

A vintage biplane with a dark fuselage and light blue wings is shown in flight against a sunset sky. The aircraft is a two-seater with a high-wing configuration. The registration "NC 15700" is visible on the tail. The background features a landscape with fields and a body of water under a warm, orange-hued sky.

VINTAGE

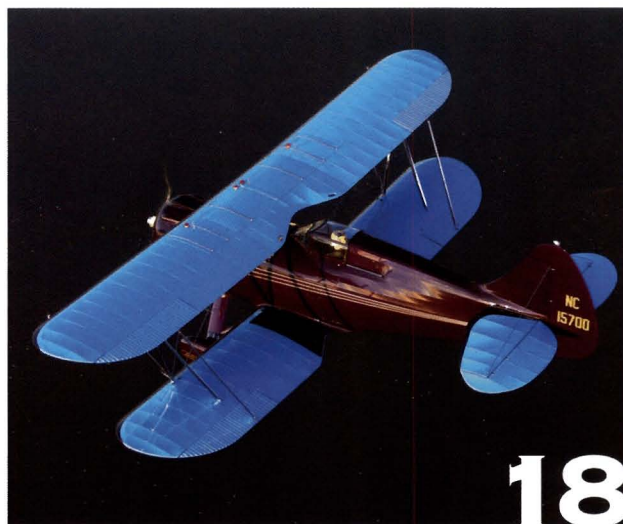
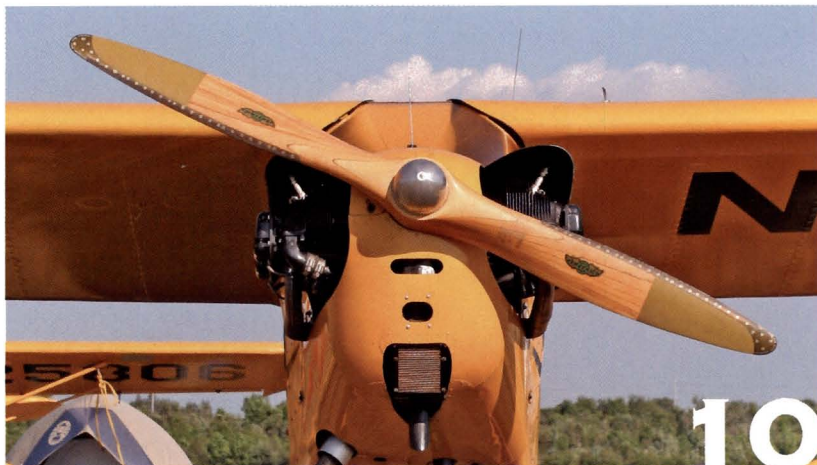
AIRPLANE

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COVERS

FRONT COVER: The one-of-a-kind Waco YPF restored by Rare Aircraft, Ltd., and owned by Jerry Wenger, was originally ordered by a 24-year-old young lady, Constance Eugenie Johnston. She specified the unique decorative elements added to the Jacobs powered Waco, as well as the deep purple metallic paint job. Not much is known about her life, but her aviation legacy is reborn in the restoration of her biplane. The airplane was selected as the Reserve Grand Champion Antique at the 2006 Sun 'n Fun Fly-In in Lakeland, Florida. Photo supplied by Breezeway/Rare Aircraft, Ltd.

BACK COVER: Leon Basler of Bismarck, South Dakota is a regular entrant in the EAA Sport Aviation Art Competition, and his watercolor painting of the Beech Staggerwing above a background of structure was selected as one of the finalists in the 2006 competition. For more information about the competition and the award winners, please log onto www.AirVentureMuseum.org/art/

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A blue biplane is shown in flight, angled upwards towards the right. The background is a dark, calm body of water reflecting the sky and the distant shoreline with some lights. The overall mood is serene and evocative of early aviation.

Connie's Coupe Top Waco

How a young lady's biplane
survived and was revived

BY SPARKY BARNES SARGENT

In 1935, when the women's National Air Marking Program was under-way, and Amelia Earhart became the first pilot to fly solo from Hawaii to California, an ever-increasing number of women were

taking to the skies—among them, a certain 24-year-old young lady by the name of Constance Eugenie Johnston, who ordered her very own specially customized, Jacobs-powered Waco biplane that year. An only child, Johnston was born in New York

and lived with her parents in Greenwich, Connecticut, during the early part of her life. She was evidently among the more financially fortunate of the era and enjoyed social affairs such as formal dinners and dances, as well as spending time at

the Calhoun Beach Club in Minneapolis, Minnesota. When she took delivery of her Waco in November 1935, her address was listed as Wings Field in Ambler, Pennsylvania. By the following summer, she had changed her address to the prestigious Lafayette Club at Minnetonka Beach.

Yet little else has been discovered about her life, such as when and where she learned to fly; after all, the sporty Waco YPF, with its narrow tread, was not a beginner's airplane. Waco built only two YPF models in 1935; they were the first of the new advanced "F" models, with an improved Clark Y airfoil, a

more sophisticated and complex fuselage, a new empennage design, a bump cowl, and a coupe top for the pilot. The front cockpit could hold two passengers or simply have a detachable metal cover placed over it.

NC15700 is the only YPF still in existence. It measures 22 feet 10 inches from prop to rudder, stands





Owner Jerry Wenger with Ben and Jeremy Redman of Rare Aircraft Co.



Note the bumps on the cowling, with Connie Johnston's distinctively designed gold trim.

8 feet 5 inches tall, and has an upper wingspan of 30 feet with a lower wingspan of nearly 27 feet. With its 75 gallons of fuel and the Jacobs' maximum fuel burn of 15 gph, it has a 575-statute-mile range with a 100-mile reserve. It's easily capable of cruising 135 mph, with 140 mph indicated not uncommon. It made the 1,275-statute-mile fight from Owatonna, Minnesota, to Lakeland, Florida, in only 9.2 hours of flying time. With this kind of performance, it's easy to see that this Waco was truly the affluent sports-

man pilot's flying machine in 1935.

Bold Elegance

Johnston embodied an assertive flair for bold elegance, as evidenced in her specifications to The Waco Aircraft Co. regarding the finishing touches for NC15700. She selected a deep metallic purple and a bright blue for its flying colors, highlighted by a trio of thin-line gold stripes, in which she cleverly entwined her initials. Her signature trim was designated for the fuselage, cowl bumps, and wheelpants, while shiny chrome

struts and stainless flying wires accented the wing and tail structure. Grimes retractable landing light fittings were installed in the upper wings, and Johnston elevated her design a step beyond tradition by specifically requesting that there be no Waco logo on the biplane.

"The way she designed the plane, you knew it was going to be neat-looking when it was finished. It's just all her, and I hope I can find some of her family so they can see the plane and maybe tell me more about her," said current owner Jerry Wenger of Wyoming, who wanted the biplane restored very close to its original configuration. "I also know that she was married twice. Her first husband, John K. O'Meara, was killed in 1941 at the age of 32 while testing a sailplane for an aircraft company in California. In 1944, she married John E. Beach on a ketch at the Nassau Yacht Club in the Bahamas. She lived the good life."

Johnston flew the biplane for about six months, until one early spring day in April 1936 in Madison, Wisconsin. "She had an incident that you can have when you're starting a round engine, if you're not careful," explained Wenger, "and she got a fire going and apparently there was some damage to the airplane." That may have discouraged her, because in August 1936, she sold the Waco to William Shaw and Robert Paul of Minneapolis, Minnesota, and they had it flying again in just a few months.

Colorful History

NC15700 has been well known in the Waco community for years because of its rarity, and even though its original aircraft logs were lost, some interesting oral history and other aircraft records have been preserved that illuminate the biplane's colorful life during its 600 hours of flying time. Ben and Jeremy Redman of Rare Aircraft (the folks who restored the plane) shared several noteworthy stories: In the late 1930s, Chuck Doyle Sr. (Minnesota Aviation Hall of Fame) made numerous parachute jumps from

SPARKY BARNES SARGENT

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the YPF during air shows as owner Bill Shaw flew it. Doyle couldn't get into the front cockpit with his parachute on, though, so he stood out on the wing walk while the Waco climbed to jump altitude. About three owners later, the Waco was in Miami, Florida, during the early 1940s, where another woman owned it for a few months.

Then early aviation pioneer Clyde Ice (South Dakota Aviation Hall of Fame), known for his record of "safe and sane flying," traveled to Florida in September 1942 and purchased it for use in the World War II Civilian Pilot Training Program (CPTP). As he flew the Waco away from Florida at a low altitude, his attention was suddenly diverted to a German submarine that he saw surfaced in a river inlet. Ice landed at the nearest air base and informed them of the intruder so appropriate action could be taken. Ice continued homeward, flying NC15700 to Spearfish, South Dakota, where he used the Waco as an instrument trainer with the pilot's coupe top canopy painted black, and the instructor in the front seat.

After the CPTP disbanded, Ice sold the biplane in August 1944 to a Beulah, Wyoming, rancher by the name of Spencer Harper. It seems that Harper liked to hunt deer, and one day he landed out in a field with the Waco, shot a deer with a nice rack of antlers, and then loaded it in the front cockpit. When Harper landed back at the local airport, the deer's head was quite visible to on-lookers, who commented that it looked like a deer was flying the biplane from the front cockpit!

Harper's adventures with the Waco continued until one cold wintry day when a large snowdrift piled up in front of the hangar. The rancher decided that instead of shoveling the drift away, he'd just blast through it with the airplane. So he started the Waco and pushed the throttle to the firewall, attempting to make tracks through the snow—but instead the grand



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"The way she designed the plane, you knew it was going to be neat-looking when it was finished."

—Jerry Wenger



Note the tapered wing root where it joins the fuselage and the art deco style of the coupe top.

SPARKY BARNES SARGENT PHOTOS

old biplane nosed over and flipped on its back. It went back inside the hangar, and Harper stored it until 1974, when he sold it to Jim Horne of Eagan, Minnesota. Horne intended to restore it and carefully kept up with its parts and pieces for 25 years before selling the project to the Waco's current owner, Jerry Wenger.

Intrigue and Inspiration

Wenger has been flying since he was a teenager, when he earned free flying lessons in Cessna 120s and 140s by holding flags up in the fields for crop dusters. Today, he is no stranger to Waco restorations, as his collection spans about a 13-year period of Waco's early history.

"I'm intrigued by a really unique airplane, something that can and should be brought back to life. I appreciate the history of it," said Wenger enthusiastically, partially explaining his attraction to NC15700 by adding, "I was kind of motivated because my grandfather was a pilot who owned a Waco 10, and he was



Connie Johnston selected the bold color combination of Berry Brothers' Plum Bronze and bright Nassau Blue.

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Look closely at the gold trim lines and you'll notice Connie Johnston's initials (lying sideways) in the leading portion.

my inspiration. And my uncle barnstormed in Wacos from Iowa to Colorado down to Louisiana."

Rare Aircraft

Under the guidance of Wenger, the Rare Aircraft Ltd. restoration team was put to work bringing Connie Johnston's Waco YPF back to life. "These older airplanes were built at a time where technology was really expensive and labor was cheap. Now the roles are reversed, and technology is cheap but labor is expensive. And these airplanes are still a hand-built, labor-intensive project," explained 33-year-old Jeremy Redman of Rare Aircraft, who began learning the art of painting in his senior year of high school.

His brother, 28-year-old Ben Redman, began welding taper-wing fuselages while still in high school and wholeheartedly agrees. He elabo-

rated with a chuckle, "We sometimes say that we're John Deere mechanics working on flying tractors, just to remind ourselves how important it is to be able to step back from a project and remember that it's a 1930s airplane. The airplane is wonderful because it's simple—that's its heart, its soul. It's old and simple, and you can lose touch with that so fast with all the tools we have in the shop."

Rare Aircraft was established in 1991 in Owatonna, Minnesota, by the brothers' father, Roy Redman. And as their award-winning work is unveiled for the public eye, it's inter-

Right: These original Hill Aircraft Streamliner wheelpants were an amazing find; they were brand new old stock, still in their wooden packing crate.



The one-of-a-kind 1935 Waco YPF, with its coupe top, was an eye-catcher on the flightline.



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The Waco YPF has a narrow tread, making it a bit more challenging to maneuver on the ground.



You'll notice modern avionics in the Waco YPF's panel—a concession to safe and practical operation of the biplane in today's airspace.

esting to see how this family business embraces the unique challenges—and pleasures—that go beyond the scope of the project at hand. “The biggest pleasure is being able to spend time together, and when you need the help and support, that’s really good. But when you’re that familiar, it can be tough because you might not hold back with family members the way you would with others,” explained Jeremy.

The brothers, who exude more than just a youthful enthusiasm for their work, are also quick to recognize another important aspect of their aircraft restorations, by giving credit to

at least half a dozen other full-time employees. “Our restorations are a group effort,” said Ben, “and I can’t state enough how fortunate we are to have the talent that we do have available every day. These people are almost like extended family.” All told, the Rare Aircraft restoration team spent about 9,000 hours during three years to complete the detailed and challenging restoration of NC15700.

Parts and Pieces

Often if a nearly 70-year-old aircraft project is uncovered from the dusty corner of an old barn, there are very few of the original airframe com-

ponents left intact, creating quite a conundrum for those who want to restore it. “This is the third airplane project I’ve bought out of a barn,” explained Wenger, happily adding, “and it had at least a dozen significant original parts. Now that’s a lot!”

Even so, it took a considerable amount of detective work to fabricate and reassemble the biplane. Rare Aircraft was able to obtain some Waco YPF drawings from the Smithsonian, adding to previous owner Jim Horne’s collection of more than a dozen sub-assembly drawings. Existing parts were used for patterns if they were no longer considered to be airworthy.

According to Ben and Jeremy Redman, the original parts and pieces included the steel-tubular airframe, boot cowl, oil scoop, air intake scoop, and engine cowl. Additionally, there were many hardware items and fittings for the cockpits, such as the handle for the locking tail wheel, the throttle, foot tread, rudder pedals, and even the knob for the front cockpit door. The original struts showed signs of wear, so they decided to build new ones and had them chromed per Johnston’s original personal specifications. One interesting note is that the landing gear-to-fuselage attachment points—new for Waco on this model—were so well worn that it was necessary to go through the laborious process of fabricating and attaching new ones.

While many of the wing fittings survived, the wings themselves served only as patterns, from which the Rare Aircraft team built new wood spars and ribs. Wood fuselage fairings, metal wing fairings, and the fuel and oil tanks were also valuable as patterns for new ones, and a new engine cowl was made by D&D Classic Restorations of Covington, Ohio. The coupe top structure and windshield were remanufactured using some original parts, as well as the factory drawing.

Score!

The most significant original item that turned up with the project was en-

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Top Waco

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cased innocuously in an old wooden crate. Ben Redman shared the discovery in his own words, a touch of awe still in his voice: "Jeremy and I opened the box and took the top off—it still had that old-fashioned wood straw in it—and there were brand-spanking new, never-been-used aluminum Hill Aircraft Streamliner wheelpants for the YPF. They hadn't even been cut yet; they were blanks! We didn't even know what to say for a couple of minutes. We thought, is this real? Hill was really the big fairing and streamline maker of the day, and it was just really cool to see them. That was the biggest score with that airplane. We mounted the original identification tag on the inside of the left wheelpant, at the lower edge of the transition cuff between the gear leg and wheelpant, where the owner wanted it."

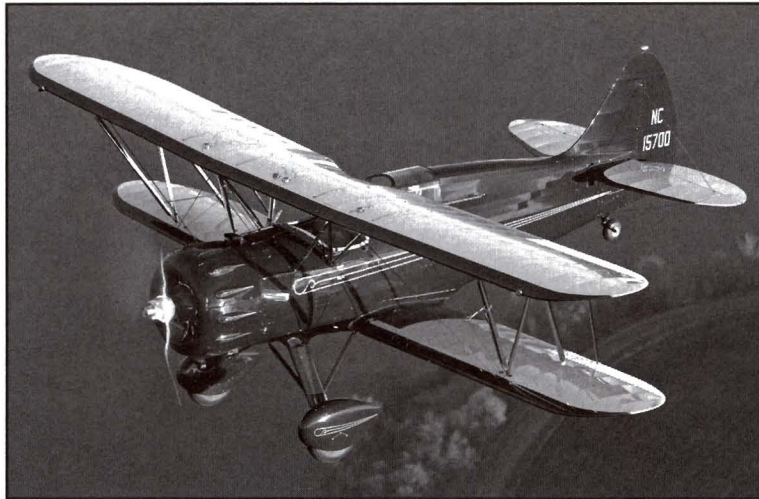
Modifications

One of the primary principles that Rare Aircraft advocates in its restorations is remaining as true to the aircraft's original configuration as possible, while incorporating some modern features that facilitate the safe and practical operation of an airplane like the 1935 Waco YPF in today's general aviation environment, thereby protecting the owner's investment in the project.

For example, NC15700 doesn't have its original Hayes tires and mechanical brakes. "But boy, do I feel better with those Cleveland wheels and brakes while landing in a crosswind, or taxiing around on a hot day and not having the brakes get grabby," explained Ben Redman.

There are other modifications for the Waco YPF, including its en-

gine and propeller. It was originally equipped with a 225-hp Jacobs L-4 engine with a fixed-pitch Curtiss Reed propeller, but today it has a new 275-hp Jacobs R75-B2 from Radial Engines Ltd. in Guthrie, Oklahoma, with a constant-speed Hamilton Standard propeller to maximize its power. And



Just imagine being 24 years old and having the privilege of ordering this biplane brand new from the factory!

one glance inside the cockpit reveals an abundance of modern avionics, including a Garmin GPS/comm, transponder, encoder, intercom, and Shadin fuel flow monitor. And lying neatly in place atop the new cream-colored leather seats are Hooker five-point harnesses.

The airframe is covered in Ceconite 102. The solid primer coat contained an ultraviolet blocker so a silver coat wasn't required—nor was sanding, except for the cowling. The PPG color coats were matched to the original Berry Brothers' Bronze Plum and the bright Nassau Blue. "The color is the top finish coat—there is no clear coat," said Jeremy Redman, adding, "What you see is what you get out of the gun, there's no buffing or rubbing to that finish."

Ultimately, and partially in response to those who are restoration purists, Ben Redman declares that "you could paint that airplane any color you want, and make modifica-

tions to it, but in the sunset silhouette, it's still a Waco."

Keep Her Flying!

Now that Johnston's coupe top Waco has made its public debut at Sun 'n Fun in Lakeland, Florida, 2006, where it was awarded Reserve Grand Champion, what will be the next leg of its journey through time?

Ben and Jeremy Redman are happy to be optimistic about the answer to that question, since they "get very attached to these airplanes we restore, and the fun thing is, with Jerry, we don't have to worry about what is going to happen to the airplane. We know it's going to be loved and flown; it's got a great home. And he loves sharing them

with people."

Wenger's answer corroborates the brothers' feelings. "I want my airplanes to fly," he said, and expressed a bit of his own personal philosophy when he added, "I intend to take real good care of it and take it to shows. As time goes on, I have to figure out where I want my airplanes, and that's not easy to do. I want a big grass field, where you can pick your own runway. And I'd like to have a flying museum with historic gliders, biplanes, and other aircraft, where they will continue to fly. Even though you risk banging them up, they're still going. Otherwise, no one will remember hearing the sound of an old radial engine, or seeing and smelling its smoke, and feeling it throbbing in your heart."

It's just a hunch, but you can bet that if Johnston were still around, she would be very pleased indeed that her biplane has survived for 71 years and has been so elegantly revived.