



Timm N2T-1

Ed and Dustin Newberg keep one of the world's first composite aircraft flying

BY JAN TEGLER | PHOTOS BY DAVID LEININGER

Matt Quy banks Ed and Dustin Newberg's Timm N2T-1 Tutor above the Minnesota countryside. The N2T-1 is a relatively unknown World War II primary trainer, eclipsed by the far more numerous Fairchild PT-19, PT-23 and PT-26 as well as the Ryan PT-22.

OTTO WILLIAM TIMM gave Charles Lindbergh "his first ride in an airplane." It's a fact Ed Newberg is fond of relating. Like Newberg, Timm was a native Minnesotan, born in Lakeville, a suburb of Minneapolis about two hours east of Hector, the farming town near where Newberg grew up. Timm was a pioneer aviator who built and flew a replica Curtiss Pusher in 1911 and went on to design and build airplanes under his own name beginning in 1916, while also flying aircraft from other makers. In 1921 in Lincoln, Nebraska, he test-flew a Lincoln Standard L.S.5, a modified Standard J biplane that could seat five people.



Lincoln was home to the Nebraska Aircraft Corporation's flying school. Lindbergh was a student there and met Timm in February, 1922. Two months later, Timm took Lucky Lindy for his first flight in a Lincoln Standard "Tourabout" biplane. From there to stardom, as the first pilot to successfully cross the Atlantic Ocean alone, took Lindbergh just five years.

Timm's career as an independent aircraft manufacturer began the same year, in Glendale, California with the O.W. Timm Aircraft Company. Renamed the Timm Aircraft Company in 1934, the firm produced a succession of models, including the parasol-wing, two-seat Collegiate series; the T-S140 high-wing, twin-engine monoplane; and an open-cockpit, closed-cabin biplane with seating for seven called the "Timm Coach."

But his most successful airplane, the N2T-1, didn't come along until World War II.

"Aeromold"

By the late-1930s, a number of aircraft designers were exploring different, lightweight, yet strong materials for aircraft construction. Virginus Evans Clark, an engineer and executive with Consolidated and Fairchild Aircraft, came up with what he

Second from the left, Otto William Timm stands next to Charles Lindbergh in 1928. Timm gave Lindbergh his first ride in an airplane in 1922. (Photo courtesy Getty Images)

called the "Duramold" process.

Duramold combined wood and resin to create a lightweight composite structural material. Birch plies impregnated with Haskelite, a phenolic resin, were laminated together in a mold under heat (280 degrees Fahrenheit) and pressure.

Duramold was famously used to construct parts of Howard Hughes' H-4 Hercules, better known as the "Spruce Goose," as well as the AT-21, a bomber crew trainer built by Fairchild that first flew in 1943 but proved unsuitable and was phased out by the USAAF within a year.

Aeromold was a similar

process pioneered by the Timm Aircraft Company around the same time and it led directly to the N2T-1. Resin-impregnated, molded plywood was bonded together but baked at a lower 180 degrees Fahrenheit, yielding what Timm referred to as "plastic-bonded" plywood.

O.W. Timm and his designers used Aeromold to build a trainer aircraft prototype they called the "PT160K" in 1939. Similar in configuration to other low-wing, two-seat primary trainers like the Fairchild PT-19, PT-23, and PT-26 as well as the Ryan PT-22, the Timm trainer first flew in 1940.

The following year, the U.S. Navy placed a single order for 262 examples of the airplane, designating it the N2T-1 "Tutor." In service by 1943, the N2T-1 earned the nickname "Tiny Timm."

By all reports it was an effective primary trainer. And if as predicted, shortages of war materials including aluminum alloys and steel had become severe, the composite Timm would have been in demand. But that didn't happen. The comparatively small order for N2T-1s was as much a result of the military having already ordered large numbers of other trainers, including those mentioned earlier and the various iterations of Boeing's Model 75 Stearman as anything else.



Less than a handful of complete examples survive, primarily in museums ... The Newbergs' Timm is the only airworthy N2T-1 in the world.

The N2T-1's smooth composite fuselage has less drag than other contemporary primary trainers, says Ed Newberg. That slippery profile helps it cruise at 120 mph—10 to 15 mph faster than the Fairchild and Ryan-built trainers.

Hector's Most Famous Crop Duster

Twenty-seven years after WW II and the N2T-1's career as a Navy trainer concluded, Ed Newberg's career was taking off—literally. He soloed in a Luscombe 8F in 1972 during his senior year of high school and bought his first airplane, a Taylorcraft BC-12, two years later.

He'd already come a long way from being the kid who hung around what is now Hector Municipal Airport, peering into the cockpit of a Cessna 195 "seeing all of those instruments and thinking, 'I'll never be smart enough to be a pilot!'"

But a pilot's life became a clear goal for Ed after a ride in an Ercoupe with a Renville County Commissioner.

"He asked if I wanted to fly it. I said 'Sure!' Of course there are no rudder pedals in an Ercoupe, so he showed me how to hold my speed with pitch and use the throttle for

altitude. He encouraged me and that was a defining moment in my life. I knew what I wanted to do."

Newberg put 850 hours on his Taylorcraft, flying "all over the place" building time for his private license and then his commercial license. In 1980 he began crop-dusting in a 1941 Stearman with a Pratt & Whitney R-985 in place of the stock 220 horsepower Continental R-670. The 985's 450 horsepower gave the "450 Stearman" better performance, but by then it was a classic from another era of aerial application.

In 1981, Newberg along with his wife Connie started their own crop-dusting business—an ambitious move for an aerial application pilot without a lot of experience. But 42 years of hard work, long days and busy spraying seasons flying Ag aircraft including CallAir A9s, Cessna 188 Agwagons, the Alexandria, Minnesota-built Eagle DW.1

and a succession of Air Tractors (301, 501, 502) made the business successful and honed his flying skills.

Along the way, Ed retained a passion for old airplanes and, along with his brother, has "bought and sold over 250 aircraft."

Today, he has a collection of 20. Among them are his Taylorcraft, several Ag aircraft, a Cessna Bobcat, a delicious Spartan Executive, and the well-known P-51D

Weighing 1,940 pounds empty, the Timm cruises at 124 mph—10 to 15 mph faster than either the PT-22 or PT-23.

"Stang" that previously belonged to the late Bob Odegaard, a close friend of Newberg's best known for his restorations of two Goodyear F2G Super Corsairs, "Race 57" and "Race 74."

And of course, N69822, the N2T-1 Newberg and his son Dustin acquired in 2012.

The Survivor

The Timm trainer is an airplane few are familiar with. Less than a handful of complete examples survive, primarily in museums, including the National Museum of Naval Aviation in Pensacola, Florida and the Air Zoo in Portage, Michigan.

The Newbergs' Timm is the only airworthy N2T-1 in the world. Why did so few of the nearly 300 trainers survive?

Some contend that the Aeromold-built trainers simply came apart as their composite structure degraded over several years. Ed Newberg disagrees. The N2T-1's limited production numbers are a factor, but he says the Timm's comparative lack of postwar utility doomed most of those that were sold surplus to civilians.

"Most World War II trainers weren't efficient aircraft as a mode of transportation. In 1946, right after the war, you had civilian Taylorcraft, Luscombes, Champs, Chiefs, Cessna 120s, and 140s. If you look at an airplane with 220 hp that cruises at about 120 mph and carries just one or two people, that's not efficient," he concludes.

"The only reason so many Stearmans survived is because they were converted to crop-dusters. The few N3Ns that are around

are here because they were crop-dusters, too. Otherwise both would have been scrapped. Had the Timm offered some kind of utility, more of them would be flying."

The N2T-1's rarity and relative obscurity are part of the attraction for Newberg. He discovered N69822 via friend and fellow warbird pilot Matt Quy. The Timm was in Lake Mills, Wisconsin. Quy stopped by to check it out. He told the Newbergs that

the airplane was airworthy and in good condition. Fortuitously, Quy is related to another Minnesotan, Dan Chbal, who owns several disassembled N2T-1 airframes and was familiar with the type.

Previous owner John Drews had obtained the N2T-1 from another owner in Boerne, Texas in 2003, then spent about six years restoring the unique composite airplane.

"The wings weren't attached and the fuselage was somewhat broken," Drews remembers. "I trucked it up here to Lake Mills and went to work on it. It wasn't easy. When they were built, Timm used resin to bond together strips of plywood 1/32 of an inch thick to make the monocoque shell.

"The shell is three strips thick right on the airframe. But I had to find the right wood. I was associated with the University of Wisconsin and asked the people in Madison where I could find the right wood. They told me I couldn't use thin plywood. Timm used spruce veneer.

"Nobody made spruce veneer anymore but I've also restored boats, and I heard that someone on the West Coast had a palette of 1/32-inch spruce. The people in Madison told me I needed to slice the veneer in small sheets, so that's what I did. When I got the airplane, the basic airframe was good, not bent. But there were three and four foot long pieces missing from the center fuselage."

Drews laid one sheet of veneer over another, 90 degrees to one another to create a strong bonding structure, formed them to the airframe, and made successful, historically correct repairs. He flew the airplane for a few years after the restoration and enjoyed it,



Clockwise from above: The Timm's main gear are spaced widely and aid in the trainer's docile handling on the ground. ■ Ed Newberg stands next to N69822, the N2T-1 he and son Dustin purchased in 2012. ■ The N2T-1's flaps, inboard of the aileron here, are hydraulically powered. It's an odd feature Newberg says, adding that he doesn't understand why Timm chose to actuate the relatively small flaps with hydraulics. ■ As a nod to O.W. Timm and the distinction of him being the first flier to take Charles Lindbergh aloft, Newberg's mechanic Jay Anderson embedded authentic Lindbergh coins in the N2T-1's front and rear cockpit instrument panels, between the airspeed and turn and bank indicators. (Photo by Ed Newberg)



then offered it for sale.

It was 2012 when Ed and Dustin Newberg purchased the N69822 from Drews.

Flying the Tiny Timm

"The airplane was in really nice condition," Newberg says. "If you looked inside the wings and fuselage, it looked like new furniture in there, really great."

Ed and Dustin began flying the N2T-1 in 2013 and like the way it handles.

"I think it will outperform a PT-23. It has a real clean fuselage with less drag, and I think it's lighter and will climb better."

Weighing 1,940 pounds empty, the Timm cruises at 124 mph—10 to 15 mph faster than either the PT-22 or PT-23. Production versions were, like the PT-23, powered by Continental's 220 horsepower R-670, seven-cylinder radial.

Newberg says the N2T-1 lifts its tail at about 50 mph and breaks ground shortly thereafter.

"The flaps work pretty well and the propeller is matched pretty nicely. It has a huge rudder, so really good authority. It's very easy to fly, probably too easy."

Like other primary trainers he's flown, including the PT-26, Newberg describes the Timm as docile, a far cry from the comparatively tricky Stearman, which he opines had a high washout rate for prospective fighter pilots because the military "wanted only the cream of the crop."

"The PT-19s, 22s, 23s, and 26s were the same way. They all had wide gear and were pretty docile. But a Stearman will eat your lunch in a heartbeat. I've flown a lot of them."

Newberg thinks the N2T-1 climbs and flies "probably a third better than the PT-26."

"It's got a really great roll rate for trainer, definitely better than a

Stearman. What's different about it from other airplanes is that the elevator is not counter-balanced, so you get a lot of feedback. It's a direct feel. Counter-balanced elevators are smoother. With the Timm you can feel every little bump. When you pull to climb, it feels funny. Then you have to trim it. It's light enough that you don't have to trim, but you do have to fly the airplane more on pitch."

The relatively large, responsive rudder helps the N2T-1 in crosswind landing situations Newberg says, but he adds "it's got wide gear so you can't handle as much crosswind as you can in a Stearman because with its narrower gear, you can hold its [windward] wing down longer."

Control surfaces are mostly cable/pushrod-actuated with the odd exception of the trainer's hydraulic flaps.

"One of the things I'm not real fond of on that airplane or any airplane is that everything's on one system. That seems dumb to me. One problem and the whole thing can fail. You've got hydraulic for the brakes, flaps. I don't know why those small flaps had to be hydraulic."

The front and rear cockpits are snug, Newberg notes, however, the airplane flies well from either position.

A look at the instrument panels in both cockpits reveals a touch that ties the airplane together with O.W. Timm and Charles Lindbergh. Newberg's mechanic Jay Anderson collects and gives out authentic Lindbergh coins from 1928 and 1929, just after he flew across the Atlantic.

Newberg adds, "In the front cockpit, we have the head of one of those coins showing and then the tail of it showing in the back cockpit. It's a tip of the cap because Timm gave Lindbergh his first flight." ➔