

Sounds of Furio

by John King
SAA SP2044

AIRCRAFT MANUFACTURING in New Zealand has been through several phases over the years. First was the wartime production, which progressed from assembly work to actual manufacturing, of Tiger Moths desperately needed as trainers to supply the air forces with pilots.

After a pause of a few years, attention was focused on the requirements of the aerial topdressing industry. Once again aircraft were urgently needed, this time to replace, ironically enough, the Tiger Moths which had been pressed into service with their only saving grace being cheap capital cost.

The Fletcher, developed from John Thorp's counterinsurgency design to drop materials beneficial to mankind instead of the nasty noisy stuff associated with insurgents, has been made in its hundreds in the factory bordering Hamilton airport.

Also emerging from Hamilton have been the Airtourer and Airtrainer, again products of the companies that have merged and reorganised into today's Pacific Aerospace Corporation. Current production, all developed within the group, comprises the CT/4 series Airtrainer, the turbine-powered Fletcher topdresser look-alike Cresco and the likewise turbine-powered 750XL utility passenger and freight aircraft. Across the airport is Alpha Aviation, starting to make the two-seat Alpha-120 and -160 trainers for a hungry worldwide market.

That's all GA stuff, although in hindsight it seems a pity that proposed local production of the DHC-2 Beaver and

Auster B8 Agricola came to naught all those years ago. Down the road at Te Kowhai is another New Zealand aviation manufacturing success story, with around 300 microlight Bantams having emerged from the half-round hangars bordering Max Clear's private Waikato airstrip.

Microlights from other manufacturers have evolved into light sports aircraft, but there's still an eager market for the entry-level, wind-in-the-face product.

So the GA and microlight types are being catered for, but what about the experimental side? The world of experimental aircraft is swarming with kits of (almost) all shapes and sizes, each one claimed by its originators to be the best thing since, well, the last similar one produced by a competitor.

That's been a quiet part of New Zealand aviation, despite the penetration of custombuilts in the overall scene. The expertise is undoubtedly there, but apart from the amphibious Shearwater reported in these pages five years ago and quietly inhabiting an Ardmore hangar ever since, there's been a notable lack of effort to break into the worldwide experimental aircraft market.

Until now. Taking place, also in an Ardmore hangar, is a project aimed at producing a high-performance two-seat retractable aerobatic sports aeroplane. It's a specialised but very attractive market for somebody with the right product — and it's certainly not something to be undertaken lightly.

Enter the Falcomposite Furio LN-27X. If that string of names and letters seems unfamiliar, it's because the organisation is new. At the same time, within the names are several clues to this

new aeroplane's origins.

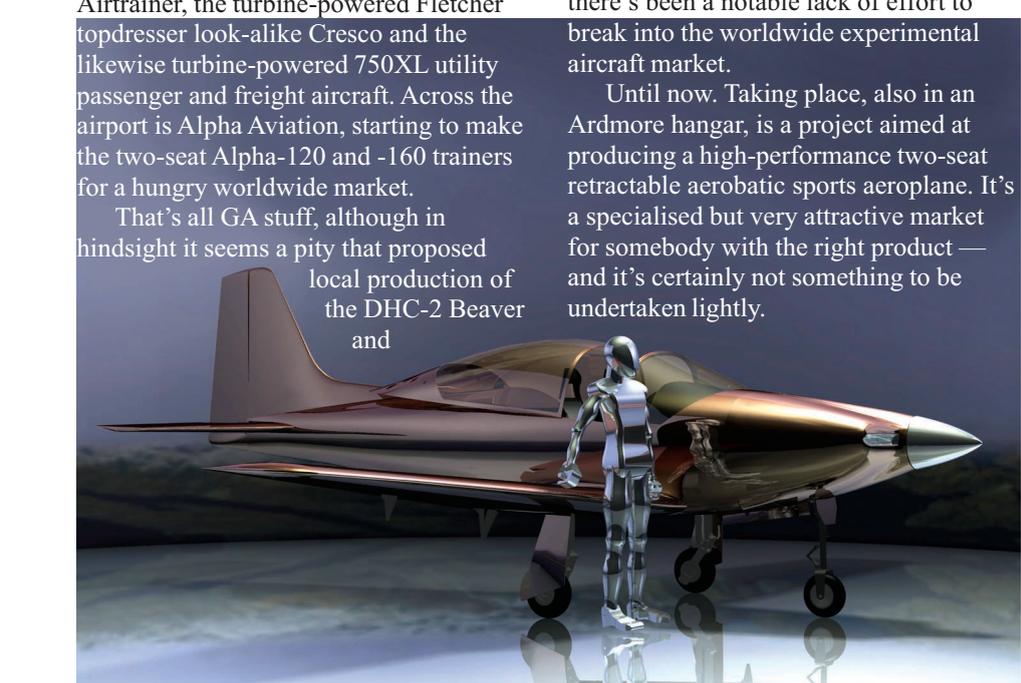
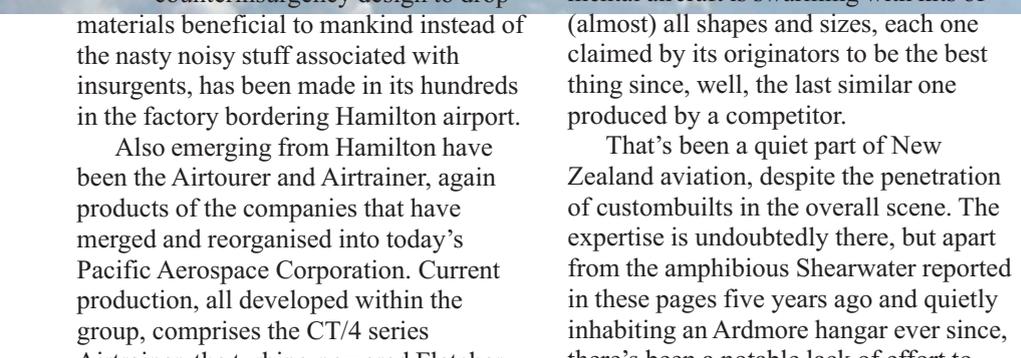
Furio is a male name derived from the Italian *furia*, and it doesn't take much knowledge of linguistics to link it to the English fury. The Italian connection is no accident, either, as the three principals of this project all hail originally from that country, with family and careers all interwoven with one another.

Giovanni Nustrini is no stranger to these pages. As the Ardmore-based New Zealand and Australian distributor for the Tecnam range he has a high profile at the lighter end of the aircraft range, and with his ownership of the Falco F.8 originally built by Syd Jensen he has participated in SAA events for some years. He brings to the new organisation, based in an office in the corner of the big new Tecnam hangar, an overview of the project as well as a considerable expertise in marketing.

Lapo Nustrini, Giovanni's younger brother, is following in the footsteps of their father Luciano as an architect and now also involved in aviation as well as teaching computer design. He brings his skills as design office manager to the team whose third member, Lapo Ancillotti, has much experience in composite materials as applied to high-performance yachts and fills the dual roles of production coordinator and structure layout concept designer. Ever since flying in a LongEze in Italy in 1985, Lapo A has wanted to build a composite aircraft but has been working in Auckland with Cookson's since 1992. He has been project manager for professional yachts, involved in building boats in New Zealand and looking after the teams in Europe.

A yachting background is common to all three men. Giovanni has long been involved in the sport and crewed *Gatorade* in the 1989-90 Whitbread race around the world, while his brother Lapo N crewed *Brookfield* in the following Whitbread race.

And the Falcomposite company name? The first project bears a more than passing resemblance to the Falco, but instead of being made of wood the



materials are all high-tech composites, carbon fibre.

The design concept originally came from Luciano Nustrini, the architect (who designed Florence airport among many other projects), airline pilot, racing pilot, yachtsman, photographer, aircraft designer and amateur astronomer who, after emigrating from Florence, set up the original Tecnam agency in this country.

Before he died in the crash of his own Falco in the outer Hauraki Gulf, he started his 27th aircraft design of which some have been models, including the LN-15 glider of August 1944 which is prominent in the main Falcomposite office. The latest design has been carried on as the LN-27X, and in true Nustrini thoroughness he even designed the factory to build it.

The project started to take shape in 2004. Long before making anything resembling an aircraft part or even a detailed drawing, the partners put together a business plan and a financial plan.

"We did very in-depth research," says Giovanni. "That was Lapo's [Ancillotti] job, and it's where others have fallen into problems."

"We discovered that the numbers were making sense," says Lapo A. They applied for a grant from Technology NZ for a technical feasibility study. He describes the response as "a true technical challenge", and while the study proved the technology the process took a whole year without any visible progress on the aircraft design.

They set up the Falcomposite company to manage the entire project, the production of a prototype, finalised a package for a potential investor and went searching. They found an investor in a week and took another month to fine-tune the package.

Behind the scheme is Kevin Grant, an investor and entrepreneur described as "technically minded with much business experience and a motorcycle enthusiast". He also speaks Italian, no bad thing with a trio who, although speaking excellent English, tend to talk among themselves in their native tongue.

"We design the pieces," says Lapo A, "and have a leading Italian aircraft designer do the load calculations. Then it's to a New Zealand company for the structural design, which is reviewed by another local engineering organisation, guiding us towards production. It's all under FAR23 as a kit plane, and we must make sure the methodology is correct."

Other staff members are taken on as required for detailed design draughting and mechanical engineering. The entire aircraft has been designed on computer, Lapo N's speciality, using Solid Works



The Falcomposite principals occupy the Ardmore office. From left: Lapo Nustrini, Lapo Ancillotti and Giovanni Nustrini.

software.

Luciano did the original wing profile in consultation with Stelio Frati, now 82, who provided the modification to his original Falco wing section. The Falco uses a 642212-1/2 section at the root and 642210 at the tip, and the original designer came up with a modification to the Furio's outer leading edge to tame the tip stall. The fuselage has also been enlarged to fit today's beefier people.

The Furio is designed to take engines up to 260 hp, and the prototype will be one of Lycoming's first customers for the new 210 hp IO-390X. The retractable gear uses electro-hydraulics instead of the Falco's mechanical actuation, and a fixed-gear version will also be developed with a view to eventual certification.

The fuselage, the first major part, is expected to be ready by the end of this year, with the wings following in early 2007. The technology has been developed with this monocoque integrated structure to drastically reduce the number of parts and hence the build time. The wing, for example, is made in only three parts. Avspecs at Ardmore will be putting the bits and systems together, and the intention is for first flight towards the end of 2007.

Although the prototype has a structure of all carbon fibre, there will probably be some fibreglass in production examples. It's designed to be fully aerobatic at +6, -4G with an ultimate of 9G, and the prototype has an extra 7 percent on top of that.

It's hard to imagine anything much sleeker than the 50-year-old Falco design, but this group at Ardmore could well achieve it. The idea of a locally designed and produced experimental aircraft has its appeal, and by this time next year the concept should be proving itself where it belongs — in the air.

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