

Flying for **the Crowd**

The saying is that aerobatics is like having sex and being in a car wreck at the same time. The truth is far more mundane. Successful aerobatic and display fliers are all about checking and practice and self-discipline, and recognising personal limits and more practice, and checking twice more.

It's interesting being a CAA staffer at an airshow. Directly after a display, little boys in particular, pile into the CAA tent wanting the booklet *How to be a Pilot*.

They see the rolls, spins, and low level manoeuvres and, sensing the crowd's awe, think "I want a piece of that".

What they probably don't realise is there isn't a thing that hasn't been anticipated, thought through, planned and prepared for, and repeatedly practised, in order that pilot and aircraft get home safely.

Aerobatic pilot Doug Brooker, 38 years in the air, flings his yellow and blue MX-2 around the heavens like a paper dart. His routine includes unique manoeuvres and at times, he pulls 8 Gs (some people start to lose consciousness at 5) and plenty of negative Gs (while descending, and even worse). But he's never oblivious to what he is doing or where his limits are.

"I was at a display at Ardmore in 2014," he says, "and due to cloud, could fly only to 2800 ft. To start an inverted flat spin I need to be at 3000 ft. It would have been tempting to do the spin anyway. There would have been no particular problem. But I thought 'no, I've set my limit at 3000, I'm not going to start it any lower'. Later reflecting on the routine, I was very pleased I was smart enough to stick to that."

Dave Brown, 42 years an aviator, is a former air force display, Strikemaster and Skyhawk pilot, current Strikemaster display pilot, member of the 'Roaring Forties' Harvard display team, and overseer of NZ Warbirds Association aerobatic and display training. He says display flying, similarly, is all about discipline, and some tough decisions.

"A few years ago at a show, the crosswind had been building all day. We came up to the finale which was an airfield attack, including pyrotechnics, WWII fighters, and eight Harvards. We were in our aircraft waiting to go and I got a wind check that told me it had swung even more.

So I cancelled the display. That was a hard decision to make and of course the show organisers were disappointed. But they understood, because the last thing they wanted was for someone to wrap themselves into a ball at their airshow."

Doug and Dave's airshow preparation is similar. They practise over and over at height, until the routine becomes comfortable, before bringing it lower.

Dave says every practice should be carried out with the same focus as a display.

"A casual approach to a practice routine leads to poor discipline in the display. If I have a glitch in the practice routine, I break it off and set it up again. It means every time I go out, practice or display, I'm in the right frame of mind."

Both pilots thoroughly pre-flight every aspect of the aircraft. Doug has replaced some of his aircraft's inspection panels, in the tail, with Perspex® so he can shine a torch in and make sure there are no foreign bodies that could make life difficult.

Dave takes the Strikemaster on an inverted run at 2000 ft, before the display, to dislodge any debris in the cockpit.

"Once, a fire extinguisher ended up in the canopy. The latch had broken. Imagine that happening, inverted, at 500 ft."

Dave says it doesn't matter how often he's flown an aircraft, a detailed preflight is essential.

"It might have been okay for yesterday's display, but it could have been that last manoeuvre that weakened an already-fatigued component."

He also does the pre-flight earlyish in the day so any repairs can be done in plenty of time.

"It's no good trying to fix something when you're trying to make a slot time."

He also checks the airshow environment.

Photo courtesy of Errol Cavit.

Doug Brooker says loss of rudder control would be catastrophic in an MX2, particularly if in some unusual attitude.



"Even though I might have been to that airshow a number of times before, on the ground I have a really good look around, check that someone hasn't put up some new aerals or buildings where I'm not expecting them."

Veteran Warbirds pilot Keith Skilling, 50 years flying, sometimes displays the same aircraft three times in one day at a show.

"I do a thorough preflight every single time. Staying engaged with the checklist the second and third time is just something I've learned as a mental discipline. It never becomes box ticking."

Just before taking to the air, all three men quietly go through their routine in their mind's eye. Essentially, it's their final practice.

Keith says this "quiet time" is too important to be interrupted.

"It's part of the display really, that mental preparation. If you do get approached, you just have to be blunt and say you are too busy to talk."

Then they fly.

The displays themselves are all about safety.

Doug says for him, it's the gyroscopic moves most likely to come unstuck.

"It is very difficult with gyroscopics to anticipate and be consistent with the energy that the aircraft has when you recover to normal flight. It can vary from being high energy to being virtually stalled.

"I start a gyroscopic move on an upline, so while the plane ends the manoeuvre pointing downwards, it's at an altitude where there's plenty of recovery margin."

Dave says when working up a display, pilots have to sort out what they call 'gates'.

"Each manoeuvre needs a certain speed and altitude, so you have to practise a range of speeds at which to enter that manoeuvre, to help you with positioning and timing. But in all cases you have to have absolute minimums."

Keith says he'll change a routine only for safety reasons.

"If I'm setting myself up for a loop, and I haven't got the speed, or the energy, I'll fly through or do a roll. In the Corsair for example, I need 250 knots for a loop. If I've only got 230, I'll do a roll. If you were to see my last 30 Corsair displays, no two would be exactly the same.

"But a golden rule for me is never, ever, trying something I suspect I do not have the speed or energy for."

During the displays, the pilots' concentration can never lapse. To illustrate, Doug describes what happens during an inverted flat spin.

"You're virtually weightless, pulling only 0.5 or 0.25 G and the plane is spinning around its centre of gravity and you are pretty close to that, so there are no big stresses on your body. You have this soothing, surging hum of the engine and I've read a number of times about people almost being hypnotised by that state, trying to recover too late, and spinning into the ground. So I count the rotations out loud 'one, two, three, four, five, five-and-a-half, RECOVER.' And by talking to myself I keep conscious of where I am and what I should be doing."

Dave Brown says display flying is not a 'group think' exercise.

"What that means is, if the conditions are marginal for your individual abilities, or you're not 100 per cent fit, then you, and only you, have to decide whether to fly.

"Of course, it takes someone quite mature to make the decision to pull out, if the rest of the team is going ahead."

The three men say airshow flying is no place for egos, with Keith saying a really good airshow pilot takes constructive criticism thoughtfully.

"If someone has the guts to come up to you and say 'I think you were too low, or too slow' you really must take that on board. No matter how long you have been flying.

"And other pilots should never be too scared to offer constructive criticism if they are worried by someone's flying.

"Some really experienced pilots have been killed after nobody felt they could offer some observation about something that was worrying them."

One of Dave Brown's biggest fears is a small aircraft bumping into the middle of a display.

"Because you assume you have sanitised airspace, a large part of your lookout is centred on positioning your display, or other team members, and not on other aircraft."

It has happened a couple of times to him.

"Didn't read their Supps or NOTAMs, did they?"

Fortunately, he has been able to recover from the 'invaders'. "But it still gives you a hell of a fright."

Keith's worry revolves around something failing in one of the 70-year old aircraft he displays, hence the meticulous pre-flight checks.

Doug shares that fear and is equally particular. Periodically his mechanic crawls right down inside the fuselage to check there are no cracks, particularly in the tail section, that cannot be checked from outside. His biggest fear is of a structural failure.

"For example, loss of rudder control would be catastrophic in an MX2, particularly if in some unusual attitude."

It is obvious that all three men recognise that safe display flying is difficult and demanding. Each year there are 10 to 15 accidents at displays around the world. They are very aware that these accidents are caused by failures of either the aircraft or the pilot. Hence the extensive preflight checks, the practice, and the mental preparation.

The biggest thrill for them? "Getting a routine right," they all say. "The spectators would probably not even notice, but when the more difficult manoeuvres go well, it's a great buzz."

Doug Brooker, however, has a final big fear: the plane's engine refusing to ignite before a routine.

"It's never happened, but the MX-2 battery has limited starting capacity, and if for some reason it didn't start, it would be a disaster!" he says, laughing. ■



Dave Brown, of the Roaring Forties Harvard aerobatic display team, says such flying is all about discipline, and some tough decisions.