

United States Army Air Forces Primary Trainers, 1939-1945



by Stephen G. Craft

A Stearman PT-17 flies over Carlstrom Field in Arcadia, Fla., where thousands of United States Army Air Corps cadets received primary flight training. (Photo by Charles C. Ebbets, courtesy of Ebbets Photo-Graphics, LLC)

WII aviation enthusiasts and Hollywood tend to remember specific fighters, such as the P-51 Mustang or the P-47 Thunderbolt, and bombers, such as the B-17 Flying Fortress or the B-29 Superfortress. Often forgotten or misunderstood are the much smaller and slower monoplane and biplane piston-engine aircraft that were used to train thousands of United States Army Air Corps and Air Forces pilots. These aircraft, built mostly by such companies as Stearman, Fairchild and Ryan, were used in what some deemed the most important stage of a cadet's training career: primary. Each possessed certain strengths and weaknesses. Some of these aircraft can still be seen flying out of small airports in the United States, offering rides to those willing to pay \$50 or more for a half hour of flight. Their occupants probably have no idea that over 60 years ago these airplanes played a vital role in laying a foundation upon which the United States built a mighty air force.

On September 29, 1938, the day when European leaders reached an agreement at the Munich Conference that was supposed to avert war in Europe, Maj. Gen. Henry Harley "Hap" Arnold, who had just become Chief of the United States Army Air Corps, outlined for President Franklin Delano Roosevelt the miniscule size and strength of the USAAC in comparison to Nazi Germany's Luftwaffe.¹ Arnold wanted a bigger air force and proposed a plan to produce 4,500 pilots in two years starting in 1939. Primary flight training would initially be provided at Randolph Field, Tex., as well at nine civilian flight schools owned by eight contractors. By 1944,

over 60 civilian schools were responsible for providing primary training to all army flying cadets.

When Arnold formulated his plan, the civilian contractors had fixed-base operations or flight schools with airfields and facilities, years of commercial and military aviation experience, and the flight instructors and mechanics in place, but they lacked the aircraft necessary to carry out flight training. In January 1939, the original eight contractors possessed a total of 24 planes. Even then, the USAAC could only make 86 planes available with another 81 projected to arrive later in the year. This was far short of the 400 primary trainers proposed for the 4,500 Pilot Plan. Although the 4,500 Pilot Plan was revised downward to less than 2,500, the USAAC was not only short 230 primary trainers, but by law could not loan government aircraft to civilians.

The USAAC looked to the U.S. Congress for money to acquire the necessary planes. It met resistance from congressmen who, wanting to save money, pressed the military to use aircraft commonly used by the Civil Pilot Training Program. As one congressman asked, "Can you use any of these smaller airplanes like the Cub or the Luscombe or any of those little two-seaters, to do primary training?" Such aircraft were powered by 65- and 100-hp engines and cost only \$1,500. The USAAC knew that it needed aircraft with at least 200 hp to do the job that came with a price tag of \$5,000 - \$6,000 apiece.² Arnold wanted congressional appropriations of over \$1 billion. On April 3, Congress approved the Arnold Plan to expand the air corps, but it appropriated only



One of the 120 Consolidated PT-3As the USAAC used in the mid-1930s to train their pilot cadets. (Photo from the AAHS archives, AAHS-59871)

\$300 million. However, Congress gave the USAAC approval to loan aircraft to the civilian contractors.³ A typical contract with each civilian operator specified the number and type of aircraft to be loaned including parts and other equipment.⁴ Nevertheless, the aircraft shortage remained a major concern for the USAAC in 1939-1940. Gen. Augustine Warner Robins, who headed the USAAC's Air Training Command, observed in December 1939: "the situation on planes here is rather acute, although we are getting by beautifully at the present time. If we have an abnormal amount of crack-ups, we will be short planes for training. There are no surplus available anywhere and pilots are being kept off cross country flights because of the lack of airplanes."⁵

The aircraft that formed the backbone of primary trainers during the first year of operation were biplanes: the PT-3 and PT-11D, both built by Consolidated Aircraft Corp. of Buffalo, N.Y., and the Stearman PT-13. The Army Air Corps introduced the PT-3 to its training program in 1928. It eventually acquired 130 of these biplane aircraft powered by a 220-hp Wright J-5 engine as well as 120 PT-3A, an improved version of the original. The aircraft was 28 feet long with a wingspan of 34.6 feet, and ceiling of 14,000 feet. Likewise, the PT-11D, a biplane powered by a Lycoming R-680-3 200-hp engine, was introduced in 1932, with a total of 21 being procured. These aircraft were slightly smaller than the PT-3 with a wing span of 31.7 feet, a length of 26.11 feet, and ceiling of 13,700 feet.⁶ Both aircraft featured two open tandem cockpits for instructor and cadet, but the PT-3 lacked a tail wheel and all instruments were located outside the cockpit. The Spartan School of Aeronautics in Tulsa, Okla., used 54 PT-3s, and the Dallas School of Aviation in Dallas, Tex., acquired 29.⁷ Meanwhile, 17 PT-11Ds were operated by the Alabama Institute of Aeronautics in Tuscaloosa, Alabama. By 1940, these aircraft had been phased out by the Army Air Corps due to obsolescence.⁸

Three different aircraft and their variants dominated the primary phase of training during WWII. The most prolific of these planes between 1939-1945 was the Stearman PT-13 Kaydet built by the Stearman Aircraft Div. of the Boeing Aircraft Co., Wichita, Kansas. In 1936, the USAAC purchased over 26 PT-13s that were powered by a Lycoming 210-hp engine. The next year, 92 PT-13As, with the Lycoming R-680-7 220-hp 9-cylinder engine, were added. Between 1939-1941, the USAAC acquired 225 PT-13Bs, complete with 280-hp engines, before purchasing 318 PT-13Ds with Lycoming R-680-17 engines in 1942. All of these aircraft were nearly 25-feet long with an upper wingspan of 32.2 feet and the lower wingspan one foot shorter. All had a service ceiling above 13,000 feet. In 1940, Stearman introduced the PT-17 that was powered by a 220-hp, 7-cylinder Continental R-670-5 radial engine. This aircraft was provided to the Royal Canadian Air Force (RCAF) as the PT-27 though it was used at some U.S. civilian schools during the war. After Pearl Harbor, the company produced 150 PT-18s that came with a Jacobs R-755-7 radial engine.⁹ The total number of Stearmans purchased by the USAAF between 1940 and 1945, including those distributed to the U.S. Navy and allies, was 7,539.¹⁰

Although the biplane had dominated primary training since WWI, the USAAC broke from that "30-year precedent" by introducing monoplane trainers at the Ryan School of Aeronautics of San Diego, Calif., in 1939.¹¹ T. Claude Ryan, owner of the school, had also been an aircraft manufacturer there since the 1920s when he resigned his commission from the U.S. Army Air Service and purchased a surplus Curtiss JN-4D Jenny from then Major Arnold, Commanding Officer at nearby Rockwell Field. It was his Ryan Aircraft Co. that, for example, built Charles Lindbergh's *Spirit of St. Louis*, and in 1934, introduced the Ryan ST (Sport Trainer) that became a popular trainer around the world. After securing a contract to sell primary trainers to the USAAC, Ryan introduced the military version of the Ryan ST; the Ryan PT-16. Powered



Stearman PT-13As lined up at Randolph Field, San Antonio, Texas. (USAAF photo from the C.H. Hamilton collection)



The prototype Ryan XPT-16, 39-717. (Jim Brady photo from the AAHS photo archives, AAHS-P000832)

by a 125-hp Menasco L-365-1 in-line engine, the PT-16 was all-metal with two tandem cockpits. The USAAF acquired a total of 30 PT-16s. The next year, cadets at Lindbergh Field were trained in the Ryan PT-20, which differed slightly from the PT-16 as a result of modifications to the engine cowling and enlargement of the cockpits.¹² In 1941, Ryan opened the Ryan School of Aeronautics in Hemet, Calif., and used the Ryan PT-21, also powered by the Menasco L-365-1, alongside Stearman PT-13s.¹³ The USAAF and U.S. Navy eventually purchased 388 PT-20s and PT-21s.¹⁴ Although Ryan had established a reputation as a manufacturer and had the full backing of Arnold, the USAAC came to regret purchasing aircraft that were clearly underpowered.

The third major producer of primary trainers during WWII was the Fairchild Engine & Airplane Corp., of Hagerstown, Maryland. In 1939, Fairchild designed and built the M-62. At a flight competition held at Wright Field in Dayton, Ohio, the M-62 competed against 17 other designs and won the fly-off.¹⁵ In 1940, the USAAC contracted Fairchild to build 270 aircraft, redesignated as the PT-19. The PT-19 was a low-wing aircraft with two tandem cockpits, 28 feet long with a wing span of 36 feet, and powered by a 175-hp Ranger L-440-1 in-line engine. In 1941, Fairchild manufactured 3,181 PT-19As that came with a 200-hp L-440-3 engine. An additional 521 PT-19As were made by the Aeronca Aircraft Corp. of Middletown, Ohio, (477), and the St. Louis Aircraft Corp. (44). Then in 1942, Fairchild introduced the PT-23, which was a PT-19 fuselage with a Continental R-670-5 220-hp radial engine. Aeronca and St. Louis manufactured 575 PT-23s while Howard Aircraft Corp., also in St. Louis, and Fleet Aircraft Corp. in Fort Erie, Ontario, built an additional 293. Howard and St. Louis also built 256 PT-23As that were equipped with blind flying hoods for instrument training.¹⁶ The RCAF version of the PT-19 was the PT-26. The USAAF purchased 7,802 PT-19s, PT-23s and PT-26s between 1940 and 1945.¹⁷

In 1940, Arnold implemented the 7,500 Pilot

Plan soon followed by 12,000 and 30,000 Pilot Plans before Pearl Harbor. He also ordered that the civilian contractors establish schools below the 37th Parallel, or what the USAAF later called the "Sunshine Belt,"¹⁸ where weather conditions were superior to that of Chicago, Ill., and Lincoln, Nebraska. Open cockpit aircraft and the men flying them were no match for the below freezing temperatures and snow. Primary flight training below the Sunshine Belt, at altitudes below 2,500 feet, also removed aircraft from higher altitudes where the "rarefied air" required more horsepower for takeoffs and landings.¹⁹ After Pearl Harbor, with the United States eventually fighting a two-front war, Arnold ordered implementation of the 50,000 Pilot Plan for 1942 followed by a 70,000 Pilot Plan for the next year.

By April 1943, the USAAF had a total of 6,436 primary training aircraft dispersed among the Eastern Flying Training Command (EFTC), the Central Flying Training Command (CFTC), and the Western Flying Training Command (WFTC), for training USAAF cadets as well as British, Chinese, French and other allied aviation cadets. The WFTC, which comprised southern California and Arizona, had 1,800 aircraft in operation alone. The USAAF also worked to create uniformity of aircraft in each training center when it announced that each would use one type of aircraft. The CFTC used only PT-19s while two-thirds of the schools in the EFTC were equipped solely with Stearmans and the rest with Fairchild aircraft. Two exceptions were the Wiggins-Marden Aero Corp. of Camden, Ark., and Riddle-McKay Aeronautical Institute of Union City, Tenn., that used both Stearmans and Fairchilds simultaneously. In the WFTC, aircraft were evenly split between Ryan aircraft (used by six schools) and the Stearman (in operation at eight schools).²⁰ Some schools already using Stearmans were forced to make the conversion. One exception was the Claiborne Flight Academy of Wickenburg, Ariz., which, after being converted from glider



All five Ryan YPT-25s at the factory on Lindbergh Field, San Diego, Calif., with instrument training hoods in place. The design was a plywood version of the PT-22 powered by a 180-hp Lycoming engine. (Ryan photo from the Ed Stoltz collection in the AAHS photo archives, AAHS-P000208)



During WWII, a group of USAF cadets stand along the flightline at Carlstrom Field in Arcadia, Fla., in preparation for flying their Stearman PT-17. (Photo by Charles C. Ebbets, courtesy of Ebbets Photo-Graphics, LLC)

training to primary in 1943, used the PT-17 and PT-23.²¹

Unfortunately, the most problematic primary training aircraft of the war were those built by Ryan. Ryan nearly lost his contract with the USAAC when an inspection of Lindbergh Field found that only three out of 40 aircraft were in commission.²² At Ryan Field in Hemet, the air corps detachment also discovered that the PT-20s and PT-21s, powered by the 125-hp Menasco engine, were underpowered at high altitudes. The USAAC detachment at the Palo Alto Airport, Inc., in King City, Calif., declared that the PT-21s “were not satisfactory for this type of training.” Ryan tried to solve the problem by replacing the Menascos with a 132-hp Kinner R-440-3 engine. In 1942, though, all aircraft using the Kinner R-440-3 were grounded because of crankshaft issues. The engines were removed, sent back to Kinner, and replaced with the Kinner R-540-1 160-hp engine.²³ The aircraft became known as the PT-22 Recruit and the USAAF purchased 1,048 of them.²⁴

Although the PT-22 has been described as “one of the best Primary Trainers of WWII,” the PT-22s had their own problems.²⁵ In 1943, all training at Palo Alto Airport was done in the PT-22, but severe engine problems persisted, leading to forced landings and accidents that resulted from piston failures, broken rods and failed bearings. Modifications of the engine mounts proved useless. The Kinner R540-1 engine turned at 1,850 rpm, but with a propeller attached, it turned only 1,650 rpm and produced significant vibration. Likewise, in 1942, all PT-22s at the Visalia-Dinuba School of Aeronautics in Visalia, Calif., were grounded after 150 hours to install new crankshafts. An investigation discovered that moisture threw the wooden propellers out of balance causing vibration and ultimate failure of the crankshafts. New engine mounts were added but cracks caused the mounts to fall apart. Fatigue

cracks and failure of the horizontal stabilizers were discovered in 1943.²⁶ Because all schools using Ryan aircraft experienced similar problems, the USAAF grounded the PT-22s. The USAAF also abandoned a plan to modify the planes to perform night training because the PT-22 could not take off with an additional 100 pounds of equipment after already undergoing a number of other modifications to get it in the air.²⁷ Eventually, the USAAF limited use of Ryan aircraft to Ryan’s two contract schools in Hemet and Tucson, Arizona.

Thousands of cadets received their training in Ryan primary trainers including men like Chuck Yeager, a future ace and test pilot.²⁸ Quite a few looked back fondly to their days flying the PT-22. Jack Laurie, a P-38 Lightning pilot, loved the airplane. Lawrence Schmidt, who trained at King City before ultimately piloting a P-38 as part of a photo-reconnaissance squadron, remembered later that the PT-22 was the “prettiest vintage airplane you ever saw... that had a saucy, can-do appearance.”²⁹



A restored PT-22 shows the classic lines and unique landing gear of the Ryan built trainer. (Charles E. Stewart photo from the AAHS photo archives, AAHS-P001531)

Former cadets noted that the plane was forgiving and almost impossible to ground loop or nose over.³⁰ On the other hand, Kenneth Dahlberg, who nearly became a triple ace flying a blue-nosed P-51 with the 354th Fighter Group over Europe, recalled that the PT-22 was so underpowered that cadets called it the “Maytag Messerschmitt” because because the sound of the engines reminded pilots of the congenial clatter of Maytag home appliances of that era.³¹ Regardless of what cadets thought then or later, it was the customer that had to be satisfied. The USAAF deemed the aircraft’s performance as so poor that by July 1944, all Ryan trainers were phased out in the WFTC in favor of Stearmans.³²

By contrast, the Fairchild PT-19 performed yeoman work mostly in the CFTC, but the EFTC as well for much of the war. USAAF detachments that used Stearman aircraft before converting to the PT-19, such as the one supporting the Coleman Flying School of Stamford, Tex., believed that the latter “to be more suitable for primary training purposes and... a very stable aircraft.” Its wide landing gear led to fewer ground loops. The civilian flight instructors at the Coleman Flying School found it easier to teach cadets using a PT-19 as opposed to the PT-17.³³

In some respects, the handling qualities of the PT-19 should not have been a surprise. Initially, the USAAC viewed low-wing monoplanes, like those built by Ryan and Fairchild, as having superior performance, and better prepared cadets for similar aircraft in USAAC basic and advanced training.³⁴ The USAAF detachment in Helena, Ark., believed that the PT-19 allowed cadets the chance to “really fly an airplane.”³⁵ For example, the PT-19 had two fuel tanks and a prop, features common on all low-wing monoplanes. At Curtis Field in Brady, Tex., USAAF check pilots and cadets described the PT-19 as a better trainer because it made them “gas and tank conscious,” gave them a better feeling for when the plane was stalling, and had a wider landing gear. At Georgia Air Service in Jackson, Tenn., cadets flew a few hours in the rear cockpit before moving to the front unlike other schools where the cadet almost always flew from the rear cockpit. Likewise, the Lafayette School of Aeronautics in Lafayette, La., discovered that cadets sitting in the front “had better visibility,” increasing the safety factor over the rear seat.³⁶

By 1943, there were 18 schools in the CFTC using the PT-19 including two British Flying Training Schools and the Women Air Force Service Pilots training activity at Avenger Field in Sweetwater, Texas. The instrument panel included an air speed indicator, altimeter, clock, vertical speed indicator, and turn and bank indicator, though one former cadet that trained at Chickasha, Okla., remembered that all instruments except the oil pressure and cylinder temperature gauge were taped over in order to learn to fly “by the seat of one’s pants.”³⁷ One aspect of the plane that stuck in the minds of men and women that trained in the aircraft was the fact that the engine was turned



The Fairchild PT-19, with its mono-wing construction most closely resembled the aircraft cadets would graduate to and fly operationally. (USAAF photo from the AAHS photo archives, AAHS-6270)

over by a hand crank, although this feature was common on all primary trainers.³⁸ Young men and women wanting to serve their country at the controls of an airplane probably preferred low-wing aircraft like the Fairchild PT-19 because it more closely resembled not only aircraft they would graduate to in the basic and advanced stages, but modern fighters, such as the P-51 Mustang. Jack Broughton, who trained at Garner Field in Uvalde, Tex., recalled later that he could not wait to get his hands on the “sleek” aircraft.³⁹ William Mitchell, who also trained at Uvalde in 1942, told his parents that the PT-19 was a “racey” aircraft that looked “a lot like a real pursuit plane, a P-40.”⁴⁰ For some cadets, and even instructors, who viewed Stearmans as relics from the past war and the PT-19 as a “miniature modern fighter plane,”⁴¹ monoplanes were a joy to fly and encouraged them to take risks in their quest to become military pilots. Years later, former cadets at Union City, Tenn., who went on to become B-17 pilots, admitted to engaging in unauthorized acrobatics in the PT-23.⁴² When PT-19s in the EFTC were replaced by PT-23s, a rumor spread among cadets that the USAAF did this because of a design flaw in the PT-19.⁴³ Although there were 52 primary training fatalities in the CFTC in 1943, which relied totally on the PT-19, it blamed weather or careless flying, not the aircraft.⁴⁴



Fairchild PT-19A offered an additional 25 hp along with some minor detail changes over the PT-19. (USAAF photo from the AAHS photo archives, AAHS-6270)

Nevertheless, the EFTC found Fairchild aircraft, especially the PT-23, to be lacking in comparison to Stearmans. The PT-23 tended to experience nose-over accidents; 119 such accidents in 1943 alone.⁴⁵ The first school to receive the PT-23 was Harris Field in Cape Girardeau, Miss., and cadets had a lower elimination rate in basic training than any other school. Yet, the aircraft was plagued with “bugs” because the radial engine that replaced the original in-line engine led to a “poor mating of airplane and engine” with resulting vibration.⁴⁶ The PT-19s used at the Lafayette School of Aeronautics were found to have cracked center sections because cadets tended to “drop the airplane” (stall several feet above the ground) on landing. When PT-23s replaced the PT-19s, the former were supposed to provide an improvement over the latter because of the added 50 hp. However, the USAAF detachment noted that the “lack of streamlining” in the fuselage actually made the speeds of both aircraft the same. Another problem with the PT-23 was that when students did snap rolls or a slow roll, flames from the engine could singe either the instructor or the cadet, forcing an end to acrobatics. Failure of a rudder control tube on a PT-23 led to one fatality at the school. Mechanics discovered other problems, including faulty crankshafts and wing center section failure due to moisture. Lack of drainage led to wood rot. Moreover, the plane’s wood propeller was too small for the radial engine leading to vibrations. Making matters worse, the EFTC issued an order that cadets were to refrain from performing certain maneuvers in the PT-23, but failure to teach cadets how to recover from a spin or high speed stall because of that order may have resulted in the death of another cadet. All of these problems forced the detachment to discontinue using the PT-23 and return to the Stearman PT-17.⁴⁷

Because of their wood construction, the PT-23s used by Anderson Air Activities of McBride, Mo., developed sections that were so weak that the landing gear sometimes pushed right through the wings. If a wing cracked, the entire wing had to be replaced. Hail perforated the wings and fuselage requiring much time and labor to repair.⁴⁸ In Camden, Ark., the Wiggins-Marden Aero Corp., located in a heavily wooded area where flight instruction called for low altitude flying, experienced so many forced landings after crankshafts failed that the morale of both cadets and instructors plummeted.⁴⁹ The USAAF detachment at Tuskegee Institute’s Moton Field replaced the PT-19 with the PT-17 because it was deemed underpowered for flying in an area with tall pine trees.⁵⁰

Another major problem for the schools using Fairchild aircraft related to parts. Schools that converted from Stearmans to Fairchilds found the transition to be costly. For example, between 1942-1944, the USAAF forced the Wiggins-Marden Aero Corp. to convert back-and-forth between Stearmans, PT-19s, and PT-23s five times. In 1942, when Georgia Air



A Stearman PT-17 struts its stuff. (Boeing photo from the Ed Stoltz collection, AAHS photo archives, AAHS-P000205)

Service in Jackson, Tenn., went from PT-27 and PT-17 Kaydets to PT-19s, this caused the company considerable problems because its mechanics, who had been trained to work on Stearman aircraft, now had to be retrained. Spare parts for the Stearmans did not work on the Fairchild aircraft, and the school struggled to buy parts.⁵¹ Schools using the PT-23 were also confronted by a parts shortage. In 1943, parts for the PT-23 were labeled as “critical items,” meaning they could only be cannibalized from an “out of commission” aircraft.⁵² As a result, the PT-23 became known as the “worst maintenance ‘headache’” of any aircraft used by a school in Helena, Ark., especially when repair costs increased 50 percent making it “cost prohibitive.” The EFTC noted that PT-23s suffered from 20 different maintenance issues and claimed that maintenance costs exceeded the Stearmans by 100 percent. In January 1944, PT-23 aircraft were grounded and replaced by PT-19s that were deemed “more dependable” than their more powerful offshoots.⁵³ Instructors at the Southern Aviation, Inc. in Decatur, Ala., believed the PT-23 was a good plane for an experienced pilot, but not for primary training.⁵⁴

Overall, civilian flight schools and USAAF detachments, especially those in the EFTC, preferred Stearman aircraft to any other primary trainer. One reason for this was lower maintenance costs.⁵⁵ One contractor in the WFTC considered the PT-17 to be a stable workhorse that could stand the beating it received from cadets and was easier to repair.⁵⁶ The EFTC agreed, calling it a “much more sturdy aircraft” with “landing gear capable of much more punishment.”⁵⁷ As one student of color observed during the war: “The punishment and tremendous bounces and bumps administered... bear mute testimony to the sturdiness.”⁵⁸

Moreover, flight instructors and some cadets preferred the Stearman biplanes to their monoplane cousins because it seemed a better aircraft for training. It was said that the PT-17 taught the cadets to better appreciate the controls that were more

sensitive. Flight instructors, who did not think the PT-23 gave cadets “a good ‘feel’ of the airplane,” thought that in the PT-17, the cadet’s “faults are accentuated to him and to his instructor, making correction easier and increasing his coordination.”⁵⁹ The Stearman was considered by some to be a better aircraft for acrobatics and teaching cadets the fundamentals of flying.⁶⁰ Cadets enjoyed rolls, loops, spins and low-level flying, authorized or not, with the biplane as much as the Fairchild. Some found the PT-17 to be a “delight” compared to the Vultee BT-13, the low-wing monoplane that they graduated to in the basic stage.⁶¹

One advantage of the biplane was that cadets could use the struts and upper wing as reference points resulting “in a better understanding of the fundamentals.” Another advantage was that it could operate from restricted fields where landings and takeoffs were short.⁶² Civilian flight instructors at Curtis Field in Brady, Tex., who flew both the PT-19 and the PT-17, disagreed with their USAAF counterparts. They described the latter as a better trainer and argued that gliding was more beneficial to cadets than using aaps. As for stalls, one instructor observed that: “The Fairchild sends a telegram before a stall.” A stall in a Stearman was harder to detect, “but once learned was of far greater value.” Finally, in their estimation, all Stearmans flew alike whereas “three different Fairchilds flew like three different airplanes.”⁶³ If the Stearman had any faults, it was the deterioration of the wings’ fabric and a penchant to ground loop.⁶⁴

One other fault of the Stearman was not inherent to its design. In 1942, the USAAF ordered that all primary aircraft be painted silver instead of blue and yellow. Many civilian contractors despised the color because of poor visibility with the potential for collisions. The contractors wanted to paint bands of different colors to contrast the silver and make the planes more visible.⁶⁵ Some stations preferred that the Stearmans be painted yellow similar to that of the U.S. Navy or the Royal Canadian Air Force, hence the nickname “Yellow Peril.”⁶⁶ John G. Williams, commanding general of the 29th Flying Training Wing, argued that silver-colored aircraft with orange and “combat dash striping” were not visible when in haze or smoke or over landing fields that lacked grass. In fact, Williams believed that the color of primary trainers in the EFTC resulted in whole or part in 48 aerial collisions in 1944. Williams and the EFTC prevailed in having the Stearmans painted blue with yellow wings.⁶⁷

The strengths of the Stearman primary trainers were obvious to all training commands. The WFTC had already eliminated Ryan trainers in favor of the Stearman. In January 1944, General Williams ordered that all PT-23s in the EFTC be removed from training because of their unsatisfactory performance, and gradually Stearman aircraft replaced the PT-19s as well.⁶⁸ The CFTC likewise began a drawdown of Fairchild aircraft. In October 1944, there were 590 PT-13s and PT-17s in use as opposed to 209 PT-19s. Three months later, all USAAF primary training was done in 310 PT-13s and 343 PT-17s.⁶⁹

In the final months of the war, there was an attempt, not entirely successful, to use only PT-13s in all commands even

though not all flight instructors or mechanics believed the PT-13 to be superior to the PT-17. Although it was said that the PT-13’s Lycoming engine was not only unreliable, but tended to throw oil and that mechanics insisted that their maintenance work increased 25 percent over that of the PT-17, the EFTC noted its definite advantages. The PT-13 had a 9-cylinder engine as opposed to seven providing for smoother power; two oil breathers instead of one allowing for longer inverted flight; the RC-73 electrical interphone system that allowed two-way communication and gave instructor and cadet soundproof helmets that reduced engine and wind sound as opposed to the gosport, a one-way speaking tube between instructor and cadet that instructors liked.⁷⁰ Rubber crash pads were also added to PT-13 cockpits. The USAAF detachment in Orangeburg, S.C., spoke with some bitterness about how earlier installation of the crash pads “would have saved the faces of several students.”⁷¹ Regardless, the fact that the aircraft finished out the war was a testament to the confidence that the USAAF had in Stearman aircraft. It proved superior in performance to Ryan aircraft and the Fairchild PT-23. The PT-19 has been wrongly described as being THE primary trainer of WWII.⁷² It was the Stearman, which also saw service during the early Cold War years and helped to train some of the country’s future astronauts.

Whatever their strengths and weaknesses, primary trainers built by Stearman, Fairchild and Ryan made their own contribution to the war. The PT-19 has rightly been called the “cradle of heroes,” but it must share that honor with its counterparts. By 1945, over 200,000 male and female cadets including over 1,300 African-Americans graduated to basic training, and went on to become part of the mighty air force of WWII. Most of the USAAF fighter, bomber and transport pilots flew one of these planes including many of the war’s America’s aces or decorated pilots. The role that these primary trainers played during the war should not be forgotten.

About the Author

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Endnotes

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