

# Grace in the sky

A single-seat motorglider may not sound much, but a Fournier is widely considered one of the best buys in aviation

Words by Bob Grimstead Photographs by James Grimstead

**T**he versatile Fournier RF4D is a lovely, easy-to-fly aeroplane with an enthusiastic following. Owning one is a ticket to the regular pan-European Fournier gatherings and frequent informal British Fournier fly-ins. Fournier is an international language.

A forty year-old certified type, the RF4D has a broad spectrum of abilities. Once advertised: 'For Touring, Training and Turning upside-down', it also makes a fair glider – and its aerobatics are good enough to wow at London's Red Bull Air Race.

But first things first. The CAA classifies it as a Self-Launching Motor Glider (SLMG) or Touring Motor Glider (TMG), but the RF4 was never designed as a powered glider. The result of a meticulous refinement process, it was the brainchild of that gifted and artistic aircraft engineer, René Fournier, who simply wanted the most efficient personal aeroplane possible with the sole available small powerplant.

Back then, the only lightweight air-cooled engine was Ferdinand Porsche's Volkswagen Beetle motor. But it was only available with 1200ccs. Rectimo added a magneto and

simple tractor carburettor, claiming 39 horsepower at 3,600 rpm, although my recently overhauled example actually only produced 35.1hp on dynamometer.

In the same era, this puny motor powered Druine Turbulents, Jodel D.9s and Topsy Nippers in France, plus Taylor Monoplanes here in Britain and a few other homebuilts. None of these performed very well, although they mostly handled nicely. Not until 1500cc, 1600cc and 1835cc VWs appeared could any of these little aeroplanes pull the skin off a bowl of custard.

Fournier's answer to this limited power was to make his airframe as light and drag-free as possible. A very clean shape with a retractable mainwheel minimised form drag, while those long, slim, gracefully tapering

wings gave low induced drag. Careful refinement led to this ultimate, the RF4D, which not only has delightful classic handling and brilliant visibility, but also a fair cruise speed, long range and a reasonable glide angle.

More, it is immensely strong (tested to destruction at +13.8g) and performs Intermediate level

aerobatics. Many readers will remember the beautiful, lyrical, balletic aerobatic displays performed to Pink Floyd's music in the nineteen eighties by the Unipart Duo and latterly the Skyhawks trio. They used RF4s.

I have flown Fourniers since 1970, and believe they are the nicest all-round single-seaters, best suiting a 'purist' – somebody who values elegance of design with efficiency and economy of operation.

Because of its retractable wheel and elegant wings, to fly a Fournier on an NPPL you need 'type differences training' or alternatively a TMG PPL rating. Either can be done in any long-winged two-seater like an RF5, Ximango, Grob, Falke or Dimona. Don't let that put you off; it's well worth the effort. Remember, the RF4D is not a homebuilt, but a proper, fully certified production aeroplane.





## OWNER

We spoke to Paul Cooper, 37, airline captain

**How much did you pay for your RF4?**

£13,500 nearly two years ago.

**What's your flying pattern?**

I've flown over 100 hours in it, touring (mostly with other Fourniers) formation flying, basic aerobatics and some soaring. I also occasionally hire a PA-28 to take friends or family flying.

**What are the running costs?**

£750 for insurance, just £290 for gliding club

hangarage, £200 for the annual inspection, and less than £200 for miscellaneous items.

**Maintenance?**

I'm on a C of A under BGA supervision. Replacing the perished bungees with heavier, stronger springs cost £200, an engine overhaul, £1,700. We've overhauled the tailwheel assembly and fixed an oil-damaged lower rudder and fin. I intend replacing my canopy with a broken club two-seater glider's canopy which was



An efficient aerobatic tourer complements airline flying

damaged at the rear but otherwise perfect for cutting down to fit his RF4D, since replacement with the standard unit is very expensive.

**How is its touring?**

I attended the Club Fournier International's

(CFI) huge Fournier fly-in last year in Southern France with over seventy other owners. Carrying a tent, sleeping bag, mattress, life jacket and clothing for a week, I cruised at 3,200rpm, flying at 105mph, burning 2.5gph.

The tank holds 8.36 gallons, so I reckon on 2:45 endurance with reserves. Throttling back to 2,200rpm reduces consumption to one gph extending empty-tanks endurance to over eight hours.



**“ Delightful,  
elegant, gentle  
aerobatics ”**



Cockpit is surprisingly comfortable, if a little tight

Those long wings make for graceful displays

#### WHAT'S IT LIKE TO FLY?

You start the engine by standing ahead of the left wing and flicking the propeller downwards from behind. From here you can reach all the cockpit controls. Once it is running, climb over the leading-edge and step down into the two foot-wide cockpit. Snug but not tight, this has a comfortable, g-resistant, semi-reclined seating position and a proper five-point harness. The side-hinging canopy can be jettisoned. A small baggage compartment behind the seat has a 10kg (22 lb) limit, and takes a soft overnight bag, one-man tent and sleeping bag.

Beside your right thigh is the mainwheel

retraction/extension lever. To retract it, you pull up a trigger on its small locking handle under your thigh, and then slide that backwards. The wheel unlocks and swings halfway, so you just pull the big lever down to lie flat beside you. Extension is the opposite. There are no flaps, but another lever by your left thigh extends a row of spoilers above each wing. A third lever, inboard of your right knee, operates the recoil starter, used for airborne re-starting.

A small instrument panel holds flight dials in the centre, with engine gauges around its edges. To the left are the red stall light and a yellow one with a buzzer for the retracted wheel warning, which sounds with either the throttle closed or the airbrakes extended. Below these are the plunger throttle and a lockable ratchet brake lever. Over on the right are the choke and fuel cock knobs.

The float-and-bent-wire fuel gauge is in the fuel cap, out on the forward decking, in your direct line of sight. The 38-litre tank holds nearly three hours worth at full throttle, or up to ten hours at low power. When the wire's bent top starts tapping the cap, five litres remain and it's time to land. An aerobatic fuel cap incorporates a ball valve preventing fuel trickling out during prolonged inverted flight.

Taxying is easy, but takes a knack since the steerable tailwheel is your only directional control, especially in strong winds, because of the long fuselage's strong weather-cocking tendency. The aircraft tilts from side to side on its monowheel during turns, but you soon get used to this. With a new cable and proper adjustment, the brake will hold against full power. Visibility is good for a tailwheeler, despite your low seating position, but you need cushions to get your head up touching

#### PRE-PURCHASE INSPECTION

### Insider knowledge helps



Beautiful, but vulnerable wooden tail surfaces

Do your homework. There's plenty of information on Fournier websites.

Wood expands and contracts with humidity changes. Examine all structural attachments for tightness, and check the bolts for corrosion. The main wing-to-fuselage joints can become loose. Forty feet of wingspan leverage will soon elongate the bolt holes. Undo the big nuts inside the cockpit and use a torch and mirror to examine these holes. Alternatively, make a

slow roll. Hearing a 'clunk' means you have loose bolts. The wing will not come off, but it will elongate those holes - a very costly repair. Examine the rear fittings too.

Is the tail secure? It's worth removing the fin's dorsal fairing and inspecting all three attachments and bolts. Sometimes you can rock the fin fore and aft. You'll have to remove the rudder to tighten these Allen screws, but it's easy. Also check the propeller - wooden prop bolts should be re-torqued every couple of months.

Fabric has a finite life, and the underlying structure

should be inspected every couple of decades. How long since it was last re-covered? Paint keeps out the moisture, but deteriorates with age.

Sportavia used top-quality glues, and rebuilding experts assure me they have never encountered glue failure, but water is wood's enemy and AD 83-15 applies. Sniff the rear fuselage and poke its undersides. Squeeze the trailing edges and all control surfaces, ensure drain holes are present and clear, especially below the spoilers. Any smell of mushrooms means rot - and a huge bill. Check the forward fuselage for oil contamination.





Three in a row!  
Fourniers are very  
sociable aeroplanes



the canopy for the best forward vision.

The take off is straightforward, although acceleration is gradual. All controls come to life immediately and, thanks to that puny power, there is little need for left rudder (yes, like most European motors, that VW turns the opposite way to American engines). You need to apply drift quickly once airborne, to prevent being blown away downwind. The crosswind limit is fifteen knots.

With such a low wing-loading, the aircraft floats into the air at around fifty

mph after a run of perhaps 300 metres for a 60mph initial climb until the wheel is up, after which you accelerate to seventy. All controls are light and responsive – the elevator is particularly sensitive, and can cause some over-correction initially, especially when retracting the wheel, which requires a change of hands on the stick. Thanks to its low span-loading, the climb rate is usually a gentle 500 feet per minute, although the manual quotes 690fpm in ISA and bigger-engined examples do better.

What most impressed me on my first

Fournier flight was the outstanding visibility from that panoramic canopy. You can see not only all around, including directly behind you, but also almost straight down over that skinny wing, both ahead and behind. Glider pilots will be used to this, but it's a revelation to most power pilots.

The handling is delightful, with light and fairly well-harmonised controls, although the roll-rate is inevitably leisurely and some rudder is needed for turns, as the adverse yaw is quite marked. Fitting aileron gap seals increases the roll rate (an LAA approved



New canopies are  
expensive, so  
examine carefully



The ailerons and elevator use push-rods and the spoilers have torque tubes, so there should be no slack anywhere, although minor play in the lower stick is easily fixed. Check the rudder cables for fraying, and check all control surfaces for full throw. Many Fourniers'

rudders and some elevators have restricted movement.

The engine isn't so important. It's only a Volkswagen, and overhauls are cheap, contributing to this type's economy. Undercarriages can be

problematic, though: suspension is a couple of small, tightly-wound bungees. Once these get oily, they deteriorate quickly. Replacements are €200, but many owners convert to steel springs. The aluminium castings can crack when taxied over rough ground; replacements are available, but expensive.

Canopy cracks are another common problem, expensive to fix. EIS, the type support company, want €2,500 plus carriage. Fournier websites suggest cheaper alternative suppliers of canopies, propellers, undercarriage and engine components.

Key area to look:  
base of stick and  
undercarriage





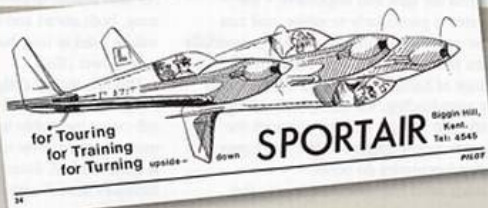


This is a short field aeroplane, but you have to do everything right.

## VARIANTS

### RF4D as in German made

René Fournier's first aeroplane, the RF01, flew in 1960. Certification in 1963 led to production of the improved RF3 by Alpvavia, whose sixteen employees turned out an airframe weekly until they had built 89. The RF3's lengthened wings gave better climb and glide angles, and it had a one-piece canopy, plus many detailed refinements to ease production. Next came a stronger, better-handling version. This slightly heavier RF4 had a bigger fuel tank (38 litres instead of 30), broader fin, lighter, push-rod operated Frise ailerons, and a rounded lower fuselage



Sadly you can no longer buy these little marvels 'off the shelf'

instead of the earlier flat-bottomed version, resulting in even lower drag, but retained the 1200cc engine. Three pre-production examples were built.

Alpvavia changed to licence manufacture with Alfons Putzer in Germany, subsequently building 155 RF4Ds (the D denoting Deutschland).

Then Fournier devised a tandem two-seater derivative, the RF-5 - 127 were made, with a bigger, 1700cc Limbach engine, electrics and a starter, wing tanks, more instruments, a broader tailplane and folding

wings. A later development, the RF5B Sperber, had longer, slimmer, fifteen-metre wings for even more efficiency, and a cut-down rear fuselage - 99 built.

So popular was the RF4 for air racing and aerobatics that a shorter-winged version was developed with the RF5's more powerful engine and tail, the RF7. The RF4's final development involved mating its fuselage to the Scheibe SF-27M's fifteen-metre wing, to make the SFS-31 Milan (4 plus 27, gettit?), a real motor glider with a 29-to-one glide ratio.

mod). Control pressures rise with increasing speed, but only slightly, and remain reasonably light up to the 155-mph Vne.

The Fournier's stall is viceless, with or without power or spoilers, although it comes abruptly, and with little aerodynamic warning. The aeroplane's low drag means it takes time to slow down for the break, which happens at 45mph clean, 46mph with spoiler. This is usually preceded by the warning light around five mph higher, and sometimes an odd organ note from the leading-edge vents. It should stall wings-level, provided you keep the slip ball centred. The height loss is generally little more than 100 feet, with or without power (the manual says '65 feet').

Steep turns are enjoyable, and the speed drops off only slowly in banks up to 60 degrees. At greater bank angles you lose height because of the limited power. The maximum cruise power of 3,300 rpm gives 110 mph TAS, at around twelve litres per hour. Reducing to 65mph, this frugal motor sips fuel at just four litres per hour for a near ten-hour endurance, or a 550nm range. That's just a fiver an hour for fuel!

Being so cheap to run, Fourniers are great for extending all your flying abilities, like learning formation flying. They also perform the most delightful, gentle, elegant aerobatics, although the very basic fuel system (a gravity-fed carburettor) means the engine stops under negative g, but the airframe is so clean the



aeroplane only slows a little, and hardly at all if you follow a slightly downward path through each manoeuvre.

Wing-overs, loops, spins, aileron rolls, slow rolls, barrel rolls, quarter-clovers, Cuban eights and reverse Cubans are easy. Stall turns, four-point rolls, rolls-off-the-top, Derry turns, half-roll-and-pull-throughs, quarter vertical rolls (upwards and downwards) and humpty-bumps (canopy up or down) are a little trickier. Inverted flight is simple (although of course the engine stops).

You can achieve a 1:20 glide ratio at 62mph, or just 256 feet per minute of sink at 56mph.

Normal descents are made at 70mph with the gear up and throttled back to just before the undercarriage warning horn sounds, although the steepest descent is achieved at 110 mph with throttle closed, wheel down and spoilers extended (sideslipping if necessary, to nearly double the descent rate). There is little yaw or pitch trim change with power or spoilers, but the elevator trimmer, operated by a small lever on the right coaming, is effective, if a trifle sensitive.

Circuit work is undemanding. The important thing is to slow below 70mph and drop the wheel. The optimal smooth air approach speed is 65mph, adding five mph for rough air or strong winds. Approaches are usually made power-off, with gradually increasing spoiler, aiming to be properly positioned with full spoiler at 200 feet. This is not difficult, although the spoilers are

effective, so your final approach angle is surprisingly steep. The spoiler lever controls descent just like a throttle – back for steeper, forward for shallower – very accurate touchdowns can be achieved.


With spoilers fully extended, the sink rate and deceleration are quite high, so the flare starts a little earlier than you might expect, and at first that light elevator can lead to over-controlling. An experienced tailwheel pilot

might initially find a smooth touchdown difficult, because the Fournier's ground angle is considerably less than its stalling angle, so if it is stalled on for a 'three-point' landing the tailwheel touches down first and the main wheel hits teeth-jarringly hard.

With their very slow landing speeds Fourniers can be inclined to weathercock, so I generally land on the runway's downwind edge, easing the stick fully aft as soon as she stops flying, for

optimum tailwheel steering. Finally, you must hold that spoiler lever once you are on the ground. If you let go, they pop back in, and you pop back into the air, six feet above the runway with decaying airspeed. The only safe solution is to open up and go around.

Once firmly on the ground, the mainwheel is so far forward there is little fear of tipping the aeroplane on its nose, so the brake can be pulled as hard as you like. Landings rarely use more than 250 metres, but this is not really a short strip aeroplane – one of its few disadvantages. ■



Spoilers and retractable undercarriage – the Fournier is almost a complex single!

## HOW MUCH?

### Expect to pay a premium

Most Volkswagen-engined single-seaters sell for around £5,000, but few are as well regarded as Fourniers. The thirteen British examples don't change hands very often, and good ones fetch premium prices. Conversely, a poor example will cost a fortune to fix, especially if on C of A (and all mainland European Fourniers are on C of A but no, you cannot transfer from C of A to a Permit). Engines up to 1600cc are approved by the LAA, but not under C of A.

C of A Fourniers need more expensive and frequent maintenance than those on owner-maintained Permits, and C of A overhauls for a VW engine (mostly done in Germany) are prohibitively pricey.

Check out [www.cfamerica.com](http://www.cfamerica.com), [www.fournieruk.com](http://www.fournieruk.com) and [www.cfi-ev-scram.de](http://www.cfi-ev-scram.de). British spares at: [www.ukaircraftparts.com](http://www.ukaircraftparts.com). For aerobatics [www.YouTube.com](http://www.YouTube.com) for FournierBob.

**BELOW £3,000** A dismantled or damaged and stored RF4D on C of A, or a partial airframe.

**£3,000 TO £10,000** A complete C of A Fournier in need of restoration/re-cover.

**£10,000 TO £12,000** An airworthy Permit example, but in need of partial re-covering or an average C of A Fournier.


**£12,000 TO £15,000** A neat, tidy, flying Permit Fournier in average condition, or an immaculate C of A example.

**£15,000 TO £20,000** A good RF4D in excellent condition and operating on a Permit to Fly.

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Spoilers and power make the Fournier easy to land

“ The important thing is to slow to 70mph and drop the wheel ”