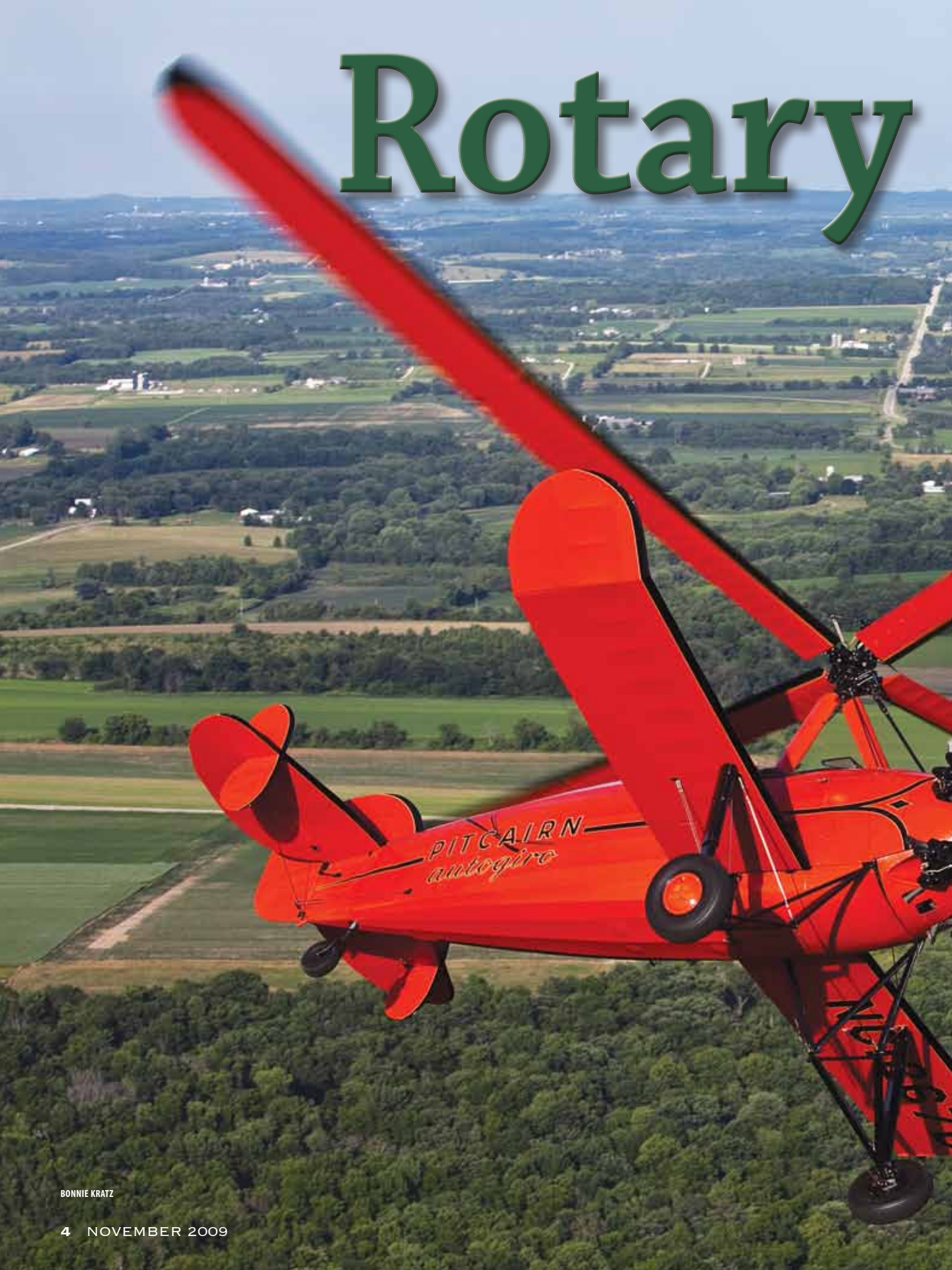


Rotary



BONNIE KRATZ

4 NOVEMBER 2009

Dreams

An aerial photograph of a lush green rural landscape with rolling hills, fields, and scattered houses. A large, bright red rotor blade from an autogiro is positioned diagonally across the frame, pointing from the top right towards the bottom left. The background shows a clear blue sky and a distant horizon.

The Restoration of a Pitcairn PA-18 Autogiro

The Reserve Grand Champion Antique
of EAA AirVenture Oshkosh 2009

BY H.G. FRAUTSCHY
WITH RESEARCH ASSISTANCE BY NICK HURM



The restoration crew from left to right: Herman Leffew, Don Seifer, Jerry Leffew, Jerry Pruden, and pilot Andrew King, with team leader and chief rotorhead Jack Tiffany standing in front. Missing from the shot are Phil Riter, who did the sheet metal work and built the new rotor mast; Nick Hurm, who tracked the Autogiro down; and, Jack's wife, Kate, one of the spark plugs of the group.

H.G. FRAUTSCHY

So what would a former high school track star, Army Special Ops soldier, and parachute ace want for a vintage aircraft? If you're a guy like Jack Tiffany of Spring Valley, Ohio, you'd go for the most unusual thing you could find—an Autogiro.

There was only one problem for the energetic Tiffany, a Vietnam veteran now in his seventh decade; he couldn't find one to restore. Other neat projects came and went for his laid-back confederation of restorers that bill themselves as Leading Edge Aircraft ("On the Trailing Edge of Technology" is its motto). A Fairchild Kreider-Reisner 21 biplane, a Fleet 16B, a couple of Davis D-1Ws, and a smattering of Wacos and other ancient but lovable aircraft passed through the hangar doors, but an Autogiro proved elusive. He searched for one for 28 years.

Enter the third generation of aviation fanatics in the Tiffany sphere of influence. Jack's father had been an Air Force crew chief, and for Jack, aviation was a major part of his life. Later, when he married Kate (an avowed aviation nut herself, she's



H.G. FRAUTSCHY

served as a volunteer judge at EAA AirVenture Oshkosh), he got a bonus in the bargain, Kate's son, Nick. The young boy soon became as enamored as his stepfather with aviation, and as a teenager Nick became quite the aviation sleuth, digging up tidbits of handy aviation knowledge. That tenacity would pay off in 1999, when he came to Jack with the revelation that there was an Autogiro out there that could be restored. In fact, there were two!

It didn't take long for Jack and Nick to track down Al Letcher of Mojave, California. Al, a longtime collector of vintage aircraft, had bought the remains of a Pitcairn PA-18 from Ted Sowirka, who had owned it for 43 years. But how it came to be in his hands is a story that will warm the

heart of many a potential restorer who still has hopes of finding his own aeronautical Holy Grail.

History

The Pitcairn PA-18 Autogiro was created by the company after the firm had created quite a name for itself with the PCA-2 Autogiro, a large, expensive craft that was bought by a few firms for its novel appearance, which, since it attracted a lot of attention, made it a suitable platform for advertising. But the PCA-2 with a 300-hp Wright Whirlwind on the nose and a 45-foot rotor span was a big rotorcraft. It could carry three with ease, and its hulking presence on the ground made it hard to miss. ("Autogiro" with a capital A is the spelling coined by the Cierva Auto-



PHOTOS H.G. FRAUTSCHY

Since it is a fixed-spindle system, the rotor head is relatively simple. The cables and the bungee cords attached to them act as limit stops when the rotor is rotating slowly or is stopped. To the sides of the rotor-attach hinges are the squarish rubber pads that, in combination with the dampers installed farther out on each blade, act to dampen and limit the lead/lag movement of each rotor blade as it flies around the rotor disc. To the left is the pre-rotator gearbox, which engages with the helical spur gear bolted to the bottom of the rotor head. The pre-rotator is used to spin up the rotor blades to a stable rpm before the takeoff roll is started. Having a spun-up rotor allows the rotor to be started and brought up to speed without the hazard of taxiing with a low-speed, unstable rotor system, and it significantly reduces the takeoff run.



By necessity, the rotor blades are quite flexible, which require the trailing edge of each blade to be segmented. This leather patch on the trailing edge covers one of the slip joints on the trailing edge.



When running, the short stacks on the 160-hp, five-cylinder Kinner-R-55 give the Pitcairn a distinctive bark in flight.



After arriving in Jim Hammond's shop, the Pitcairn's pieces were assembled as much as possible so the restorers could get a better idea of just what they had.



A restorable PA-18 rotor head and pre-rotator gearbox was obtained from Steve Pitcairn, and thanks to his interest in his father's company history, Steve was also able to supply a set of drawings so Phil Riter could build a new rotor mast.



After 60-plus years, it's not surprising that the blade rubber dampers were not usable, so a new set were cast using new urethane rubber material with the correct 90 durometer hardness.



COURTESY JACK TIFFANY

The rotors were complete, with steel spars that were inspected and deemed airworthy. All-new wood components were used to restore the blades. With the experience of building the first set, the Leading Edge gang continued to build blades as spares.

giro Company for aircraft produced under license; the generic term "autogyro" applies to all rotary-winged aircraft with unpowered rotors; the FAA simply avoids the entire issue by calling them "gyroplanes.")

What was also needed was a smaller, more compact version, something that a well-heeled owner could purchase and fly. Harold Pitcairn, the founder of the aviation manufacturing concern that bore his family name, had started his firm in the 1920s building mail-hauling aircraft renowned for their structural strength and safety with regard to their ability to protect the pilot in the event of a crash. Harold's long-time pursuit of the safe operation

of aircraft led him to a collaborative agreement between his company and Juan de la Cierva, the inventor of the Autogyro. Assigned the exclusive rights to license and produce the Autogyro in the United States, the Pitcairn-Cierva Autogyro Company of America pursued the vision of a safe aircraft that could be landed just about anywhere.

Harold Pitcairn wanted that capability to be within reach of anyone who could fly, and a personal aircraft was just the next logical step in the progression of the Autogyro. The first version, the PAA-1, was basically a scaled-down PCA-2, with a fixed-spindle rotor system atop a fuselage powered by a 125-hp Kin-

ner. One version was built with the Chevrolair engine and an odd tail wheel/nose wheel configuration.

The PAA-1 was well-received but it was considered significantly underpowered (25 were built and delivered in the darkest period of the Great Depression of the early 1930s), but it wasn't exactly what Harold wanted. The factory came up with the next version, a slightly larger aircraft that was destined to be just what Harold Pitcairn wanted. In fact, he liked it so well that in 1932 when he rented a beach house on the Jersey shore, he used his personal PA-18 as his weekend "commuter car" to cover the 80-mile drive in half an hour, rather than battling



Fifty-four individual ribs are in each blade, for a total of 216 ribs in each set of four blades. Each was routed out using a CNC machine, and then the ribs are secured to the tubular steel spar using bolts and a flange.



Since the original wood parts were significantly deteriorated after being stored outside for many years, they needed a complete restoration. A major portion of the wing and aileron rebuild was done by Jan Lavally.

the terrestrial traffic down below. Landing on the beach in front of the cottage proved to be a simple matter, and tucking it neatly on the sand nearby kept it ready for a dash back to his office near Philadelphia.

The PA-18 was also popular with new rotorcraft aficionados; deliveries began in 1932, with 18 being built. (Nineteen serial numbers are listed in Joe Juptner's *U.S. Civil Aircraft*, but it is believed that one airframe had two serial numbers in its lifetime.) Debuting at the Detroit Air Show for a price of \$4,940, the new Autogyro had improved performance thanks in part to engineering work that refined the rotor head, allowing for smoother rotor operation, and the



In 1954, Warren Shipp had spotted the forlorn Pitcairn sitting at a Pennsylvania airport. Two of his photos and a brief write-up pleading its case were published in the first issue of *American Airman* magazine.

increase in horsepower to 160, pumped up by a Kinner R-5 engine. It still had a fixed-spindle rotor system, which meant that all control of the aircraft was affected using aerodynamic controls, that is, rudder, elevator, and ailerons mounted on the stub wings. Direct control of the rotor head was being actively worked on at this point, but it would be months before the system was perfected so that it would allow the dispensing of the stub wings.

In March of 1932, serial number G-65, the fourth PA-18 off the factory line, was delivered as the personal aircraft of the company president, and it was also used as a factory demonstrator. Harold Pitcairn had a great deal of affection for the little Autogyro as evidenced in a portion of a letter he sent to his executive vice president, Geoff Childs. "Sunday the weather became very bad so I told Chambliss to take my machine over to the hangar: Because of the wind direction he was going to take off towards the Church. The ground was slippery and the machine was on a slope. He got into the air before he meant to and the starter was engaged. This, in addition to all the other conditions under which he was working made the machine turn and drift very badly to the right. Before he had

the situation straightened out, he hit the fence so that my little 'giro is minus a set of blades. When I came out of Church, it was standing up on its nose. I patted it gently and all it said was 'cheep' 'cheep.'"¹

He wouldn't be the first person taken in by the charms of the little Autogyro. This particular PA-18, registered as NC12678, was kept by Harold until it was sold in 1935. Anne West Strawbridge was an adventuresome spirit who had climbed mountains and was an accomplished artist and author. (A little side note—on the Web and in other publications an incorrect connection was made between Miss Strawbridge and the Strawbridge & Clothier department store fortune. In fact, according to her great grand-nephew, she was the daughter of a doctor from Maine, whose family connection to the department store family is very distant, at best. She was not the daughter of someone directly related to the store.)

Her family fortune allowed her to pursue all sorts of interesting pursuits. Apprehensive about flying, she became a convert to the Autogyro after a flight demonstration, even after her first PA-18 was crashed by another pilot, hitting wires near Wings Field in Philadelphia and killing the pilot and his passenger. In 1935, she bought NC12678. To express her appreciation, she sent a



H.G. FRAUTSCHY

letter to Harold that read, in part:

"Please may I tell you something of the great pleasure you've given me in allowing me to buy the blue autogiro; it was most awfully good of you and Mr. Ray to take so much trouble in arranging it and I thank you ever so much. I am also writing Mr. Ray. The giro is the loveliest ship I've ever flown in and I simply have not words to tell you how much it

means to me to have her...

". . . There is a beauty of existence which one enters through flying the autogiro which is largely a thing of the spirit and could so easily be lost through any discourse. (I know you will understand what I express so inadequately), but at both factory and flying field one meets only with the most courteous kindness, efficiency, and a vast love of the work and loy-

alty to you. May I congratulate you on your splendid work."²

It seemed the little PA-18 had once again cast its magic spell on yet another aviator. Anne Strawbridge came to name the autogiro *Isobella*. In 1936 and 1937, she sent similarly complimentary letters to Harold Pitcairn expressing her admiration for *Isobella*, and for the instruction being provided by Mr. Lukens, one of



Since the early models of Autogiros did not have direct control of the rotor head or blades, all control was effected through the use of standard aircraft controls: elevator, rudder, and the ailerons mounted in the stub wings. The wings provide about 20 percent of the total lift produced by the rotorcraft.

Pitcairn's instructor pilots. She flew the blue 'giro more than 90 hours by mid-1937, enjoying the operational peace of mind that the Autogiro gave her. She wrote later:

"I have been amazed at Mr. Luken's ability as an instructor. When he took me on, I could not have been a more unpromising student. Now I get into the ship as tranquilly as into my Ford car—and with

a lot less feeling of risk in the air than on the highway."³

A couple of explanations are in order. The color, as described to me by Carl Gunther, the archivist of the Pitcairn Aircraft Association, was dark blue with a light blue stripe with a white keyline around the stripe.

The Mr. Ray she refers to in the letter is Jim Ray, Pitcairn-Cierva Autogiro Company's vice president

and one of the most accomplished Autogiro pilots in history.

While there is fascinating material to learn more about in Autogiro history, we need to skip a few years ahead to complete the history of NC12678. It's 1939, and thanks to the German U-boat menace, the British are having a devil of a time getting their war effort and nation supplied via convoy across the North Atlantic. Looking at any means at their disposal to gain an advantage in knowing where the U-boats were lurking, the British contracted with the Pitcairn-Larsen Autogiro Company, a successor to the original company set up by Harold Pitcairn, to remanufacture the remaining PA-18s into sub-spotting Autogiros that could operate from small decks on ships within the convoys. Using the PA-18 as a base gave them a quick start on the creation of an Autogiro suitable for the purpose.

Technological advances in rotor and flight control systems, including the now perfected direct-control rotor head, gave the remanufactured aircraft, now called the PA-39, improved performance, and the installation of a 165-hp Warner Super Scarab gave it added reliability. All the company had to do was buy back the remaining PA-18 Autogiros from the owners, run them through the remanufacturing process, and then load them on ships for delivery to the United Kingdom. That's just what they did with all of them. All of them except one. Anne West Strawbridge's Autogiro wasn't on the list.

There's no record of what conversation or letter transpired between the company and Anne Strawbridge, but based on her lovely letters to Harold Pitcairn, I can't imagine it was anything but a very polite "Oh my goodness, no, I could never sell it" type of refusal to sell little *Isobella* so that it go off to war. In any event, it was not part of the group to be converted to the PA-39 configuration.

Her strong attachment to the little blue Autogiro is what saved it for restoration many years later; only two of the PA-39 Autogiros ever made it



From left to right, on display in August during EAA's Good Ol' Days celebration at Pioneer Airport, here is the sole remaining Pitcairn PA-39, the PA-18, and the PCA-2 *Miss Champion*. The PA-39 and PCA-2 are part of the permanent collection of EAA, donated by Steve Pitcairn.

H.G. FRAUTSCHY

to England. Three were lost at sea in a torpedoing of the cargo ship carrying them, with at least one remaining in the States, where it was used for research and development work. There is one PA-39 remaining, restored and on display in EAA's Pitcairn Hangar on Pioneer Airport, a gift of Harold Pitcairn's son, Stephen.

After civilian flying was banned for the duration of the war along the East Coast, Anne never again flew her beloved 'giro. She died in 1941 at the age of 58, willing the little rotorcraft to her brother, John Strawbridge.

A few years later, just after the end of World War II, the ownership of the Autogiro flipped back and forth a few times before being sold to G&A Aircraft. It was wind-damaged, and later, Firestone Aircraft (the successor to G&A Aircraft) repaired it.

They didn't keep it long (G&A also operated the remaining PA-39), selling it to Sky Voice Inc. of East Orange, New Jersey, on March 15, 1947. A shoreline advertising company, Sky Voice planned to pull banners and even put a big speaker in the 'giro to generate advertising publicity. There's no record it actually did that with the Autogiro, but it's fun, if not

a bit unnerving, to imagine a voice from the sky exhorting those on the shore to "Eat at Joes!"

Four years later, the Wyoming Valley School of Aviation at Wilkes-Barre, Pennsylvania, acquired the Autogiro after Joseph Budjinski of the school determined, by querying the Civil Aviation Authority, the most recent registered owner. Within the next two years the school folded, and on July 3, 1954, a flight school on the same field, Morlin Air Service, sold NC12678 to Ted Sowirka, who brought the still mostly complete 'giro to Old Star Airport near Langhorne, Pennsylvania. Most likely it was sold by the flight school as part of a settlement for payment, and while such things happen, if they're not executed properly, it can cause a big headache for those who follow, as we'll see later in this article.

While the rotor blades were stored in a hangar, the partially reworked fuselage sat outside. While it was there, Warren D. Shipp, a transit policeman from New York City who had an interest in aviation, and Autogiros in particular, spotted it sitting out in the grass. Shipp, one of

the earliest American Aviation History Association members (No. 14) sent a couple of photos and a letter that were published in the first issue of *American Airman* magazine (September 1957), imploring someone to save the Autogiro before it was lost to history. That story helped Nick Hurm track down the whereabouts of the PA-18. (See the photo in this article.)

Sometime later, after those photos were taken, a rogue pilfered the main rotor mast, supporting structure, and the all-important rotor head and pre-rotator mechanism, forcing the Autogiro's storage inside a hangar. Ted still intended to restore the aircraft to flying condition, but without the heart of the aircraft, it proved to be a long-term storage situation. While he never got a chance to restore it, Ted Sowirka's dedication to keeping the project as intact as possible saved it for the next generation of restorers.

By 1996, the registration of the aircraft has been allowed to lapse, and the N number has been assigned to a Cessna 172 made in 1973. Ted had attempted to get the aircraft re-registered, noting in a letter to the

agency dated July 1996 that “the aircraft has been stored by me since 1954 . . .”

The next month Ted sold the project to Al Letcher of Mojave, California. The next year Nick Hurm tracked the PA-18’s whereabouts to Al Letcher. Jack Tiffany first made contact with Al, checking to see if Al would be willing to part with the Autogiro. Over the next two years, during a visit to California by Jack, he made a deal to restore the Autogiro for Al Letcher. As agreed, during the restoration Jack was also going to create a clone of the Autogiro. Jack, giddy with the prospect, just couldn’t keep quiet about the find, and word leaked out during the annual EAA fly-in convention that there was indeed a Pitcairn out there to be restored. Not too much later Jack heard from Al that instead of allowing Jack to restore the PA-18, Al has decided to *sell* the ship to another vintage airplane enthusiast.

Jack forthrightly explained that he didn’t think that was fair, and that he should have the right of first refusal on the purchase. After thinking for a moment, Al agreed. Jack then said, “I want it!” and shortly thereafter hung up the phone, happy that he’d come to an agreement to buy the Autogiro. He hung up a bit too quickly it turned out. When Kate asked him how much it was going to cost, it suddenly struck Jack that he didn’t know! He jumped back on the phone, heard a price, gulped, and hung up. When the subject of the price came up again with Kate after the call, his response was, in part, “Well, if we sell the house, the cars . . .”

Thankfully, that draconian measure wasn’t needed. Longtime friend and fellow aircraft restorer Jim Hammond, whose family owns and operates Hammond DrieRite in Xenia, Ohio, became a silent partner in the



Pilot Andrew King gathered as much written material as he could regarding flying the PA-18, along with spending considerable time interviewing both Steve Pitcairn and Johnny Miller, who both had extensive experience flying Pitcairn Autogiros.

Still, you don’t know what you don’t know, and not everything that was available back in 1931 had surfaced in 2008.

project by helping with the funding to acquire the Autogiro. Within days a truck and crew consisting of Jack and Kate Tiffany, Herman Leffew, Don Siefer, and Herb Ware were off to the Mojave Desert to pick up the remains of the rotorcraft, still missing the parts stolen from it so long ago. By Thanksgiving of 1999, it was in Jim Hammond’s shop, where Jim put all the pieces they had dragged back to Ohio into a semblance of an Autogiro. Soon it was moved to the Leading Edge shops near Dayton. The restorers had high hopes of finishing the aircraft by the end of 2003, just in time for the 100th anniversary of the Wright brothers powered flights in Kitty Hawk. But not surprisingly, given the multifaceted issues involved, that date would come and go before the PA-18 was ready to fly.

The Restoration

As I mentioned before, the project was mostly complete, but it did lack one critical item: the rotor head.

Nearly everything else on the Autogiro could be built if drawings could be obtained, but the rotor head isn’t something one can just whip out using a band saw and a lathe. Thankfully, Jack had been in regular contact with Steve Pitcairn, Harold Pitcairn’s son and a well-known restorer and aviation enthusiast. Steve had participated in and funded the restoration of the most famous of Pitcairn Autogiros, the PCA-2 *Miss Champion*, and he had a spare PA-18 type rotor head that he was willing to sell. Steve also had access to a few of the drawings from the company, so he was able to fill in the blanks for a few of the missing parts, including the all-important main rotor mast. Phil Riter, a master at sheet metal work and welding, created the new mast and did all of the sheet metal work for the cowling, including the beautiful nose-

bowl covering the Kinner.

What often appear to be little changes in a type design often wind up being big headaches. Somewhere along the line the little blue Autogiro’s Kinner R-5 engine was separated from the airframe, and it wasn’t part of the project when it was brought to Ohio. That’s fine, a Kinner R-5 is rare to begin with, but the later version, the Kinner R-55, is more common, having been used on the Ryan PT-22. They’re nearly identical, with the R-55 having a number of improvements that make it a more reliable engine, so making the change shouldn’t be too much of a big deal, right?

Not so fast; in this case, since the R-55 isn’t on the type certificate data sheet, installing it means that the restorers were making a major alteration to the aircraft. Just getting all the data and approvals through the engineering section of the FAA added more time than they expected to the project. Like most every Kinner rework done these days, the Kinner was inspected and overhauled by Kin-

There's plenty more photos



and other goodies on the Pitcairn at www.vintageaircraft.org/extras/pitcairn



After a fun cross-country from New Carlisle, Ohio, to Oshkosh, the PA-18 Autogiro spent the summer months displayed in EAA's Pitcairn Hangar located behind the museum at EAA's Pioneer Airport.

ner engine experts Al and Brad Ball in Santa Paula, California.

The other obviously critical items were the main rotor blades. Each of the blades, as can be seen in the photos accompanying this article, are built like a very high-aspect ratio wing, with a steel tube spar, over which are fitted tightly spaced wood ribs, with plywood leading edges and stainless steel trailing edges. One un-

usual aspect to their construction is the requirement for slip joints in the trailing edge of each blade, necessary since the blades flex significantly in flight. This flexing is important, soaking up both flight and structural loads spanwise along the blades as each blade circumnavigates the rotor arc 140 times per minute, just a little faster than twice each second. The rotor blades that had been retained with the project were in rough shape, but the spars were usable, allowing the restorers to build up not only the ribs (all 216 for a set of four blades, thank goodness for CNC milling machines!), but they had enough information and parts to create a new replacement set of rotor blades, and are confident that their "rotor shop" can handle their maintenance needs for years to come.

The rest of the rotorcraft's restoration was pretty straightforward, with the standard repairs being made to a 70-plus-year-old airframe. While the

stub wings were intact, they were rebuilt almost completely, built up entirely of wood. The fuselage needed a bit of steel tubing replaced, and while we'll get a bit ahead of the story a bit here, one little bit of clever engineering deserves to be highlighted. During the flight-testing phase of the restored Pitcairn, a series of mistakes resulted in a main rotor blade or two, or three, contacting the top of the vertical fin. It promptly folded over to the side, with no damage done to the tail post or the rest of the fuselage. (You'll get a chance to read more about the incident in the upcoming January 2010 issue of *EAA Sport Aviation*, in the feature article on the PA-18 written by Andrew King.)

Once repairs were started, the reason why the fin folded so neatly became apparent. Pitcairn's engineers, realizing that it was likely that a combination of surface winds, low-rotor rpm, and taxiing on the ground could result in a rotor strike in the fin, simply had a set of holes drilled in the tail post, creating a weaker spot on the tube just above the top of the fuselage. Whack it with a rotor blade, and voilà, the fin flips to the side, damage is minimal to the fuselage, and if you were a lucky owner back then, you could call up the factory and order up a new fin. If you're a restorer, you get to break out your jig and torch and build up a new one yourself!

The Wright brothers' anniversary in 2003 came and went, and the project wasn't done yet, but restorers were making good progress, and it looked like the middle of the first decade might see it flying. But as we all know, sometimes what you plan isn't what happens. Paperwork on the repairs and alterations was taking time, as was the process of acquiring the use of the orig-

Notes:

¹: Chapter 5, page 171, *Harold F. Pitcairn: Aviator, Inventor, and Developer of the Autogiro*, by Carl R. Gunther, published by Bryn Athyn College Press

² Chapter 8, pages 330/331, see above.

³ Chapter 8, page 381



H.G. FRAUTSCHY

inal N number. Since it was painted on the side of a currently registered Cessna 172, Jack (and yours truly, as a matter of fact) did his best to convince the owner that it would be greatly appreciated if the original N number could be moved back to the Pitcairn. Jack would pay to have the 172 repainted with the new numbers, and that seemed to be just fine with the 172's owner, but he just could never seem to bring himself to get the work done. Finally, when it was apparent that the change just wasn't going to happen, the PA-18 was registered as NC1267B instead of NC12678, and the minor change was made to the paint of the Autogiro.

The delays and seemingly endless paperwork also took their toll on the last two men who had been waiting to see the restoration fly. Johnny Miller, who had flown his own PCA-2 across the United States a full two weeks before Amelia Earhart's flight in the Beech-Nut gum-sponsored PCA-2, had been regularly consulted about flying the Autogiro by Andrew King, who was slated to be the Pitcairn's pilot. Johnny died on June 24, 2008, within days of when the first flights were scheduled. And Steve Pitcairn, who had done so much to help the Leading Edge crew, passed away a couple of months before, in March of 2008. Andrew King in particular was thankful that he'd had the good fortune of knowing and chatting with both men about the operation of the Autogiro.

Nearly three years of time was added to the restoration due to one significant paperwork issue—accord-

ing to the FAA records, the last registered owner was Sky Voice. The next owner didn't actually execute a bill of sale for the aircraft, which meant that in the FAA's eyes, Jack and Leading Edge Aircraft didn't have a clean paper trail to establish ownership. Three years of paperwork "heck" ensued for Jack, while the rest of the crew finished off the airframe details.

When the big day finally came in late June of 2008, Andrew had been gyroplane rated, had read as much as he could find on Pitcairn Autogiro operations, and had reviewed his notes from the conversations with Steve Pitcairn and Johnny Miller. Still, you don't know what you don't know, and not everything that was available back in 1931 had surfaced in 2008. One of the most critical times during Autogiro operation is the period of time from when the rotor brake is released and when the rotor has enough speed for centrifugal force and lift to keep the blades steady in their respective flight paths as they whirl around the rotor disc. During early testing, Andrew was moving down the runway at low rotor rpm when he heard the main rotor blades smack the top of the vertical fin. The blades weren't damaged, but the fin was neatly laid over, the built-in fail point having done its job perfectly. Not too much later, an old checklist surfaced that pointed out that no movement of the 'giro should be done unless the rotors are stopped, or unless the rotor is turning at least 65 rpm.

Three weeks later, after repairs were

made, nine years of work, more than 6,000 man-hours of restoration time, and untold mechanical difficulties and paperwork hassles were about to melt away, as mid-summer dawned with light winds and just a few cirrus clouds way up in the heavens.

Andrew and the Autogiro were ready again, and on July 10, 2008, with a takeoff roll that seemed a bit long, Anne Strawbridge's *Isobella*, the Autogiro she could not part with, was back in the air with her blades flashing in the morning sunshine in central Ohio. With the retirement by Steve Pitcairn of the PCA-2 *Miss Champion*, it's now the only Pitcairn Autogiro flying.

We may get lucky and see just one more Pitcairn Autogiro flying as the Posey brothers work toward the completion of the only other PA-18 known to exist, but for me and my son, Alden, along with EAA photographer Bonnie Kratz and out photo pilot Janet Davidson, the sight of the Pitcairn's slowly turning blades rotating over Andrew's head as he sling-winged his way north to Oshkosh past more than 100 newly constructed wind turbines firmly anchored to the ground will be something we'll never forget. It's a remarkable aircraft crafted and engineered by some of the finest engineers of the first half of the previous century, and restored by an equally talented group of men and women who are thrilled to have been given the opportunity to restore one of aviation's great aircraft, the Pitcairn Autogiro. 