

Those Wonderful P-12s

Keith Ferris, ASAA

It is difficult to remember exactly when I first became aware of my surroundings.

I do remember gradually becoming aware that my life was governed by a recurring sound and smell that came with dawn's light. I was being awakened to the regular sound of inertia starters winding up before sunrise as the D-12 engines of 24 Curtiss P-1Ds were turned over, each hand-cranked

March/April 1932 when I was but three years old. The P-12s were powered by the air-cooled 450 horsepower nine-cylinder Pratt & Whitney Wasp radial engine I was to come to know so well. Each cylinder had its own six-inch or so exhaust stack which put on a real show in the dark each morning. The P-12's inertia starters would whine, increasing their shrieking pitch, until once engaged the engine's individual cylinders would

catch, cough, emit individual puffs and then a larger cloud of white smoke. This would be whisked away as combinations of the nine cylinders came to life. When viewed from the rear in the darkness, the circular pattern of counter-rotating blue flashes of exhaust would reveal the engine's ignition sequence. We had 25 of these P-12s assigned. This tiny world would be the only world I was to know until beyond six years of age.



Photo 1 - Kelly Field in 1931 Curtiss P-1Ds of the Pursuit Section of the Air Corps Advanced Flying School. The Ferris quarters faced between the last two hangars at the shadow.

to life by a crew chief responsible for readying his airplane for its daily work. The closest of these airplanes resided literally 100 feet across the street from my bedroom window. We lived on the WW I era Kelly Field just southwest of San Antonio, Texas [Photo 1]. We faced between the last two of the Pursuit Section hangars at the shadow in the photograph. The air I breathed was that of the flight line... of gasoline, airplane dope, and motor oil. [Photo 2] The Curtiss P-1s in place when we arrived at Kelly Field in November of 1929 were replaced with Boeing P-12Bs beginning in



Photo 2 - Curtiss P-1B across the street from our quarters before the P-12s arrived in March/April 1932.

To sample of the sounds that accompanied my childhood at Kelly Please use the following link:

<https://www.youtube.com/watch?v=3zXkVQnVmuo>

Title: "Hand-Cranking the Inertia Starter on Restored 1934 Boeing P-26"



2:09

[Be sure to go full screen and turn up your sound.]

The Wasp engines and 9-foot Hamilton Standard propellers were common to both P-12 and later P-26. They sounded exactly alike.

Students completing primary flight training at the new "West Point of the Air" northeast of San Antonio at Randolph Field needed only to cross-town to Kelly for their advanced training. Kelly provided training in the Pursuit, Attack, Observation, and Bombardment specialties, which made for a very busy flying field. Air Corps pilots were expected to be able to fly any airplane. Students entering advanced flight training received a brief introduction to each Kelly aircraft type before being selected for one of the specialized courses.

Dad was to serve as an instructor at Kelly for six years, serving his final year as Commandant of Cadets. [Photo 3] Kelly instructors alternated, teaching cadets in each of those specialties. Dad was happiest in Pursuit teaching students to fly the Boeing P-12. Everyone I have known who flew any of the Boeing P-12 series reported it a favorite, a delight to fly. The P-12 was simple, powerful, highly maneuverable, and nearly indestructible. Its G-limits greatly exceeded those of its pilots.

The aircraft was relatively small with its 30-foot wingspan and 20-foot

length. Weighing less than 2000 pounds empty, the P-12B was powered by the 450 horsepower SR-1340-9 "C" version of the Wasp engine. [Photo 4] Dad was happy to finally have the opportunity to fly aircraft with the Wasp engine. It was reliable, accessible, easy to maintain and never failed him as had the WW I era Liberty engine many times during his earlier training and three year tour in Hawaii.



Photo 3 - Lt C. I. Ferris, Kelly Field P-12 Instructor 1929-1933, Commandant of Cadets, 1934-1935.

Dad and instructors Lieutenants Henry Baxter and Eddie Underhill delivered the school's third, fourth and fifth P-12Bs to Kelly arriving on April 6, 1932 after 8 hour and 40 minute cross country flights from Rockwell Field, San Diego with stops at Tucson and an overnight at El Paso. All twenty-five of Kelly's P-12Bs delivered by Kelly instructors were, in place and operational by July 21, 1932. Each of these had received thorough Depot Maintenance with timely modifications after having been replaced in front line pursuit squadrons by later models of the P-12.

Dad preferred the P-12B to later versions which had grown progressively heavier. Though slightly faster, the P-12Cs, later 525 horsepower Ds and Es with later 14:1 built-in rotary induction blower Wasps and 600 horsepower P-12Fs were not as "nimble" as the 450 horsepower "bare-boned" P-12Bs. There were noticeable differences in details between these models of the P-12. Details standard on newer aircraft would later appear on earlier models returning from depot maintenance.

We received a single plain P-12 in March of 1932 preceding delivery of our B Models.



Photo 4 - 43rd School Squadron Boeing P-12B, 29-337 on 5/19/32 flown by Pursuit Section Instructor "Curly" Lawson. Squadron insignia is incomplete, note shortened cockpit installed at depot a month earlier. She carries the standard paint scheme of the time, olive drab fuselage with yellow wings and tail group. The fuselage stripe identifies the aircraft of the instructor pilots.

This was the eighth of the nine P-12s built and one of the eight pioneer P-12s flown by the 95th Pursuit Squadron at Rockwell in 1929. These airframes were initially identical to the civilian Boeing Sport Model 98 [Photo 5] having the original lengthy split-axle landing gear with slightly smaller wheels. They featured simple hinged, angled ailerons on the upper wing, extending to the wingtips. They also carried individual streamlining fairings behind each cylinder of its Pratt & Whitney SR-1340-7 Wasp engine. These fairings were soon dis-

P-12s, P-12Bs, Cs and Ds were all delivered with cockpits of unfortunate design. Cockpit openings were found to be longer than necessary. Wright field test pilots recorded the fact that protection from the slipstream was inferior to preceding aircraft. [Photo 7]

Protection was improved by moving the windshield further back under change order performed during scheduled depot maintenance. This shortening of cockpits can be seen on our Kelly P-12Bs and later P-12Cs and Ds.

The change order also seems to have coincided with the provision of fabric "Capes" for all models of P-12s. When attached to cockpits, these offered additional protection of pilots flying at high altitudes or in cold or inclement weather.

While the P-12C as initially delivered shared its Pratt & Whitney R1340-9 engine, fuselage, wings and tail surfaces with those of the P-12B, the "C" included the new "ring" cowling for the engine. P-12Cs also had an entirely new "hinged Spreader Bar" landing gear replacing the earlier split-axle type. This new gear was to be standard for all succeeding models of the P-12. [Photo 8]



Photo 5 - Boeing Sport Model 89 of 1928 shared basic P-12 airframe including the streamlined fairings behind cylinders, longer strut split-axle landing gear, smaller wheels and angled hinged ailerons extending to wingtips.

carded as troublesome and were found to adversely affect cooling.

The P-12Bs retained the split-axle landing gear of the original P-12s however with shorter struts, larger wheels and 30 inch x 5 inch tires. The B model also introduced the constant chord Frieze ailerons on the upper wing, their outer ends inboard of the tips. [Photo 6] These ailerons were hinged low and further aft of their leading edges, allowing their leading edges to extend below the wing on the up-aileron, the resulting drag balancing the drag of the down- aileron on the opposite side.



Photo 6 - P-12B 30-34 on 6/12/32. New Frieze ailerons are clearly shown. 43rd Squadron insignia yet to be completed. Note steer-able tailskid cocked at angle of the rudder.



Photo 7 - 17th Pursuit Squadron P-12C 31-168 from Selfridge Field, MI displays its standard airfoil shaped ring cowling. The original longer cockpit is still in place with its added "cape" used to further protect pilots at high altitude. It is otherwise identical to the P-12B, including the original shaped fin and rudder. 31-168 transferred to Kelly Field in September of 1936 after a tour with the Air Corps Tactical School at Maxwell. Note also the 57 gallon auxiliary tank available for all P-12 models for cross-country flight



Photo 8 - P-12C 31-238 at Kelly in December 1936. Fresh from Rockwell Air Depot, she clearly shows her hinged Spreader Bar landing gear, a replacement "flatter" cowling, her new oil cooler just in front of left gear strut, her new short cockpit, Frieze ailerons and the replacement P-12E style vertical stabilizer. Note the sod which often graced those tail skids and the single bomb rack used to carry parachute flares for emergency landings at night.

Tactical School at Maxwell Field in Montgomery, Alabama.

Boeing P-12, P-12B, C, and D fuselages were strongly constructed of bolted square aluminum tubing, a considerable departure from the late WWI era welded steel tube construction. Forward fuselages were covered by unstressed aluminum panels while aft they were covered by laced fabric with the exception of the aluminum baggage compartment door on the left side behind the cockpit. The more advanced P-12Es, which followed, had newly designed aluminum monocoque stressed skin fuselages with integral streamlined headrests for the pilots. [Photo 9]

Those beautiful headrests were soon replaced by bulky depot installed "Panama" modifications allowing stowage of a life raft within the headrest. [Photo 10]

All P-12s up through the E Models were equipped with steerable tail-skids. These were preferable for operation from grass flying fields, which allowed take-off and landing directions to be adjusted for wind conditions. For example, when the winds were from the north at Kelly, the P-12s took off towards us right over the hangars and our quarters. If winds were from the south, they dragged in over our heads and hangar line onto the huge grass field. The closer to the flight line they landed, the shorter their taxi back to the flight line.

In addition to the new monocoque fuselages, P-12Es abandoned the aerodynamically balanced rudder of earlier models replacing them with a newly shaped vertical stabilizer and rounded rudder. [Photo 11] To add confusion to P-12 model identity these newly manufactured vertical stabilizers and rudders later were to appear on P-12Cs and Ds and finally even P-12Bs returning from annual Depot maintenance. Other changes performed at Depot were the upgrading of oil cooling systems from the original ram-air-fed cooling tubes routed



Photo 9 – P-12E 31-562 flown from November 1932 to June 1934 by BGen Charles H. Danforth, Air Corps Flying Training Center Commander at Randolph. This shows the beautiful all-metal monocoque fuselage and vertical stabilizer and rudder introduced on the P-12E. Lighting is installed but no radio.

“The final version of the P-12 was the powerful 600 horsepower P-12F. These were equipped with radio, landing lights and new tiny tail wheels for operation from then proliferating runways.”



Photo 10 –Selfridge based P-12E of the 27th Pursuit Squadron on a cross-country flight with transient ground crew cranking the Wasp by inertia starter after the refueling stop. Note the radio mast on vertical stabilizer; the ugly life raft modification to the headrest. The parachute flare on the bomb rack and the auxiliary fuel tank were temporary additions for cross-country flight.

through the oil tanks to later types of oil cooling systems, the adding of navigation lighting, radio, radio antennae. All versions of the P-12 included the unique Boeing engine temperature control faceplates with openings controllable from the cockpit through rotatable sliding shutters.

The final version of the P-12 was the powerful 600 horsepower P-12F. These were equipped with radio, landing lights and new tiny tail wheels for operation from then proliferating runways. While the drag of the earlier tail-skid on the turf helped keep airplanes rolling straight, that little P-12F tail wheel, necessary for operating from paved runways, did not like the cross-wind landings often required when dealing with fixed direction runways.

All P-12 models were capable of short take off ground runs of between 300 and 500 feet depending on loaded weight.

The Wasp engines’ initial integral rotary induction blower with its 10:1 impellor provided built-in supercharging. This allowed the initial P-12s to fly nearly as high as 30,000 feet, the first Air Corps aircraft routinely able to do so. This was demonstrated in 1929 above San Diego by Rockwell Field’s 95th Pursuit Squadron, the first squadron to receive the new P-12s. [Photos 12 and 13] These surprised everyone by producing contrails as they took entire formations of this new aircraft higher than anyone had seen before. Later P-12Bs of the 95th Squadron continued to demonstrate their high altitude performance in tactical formations during the Air Corps 1930 Field Exercises. Rockwell’s P-12s were joined by P-12s of the three squadrons of the 1st Pursuit Group at Selfridge Field, Michigan which were training alongside Attack and Bombardment units from around the country. These maneuvers demanded a high degree of performance from the pursuit pilots, Pratt & Whitney’s Wasp engines and the Boeing’s P-12s involved. At the beginning of the exercises, it was noted by 95th Pursuit

Squadron Commander Captain Hugh M. Elmendorf that there was but a single spare Wasp engine on hand for all of the participating Boeing P-12s. He reported that amazingly only a single P-12 engine change was required during the entire exercise.

Students arriving at Kelly from Randolph in 1932 had completed eight months of primary and basic flight training in low powered dual-seat trainers. Those entering the four-month Pursuit course at Kelly were to learn solo the take-off and landing characteristics of this much more powerful single seat fighter-type airplane. Instructors were assigned five



Above: Photo 11 – A nice Boeing photo of an unidentified standard P-12E showing clearly the new shape of the vertical stabilizer, rudder, and the now standard shorter cockpit with “cape” installed. This particular P-12E appears to have the actuating cable for a camera gun installation on the upper wing.



Above: Photo 12 – Rockwell 95th Pursuit Squadron “plain” Boeing P-12s preparing for early morning high altitude flight. The lengthy original landing gear has been replaced with P-12B gear, wheels and tires. This must be August of 1930 since two of their eight P-12s had just returned from their first Rockwell Air Depot maintenance and modification.

Right: Photo 13 – 95th Pursuit Squadron Pilots prepared for high altitude flight. Note the spaces where streamlined fairings had been removed behind cylinders on this P-12. The classic Boeing engine temperature controlling faceplate can be clearly seen to be closed in this photo. Note also the crude hand-painted 95th squadron “kicking mule” insignia common to the original eight 95th Squadron P-12s.



students each. [Photo 14] Instructors led three-ship flights teaching two students at a time. Once having mastered the basics of flight in the P-12 the student moved on to formation flight and strange field landings. In spite of the proven reliability of the Wasp engine, students were required to master getting into and out of small-unimproved fields safely and with accuracy. The P-12, with its higher power- to-weight ratio excelled at this. Students learned three-ship and multi-ship formation flying [Photo 15], flight planning, cross-country navigation and night flying. Students were introduced to individual aerobatics and what today would be called Basic Fighter Maneuvering (BFM). Actual Bombing, Gunnery and Tactical Flight Training would await graduation and be handled in their assigned operational pursuit squadrons. [Photo 16] (The graduation fly-by formation)

I am grateful for the assistance of dear friend and Golden Age of Aviation historian, the late Walt/Matt Jeffries who provided me with his compilation of timelines, of depot visits and service lives of every P-12 built. This allows tracking the life histories month-by-month of any Boeing P-12 as long as I can identify the aircraft serial number. My Dad's log books, letters and form 5 flight records allow me to track precise times and dates of events involving his involvement with the airplane.

The P-12F photo [Photo 17] was taken by my late friend Otto Voigt at Biggs Field, El Paso, Texas in June 1941. (Otto, a 1930s Air Corps photographer turned New Jersey Lithographer. Otto lived a very active 104 years! He even attended an ASAA Eastern Regional meeting)

The P-12F was Air Corps Serial number 32-83 delivered by Boeing to the Air Corps in March 1932. Her career is of interest: My records show she served at March Field, CA, 1932-34; Barksdale Field, LA, 1934-35; Langley Field, VA, 35-36; Albrook Field, Panama 1936-39; Oklahoma City Air Corps Detachment 1939-40: and fi-



Photo 14 - Instructor Lt C. I. Ferris briefs students prior to formation flight.



Photo 15 - Instructor Ferris in P-12B 30-30 (Kelly #2) and two students show how it is done.



Photo 16 - Instructor Ferris in "instructor striped" Kelly #2 with two students in #4 and #6 lead two additional elements of instructor led students in P-12Bs for the graduation fly by. A close look reveals that the P-12B of number three instructor has been to depot and returned with a ring cowling.

nally, the 8th Corps Area, Organized Reserve, Dallas, Texas where she served from 1940 through June 1941 when the photo was taken on a final cross country flight. She was retired after 2,597 flying hours on June 7, 1941 and presented to the Dallas Aviation School as an instructional airframe.

I was extremely fortunate to have experienced my formative years among those P-12s and the military aviators privileged to fly during the "Golden Age of Aviation." Those years were certainly unique. While the country was experiencing its great depression the tiny Air Corps soldiered on with minimal funding developing the leadership and technical capabilities needed to conduct the massive successful efforts leading to victory in World War Two.

I have always longed to see that wonderful Boeing P-12 fly again. I am eagerly looking forward to exactly that as seven brand-new examples of the Boeing P-12 family are in final phases of construction by superb craftsman Roy Rehm in Gardner, Nevada. These include rebuilding Kermit Weeks' Boeing 100 destroyed in Hurricane Andrew; a second Boeing 100; two Navy Boeing F4B-1s wearing the colorful markings of Navy fighter squadrons of the thirties; an equivalent Boeing P-12 in the markings of Captain Hugh El-mendorf's 1929 Rockwell based 95th Pursuit Squadron P-12; the 43rd Pursuit Squadron P-12B in markings of my Dad's Kelly #2, and the later P-12C/D. Original zero-timed vintage Wasp engines are in place, already installed or awaiting installation. More on this project will be explored in future issues of Aero Brush.

Can't help but love that airplane!



Photo 17 – My late friend Otto Voigt's beautiful photo of P-12F 32-83 at Biggs Field, Texas in June of 1941. The original photo reveals its serial number on its auxiliary fuel tank. Details include the now standard life raft headrest, navigation lighting, radio masts at each upper wingtip, static discharge wire reaching the ground forward of her little tail wheel and the addition of a pilot's relief tube seen at bottom of fuselage below the number. It carries bomb racks and new landing lights on lower outer wings. She carries the less attractive version of the ring cowl and for the first time I see a venturi-tube, mid-fuselage forward of the cockpit which powers its new vacuum instruments. Her paint scheme is the overall aluminum paint of obsolete and trainer aircraft rather than the new olive drab for combat aircraft. When looked at closely each aircraft has its own story to tell.



Keith with Y1B-7 at Kelly Field age four