

Flying the Pitcairn and Kellett

This fascinating piece by John M Miller is an account of his flying experiences with the Pitcairn PCA-2 and Kellett KD-1B autogyros. It is reprinted with permission from *Wings of Freedom*, newsletter of the Delaware Valley Historical Aircraft Association, Volume 20 Number 2. It first appeared in 2005, at which time John, pictured below, was 99. At the time of writing he is 102 and still an active pilot!

John first soloed in a WW-I Jenny on his 18th birthday, 15 December 1923. He started flying Pitcairn autogyros at Pitcairn Field in 1931 and later flew for UAL in the then new Boeing 247-D.

Later, Kellett persuaded John to leave UAL to test their new wingless KD-1B. Kellett then loaned John to EAL to fly the KD-1B in an experimental one-year Air Mail contract to and from the roof of the Philadelphia Post Office, during which time 10 flights were conducted per day, without accident.

John stayed with EAL for 25 years until retiring as a captain. While with EAL John flew a series of aircraft, ending with the DC-8.



I was the first individual person to purchase a Pitcairn autogyro; it was a PCA-2, with a Wright 330 hp R975E engine. It was originally serial number 12 and I had advised Mr Asplundh, of Pitcairn, that I intended to make the first transcontinental flights in each direction with it.

Delivery was to be on 1 May 1931. In April, the factory notified me that my autogyro would not be delivered until 15 May, which would cost me two airshow appearances at quite a few dollars apiece. However, in the meantime, I read in the *NY Times* that Amelia Earhart was at the Pitcairn factory awaiting the delivery of an autogyro and intended to make the first transcontinental flights.

I flew to the factory to investigate and quickly found that Earhart originally was to receive the next autogyro in the production line after mine but that the nameplates had been switched and I now had serial number 13 and she had serial number 12.

Amelia had made an altitude flight in a prototype PCA-2, flying it airplane style, but she was still undergoing instruction in how to land properly, autogyro style. They were having difficulty instructing her and she said to me (evidently not knowing who I was) that she was not interested in 'all this aerodynamics stuff, but just want to fly to California and back'.

I kept quiet and let the factory know that I had a lucrative contract to appear at the Omaha Air Races by 17 May and did not wish to miss that race. They let me have my autogyro on the afternoon of 14 May and I promptly took off and flew to Omaha, arriving on the 17th, it was a lot of flying but the weather was perfect.

After the show at Omaha, I took off and demonstrated along the way and arrived at the San Diego Naval Air

Station on 28 May. Later, I returned, thus making the first transcontinental flights in a rotary wing aircraft.

Amelia Earhart took off on May 29 for her transcontinental flight and arrived in California about two weeks after I had arrived and already left. On the way back, Amelia tried to take off over a large crowd but the wheels

struck the steel wire fence holding the crowd back and she flew over the heads of the people and crashed into the parked cars behind them. She and her mechanic walked away uninjured but the PCA-2 was totalled.

After all that, I did more than 4000h flying my PCA-2 at airshows etc without ever scratching its paint. The PCA-2 autogyro I owned and flew so much all over the US was a really wonderful aircraft, easy to fly if done properly, and extremely safe.

Many pilots apparently never did learn to really fly the autogyro correctly and considered it a comedown from other aircraft they were flying. It never was given a chance to show its real flying qualities by fixed-wing pilots.

The two women pilots who flew it said that it was too difficult to fly. Well, they were flying it like a fixed-wing airplane and as such, it was inferior to other fixed-wing airplanes. If flown properly, it had wonderful flying characteristics that I am sure many pilots never discovered.

The Pitcairn and Kellett autogyros that I flew so much had rotors of fixed pitch, without a collective pitch lever. Therefore, the pilot could not get himself in serious trouble by stalling the rotor blades, with resultant crash. There was no way that the rotor could stop rotating, or stall in the air as a fixed wing does.

With the universal joints that joined the blades to the rotor hub, there was likewise no way that the blades could



Just a dollar a flight for a spin in a record-breaker



Johnny Miller congratulated: Transcontinental autogyro flight, 14 May 1931, John Miller in Pitcairn PCA-2 [NC10781], from Willow Grove to San Diego, California on 28 May, flying during daylight at 90mph and landing every 3h for fuel. Flight time of 43.8h included a four-day stopover at Omaha Air Races for demonstration flights. A successful return trip was made on 21-30 June.

→ be stressed beyond their bending or tensile strength, unlike the situation in the case of fixed-wing aircraft or the rigid blade type autogyro. There was a lot of very false information put out about the Pitcairn autogyros which had the small fixed-wings, ailerons, elevators and rudders, and the fixed rotor axis and fixed blade pitch. One of the most incorrect was the notion that at low and zero speed, control was insufficient or lost altogether.

Contrary to many such reports by inexperienced autogyro pilots, such as fixed-wing pilots flying autogyros, control is *not* lost at low or zero speeds. The reason for that is the aileron and elevator areas are much larger than on airplanes *and* in even vertical descent at zero airspeed, there is a large amount of air escaping outward from the descending rotor and that provides airspeed for the large area elevators and for the rudder, so sufficient control is provided at zero airspeed in vertical descent.

As for the ailerons, yes they are ineffective *but* are of no use in vertical descent and simply not needed, since the autogyro is hanging on its rotor in a stable condition. One of the most common types of accidents by inexperienced autogyro pilots occurred when they were on approach to a landing and undershooting the spot on which they intended to land. They would commonly ease back on the control stick to stretch the glide.

Autogyros have a low L/D ratio, especially in a glide, and fixed-wing pilots are not accustomed to that characteristic. When the stick is pulled back under that condition, the autogyro settles down steeper and enters a vertical descent.

They would try to nose down but by that time the autogyro was sliding backward and with its elevators in the full down position they would cause the tail to go down farther and the autogyro would crash short of the runway, often in a parking lot full of cars. The pilot would walk away uninjured, since he crashed either going down vertically or actually backward.

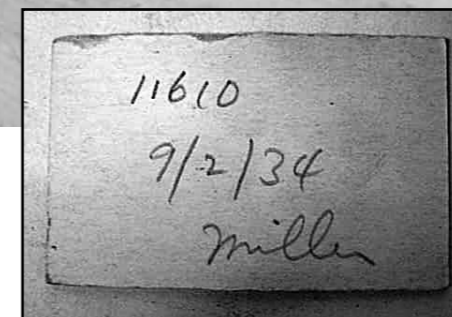
Of course, they would always blame it on loss of control, but it was due to a complete lack of knowledge of the aerodynamics of the autogyro, and lack of proper instruction in flying methods. When such an undershoot condition occurs on a landing approach, it is essential to add power. It is best to make high, steep approaches. If such accidents occurred in a fixed wing airplane there would be another funeral.

Such false reports of loss of control eventually led to the development of the direct control autogyro, such as developed first by Cierva in England and by Pitcairn and Kellett in this country. They depended on weight being on the rotor and did give excellent control. In the case of the Kellett KD-1 types I flew, the rotor hub was actually tilted in the direction in which the pilot desired to tilt the aircraft, longitudinally or laterally, so as long as there was weight hanging on the rotor there was control.

However, when in a condition when little or no weight was hanging on the rotor, as at the top of a wingover, control would be lost, and such a manoeuvre must be avoided near the ground or pullout would be likely too late. When that type of autogyro is put into a sudden pushover, with a download on the rotor, a reversal of control could occur when the stick is pulled back, resulting in the further inversion of the aircraft. Such a condition can happen with the newer helicopters too, entirely avoidable also.

I flew the direct control Kellett KD-1B to and from the roof of the 30th Street Post Office in Philadelphia in all conditions, including extreme turbulence. In the case of my aerobatic demonstrations, they positively could not have been carried out with a direct control autogyro. The aerodynamic surface controls worked beautifully in weightless manoeuvres and even inverted loads on the rotor.

I made all autogyro landings without power and with almost no forward roll and I flew it in winds as high as →



Left: Two dollars this time – a precious ticket stub from Pennsylvania

Right: Ticket stub complete with autograph

Above: John Miller in a PCA-2

→ 73mph. I also flew a lot of aerobatic demonstrations, some of which would have collapsed the wings of almost any fixed-wing airplane.

I owe my very life to the PCA-2. When I was towing a huge 9ft high banner of 37 letters, made of muslin, cotton ropes, and bamboo spreaders and trying to get above 1000ft, the engine, without the slightest warning, quit cold and the airspeed instantly went to exactly zero! I cut the banner loose. The autogyro went into an automatic vertical descent at about the same vertical speed as a parachute.

I looked around and there was nothing but resident houses under me. I was quickly down to about 500ft when I saw a slight open space behind the right-hand wing and made a diving right turn toward it. It was at the north edge of a cemetery and I landed in it gently without an inch of roll, in zero wind and no damage whatever. There were gravestones all around me.

If I had been towing the banner with a fixed-wing airplane, it would have instantly dived straight down into the houses and I would have been dead on 26 January 1934. My gravestone would be thoroughly weather beaten by now.

Of course, several experimental autogyros were built with Jump takeoff systems, but none were ever advanced to Approved Type, for WWII stopped such development. So, both the Pitcairn and Kellett autogyros made takeoffs with forward speed on the ground, but short ones. As for landings, they could be made airplane style too, but properly flown, the autogyros have the ability to make poweroff birdlike flared landings with little or no forward roll at all, by pilots properly trained.

All of the landings made on the roof of the Post Office building in the center of Philadelphia were made in this manner, entirely without power or roll, except when the



John Miller flying the Kellett KD-1B on the post run in Philadelphia

wind was very strong, such as 40-55mph, when landings were most conveniently made with power to prevent being blown backward. I have movies of such roof landings.

Those flared, no-roll landings are one of the greatest advantages of an autogyro in the case of a poweroff forced landing, and contributing to the extreme safety of autogyros. The Pitcairn PCA-2 is a wonderful aircraft. I wish there had been a controllable propeller available at that time, for it would have cut the takeoff distance almost in half.

It was a sad day when I had to sell my PCA-2 to a crop duster who later left it out in a hurricane without even tying down the blades. It was a noble aircraft. **GF**

What have I let myself in for?

For more on John Miller's amazing career, see:
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cityguide.pojonews.com/fe/Heritage/stories/he_john_miller.asp
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