

CLASSIC WARBIRDS DESIGN TEAM

F6F HELLCAT

USER'S MANUAL

DESIGNED BY : Jerry Lindell

PAINTED BY : Sophocles

AIR FILES : ACWAI

SOUND FILES : DAVID COPLEY

GAUGES : Sophocles



Special Thanks to

Warwick Carter (Wozza) - VC effects, Technical Wizard

Herman (Krazy) - Effects

Robert Folsom (Helldiver) - Detailed historical information and flight
(beta) testing

Nick Churchill - Screenshot Art <http://www.screenshotartist.co.uk>

Ron Larsen (Ickie) - SOH ftp site

Ed (Panther), Roger Law (Roger), Marv (Gzr_Sactargets) - Beta testing

BACKGROUND

This aircraft was designed for the high end PC. The recommended PC requirement is a P4 2.4 Ghz with 128 mb graphics card. A lower detailed set of bitmap files will be furnished upon request. It was test flown successfully on an Athlon 1.2 Ghz PC with a GeForce 4 Ti-420 graphics card with 128 mb memory.



INSTALLATION INSTRUCTIONS

Simply run the CWDT_Hellcat.EXE program. The installation procedure points to the Default " C:\Program Files\Microsoft Games\Flight Simulator 9" folder. If this is not where your FS9 resides, simply point the installer to where it is on your system using the Browse function.

CWDT Hellcat Features:

- 7 model set (F6f-3 Clean, F6f-3 with Drop tank, F6f-5 Clean, F5f-5 with Droptank, F6f-5 with 500lb bombs, F6f-5 with HVAR rockets, and the F6f-5N Night fighter variant).
- 9 high resolution 32-bit texture sets, including US Navy, Marines and Royal Navy Fleet Air Arm schemes; all historically accurate.
- High quality soundsset included by David Copley
- Specular Reflectivity on all models
- Super detailed 'virtual cockpit'
- Virtual Cockpit with hi-resolution custom virtual gauges in XML format. "clickable" and mouse controlled throttle, pitch, mixture, landing gear, wingfold, flaps and cowl flap levers; rudder aileron and elevator trim wheels, and starter, magneto and tail-hook switches
- Detailed crew figure
- Super-Detailed Gunbays (with removable access panels) featuring 6 Browning .50 machine guns, ammunition belts, drives and trays. 4 Browning .50 machine guns and two 20mm cannon for the F6f-5N
- Externally visible night-lighting
- Fine-tuned flight characteristics in seven airfiles for all seven models.
- Authentic 2D panel with pop-ups for Nav Instruments, GPS, Fuel gauges, engine instruments, and throttle/Pitch/Mixture/cowl flap levers (available in VC also)

ANIMATED FEATURES :

1. CANOPY - SHIFT + E
2. WING FOLD – WING FOLD KEY (SHIFT + F)
3. LANDING GEAR – G
4. COWL FLAPS - CNTRL + SHIFT + C and CNTRL + SHIFT + V
5. FLAPS – F5, F6, F7 and F8
6. GUNBAYS – (extend concorde nose & visor fully, retract concorde nose & visor fully)**
7. TAIL HOOK - SHIFT + H

** note – above functions and their respective keys and combinations represent the default assignments; you may have to check within the control assignments screen to check that the commands have been assigned keys.

FLYING THE CWDT HELLCAT

Once you have selected a Hellcat configuration, the fuel and payload weight are required to be adjusted manually. The following mass properties are estimated from historical data.

	<p>HELLCAT CLEAN CONFIGURATION MAX FUEL LOAD = 250 GALLONS ONE PILOT</p>																												
<p>Classic Warbirds Design Team Grumman</p> <p><input type="checkbox"/> Display fuel quantity as weight</p> <table border="1"> <thead> <tr> <th>Tank</th> <th>%</th> <th>Gallons</th> <th>Capacity</th> </tr> </thead> <tbody> <tr> <td>Left</td> <td>100.</td> <td>87.5</td> <td>87.5</td> </tr> <tr> <td>Center</td> <td>100.</td> <td>75.0</td> <td>75.0</td> </tr> <tr> <td>Right</td> <td>100.</td> <td>87.5</td> <td>87.5</td> </tr> <tr> <td colspan="2">Total fuel:</td> <td>100.0</td> <td>250.0</td> </tr> <tr> <td colspan="2">Fuel weight Lbs/Gal:</td> <td colspan="2">6.0</td> </tr> </tbody> </table>	Tank	%	Gallons	Capacity	Left	100.	87.5	87.5	Center	100.	75.0	75.0	Right	100.	87.5	87.5	Total fuel:		100.0	250.0	Fuel weight Lbs/Gal:		6.0		<p>PAYLOAD SETTINGS</p> <p>Classic Warbirds Design Team Grumman</p> <table border="1"> <thead> <tr> <th>Station</th> <th>Pounds</th> </tr> </thead> <tbody> <tr> <td>Pilot</td> <td>200</td> </tr> </tbody> </table>	Station	Pounds	Pilot	200
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HELLCAT WITH BOMBS
 MAX FUEL LOAD = 250 GALLONS
 ONE PILOT
 2 BOMBS = 600 LBS ON EACH WING

Classic Warbirds Design Team Grumman

Display fuel quantity as weight

Tank	%	Gallons	Capacity
Left	100.	87.5	87.5
Center	100.	75.0	75.0
Right	100.	87.5	87.5
External 1	0.0	0.0	150.0

Total fuel: 62.5 250.0 400.0
 Fuel weight Lbs/Gal: 6.0

PAYLOAD SETTINGS

Classic Warbirds Design Team Grumman

Station	Pounds
Pilot	200
R Rockets @120	0
L Rockets @120	0
R Bomb	600
L Bomb	600



HELLCAT WITH ROCKETS
 MAX FUEL LOAD = 250 GALLONS
 ONE PILOT
 6 ROCKETS = 460 LBS ON EACH WING

Classic Warbirds Design Team Grumman

Display fuel quantity as weight

Tank	%	Gallons	Capacity
Left	100.	87.5	87.5
Center	100.	75.0	75.0
Right	100.	87.5	87.5
External 1	0.0	0.0	150.0

Total fuel: 62.5 250.0 400.0
 Fuel weight Lbs/Gal: 6.0

PAYLOAD SETTINGS

Classic Warbirds Design Team Grumman

Station	Pounds
Pilot	200
R Rockets @120	460
L Rockets @120	460
R Bomb	0
L Bomb	0



HELLCAT WITH EXT FUEL TANK
 MAX FUEL LOAD = 400 GALLONS
 ONE PILOT

Classic Warbirds Design Team Grumman

Display fuel quantity as weight

Tank	%	Gallons	Capacity
Left	100.	87.5	87.5
Center	100.	75.0	75.0
Right	100.	87.5	87.5
External 1	100.	150.0	150.0
Total fuel:		100.0	400.0
Fuel weight Lbs/Gal:		6.0	

PAYLOAD SETTINGS

Classic Warbirds Design Team Grumman

Station	Pounds
Pilot	200
R Rockets @120	0
L Rockets @120	0
R Bomb	0
L Bomb	0



HELLCAT WITH RADAR
 MAX FUEL LOAD = 250 GALLONS
 ONE PILOT
 RADAR = 200 LBS ON RIGHT WING

Classic Warbirds Design Team Grumman

Display fuel quantity as weight

Tank	%	Gallons	Capacity
Left	100.	87.5	87.5
Center	100.	75.0	75.0
Right	100.	87.5	87.5
Total fuel:		100.0	250.0
Fuel weight Lbs/Gal:		6.0	

PAYLOAD SETTINGS

Classic Warbirds Design Team Grumman

Station	Pounds
Pilot	200
Radar	200

HISTORY / SPECIFICATIONS

Specifications:

Grumman F6F-5 Hellcat

Dimensions:

Wing span:

42 ft 10 in (13.05 m)

Length:

33 ft 10 in (10.31 m)

Height:

14 ft 5 in (4.39 m)

Wing Area:

334 sq ft (31 sq m)

Weights:

Empty:

9,060 lbs (4,110 kg)

Normal Gross:

12,598 lbs (5,714 kg)

Maximum Gross:

15,413 lbs (6,991 kg)

Performance:

Maximum Speed:

380 mph (612 km/hr) @ 23,400 ft (7,132 m)

Cruising Speed:

200 mph (322 km/hr)

Landing Speed:

88 mph (142 km/hr)

Service Ceiling:

37,300 ft (11,369 m)

Combat Range:

945 mi (1,521 km)

Maximum Range:

1,530 mi (2,462 km)

Powerplant:

Pratt-Whitney R-2800-10W "Double Wasp" Air Cooled Radial 2,000 hp (1,492 Kw) Take-Off - 1,975 hp (1,473.9 Kw) @ 16,900 ft (5,151 m)

Armament:

Six .50 caliber (12.7 mm) Browning M-2 machine guns with 2,400 rounds mounted in the wings. F6f-5N substituted two 20 mm guns for the two inboard .50 calibers. Two 1000 lb bombs or 6 HVAR rockets could also be carried.

Although The Grumman F6F began development as an improved F4F Wildcat, it ultimately evolved into a completely new design, sharing no obvious affinity with its predecessor. The Hellcat replaced the Wildcat as the primary United States Navy carrier fighter in 1943, and also served in significant numbers with the Royal Navy's Fleet Air Arm.

The Hellcat was by far the most successful fighter aircraft in naval history, having destroyed over 4,700 enemy aircraft with the U.S. Navy, and approximately 800 with the U.S. Marine Corps. After distinguished service during the second half of World War II, the Hellcat was quickly replaced by newer types, and the few remaining in service were relegated to night-fighter squadrons (and later operated as pilotless target drones). Rugged, reliable, and loved by its crews, the Grumman F6F Hellcat has secured its place in aviation history as one of the greatest fighting machines of all time.

Originally to be fitted with the Wright R-2600 Cyclone engine of 1,700 hp, the Hellcat was instead powered by the more powerful Pratt & Whitney R-2800 Double Wasp 2,000 hp, which indicated better performance. The contract for the prototype XF6F-1 was signed on June 30, 1941; the first, Cyclone-equipped prototype making its maiden flight on June 26 1942. The first Double Wasp-equipped aircraft was first flown on July 30, 1942, and the first production aircraft flew on 3 October 1942. The Hellcat reached operational status onboard USS Essex in March, 1943 with VF-9.

The Hellcat was a sturdy, simple aircraft. The wing was low-mounted, it boasted wide-set hydraulically-actuated undercarriage struts which retracted backward into the wings, and featured the greatest wing area of any World War II fighter (334 square feet). Designed for ease of manufacture and ability to return safely to the carrier with severe damage, the Hellcat was fitted with self-sealing fuel tanks, 212 lb of cockpit armor to aid pilot survival, a bullet-resistant windshield, and armor around the engine oil tank and oil cooler.

The first production variant was The F6f-3. Standard armament on this variant comprised six 0.5 inch Browning machine guns with 400 rounds each. The F6f-3 had the ability to carry a single 150 U.S. gallon disposable drop tank on a center hardpoint.

The next and most common variant was the F6F-5 which featured improvements such as all-metal control surfaces, replacement of rear windows with armor, and a re-structured forward canopy; much improving visibility through the windshield. The F6f-5 also featured 2 under-wing hardpoints to carry a total load of 2,000 lb. of bombs. Six 5 inch HVAR's (High Velocity Aircraft Rocket) could also be carried on 6 under-wing hard points; three under each wing. As in the F6f-3, the F6f-5 also had the ability to carry a single 150 U.S. gallon disposable drop tank.

Another variant in use by both US Navy and Marines squadrons was the F6f-5N Night fighter. This aircraft was equipped with the AN/APS-6 radar. The most externally discernible feature of this variant was the radar pod which was attached to the tip of the right wing. Armament of the F6f-5N comprised four

0.5 inch Browning machine guns with 400 rounds each, and two Hispano 20 mm cannon with 220 rounds each.

A total of 12,272 F6f Hellcats were produced, of which 11,000 had been built in just two years, testimony to the soundness of the original design which underwent few changes through its development.

The Hellcat first saw action against the Japanese on 1 September 1943, where fighters aboard the USS Independence downed a seaplane, and would ultimately account for 75% of all aerial victories recorded by the U.S. Navy in the Pacific.

From its introduction into the War in the Pacific, the Hellcat proved to be decisive. With a kill-to-loss ratio of 19:1, the F6F became the principle "ace-maker", with 306 Hellcat aces arising from the conflict. (By contrast, the P-51 Mustang, produced 275 American aces.) It is widely believed that the Hellcat's introduction into the War in the Pacific played a pivotal role, firmly shifting the balance of air-power in favor of the United States.

During the Battle of the Philippine Sea, such was the dominance displayed by the Hellcat and its Pilots that the battle came to be known as "The Great Marianas Turkey Shoot" where many US Navy pilots scored multiple victories in single sorties.

Foreign Service:

The British Fleet Air Arm received 1,263 F6Fs under the Lend-Lease Act. The F6F-3 was called Hellcat F.I, the F6F-5 the Hellcat F.II, and the F6F-5N the Hellcat NF.II. They saw action off Norway, in the Mediterranean, and in the Far East. Hellcats also served with The French Aeronavale in Indochina, and with The Navy of Uruguay until the early 1960s.

Operators:

United States (Navy, Marine Corps), United Kingdom, France, Argentina, Paraguay, Uruguay.

COCKPIT / INSTRUMENT PANEL

The CWDT Hellcat includes highly detailed Virtual and 2D Cockpits that have been modelled and illustrated from a variety of technical and historical sources. The modelling and texture work have been further enhanced by a custom gauge set that has also been based on actual photographs from F-6f cockpits. The external Drop-tank models also feature a custom fuel gauge for the external tank. The four extra panels (Fuel/Engine instruments panel, GPS, Throttle-Mixture-Prop pitch, cowl flaps panel, and avionics/radio panel) can be accessed either directly from the 2D panel using the icons in the bottom right of the 2D panel; or they can be accessed in the 2D OR VC by using the following commands: Shift + 1 through Shift + 5.



- | | |
|---------------------------------|-------------------------|
| 1. Magneto | 17. Throttle Lever |
| 2. Clock | 18. Pitch |
| 3. Direction Indicator | 19. Mixture |
| 4. Compass | 20. Flaps |
| 5. Artificial Horizon Indicator | 21. Landing gear toggle |
| 6. Tachometer | 22. Wing-Fold Lock |
| 7. Gear Position Indicator | 23. Cylinder head Temp. |
| 8. Altimeter | 24. Oil Temperature |
| 9. Airspeed Indicator | 25. Fuel Pressure |
| 10. Turn & Bank Indicator | 26. Oil Pressure |
| 11. Vertical Speed Indicator | 27. Fuel Quantity |
| 12. Manifold Pressure | 28. Volt Meter |
| 13. Canopy handle | 29. Ext. Tank Fuel Qty |
| 14. Arrestor Hook toggle | 30. Rudder Trim |
| 15. Fuel Selector Valve | 31. Aileron Trim |
| 16. Cowl Flaps Lever | 32. Elevator Trim |



2D PANEL POP-UPS

1. Throttle, Mixture, Pitch, Cowl flaps.
2. Fuel quantity gauges, selector and engine instruments.
3. Icons to toggle other panels (avionics/radios & GPS)

PAINT SCHEMES

There are 9 different paint schemes included in this package. All of them have been thoroughly researched for historical accuracy and represent examples of the US Navy, Marines, and Fleet Air Arm Hellcats that saw service in World War II.



F6f-3 'Little Joe' of VF-51, USS San Jacinto, July 1944.



F6f-5 'Death & Destruction' This aircraft was flown by 3 pilots of VF-83 on USS Essex, May 1944.



F6f-5 'White 74' of Lt. John M Wesolowski, VBF-9, USS Yorktown, 11 April 1945.



F6f-3 'White 23' of Lt. James 'Red' Shirley, VF-27, USS Princeton, 24 October 1944



Hellcat Mk. II (F6f-5) JV 316, 804 Squadron Fleet Air Arm, Royal Navy.



F6f-5 'White 135' of VF-84, USS Bunker Hill, February 1945.



Hellcat Mk.I (F6f-3) JV 105 of 800 Squadron, HMS Emperor, July 1944.



F6f-5 'White 7 Paper Doll' of Ens Bob Burnell, VF-27 USS Princeton, 24 October 1944.



F6f-5N 'Black Death' of Major R. Bruce Porter, commander of VMF(N)-533, Okinawa, June 1945.

LINKS

*A WWII F6F Navy Fighter Pilot's Experiences
in the Pacific*

<http://www.battleofsaipan.com/Nstark000101>

http://en.wikipedia.org/wiki/F6F_Hellcat

<http://zenoswarbirdvideos.com/F6F.html>

http://www.zenosflightshop.com/F6F_DVD_p/f6fdvd.htm

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