Brian Hope and Jez Cooke relate the story of the Comper Swift and Phillip Cozens’ labour of love building his simply stunning replica, G-ECTF.

Pictures by Damien Dyer and Nigel Hitchman.
Isn’t history fascinating? As aviation enthusiasts we now have well over 100 years of powered flying behind us, and during that time we have gone from a 120ft barely controllable hop to hauling hundreds of people in aluminium (or composite!) tubes thousands of miles across continents in a matter of hours. It has sometimes been a rocky road, particularly in the first few decades, but our aviation heritage is a fascinating archive of man’s achievements in conquering the challenges that safe and reliable flight has presented.

Our sport and recreational sector of aviation has played a vital role in that success story, indeed it was ‘our’ sort of aeroplanes that led the way in those formative years up to WWII. The interwar years, that 20 year span from 1918 till 1938, saw the development of the aeroplane as a meaningful and useful machine, capable of global travel not just for the adventurous pioneer, but for the man in the street. It was a path beaten by small manufacturers and daring pilots who trail-blazed across the globe in light aeroplanes, the like of which today’s pilots can still relate to. They are rightly described as the ‘Golden Years’ of aviation, and the subject of this month’s air test rests bang in the centre of that period.

The Comper Swift is a diminutive single-seater, designed in 1929 by a former RAF officer, Nicholas Comper, and put into production as a sporting, privately-owned aeroplane. Only around 45 examples were produced before the company became insolvent and ultimately closed, yet unlike so many similar stories, mostly long forgotten, the Comper Swift is remembered and revered by all those with a penchant for classic aeroplanes. Indeed, there are those, such as LAA member Phillip Cozens, who have spent a significant part of their lives recreating an aeroplane that could so easily, like so many others, have been lost in the mists of time.

There are three aspects to this story. Firstly there is the life and career of enigmatic Nicholas Comper, a complex, somewhat dogmatic individual intent on ploughing his own furrow. Then there is the aeroplane itself, a delightful and eminently capable shoulder wing monoplane, of which Jez Cooke shall describe the flying qualities that elevated it above its contemporaries. Finally, there is Phillip Cozens, whose single-minded and focussed approach saw a superb recreation of this 85 year old design take to UK skies in early October, after a 15 year odyssey.

**NICHOLAS COMPER**

Nicholas Comper was born in London in 1897, one of the six children of Sir Ninian Comper, a church architect. Educated at Dulwich College, he went on to study aeronautics then work as a draughtsman with Airco, the Aircraft Manufacturing Company Limited, at a time when Geoffrey de Havilland was its chief designer.
The club used its financial windfall to build Comper’s CLA.3, a parasol wing single-seater, again powered by a Bristol Cherub. It flew in July 1925 and Comper won a single-seat race at a Royal Aero Cub event at Lympne in August. At the same meeting it set a speed of 86.8mph (139.89kmh) over 3km and 84.25mph (135.5 mh) over 50km, not bad on just 36hp. The aircraft was scrapped in 1929.

Comper returned to the two-seat Sesquiplane theme for the CLA.4, although it was unusual in that the smaller wing was at the top. Two examples were built to compete in the 1926 Lympne Trials, one with a 36hp Bristol Cherub and one with a prototype 65hp Pobjoy, although the Pobjoy-engined machine had to withdraw due to engine problems. The two aircraft never achieved any notable success and were ultimately destroyed. Interestingly though, a third aircraft was built in Canada after plans were sold to the Alberta Aero Club. This machine is reported to have flown initially with a 30hp three-cylinder radial Blackburn Thrush engine and later a 55hp Viele M-5 radial, being damaged and withdrawn from use at Edmonton in 1934. Today it resides, rebuilt, in the Alberta Aviation Museum as the sole, pre-Swift Comper design to have survived.

Comper Aircraft Company

In late 1926, Comper was posted to Felixstowe to work on flying boats and seaplanes until, wanting to move into civil aircraft design and manufacture, he resigned his commission and established the Comper Aircraft Company Ltd at Hooton Park Aerodrome, Cheshire in April 1929. His first commercial venture, the CLA.7 Swift, first flew at Hooton Park in January 1930, the prototype G-AARX being powered by a 35hp ABC Scorpion flat twin. While he waited for Douglas Pobjoy to get into full production with his 67hp seven-cylinder type P radial in the factory he had established on the same site, the first seven production aircraft were built in 1930 with the 50hp AD.9 Salmons nine-cylinder radial. Following trials with the Pobjoy P. all but three of the remaining Swifts built were powered by the 75hp Pobjoy R, those final three using the DH Gipsy Major.

The Swift is a small machine, being just 17ft 6½in long with a span of 24ft and standing just 5ft 3¾in high. It is of wood and fabric construction but at a time when glued wooden structures were the norm, Comper relied heavily on metal brackets to hold much of the structure together. “It’s almost as if he didn’t trust glue,” observed Phillip Cozens, adding, “There are an incredible number of individual metal brackets in the aircraft!” That said, the aircraft weighs in at a not unreasonable 540lb (245kg) and its spritely performance found favour with a number of long distance racers of the period. Alex Henshaw being one such customer. Henshaw won the Siddeley Trophy at the 1933 King’s Cup race at an average speed of 127.78mph over an 830.8 mile course.

In 1931, a somewhat more adventurous record had been set when Cecil Butler flew a Swift from England to Darwin, Australia in nine days, one and three-quarter hours. Another long distance flight of note was made by C Byas who flew England to Cape Town in 10 days. Swifts competed in every King’s Cup air race between 1930 and 1937, and acquitted themselves very well. In the 1932 race, Flight Lieutenant EH Fielding achieved second place in G-ABWW, a Gipsy-engined Swift owned by Edward, Prince of Wales, later to become King Edward VIII.

The Swift leaves the ground in a tail-down attitude as prop clearance is minimal

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The start of it all – the Rally Fleamarket Pobjoy engine that Philip bought and overhauled.

The cosy ‘wraparound’ cockpit with period style instruments. You can almost imagine yourself heading off for far away lands.

(Captivating Comper)
POST SWIFT
Over the three years following the Swift going into production, Comper penned and built three new designs. The first was another single-seater, the low-wing, Gipsy Major-powered Streak, two examples of which were built. But Comper realised the market wanted a larger machine and designed the tandem two-seat Kite, which owed much to the Streak but was powered by a 90hp Pobjoy. Only one was built and it was scrapped in 1935. Finally, but too late, he built a three-seat low-wing monoplane, called the Mouse. Powered by a Gipsy Major, it was again an all-wood design and featured retractable main gear and a one person wing-fold system. It flew for the first time in September 1933 and received its airworthiness certificate in May 1934, by which time the company was sadly on the verge of bankruptcy. Although several airframes were started, no Mouses (Mice?) were sold and a joint venture with Cierva to build the C25 single-seat gyroplane using a Swift fuselage also came to nothing, although a prototype was built. The company had by this time moved to Heston Aerodrome and in August 1934 a new board of directors was appointed and the Comper Aircraft Company became the Heston Aircraft Company. Comper ceased to have any further involvement with the company he had founded.

Over the next five years Comper attempted to revive his career but sank deeper into debt after a number of failed ventures until, by 1939, he was in dire straits. He died of a brain haemorrhage after being pushed over in the street and hitting his head on a curb, reputedly for saying to a passerby that he was an IRA man who was going to blow up the town hall. He was just 42 years of age.

FLYING THE SWIFT
Jez Cooke, who has been carrying out the test flying on Phillip Cozens’ delightful homebuilt Comper Swift, explains what it is about the aircraft that has made it such an enduring machine.

‘I have always had a fascination for the Comper Swift. As a young schoolboy I distinctly remember reading a dog-eared copy of Aircraft Illustrated in which an article on the Swift enthralled me; I hoped that one day I might get my pilot’s licence and own one. To me, it was the perfect cheap to run and classic aircraft that could be stored, wings folded, in my uncle’s barn.

Time passed of course, no Comper appeared, but about 10 years ago, Phil Cozens asked me if I might like to test fly his Comper upon completion. To say I was excited was an understatement and it was a full 10 years of watching his wonderful creation grow before I had the honour to accomplish his request.

‘I made two flights at Hinton-in-the-Hedges airfield on 2 October 2015, the weather (at last!) being perfect with a slight 5kt crosswind from the right. The first flight was curtailed early due to some oil escaping from the crankcase breather over the airframe and pilot! The airflow into the hollow propeller shaft was obviously pressurising the crankcase, so this was blocked (with a Glenfiddich cork that Damien just happened to have on his person!) and the second 40 minute flight was completely oil free.

‘If you have short legs, installing yourself into this little beauty is a bit of a challenge. A three foot section of the trailing-edge of the centre-section of the wing hinges forward to allow entry to the cockpit, but the fairly high fuselage means you have to raise your right leg up in true ‘Ministry of Funny Walks’ fashion prior to placing it lightly onto the cockpit seat. You then hoist yourself into a standing position on the seat and then lower yourself carefully down into the cockpit. This (of course) would be easy if a small mounting-block was to be used.'
CAPTIVATING COMPER
Once inside, I am completely at home. The cockpit sides curve up and around me, and the fuselage sides are just touching my shoulders in a snug embrace, very reminiscent of the Midget Mustang or Pitts.

The few instruments are in keeping with the period and all controls come comfortably to hand. The fuel cock, hidden away under the instrument panel, is accessible with my straps tight - important if you need to get to it in a hurry. The view immediately forward is impeded by the centre cabane, but by moving my head slightly outside, most of the path ahead is revealed.

For the first flight, the aircraft had 10 gallons of fuel and my 190lb weight, giving a take-off weight of 884lb, so well within the aircraft’s MTOW of 985lb.

The zero-hourred 85hp Pobjoy Cataract engine drives a gearbox which reduces prop rpm at a ratio of 0.47:1. Starting the engine is fairly simple (now that the knack has been learned!), and is achieved to the accompaniment of various clatters and clunks from the gearbox as the prop is turned over to suck-in. She starts first blade, much to the relief of the (by now) wheezing prop swinger, settling down to a lovely smooth rumble. We warm up at 1,500 engine rpm for about five minutes. Carb icing is known with these engine/carburettor combinations and carb heat is achieved by passing the warm oil around the carb, therefore a good oil temperature prior to departure is important to ensure sufficient warming of the carb.

The static full power run up (with our wheezing prop swinger holding the tail down) achieved 3,200 (engine) rpm, with the oil pressure a steady 50lb. There is very little mag drop.

When taxying, ground manoeuvring is fairly easy and positive, with quite tight turns achievable with careful neutral or slight forward stick against engine and full rudder (at full travel, rudder applies brake to that wheel), but beware of side-loads on the skid. The view forward is obviously slightly restricted, but turns of up to 30° left and right ensure that the path ahead is clear.

FABULOUS LITTLE AIRCRAFT

The take-off was rapid, with this fabulous little aircraft fairly shooting off and no problem keeping straight with the powerful rudder. The prop clearance in the three-point attitude is not good so the tailskid is just allowed to leave the ground and then that tail down attitude is held until unstick occurs after about 200m ground roll. There is a slight P effect induced yawing to the left upon unstick at 67mph IAS, but it was easily controlled with rudder. Lowering the nose immediately after take-off to accelerate to the climb speed of 80mph IAS is unnecessary, since the first look inside the cockpit about five seconds after take-off reveals this speed has already been attained.

Climb out gave a rate of climb of approximately 1,200fpm, with engine at 3300rpm and oil pressure 52psi. The visibility in the climb was reasonable, but weaving to clear blind spot ahead is always necessary. All controls are very light and powerful across the speed range, while elevator forces are particularly light, although not ‘snatchy’. Stability of the aircraft is just positive in roll, negative in yaw and just positive in pitch.

The instability in yaw makes constant attention to yaw and roll necessary to maintain altitude and heading. The powerful rudder requires a very light
CAPTIVATING COMPER

touch (NB the slip indicator is mounted upside down so rudder inputs ‘away’ from the displaced bubble are required to regain balanced flight). At higher cruising speeds, this yaw instability becomes very marked, but with practice this becomes part of the character of the aircraft.

The ASI appears to over-read by approximately 10mph (compared with the chase aircraft flying alongside) but this will be verified later in the testing programme. The engine is very smooth above 2,800 (engine) rpm and seems to settle quite nicely in the 3,000-3,200rpm range, with an IAS of 110-115mph. Oil pressure remains steady in the range 48 – 52psi, depending upon engine rpm.

In the cruise, the airflow (or lack of it) into the cockpit makes for a very comfortable environment - it is quite possible to fly with goggles up.

Stalling is at an extreme nose-high attitude and occurs at 57mph IAS, with a slight buffeting 4mph prior to the stall. There was a slump in pilot requirement, which could well have had a major influence.

There are no complete sets of Swift drawings.

It takes a huge commitment to scratch build any aircraft, let alone a vintage aeroplane like the Swift. Such a machine uses very few proprietary parts, pretty much every component has to be fabricated, and in Phil’s case that even included some of the parts in the engine. An added complication is that there are no complete sets of Swift drawings.

Fortunately Phil is a well trained mechanical engineer, although when he left school that was not the path he had mapped out for himself. As an aviation enthusiast and aero-modeller, he was intent on becoming an airline pilot and made a good start by being accepted into the BEA/BOAC College of Air Training at Hamble. However, like so many of his alumni at that time, he did not manage to complete the course. This was at a time when there was a slump in pilot requirement, which could well have had a major influence. The only saving grace was that Phil did emerge with his PPL and, not one to feel sorry for himself, he enrolled in Hatfield Polytechnic to study aeronautical engineering. The first year course covered Aeronautical and Mechanical engineering, and at the end of it Phil took a lecturer’s advice and headed down the mechanical path at a time (the 1960s) when the future of the British aviation industry was looking very bleak. He has spent his working life in the energy industry, initially oil and gas, and latterly renewables.

Phil joined the PFA in 1974, having seen an advert in Aeromodeller for Tipsy Nipper kits. It was one of those defining moments when the realisation took hold that he might be able to build a full-size aircraft. In the event he chose to build a Sonerai II, which first flew in 1982 with a big crank 1,900cc VW conversion that he developed himself. It was a pretty fast example, cruising at 120kt, but was a marginal as a two-seater and he generally flew it solo. Phil enjoyed the Sonerai and made a number of trips in Europe, including a trip to see his daughter compete in the World Junior Athletics Championship in Annecy. But Phil wanted his wife to be able to fly with him, so he bought a Gardan Minicab, although as so often happens, his wife wasn’t so keen and turned out not to be an enthusiastic flying companion.

The Comper Swift story starts when Phil and a flying friend, Brian Mann, would have the discussion about their ultimate aeroplane and Phil’s scribbles would always end up looking like a Comper Swift. Then on a visit to the LAA Rally in 1996/7, he found out about a Pobjoy engine in the fleamarket and bought it. He also bought a second engine from LAA inspector Dave Silsbury and, as both were pretty tired, he decided to make one good engine from the two. Even that wasn’t a straightforward job, he

Philip flew his Comper Swit for the first time on Sunday 22 November. (Photo Damien Dyer)

What might have been – the sole Comper Mouse, Gipsy engine, three seats and retractable gear but it came too late to save the company

A medley of construction images that highlight the extraordinary detail and workmanship in ‘TF (Photo Damien Dyer)
spent two weeks looking through piston ring catalogues to find compatible piston rings (mainly from a 1978 Honda Civic), had to have new valve springs and bearings made, and spent hours at the Shuttleworth Collection measuring and drawing the prop hub from their Swift so he could make a new one.

He had already acquired what Swift drawings were available from Dave Pounder but held back on starting any airframe work until he was satisfied that he would have a satisfactory engine to put into it. By the start of the new millennium the Pobjoy was looking good, so the epic build began.

As mentioned earlier, there are many metal fittings to make, and Phil’s pretty sure that some of them were made first and drawn afterwards, because the drawings, measured in 1/64 inches, often have no datum from which the measurements are referenced. The wing hinges proved to be the most awkward parts to make, but in general the fittings were not overly difficult, just fiddly and numerous!

I asked Phil what kept him going for 15 years and his reply was typical of the scratch builder: “You have to see pleasure in making each individual piece; each completed component is a worthwhile exercise in itself, a thing of beauty and achievement which will ultimately lead to a completed project.”

There were no major periods of inactivity in the build, it was a steady 15 years of progress, enjoyable progress spurred on by the many helpers and friends he made along the way.

Making the parts where drawings were missing proved interesting, rather than forbidding. He met several times with the late John Greenland, who built Swift G-LCGL, and he was forthcoming with help and advice. So too were the Shuttleworth engineers, allowing Phil to photograph and measure their G-ACTF, although that example has had some non-standard modifications made over the years.

A PERIOD TOUCH
Period instruments proved interesting to acquire. Phil managed to get a bubble level from a Bristol Fighter which is the correct type and currently has a period but incorrect altimeter. However, he found a correct 1914 model Zenith altimeter on Ebay being sold by a lady in Portugal who was raising money for a cat’s home! That will be fitted in due course. The tachometer was a particular problem because it runs at a quarter speed rather than the typical half speed. He discovered that the Merlin drives its tacho take-off at a quarter speed too, but a tacho from the Spitfire proved too bulky, so he had to settle for an electronic tacho packaged behind an antique face.

Phil readily acknowledges that without the help of friends and family, completing the Swift would have been impossible. He would like to acknowledge help and advice from the late John Greenland who passed on tips from his own experience. He would also like to thank Pat Barker, his inspector who was always available for consultation and advice, his mates at Hinton especially Barry Plumb and Damien Dyer, and latterly the intrepid Jez Cooke who undertook the first flights. They have been a great moral as well as practical support in getting it over the line towards the end. And of course the good old LAA; we couldn’t do these things unless they had worked so hard to provide the environment in which it was even possible.

The Swift has certainly been a labour of love and now that it is complete and flying, Phil is already planning to take his Minicab out of the air to recover it. I somehow doubt Phil’s aviation endeavours will end there; like all compulsive engineers who just have to keep busy, it may well end up turning into a full restoration!}

Jez Cooke has wanted to own a Comper Swift since he was a lad and was delighted to have at least had the opportunity to fly one. He is full of praise for Phil’s achievement.

Phil carrying out engine runs at Hinton. It has thus far performed faultlessly. (Photo Damien Dyer)

Jez Cooke has wanted to own a Comper Swift since he was a lad and was delighted to have at least had the opportunity to fly one. He is full of praise for Phil’s achievement. (Photo Nigel Hitchman)