

# The Ministry of Aeronautics and the seeds of a public policy for pilot training in Brazil

*El Ministerio de Aeronáutica y las semillas de la formación de pilotos en Brasil*

*O Ministério da Aeronáutica e as sementes de uma política pública de formação de pilotos no Brasil*

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## ABSTRACT

The origin of aviation in Brazil dates back to 1911, when the first aeroclub in Brazil was founded: the Aero Club Brasileiro. From the success of the first flights, other people began to be interested in learning the piloting technique. Therefore, the necessity of providing adequate training to these new aviators emerged. However, the systematization of air instruction in Brazil occurred only in the 1940s, with the National Aviation Campaign and the creation of the Ministry of Aeronautics. This article aims to present a reflection on the role of the Ministry of Aeronautics in structuring a public policy for pilot training and learn how a little of the *modus operandi* and the aeronautical mentality worked behind the first piloting course manuals published in Brazil.

**Keywords:** Ministry of Aeronautics. Public Policy. Pilot training. Piloting course manuals.

## RESUMEN

*La aparición de la aviación en Brasil se remonta a principios del siglo XX, cuando se fundó el primer aeroclub en Brasil: el Aero Club Brasileño, en 1911. Tras el éxito de los primeros vuelos, otras personas se interesaron por aprender la técnica de pilotaje. Entonces, surgió la necesidad de proporcionar una formación adecuada a estos nuevos aviadores. Sin embargo, sólo en la década de 1940, con la Campaña Nacional de Aviación y la creación del Ministerio de Aeronáutica, se sistematizó la enseñanza aeronáutica en Brasil. Este artículo tiene*

*como objetivo presentar una reflexión sobre el rol del Ministerio de Aeronáutica en la estructuración de una política pública de formación de pilotos y conocer un poco el *modus operandi* y la mentalidad aeronáutica detrás de los primeros manuales de cursos de formación de pilotos publicados en Brasil.*

**Palabras clave:** Ministerio de Aeronáutica. Política pública. Formación de pilotos. Manuales del curso de formación de pilotos.

## RESUMO

*O surgimento da aviação no Brasil remonta ao início do século XX quando foi fundado o primeiro aeroclube no Brasil: o Aero Club Brasileiro em 1911. A partir do sucesso dos primeiros voos, outras pessoas começaram a se interessar por aprender a técnica de pilotagem. Surge, então, a necessidade de prover formação adequada a estes novos aviadores. Contudo, a sistematização da instrução aérea no Brasil ocorre somente na década de 40, com a Campanha Nacional de Aviação e a criação do Ministério da Aeronáutica. Este artigo se propõe a apresentar uma reflexão sobre o papel do Ministério da Aeronáutica na estruturação de uma política pública de formação de pilotos e conhecer um pouco do *modus operandi* e da mentalidade aeronáutica por trás dos primeiros manuais de curso de pilotagem publicados no Brasil.*

**Palavras-chave:** Ministério da Aeronáutica. Política Pública. Formação de pilotos. Manuais de curso de pilotagem.

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The acronyms and abbreviations contained in this article correspond to the ones used in the original article in Portuguese.

## 1 INTRODUCTION

This article is part of my postdoctoral research, developed at the Pontificia Universidade Católica of Rio Grande do Sul. The original study deals with the history of Aeroclub do Brasil and its importance for the pilot training in Brazil. The investigation shows the various phases by which the Aeroclub do Brasil went through in a century of existence and how it was shaping, together with the Ministry of Aeronautics, the instruction of Brazilian pilots while building an aeronautical culture in Brazil. The work is essentially based on documentary sources, researched in the archives of Museu do Aeroclub do Brasil, in the collection of José Garcia de Souza Library of the Aerospace Museum, in the digitized historical collections made available by the National Library (Brazilian Digital Library) in addition to the acquisition of the first piloting manuals produced in Brazil. This way, the history of the pilot training in Brazil under the command of the Ministry of Aeronautics was approached.

Figure 1 - Creation of the Department of Civil Aeronautics



Source: (BRASIL, 1931).

Aviation arrived in Brazil as a pilot training service, without specialized labor and without technical-scientific production, since the country lacked a basic industry necessary for technological development in various sectors of the economy, still essentially agrarian. Even the manufacture of propellers was “a challenge to the incipient Brazilian aeronautical industry, which was obliged to import them [...] at a time when import difficulties were enormous, because of the war in Europe” (INCAER, 1988, p. 500).

From the 1930s, there was a government concern about structuring air power in the country. Until then, the Ministry of Transport and Public Works dealt with aviation-related issues. In 1931, when there were aeroclub piloting courses in Brazil and commercial aviation was already a reality, the Department of Civil Aeronautics (DAC) was created through decree n.º 19,902 of April 22, 1931, signed by President Getúlio Vargas (1930-1945), subordinated to the Ministry of Roads and Public Works, which began to control and regulate civil air activities in Brazil.

Thus, the normative function of the Brazilian Aero Club, now Aeroclub do Brasil, was emptied as an institution of public interest<sup>1</sup> affiliated to FAI (Fédération Aéronautique Internationale) which, since 1918, was responsible for issuing brevets for Brazilian pilots, fulfilling an important governmental role. As a representative of FAI, the Brazilian Aero Club was officially in charge of evaluating the pilots trained in Brazil, in order to grant their respective licenses.

From the creation of the DAC in 1931, the roles previously performed by Aeroclub do Brasil started being planned, managed and controlled by DAC, that began to set flight proficiency exams and issue pilot licenses in the national territory.

At this time, there was already a strong movement among military pilots to create a ministry that united military, naval and civilian aviation. Major Lysias Rodrigues, one of the greatest enthusiasts of the cause, wrote an article entitled A pressing need: the Ministry of Air, published in “O Jornal”, issue no. 3,026, October 7, 1928, and stated that “the creation of the Ministry of Air (...) would be able to give us the long-lost, first-ever aeronautical power in South America” (RODRIGUES, 1928, p. 4).

The World War II in 1939, the strength demonstration, the development of air operations in Europe and the necessity of creating a ministry that brought together air activity in Brazil would expand.

<sup>1</sup> The Vargas government, through Decree-Law No. 1,683, of 10/14/1939, which provides for the organization of aeroclubs, recognized these institutions as Public Utility. The decree was revoked on 27/02/1967 by the Deliberation 205.

In order to better analyze the issue, Vargas gathered all the documentation sent by civilians and military to his office and handed it to Captain Nero Moura, his right-hand man, who was in charge to take other aviators opinion and present Vargas a report. In the end of 1940, the President decided in favor of the implementation of a new ministry (INCAER, 1991; PIMENTA, 2008).

Then, the Ministry of Aeronautics was created on January 20, 1941, through Decree No. 2,961, bringing together the military, naval and civil aviation of the Ministry of Transport and Public Works. It was an innovation that brought together all the aviation under the command of a single ministry and enabled the Brazilian Air Force emergence (FAB). In September 1969, the DAC had its name changed to the Department of Civil Aviation (DAC), remaining active until March 2006, when its attributions were absorbed by the then newly created National Civil Aviation Agency (ANAC). (INCAER, 1991).

The emergence of the Ministry of Aeronautics in 1941 represented the integration of national, civil and military aviation forces, with the union of the Naval Aviation School (1916), the Military Aviation School in the Army (1919) and the DAC (1931) (Art. 4 of Decree No. 2,961/1941). While the former was making progress in flight instruction under the American technical consultancy, the second one developed under the French technical direction. Based on this assumption, there were flight instruction manuals in the military pilot training schools, prior to 1941. However, the Ministry's challenge was to integrate national forces to combat training in support of the Allies during World War II, and to do so, Brazil received all U.S. financial, technological and training support.

In the same year, the Aeronautics School was created, based in Campo dos Afonsos, centralizing the entire FAB aviator officer training. In 1960, the School of Aeronautics is transferred to Pirassununga, a city located in the State of São Paulo. On July 10, 1969, the School of Aeronautics was called the Air Force Academy (LAVENÈRE-WANDERLEY, 1975).

In 1941, with the creation of the Ministry of Aeronautics, the DAC, responsible for pilot certification processes, also began to legislate on

the subject, although rather timidly, in order to regulate and standardize civil aviation instruction in the country.

According to article 26 of Decree-Law No. 2,961/41, which originated the Ministry of Aeronautics:

All aeroclubs are subject to the coordination, supervision and guidance of the Ministry of Aeronautics, and the operation and facilities of any entities, enterprises or companies intended for the study and learning of aeronautics or commercial exploitation of air transport shall be subject to their prior authorization. (BRASIL, 1941).

The structure of the new Ministry encompassed the Directorate-General (DGAC); three sub-departments: Planning (SPL), Operations (SOP) and Technical (STE); the Institute of Civil Aviation (IAC); the Committee for Studies on International Air Navigation (CERNAI) and the seven Regional Civil Aviation Services (SERAC), distributed by: Belém, Recife, Rio de Janeiro, São Paulo, Porto Alegre, Brasília and Manaus, which today are part of the twelve NURACs (Regional Civil Aviation Centers) operating in the main cities of the country.

Vargas nominated a civilian, the gaucho politician Joaquim Pedro Salgado Filho<sup>2</sup>, bachelor of laws, politically active in the Revolution of 1930, Minister of Labor in 1932, Minister of the Superior Military Court in 1938 to command the new ministry formed by men of the Army and the Navy. According to Lavanère-Wanderley, it is possible to understand the reasons why Vargas to chose a civilian as the first Minister of the Air Force.

The first Minister would have the thorny task of merging into a single military force the Army and Navy, avoiding the jealousy and attempts of this or that group. Salgado Filho was the equidistant element of the extinct Military Aviation and Naval Aviation, solving and reconciling the complexes of the creation of the new Armed Force. (LAVENÈRE-WANDERLEY, 1975, p. 217).

In an interview with the press on January 21, 1941, Salgado Filho stated that:

One of my greatest concerns will undoubtedly be to provide the largest number of pilots in Brazil. By creating flying schools in all states and cities, with a rationalized instruction in courses as good as all the scholarships, we can, at the end of a short term, have thousands of young aviators. (NOBRE, 1941, p. 101).

<sup>2</sup> Salgado Filho left the Ministry on October 29, 1945, when Vargas was deposed. He was elected senator in 1947 by the PTB and died at the age of 62, on 07/30/1950, in a plane accident in the middle of the election campaign, when he was going to Itu to meet Vargas

The creation of the Ministry of Aeronautics and later the institutionalization of policies aimed at training courses for civilian pilots is part of the scope of a public policy of the Brazilian State in partnership with the societal actors represented, on the one hand, by civil society and non-profit organizations (aeroclubs) and, on the other hand, by the emerging aeronautical market. (MARQUES; FARIA, 2013).

Vargas sought to align his political agenda with the themes of current debate, such as the industrialization that motivated Brazil to get into World War II, from which he reaped later results with the support of the United States in the development of national aviation (AGUIAR, 2019; LASSANCE, 2020).

It is worthy mentioning that the Vargas government's policy was intensely focused on the national integration project promoted by commercial aviation. "At that time, subsidies were created per kilometer flown and tax exemptions were granted for the acquisition of aeronautical material by airlines" (FAY, 2002, p. 130). In addition, the technological evolution of the aeronautical industry made aviation a strategic sector for national defense and the country industrialization process, especially due to the lack of transport, communication and energy infrastructure at the time.

National aviation, thus, became a propaganda tool of Vargas government strongly publicized by the media of the time (PIMENTA, 2008).

## 2 THE MINISTRY OF AERONAUTICS AND THE NATIONAL AVIATION CAMPAIGN

In Brazil, the 1940s proved extremely fertile in aviation. The government of Getúlio Vargas (1930-1945) boosted aviation through the granting of benefits and the National Aviation Campaign (CNA). (FERREIRA, 2012).

During his government and with the approach of World War II, the implemented aeronautical policy was accentuating its nationalist contours. It had its high-pressure points related to some critical moments of the international scenario: the entry of the United States into the war in December 1941, the Brazilian rupture of relations with the Axis (January 1942), Brazil's declaration of war in Germany and Italy (August 1942), the creation of the Brazilian Expeditionary Force

(1943-1944) and the pressure to close airlines linked to the Axis (SILVA, 2012).

As Fraga recalls (2014, p. 5) "the plane, more than ever, had the fundamental function of guaranteeing Brazil's sovereignty with regard to the attacks of the Axis countries, especially Germany, which was making inroads over the coast of South America."

Another factor of concern of the government was the Brazilian pilot training. In 1938<sup>3</sup> the legislation which recommended that aircraft in Brazil should be operated by Brazilian crew members, born or naturalized, already reflected the lack of pilots in the country.

The lack of pilots in Brazil during World War II led Getúlio Vargas' government to carry out the National Aviation Campaign, or CNA. The emergence and consolidation of the idea of the future Minister of Aeronautics Salgado Filho to create CAN in 1941, dates back the Week of Wing, in 1935, with the fundamental support of journalist Assis Chateaubriand, owner of the chain of newspapers *Diários Associados* and president Getúlio Vargas himself. Getúlio was also noted for being one of the presidents who most used the plane as a means of transport in his government (SOUZA, 1944).

Assis Chateaubriand launched a campaign, by using his newspapers to ask for donations and also to publicize the names of the aeroclubs that had received the contribution. He employed the consecutive method: donations followed by "baptisms" and inaugurations. First, he raised funds, then bought the plane and baptized it with the name of the godfather or a personality he wanted to highlight. Almost every day there were notes in the newspapers about the campaign.

Also known as Campaign to Give Wings to Brazilian Youth or Give Wings to Brazil, CNA contributed decisively to the number of aeroclubs, going from less than forty, in the 1930s, to about four hundred throughout the country.

It should be noted, however, that this stimulus for the consolidation of an "aeronautical mentality"<sup>4</sup> among the Brazilian youth had a real concern with the war and, therefore, it was necessary to create an aeronautical reserve army, calling on the young people of society to engage in campaigns in favor of aviation and that could be incorporated into military aviation, if necessary. In order to facilitate the constitution of

<sup>3</sup> Previously on October 21, 1931, Dr. César Grillo, Director of the DAC through an Ordinance had set in two years the deadline for nationalization of crews. In 1936 through Ordinance No. 828 of 12/8/1936 and No. 520 of 10/29/1938 recommended that 100% of the crew be Brazilian.

<sup>4</sup> The expression "aeronautical mentality" was used by the newspaper *A Noite* in the article entitled "Give Wings to Brazil: more airplanes in the national construction", which narrated the celebrations commemorating The Week of the Wing with the emergence of new national prototypes. (NOITE, 1940, p. 7)

this aeronautical reserve, the government assumed the responsibility for paying the flight hours in aeroclubs and flight schools.

With visible support from the Vargas government, during the Estado Novo (1937-1945), several aeroclubs were created and the pilot training surpassed expectations.

During CNA, which ended in the early 1950s, more than 1,000 planes were donated throughout Brazil, in addition to some donated to aeroclubs from other South American countries. Brazil had an increase of more than 3,000 civilian and military pilots trained by the aeroclubs. The campaign numbers are impressive. According to Morais (1994, p.475, apud. FERREIRA, 2012), in 1944 about 600 aircraft were donated and, in 1946, 800 aircraft were donated by CNA.

In a single day, on October 20, 1951, in Manguinhos, 80 aircraft were given to aeroclubs. At the same time, at the end of the ceremony, a check worth one million cruzeiros<sup>1</sup> was handed to the President of Brazil by the National Aviation Campaign, for the acquisition of 41 new aircraft (in total, it would raise \$2.5 million dollars) (CRUZEIRO, 1971, p. 80).

If, on the one hand, CNA encouraged the pilot training in Brazil and the strengthening of aeroclubs, it also generated a propitious moment for the development of the aeronautical industry in the country, enabling the government to purchase light aircraft for primary training manufactured by the National Air Navigation Company (CNNA) and the São Paulo Aeronautical Company, encouraging the national industry. However, with the end of the war, the American industry, which had been in a process of accelerated growth and had large quantities of aircraft and aeronautical materials, began to donate or sell its aircraft at symbolic prices, which prevented the growth of the emerging Brazilian industry, leading Brazil to resume imports of larger civilian aircraft and become dependent on the import of inputs from the United States (MARQUES, 1948; FAY, 2002; FORJAZ, 2005; PIMENTA, 2008; RIBEIRO, 2008; SALES, 2012; GODOY; CALAZA, 2013; TEIXEIRA, 2013).

### **3 THE BEGINNING OF THE STANDARDIZATION OF THE PILOT TRAINING IN BRAZIL**

The 1940s was emblematic for the development of aviation in Brazil and worldwide, largely driven by the need of military war power due to World War II (1939-1945).

The construction of Parnamirim air base in Natal in 1942 was considered the most strategic for the defense of the American continent in the face of the military offensive of the Axis countries. The site was provided with the most modern warfare technology. It's worth mentioning that Natal air base is located west and Parnamirim Field, known as the largest U.S. base outside the United States, to the east. Records indicate that it was the busiest air base on the planet, operating 24 hours a day, with landings and takeoffs in short time intervals (LAVENÈRE-WANDERLEY, 1975).

The partnership with the United States, which saw the Brazilian territory as a strategic geographical point for the defense of the American continent and to establish its bases during the war, also bore fruit to Brazil. In 1943, a training unit was organized at Natal air base, entitled USBATU (United States – Brazil Air Training Unit) whose purpose was to provide air and ground instruction to FAB officers.

At the end of the war, the command of the US bases was transferred to the Brazilian air authority. Brazil not only incorporated a network of modern airports built by Panair do Brasil S/A, which were used as a U.S. military air base during the war but also implemented the long-dreamed steel industry, trained its military contingent in real war through contact with state-of-the-art materials and equipment, and received funding for the acquisition of weapons, vehicles and ammunition of American origin (INCAER, 1991; SILVA, 2012).

Although Brazil/US alliance encountered some resistance among the military who observed the unequal relationship between the armaments and supplies used by US forces and the ones available for the Brazilian troops, “the Brazilian military authorities, in need of the foreign pair to modernize their forces, compete with their historic rival of Prata and, mainly, fight a modern war in a minimally efficient way” (OLIVEIRA, 2015, p. 13), could not dispense with the United States aid at that time.

In this decade, focused by the strong development of civil and military aeronautics, now under the command of the Ministry of Aeronautics, the first pilot course manuals in our history are published: Pilotage Manual (1940); Elementary Maneuvers of Flight (1946), and Manual of Training of the Civil Pilot (1947), opening new paths to the research, whose trail would lead us to what would be the first manual of theoretical and practical knowledge of piloting published in Brazil entitled Aviation Elements (LEITE, 1940).

**Figure 2** - North American instructor teaching the engine mechanics of a PV-1 Ventura during a USBATU course (United States Brazil Training Unit) – Natal (1943).



Source: (MEDEIROS, 2014).

### 3.1 Aviation Elements (1940)

The indication of this being the first piloting manual published in Brazil becomes evident in the preface of the work, written by Col. Antonio Guedes Muniz, on May 19, 1939, where it can be read: “we do not know, written in the Brazilian language, any book on ‘ELEMENTS OF AVIATION’ which, by itself, would make the present work worthy of the greatest applause” (LEITE, 1940, s./p.).

With 219 pages and 249 figures, including drawings and photographs, almost all produced by the author, the book integrates volume XV of the Aeronautical Dissemination Library of the Aero Club do Brasil. The objective of the book, which presents basic knowledge of the piloting technique in a very embryonic way, is to be an introductory work aimed at the beginner, layman or simple curious who wants to know about aviation. Written in Portuguese, the author, who is a civil aviator, seeks to overcome the difficulties of access to foreign books and articles. With a fluent language, the book is revealed through an informative dialogue with the reader.

The book also presents curious facts that marked a time due to the scarce and rudimentary air navigation capabilities, according to the following examples: “The localities that are on the common route of the aircraft have their names painted on the roofs of the railway stations, or other main buildings” (LEITE, 1940, p. 14); “Farmers, for their guidance, know some practical rules of weather forecasting that generally give good results” (LEITE, 1940, p. 160), in praise to the empiricism of common sense. Or, it points out the aviation modernity with which the pilots of the time were enthusiastic: “Today’s commercial aircraft reach, in trips that can be made at any time, any season, speed of approximately 400 kilometers per hour, with relative safety like in all means of transport (...)” (LEITE, 1940, p. 11-12). It should be known here that flight safety was not yet the central concern of air activity in Brazil, still widely practiced by amateurs and aviation lovers.

Information about flight instruction is presented in the manual as well as advice about the student’s recurring practice of making his/her first solo flight only “after a training period that should not be less than 10 hours, totaled in lessons of 15 to 20 minutes and when the student has already performed a good series of flights without the need of the instructor intervention” (LEITE, 1940, p. 134). It is also stated that the universally adopted method of flight instruction was the double-command, in which the instructor should seek, from the first flights, to inspire the student confidence. The courses had an average of 12 to 15 hours of flight time.

It is, therefore, a document that deserves to be highlighted more for its historical value, for recording Brazilian aeronautical culture and thinking of the early 1940s, when world aviation was not yet governed by international legislation, than for its technical importance, since it dispenses with more specialized theoretical knowledge, but that “will certainly serve as a happy foundation for much more complex future studies” (Cel. Antonio Muniz, preface, apud. LEITE, 1940, s./p.).

### 3.2 Pilotage Manual (1940)

The Pilotage Manual also published in 1940 has two volumes with very complete and richly illustrated contents and can be considered the first official manual of military flight instruction published in Brazil. No information was found that it was an authorized translation or on what documents the work was based. Volume 1, with a circulation of 3000 copies, has 156 pages and presents the following subjects: elementary

maneuvers, training maneuvers, acrobatic maneuvers, flight without visibility, cruise flight, group flight, and night flight.

It is possible to identify in this document the first indications of the flight course by instrument called “flight without visibility”, as well as there is an instruction for flight in formation (group flight).

Volume 2 has 38 pages and is specifically for the piloting instruction. In this document it can be found the seed of philosophy to be developed in the flight instructor course manual, including identifying the moral qualities and mental reactions that the students are supposed to have during the instruction, in which it is possible to recognize the flight maneuvers to be performed and the necessary workload at each stage from ground instruction to advanced training totaling 220 hours.

**3.3 Elementary Flight Maneuvers (1946)**

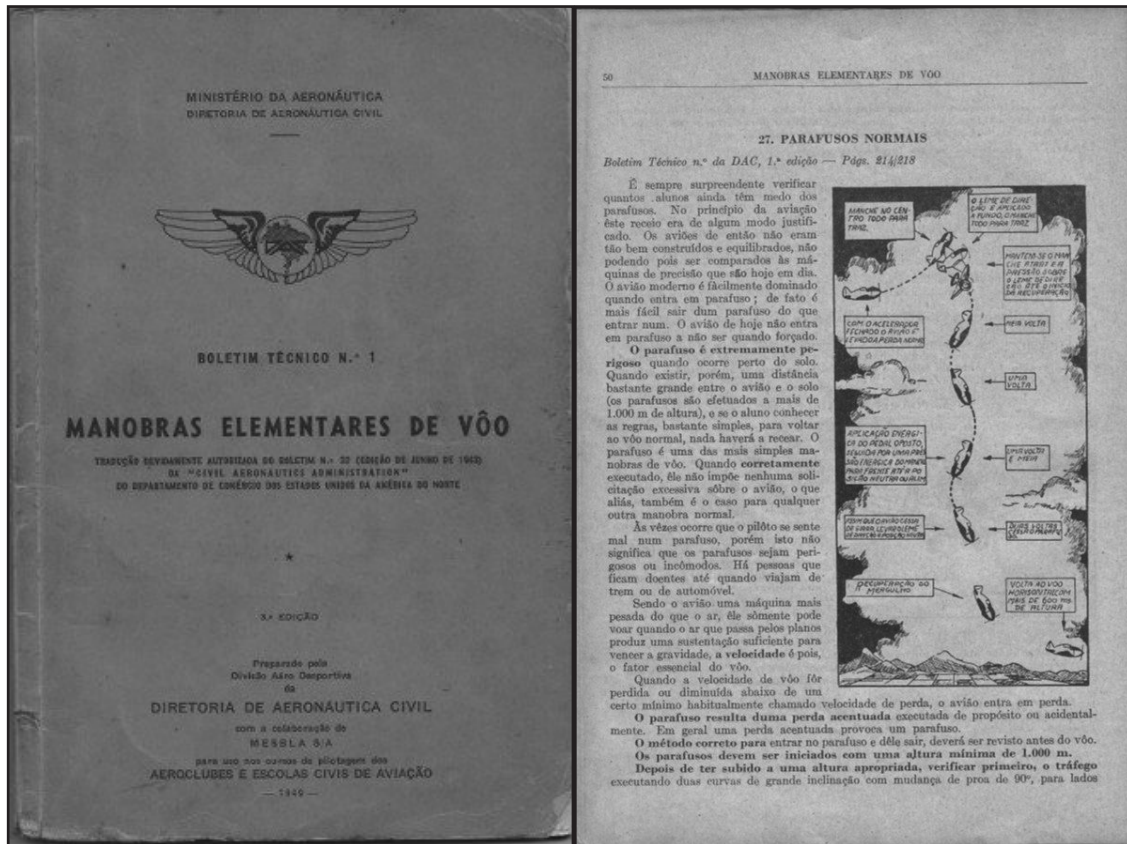
The manual entitled Elementary Flight Maneuvers (BRASIL, 1946), published through the

Technical Bulletin No. 1 is an authorized translation of Bulletin No. 32, of June 1943 of the Civil Aeronautics Administration of the United States, predecessor of the Federal Aviation Administration (FAA), published by the Directorate of Civil Aeronautics for use in the piloting courses of aeroclubs and civil aviation schools. This edition has 75 illustrated pages that present the elementary maneuvers for the pilot training. The objective is to standardize rules and methods aimed at the instruction of pilots and instructors.

In the preface of the second edition, it is informed that the manual is only a complement, being recommended the reading of Technical Bulletin No. 2 “Manual of the Flight Instructor” and technical bulletin No. 4 “Manual of the Civil Pilot”.

The manual is addressed to the student and presents didactic explanations from the familiarization with the plane to its landing, and also the care to be observed during takeoff, ascent, flat flight, curves, losses, flight in rectangle and approach for landing.

Figure 3 - Elementary Flight Maneuvers – Rio de Janeiro (1946).



Source: (THE AUTHOR, 2016).

The manual also presents some flight exercises with the purpose of assisting in the increase of the student's expertise. Among the maneuvers indicated for the flight instruction described in the manual Elementary Flight Maneuvers are: the "S" curves over the road, 180° vertical approaching, 360° vertical approaching, series of eights, forced landings, spins, takeoffs with crosswinds, curves of large lateral inclination, landings with crosswinds, 720° curves of large lateral inclination, spirals, runway landing with engine, sideslips and terrain recognition for landing.

The text presents a comparison in relation to the state-of-the-art of aircraft safety in the early years of aviation with those used in the instruction at that time:

It's always surprising to check how many students are still afraid of the spins. In the beginning of aviation this fear was somehow justified. The aircraft of that time were not so well built and balanced and, therefore, cannot be compared to the precision machines that are available today. The modern airplane is easily mastered when it goes into a spin; in fact, it's easier to get off a spin than to get into one. Today's plane doesn't spin unless forced. (BRASIL, 1946, p. 50).

Spin flight instruction maneuvers were recommended to be performed more than 1000 meters high in order not to endanger the student's and instructor's lives. Finally, the document provides guidance to the student about the proficiency exam, which is called "flight exam".

### 3.4 Civil Pilot Training Manual (1947)

The document entitled Civil Pilot Training Manual (BRASIL, 1947), published through Technical Bulletin No. 4, is an authorized translation of Bulletin No. 23 of September 1941 of the Civil Aeronautics Administration of the United States, predecessor of the FAA. This edition has 354 illustrated pages that introduce the maneuvers for the Elementary and Secondary Course of the Civil Pilot Training Program. It can be said that this is the first official manual published by the Directorate of Civil Aeronautics for use in the piloting courses of aeroclubs and civil aviation schools in Brazil.

The Manual is divided into five parts: a) Aircraft Operation; (b) Elementary Piloting

Figure 4 - Civil Pilot Training Manual – São Paulo (1947).



Source: (THE AUTHOR, 2016).



Course; (c) Secondary Flight Course; d) Flight of the Hydroplane; and e) General Information. The manual objective is to supplement the instructor's explanations and help the student remember the knowledge previously acquired.

The instruction methodology is based on the view of the maneuver as a problem to be solved. At the end of the maneuver, the student is also evaluated with questions that allow the verification that he fully understood the maneuver. The spins constitute some maneuvers to be performed still at the elementary level of the instruction. And solo flight is reaffirmed with a minimum of 8 hours of double command training in basic maneuvers.

The Elementary Piloting Course is a prerequisite of the Secondary Flight Course. Hence it can be inferred that the first is the current private pilot training course (PP), and the second is the precursor of the commercial pilot training course (PC) of aircraft in Brazil. Generally speaking, the Secondary Flight Course follows the same maneuvers developed in the Elementary Piloting Course, in which the advanced interpretation of maneuvers and their application to the heavier and more powerful aircraft will be complemented by instruction on acrobatic maneuvers. In this sense, strong emphasis was placed on the most advanced maneuvers, of the acrobatic type like chandelle, wingover, tail slide, precision spins, looping, tonneau, Cuban eight, retournement, and Immelmann.

The Civil Pilot Training Manual provides some moral advice to young pilots, using experiences lived in the daily routine of aerial instruction as it can be seen in the fragment below:

Having acquired his pilot's certificate and thus being allowed to leave the field, the young pilot is often tempted, when out of sight of his airport, to do things he would never think of doing while under observation. It has a natural inclination to "show off", to dive into his girl's house, and do other things that violate the Air Traffic Regulations and that, moreover, are generally highly dangerous" (BRASIL, 1947, p. 264).

It seems that the guidelines, although no longer recorded in the Course Manuals of the National Civil Aviation Agency (ANAC, 2020), remain quite current, according to the testimony of the coordinator of Aeroclubes do Brasil courses at that time:

Commander: He's giving an instruction. He's not taking the plane for a joy ride. As there are instructors in other schools who see a ship down there and gives a low fly-by on the ship. Or there's a house there, "ah it's my girlfriend's house," so... Got it? He has to focus and know that he is giving an instruction, that he is providing a service to a person who is paying for it. He has to follow what the course manual, our course regulations require. (Interview on 11.07.2015).

The analysis pointed out that although the concern with flight safety was present in a transversal way in the first manuals, this idea was still incipient, since the maneuvers foreseen as spins and spirals, characteristic of acrobatic flights, as part of the flight instruction.

#### 4 FINAL CONSIDERATIONS

The 1940s proved to be the golden age for aeroclubs and the promotion of Brazilian aviation, thanks to the National Aviation Campaign (CNA). With visible support from the Vargas government during the Estado Novo (1937-1945), which issued several decree-laws<sup>5</sup> for providing grants to aeroclubs, glider clubs and civil aviation schools, several aeroclubs were created and the pilot training exceeded expectations.

The campaign entitled "Give wings to Brazil" encouraged donations from civil society to purchase airplanes and aeronautical material for aeroclubs, helping to build an aeronautical mentality in the country.

Through the history of aviation in Brazil, it is observed that the institutionalization of the pilot training as a public policy has its origin with the creation of the Ministry of Aeronautics (1941) that enabled the structuring of the pilot training in the country, with the publication of the first piloting manuals, which definitively launched the seeds of the current flight course manuals in Brazil.

This virtuous cycle of public policies during the Estado Novo drove important sectoral advances in the Brazilian economy, strongly marked by the developmental bias and the economic relations with the United States that financed Brazil's loyalty. Despite being taken as a propaganda tool of the Vargas government, the promotion of aviation left indelible marks in the development of Brazilian aeronautical thinking and training.

<sup>5</sup> Decree-Law No. 678 of September 12, 1938 (approves regulation for the provision of grants to aeroclubs, glider clubs and civil aviation schools); Decree-Law No. 1,320 of June 5, 1939 (provides for the application of the appropriation to subsidize aeroclubs and civil aviation schools), and Decree No. 11,278 of January 8, 1943 (approves the regulation for granting a subsidy to aeroclubs and civil aviation schools).

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