PHOTOS: RAY FENELEY.

Engine failure *after take-off*

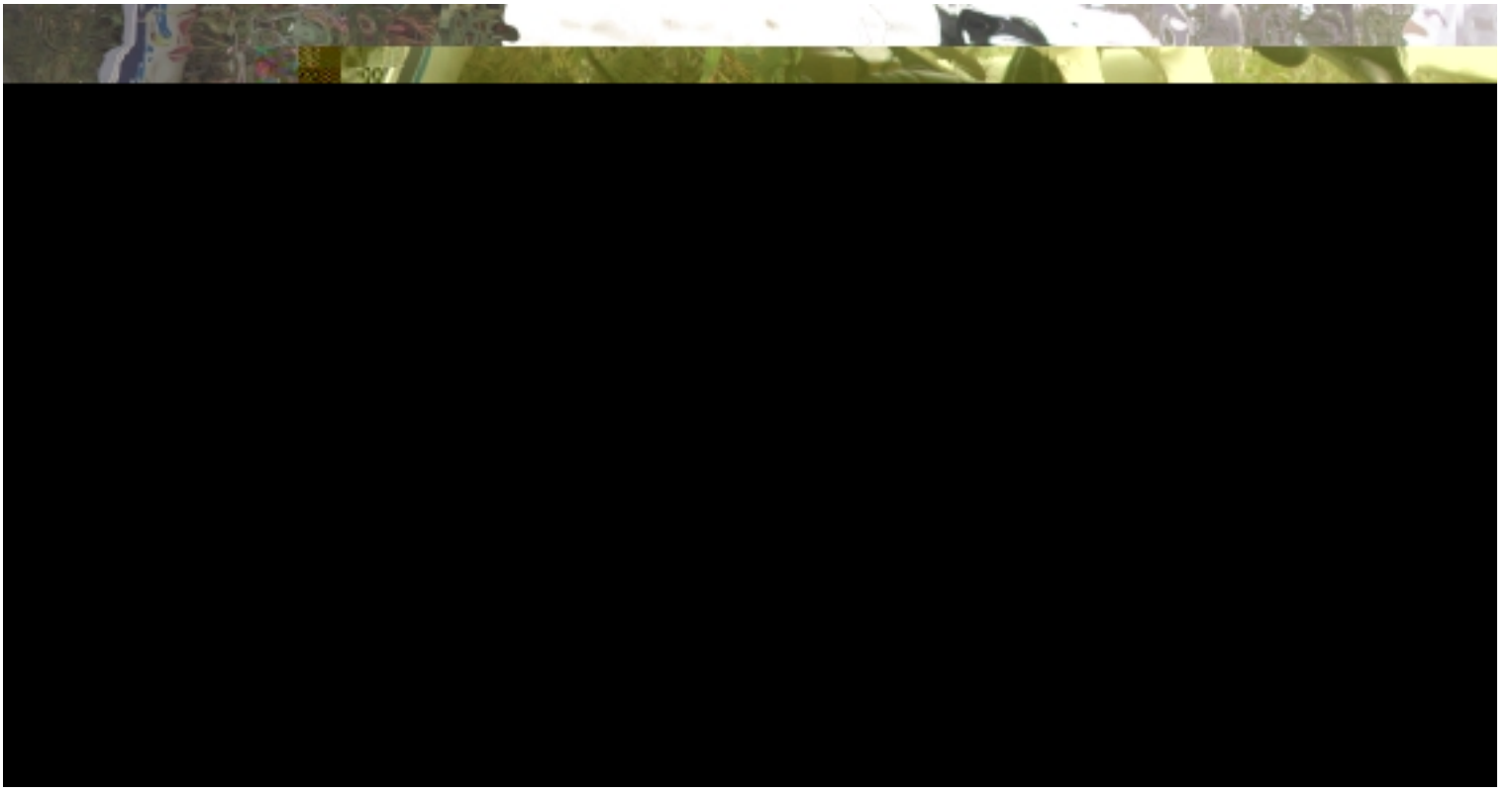
A miraculous escape for two ultralight pilots.

Carl Holden

I'D BEEN flying for 30 years and had logged 4000 accident-free hours, when I found myself in the right seat of a Jabiru parked at Wedderburn airfield, near Holsworthy Firing range, south-east of Sydney.

A pilot friend and I were on our way from Wedderburn to my home airfield, the Oaks, only minutes to the west. The 2.2-litre Jabiru we were flying had around 70 hours on the engine since major factory rebuild, and was maintained regularly by a licensed aircraft maintenance engineer (LAME). Although ultralight registered, this particular aircraft was capable of being registered on the VH register.

Because the runway at Wedderburn slopes down to the north (Runway 35), this direction is used for take-offs unless the



tailwind is excessive. On this day, the surface wind was from the south east at about five to eight knots. This was within the pilot's acceptable take-off criteria for a downhill take-off.

Our run-ups appeared normal and the traffic check was okay.

My instructor-trained eyes scanned the gauges which appeared fine. Being an auditory person, I am used to checking engine performance by exhaust note and other sounds and I didn't hear any problems.

Lastly, but most importantly, I checked my "instructor's smile". This can be very important in giving students confidence. Although it was not an instructional flight, it came as an automatic reaction.

We climbed north on the initial heading with the runway rapidly disappearing beneath us. Approaching a "noise sensitive" residential area straight ahead it was time to turn crosswind. We were about 350ft above the tops of the trees.

Many years ago, Wedderburn airfield was literally carved out of the bush by the military. Consequently there are trees on all four sides and the only small clear patches contain hangars, a clubhouse and a parking area. The trees are mature and average 20 to 40 feet in height.

The pilot had just rolled the aircraft onto crosswind, when the forward speed of the aircraft suddenly slowed and the roar of the engine was replaced by a loud rapidly-slowing ticking sound.

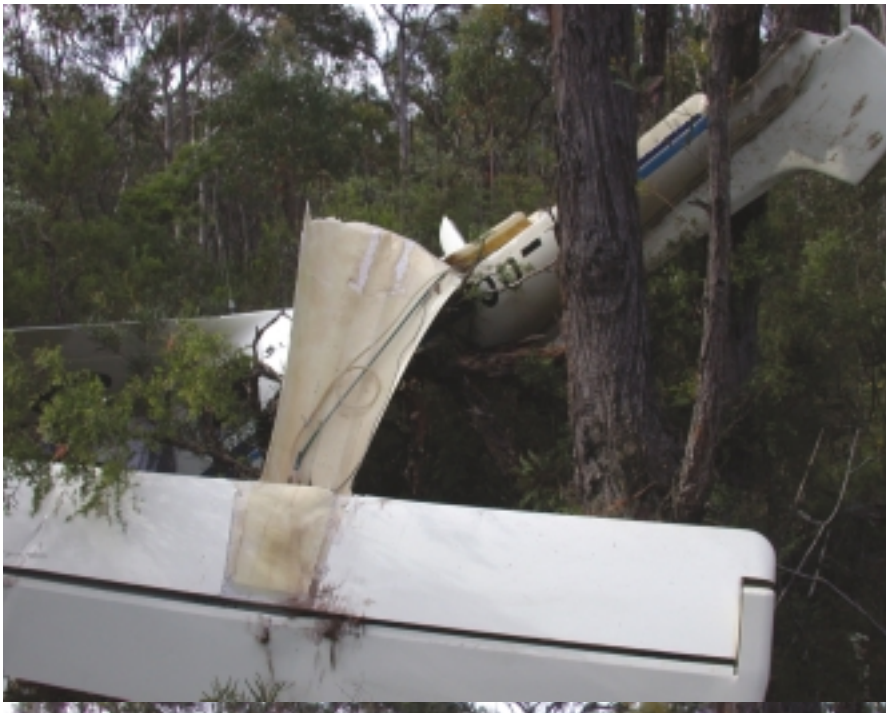
The propeller had stopped turning as suddenly as if someone had pulled the mixture control to "idle cut-off".

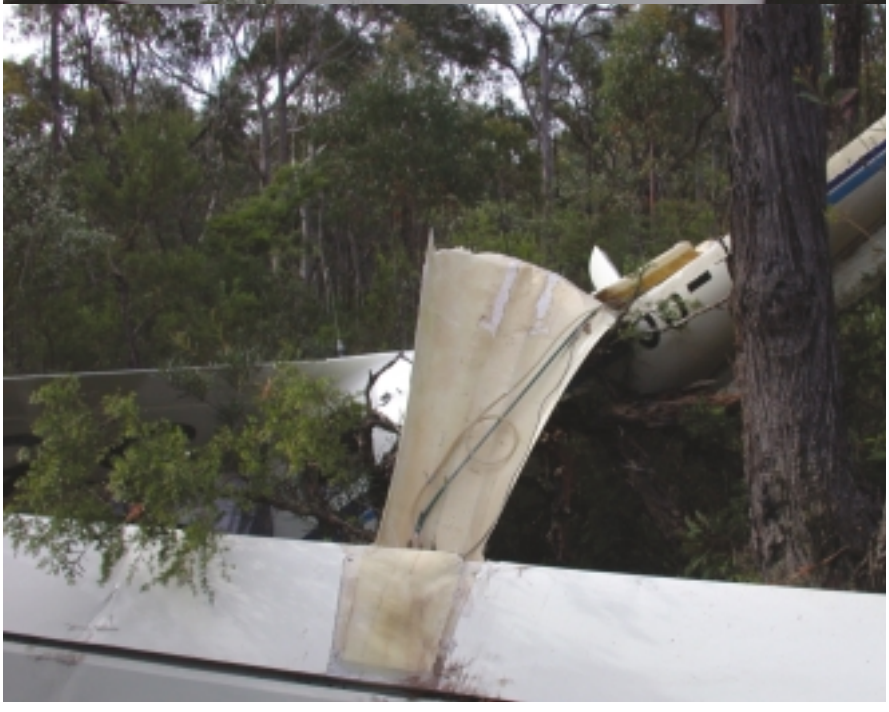
My in-flight smile disappeared with the RPM, but for the sake of the pilot I stayed outwardly calm and followed pre-programmed procedures. I checked that appropriate actions were happening and resisted any urge to verbally or physically take over or sway the pilot from his apparently successful plan-of-attack for the emergency.

The pilot skillfully lowered the nose to maintain the best glide speed, about 65 knots, and turned the aircraft slowly into the wind to ensure the landing would be with the least forward airspeed.

A further problem became apparent. There were trees to the front of us, trees to the side of us, trees underneath us . A vast multitude of trees everywhere; within and beyond gliding range of the stricken, descending Jabiru.

I was used to flying Hughes Lightwings, aircraft with a much better power-to-weight ratio. Under similar conditions, myself and the Lightwing would be at a much greater altitude and within easy gliding range of the





PHOTOS: RAY FENELEY.

The author, Carl Holden was the passenger in this Jabiru which crashed after its engine failed, shortly after take-off from Wedderburn, NSW. Miraculously, both people on board survived.

main runway we had just departed, even with the tailwind we were stuck with.

However, the Jabiru design trades climb ability for speed. I checked what was going on in the left-hand-seat and was relieved to see the pilot keeping best glide speed up and turning the aircraft into wind.

The trees were rapidly getting closer. They changed from a mass blur to individually defined trees and I prepared myself for the worst.

The pilot tried the engine again unsuccessfully, then turned fuel and magnetos off. He started making a mayday broadcast, but before the transmission was complete, there were sounds of trees and aircraft breaking bits off each other as first contact was made.

Full marks to my pilot as he unerringly and unhesitatingly flew us right into the tree canopy, our only survival option.

This went by the book. The pilot flew us onto a selected tree top, raised the nose a little to slow down our forward airspeed and then expertly used the top of a tree to slow us down still further from an estimated 60 to 40 knots, yet left us with sufficient forward speed to prevent the deadly vertical fall to the awaiting ground immediately below.

Seemingly incredible G forces tried to rip me out of my seat – thank goodness for seat belts.

We hit a tree with the inboard section of the starboard wing and decelerated rapidly as we were flung violently to the right. The engine cowling disappeared, exposing the engine which ripped outwards right in front of my field of view, dragging the firewall and windscreen area with it.

Next I was aware that we were bouncing backwards, then falling vertically some 10 to 15 feet. We hit the ground with an almighty thud.

I became aware of smoke and electrical zapping noises coming from the distorted centre console/instrument panel, which lay on its back with the gauges pointed to the sky.

"Get out! Get out!" I yelled to the pilot, who was still sitting in the left hand seat looking a little stunned.

I couldn't exit my right-hand side door as something was jamming it. I was keen to get out as quickly as possible as sparks, smoke and arcing were coming from the damaged central instrument console and we had at least 30 litres of fuel sitting in the cockpit right behind us.

I followed the pilot out his side door and touched the ground with relief. However, I discovered I was in immense pain, which worsened when I tried to stand up. Due to my fear about being in an "aircraft inferno" I left the immediate scene of the accident and headed towards the nearest road. I yelled to the pilot to follow me and hobbled off like some horribly tortured

orang-utan. I expected emergency services to whiz along the road any minute to help us.

Unfortunately Sydney Radar only heard the first part of the mayday message and asked aircraft on frequency if they could help with the rest of the message (which contained our location) so no-one could positively identify where we were. One aircraft apparently reported they thought we had gone down in the light aircraft lane (in the northern suburbs of Sydney) and they had spotted smoke coming from trees ahead of them.

Pilots back at my flying club monitoring the area frequency, while doing other things around the clubhouse, heard the first part of the mayday but could not be sure it was us.

Despite his injuries, the pilot walked back up the road to the airfield to get assistance and eventually one of the pilots from Wedderburn appeared in his car to pick me up.

What we could have done better in hindsight:

• Both of us left our mobile phones, water and flying jackets back at the Oaks – it was only a short flight so why carry them?

• We did not have an ELT.

• I could have brought my aircraft hand-held radio.

Our tail boom was broken and even if we had been prepared/brave/stupid enough to re-energise the electrical system to see if we could get the radio to work, our transmitting antenna was in the leading edge of the tail fin which was separate and disconnected from the aircraft's structure and the radio set wiring.

Had we become so badly injured that we could not get out of the wreckage, or had we become trapped in the wreckage, we could have been stuck there until the next day or until our route was retraced by someone with keen enough eyes to spot the wreckage through the tree canopy. And who knows what condition we would have been in by then?

I realise how lucky we are to be alive. We could have easily been killed: quickly due to impact forces; or slowly if we had been more-seriously injured and the wreckage had not been found.

Carl Holden is chief flying instructor at Sydney Ultralight Flying Club.

ANALYSIS > Prepare for the worst

Staff writers

BOTH THE pilot and the passenger appear to have handled the actual emergency with a degree of calm and proficiency that would have been a credit to any private or commercial pilot. A sudden engine failure after take-off can be a startling, alarming and distracting event, especially close to the ground, where self-control and quick but rational decision making will vastly enhance the chances of survival.

Rather than attempting to return to the field (which can present a strong temptation to a flustered pilot in this situation even though it is usually impossible), this pilot responded correctly and capably by lowering the nose and preparing for a crash landing, having assessed that course as the only viable option that was available.

He also had the presence of mind to make the approach to the treetops into wind, a fact which no doubt limited the damage by reducing impact velocity. Even in a 10 knot wind (the least one would expect above the trees with that surface wind) the difference between a tailwind and a headwind, is 20kt at impact. Aircraft damage tends to be proportional to the *square* of velocity, so each knot counts.

"The success or otherwise of any forced landing is closely related to the extent to which the pilot has mentally rehearsed the emergency beforehand."

That said, it's critical you don't let the speed drop below best glide. The worst thing you can do in a situation like this is stall or spin prior to impact.

The experienced pilot in the right seat also did well by monitoring the other pilot's actions without attempting to take over unnecessarily. This example of ad hoc cockpit resource management assured that the handling pilot felt he was supported to the maximum possible extent by the apparent confidence of his companion – far more so than if the other pilot's reaction had been one of alarm or intervention.

As in this case, post-event analysis is a valuable learning tool, and there is no doubt that if the pilots' injuries had been more serious, such resources as mobile phones, water, protective clothing, an ELT and a hand-held VHF radio might have meant the difference between timely rescue and a more negative outcome.

It is a good idea to have a pre-flight checklist, even if only a mental one, to ensure you are as well-equipped as you would hope to be if any emergency occurs.

The success or otherwise of any forced landing is closely related to the extent to which the pilot has mentally rehearsed the emergency beforehand.

It's sensible to get into the habit of preparing an engine-failure plan prior to each take-off. The plan should be made with respect to local terrain, wind direction and wind speed, and should include a review of vital actions (best glidespeed, etc).

That way, if you do experience an engine failure after take-off, most of the hard work – knowing what to do and where to go – is already done.