F9F PANTHER

With the *Panther,* Grumman maintained its position into the jet age as a major supplier of Navy carrier fighter aircraft. The *Panther* never enjoyed the recognition of Grumman's last piston engine fighter, the F8F *Bearcat,* as a spectacular performer. However, it did extend Grumman's reputation for building rugged, effective fighter aircraft.

The F9F series began when development was initiated on the large two-place four-jet XF9F-1 night fighter. Before design work was completed, the XF9F-1 was dropped and the project shifted to the single-place, single-jet XF9F-2 day fighter. The imported Rolls-Royce *Nene* jet engines of the two XF9F-2 prototypes were replaced in production F9F-2s by Pratt & Whitney-built J42 *Nenes.* In the XF9F-3 and production F9F-3s, an Allison J33 replaced the *Nene.* Only engine installation details differed between the -2 and -3 *Panthers.* Permanently attached tip-mounted external fuel tanks were the most obvious change added to all *Panthers* early in the program.

While the first aircraft to see squadron service were the -3s, which VF-51 received in May 1949, the *Nene*-powered -2 became the sole production version following early deliveries.

An increased thrust version of the Allison J33 led to the -4 with a longer fuselage and increased area vertical tail. The same airframe with the P&W-produced J48 version of the Rolls-Royce *Tay* engine became the F9F-5. The -5s joined the -2s as the major production versions. Photo versions, the Navy-modified -2P and Grumman-built -5P, also served in carrier air groups of the early Fifties. A total of 1,385 *Panthers* were delivered to the Navy.

The *Panthers* became a mainstay of Navy and Marine forces in Korea. They were the first carrier jets to fly in combat, shooting down two YAK-9s on their first mission in July 1950. Later, in November, LCdr. W. T. Amen, C.O. of VF-111, was the first carrier jet pilot to shoot down a MiG-15.

As the -4 and -5 *Panthers* replaced the -2s in carrier squadrons, the -2s took over advanced training, drone/drone control, reserve squadron and other duties, followed in turn by the -4s and -5s as they were replaced by their swept-wing F9F-6 successors. The last Marine combat squadrons to use *Panthers* kept their -5s until late 1957, and a few drone F9F-5KDs remained to be redesignated DF-9Fs under the 1962 DOD redesignations.

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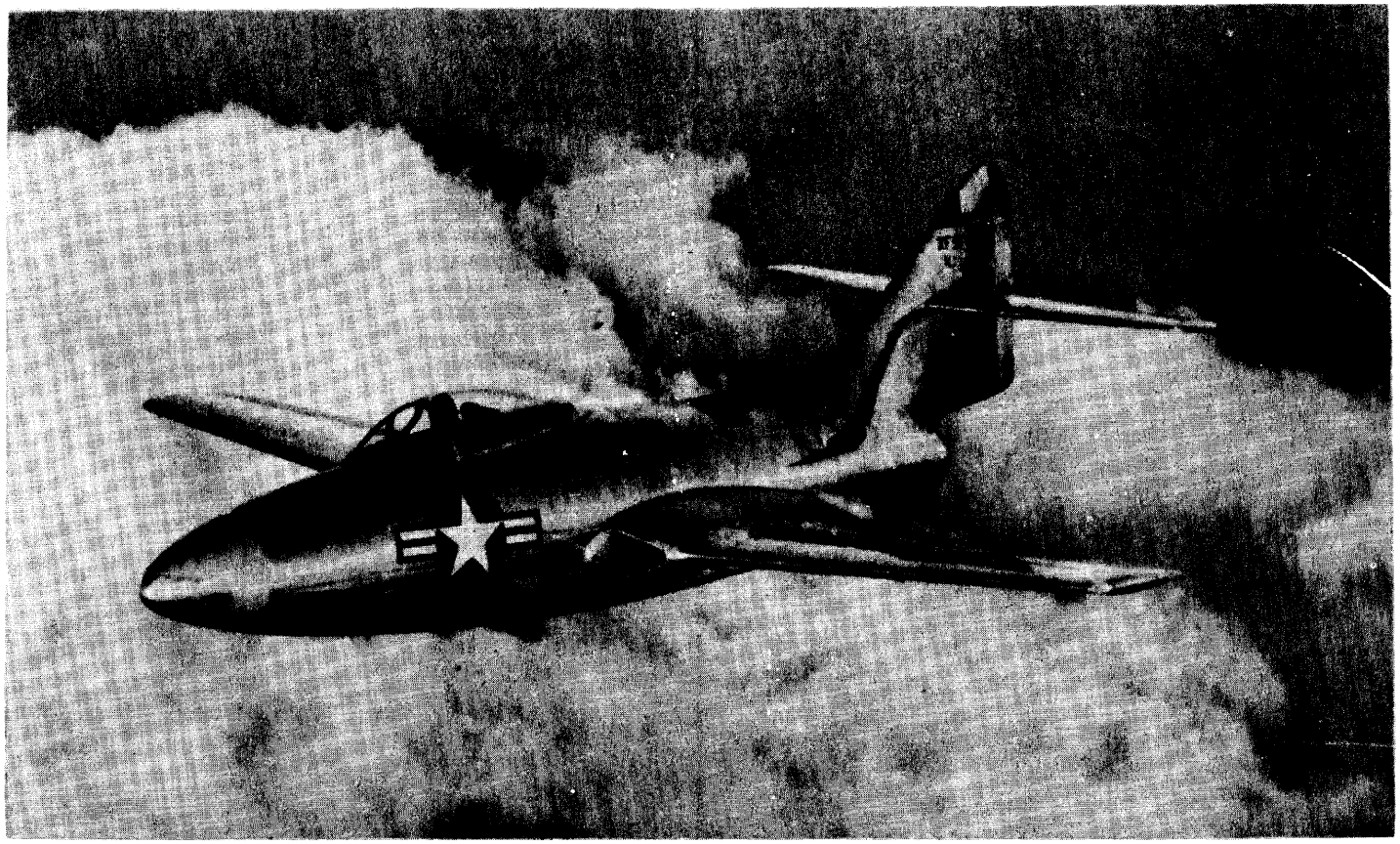

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STANDARD AIRCRAFT CHARACTERISTICS

F9F-2 "PANTHER"

GRUMMAN

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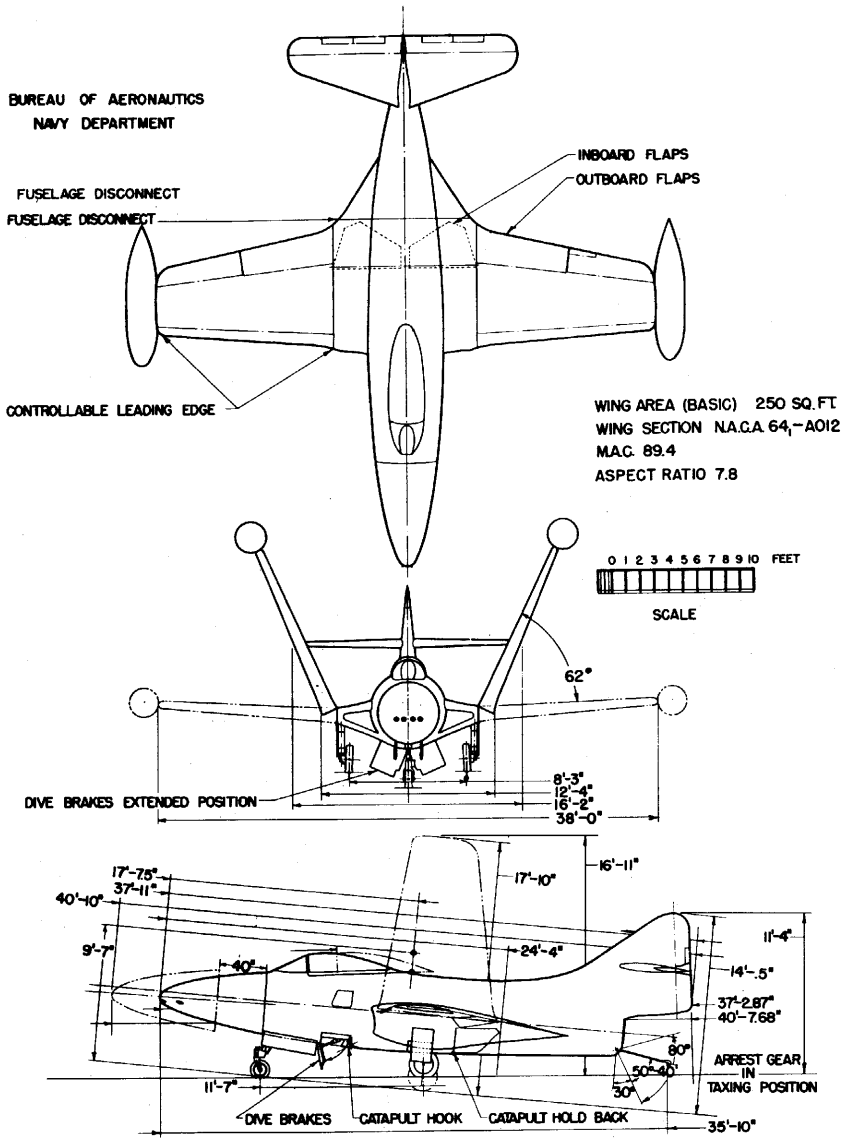
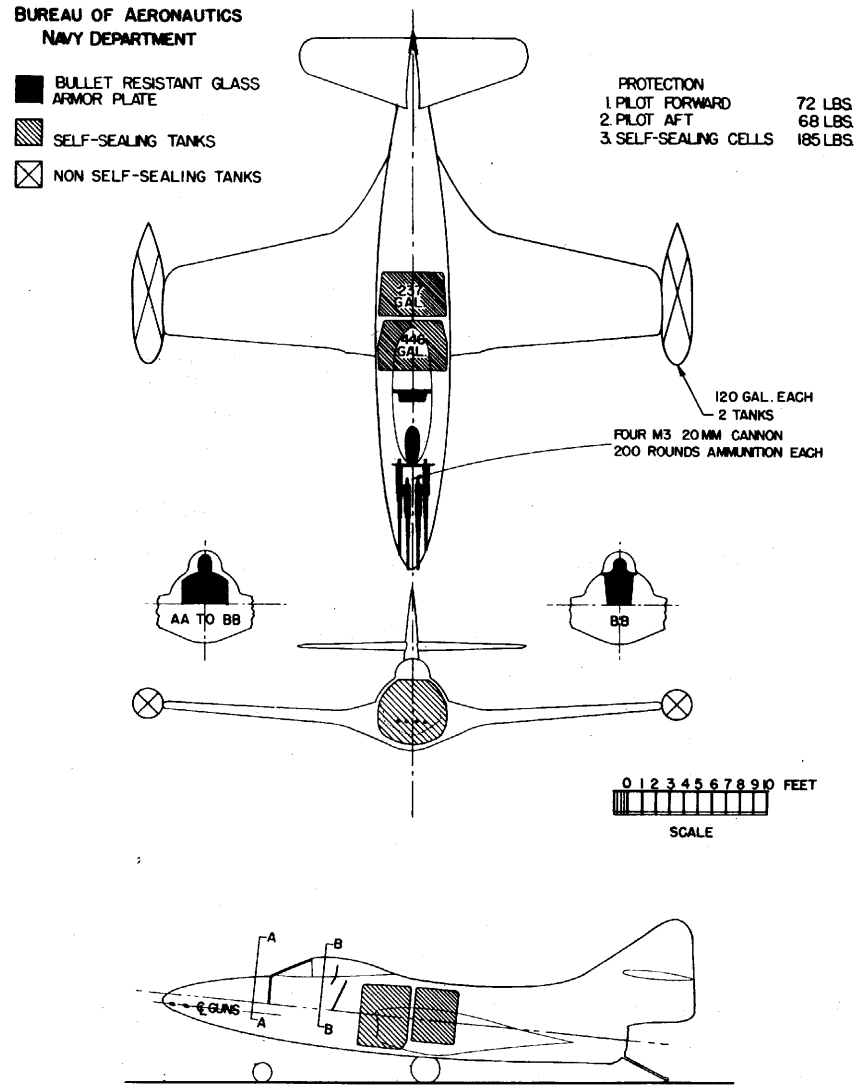
Standard Aircraft Characteristics NAVAER 1335A (REV. 1-49)



DESCRIPTIVE ARRANGEMENT



ARMAMENT & TANKS

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POWER PLANT

NO. & MODEL.....(1) J42-P-8
MFR.....Pratt & Whitney
ENG. LENGTH.....104"
ENG. DIAMETER.....50"

RATINGS

	Lbs.	@ Rpm	@ Alt.
T. O. (Wet)	5,750	12,300	S.S.L.
T. O.	5,000	12,300	S.S.L.
MIL.	5,000	12,300	S.S.L.
NORM.	4,000	11,600	S.S.L.

SPEC. NO. N-1603

ORDNANCE

GUNS

No.	Size	Location	Rds.
4	20 mm	Fuselage	800

FIRE CONTROL

AFCS.....Mk. 6, Mod. 0
Radar Ranging Equip... AN/APG-30

BOMBS AND ROCKETS

Type	Size	Location	No.
HVAR	5"	Outer Wing	6
Bombs	250#	Outer Wing	6
Bombs	500#	Outer Wing	4
Bombs	1000#	Inner Wing (On Mk. 51 racks)	2

Any combination of above not to exceed 2,800 pounds.

MISSION AND DESCRIPTION

The F9F-2 is a single seat carrier-based fighter airplane whose mission is the destruction of opposing aircraft and ground support. Water injection is available to aid in take-off. A droop nose is fitted for take-off and landings.

Guns and radio are accessible by sliding forward the movable nose. The engine is serviced or changed quickly by removal of the tail section of the fuselage.

All internal fuel is in two interconnected tanks and two removable tip tanks also feed automatically into the main fuel tank.

The pressurized cabin has temperature control and a Grumman ejection seat.

For normal aileron control a hydraulic boost system is provided. In case of hydraulic failure a mechanical boost is available. The canopy is hydraulically operated.

Dive brakes are located under the fuselage. All control surfaces are metal covered and spot welded. All control surfaces are equipped with conventional trim tabs.

DIMENSIONS

WING AREA.....250 sq. ft.
SPAN.....38' - 0"
LENGTH.....37' - 3"
HEIGHT.....11' - 4"
TREAD.....8' - 3"
M.A.C.....7' - 5"

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WEIGHTS

Loadings	Lbs.	L.F.
EMPTY	9,303	
BASIC	10,107	
DESIGN	13,000	7.0
COMBAT	14,235	7.0
MAX.T.O..(Field)	19,494*	6.0
MAX.LAND.(Field)	14,200	

All weights are actual.

* Maximum anticipated loading

FUEL AND OIL

Gal.	No. Tanks	Location
683	2	Fuselage (S.S.)
240	2	Wing, Tip

FUEL GRADE.....100/130
FUEL SPEC....MIL-F-5572

OIL

CAPACITY (Gals.).....2.2
GRADE.....1010
SPEC.....MIL-O-6081

ELECTRONICS

VHF COMM.....AN/ARC-1,-1A
HOMING.....AN/ARR-2A
ADF.....AN/ARN-6
IFF.....AN/APX-6
RADIO ALTIMETER.....AN/APN-1

UHF D.F.....AN/ARA-25
(Service Installation)
UHF.....AN/ARC-27
(Replacement for AN/ARC-1)
HOMING.....AN/ARN-21
(Replacement for AN/ARR-2A and AN/ARN-6)

PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION		(1) FIGHTER 2 - 120 Gal. Tip Tanks	(3) GRD. SUPPORT 2-1,000# Bombs 6-5" HVAR Rock. Tip Tanks			
TAKE-OFF WEIGHT	lb.	16,450	19,494			
Fuel (Internal/Fixed Tip)	lb.	4,098/1,440	4,098/1,440			
Payload (Ammunition, Bombs, Rockets)	lb.	450	3,306			
Wing loading	lb./sq.ft.	65.8	78			
Stall speed - power-off	kn.	112	122			
Take-off run at S.L. - calm	ft.	(Dry) 2,330	(Dry) 3,450			
Take-off run at S.L. 25 kn. wind	ft.	(Dry) 1,450	(Dry) 2,253			
Take-off to clear 50 ft. - calm	ft.	--	--			
Max. speed/altitude (1)	kn./ft.	457/22,000	342/S.L.			
Rate of climb at S.L. (2)	fpm	5,140	3,000			
Time: S.L. to 20,000 ft. (2)	min.	5.3	10.7			
Time: S.L. to 30,000 ft. (2)	min.	10.3	--			
Service ceiling (100 fpm) (2)	ft.	44,600	27,600			
Combat range	n.mi.	1,175	485			
Average cruising speed	kn.	423	290			
Cruising altitude(s)	ft.	40,800/43,000	25,000/20,000			
Combat radius	n.mi.	465	150			
Average cruising speed	kn.	435	294			
COMBAT LOADING CONDITION		(2) Tip Tanks	(4) 2-Mk 51 Racks 6-Mk 9 Launchers			
COMBAT WEIGHT	lb.	14,235	14,423			
Engine power		Military	Military			
Fuel	lb.	3,323	3,323			
Combat speed/combat altitude	kn./ft.	460/35,000	459/S.L.			
Rate of climb/combat altitude	fpm/ft.	1,360/35,000	5,600/S.L.			
Combat ceiling (500 fpm)	ft.	43,400	40,000			
Rate of climb at S.L.	fpm	6,000	5,600			
Max. speed at S.L.	kn.	500	459			
Max. speed/altitude	kn./ft.	500/S.L.	462/15,000			
LANDING WEIGHT	lb.	11,477				
Fuel	lb.	1,036				
Stall speed - power-off	kn.	94.3				
Stall speed - with approach power	kn.	91.3				

NOTES

(1) Normal Power
(2) Military Power

Performance is based on NATC flight test of the F9F-2 airplane.

Range and radius are based on flight test fuel consumption increased by 5%.

Spotting: 200 ft. length is required to spot 28 airplanes on the 96 ft. wide deck immediately aft of the forward ramp on CV-9 class carriers.

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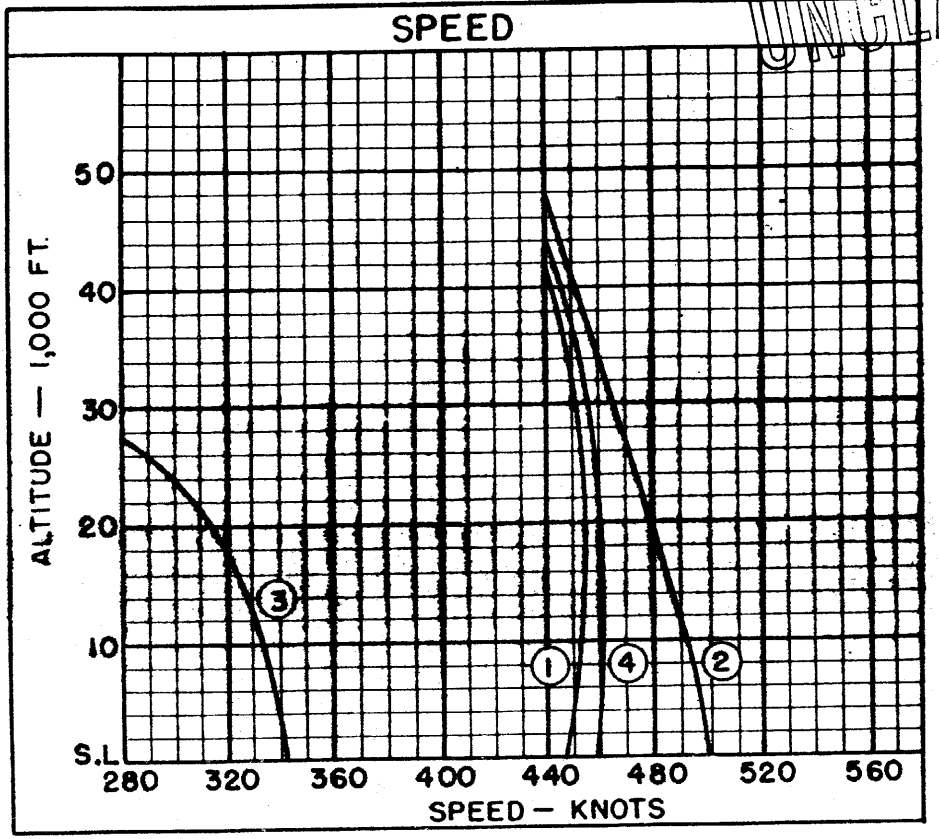

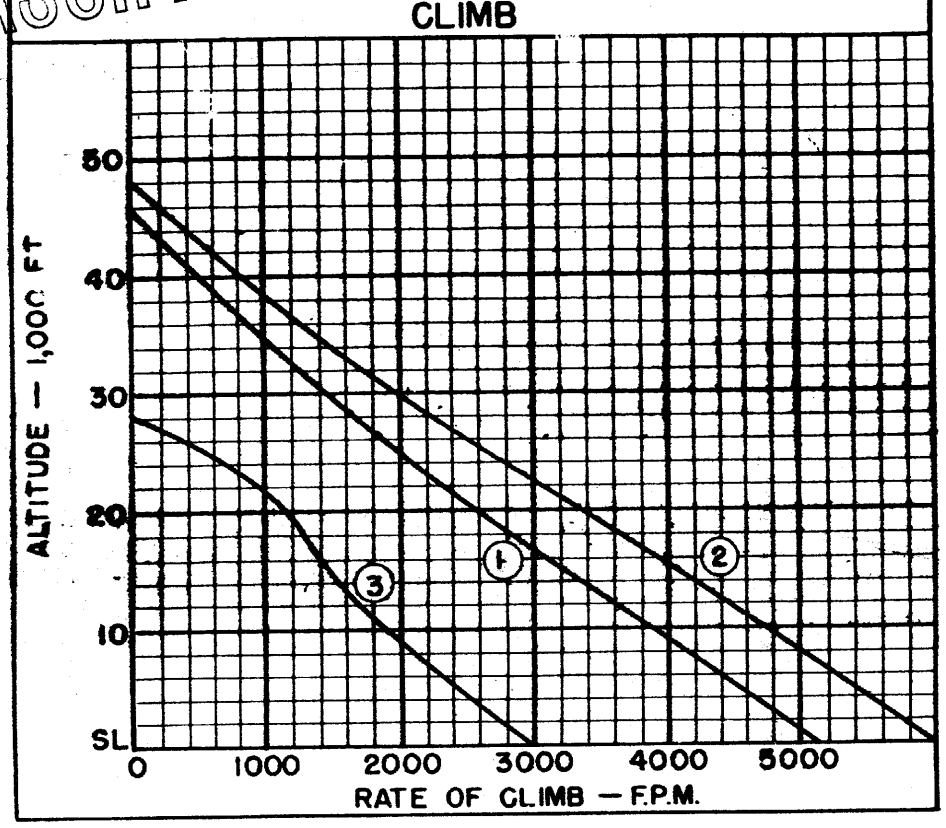

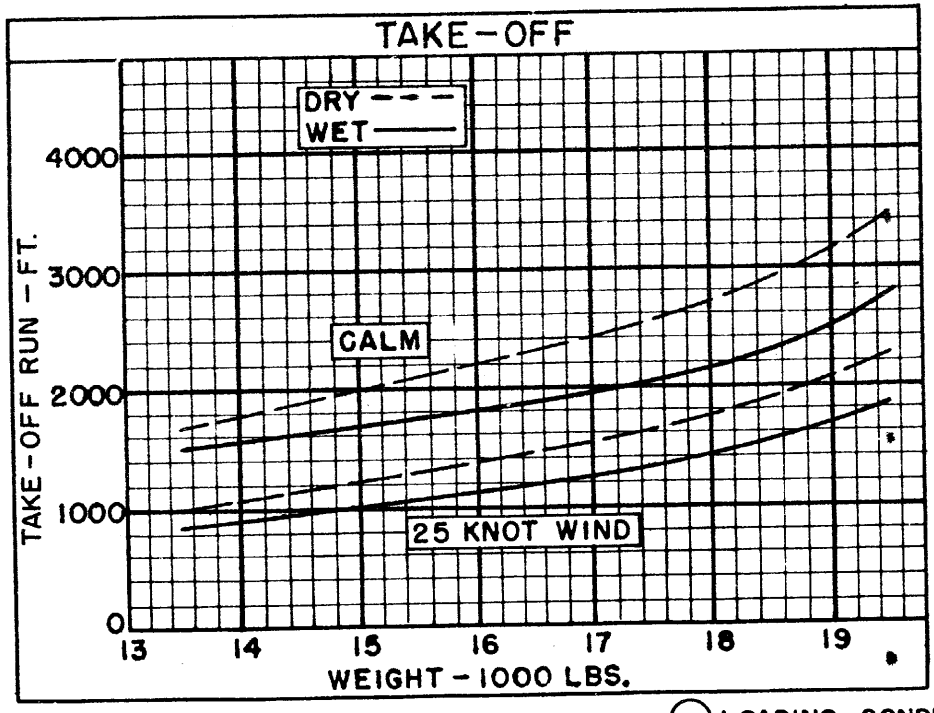

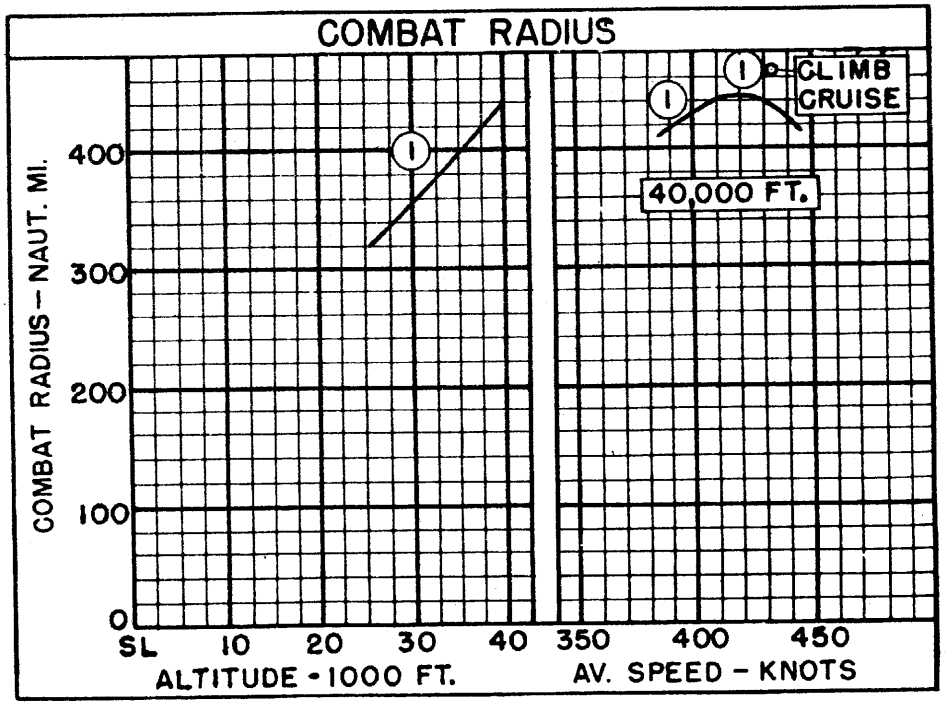

◯ LOADING CONDITION COLUMN NUMBER

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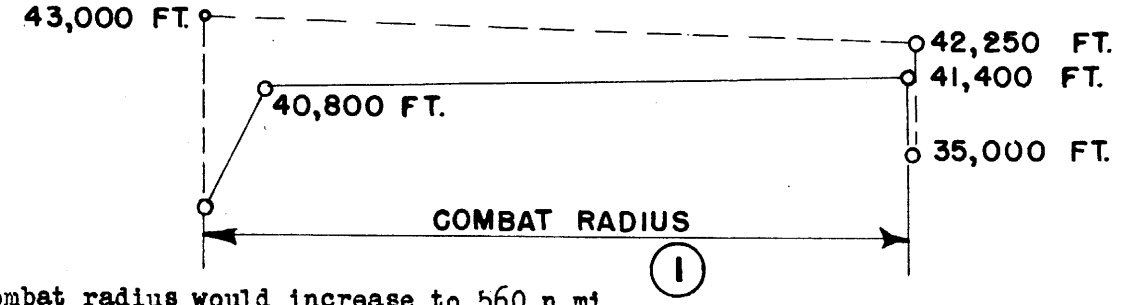
NOTES

GENERAL PURPOSE AND ESCORT FIGHTER COMBAT RADIUS PROBLEM (GAS TURBINE)

WARM-UP, TAXI, TAKE-OFF: 5 minutes at normal power
CLIMB: To cruising ceiling at military power. (Cruising ceiling = altitude for 300 ft./min. at normal power)
CRUISE-OUT: At V for long range at cruising ceiling
DESCEND: To 35,000 ft. (No fuel used, no distance gained)
COMBAT: At 35,000 ft. for 20 minutes at military power. (Assume combat concluded at initial cruise-back altitude)
CRUISE-BACK: At V for long range at cruising ceiling
RESERVE: 20 minutes at V for maximum endurance at Sea Level plus 5% of initial fuel load

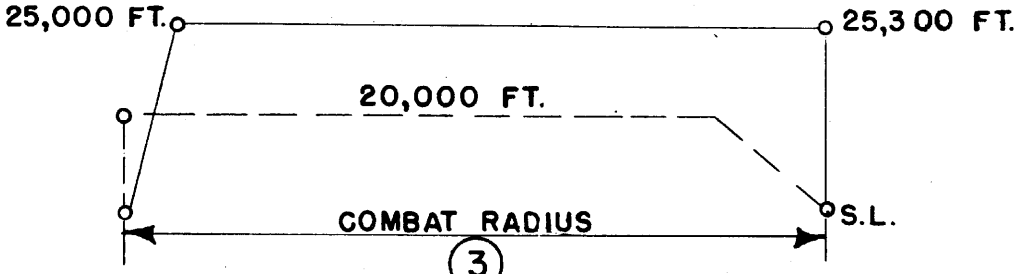
COMBAT RADIUS = CLIMB + CRUISE-OUT = CRUISE-BACK



Based on F-5 problem, combat radius would increase to 560 n.mi.
Based on reserve fuel allowance of F-5 problem (10% of initial fuel load), range would increase to 1,335 n.mi.
Radius is reduced approximately 6.5 n.mi. for each additional minute of combat.

GROUND SUPPORT FIGHTER COMBAT RADIUS PROBLEM (GAS TURBINE)

WARM-UP, TAXI, TAKE-OFF: 5 minutes at normal power
CLIMB: To cruising ceiling at military power. (Cruising ceiling = altitude for 300 ft./min. at normal power)
CRUISE-OUT: At V for long range at cruising ceiling
DESCEND: To sea level (No fuel used, no distance gained)
LOITER: 10 minutes at airspeeds for maximum endurance at sea level
DROP BOMBS AND FIRE EXTERNAL ROCKETS
COMBAT: At sea level for 10 minutes at military power
CLIMB: To altitude for maximum radius (20,000 feet) at military power
CRUISE-BACK: At V for long range at 20,000 feet
RESERVE: 20 minutes at V for maximum endurance at Sea Level plus 5% of initial fuel load



This chart supersedes previously issued chart dated 1 July 1949. Reason for reissue: Flight test data available.

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

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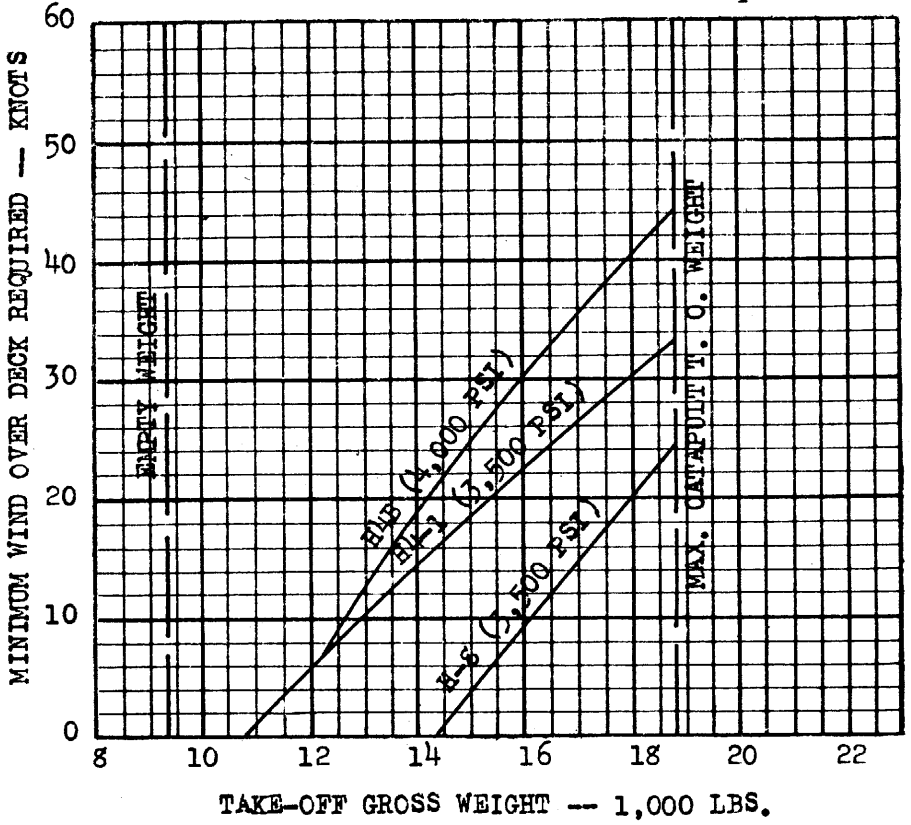
NOTE: These curves should be used for planning purposes only. Actual catapult and arresting gear operation should be in accordance with applicable Aircraft Technical Orders, and Catapult and Arresting Gear Bulletins.

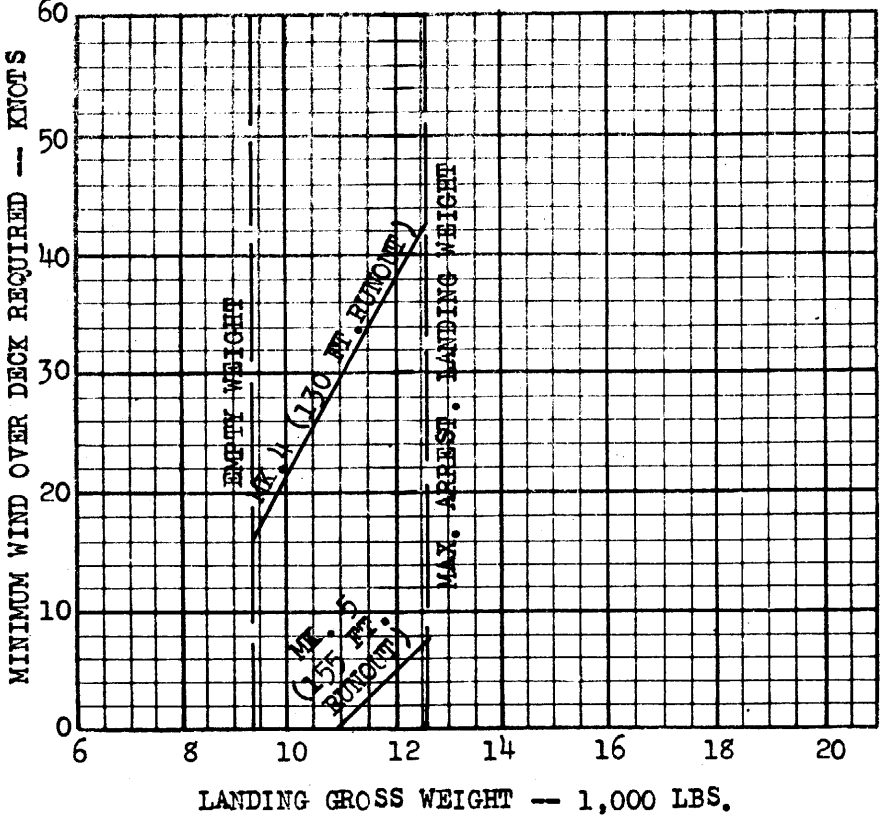
WIND OVER DECK REQUIRED FOR CATAPULTING VS. GROSS WEIGHT

Based on minimum safe take-off speed



WIND OVER DECK REQUIRED FOR LANDING VS. GROSS WEIGHT

Based on approach speed of 1.2 power-off stall speed



NOTE: No wind required for Mk. 7 arresting gear

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