

THOSE FABLED FOURNIERS

April marks the 100th birthday of the original promoter of ‘green aviation’, the French light aircraft designer whose ambitions were sadly frustrated over and again by ‘impossible’ rules

By: Bob Grimstead

In April, when they were due to be gathering in Nitrav, northern France at a now-postponed fly-in, pilots from all corners of the Earth will be raising a glass to celebrate the 100th birthday of world-famous visionary aircraft designer, René Fournier.

Fournier started working life as a ceramicist and supplier of school educational art equipment after a spell in the French Air Force towards the end of WWII, and a mere year at the Rochefort aeronautical engineering school. But he always harboured dreams of a super-efficient, economical but truly versatile personal aeroplane powered by the smallest possible engine. Quoting from his lovely, lyrical autobiography *My Dreams and My Aeroplanes*: ‘My plane I

dreamed about would not be like the others; it would be a soaring bird, a bird with long, fine and pure wings; a poet’s plane, designed to float on the air – a ‘glider-plane.’

RF1
René began researching and sketching his design in 1947, but was only able to start building it ten years later, aged 36, having quit his ceramic business. Decisively leaving his Touraine roots, for health reasons he decamped to warmer climes in Cannes with the partly-completed tailplane and a roll of drawings, to begin full-time building under the guidance of acclaimed glider-maker Charles Fauvel. In a disused laundry and with the help of craftsman Jean Rideau it still took three



PHOTO: RENÉ FOURNIER ARCHIVE



PHOTO: DANIEL STREICHER

ABOVE: still sprightly in his 100th year, René stands beside a line-up of his designs

LEFT: the RF1, which made 95mph on a 27hp VW Beetle engine

more years to complete his dream. The result was a semi-aerobatic, wood-and-fabric airframe with slender, tapering, eleven-metre wings, a single retractable main wheel and a little Volkswagen Beetle engine of just 1,130cc and 27hp. Fauvel

floated it into the air for him on 30th May 1960. That RF1 cruised at an impressive 95mph using just eight litres per hour and burned only 3.5 litres per hour at fifty knots. It immediately drew crowds. In August 1960 it

gained first prize at the RSA homebuilders fly-in. Journalists and knowledgeable pilots praised it and French state flying organisation officials expressed interest in making a production version for their clubs.

BELOW: RF2 cutaway reveals details of Fournier's classical all-wood structure

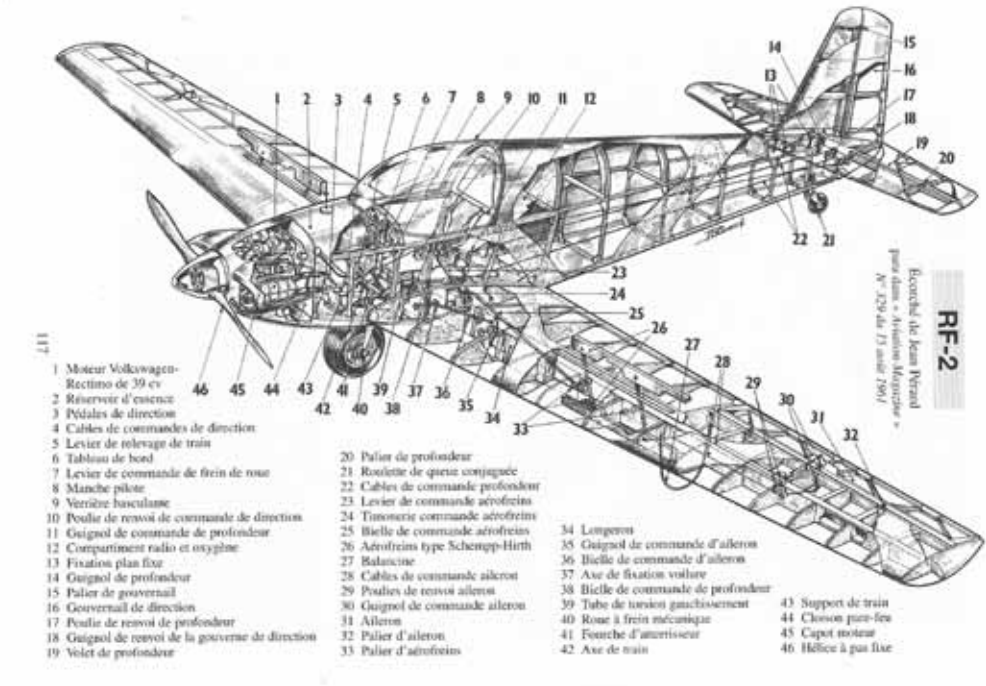


ILLUSTRATION: RENÉ FOURNIER ARCHIVE

RF2
So, early in 1961, state funds were granted for two pre-production examples to be built by Pierre Robin at Dijon, with the hint that he might undertake series production. Unfortunately, while the RF1 was classified as amateur-built with no specific strength or handling requirements, production RF2s had to meet the stringent standards specified for all aeroplanes up to 5,700kg

but, because it only had single ignition, also those for gliders, including performing a vertical dive without exceeding Vne. They also required a certified engine, so René persuaded Rectimo of Chambéry to modify the later, bigger, 1,179cc, 39-horsepower Beetle engine to become the first use of a converted automotive powerplant in a certified aeroplane. Construction of two pre-production RF2 airframes began,

but Robin was distracted by his need to produce three-seat Jodels, so final assembly took place at Gap-Tallard in south-eastern France where Fournier joined forces with the Belgian Count Antoine d'Assche's company Alpavia. But the RF2 weighed a significant twenty kilos more than the RF1 because of its bigger engine, the main spar's reinforcement to achieve the required terminal-velocity dive, and its unnecessarily powerful airbrakes. The undercarriage turned out fragile while the airbrakes were too powerful for use in a club environment, so Fournier further refined his design as the RF3.

RF3
To escape those excessively penalizing glider requirements, this version was re-certified to ordinary standards, after the authorities were persuaded to incorporate a new aircraft class



PHOTO: BOB GRIMSTEAD

First design produced in numbers, the RF3 tempted its pilots to fly aerobatics but ultimately was just not strong enough

to circumvent the engine's single ignition system: 'Aircraft with a good glide angle and capable of short landings.' So its airbrakes were replaced by smaller spoilers to lighten the structure. Having passed its flutter and ultimate strength airframe destruction tests, between June 1963 and June 1966 no fewer than 89 RF3s were produced by Alpavia. Flown by his test and demonstration pilot Bernard Chauvreau, their RF3 starred at the 1963 Paris Air Show, particularly catching the eye of German wooden aircraft builder Alfons Pützer. Glider pilots realised this type might be their answer to independent operations and one climbed his RF3 engine-off to a massive 36,750 feet in mountain wave.

RF4 & RF4D
After a fatal accident to an RF3 performing aerobatics over their factory, René redesigned a strengthened 'unbreakable' aerobatic version – the RF4. Improvements included a spar designed to ultimate limits of +12/-6g, pushrod controls with sealed bearings instead of the former cables, a rounded belly, wing-root fairings, a broader fin, balanced Frise ailerons and a bigger fuel tank. Initially three pre-production RF4s were built by Alpavia



PHOTO: BOB GRIMSTEAD

Improvements included a spar designed to ultimate limits of +12/-6g

LEFT: the 'unbreakable' aerobatic RF4D

Fournier derivatives

SFS 31 Milan
The Milan (Kite) was created by combining a Fournier RF4D fuselage with a Scheibe SF-27's fifteen-metre wings and an optional feathering propeller to make a true powered glider. Its designation was derived from the initials of the three manufacturers involved: Sportavia, Fournier and Scheibe, with the sum of the numbers of the two models used. The SFS 31's prototype flew on August 31, 1969, but only thirteen were built. Fournier himself never liked it because of the massive adverse yaw caused by its long wings and plain ailerons.

Sportavia S.5, S.5K, C.2
These were three RF5 airframes built in

1971 and fitted with Lycoming O-235 engines, broad-chord three-bladed Hoffmann propellers, extensive exhaust silencing and infra-red shielding. Intended as stealth reconnaissance aeroplanes for the German forces, they exceeded expectations by only producing 45dBa in 600-foot, full-throttle overflight, but the Cold War's cessation and improving satellite imagery superseded them. They are now in museums.

Aéromot Ximango
Aéromot, of Porto-Alegre, Brazil, built 150 examples of the composite, side-by-side, retractable tailwheel RF10 with detachable wings under the name

AMT-100 Ximango (a pampas falcon) for the Limbach-powered version, and AMT-200 Super Ximango for a later model with the more powerful Rotax engine. Fourteen more AMT 200Ss with removable winglets were purchased to equip the USAF Academy, replacing their Fournier-derived Slingsby T-3A Fireflies. Military and police observation versions of the Ximango were developed, with improved instrumentation, additional glazing, modified cowlings and turbocharged Rotax engines. There were also glider tug versions. A total of 163 Ximangos and Super Ximangos were sold in fifteen different countries. In 2001 Gérard Moss flew 30,000nm circumnavigating the entire globe (westwards) in one hundred days via 89 airports in thirty countries in his Super Ximango.



Fitted with a Lycoming O-235, broad-chord three-bladed Hoffmann propeller, extensive exhaust silencing and infra-red shielding, the Sportavia S5 was a 'stealth' machine intended for military use

PHOTO: RON SMITH

in France, but because of unfavourable exchange rates, unreliable electricity supplies and an intermittent telephone service, in 1966 Alpavia joined forces with Alfons Pützer to form Sportavia-Pützer. They mass-produced René’s new aeroplanes at Dahlemer-Binz in Germany as the RF4D (D for Deutschland) turning them out at an impressive rate of six per month, exporting them to thirty countries worldwide, and eventually selling 155 examples.

This is René’s masterpiece, and the best-known and most esteemed of all his designs – an elegant aeroplane that flies intermediate level aerobatics and even some advanced manoeuvres, will cruise comfortably for three hours at 100mph, has great visibility and delightful handling. One has flown across the North Atlantic (twice) and is now in England. The type holds many world records.

RF5

The RF4D was so successful that customers soon requested a two-seat version, so René added three broader ribs at the wing root to increase span while retaining his preferred high aspect ratio. These wings folded at one-third their semi-spans to minimise hangar space. He chose tandem seating as being the most aerodynamically

efficient, but later admitted regretting it. It was an immediate success but the prototype’s 1,700cc engine failed through overheating after just fifty hours of test flying. Rectimo wasn’t interested in fixing the problem, so they had to find an alternative engine quickly. Alfons Pützer persuaded local VW-tuner Peter Limbach into the amazing feat of producing another Volkswagen-derived 1,700cc engine in just eight days! Certified as a motor-glider in its native Germany and classified in that specialised French ‘Good-glide, short-landing’ category, RF5 aerobatics were

permitted, and this certification was accepted in Britain. Bernard Chauvreau gave countless aerobatic displays, including at Paris Air Shows. Watch him aerobating with René from 6:45 at youtu.be/-CVYDfl6gvq

RF5B Sperber (Sparrowhawk)

The gliding fraternity preferred Schleicher’s SF-25 Motor Falke over Sportavia’s RF5 because it soared better, so Pützer organised a long-winged RF5 variant by calling in experienced glider pilot and designer Manfred Schliwa. He lowered the aft turtledeck to improve rearward visibility,

ABOVE: ‘big brother’ to the RF4, the two-seat RF5



PHOTO: BOB GRIMSTEAD

increased the root span by three metres and slightly extended the wingtips, while the empennage got sailplane-like quick-release attachments.

Its seventeen-metre span enhanced soaring characteristics, the Lift/Drag ratio increasing by six points while the sink rate reduced from 1.40 to 0.89m/s (275 to 175fpm). Certified in May 1972, and clearly a better soaring machine, control harmony had been sacrificed and it was non-aerobatic. Eventually 127 RF5s and 99 RF5B Sperbers were built, the majority still flying today.

RF6 & RF6C

Continued strengthening of the Deutschmark penalised German exports but facilitated imports, so American planes flooded into Germany. The demand was for American-style tourers and trainers with tricycle undercarriage, side-by-side seating, engines from 100 to 200hp and yokes rather than sticks, but René Fournier saw this as denoting the end of skilled piloting.

Alfons Pützer wanted to compete in this market and asked René to study feasibility of a wooden two-plus-two or three-seater with a 115hp Lycoming O-235. This would become the RF6, a design of which René Fournier did not approve because

he thought they could not match American prices. It first flew in March 1973 but that autumn an even more serious event occurred than the Deutschmark’s strength: the OPEC oil crisis. Suddenly pilots were selling their aeroplanes, so Sportavia was forced to abandon production.

RF6B

If he was to survive, Fournier knew he must sell aeroplanes so, in parallel he designed and built his preferred two-seater based on the RF6’s airframe. Unlike American types, René’s would be a versatile trainer to develop real piloting skills including aerobatics. Using the

Cessna 150’s 100hp Continental O-200 engine, he designated it the RF6B – B for ‘biplace’ (two-seater). Bernard Chauvreau flew the prototype from Nitrav in March 1974, revealing the anticipated fine handling and performance. Despite that continuing fuel crisis there were customers so, encouraged by traditionalist instructors, René launched production in France where costs had once again become competitive thanks to a sharp fall in the Franc. Unfortunately authorities felt that René’s new aircraft would compete with other French manufacturers and so refused financial

ABOVE: the side-by-side two seater RF6B



PHOTOS: RON SMITH



PHOTO: RON SMITH

Fitted with a big bubble canopy, cruciform tail and 180hp engine, the RS180 was a development of the RF6C three/four seater that proved equally uncompetitive with American all-metal designs

Aéromot Guri

Aéromot later produced the Lycoming O-235-powered AMT-600 Guri nosewheel semi-aerobatic trainer derived from the T-tailed RF10-based Ximango but with reduced span and a fixed trailing-link nosewheel undercarriage. Twenty five of these were ordered by the Brazilian civil aeronautics department for local aero clubs.

Sportavia RS-180

The Pützer brainchild three/four seat RF6 was later re-engined with a 150hp Lycoming O-320 to become the RF6C. Unable to compete with American all-metal imports, the oil crisis and displaying serious stability problems, only four of these three-seaters were built. Determined that his concept was sound, Alfons Pützer had the aeroplane re-designed in-house with a longer fuselage, a

big bubble canopy, a cruciform tail and the even larger 180hp O-360 engine as the RS-180 Sportsman. Eighteen were eventually sold between 1977 and 1979.

Slingsby T67A, B, C, T67M200 & M260 Fireflies

Slingsby eventually built 271 examples of their fibreglass Fournier RF6B derivative, the T67 with ever-increasing engine powers, using Lycomings of from 118 to 260 horsepower turning two- and three-bladed constant-speed propellers. Development included various designs and sizes of canopies, anti-spinning strakes, aileron fences, optional electric flaps and elevator trims, optional air conditioning, increased fuel capacity and improved flying and engine controls. They were used for military pilot training around the world, including with the RAF and USAF.



PHOTO: RON SMITH

Slingsby made the French RF6B into a British success, eventually building 271 examples of its derivative, the T67 Firefly, with ever-increasing engine power

support, despite its excellence, so he mortgaged his house and arranged for sub-contractors to make the main components while creating a small assembly facility near his Nitray home.

RF7
While awaiting promised German state assistance for the three-seat RF6, Sportavia responded to demand from aerobatic purists who wanted Fourniers with shorter wings, improved roll-rate and more power. The RF7 resulted from 1,800 hours of study by the Fournier Design Office—mating an RF4D fuselage to a cropped wing, wider tail, fewer spoilers and a bigger Limbach engine. It flew successfully on February 26, 1970, but turned out a waste of time because certification was refused due to its single ignition. The prototype and one amateur-built example still fly today.

RF8
In 1969 Fournier was visited by patriotic General Gavaille, disgusted that French authorities had allowed Fournier aircraft production to migrate to Germany. After eight months of negotiations, a loan was granted for design of an all-metal, tandem, two-seat, military trainer with retractable bicycle undercarriage—the RF8. Sportavia built a mock-up, and construction was undertaken by Indraéro. After four years the RF8 flew on January 19, 1973. One hundred hours of flight testing confirmed its technical success but capital was lacking,



PHOTO: RONS MITH

with neither the state nor banks prepared to provide funding. Indraéro couldn't launch series production, so the RF8 story ended right there, although the prototype still exists, displayed in the Angers-Marcé Air Museum.

RF9
Eventually French officialdom suggested they might help René with another project to meet their new motor glider category, so he developed the seventeen-metre span, side-by-side, retractable tailwheel RF9 while continuing RF6B production. This flew on 20th January 1977, demonstrating brilliant economy and flying qualities, but the complexity and cost of French state certification hadn't changed, so the company ran out of money on May 30 when the bank refused credit and the government shrugged its Gallic shoulders. After paying out creditors, a receiver closed down the business, Fournier was

Designed as a more practical aerobatic machine, the short-wing, up-engined Fournier RF7 was denied certification

ruined and his home was put up for sale. Miraculously, a buyer appeared to save René and his family by retaining him as Chief Designer on a reduced salary. This revived company finally completed a further five RF6Bs, making 42 in total. Eventually the English firm Slingsby bought all remaining RF6B assets, including design rights. They began by collecting from France and then assembling in Britain the surviving components into nine wooden T67A airframes with slightly more powerful 118hp Lycoming engines before ultimately producing nearly three hundred examples of successively improved and more powerful composite models.

Fournier devoted himself to certification of the RF9 and starting production. Twelve were completed, but unfortunately it was no longer the only design of its type on the market because German firms began offering similar aeroplanes but in the composite materials which were becoming fashionable.

RF10
So René Fournier embarked on a composite RF9, to become the T-tailed RF10. Construction was subcontracted to Aérostructure, a small company near Bordeaux. When delivered six months later the first fuselage was sadly much heavier than expected, but it flew on March 5, 1981. Hopes were high but the following April, during spin tests at a rear C of G, the aeroplane wouldn't recover. The pilot jumped and the plane crashed.

Two modified and lightened RF10s were eventually certified. Fourteen civilian examples were subsequently delivered, plus another four for the Portuguese Air Force. But French manufacturing costs still didn't allow profitability so, after seven years of struggle, and completely demotivated by bureaucratic obstructionism, in July 1985 the RF10's tooling and rights were sold to Aéromot in Brazil.

Spanish RF5s
In 1985 a ray of hope shone from Spain where labour costs were lower and light planes had not been built for forty years, so several Spaniards were trying to create aircraft factories. They only needed to relaunch RF5 production, but didn't anticipate the many obstacles imposed by Spanish bureaucracy, which proved to be even more complex than the French. After producing twelve more Spanish RF5s, the backer understandably quit.

RF47
By 1990 septuagenarian René Fournier was due retirement, but still passionate. Given the continuing fuel cost increases, he felt sure there must be a market for a trainer smaller and lighter than his RF6B, with a less thirsty engine. The authorities were actually ready to support such a project, but Fournier did not have the necessary political clout, so Robin got their subsidy instead. Now appeared André Daout, an aviation devotee who was enthusiastic about this concept and provided funding. René set to work designing the RF47—derived from his two successful and economical aerobatic single-seaters, the RF4 and RF7. Kit production seemed the future, because the French had recently accepted that formula.

This RF47 incorporated a wing based on the RF7's with a widened centre-section for two abreast, married to the RF9's firewall, cowlings and canopy, but with a more powerful 2.5 litre, 92-horsepower, VW-derived Sauer engine. The aerobatic wooden prototype



PHOTOS: RENÉ FOURNIER ARCHIVE

flew on 9th April 1993, once again piloted by Bernard Chauvreau. It is currently being rebuilt in England by the LAA's Chief Engineer, Francis Donaldson.

For improved performance the RF47's weight had to be reduced and the new 'simplified' European JAR-VLA certification standard didn't allow aerobatics. So René designed and built a second, lighter prototype utilising carbon fibre spar caps and other components, a widened fuselage, enlarged fuel tanks and baggage compartment and the more established 2,400cc, 87hp Limbach.

This second, but non-aerobatic prototype flew successfully on March 30, 1995 but again no financial aid was forthcoming, despite expensive certification having been obtained. Production was launched with the support of a few enthusiastic private shareholders, but this dream was also short-lived. Administrative complexity increased until it reached a level that, added to the young company's lack of cash flow, the first production batch of ten airframes would never be finished. Only five examples were eventually built and delivered.

RF4UL
Ever the optimist, when René was approached in 2010, at the age of ninety, to sanction production of a super-lightweight, folding-wing, kit-built version of his most successful design, the RF4, he gave it his blessing and

ABOVE: after French manufacturing costs and 'bureaucratic obstructionism' became too much, production of the certified RF10 went to Brazil, the aircraft becoming the Aerormot Ximango

assistance. A handful of French enthusiasts learned that revised French regulations allowed aeroplanes of under 300kg to be mass-produced and sold without any regulatory oversight. René promptly re-designed his RF4 with RF47-like carbon-fibre spar caps, cowlings, fairings, and wing-, tail- and fin-tips, lighter plywood skins, simpler ribs, and modern lightweight fabric covering. A tuned version of the Briggs & Stratton Vanguard four-stroke V-twin engine with electrics would drive its carbon-fibre propeller via a 2:1 belt-and-pulley reduction system and the undercarriage, while still retractable, would be halved in weight. Instrumentation would be digital and the fuel tank was easily removable while both seat and pedals were adjustable. This ultimate development of René's timeless aerobatic classic sadly foundered on an excess of enthusiasm over development funds, so the prototype currently languishes in a French hangar awaiting completion.

Epilogue
At last, in the twenty-first century, René Fournier has been recognised as the original promoter of 'green aviation', despite bureaucrats of the time not comprehending the value of his formula and imposing inappropriate standards. In his book he pondered: 'Why were there so many constraints and such crippling rules, and why were they imposed only on certified aircraft? Simply because by granting certification, the state vouched for the quality of future examples produced. To protect itself, it imposed rules that were impossible to satisfy.'

With his aeronautical career over, René Fournier did not abandon his former clients and friends, but has continued volunteering help and advice until this very day. Now, approaching his hundredth birthday, he has but one regret: that he didn't emigrate from France to the United States, the homeland of free enterprise, when his first aeroplane flew in 1960.



PHOTOS: RENÉ FOURNIER ARCHIVE

Only one prototype of the all-metal bicycle undercarriage RF8 military trainer was built. The project died for lack of funding



Competition from similar side-by-side two-seaters constructed from composites saw off the RF9. Only twelve examples were completed