



# FLIGHT TEST

■ The Cabri hovers over a rough sea off the south of France coast. Let's hope its future isn't so turbulent!

WORLD EXCLUSIVE FIRST TEST

# Oui, c'est formidable!

New piston-engine helicopters are rare so when one is launched from scratch, by a renowned engineer, it's a big event. LOOP is the first publication in the world to fly the all-new type certified Cabri G2 from Hélicoptères Guimbal

See the Cabri in action on



WORDS Dennis Kenyon PHOTOS David Spurdens





**S**HE stood quietly on the apron at Aix-en-Provence aerodrome. As French as the Eiffel Tower, curvier than Nicolas Sarkozy's new wife... and I was about to try her! She is the newly certified Cabri G2 two-seat helicopter from Hélicoptères Guimbal.

The arrival of a small piston helicopter is a rare event. In my 35 years in the helicopter side of the industry, I have seen it happen but three times, the last being in the mid-1990s when Robinson took a second step on its production ladder with the four-seat R44.

For a two-seater, we need to go back to the late 1970s when Frank's R22 burst into the world with a sea-changing effect on private ownership and the training schools.

Now it is the turn of Monsieur Bruno Guimbal who has arrived with his innovative Cabri G2.

I first bumped into the pretty Cabri at the 2005 World Helicopter Championship at Rouen. I liked her looks so much I couldn't stop taking pictures for my personal album. Sadly the album is filled with too many models that never made it into production.

So how will this curvy new design fare? More importantly, how will she fly?

A few years ago, I remember writing that with the ever-stricter certification requirements, and the technology and specification of the larger helicopters constantly improving, it was unlikely that any individual other than one of the major players could build and certify a small helicopter again.

I considered the ubiquitous R22 to be the last helicopter to have cleared the certification hoop. I was wrong.

#### STIFF CERTIFICATION

Bruno Guimbal has an impressive pedigree. He is the charismatic founder of Hélicoptères Guimbal and if you fly a Fenestron tail rotor helicopter, you can thank him for the extra safety of his design.

At Eurocopter, Bruno held the position of chief development engineer and was responsible for the main and tail rotor design of the AS350 Squirrel.

As our hire car sped past the Marseille Eurocopter factory on the A51 autoroute, I was excited at the prospect of being in on the birth of

a brand new light helicopter.

The Cabri G2 had to meet stiff CS-27 EASA (European Aviation Safety Agency) certification requirements, which includes noise and crashworthiness numbers.

For example, the rotor blades were submitted to 200,000 fatigue life events. The Formula One design collapsible fuel tanks had to be dropped 15 metres while full to simulate a vertical high G crash – and not spill a drop. The main rotor hub and swash plate components were required to prove resistant to impact damage and remain serviceable. The forward footprint 'noise' was established at an equivalent 75 Pndb (perceived noise decibels).

EASA full public transport certification was received on 14 December 2007. I wonder how our CAA friends at Gatwick will view this new type, which has so many new features – an all-plastic, one-piece airframe construction for starters.

#### FIRST IMPRESSIONS COUNT

We arrive at Aix-en-Provence aerodrome in bright sunshine and a clear blue sky. The introductions are made. I shake hands with an English-perfect Bruno Guimbal and his supporting team, but am a trifle concerned when I learn a German team are also due to arrive. Have we beaten them to the deck chairs? But I know their pilot Werner Iberler, a 5000-hour ex-military man. We can work together.

At 12:00 hours, Bruno Guimbal briefs us on the programme. We will be given the factory tour first. The Alouette II cameraship will shortly arrive, and chief test pilot Olivier Gense is to oversee our air test. Happily I am to fly first.

You'll often hear the old adage first impressions count. As I approach Bruno Guimbal's new design, I am impressed. If a helicopter looks right, it probably flies right.

But let's take a look at the impressive specification. The Cabri is a first in many areas:

» First light helicopter to be certified under TCDS 145 EASA regulations.

» First light helicopter to have plasma ignition.

» First type to use a 'glass cockpit' for engine, fuel, rotor rpm and carburettor readouts. The electronics allow a compact but highly readable instrument panel. Pilot indications are

informative and particularly good.

For example, the fuel readout provides details of total quantity, fuel pressure, instantaneous fuel consumption, distance to go, and time remaining on the available fuel.

The rotor rpm dial has an impressively wide emergency operating band. No less than 450 to 630 rpm – an unheard of spread! In the green, operating revs are a more normal 530rpm. My pilot, Olivier Gense tells me rpm recovery is possible from as low as 400. I didn't ask to try it!

The horizontal line of dials on the lower glass panel indicate battery information plus carb-air, cylinder head, exhaust gas and oil temperatures, as well as a digital clock and sortie timing information including the previous sortie. That should shut up the flying time cheats!

Engine power is shown as a percentage from zero to 120% (a la turbine) so manifold pressure becomes a thing of the past. And there's so much more pilot information that brings this ship into the 21st century by use of screen information selection and colour coding.

But what when the TV screen goes on the blink? All emergency alerts have conventional back-up indications. Rotor rpm (NR) has three warning lights to get you home. High, normal and low, including the 'aural' low rpm warning, and the Cabri G2 can be flown quite easily on this information alone.

Like the Robinson R22, the electronic rpm governor is 100% effective, so throttle twisting is a thing of the past too. Chip detectors are fitted for tail rotor and main rotor transmissions. The mechanical 'cam' works well, so for a well-trained pilot, a governor failure is barely a problem.

**AUTO CARB HEAT**

I'm not a fan of non-fuel-injected engines for helicopters, but the problem of carburettor icing has been firmly addressed by fitting an automatic heat control. So there's another of my biases gone!

I'd have to say, as an old-fashioned guy, that the above modern goodies are welcome, but what really matters are the big performance issues.

Bruno Guimbal has got it right here too. His three-rotor blade, fully articulated main rotor hub is a clever copy of the AS350 Squirrel design. We'll see how it works when we fly.

Guimbal has also used the well-tried Lycoming O-360 J series engine, to which he has added a neat STC (Supplementary Type Certificate) by way of a plasma ignition overhead switch system.

In the Cabri installation, this produces a healthy 145bhp at 2700rpm, but my personal view is Monsieur Guimbal has given his helicopter plenty of work to do, with 170 litres of fuel to cart around when fully fuelled! Nice work, but the resultant 270lb weight does reduce what is an impressive lift performance.



» LOOP tester Dennis Kenyon about to have his first flight in a brand new two-seat helicopter... in winds gusting to 30kt!

» Below: test pilot Olivier Gense, left, and Bruno Guimbal, a PPL(H), flying the Cabri above the Provencal countryside.



» Spectacular coastline near Marseille and a spectacular success, the Cabri G2.



On the plus side, the Cabri has an endurance of over five hours! It's more than most European countries might need, but, of course, France is a big country and no doubt the resultant 450-mile range will be very welcome there – and, for those of us who don't mind a sore bum, here too!

There are many features I like. Start-up is simplified by an instrument which indicates the correct throttle position for priming. No more, "Try giving her five seconds, mate."

And, the Cabri has a separate luggage locker with a capacity of 200 litres or 40kg, somewhat better than the Enstrom FX Shark. Space-wise, the locker will stow two airline-carry-on-size cases and, as an avid golfer, I could actually load up my golf clubs... but not the tall No1 driver! Knowing my amateur's standard slice off the tee that may not be a bad thing!

Looking at the speed department reveals another plus. Vne is a whopping 130 knots. On my air test, I set 100% power and pushed the cyclic forward. The ASI needle moves smoothly round the dial to the 'barber's pole', albeit with a significant increase in airframe vibration. Vne in autorotation is 110kt. The economical cruise speed is achieved at 80% power setting, which gives an IAS of 85kt, but the fuel consumption increases disproportionately at higher power settings.

#### ALL-ROUND VISIBILITY

Enough of the specification. I'm strapping myself into the right seat under the guidance of chief test pilot and amiable instructor Olivier Gense. Olivier ensures I'm nicely settled for my first flight in a new type. The latest Bose headsets are good. I check around outside; the large expanse of cockpit glass gives great all-round visibility.

The Cabri is not a large machine. Overall length is a mere 21ft. Cabin width is a comfortable 4ft, plenty for two pilots. The three rotor blades stretch out to 24ft disc diameter. The Fenestron tail rotor has seven fully enclosed blades, which whistle like a gazelle. Ground handling is the usual removable wheels.

Olivier guides me through the start procedure. The TV screen tells me to set 12% throttle position and, with a touch of the starter button, the trusty old Lycoming fires up and rumbles for a second or so before settling into its steady idling beat. Oil pressure is up with the temperatures and pressures approaching the green arcs.

The temperature digital read-out tells me the OAT is six degrees centigrade so we need to spend a minute on the warm-up. I glance at the windsock... almost horizontal. ATC pass instructions in French. I struggle with the words but recognise 30kt, gusting 30kt. Not a good day to flight test a new light helicopter!

The warm-up complete, I familiarise myself with the cockpit and instrument layout. With the exception of the one-piece glass instrument presentation, there's nothing out of the ordinary, but, in any case, the various readings are so well set out that even in the strong sunlight the smallest dials are very readable.

#### STIFF BREEZE

Rotor engagement is a one-time action switch and for some reason I was thinking this helicopter would have similar handling to the Schweizer 300 series. Lycoming engine and three blades I suppose. As I monitor the numbers, the rotors settle at the bottom of the yellow arc at 400rpm.

I check out the four-way electric trim switch to maintain a horizontal disc attitude as it flaps in the stiff breeze. The trimming takes effect smoothly. Yes, that is the same as the 300, I'm smiling to myself, but thinking ahead for my first lift-off in 30 knots and with the rotors turning the wrong way. I need to reinforce this in my mind – RIGHT foot as I raise the lever. I don't want to disappoint the instructor sitting alongside!

The throttle twistgrip has two cork sections. The slimmer forward section is linked to the rpm governor and the larger aft section is used for collective lever control. Initially, I find the conflicting movements strange. Olivier Gense advises using the aft cork grip for collective lever control and simply use the

#### GETS MY GOAT



OK, so where does the name 'Cabri' come from? Bruno jokes about the letters standing for something corporate, but in fact, it's after a skiing trophy he won as a child. More accurately, the trophy was a level of skiing competence named after a mountain goat, the Cabri. For someone born in the Alps to a ski-mad family, it was a trophy that meant a lot.

Right: Cabri looks like a mini Eurocopter with that Fenestron tail rotor.



## MADE IN FRANCE

HÉLIPTÈRES Guimbal moved across the aerodrome into new premises in the middle of January, and is at the start of setting up a production line.

Many parts of the Cabri are manufactured locally by outside contractors, using tooling and moulds made by Hélicoptères Guimbal. The carbon-fibre composite tailboom and fuselage are such items. The tailboom is a work of art, being made from two halves joined together. It weighs just 7kg and comes out of the mould with pre-drilled holes in exactly the right places.

Bruno Guimbal is very proud of the tooling, which his company has produced in-house using computer-controlled machines. But he is most proud of his blade shop, which has just received its production certificate from EASA.

The company makes its own blades in a state-of-the-

art mould – and it has also demonstrated 'infinite life' on a testbed, again made in-house. This has performed 200,000 cycles at 15-20 tons of force with no breakage.

They have tested blades with deliberate induced damage (to simulate rough use in the field), with misaligned mounting bushes and have even polluted the foam core of the blades with Teflon to simulate a potential manufacturing fault.

Hélicoptères Guimbal currently has 14 staff – four with private helicopter licences, including Bruno himself. That number will rise as their new factory, a former army base, takes shape. This year, they plan to build 12 Cabri G2s, with the first going to local charter and training firm IxAir. Within two years, they plan to be making 50 aircraft a year.



Company boss and former Eurocopter engineer Bruno Guimbal and the Cabri's tailboom.



New factory is being prepared for series production.



The company has its own blade manufacturing shop.

## TESTING, TESTING

UNDER the French system in place when the Cabri started its certification programme, the test pilot had to have an experimental aircraft test pilot qualification. That was strictly enforced, and they were fortunate to have Olivier Gense. However, his availability from his job as an instructor at the French Test

Pilot School was always in question. "We had to go to the Ministry of Defence to get permission," said Bruno. Even then, Olivier's original pass to fly the Cabri ran out in November 2006, just as the flight tests were coming to a conclusion. In total, 150 test flights were made, clocking up 200 flight hours.



All the tooling for the Cabri has been made by the company.



index finger to monitor the action of the governor. Instant success.

With a final glance at the bustling windssock, I tentatively raise the lever with insufficient right pedal and we yaw 30 degrees left.

Blast! I think to myself. I know our cameraman is shooting video.

"Just relax on the pedals," comes the voice in my ear and I momentarily think how many hundreds of times I have used those words to my student pilots! But I need to get to grips with the different handling and co-ordination of the new controls. I move off to the runway in a crosswind with less than a dead stable hover taxi.

**High above the autoroute linking Marseille and Aix-en-Provence, the Cabri G2 heads home after a successful test flight exclusively for LOOP.**

#### HOVER HANDLING

The hover handling is typical of a very light helicopter. The Cabri weighs only 700kg at max gross weight and we are not full tanks. The 30kt gusts need my full attention, but the Cabri is shrugging them off. I was wishing I could! Olivier tells me they have posted a 35kt Flight Manual crosswind limit. I need a few minutes to get the hover knack... after perhaps five, I'm happy again. It is time for a first circuit.

I hear the ATC clearance to depart and, with a cautious 90-degree clearing turn, I go for a standard Schweizer take-off profile. Olivier seems happy at the result.

Now, for the first time, I start to consider balance. I can tell this helicopter comes from the Eurocopter Squirrel stable. A 75-pence tuft of wool is my balance guide! This one is more sophisticated. There's a graduated 'degrees of slip' piece of paper pasted to the windscreen. It works fine, but if I owned this machine, I'd fit a conventional slip ball.

Now the Cabri's excellent handling really starts to show itself off. As we climb through 1000ft, the turbulence makes the handling choppier, but as with all multi-blade machines, a little judicious nursing of the cyclic copes easily. I want to spend more time admiring Cezanne's beautiful St Victoire mountain that looks down on the aerodrome, but for the

moment, there are more important items in hand.

It says a great deal for the little Cabri that in the first 15 minutes I feel absolutely comfortable, albeit still needing to remind myself that it's left foot for power reductions, right for power increase. I find it best to ignore the Woolworth woolly tuft and let my bum do the balancing.

I bank over for some steep turns. "Further over if you want," my co-pilot encourages. Not just yet, I think to myself. The smooth computer-designed lines make the Cabri airframe a slippery ship and at the higher speeds she holds attitude exceptionally well. Random yaw is non-existent. The collective lever is rather heavier than the Schweizer 300, but the

payback in turbulence is a reduced workload making constant adjustments.

I'd seen Olivier Gense fly some nice 180-degree wingover manoeuvres, so I experiment with a few cyclic pull-ups. I need to keep reminding myself we are flying over a hilly terrain with the mistral blowing hard, but the handling remains positive.

#### VORTEX RING

I ask Olivier to show me a Vortex Ring condition. "You show me," he responds. I set up what I think might be a reasonable collective lever entry downwind, but even with an initial 750ft rate of descent, and the ASI



There are over 90 Cessna aircraft based in the UK.

80% of owners choose RGV to maintain their pride and joy.

- Efficiently
- To a high standard.
- Without fuss.

Who do you trust?

**RGV AVIATION:**  
+44 (0) 1452 855 601  
[www.rgv.co.uk](http://www.rgv.co.uk)



## FLIGHT TEST



indicating zero, the introduction of power had little adverse effect, just the usual airframe vibration, but no increased rate of descent or incipient Vortex Ring. But anyway, I knew the VR condition would be unlikely in the 40kt we had at 1500ft.

By now Olivier seemed happy to let me do all the flying. I worked on the cyclic trim to produce hands and feet off handling for straight and level, but didn't quite manage to do so. Probably my limited knowledge of the type, I decided.

Now I had time to take in the beautiful countryside. My chunk of mountain sat solidly in the distance – it is easy to recognise it from Cezanne's classic painting.

But to get on with the air test. "I'd like to see the autorotational handling," I say. Olivier and I had already discussed the control sequence on our pre-flight brief. I routed back to Aix-en-Provence Aerodrome for a left base approach. With the target in range, Olivier showed me the entry from 700ft and we settled into a steady-state autorotation at a comfortable 60kt. I checked the VSI at 1300ft per minute.

In the strong wind, we were undershooting the selected target, so Olivier simply stretched the glide with a touch of forward cyclic to give a higher speed in the descent.

At 20ft to 30ft, we commenced the standard progressive cyclic flare co-ordinated with sufficient lever to slow the high rate of descent. As the Cabri settled into its final sink, use of the remaining lever and a touch of forward cyclic to level the skids gently cushioned the touch down for a 10kt run-on landing. The Cabri does sit lower on its skids and initially it would be easy to use the lever too soon.

I lifted off for a second go, this time making allowance for the strong wind, and we reached the landing site, once again using the same procedure, but this time achieving a vertical zero speed touchdown. All very satisfactory, and an exercise I'd like to practice for training demonstration purposes.

By the way, we shot the autorotations on video, and the resulting movie will be on LOOP TV soon.

Next came the EOLs (Engine Off Landings) in the hover, and again I needed to keep my thinking alert. Engine failure in the hover, "GO". Throttle wound off, nose yaws RIGHT to 45 degrees, sufficient LEFT yaw pedal to stop the rotation, collective up to cushion the landing. Unlike some types, I note there is absolutely no roll, so lateral cyclic correction isn't necessary. Almost a non-event!

Finally, I asked to have more than a few minutes achieving a respectable hover and to try some routine sideways and backwards manoeuvring.

The windsock still indicated plenty of surface turbulence, but again the sporty Cabri shrugged it off. I'd have liked to do some hover work on a calmer day. Olivier tells me the Cabri can be cyclic trimmed to actually hover hands off. I nearly got there even in the 25kt breeze.

**'In the strong wind, we were under shooting the target, so Olivier simply stretched the glide with a touch of forward cyclic to give a higher speed in the descent'**

**Remember the rotors turn the other way on French helicopters, Dennis!**



# TRIG

## TT31 Mode S Transponder

Meet the upcoming European Mode S requirements with the new Trig Avionics TT31 transponder. Low power consumption, high performance, plug and play upgrade. Contact your avionics installer now for more information.

www.trig-avionics.com T: +44 (0)131 449 8810





**CONCLUSION**

So how do I rate the Cabri G2? I checked the fuel situation. My one-hour sortie used a mere 34 litres, and we were in training mode. I guess flying schools could budget for an hourly fuel cost of around £37 to £38 at current UK prices. The Cabri design appears to be low hourly maintenance, so labour costs could be in the £20 to £30 per hour area, but see parts provision as below.

The standard fixed costs would be based on a purchase price of 250,000 euro. So using, say, 6% insurance, perhaps the same again for depreciation, and ditto some capital interest – this perhaps totals 45,000 euro per year.

The Cabri G2 is unique in having no finite life dynamic or static components. All items are 'on condition' except, of course, the Lycoming engine. Not knowing a parts price, I'm unable to offer any guidance on this aspect, but I cannot see these particular costs being higher than other piston types and on a smaller machine are more likely to be lower.

It is a particularly modern-looking helicopter and its aerodynamic curves make it slip efficiently through the air. The flying controls are nicely harmonised. Student pilots would, in my view, need to be taught to make maximum use of the electric trim system to lighten the cyclic loads.

The type has plenty of performance at almost 200hp per tonne, but operators might not always need its maximum fuel capacity for some training exercises. Using a two-hour sortie basis, the power to weight could be upped to 220hp per tonne.

Full stop engine-off landings, when required, would present little difficulty following specific handling training. I'd like to see a GPU (ground power unit)

socket fitted for those bad battery days.

Looking at the performance graphs, I note the HIGE is quoted at 4800ft on a standard temperature day. I like the height-velocity engine-off landing numbers, which even at max gross weight are a respectable 500ft and 45 knots. Service ceiling is quoted at 13,000ft, but Olivier Gense tells me they have flown to 20,000!

The glass instrument presentation is where all new helicopters will be heading in the next few years and the extra information it provides improves pilot awareness. Throttle co-relation of the Cabri is as good as anything I have flown, while cabin space and comfort is more than adequate.

And here is a final note. Monsieur Guimbal continues to work with Eurocopter, and my personal view is that while the mighty manufacturer would like to build a light training helicopter, it would find it difficult to divert from the core business of the profitable turbine machines. Witness Sikorsky and Schweizer.

As I write, Hélicoptères Guimbal is working in collaboration with Eurocopter to produce an un-piloted drone version of the Cabri for use by the military.

With some French Government funding and the expertise of Eurocopter available, I can only see the Cabri G2 making a sound entrance into the market in the next couple of years, and probably going on to establish itself as a successful low-cost training helicopter and a good entry level for the private flyer.

Monsieur Bruno Guimbal is a talented, enthusiastic entrepreneur. He knows precisely where he is going with his new baby, and my money would be on him succeeding.



**BRUNO GUIMBAL INTERVIEW**

**SEVEN YEAR ITCH**

**THE Cabri G2 is the brainchild of engineer Bruno Guimbal, who spent six years heading up the design team on Eurocopter's EC120, working on the main rotor and transmission. Bruno had built his own fixed-wing aircraft in the 1980s, then his own helicopter, the original Cabri. As long ago as 1996, he set a world record for distance in this early experimental helicopter.**

Then in 2000, it all became serious. Bruno left Eurocopter and set up Hélicoptères Guimbal at Aérodrôme d'Aix-en-Provence, halfway between Marseille and the lovely old city of Aix-en-Provence. It's Eurocopter country, with the French giant having one of its main bases at Marignane, just down the road.

Originally, Bruno had thought that turning his experimental Cabri into a production version, with full type certification, would take three years – two years of flight testing, then a year to certify. Seven years later, the EASA Type Certification came through on 15 December 2007, a year after the flight testing programme under Chief Pilot Olivier Gense had finished.

"We finished the flight testing programme in November 2006, Olivier's availability ending at the end of November. On the 30th we flew until 11pm, with torchlights!"

"It was nearly a year from then to get the stamp and I can assure you it was not a year of waiting! We just did not realise the amount of work required to qualify the

equipment, to qualify the lightning strike resistance and some other things in the rules. But we still came in on budget."

Flight test engineer Olivier Gamard was in charge of the certification programme and had to cope with the transition from the DGAC – the French CAA – to EASA, once airworthiness passed to the European authority. "No one will have to go through this again," said Bruno.

Funding a project like this is tough, and the company has benefited from both government and local grants, as well as a handy agreement with Bruno's former employer, Eurocopter.

"We have a couple of patents on the Cabri, but both were taken by Eurocopter under an agreement we had when I left Eurocopter. All that we do is our property below 1.2 tonnes [helicopter weight], and Eurocopter's property above 1.2 tonnes.

"So it is a 'win-win' agreement because it gives us some money, and doesn't cause any problem for our helicopter, including a bigger one, a four-seater, some day.

"The biggest consequence of this deal is that we are forbidden to sell this technology to Eurocopter's competition."

By this, Bruno explains that his past experience working on the EC120 would have been highly prized by some of Eurocopter's rivals – this ties him to the French company, which he is very pleased about. "Eurocopter is my culture, my standards," he says.



■ Bruno Guimbal and just one of the hundreds of precision parts for the Cabri, in this case the tail rotor transmission.

**JAA-EASA PPL**

# GROUND TRAINING TEXT BOOKS FOR THE PPL AND BEYOND

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Air Law</b> (and Operational Procedures) £20.95*	<b>Human Performance &amp; Limitations</b> £21.95*	<b>Navigation</b> (including Radio Aids) £29.95*	<b>Meteorology</b> £29.95*	<b>Principles of Flight</b> (and Aircraft Performance) £29.95*	<b>Aeroplanes</b> (including Mass & Balance) £29.95*	<b>Radiotelephony</b> £21.95*

- Packed with full-colour diagrams
- Ground instruction for the PPL and beyond from the world's premier flying training organisation
- Fully compliant with the JAA/EASA PPL theoretical knowledge syllabus
- Also suitable for those preparing for the UK NPPL ground examinations
- Numerous PPL-style questions and answers
- Navigation volume includes CD-ROM tutor for the "dalton-type" navigation computer

Order: by telephone: +44 (0)1865 844290 or online from [www.oatmedia.com](http://www.oatmedia.com)

**OATmedia** Innovative Learning

*innovative learning solutions for*

**OXFORD** AVIATION TRAINING

OATmedia, Oxford Aviation Training, Oxford Airport, Kidlington, Oxford, OX5 1GX, England

# Spitfire Mk 26b

*Fly The Aircraft of Distinction*

*The Fighter of Yester Year  
Let The Legend Live On*

Fully engineered - 6+/-4 g  
90% Reproduction  
Fast Build Aluminium kit  
2 Seater

Optional Extras  
Dual Column  
V6 260 - 340 hp Engine Package

**UK AGENT'S REPRESENTATIVE**  
KIERAN

Tel: 01670790696 Mob: 07902739955  
[www.supermarineaircraft.com](http://www.supermarineaircraft.com)  
e-mail: [spitfire@supermarineaircraft.com](mailto:spitfire@supermarineaircraft.com)

**SUPERMARINE AIRCRAFT**

Now showing on **LOOP** TV

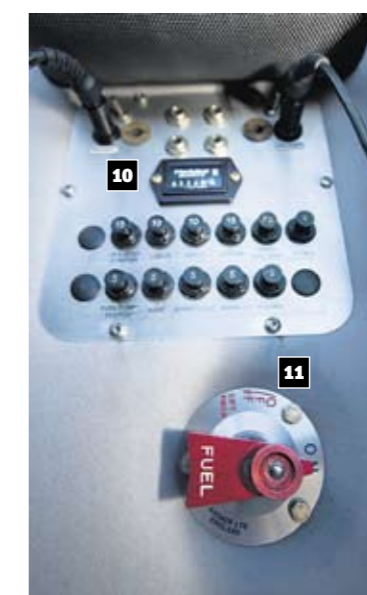
# FLIGHT TEST



## THE DETAILS

### GUIMBAL CABRI G2

- 1.** Cyclic (control stick). **2.** Yaw pedals (rudder).
- 3.** Vega Industries Engine Instruments Display.
- 4.** Warning lights. **5.** Compass. **6.** Additional screen (extra).
- 7.** Primary flight instruments. **8.** Garmin avionics. **9.** Bendix King KMD 150 GPS.
- (Below) **10.** Circuit breakers. **11.** Fuel tap (Andair - British). **12.** Collective and throttle.



### GUIMBAL CABRI G2

#### PERFORMANCE

- Vne** 120kt
- Max cruise** 109kt
- Eco cruise** 85kt
- Hover**
- HIGE 9000ft @ 600kg
- H0GE 3800ft @ 680kg
- Fuel burn** 38-42 ltr/hr @ eco
- Range** approx 425nm
- Ceiling** 13,000ft

#### SPECIFICATIONS

- Power** Lycoming O360-J2A derated to 145shp
- Main rotor** 3-blade, 7.2mt ø
- Tail rotor** 7-blade, 0.6mt ø
- Fuselage** 8.31mt
- Cockpit width** 1.24mt
- Height** 2.5mt
- Mtow** 700kg
- Empty weight** 430kg
- Useful load** 270kg
- Fuel capacity** 170 litres

#### PRICE

**Base price** €250,000

#### MANUFACTURER

Hélicoptères Guimbal S.A.  
Aérodrome d'Aix-en-Provence  
13290 Les Milles, France  
T: +33 (0)4 42 39 10 80  
E: [infos@guimbal.com](mailto:infos@guimbal.com)  
W: [www.guimbal.com](http://www.guimbal.com)



Lycoming O360 engine derated from 180 to 145bhp.



7-blade tail rotor enclosed within Eurocopter-like Fenestron.



Cabri has a 'proper' fully articulated 3-blade main rotor head.