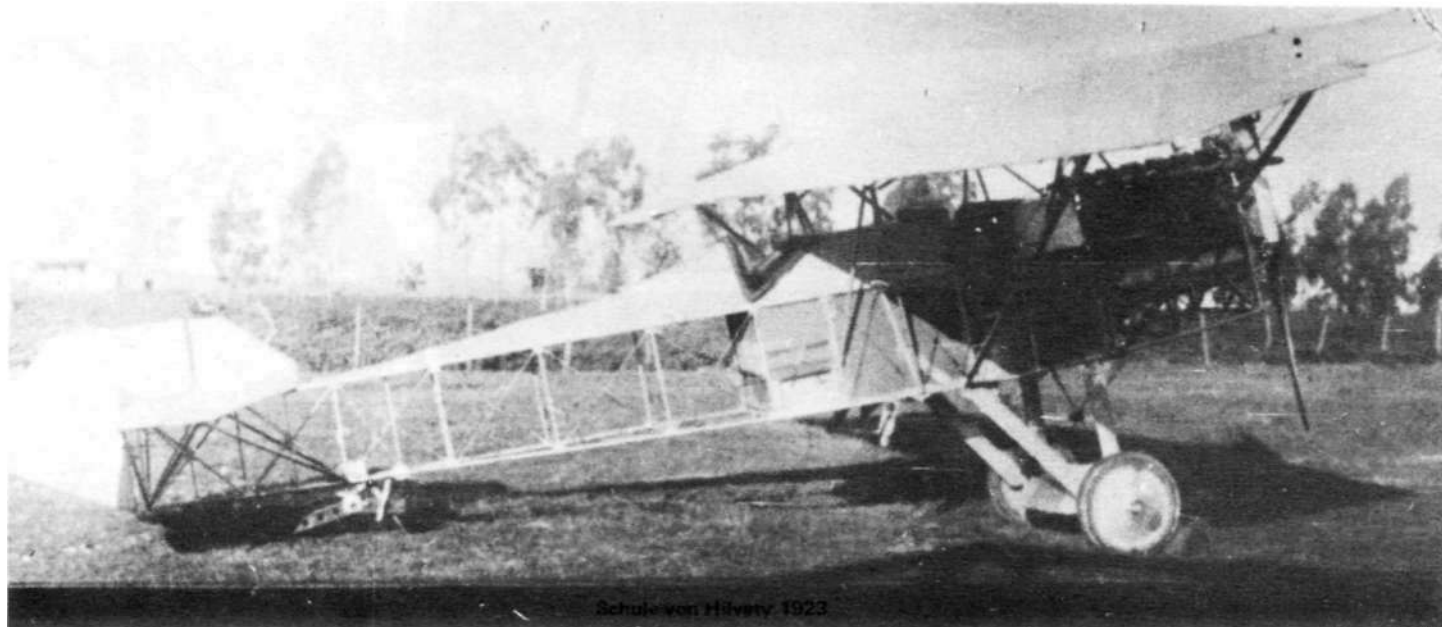


Argentine Civil Aircraft

PART 5

ARGENTINE INDIGENOUS DESIGNS

By (the late) FEDERICO A. GIRO and ANTONIO M. BIEDMA R.
(Concluding the series begun in the Summer 1967 JOURNAL)



First Part: Civil Production - Continuation

Schule von Hilvety 1923 - Georges C. Schule von Hilvety was born at Bucharest in 1897, but adopted the Swiss nationality of his father. At Lausanne, in 1917, he received an aeronautical engineering degree. The same year, at the flying school of Dubernof, he designed and built a 180 h.p. biplane which was used by the Swiss Army, in which he served as a first lieutenant. He also designed and built several monoplanes with gyroscopic stability, ordered by the important Austrian firm Lohner. Altogether, Schule built 17 planes before arriving in Argentina.

He established an operation in a shed at the almost-abandoned aerodrome of Villa Lugano. After a great deal of hard work, he completed and flew for the first time (April 8, 1923) his monoplane which had the distinction of being the first aircraft built in Argentina completely with welded steel tube framework. Schule was not able to find the financial support needed to establish a factory where he could begin to build his craft. Thus, his aeronautical work in Argentina was at an end, and calculations and drawings of a big 20-passenger transport, a touring monoplane, and several engines were lost for ever.

The craft was a two-seater parasol monoplane, its wing in two sections supported on each side (four points) by a pair of struts. The ribs were Mazzard wooden with plywood covering. Having balanced ailerons over one-half of span and variable incidence, the wing could be raised in flight. The fuselage of quadrangular section had a welded steel-tube framework.

The tail unit was of the normal monoplane type, externally braced and with balanced surfaces. The undercarriage consisted of two side Vees and a faired axle.

Specifications: Power Plant, one 185 h.p. B.M.W. water-cooled engine with six in-line cylinders on a steel-tube mounting. A mechanical device was incorporated that allowed the engine to move by tilting it on a longitudinal axle, or displacing it to the left or to the right in flight.

Span: 12.80 m. (41 ft. 11 in.); length: 8.39 m. (27 ft. 6 in.); height, 2.90 m. (9 ft. 6 in.); wing surface, 32.00 m², (344 sq. ft.); cord, 2.30 m. (7 ft. 6.5 in.). Empty weight, 1,000 kg. (2,205 lbs.); useful load, 390 kg. (860 lbs.); total weight, 1,390 kg. (3,065 lbs.); max. speed, 163 km/h (101 m.p.h.); cruising speed, 130 km/h (80 m.p.h.); min. speed, 72 km/h (44 m.p.h.); climb to 3,000 m. (9,842 ft.) in 28 minutes. Service ceiling, 5,200 m. (17,060 ft.). Endurance, 3 hours.





Sfreddo & Paolini SYP-I "El Nacional."

Sfreddo & Paolina SYP-I "El Nacional" - Jorge Sfreddo and Luis Paolini established a society to work in the aeronautical field in 1916. Jorge Sfreddo, born in Italy in 1889, worked during 1911 and 1913 at the "Scuola Italiana de Aviazione — Campo de Pordenone" and in 1912 at the "Usinas Caproni - Malpensa." He arrived in Argentina in 1914 and began immediately to work at the San Fernando flying school. Working there also was Luis Paolini, a young Argentinian artisan born in 1894.

At the School workshop, Sfreddo displayed not only his great knowledge in the construction of the classic Henry Farman, but also his prowess as a very qualified technician. His improvements on this biplane were considered the best of all the modifications to the Farman to date.

In August 1915, he built a two-seater biplane of reduced dimensions, powered by a 50 h.p. Gnome engine. He named it "Race Farman." Span of the upper wing was of 12.00 m. (39 ft. 4.5 in.) and that of the lower wing only 6.00 m. (19 ft. 8 in.). He introduced balanced ailerons and a balanced rudder, gave to the tail a triangular platform, and replaced the stick with a steering wheel.

Next, at the request of the Lonchamps Flying School, he built a three-seater biplane. This time, based on a Maurice Farman, he provided his plane with a cockpit and an 80 h.p. rotative Gnome with aluminum covering. Fuel tanks were installed which allowed an endurance of 5 hours. Flying characteristics of both biplanes were considered eminently good.

When the San Fernando school closed its doors, Sfreddo and Paolini began to work at the workshop of "Escuela de Aviacion Militar" at El Palomar, but left in 1916 to found their own company. By utilizing their great technical knowledge, the partners soon converted their workshop into the central point of technical supervision of the private flying machines in Buenos Aires. When the Great War was over, many new aviation clubs were established. This resulted in so much business that, in 1926, Sfreddo and Paolini considered it was time to move. They established themselves in the recently founded "Presidente Rivadavia" airport at the city of Moron, in the neighborhood of Buenos Aires. From there on, the firm "Sfreddo & Paolini" became more and more well-known. Not only had private fliers brought their machines to them for repair, but also the air companies delivered their bigger planes for major work. Due to the sound financial situation of the company, the two partners decided to build an airplane of their own design. The SYP-I was finished in 1930. Its maiden flight was made on April 13 of that year.

It was a two seater all-wooden biplane. Power plant: a 100 h.p. Kinner K.5; span, 10.16 m. (33 ft. 4 in.); length, 7.30 m. (23 ft. 11 in.); height, 2.70 m. (8 ft. 10% in.); wing surface, 28.55 m². (307 sq. ft.); cord, 1.50 m. (4 ft. 11.5 in.); empty weight, 267 kg. (588 lbs.); useful load, 290 kg. (639 lbs); total weight, 557 kg. (1227 lbs.); max. speed, 180 km/h (112 m.p.h.); cruising speed, 150

km/h (93 m.p.h.); min. speed, 60 km/h (37 m.p.h.); rate of climb, 280 mts/min. (918 ft/min); ceiling, 5.000 m. (16.404 ft); endurance, 3 hours.

With this plane, Miss Isabel Gladys captured the record for loops by a woman, completing 153 loops in one hour and 53 minutes (November 11, 1935).

Sfreddo & Paolini SYP-II - This biplane was completed in 1934, first flown on July 21st of that year.

It was also a two-seater with tandem open cockpits, complete dual controls. But, this time of mixed construction, welded steel-tube structure and fabric coverings were used. Wings were in two pieces, ailerons on all four wings. One "N" type interplane strut was on each side of the fuselage. Two fuel tanks were installed in the upper wing with gravity feed to the engine and an oil tank behind the fireproof bulkhead. Tail unit was of the monoplane type, all movable surfaces balanced. The undercarriage consisted of two side Vees, without axle. Power plant was a 165 h.p. Continental A.70 - span: 9.30 m. (30 ft. 6 in.); length, 6.60 m. (21 ft. 8 in.); height, 2.70 m. (8 ft. 10.25 in.); wing surface, 25.22m². (269 sq. ft.); empty weight, 560 kg. (1235 lbs.); useful load, 407 kg. (897 lbs.); total weight, 967 kg. (2132 lbs.); max. speed, 197 km/h (122 m.p.h.); cruising speed, 166 km/h (103 m.p.h.); min. speed, 75 km/(47 m.p.h.); rate of climb, 300 mts/min. (984 ft/min); ceiling, 6,000 m. (19,684 ft.); endurance, 5 hours.

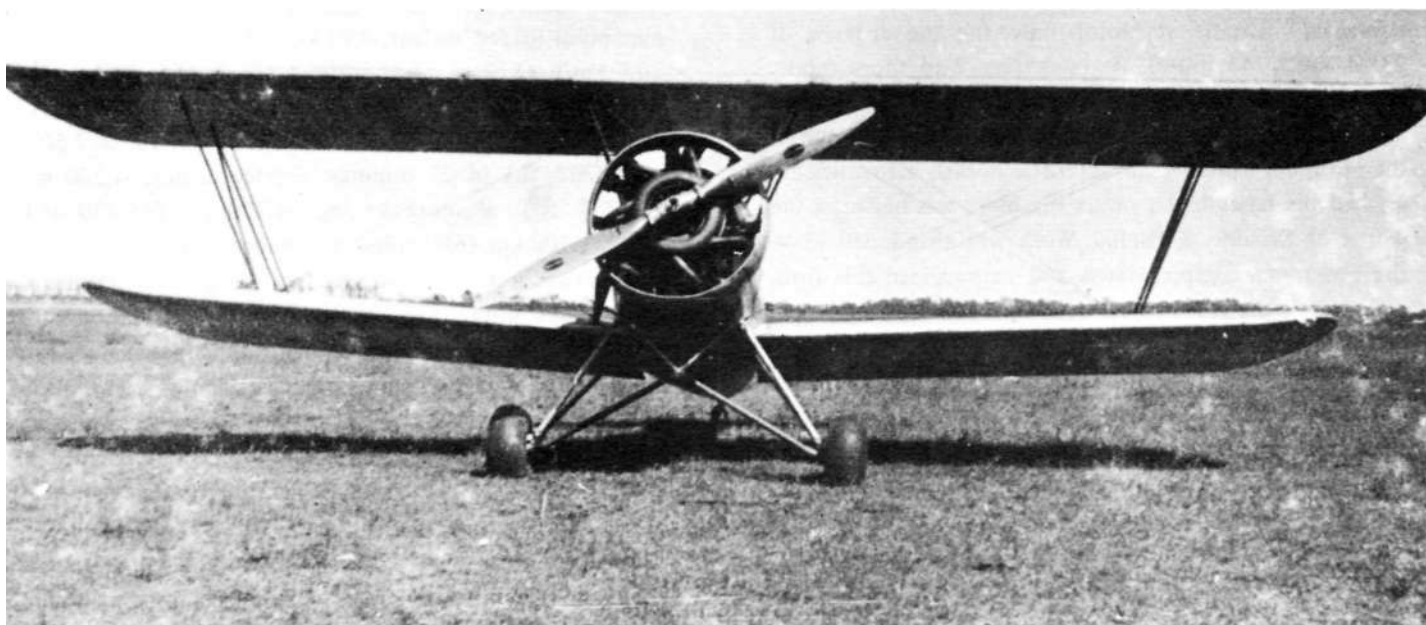
On December 24, 1940 a violent cyclone destroyed all the facilities the two partners had at "Presidente Rivadavia" Airport. To rebuild these works and continue with the firm, a stock company was formed. The dictatorial government expropriated and nationalized the firm in

1947 and Sfreddo and Paolini retired from the air-business.

Torra 1914 - In 1908, the brothers Jaime and Francisco Torra arrived to Buenos Aires. Both were Spanish carpenters that were enthusiastic for aviation. They entered in aircraft construction with a glider of the Demoiselle type. Later, inspired by the flights held during Aeronautical Week (to commemorate the century of Argentine independence) by fliers Cattaneo and Paillete, they decided to design and build a monoplane. They completed the drawings and bought from Castaibert a 35 h.p. Anzani engine. Almost finished, the monoplane was destroyed in 1912 when a hurricane collapsed the shed in which the brothers were working. All work had to be started again, and their last dime was invested to rebuild their machine. In 1914, it was completed but no pilot was found to fly it, principally due to the "command" of Bleriot type bell system, of which pilots were not very fond. Jaime flew the plane, himself, from a field in front of his house known as "Campos de Nunez." After several hops, he wisely desisted from any further test. He installed a conventional stick for warping and elevation, and a feet swing bar for rudder control.

Once this change was accomplished, the monoplane was successfully flown by the renown pilot, Pedro A. Garre. This little one-seater aircraft was all-wood constructed. wings were fabric covered, and the undercarriage had wheels and skids. Dimensions were: span, 9.00 m. (29 ft. 6 in.); length, 7.30 m. (23 ft. 11 in.); height, 2.40 m. (7 ft. 10.5 in.); wing surface, 15.00 m² (161 sq. ft.). (No photograph is available.)

Sfreddo & Paolini SYP-II





Turbay T-1 "Tucan"

Turbay T-1 "Tucan " (Toucan) — Aeronautical engineer Alfredo Turbay was born at the city of Tucuman in 1912. In January 1941, he began work on his little Parasol-type monoplane at the workshop of the "Instituto Tecnico de la Universidad de Tucuman," by then at the disposition of the Popular Aviation Center "Los Tucanes," of which Turbay was founder and president. Two years later, on the 5th of April 1943, the first flight was successfully made. Then designed X-I, the airplane was named "Tucan" in honor of the center that sponsored the work. The following month of May-and in order to present the plane to the aeronautical authorities, industry and amateurs—he flew from the field of "Los Tucanes" Center, 20 km. far from the city of Tucuman, to the "Presidente Rivadavia" Airport at Moron, covering the distance of 2,004 km.(1245 miles). As consequence of the demonstrations held at Bs.As. on August 22, 1943, at Moron's airport, it was considered superior to the Fw 44J due to the optimum handling characteristic in high acrobatics. So a small pre-series batch of six machines was begun at the works of Sfreddo & Paolini. Work was abandoned when the government expropriated and nationalized this firm, and with it the six engines, wing longerons, fuselage spars and the correspondent metal fittings.

Fourteen years of uninterrupted service demonstrated the worthiness of this little single-seater monoplane, until it was destroyed in an accident on April 18, 1957. Construction details; High-wing rigidly-braced monoplane, NACA 23012 wing section, wing in two sections joined on the centre-line and carried above fuselage on a steel tube cabane. Vee bracing struts. Two-spar wing structure with piano-wire drag bracing. Leading-edge covered with plywood, remainder with fabric. Slotted flaps inboard of

ailerons. Built-in Handley Page wing slots in leading-edge forward ailerons. Fuselage of semi-monocoque structure of spruce and plywood. Tail unit of cantilever monoplane type. Fin built integrally with fuselage. The landing gear was of fixed cantilever type. Goodyear low-pressure wheels with brake. Tail-wheel. Enclosed cockpit with sliding cover.

Power Plant: One 65 h.p. Continental A.65 four-cylinder horizontally opposed air-cooled engine driving a two blade Sfreddo and Paolini wood airscrew. Fuel tank in fuselage. Span, 7.22 m. (23 ft. 8 in.); length, 5.55 m. (18 ft. 2 in.); height, 1.90 m. (6 ft. 2.5 in.); wing area, 7.20 m² (77.5 sq. ft.); empty weight, 285 kg. (627 lbs.); weight loaded (aerobatic factors), 400 kg. (880 lbs.); maximum loaded weight, 450 kg. (990 lbs.); max. speed, 205 km/h (127 m.p.h.); cruising speed, 185 km/h (115 m.p.h.); landing speed (with flaps), 72 km/h (45 m.p.h.); rate of climb, 150 mts/min. (492 ft/min.); climb to 2,500 m. (8202 ft.) in 27 minutes. Service ceiling, 4,200 m. (13,780 ft.); absolute ceiling, 4,700 m. (15,420 ft.) range, 1,100 km. (680 miles); endurance, 6 hours.

In 1963, a project to resuscitate this plane in Turbay's own works didn't materialize. Five pre-production aircraft were to be constructed, this time designated the T-1B and equipped with a 90 h.p. Continental engine with fuel injector. The estimated performances of the new model were: Max. speed, 245 km/h (152 m.p.h.); cruising speed (75%), 230 km/h. (143 m.p.h.); min. speed, 82 km/h (51 m.p.h.); landing speed, 70 km/h (43 m.p.h.); ceiling, 4,500 m. (14,763 ft.); endurance, 6 hours; range, 1,380 km (857 miles); applied loading factor, 9g.; final loading factor, 13.5 g.

Turbay T-2 - This was the third Turbay design, the 2nd being a two-seater glider that was not built. The T-2 was a low-wing, twin-engine monoplane that was completed and prepared for its first trials, when a fire (January 28, 1949) destroyed completely the "Turbay & Soler" workshops at the Moron airport, and with it his new machine. Construction of this five-seater began in 1947, a mixed structure of wood and welded steel-tubes. It had a completely retractable landing gear, and engines were two Franklin 6A4-150-B3 developing 150 h.p. each. No pictures were taken by its builders prior to the fire. The lines of this plane resembled closely the Aero 45.

Span, 12.00 m. (39 ft. 4.5 in.); length, 9.25 m. (30 ft. 4.5 in.); height, 2.60 m. (8 ft. 7 in.); wing surface, 17.80 m². (193 sq. ft.); empty weight, 860 kg. (1,896 lbs.); useful load, 390 kg. (860 lbs.); total weight, 1,250 kg. (2,766 lbs.). Estimated performance: Max. speed, 250 km/h (155 m.p.h.); cruising speed, 240 km/h (149 m.p.h.); ceiling, 5,200 m. (17,060 ft.); range, 1,100 km. (683 miles).

Turbay T-3A - In the T-3A, of which the design began in 1957, Ing. Turbay has attempted to produce a general purpose light transport combining the ability to operate from Argentina's many small airfields with grass runways, with a range of up to 2,100 km. (1,300 miles), while carrying a useful payload. Low initial cost was important, but so was economy in the use of imported materials and equipment. To obtain the required take-off and landing performance, a comparatively large wing area was adopted with large semi-Fowler type flaps. The wing sections are NACA 23024 at the root, NACA 23018 at the outer sides of the nacelles, and NACA 4412 at the tips, these aerofoils being similar to those of the Avro 748. The wing tips have end-plate fairings to delay the effects of tip-stalling.

The two-spar wing has a slight anhedral on the inner sections, which are thickened to accommodate the twin wheels of each main leg. All five wheels (including nose-wheel) have the same diameter. Disc brakes are fitted, and the nosewheel is steerable through the braking pedals. Undercarriage retraction is electric. Flaps are actuated electrically which deflect a max. of 40 degrees. A variable incidence tailplane is fitted. The fuselage is a monocoque structure with double curvature of the skin, restricted only to the nose cone to simplify manufacture.

The cabin normally seats six in two pairs of individual seats and a rear bench seat. The airframe has been stressed to take engines up to 250 h.p.

Power Plant: two 180 h.p. Lycoming O-360-A1D engines with Hartzell propellers. Fuel carried in two tanks of 253 lt. (67 US gal.) each. Span, 13.52 m. (44 ft. 4 in.); length, 9.40 m. (30 ft. 10 in.); height, 3.60 m. (11 ft. 9.5 in.); wing area, 24.08 m². (259 sq. ft.); aspect ratio, 7.5; empty weight, 1,034 kg. (2,280 lbs.) useful load, 522 kgs. (1,151 lbs.); max. take-off weight, 1,860 kg. (4,100 lb.); max. speed, 318 km/h (198 m.p.h.); economical cruising speed, 235 km/h (145 m.p.h.); take-off run, 118 m. (387 ft.); initial rate of climb, 397 mts/min. (1,300 ft/min.); landing speed, 105 km/h (65 m.p.h.); max. range, 2,000 km. (1,243 miles); endurance, 8 hours.

The T-3A flew for the first time on December 8, 1964.

Turbay T-3B and Turbay T-4 are the latest designs made by Ing. A. Turbay.

The T-3B, in spite of having the same lettering, is an entirely new aircraft that has nothing to do with the T-3A. Still on the preliminary stage of drawings the T-3B is an 8 - 10 seater light transport of sophisticated lines.

The T-4 resembled a scaled-down Aero Commander.



Turbay T-3A