CONFIDENTIAL

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

FINAL REPORT

of

PERFORMANCE TEST EACH 1000th AIRPLANE
(TED NO. PTR 2125.1)

on

MODEL F6F-5 AIRPLANE NO. 72731

held

12 DECEMBER 1944 to 19 APRIL 1945

by

FLIGHT TEST

at

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

for

DESIGN COORDINATION
BUREAU OF AERONAUTICS

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INTRODUCTION

Reference (a) established a program whereby approximately each 1000th model F6F-3 airplane would be periodically checked for performance data consisting of maximum speed, stalling speed, service ceiling, and take-off distance. In compliance with reference (b), model F6F-5 airplane No. 72731 was designated as the second model F6F-5 airplane to receive this check, having been preceded by model F6F-5 airplane No. 58310, reference (c). It is to be noted that during these tests model F6F-5 airplane No. 72731 was equipped with zero-length rocket launchers for accommodating six (6) rockets and with twin pylons whereas model F6F-5 airplane No. 58310 carried only a starboard pylon when similarly checked.

The engine-propeller installation of this airplane consisted of a Nash Kelvinator model R-2800-10W engine with a 3-blade Hamilton Standard constant-speed hydromatic-control propeller of 13'1" diameter (blade design No. 6501A-0, hub design No. 23D50-495).

Photographs showing the external configuration of the airplane form enclosures while additional detailed information regarding this configuration follows:

(a) Six .50 caliber gun barrel openings were sealed with tape. Shell ejection chutes on the underside of both wing panels were open.

(b) Airspeed pitot head was located on underside of right wing tip near the leading edge; static flush plate was on starboard side of fuselage approximately $2\frac{1}{2}$ feet above the wing root trailing edge.

(c) Starboard and port wing pylons and zero-length launchers for carrying six (6) rockets were installed.

(d) Outside air temperature gauge was installed on topside of right wing panel.

(e) A mast, located aft of the cockpit canopy, supported an aerial extending from the starboard side of the fuselage to this mast and thence to the rudder.

(f) VHF antenna was located atop the fuselage aft of the aerial mast.

PURPOSE OF TEST

This test was a periodic performance check conducted on approximately each 1000th model F6F-3, -5 airplane.

METHOD OF TEST

Performance data were obtained on the airplane as a representative overload fighter at a gross weight of 12,640 lbs. (c.g. at 29% MAC, gear up; 27%, gear down), carrying full internal fuel, ammunition (ballast), and water for combat power usage. Climbs to service ceiling and Vmax level flight runs, normal and military rated power, were performed in auto-lean. Engine powers developed are based on torquemeter readings.

RESULTS

Comparative auto-lean performance data, contained in the Summary below, were taken from reference (c). Reasons for submitting take-off and stalling speed data on model F6F-5 airplane No. 77593, reference (d), in lieu of the subject airplane are discussed later in this report.

Model.....	F6F-5	F6F-5
Airplane Number.....	72731	58310
Loading.....	Overload Fighter with rocket launchers-twin pylon	Overload Fighter - single pylon
Gross weight - lbs.....	12,640	12,420

Military Power Performance:		
Airplane critical alt. ft.....	23,900	23,100
BHP @ ACA.....	1625	1655
Maximum speed at airplane critical alt. - MPH.....	376.5	391.0
Service ceiling - ft.....	37,600	37,100
Maximum rate of climb at sea level - FPM.....	2,910	2,660
BHP @ S.L. (52.5" Hg. MAP).....	1905	1850
Normal Power Performance:		
Airplane critical alt. ft.....	24,700	24,100
BHP @ ACA.....	1560	1555
Maximum speed at airplane critical alt. - MPH.....	372.5	386.5
Service ceiling - ft.....	37,200	36,500
Maximum rate of climb at sea level - FPM.....	2,480	2,020
BHP @ S.L. (MAP-in.Hg.).....	1,630(45.0)	1,500 (44.0)

* Model.....	F6F-5
Airplane Number.....	77593
Loading.....	Overload Fighter with rocket launchers - twin pylons
Gross weight, lbs.....	12,686
Center-of-gravity, % MAC:	
Gear up.....	29.1
Gear down.....	27.0
Take-off Performance:	
Distance, no wind - ft.....	650
Distance, 25 knot wind - ft.	295
Speed - MPH.....	84.0
Stalling Speed:	
Clean - power on - MPH.....	97.5
Clean - power off - MPH.....	101.5
Landing condition - power on - MPH.....	79.5
Landing condition - power off - MPH.....	87.5

* Note - This data previously reported in reference (d) under TED No. PTR 2311.

DISCUSSION

Figures 1 and 2 graphically illustrate the performance characteristics of the airplane during Vmax runs and climbs in auto-lean at various altitudes, normal and military rated powers. Note on Figure 1 that airplane critical altitude is defined as that altitude where rated manifold pressure for the respective blower ratio was attained with full-throttle setting. Brake horsepower required and airspeed calibration curves are shown on Figure 3.

The difference in Vmax at airplane critical altitude between model F6F-5 airplane No. 72731 and model F6F-5 airplane No. 58310 as tabulated under RESULTS would be expected to be caused by the differences in: (1) external configurations, (2) horsepowers developed at the respective criticals, and (3) gross weights to a minor degree, all of which are included in this tabulation.

Stalling speeds and take-off performance data are reported herein on model F6F-5 airplane No. 77593 in lieu of airplane No. 72731 as it was contended that to conduct such tests on airplane No. 72731 would be to duplicate tests only recently conducted on airplane No. 77593. In support of this contention, it is pointed out that both airplanes were of like configuration, i.e., equipped with zero-length rocket launchers for accommodating six (6) rockets and having twin pylons; of approximately the same gross weight, airplane No. 77593 was 46 lbs. heavier than airplane No. 72731 at take-off gross weight; and separated by approximately 500 production airplanes notwithstanding the wide divergence in serial numbers.

Noteworthy during this performance check was the substantial increase in neutral blower power developed, normal and military, over that obtained during a similar check on model F6F-5 airplane No. 58310, reference (c). It was reported in reference (c) that malfunctioning of the carburetor was believed responsible for the drastic power loss reported therein, with the ensuing recommendation that immediate investigation be made to determine the reason (or reasons) therefor.

CONCLUSIONS

Flight performance and handling characteristics appeared normal and commensurate with previously tested model F6F-5 airplanes.

Encls: (HW)
1. Three (3) Performance Curves, Photo PTR Nos. 24340, 24341, and 24342.
2. ~~six~~ (5) Photographs, Photo PTR Nos. 19180, 19181, 19179, 19178, ~~19183~~, and 19182.

PHOTO PTE 24340

MODEL F6F-5 AIRPLANE NO. 72731
PERFORMANCE CHARACTERISTICS
OVERLOAD FIGHTER GROSS WEIGHT = 12,640 LBS.

——— MILITARY POWER / AUTO LEAN
- - - - - - NORMAL POWER / AUTO LEAN

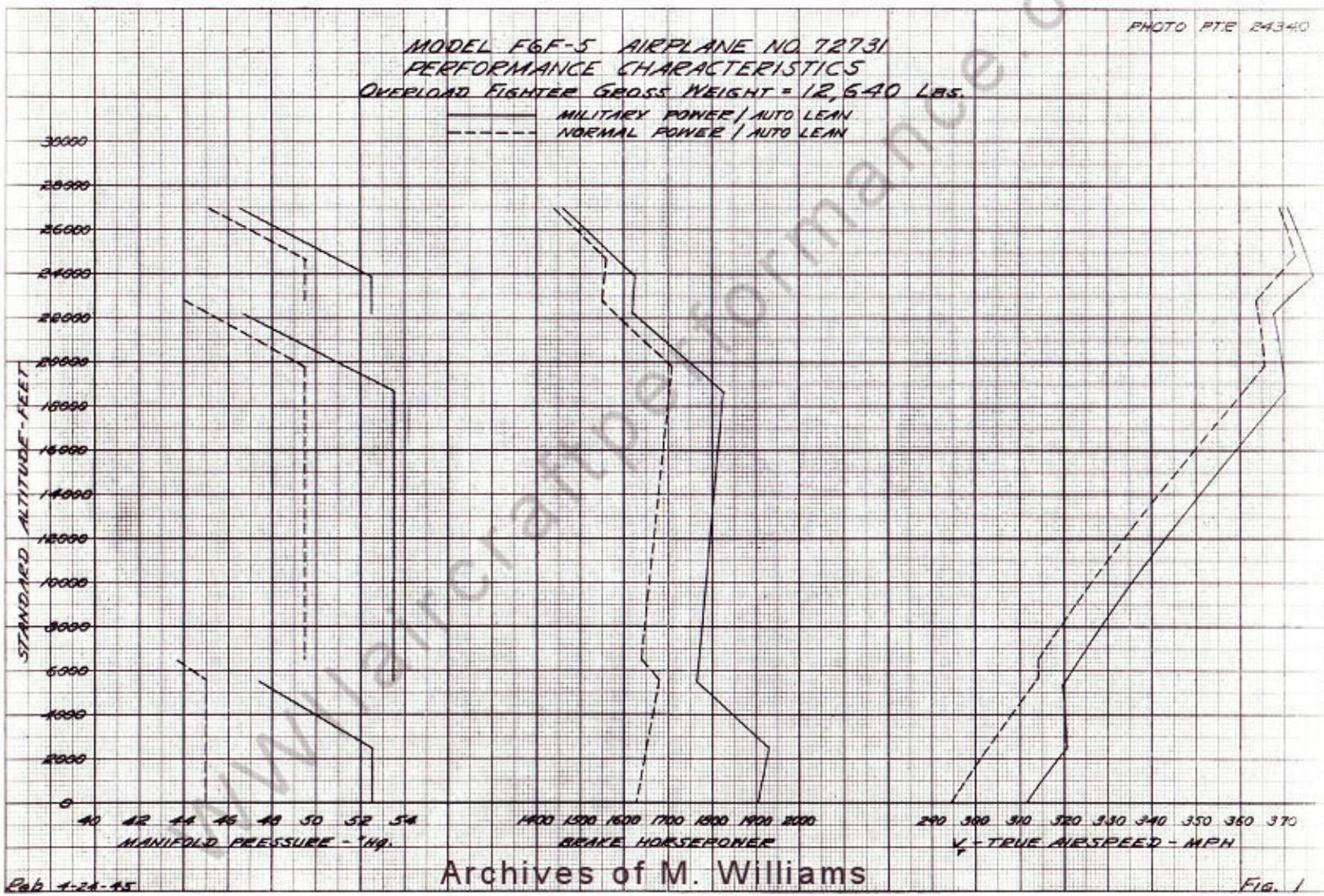

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FIG. 1

PHOTO PTR 24341

MODEL FGF-5 AIRPLANE NO. 72731
PERFORMANCE CHARACTERISTICS
OVERLOAD FIGHTER GROSS WEIGHT = 12640 LBS.

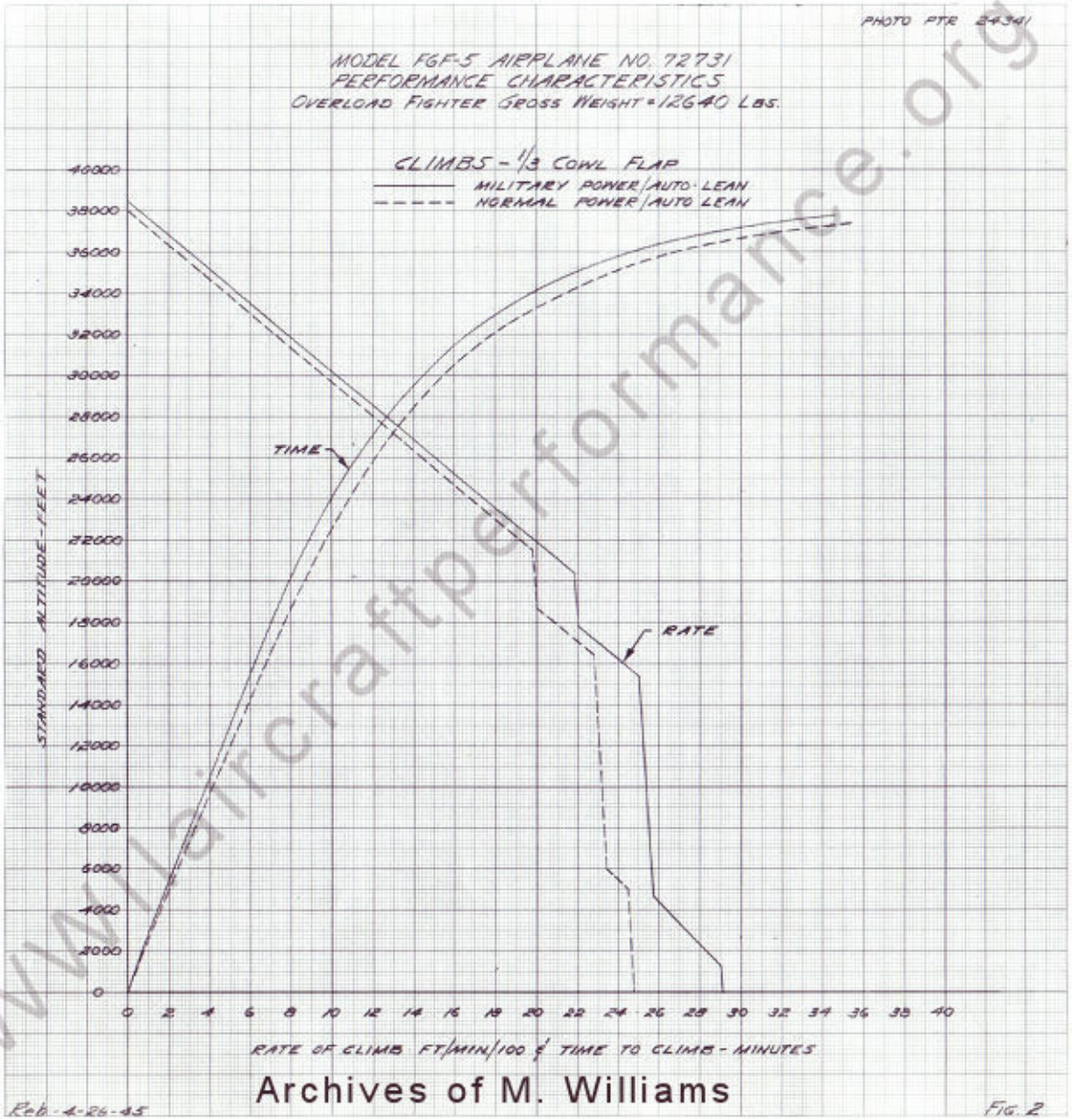

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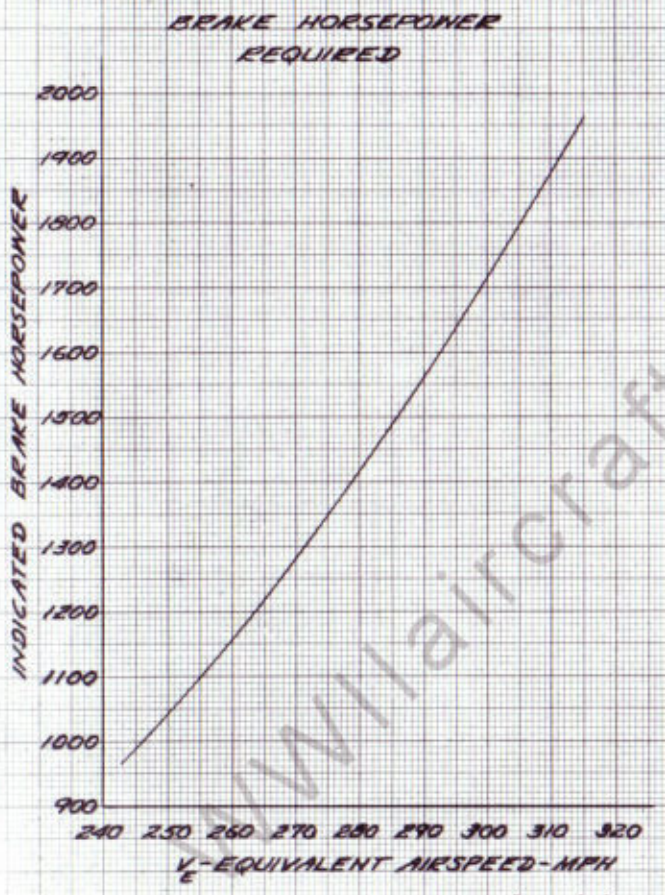
FIG. 2

PHOTO PTE 24342

MODEL FGF-5 AIRPLANE NO. 72731
OVERLOAD FIGHTER GROSS WEIGHT = 12640 LBS.



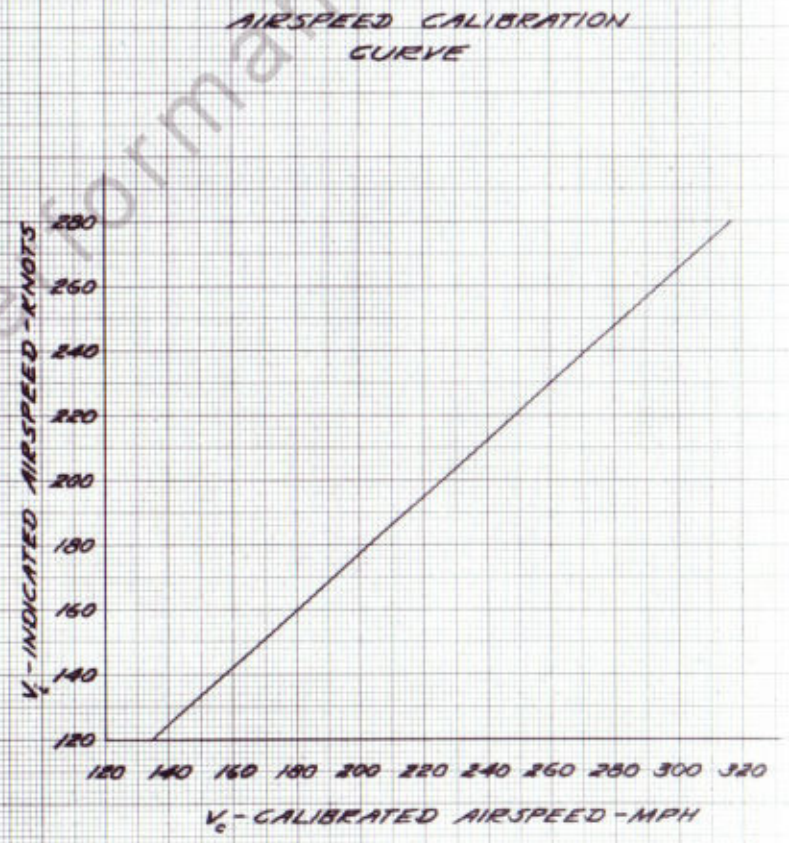


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FIG. 3