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

FINAL FLIGHT REPORT

of

FLIGHT TEST

of

TWO MODEL FG-1 AIRPLANES
No. 14796 (British Corsair Mk IV
KD 365) and British Corsair Mk
IV KD 502
(TED NO. PTR 2140)

held

12 SEPTEMBER 1944 - 12 OCTOBER 1944

by

FLIGHT TEST

at

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

for

VF DESIGN BRANCH
BUREAU OF AERONAUTICS

Project Pilot:

E. M. OWEN
Lt. Comdr., USN

Project Engineer:

W. W. BOESEWETTER
Lt. (jg), USNR

Approved:

C. T. BOOTH
Comdr., USN

Archives of M. Williams

NOV 10 1944

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Table of Contents

Title Page.....	1
Table of Contents.....	2
References.....	2
Test Directive.....	3
Introduction.....	4
Purpose of Test.....	4
Method of Test.....	4 - 5
Results of Test.....	5 - 7
Discussion.....	7 - 8
Conclusions.....	9
Recommendations.....	9
Performance Curves.....	10 - 11
Photographs.....	12 - 24

References

- (a) BuAer restr. ltr. Aer-E-211-JCM (149713)
PTR 2149 dated 28 Aug 1944.
- (b) BuAer ltr. Aer-E-211-JCM (160281) PTR 2149
changed to PTR 2140 dated 14 Sept 1944.

Aer-E-211-JCM
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NAVY DEPARTMENT
BUREAU OF AERONAUTICS
WASHINGTON 25, D.C.

COPY

149713

28 Aug. 1944

From: Chief, BuAer
To: CO, NAS, Patuxent River

Subj: British Corsair Mk IV - Flight Characteristics - TED No. PTH
2149.

1. The British Corsair Mk IV is provided with a shorter span than the P4U, and square wing tips. Favorable reports have been received concerning the flight characteristics of this model.

2. BuAer has arranged with Lt. Cdr. Callingham, RN, BAC Repr. at Patuxent River, for an airplane to be made available in the near future.

3. It is requested that brief tests be carried out to check the flight characteristics with particular reference to stall and roll, and to determine the maximum speed and stalling speed. Such comment as can be furnished on the relative merits of the Corsair Mk IV and the P4U-1 are also desired.

4. A Class "A" priority is assigned to this project since the airplane will be made available for a short period.

CC: Lt. Cdr. Callingham,
BAC Representative
NAS, Patuxent River

/s/ C.L. FINE

C.L. FINE
Col. U.S.M.C.
By Direction Chief of Bureau

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INTRODUCTION - Reference (a), requested that brief performance tests be conducted on model FG-1 airplane BuNo. 14796, British No. KD 365 under TED No. PTR 2149. This designation was changed to TED No. PTR 2140 by reference (b).

The model FG-1 airplane No. 14796, British No. KD 365, has a shorter wing span than that of the standard model F4U-1 airplane, the span being 39'-9 1/8" as compared with 40'-11 3/4" for the standard F4U-1 airplane. The wing is the same as that of a standard model F4U-1 wing with a portion of the tip removed. Two carbon monoxide decontamination scoops are installed on either side of the fuselage aft of the pilot with a single exhaust port located under the fuselage.

The airplane was equipped with a Pratt and Whitney R-2800-8W engine, manufactured by Nash Kelvinator, and a Hamilton Standard, 3 blade, constant-speed propeller, 13'4" in diameter, blade design No. 6525A-21.

Photographs showing the external configuration are included, pages 12 to 24.

The preliminary results on this airplane indicated that further tests on a similar model FG-1 would be advisable. Accordingly, further tests on model FG-1 airplane No. KD 502 were obtained and the results are included herein.

PURPOSE OF TEST - The purpose of this test was to check the flight and performance characteristics of this model airplane having clipped wings with particular reference to stall and roll, to determine maximum speed and stalling speeds and to offer pertinent comment on the relative merits of the Goodyear Corsair MK IV and the F4U-1.

METHOD OF TEST - A torquemeter was used on the model FG-1 No. KD 365 to record all powers obtained during the tests. Stick forces were recorded in both airplanes by means of a spring-type stick force indicator.

The airplanes were flown in the normal fighter condition for all tests. This loading is summarized as follows:

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Gross weight - lbs.....	11,974
Fuel - gallons.....	237
Oil - gallons.....	18
Armament - .50 cal. machine guns.....	6
Ammunition - rounds.....	2,400

RESULTS OF TESTS - Curves contained in enclosure 2 present the performance obtained on airplane No. KD 365 during these tests.

Aileron stick forces obtained for full deflections are summarized as follows:

(a) Model FG-1 No. KD 365

Landing Conditions - 50° Flap

<u>IAS</u> <u>(Knots)</u>	<u>Left</u> <u>(pounds)</u>	<u>Right</u> <u>(pounds)</u>
80	5.5	6.0
90	7.0	10.0
100	9.5	12.0
110	12.0	12.0

Clean Condition

<u>IAS</u> <u>(Knots)</u>	<u>Left</u> <u>(pounds)</u>	<u>Right</u> <u>(pounds)</u>
145	13.0	18.0
150	16.0	20.0
160	16.0	----

(b) Model FG-1 No. KD 502

Landing Conditions - 50° Flap

<u>IAS</u> <u>(Knots)</u>	<u>Left</u> <u>(pounds)</u>	<u>Right</u> <u>(pounds)</u>
80	7.2	6.7
90	10	10
100	13	13
110	14	14.5

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Clean Condition

<u>IAS</u> <u>(Knots)</u>	<u>Left</u> <u>(pounds)</u>	<u>Right</u> <u>(pounds)</u>
145	18	19
150	21	20
160	21	21

The rates of roll obtained are summarized as follows:

(a) FG-1 No. KD 365

Landing Conditions - 50° Flap

<u>IAS</u> <u>(knots)</u>	<u>Degrees</u>	<u>Direction</u>	<u>Degrees/Sec.</u>
80	60	L	33.8
80	60	R	36.0
90	60	L	34.3
90	60	R	42.8
100	60	L	37.5
100	60	R	46.2
100	90	L	36.0
100	90	R	40.0

Clean Condition

<u>IAS</u> <u>(knots)</u>	<u>Degrees</u>	<u>Direction</u>	<u>Degrees/Sec.</u>
200	360	L	75.0
200	360	R	88.0

(b) FG-1 No. KD 502

Landing Conditions - 50° Flap

<u>IAS</u> <u>(knots)</u>	<u>Degrees</u>	<u>Direction</u>	<u>Degrees/Sec.</u>
80	60	L	31.5
80	60	R	33.5
90	60	L	31.5
90	60	R	36.0

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100	60	L	33.5
100	60	R	41.0
100	90	L	37.5
100	90	R	39.0

Clean Condition

<u>IAS</u> <u>(knots)</u>	<u>Degrees</u>	<u>Direction</u>	<u>Degrees/Sec.</u>
200	360	L	83
200	360	R	100

The stalling speeds for these two model FG-1's are as follows:

True indicated airspeed at stall - MPH

	<u>KD 365</u>	<u>KD 502</u>
Clean, power on.....	99.0	99.5
Clean, power off.....	103.0	104
Landing condition, power on.....	73.5	74
Landing condition, power off.....	86.5	86.5

A summary of the performance data obtained on the model FG-1 No. KD 365 at military power is as follows:

Airplane critical alt. in high blower ft.....	22,600
Maximum speed at airplane crit. altitude in high blower, MPH.....	389
Take-off characteristics (2700 RPM, 54" MAP):	
Take-off speed, MPH.....	82
Take-off distance - zero wind, ft.....	675
Take-off distance - 25 knot wind, ft.....	305
Take-off BHP (Torquemeter).....	1,870

DISCUSSION - The stalling characteristics of the first model FG-1 airplane tested (KD 365) appeared to be similar to those of the standard model F4U-1 airplane with minor exceptions. This airplane had a greater tendency to pitch forward in the early part of the stall and would fall either directly forward or roll off to either side in the stall. The ailerons appear to give better controllability at low speeds down to the stall. The rate of roll is about the same as that of the standard F4U-1 with the aileron stick forces being higher.

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The airplane (KD 365) was poorly rigged with the stick about 2 inches to the left of neutral at normal trim for 200 knots. The left aileron was found to be drooped $3\frac{1}{2}^{\circ}$, the left flap 2° high, the right aileron $1\frac{1}{2}^{\circ}$ low and the right flap 2° low. The airplane required less right rudder and aileron trim than the standard model FG-1 airplane for a given speed, and also required more trim tab adjustments for changes in power and speed.

Since the conditions described above are factors which affect the flying characteristics, it was considered advisable to repeat a portion of these tests on another model FG-1 with the same external configuration and having correct rigging.

The general flight characteristics of this second model FG-1 airplane indicate little if any difference in stall and roll characteristics as compared with the standard model F4U-1 with the possible exception of there being a slight increase in aileron control present at low speeds. The pitching tendency at the stall present in the first airplane was not present in this airplane and may have been caused by the drooped ailerons of the first airplane. Both model FG-1's have somewhat higher aileron stick forces at full deflection than the standard F4U-1.

These model FG-1 airplanes were equipped with anti-carbon monoxide scoops. The anti-carbon monoxide system consists of one scoop on each side of the fuselage aft of the pilot and a large exhaust at the bottom of the fuselage. The scoops circulate air in sufficient quantities to lower the temperature of the cockpit compartment considerably, making the cockpit uncomfortably cold in high altitude flight. No measurable increase in airspeed at a given power was obtained on KD 365 after removing the scoops and covering the holes with tape.

The powers obtained from the engine in model FG-1 No. KD 365 in auxiliary blower at rated carburetor impact pressure were considerably lower than the ratings given for the model R-2800-8W engine. The military rated horsepower at the high blower critical altitude is 1650. This engine produced only 1600 horsepower at 22,600 feet in high blower at rated carburetor impact pressure of 28.1" Hg. and 1725 horsepower in low blower at a critical altitude of 17,600 feet. Military rated power in low blower is 1800 horsepower. The neutral blower powers obtained were approximately equal to rated military power.

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CONCLUSIONS - 1. The general flight characteristics of the model FG-1 No. KD 502 with clipped wings were in general similar to those of the standard model F4U-1 airplane.

2. The rate of roll appears to be unchanged as compared to the standard model F4U-1 airplane.

3. The effect of the anti-carbon monoxide scoops installed on the model FG-1 No. KD 365 on maximum speed was found to be negligible.

4. The performance characteristics of these airplanes are similar to those of a standard model F4U-1 airplane.

RECOMMENDATIONS - 1. Make provisions to enable the pilot to control the flow of air through the anti-carbon monoxide scoops.

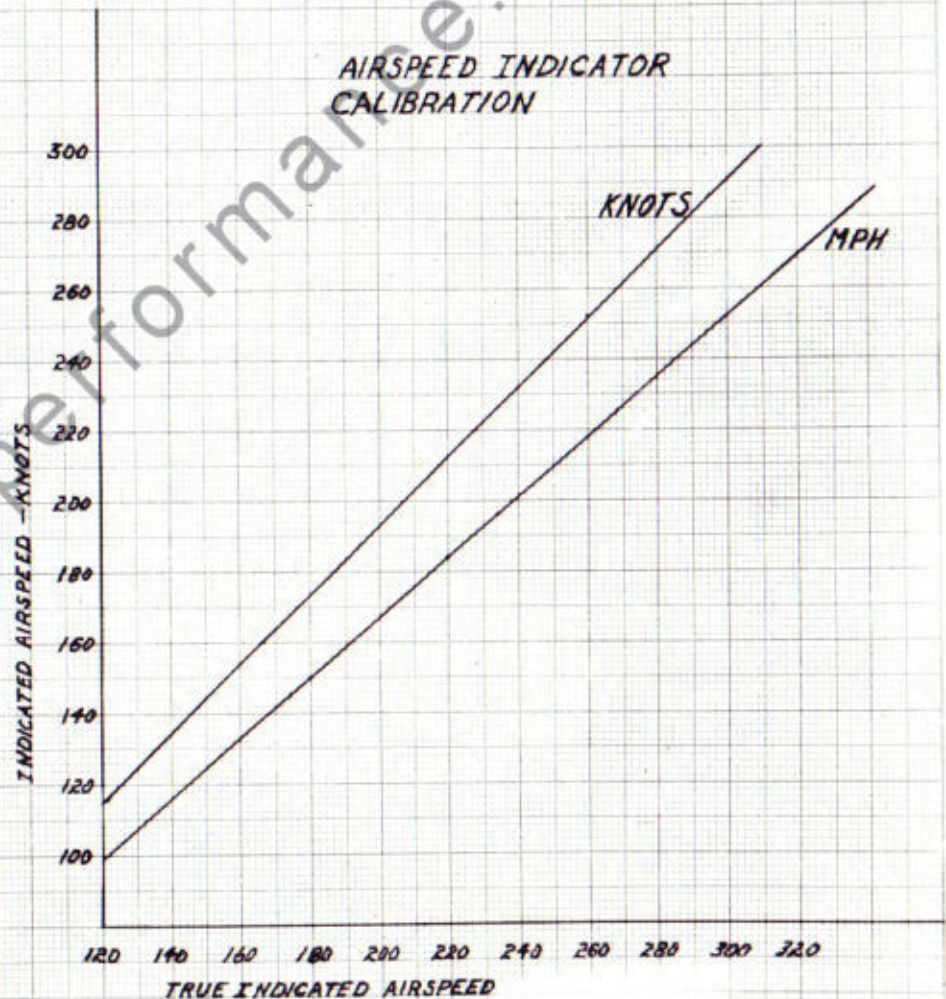
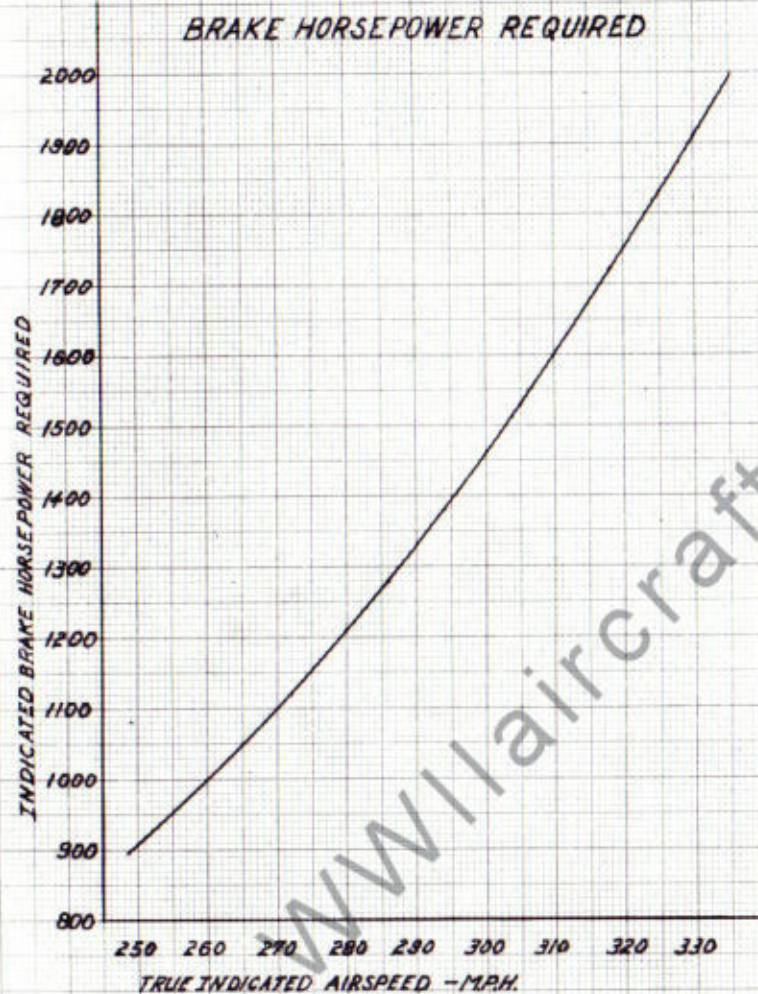
2. Investigate the loss of power in auxiliary blower in the model R-2800-8W engine installed in the model FG-1 No. KD 365.

Encl: (HW)

1. Performance Curves, PTR Nos. 13532 and 13531.
2. Photographs, PTR Nos. 13406, 13404, 13402, 13403, 13401, 13405, 13398, 13397, 13399, 13195, 13194, 13193, and 13400.

MODEL FG-1 AIRPLANE NO. 14796 (KD-365)
PERFORMANCE CHARACTERISTICS (CLIPPED WINGS)
NORMAL FIGHTER, GROSS WEIGHT=11,974 LBS.
MILITARY POWER

PHOTO PTR 13532
REVISED 10-5-44.



MODEL FG-1 AIRPLANE NO. 14796 (KD-365)
 PERFORMANCE CHARACTERISTICS (CLIPPED WINGS)
 NORMAL FIGHTER, GROSS WEIGHT = 11,974 LBS.

PHOTO PTR 13531

MILITARY POWER

R-2800-8W ENGINE

AIRPLANE CRITICAL
 ALTITUDES

MAXIMUM SPEED

STANDARD ALTITUDE - FT. + 1000

26
24
22
20
18
16
14
12
10
8
6
4
2
0

330 340 350 360 370 380 390 400
 TRUE AIRSPEED - MPH

Archives of M. Williams

STANDARD ALTITUDE - FT. + 1000

30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0

1300 1400 1500 1600 1700 1800 1900 2000
 BRAKE HORSEPOWER AVAILABLE

9-28-44 JMW



FG-1 - KD 365
Left Side View

Photo PTR 13401
9-23-44

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