important sea battles of Coral Sea and Midway and served with the Marines at Guadalcanal. They also made up the Navy's fighter force during the North African landings in November 1942.

In April 1942, Eastern Aircraft assumed *Wildcat* production to allow Grumman to concentrate on the F6F. Eastern's versions were designated FM-1's and -2's, and, in British service, as *Wildcat V's* and *VI's*. The FM-2 was recognized by its taller stabilizer.

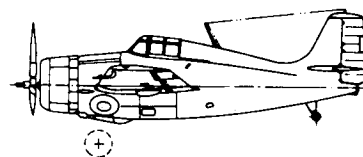
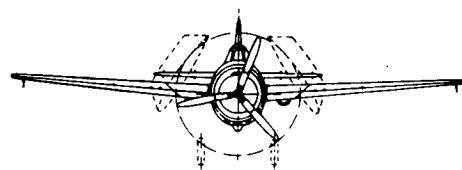
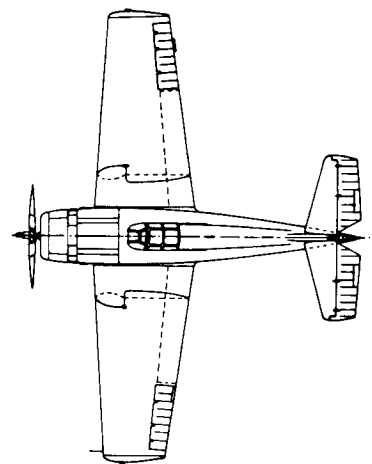
Though inferior in performance in certain respects to many of the fighters met in combat, *Wildcats*, because of their rugged construction and the well trained men who flew them, maintained a victory-to-loss ratio of nearly seven to one, even though they were the only carrier-based fighters operated by the Navy during the first half of the war in the Pacific.



# LD CAT



Length	FMF/FM-1	28' 9"
	FM-2	28' 11"
Height		11' 4"
Wingspan		38' 0"
Engines		
	F4F-3	R-1830-76 1,200 hp
	F4F-4	R-1830-86 1,200 hp
	FM-2	R-1820-56 1,350 hp
Maximum speed		
	F4F-4/FM-1	320 mph
	FM-2	332 mph
Service ceiling		
	F4F-4/FM-1	34,900'
	FM-2	34,700'
Range		
	F4F-4/FM-1	770 st. mi.
	FM-2	900 st. mi.
Armament		
	F4F-4	Six .50 cal. and two 100-lb. bombs
	FM-1	Four .50 cal. and two 100-lb. bombs
	FM-2	Four .50 cal. and six 5" rockets or two 250-lb. bombs



**NAVAER ISSUE OF 6 PAGES  
AIRPLANE CHARACTERISTICS & PERFORMANCE**

BUREAU OF AERONAUTICS-NAVY DEPT.

COLUMN NUMBER		1	2	3	4
LOADING CONDITION		FIGHTER	FIGHTER	FIGHTER ONE TANK EXTERNAL	FIGHTER TWO TANKS EXTERNAL
GROSS WEIGHT	LBS.	7975	7975	8369	8762
EMPTY WEIGHT (ACTUAL)	LBS.	5895			
FUEL/OIL	GALS.	144/11	144/11	202/11	260/11
FIXED GUNS/AMMUNITION		6-.50 Cal./1440 rds.			
FLEXIBLE GUNS/AMMUNITION		None			
ENGINE POWER USED FOR PERFORMANCE		MILITARY	NORMAL	NORMAL	NORMAL
WING LOADING	LBS./SQ.FT.	30.7	30.7	32.2	33.7
POWER LOADING ①	LBS./BHP.	7.3	7.7	8.1	8.4
V-MAX. SEA LEVEL	MPH.	284	274	263	253
V-MAX. AIRPLANE CRIT. ALT.	MPH.	320/18800	320/18800	305/18800	294/18800
V-STALL. GROSS WEIGHT. ②	MPH.	81.2	81.2	83.2	85.1
V-STALL. WITHOUT FUEL ②	MPH.	76.7	76.7	77.0	77.1
TIME-TO-CLIMB -10000FT.-	MIN.	—	5.6	6.0	6.6
TIME-TO-CLIMB -20000FT.-	MIN.	—	12.4	13.6	15.2
SERVICE CEILING	FT.	34000	34000	32900	31800
TAKE-OFF DISTANCE -CALM-	FT.		640	733	842
TAKE-OFF DISTANCE -15 KN-	FT.		410	475	550
TAKE-OFF DISTANCE -25 KN-	FT.		278	330	390
TAKE-OFF TIME	SECONDS.				
MAX. RANGE/V-AV. ③	ST. MI./MPH.		830/161	1050/157	1275/153
BOMBING RADIUS/V-AV.-20% R-	NMI/KN.				
BOMBING RADIUS/V-AV.-33% R-	NMI/KN.				
PATROL RADIUS/V-AV.-20% R-	NMI/KN.				
PATROL RADIUS/V-AV.-33% R-	NMI/KN.				
SCOUT. RADIUS	NMI.				
COMBAT RADIUS	NMI.		105	245	325
ENGINE /PROP.GEAR RATIO		P.&W. R-1830-86 (3:2)			
ENGINE RATING BHP/RPM/ALT	NORMAL	1100/2550/S.L.-3300-	MILITARY	1200/2700/S.L.-1800'	TAKE-OFF
		1080/2550/3800		1135/2700/3400	
		1090/2550/11300		1150/2700/11500	
		1030/2550/13000		1030/2700-2550/15000	
		1040/2550/18400		1040/2550/18400	
1200/2900					
NOTE	STATUTE MILES USED-EXCEPT-RADIUS IS GIVEN IN NAUTICAL MILES & KNOTS. ① BHP AT MAX.CRIT.ALT. ② STALL-WITHOUT POWER ③ AT 5000' ALTITUDE				

	TANKAGE IN GALLONS	OIL	FUEL	OFFENSIVE ARMAMENT
FIXED	PROTECTED	11	144	
	UNPROTECTED			
	TOTAL-INCL.PROT.	11	144	
	INCREASE-REMOVED PROTECTION (Not removable)			
AUX.				
	DROPPABLE			
	DROPPABLE - Wings - 2 @ 58		116	
PROTECTED+UNPROTECTED+DROPPABLE.		11	260	

REMARKS- Model FM-1 has 4-.50 cal. guns and 1720 rds. ammunition, with gross weight 75 lbs. greater than F4F-4. The performance is based on the F4F-4 weights.

NAVAER  
AIRPLANE CHARACTERISTICS & PERFORMANCE

BUREAU OF AERONAUTICS-NAVY DEPT.

COLUMN NUMBER				
LOADING CONDITION				
GROSS WEIGHT LBS.				
EMPTY WEIGHT LBS.				
FUEL/OIL GALS.				
FIXED GUNS/AMMUNITION				
FLEXIBLE GUNS/AMMUNITION				
ENGINE POWER USED FOR PERFORMANCE				
WING LOADING LBS./SQ.FT.				
POWER LOADING ① LBS/BHP.				
V-MAX. SEA LEVEL MPH.				
V-MAX. AIRPLANE CRIT. ALT. MPH.				
V-STALL. GROSS WEIGHT. ② MPH.				
V-STALL. WITHOUT FUEL ② MPH.				
TIME-TO-CLIMB -10000FT.- MIN.				
TIME-TO-CLIMB -20000FT.- MIN.				
SERVICE CEILING FT.				
TAKE-OFF DISTANCE -CALM- FT.				
TAKE-OFF DISTANCE -15 KN- FT.				
TAKE-OFF DISTANCE -25 KN- FT.				
TAKE-OFF TIME SECONDS.				
MAX. RANGE /V-AV. ③ ST.MI/MPH.				
BOMBING RADIUS /V-AV.-20% R- NMI/KN.				
BOMBING RADIUS /V-AV.-33% R- NMI/KN.				
PATROL RADIUS /V-AV.-20% R- NMI/KN.				
PATROL RADIUS /V-AV.-33% R- NMI/KN.				
SCOUT. RADIUS NMI.				
COMBAT RADIUS NMI.				

PERFORMANCE IS BASED ON- Flight Tests

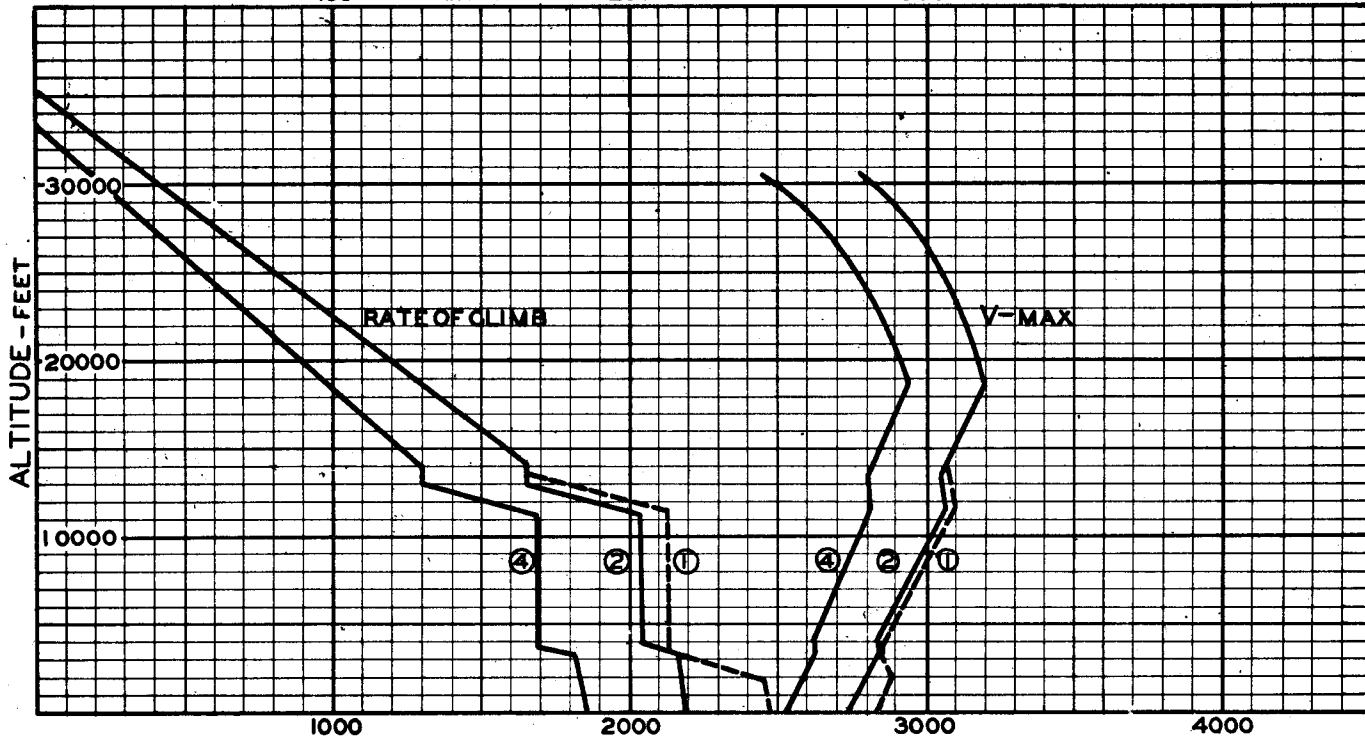
RANGE & RADIUS ARE BASED ON Engine Requirement FUEL CONSUMPTION DATA INCREASED BY 15 PERCENT TO CONFORM WITH PAST EXPERIENCE.

Practical combat radius is based on 20 min. warm-up and idling; 1 min. take-off; 10 min. rendezvous at 60% normal sea level power (n.s.p.) and auto-rich; climb to 15000' at 60% n.s.p. and auto-lean unless auto-rich is required for cooling; cruise-out at 15000' at V for max. range and auto-lean; drop bombs and external tanks; 20 min. combat at 15000' at full military power; descent; cruise-back at sea-level at V for max. range and auto-lean; 60 min. rendezvous, landing and reserve at V for max. range and auto-lean. Radius includes distance covered in climb, but not in descent.

Contract Changes thru "R" and Service Changes thru #82 are incorporated.

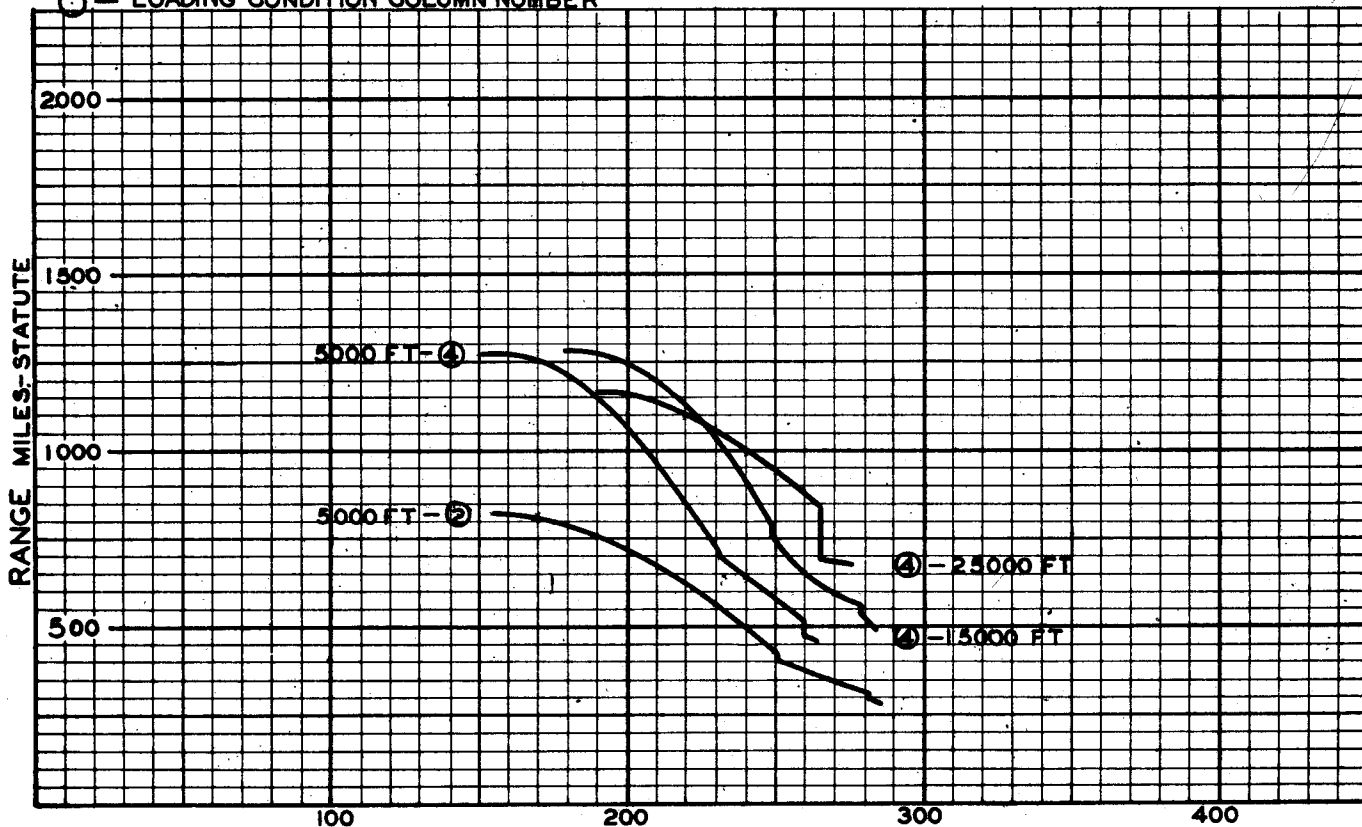
100 M.P.H. 200

300 400



RATE OF CLIMB FEET PER MINUTE

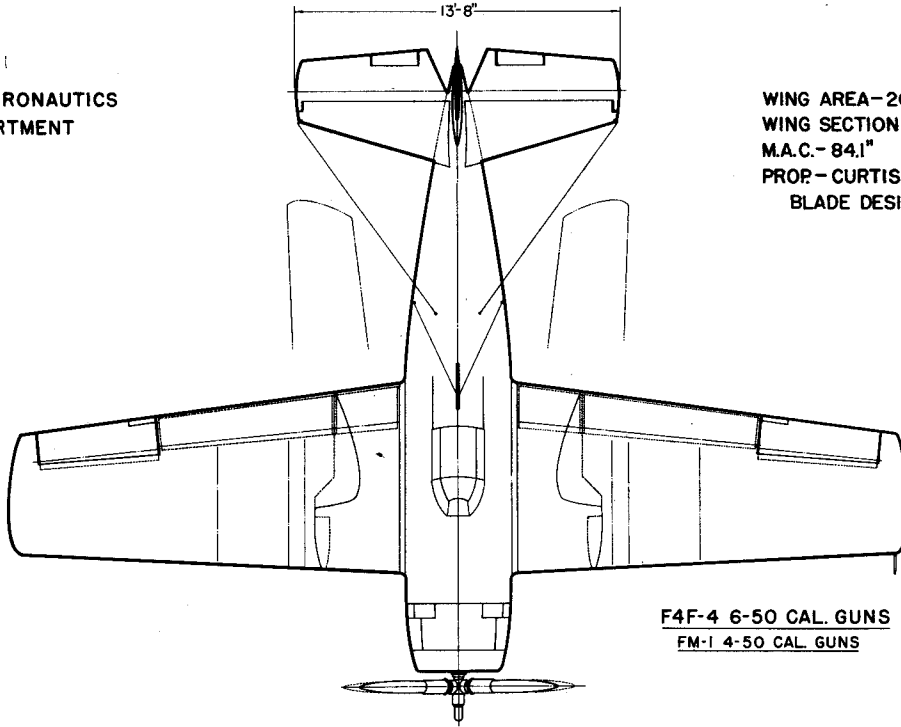
④ — LOADING CONDITION COLUMN NUMBER



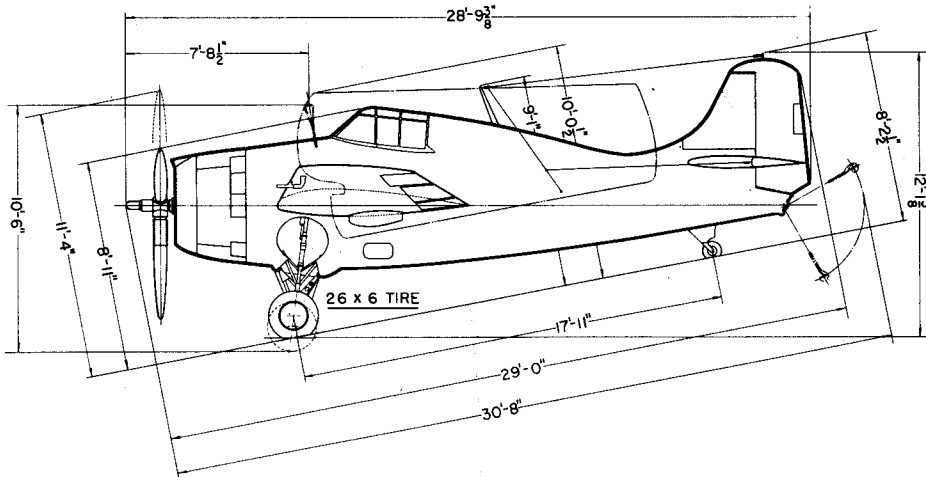
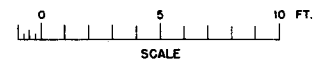
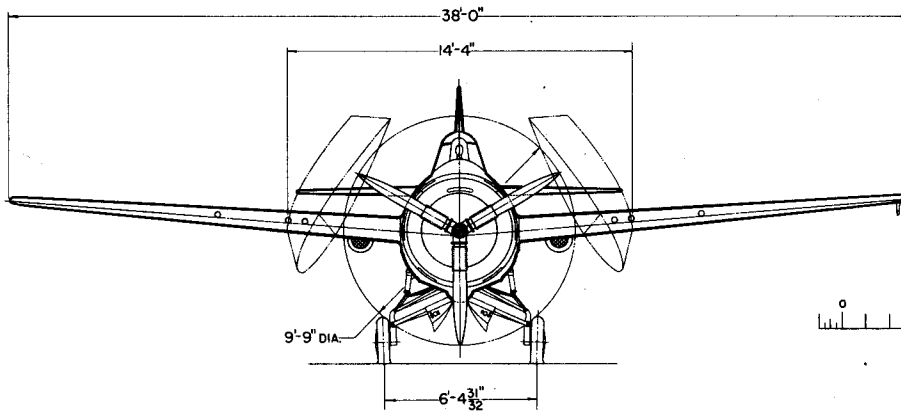
VELOCITY STATUTE MILES PER HOUR

BUREAU OF AERONAUTICS  
NAVY DEPARTMENT

WING AREA-260 SQ. FT.  
WING SECTION-N.A.C.A. 23000  
M.A.C.-84.1"  
PROP-CURTISS ELECT. C.S.  
BLADE DESIGN NO.512-ICL-5-15



F4F-4 6-50 CAL. GUNS  
FM-1 4-50 CAL. GUNS







ALSO FM-1  
MODEL F4F-4

MODEL F4F-4

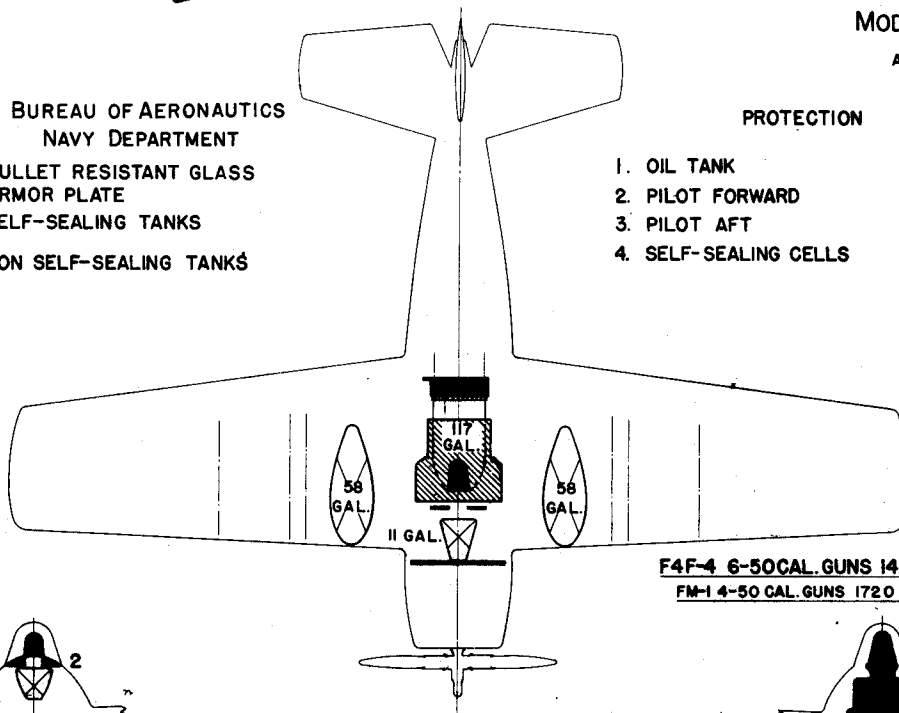
ALSO FM-1

BUREAU OF AERONAUTICS  
NAVY DEPARTMENT

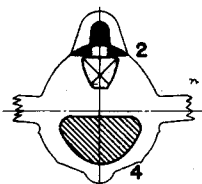
-  BULLET RESISTANT GLASS
-  ARMOR PLATE
-  SELF-SEALING TANKS
-  NON SELF-SEALING TANKS

PROTECTION

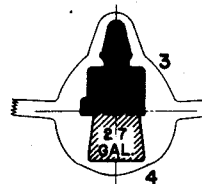
- |                       |          |
|-----------------------|----------|
| 1. OIL TANK           | 45 LBS.  |
| 2. PILOT FORWARD      | 25 LBS.  |
| 3. PILOT AFT          | 94 LBS.  |
| 4. SELF-SEALING CELLS | 126 LBS. |



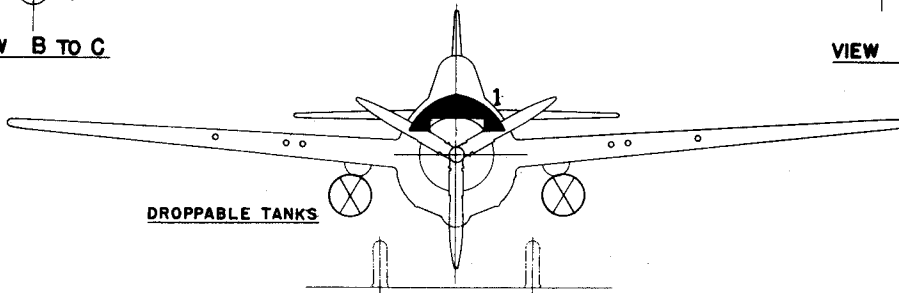
F4F-4 6-50CAL. GUNS 1400RDS. AMM.  
FM-1 4-50 CAL. GUNS 1720 RDS. AMM.



VIEW B TO C

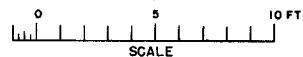
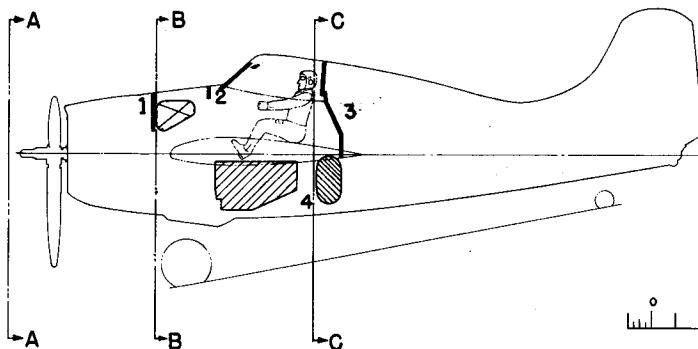


VIEW C



DROPPABLE TANKS

VIEW A TO B



SCALE