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FLIGHT TEST
U. S. NAVAL AIR STATION
PATUXENT RIVER, MD.

FINAL FLIGHT REPORT

of

PRODUCTION INSPECTION TRIALS
(TED NO. BIS 2125)

on

MODEL F4U-1 AIRPLANE
(CONTRACT NOa(s)-198)

held

21 JULY 1942 to 26 SEPTEMBER 1944

by

FLIGHT TEST

at

U. S. NAVAL AIR STATIONS,
ANACOSTIA, D. C., and
PATUXENT RIVER, MD.

for

BOARD OF INSPECTION & SURVEY

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Approved:

C. T. BOOTH
Comdr., USN

OCT 31 1944

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Model F4U-1
No. 02153
3/4 Left Front View

Photo PTR 12320
8-24-44

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OFFICIAL NAVY PHOTOGRAPH
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References

(a) BuAer conf. ltr. Aer-E-2112-EM, C-82811, C7899 of 8 Jun 1942.

(b) Contract NOa(s)-198, dated 14 Dec 1943.

(c) FT conf memo for VF Design Desk, VF4U-1, of 8 Sept 1943.

(d) FT conf memo for files of 23 Jun 1943.

(e) FT memo for files, VF4U-1 of 18 May 1943.

(f) NAS, Patuxent River conf ltr. NA83, VF4U-1 PTR 2304 (FT) (44154) of 2 Aug 1944.

(g) FT conf memo for VF Design Desk, VF4U-1 of 10 Aug 1943.

(h) FT conf memo for VF Design Desk, VF4U-1 of 4 Aug 1943.

(i) FT conf memo for VF Design Desk, VF4U-1 of 26 Jul 1943.

(j) SD-261-1-1, Detail Specification for model F4U-1 airplane, dated 17 Aug 1942.

(k) Chance Vought Aircraft Report No. 5599, dated 3 Jul 1942.

(l) BuAer conf ltr Aer-E-2112-RJ, C-NOa(s)-198, C17450 of 14 Aug 1943.

(m) BuAer conf ltr Aer-E-211-RJ, C-NOa(s)-198 C12765 of 18 Jun 1943.

(n) Power Curves for models R-2800-8 and -10 engines, AEL Proj. 3911.

(o) BAR, Stratford. Conn. spdltr. to BuAer, file No. C-NOa(s)-198/RSK/mre of 13 Apr 1944.

(p) FT conf memo for files VF4U-1/NA6 of 30 Jul 1942.

(q) FT conf memo for files, VF4U-1/NA6 of 20 Aug 1942.

(r) Recommended Changes in the model F4U-1 airplane, Items 1 and 2 dated 18 Jun 1943 and 10 Sept 1943.

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INTRODUCTION - The subject report covers the flight tests performed in accordance with reference (a) as a part of the Production Inspection Trials of the model F4U-1 airplanes procured under reference (b). It is to be noted that the final demonstration of the subject airplane in accordance with reference (b) has not as yet been completed. Preliminary data obtained during the trials have been submitted by references (c), (d), (e), (f), (g), (h), and (i).

The model F4U-1 airplane is a single-engine, single-seat, landplane fighter for use aboard aircraft carriers and was designed and constructed by Chance Vought Aircraft, of Stratford, Connecticut, in accordance with reference (j). The airplane is equipped with a Pratt and Whitney model R-2800-8 engine and a Hamilton Standard, constant-speed, hydromatic control, three-blade, propeller of 13 ft. 4 inch diamter (hub design No. 23E50-123, blade design No. 6443A-21).

The first model F4U-1 airplane, No. 02153 was flown to the NAS, Anacostia, D. C., from Stratford, Conn. on 21 July 1942 for preliminary tests. Airplane No. 02155 which was used for most of the performance tests was received at Anacostia from Stratford on 24 April 1943. Various other production model F4U-1 airplanes were used for miscellaneous tests during the conduct of the trials, which were completed on 26 September 1944.

Model F4U-1 airplane No. 02155 was a typical early production model, equipped with the low cockpit enclosure and the low tail wheel fork. The GF-12, and ZB radio antennas were installed. Gun blast tube and ejection openings were faired over with tape.

PURPOSE OF TEST - The trials on the model F4U-1 airplane herein reported on have been conducted to determine the following:

(a) Performance and handling characteristics.

(b) General suitability for service use as a fighter airplane.

METHOD OF TEST - The performance data was obtained and reduced to standard conditions in accordance with the established Flight Test methods. Engine power was measured by means of a torquemeter.

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The following table is a weight and balance summary of the basic loadings used during the tests. The actual weight and balance of the first production airplane, No. 02153, is given in reference (k).

Loading	Normal Fighter	Overload Fighter Less unprotect. fuel
Airplane No.....	02155	50360
Par. from Detail Spec.....	104a	104c (mod.)
Gross Wt. - lbs.....	11,194	11,977
Useful load - lbs.....	2,404	3,257
Useful load - % gross wt.....	21.5	27.2
Weight empty - lbs.....	8790	8720
Wing loading - lbs. per sq. ft.	35.6	38.1
Take-off power loading - lbs/BHP	5.6	6.0
Center of gravity loaction - %MAC:		
Wheels up.....	32.1	32.9
Wheels down.....	30.8	31.6
Detailed Useful load:		
Pilot - lbs.....	200	200
Fuel:		
Fuselage (protected) lbs.	1068	1422
- gals.....	(178)	(237)
Oil - lbs.....	90	120
- gals.....	(12)	(16)
Trapped fuel and oil -lbs.	88	111
Armament:		
Fixed guns installation - lbs.....	405.4 (6-.50 cal.)	408.1 (6-.50 cal.)
.50 cal. ammunition -lbs.	360	720
- rds....	(1200)	(2400)
Pyrotechnics - lbs.....	11	11.8
Navigating equip.-lbs....	3.7	4.3
Life raft - lbs.....	14	14
Emerg. equip. - lbs.....	8.7	13
Oxygen equip. - lbs.....	27.5	23.5
Radio - lbs.....	107.5	133.5

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RESULTS OF TEST

1. Performance (Airplane No. 02155 loaded as a "normal" fighter except as noted)

(a) Maximum speed (high blower):

Power	Normal	Military
Brake horsepower.....	1550	1650
Airplane critical alt-ft.....	23,800	22,800
Maximum speed at ACA-MPH.....	395	395
(b) Service ceiling - ft.....	38,200	38,400
(c) Maximum rate of climb at sea level - FPM.....	2490	3160
(d) Minimum speed at sea level:		
Airplane No.....	02158	02555
Loading.....	Normal Fighter	Overload Fighter + 176 gal. drop tank
Gross weight - lbs.....	11,194	13,320
Clean condition - power on - MPH.....	97.5	103
Clean condition - power off - MPH.....	101.5	110
Landing condition - power on - MPH.....	76.5	79
Landing condition - power off - MPH.....	83.0	90.5

(e) Take-off distance:
(see next page)

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Summary of Take-off Data
Model F4U-1 Airplane
Full Flap, 2700 RPM, 54" Hg. MAP, 2000 BHP

Airplane No.	02158	02557	50360	50360	50360	50360
Basic Loading	Normal Fighter	Normal Fighter	Overload Fighter(mod.)	Overload Fighter(mod)	Overload Fighter (mod.)	Overload Fighter (mod.)
Gross wt. - lbs.	11,194	11,194	13,067	13,067	13,119	14,138
Drop tanks	No	No	176 gal. Centerline	176 gal. Centerline	165 gal. Stbd. Pylon	165 gal. Stbd. Pylon
Bombs	No	No	No	No	No	1-1000-lb. Port Pylon
Main gear oleos	High	High	High	Low	Low	Low
Tail wheel	Low	High	High	Low	High	High
Take-off distance, No wind - ft.	560	595	1025	715	730	1030
Take-off distance, 25 knot wind - ft.	240	270	500	310	330	485
Take-off speed - MPH	78.0	82.5	89.5	79.0	82.0	86.5

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2. Handling Characteristics

(a) Longitudinal stability and control.

1. A summary of the longitudinal stability of the airplane when loaded as a "normal" fighter (gross wt. = 11,194 lbs., C. G. = 32.1% MAC wheels up, 30.8% MAC wheels down) is as follows:

Condition	Longitudinal Stability Static	Dynamic
High power climb - clean.....	Negative for decreasing speed Positive for increasing speed	
High speed level - clean.....	Positive	Neutral
Cruising speed level - clean.	Positive	Neutral to slightly positive
Low power glide - clean.....	Positive	Neutral to slightly positive
Power-off glide-clean.....	Positive	Neutral to slightly positive
High power climb-landing cond.*	Positive	Positive
Carrier approach-landing cond.*	Barely positive for decreasing speed - Positive for increasing speed	Slightly positive
Power-off glide-landing cond.*	Positive	Positive

* An eleven lb. bungee spring pulling the stick forward acts only when tail wheel is down.

2. As a "normal" fighter, elevator control forces were very light at moderate speeds but tended to become heavy in high speed dives (1:1 booster tab). There was a definite lightening of force as the stall was approached in the landing condition but the elevator force did not reverse if the airplane was trimmed for a carrier approach at about 82 kts IAS. Trimming for a lower approach speed (77 kts. IAS was 10 kts. above the indicated stalling speed power on) caused a reversal of control force as the stall was approached.

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3. As an "overload" fighter with a 176 gal. centerline drop tank installed (gross wt. = 13,320 lbs., C.G. = 29.1% MAC wheels up) longitudinal stability was much improved over that described above, being statically and dynamically positive in all flight conditions.

(b) Directional stability and control

1. Directional stability was positive in all flight conditions with the airplane loaded as a "normal" fighter, as manifested by rudder free recoveries from level yawed flight. Rudder forces were normal to high, it being impossible to obtain full rudder at maximum speed level. No rudder force reversals were encountered although forces lightened up very much as full deflection was approached in the high power climb clean. Adequate rudder effectiveness was available for control during full flap take-offs and during wave-offs.

2. As an "overload" fighter with a 176 gal. centerline drop tank installed, directional stability was much weaker than as a "normal" fighter, approaching neutral in all clean flight conditions. Rudder control force reversal was encountered in all conditions clean but only in the high power climb in the landing condition.

(c) Lateral stability and control

1. With the airplane loaded as a "normal" or "overload" fighter lateral stability was positive in all flight conditions. Satisfactory turns were made in both clean and landing conditions using rudder alone, ailerons free. Rolling moments in yawed flight were positive (tending to roll airplane into direction of yaw) as measured by the aileron control force required to hold the lower wing down.

2. Aileron control was adequate and forces reasonably light. Actual data obtained relative to rolling velocities and aileron control forces are included under Miscellaneous Tests.

(d) Miscellaneous

1. All manoeuvers expected of the type except spins were satisfactorily performed. No unusual tendencies to enter unintentional spins were observed.

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2. In the final production configuration with right wing spoiler installed, the stalling characteristics were considered satisfactory. The stall was fairly gentle in both clean and landing conditions, power on and power off. There was a moderate left roll from power on stalls. Ample warning in the form of buffeting occurred before the clean condition stalls but in the landing condition buffeting occurred late, only a few knots above the stall. Full open cowl flaps had no apparent detrimental effect on control at the stall. The approximate altitudes required to recover from unaccelerated stalls were as follows:

Condition	Power	Approximate altitude required for recovery - ft.
Clean	On	150 - 200
Clean	Off	200 - 250
Landing	On	350 - 400
Landing	Off	400 - 450

3. Landing characteristics were considered satisfactory with the airplane in its final production configuration, i.e., raised cabin, high tail wheel, and right wing spoiler. In this condition the strong directional buffet and tendency for the left wing to drop as a three point landing was made were not present as in the original configuration with the low tail wheel and no spoiler.

4. Ground handling characteristics with the raised cabin and high tail wheel were satisfactory with adequate braking power available. However, there was considerable shimmy present in the tail wheel installation when taxying, even at moderate speeds, with the tail wheel unlocked.

3. Miscellaneous Tests

(a) In accordance with reference (a) tests were conducted on model F4U-1 airplane No. 02555 to determine the effect of the centerline droppable fuel tank on take-off distance, stalling speeds, and general flight characteristics. Reference (c) is a report of these tests. Pertinent data from this report are included under other appropriate sections of Results of Test. Four drop tanks were released in flight, three empty and one full, at an IAS of 250 kts. No difficulty was experienced except that one empty tank would not release until approximately 2g were applied on the airplane.

(b) Reference (m) requested that brief tests be conducted on model F4U-1 airplane No. JT101 to determine the effect of the modified wing tips (wing span reduced 10½ inches) on performance and handling characteristics. The results of these tests were summarized by reference (d) which stated that there was no measurable difference between the maximum speeds of the clipped wing and the standard wing model F4U-1 airplanes. Stalling speeds measured were approximately 1 - 3 mph higher. Take-off distance in a 25 knot wind was approximately 15 ft. longer with a 2 mph greater take-off speed. Flying characteristics were not noticeably changed except that there was slightly improved stall warning in the form of buffeting.

(c) A temperature survey was carried out on model F4U-1 airplane No. 02155 to determine the cooling characteristics with the top segment of the cowl flaps closed. A report of these tests was forwarded to the Bureau of Aeronautics by reference (i). In the carrier approach condition with cowl flaps 1/3 open excessive temperatures were encountered on cylinder heads Nos. 2 and 4, being 282 and 272°C respectively (auto rich mixture). In a military power climb with full cowl flaps opening no excessive temperatures were encountered (auto rich). In a normal power climb with 1/4 to 1/3 cowl flap opening excessive temperature of 268 and 262°C were encountered on cylinder heads Nos. 2 and 4 respectively (auto rich). No excessive temperatures were found in a ground run. The effect of cowl flap opening and climbing speed on rate of climb and cylinder head temperature was also investigated. The results are summarized in the following tables.

No. 4 Cylinder Head Temperatures - °C

	1/3 Cowl Flap Opening			2/3 Cowl Flap Opening			Full Cowl Flap Opening		
IAS - Kts.....	120	140	160	120	140	160	120	140	160
5000 ft. Alt....	223	212	186	209	196	186	195	185	185
15000 ft. Alt....	234	211	210	232	211	203	207	206	193
25000 ft. Alt....	249	219	203	232	209	200	206	202	195

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Rates of Climb - FPM

	1/3 Cowl Flap Opening			2/3 Cowl Flap Opening			Full Cowl Flap Opening		
IAS - Kts.....	120	140	160	120	140	160	120	140	160
5000 ft. Alt....	2360	2280	2120	2310	2190	2060	2240	2130	1900
15000 ft. Alt....	2300	2200	1990	2220	2090	1900	2010	1960	1640
25000 ft. Alt....	1480	1340	1120	1360	1120	760	1160	990	630

(d) Angles of climb and dive were measured at 10,200 ft. altitude using military power. The results are given in Figure 4 of Performance Curves.

(e) Rates of roll and stick forces for full aileron deflection were measured under various conditions with model F4U-1D airplane No. 50360. The data obtained are summarized as follows. (Airplane loaded as overload fighter, 237 gals. fuel in fuselage tank, wing tanks empty.)

Maximum Rates of Roll at 6,500 ft. Alt.

Condition	IAS -KTS	Time to Roll 270° Left Sec.	Time to Roll 270° Right Sec.	Rate of Roll - °/Sec. Left	Rate of Roll - °/Sec. Right	$\frac{pb}{2V}$ Left	$\frac{pb}{2V}$ Right
Clean	150	3.7	3.9	73.	70.	.089	.086
Clean	200	3.2	3.6	84.	76.	.078	.071

p = rate of roll, radians per sec.
b = wing span - ft.
v = true airspeed, ft. per sec.

Times to Roll 90° (From level flight)

Condition	IAS -KTS	Time to roll 90° Left Sec.	Time to roll 90° Right Sec.	Stick force for full aileron deflection - lbs. Left	Stick force for full aileron deflection - lbs. Right
Landing	90	2.4	2.5	5.5	7.5
Clean	150	1.6	1.8	14.0	15.5
Clean	200	1.3	1.4	17.0	19.5

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(f) A carbon monoxide survey was conducted on model F4U-1D airplane No. 50360. The first attempt disclosed abnormally high concentrations. An inspection disclosed several faulty seals both in the firewall and in the bulkhead aft of the cockpit. The following data was obtained after all visible openings had been repaired.

Condition	Altitude	Hood	Ventilator	CO Concentration Pilots Face	CO Concentration Oxygen Diluter
Military power climb-clean.....	3,000	Closed	Closed	.006	.006
Military power climb-clean.....	9,000	Closed	Closed	.013	.022
Military power climb-clean.....	12,000	Closed	Closed	.018	.048
Military power level-clean.....	3,500	Closed	Closed	.008	.008
Max. Cruise - clean.	8,000	Closed	Closed	.006	.011
Carrier approach....	1,000	Open	Closed	.0	---
Carrier approach....	1,000	Closed	Closed	.003	---
Military power climb-clean.....	3,000	Closed	Open	.003	.004
Military power climb-clean.....	9,000	Closed	Open	.010	.010
Military power climb-clean.....	12,000	Closed	Open	.010	.016
Glide at 200 kts. - clean.....	5,000	Closed	Closed	.005	---
Glide at 200 kts. - clean.....	5,000	Open	Closed	.005	---
Military power level-clean.....	3,500	Closed	Closed	.026 at heater outlet (heater on)	
Military power level-clean.....	3,500	Closed	Open	.000 at ventilator outlet	

DISCUSSION - 1. The engine ratings used for the trials, obtained from reference (n), were as follows:

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Blower	Altitude - ft.	Brake Horsepower	RPM	Manifold Pressure -in. Hg.
		Normal Power		
Neutral	5,500	1675	2550	44.0
Low	16,500	1625	2550	49.5
High	21,700	1550	2550	49.5
		Military Power		
Neutral	1,700	2000	2700	52.5
Low	15,700	1800	2700	53.5
High	16,500	1650	2700	52.5
		Take-off Power		
Neutral	S.L.	2000	2700	54.0

2. In many instances it was found to be impossible to obtain rated military power in auxiliary blower due to faulty setting of the supercharger pressure regulator. Carburetion difficulties resulting in over-rich mixture strengths were also responsible for several failures to obtain rated power at the manifold pressures given above.

3. Although the maximum speed and climb data given under Results of Test were obtained on an early production airplane equipped with the low cabin it is believed that these results may be assumed to apply also to the latest raised cabin production models, as informal comparisons have indicated that the change in drag due to the raised cabin is negligible.

4. The minimum speeds given under Results of Test were obtained on airplanes equipped with the latest production type right wing spoiler which was added to improve the stalling characteristics. Reference (e) is the report on the original tests of this spoiler and states that the net effect on stalling speed was to increase the power on stalling speed approximately 2 to 3 mph with no appreciable effect on the power off stalling speed.

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5. The take-off data on airplane No. 50360 included under Results of Tests was obtained under Proj. TED No. PTR 2304 reported on by reference (f). This project was established to investigate the effect of the "low" revised main landing gear oleos on take-off distance. Servicing the oleos in accordance with reference (o) caused the length of the strut to decrease approximately 2 5/8 inches in the static position. It may be seen from a comparison of the take-off distances obtained with the "high" and "low" oleos that a considerable decrease in distance is obtained with the "low" oleos. This improvement is believed to be due to the revised extension characteristics of the "low" oleos. A more detailed description of this effect is included in reference (f). The ground handling and landing characteristics were also improved with the "low" oleos. The "low" tail wheel in combination with the "low" oleos gave the shortest take-off distances of all configurations tested. Although landing characteristics with the "low" tail wheel ("low" main gear oleos) were not as good as with the "high" tail wheel, this configuration was considered to be satisfactory for pilots with reasonable experience in the airplane. The technique used on all take-offs was the same. Flaps were put full down and engine turned up to approximately rated brake horsepower with the airplane held by the brakes. The brakes were released to start the run, and the tail was raised as soon as possible so that the thrust line was approximately level during the run. Approximately fifty feet from the take-off point the tail was brought down rapidly but smoothly until the tail wheel touched the ground. The tail wheel was then held on the ground until the airplane took off.

CONCLUSIONS - The model F4U-1 airplane was found to be satisfactory for service use as a fighter airplane, subject to correction of all defects covered under Recommendations (a).

RECOMMENDATIONS - 1. As a result of the trials, changes in the model F4U-1 airplane have been recommended in references (f), (g), (p), (q), (r). These recommendations are summarized below with responsibility for incorporation indicated as follows:

C - Contractor responsibility.
G - Government responsibility.

(a) Necessary changes considered essential to obtain a satisfactory combat airplane. These changes should be incorporate on undelivered airplanes prior to delivery and on delivered airplanes as soon as practicable.

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1. Raise the tail wheel to reduce the angle of attack in the three point attitude. - C

2. Eliminate left wing heaviness with flaps extended and ailerons drooped. - C

3. Improve vision over nose. - C

4. Provide sufficient elevator control to hold tail down at higher engine powers, flaps down, prior to take-off. - C

5. Improve stall characteristics. - C

6. Eliminate difficulty in opening cockpit enclosure at moderate airspeeds. - C

7. Eliminate interference with toes on brake pedals caused by parts of structure and fixed installations immediately above pedals. - C

8. Eliminate interference of electrical wiring with installing and removing oxygen bottle. - C

9. Eliminate oil deposits on windshield during flight. - C

10. Eliminate oil deposits on bombing window. - C

11. Eliminate engine roughness. - C

12. Correct deficiencies in the engine installation which prevent obtaining rated power at altitude. - C

13. Investigate adequacy of intercoolers at military power under hot summer operating conditions. - C

14. Increase rate of pitch change of propeller to improve governing characteristics. - C

15. Provide an elevator control system weight for test in lieu of the present spring or in conjunction therewith. - C

16. Provide satisfactory ailerons. - C

17. Modify landing gear retracting control to facilitate operation. - C

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18. Move flap control handle to a more convenient position above and ahead of the throttle. - C

19. Provide a satisfactory "oil-in" temperature gauge. - C

20. Eliminate movement of the rudder and elevator tab control wheels when the main controls are moved. - C

21. Provide a satisfactory rear view mirror. - C

22. Provide easier operation of arresting hook control. - C

23. Remove all latches on hook control handle. Substitute indents to indicate the three positions by feel. - C

24. Provide a standard engine gauge unit in lieu of the present individual gauges. - C

25. Move engine cowl flap control to left side of cockpit. - C

26. Adjust throttle stop to give take-off manifold pressure. - C

27. Provide a Mark VII-1 gunsight. - G

28. Reduce elevator forces by improving aerodynamic balance characteristics. - C

29. Reduce rudder forces at very high speed. - C

30. Increase mechanical advantage of rudder tab control. - C

31. Decrease mechanical advantage of aileron tab control. - C

32. Install carburetor air temperature gauges in addition to the warning light. - C

33. Eliminate pounding and chattering of hydraulic regulator valve. - C

34. Provide pneumatic tail wheel. - C

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35. Eliminate backfiring on starting and resulting deformation of ducting. - C

36. Investigate installation of spoiler on right wing to give same stall characteristics as obtained by leaving right wing gun ports open. - C

37. Improve landing flap operation and eliminate failures in follow up mechanism. - C

38. Investigate feasibility of eliminating the hydraulic cowl flap operating cylinders from the top sections of flap system to avoid oil deposit on windshield. - C

39. Eliminate failures of cowl flap operating cylinders and creeping of cowl flaps. - C

40. Eliminate damage to wing fabric at various points around folding joint. - C

41. Improve durability of surface finish on center section. - C

42. Provide means of by-passing supercharger pressure regulator in an emergency. - C

43. Top engine cowl flaps should be adjustable rather than fixed closed in order to provide satisfactory engine cooling. - C

44. Modify Columbian Rope Co. droppable fuel tanks so that tanks may be installed without alterations. - C

45. Provide bungee spring that will apply 14 pounds forward stick force when tail wheel is down only. - C

46. Investigate feasibility of automatic elevator tab adjustment as elevator bungee is actuated. - C

47. Adopt the configuration of "low" oleos as described in reference (o) together with the low tail wheel as standard for model F4U-1 airplanes. - G

48. Eliminate throttle creep. - C

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49. Investigate buffet with dive brakes open. - C

50. Reduce carbon-monoxide concentration to an acceptable value. - C

(b) Desirable changes which will enhance the airplane's efficiency. Such changes should be incorporated when practicable and should be considered for any redesign or future construction.

1. Move center of gravity forward to increase stability. - C

2. Remove bombing window. - C

3. Eliminate the landing card from the landing gear warning howler circuit. - C

4. Provide means for reading interstage air pressure. - C

Encl: (HW)
1. Performance Curves, photo PTR No. 12466, 12467, 12468, and 12469.
2. Photographs, PTR Nos. 12321, 12322, 12319, 8969, 8964, 8966, 8968, 9527, 9205, 9847, 1479, 1476, 1477, 1480, 1478, 12090, 12091, 12092, 12093.

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MODEL F4U-1 AIRPLANE NO. 02155
PERFORMANCE CHARACTERISTICS
NORMAL FIGHTER GROSS WEIGHT 11,194 LBS.

PHOTO PTR.12466

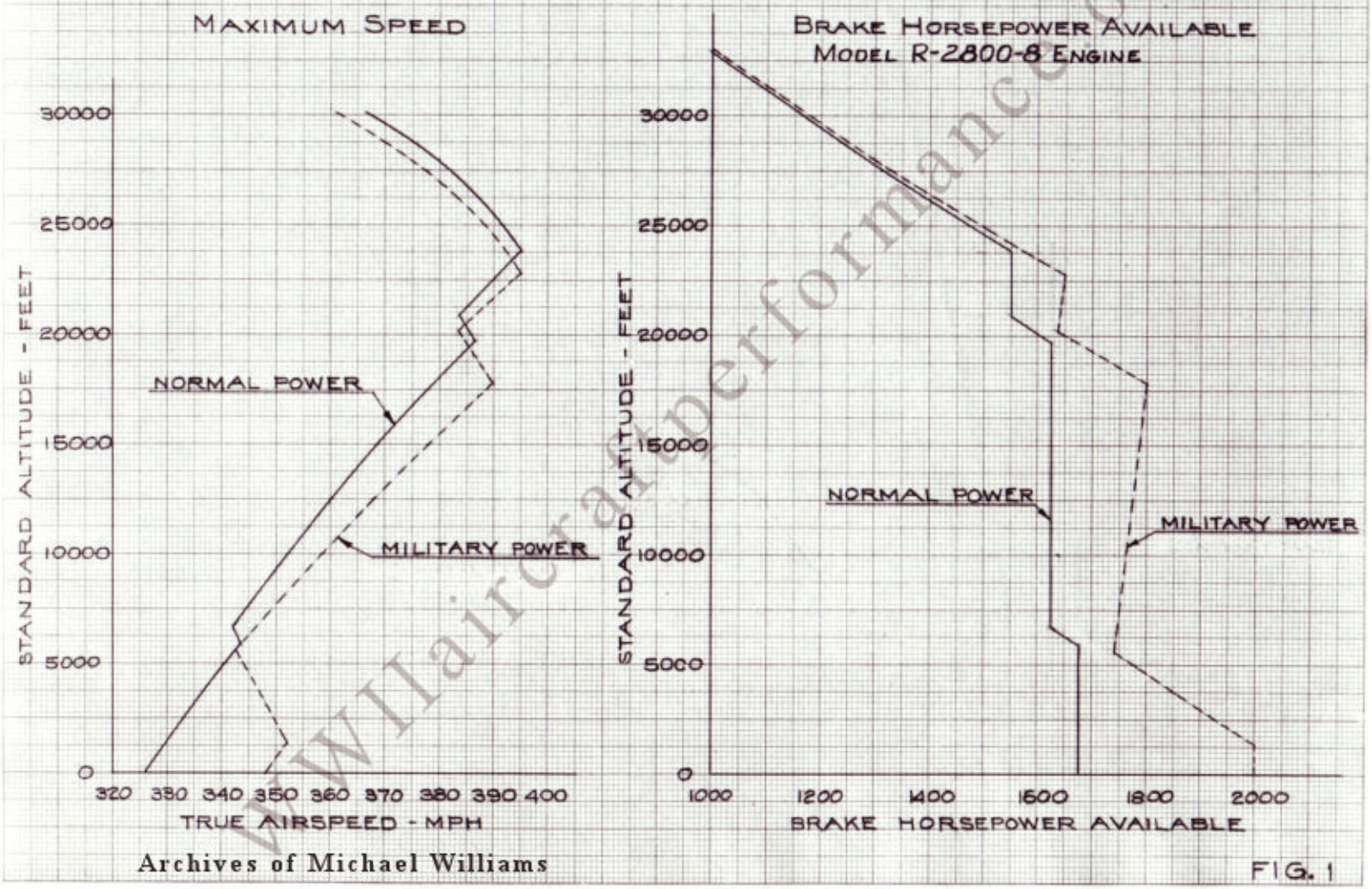

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FIG. 1

PHOTO PTR. 12467

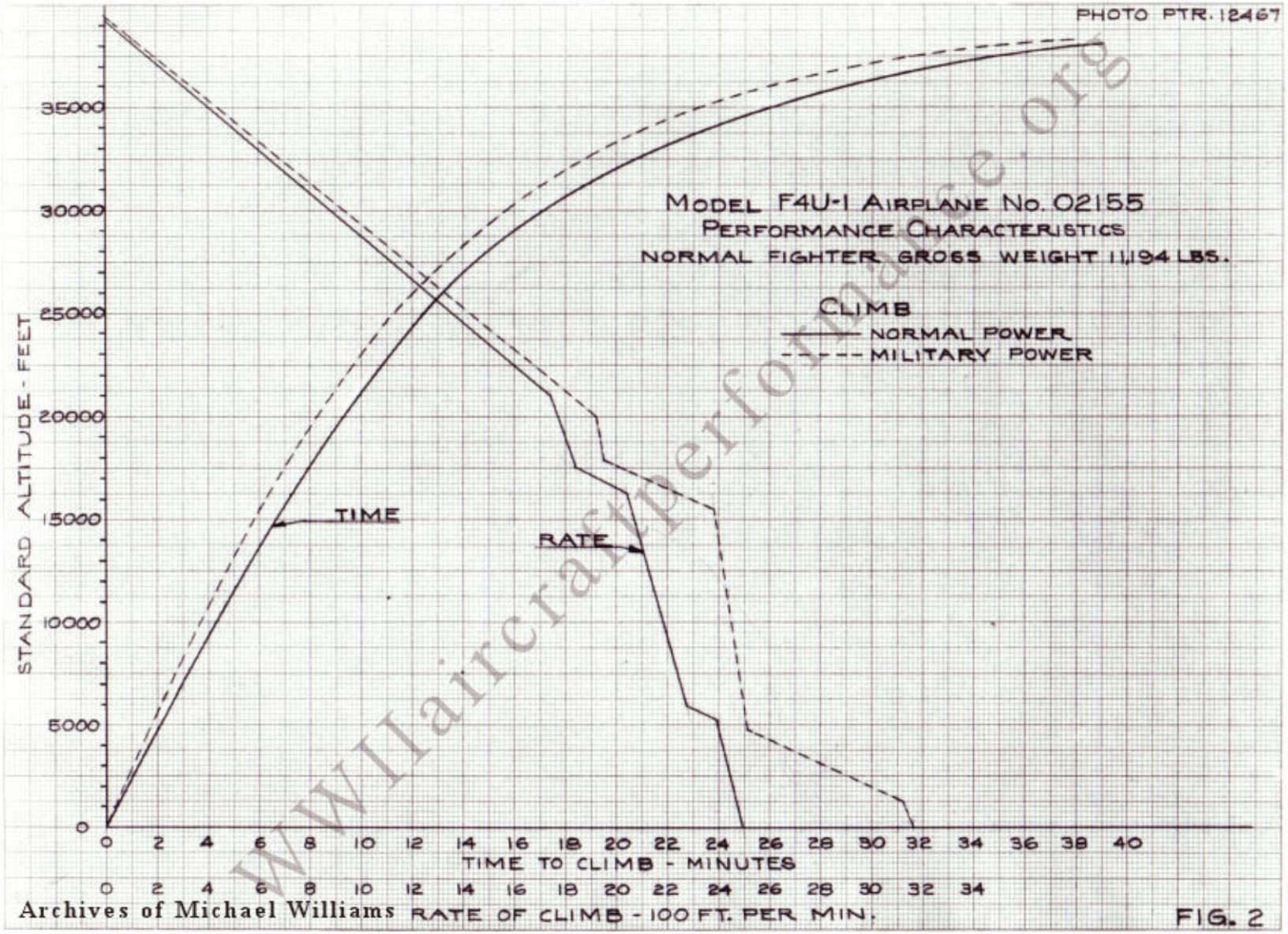

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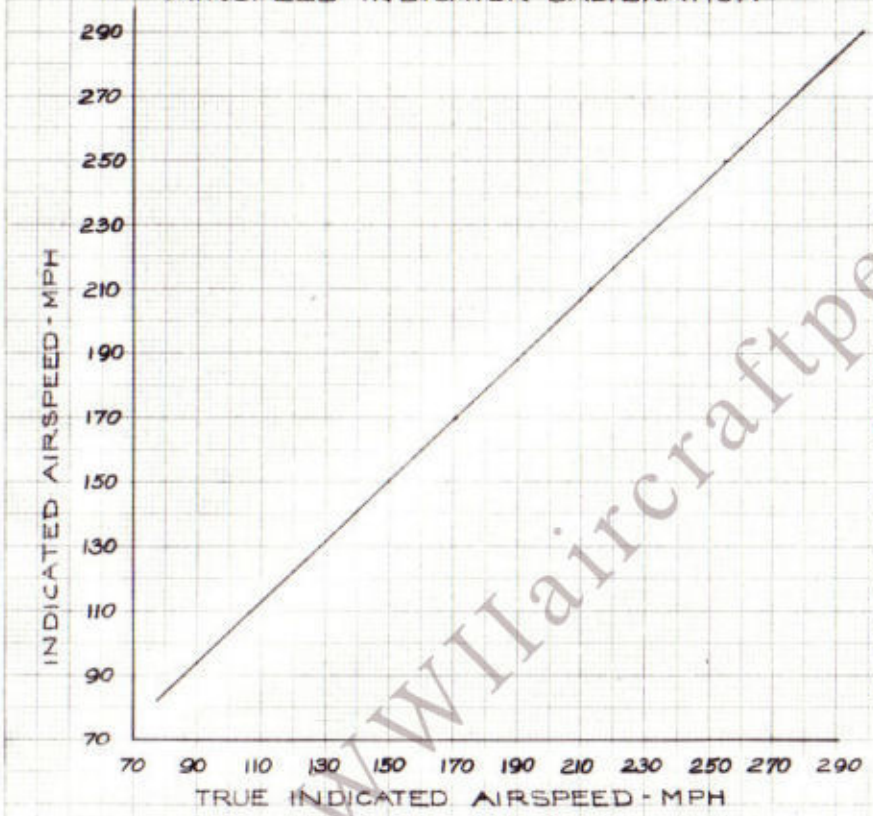
FIG. 2

PHOTO PTR. 12468
REVISED 10-24-44

MODEL F4U-1 AIRPLANE NO. 02155
PERFORMANCE CHARACTERISTICS
NORMAL FIGHTER GROSS WEIGHT 11,194 LBS.

AIRSPEED INDICATOR CALIBRATION



BRAKE HORSEPOWER REQUIRED

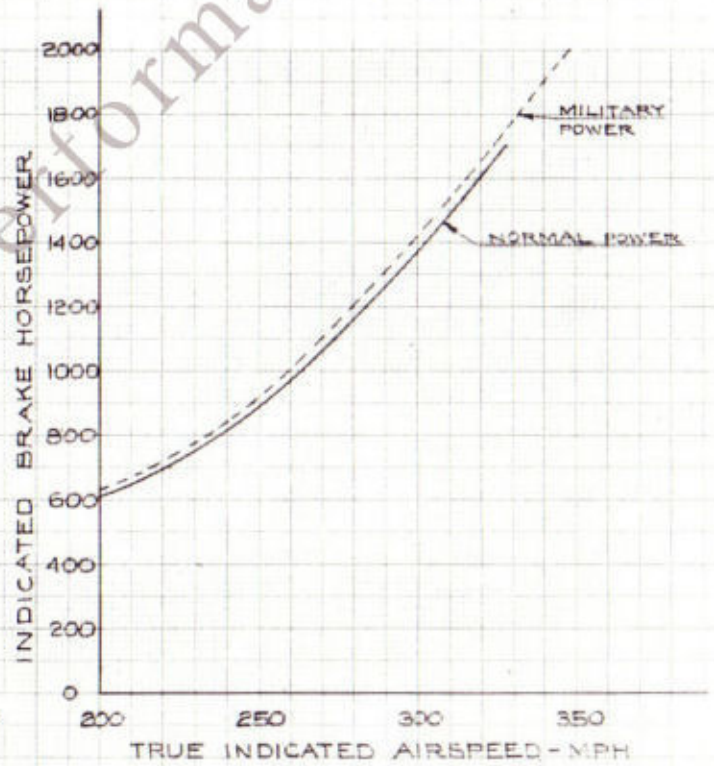


FIG. 3

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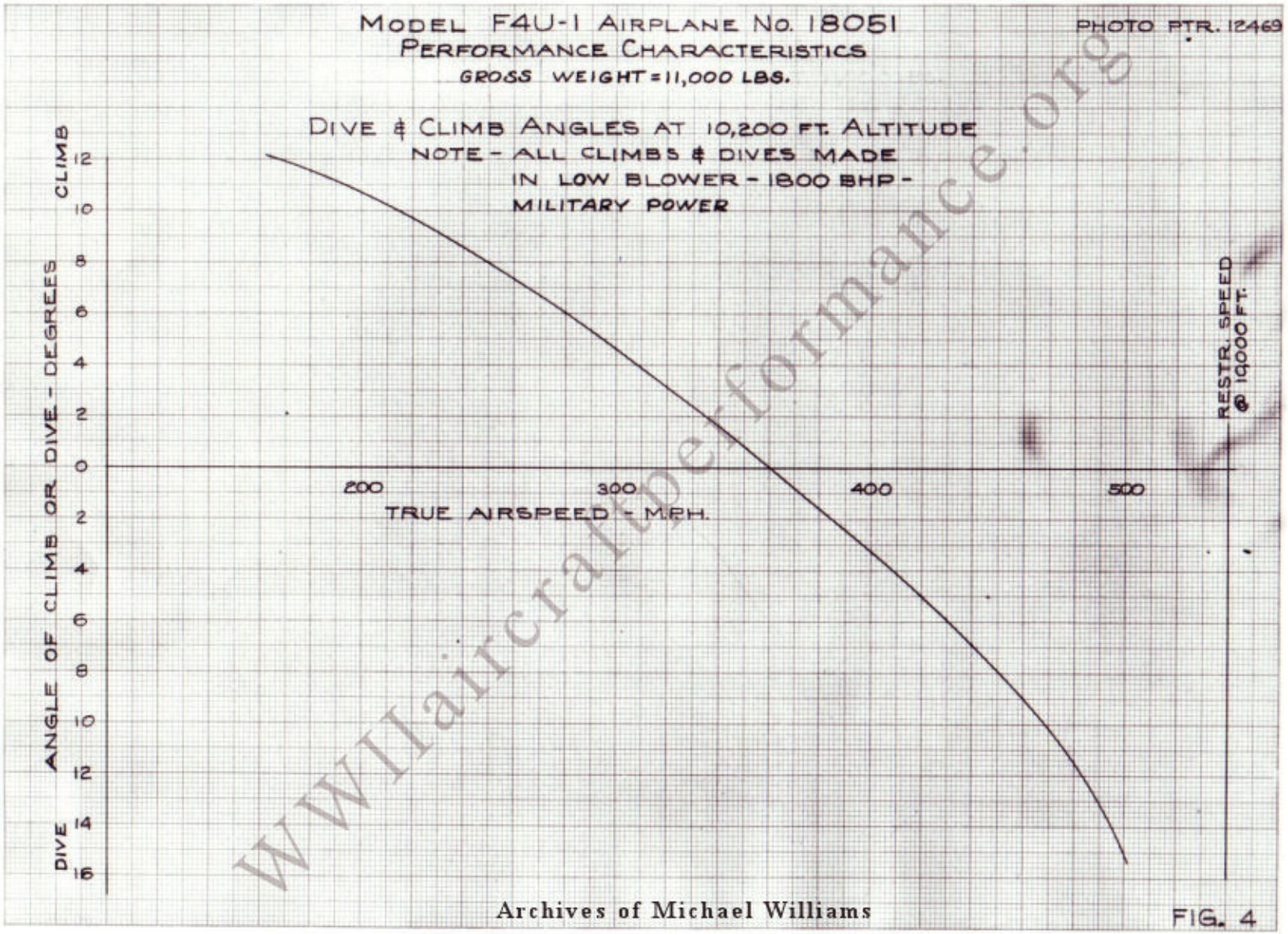

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FIG. 4