

# SPITFIRE II AS BUILT SPECIFICATIONS

6-03

## **Spitfire History:**

Over 600 Spitfires have been assembled since 1983 with about only 150 being two seat models. Most 2-seat Spitfire models were produced with the 503 Rotax engine (55 hp.) and utilizing the cog belt drive system. 2:5 to 1 ratio, and a standard 36 degree 2 blade wood prop. Although these 83 models Spitfire II's flew marginally with two passengers on board, the aircraft lacked sufficient climb performance. These planes however, had a very good flying capability that satisfied the customer so most customers have kept the aircraft over the years. So few Spitfire II's come up for resale. The aircraft has undergone some cosmetic changes to enhance the mobility and the manufacturing over the years. New engine mounts have been designed to accommodate other engines, and the landing gear has been improved to a double leaf spring gear to suffice those tough landings associated with student training. The windscreen has been widened to remove more air off of the pilot and student. The aircraft's structural integrity has remained the same since 1981 since it first took to the air.

In 1999, I started producing new Spitfire II's (Ultralight America). There have been several new II's built and several refurbished with the new updates added. All changes have been successful with very little revisions needed. The Spitfire II's long dashboard was discontinued and a small rounded instrument pod placed in the center to give much more legroom to the pilots. The front nose wheel has had a new extended carrier added to give the aircraft a more level look and enhances the takeoff performance. The aileron control system had been changed to use a pulley cable system, discontinuing the push-pull teleflex cables. Although the teleflex cables are still used on the rudder and elevator system.

All two-seat models produced since 1999 have all been equipped with the Rotax 582 two-stroke water-cooled engines (65 hp). This combination has improved the performance to a awesome climb rate of 800 fpm. With two pilots on board. With one pilot, the plane can reach 1000-fpm climb with ease. The takeoff roll was decreased considerably.

A new enclosure is being considered for winter flying and may well end any further improvements. The addition of the HKS 700 engine can be outfitted. But the funding for that project has not been approved. The inquiries for this engine combination have been very low. To add the Rotax 912 engine combination would require a complete new redesign. And considering the aircraft design age and sales again does not warrant the expenditure. Unless someone wants to invest the money individually, then it could be done.

## **Spitfire Gross weight Specifications:**

### **Standard weight Dry:**

with 582 engine, c-drive, 3-blade propeller, electric start, battery, brakes, 6x6 tires w/alum. Rims, Ballistic recovery system.

**447 lbs.**

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### Additional Weight:

10 gal. Fuel	72 lbs.
Pilot and co-pilot weight	500 lbs.

**Standard Gross Weight: 1050 lbs.**

### **ACTUAL PERFORMANCE DATA:**

With Rotax 582, 65 hp. Water-cooled engine, Rotax type c-box 3:47:1 ratio and 3-bl'd 72" adjustable kevlar propeller. (Adjusted to 14 degrees pitch) Electric start, and standard muffler assembly. This combination normally accrues about 330 lbs. of thrust.

Specifications with 2 persons on board up to 500 lbs. total.

Rotational Speed for Nosewheel with two persons		40 mph
Best rate of Climb Speed		55 mph
Cruise Speed, (No Flaps)	5400 rpm	65 mph
Top Speed, straight/level, (No Flaps)	6700 rpm	85 mph
Do not Exceed Speed		100 mph
G-Rated, Positive/ Negative		+3/-2
G-Rated with only one occupant		+6/-4
Stall Speed	Indicated	42 mph
Approach Speed landing, (2-notches flaps)	Indicated	60 mph
Slow Flight Maneuvering Speed (2-notches flaps)	Indicated	55 mph
Take Off Distance (10 mph headwind, 2-notches flaps)		250-300 ft.
Single occupant Distance, same		50 ft.
Climb Rate (2-notches flaps)		800 fpm
Single Occupant		1000 fpm
Power Off Decent, nose angle 38 degrees, glide ratio		8 to 1

Spitfire II has a built in osolating effect that comes into play at 85 mph. The aircraft will pull itself out of a dive at that airspeed if cg is correct. Then will slow to 50 mph before nosing over again. With 2 notches of flaps the aircraft should hold a steady level flight at 65-mph hands off. Trim tabs located on the elevator should stabilize the aircraft for level flight at 0 flaps. One person on board should be able to maintain level flight if cg is correct at 60 mph. Check with factory if aircraft should not maintain these flight characteristics.

Fuel Consumption (10 gallon Capacity)	max.	6700 rpm	6.5 gph
	Cruise	5400 rpm	4.5 gph
			9.6 gallons usable

Flight time, full load capacity, clean w/ no flaps @ cruise	1.5-2 hours
Average Flight Distance, full load capacity, clean w/no flaps	100 miles
Single Occupant, may obtain greater distance.	

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All performance figures are configured on an average day of 78 degrees with a mild headwind. Figures and time/distance specified may change due to different settings in gear drive and propeller combinations and wind direction, and also temperature.

In maintaining a properly trimmed and balanced two-seat ultralight gives the ultimate in performance capacities. Most pilots will invariably load the aircraft down with so many accessories and add on's that it infringes on the aircraft's takeoff and flight characteristics. One thing I have learned in pioneering ultralight performance is to keep the aircraft as light as possible and assemble the most horsepower available. That combination makes a fun plane.

**Some possible Factors that can throw an aircraft out of Balance or cause it to fly BAD.**

- 1. Engine to far forward of cg range.**
- 2. Engine/prop shows negative camber at full throttle.**
- 3. Parachute or battery location incorrect.**
- 4. Seat area to far forward of cg.**
- 5. Wing angle wash out is incorrect.**
- 6. Ailerons and flaps not set properly**
- 7. Horizontal Stabilizer set incorrectly.**
- 8. Bent landing gear or Spreader assembly.**
- 9. Negative incidence at nose wheel creates too much back pressure on control stk.**

**Remember, the more weight assembled into the aircraft means less pilot weight to carry. Lighten the aircraft and you can fly more pilot weight, or go on a diet yourself.**

### **FACTORY RECOMENDATIONS**

- 1. Install BRS ballistic parachute system (1200 lb. Capacity)**
- 2. Install a good operating braking system.**
- 3. Gauges: Airspeed, Dual EGT, Water temp. & Altimeter, Rpm, Compass**
- 4. Three point seat belt restraint system.**
- 5. Fuel bypass with shutoff valve @fuel squeeze bulb.**
- 6. Fuel tank pressure relief hole.**
- 7. Replace fuel lines once a year. Watch out for too many bubbles in line.**
- 8. Replace Rotax fuel pump every 75-100 hours. Change Spark Plugs regularly.**
- 9. Do puncture test on Dacron fabric coverings at least once a year. Life span of fabric is about 7 years if taken care of, keep out of sunlight if not in use.**
- 10. Keep fabric clean and coat with 2001 fabric protector from Wal-Mart at least once a month.**

### **SUMMARY:**

The Spitfire II has stood the test of time since 1983 and has accumulated 1000's of hours of flight time to date with no known structural failures on record. Many of our first built aircraft continue to fly on a daily basis. The resale value of the aircraft depends on the condition and

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hours flown. Most two seat Spitfire II's will have a consistent resale value of 15k. with the lowest at 9k. New Spitfire kits sell for \$7550.00 and a completed kit built with 582 and parachute system topping out at \$18,000.00 Factory built aircraft top out usually around \$24,500.00 with paint and accessories. Prices will ascend even higher when Sport Pilot Certification and Insurance product liability are added in place. Probably Sport Pilot Factory built aircraft will probably reach into the \$50k price range.

Some aircraft will be grandfathered into Sport Pilot certification, which will automatically ascend the price of these used aircraft. A two seat ultralight aircraft can earn up to 50k year if properly maintained with minimum maintenance. That about 500 hours of flight time. I have a 96 model two seat with a 582 that was purchased for \$12,000.00 and has already earned over 100k in 3 years of easy work. An excellent bread and butter aircraft.

The Spitfire II is a good aircraft.....TAKE CARE OF IT.

Sincerely  
Kim Zorzi-

CEO/ Ultralight America, Designer of the Spitfire, Spitfire II, Clipper, DZ1, Fireball 700es & (Fireball RE, VTOL) aircraft.