THE 1965 *ANGOLA UNDERTAKINGS* AIRMAIL STAMP SERIES

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[ABSTRACT]
This article focuses on a group of engineering undertakings in Angola, which are dealt with in an inverted order, as the iconographic sources the article looks at established the case-studies, and not the other way around. An airmail stamp set issued in 1965, and in use in the Portuguese Province of Angola, was the basis for the research, and also validated the territorial, technological and economic strategic worth of the objects included in it.
One of the major difficulties with infrastructure in Angola has to do with the distance between its larger cities. Apart from Huambo, which is strategically close to the country's territorial centre, all its main towns are located along the coast, at distances that were travelled by boat. This explains why the major railroads that penetrated the Angolan inland, from Luanda, Lobito and Moçâmedes (plus the shorter, narrow-gauged, Amboim railway), do not meet at any point. This urban settlement dispersion is a drawback also in terms of the electricity supply, an issue the hydroelectric plants included in the group of engineering feats were meant to solve.
Almost all the facilities featured on the ten stamps were built during the third quarter of the 20th century, which was a period of technological development and the exploration of Angolan natural resources and transportation networks. All have survived, even if some have undergone considerable change and reconstruction.
Paradoxically, the Colonial War years were also times of economic growth in the Portuguese-speaking territories in Africa, and particularly so in Angola, through investment by the Portuguese State in infrastructure, the immigration of Portuguese colonisers seeking out this land of opportunity, and the so-called 'war effort'. This was the case of the oil and natural gas sectors, which grew in importance in the Angolan economy, so that by 2005 and 2008 they accounted for 56% and 58% of the country's Gross Domestic Product (Esperança, 2011: 184). This has certainly not changed much over the last decade.
The facilities in the article are in part dealt with in accordance with the schedule for the 1963 presidential visit to Angola by Américo Tomás, during which this President of the Portuguese Republic visited — and in some cases inaugurated — said infrastructures.
The visit was accompanied by the issue of new banknotes from the Bank of Angola, which had some reissues during the following years, and were also dealt with in the research, as they also showcased infrastructural endeavours in Angola, and twice repeated the same subjects as in the postage stamps.

KEYWORDS: 20th Century Engineering in Angola; Hydroelectricity in Angola; Bridges in Angola; Portuguese Civil Engineering

THE *ANGOLA UNDERTAKINGS* POSTAGE STAMP ISSUE

The Portuguese Ministry for Overseas Affairs had great autonomy of powers and policies over the country's vast and widespread colonies in continental Africa; the archipelagos of Cape Verde and São Tomé & Príncipe (in the Atlantic Ocean, off the west coast of Africa); the Macau territories; East Timor; and the territories of Goa, Daman and Diu, on India's West Coast (until 1961). It accordingly had the power to order and issue postage stamps, independently of the main Postal Service in 'European' Portugal (officially known as 'the Metropole').

The Angola Undertakings Airmail Stamp Series resulted from the Ministry for Overseas Affairs decision to issue ten stamps showcasing the most significant infrastructures built in Angola after World War II. The Ministry resolution, through its Postal Values Service, was duly published as Ministerial Order 21 377 in issue 149 in the 1st Series of the Government Legal Gazette (*Diário do Governo*) of 7 July 1965. The stamps were ordered from Lisbon's National Mint and Printing Office (*Casa da Moeda*), where the imprints are still stored, under a process dating from the end of 1963: much earlier, therefore, than publication of the related Ministerial Order in the Government Gazette.

The Ministerial Order called for stamps worth 1$50 (an issue size of 5 million), 2$50 (7 million), 3$, 4$ and 4$50 (1 million each), 5$, 6$, 8$50 and 12$50 escudos (500 000 each). The issue was not given a name, so that it has been variably known under several names in stamp collecting circles and catalogues, such as Angola Undertakings (*Empreendimentos Angola)*, but also Oil Refinery, Dams and Bridges (*Refinaria de Petróleo, Barragens e Pontes*) or *Development Issue* (*Edição Fomento*) — since most of the engineering facilities depicted were subsidised by the Overseas Investments Fund. *National Mint/Printing Office* papers also refer to it as "Dams and other undertakings in the Province of Angola" (*Barragens e outros empreendimentos da Província de Angola*), or "Angola Airmail – Bridges, Dams and Other Undertakings" (*Correio Aéreo de Angola — Pontes, Barragens e Outros Empreendimentos*).[1]

All stamps were in a horizontal (landscape) position, except for the 1$50 upright (portrait) one. In accordance with the information in stamp catalogues, the illustrations for the 3$00, 4$50, 5$00 and 8$50 stamps were drawn by António Silva da Cunha Rocha, an artist born in Figueira da Foz in 1932, known for landscape paintings and watercolours who died on 26th July 2016 — one week before the research identified him as the artist.

The 1$50 stamp (Fig. 1) was illustrated by Ibolya Salkovits. This artist, born in Hungary on 5 May 1928, had emigrated to Brazil in 1949, together with her husband Zoltan Ostffy Salkovits, also a graphic artist of Hungarian descent. Their move was approved through the South American country's programme of Selection of Displaced People in Europe, via its Turin Consulate, according to papers kept at the National Archives in Rio de Janeiro, where the Salkovits entered the country (Fig. 2).

1. Portuguese Mint process 6210/60 "Pontes e Barragens" — ANGOLA, shelf 13, box 103.

Fig. 1a. Oil Refinery. 1$50 Angola Postal Service airmail stamp. Printed at the Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: Ibolya Salkovits

Fig. 1b. Luanda Oil Refinery. Portuguese Communications Foundation. Picture Archives, Archive no. 8000355, ref. FT-621.D SVPU

Ibolya Salkovits' family disclosed to the research team that she moved to Porto (Portugal) in 1956, where she founded an advertising agency named *Época*, which engaged Cunha Rocha. Both would move to Lisbon in 1962, taking *Época* with them. Salkovits' illustration of the Luanda oil refinery was not her only commission for the Portuguese Ministry for Overseas Affairs, as in 1963 she had designed a beautiful set of stamps depicting snakes of Guinea-Bissau, for use in that Overseas Province, as the colonies were then known. The same family sources suggest, however, that all drawings attributed to Salkovits in stamp-collecting circles may have been by Cunha Rocha, probably ordered through *Época*, and that the sharing of authorship credits was a marketing decision by both of them. Ibolya Salkovits was to move to France in 1964 and later settled in Sweden, where she died in Skövde in 1985.

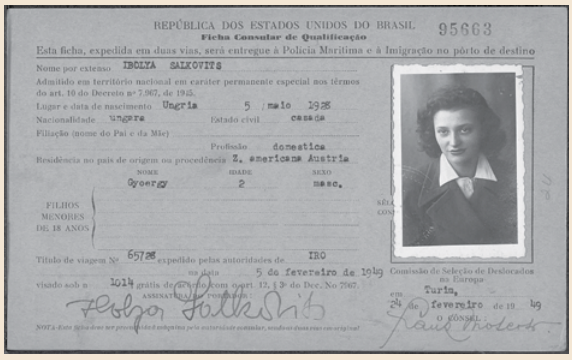
REPÚBLICA DOS ESTADOS UNIDOS DO BRASIL 95663
Ficha Consular de Qualificação
Esta ficha, expedida em duas vias, será entregue à Polícia Marítima e à Imigração no pôrto de destino
Nome por extenso IBOLYA SALKOVITS
Admitido em território nacional em caráter permanente especial nos têrmos do art. 10 do Decreto nº 7.967, de 1945.
Lugar e data de nascimento Ungria 5 maio 1928
Nacionalidade Ungra Estado civil casada
Filiação (nome do Pai e da Mãe)
Profissão domestica
Residência no país de origem ou procedência Z. americana Austria
NOME IDADE SEXO
FILHOS MENORES DE 18 ANOS Gyoergy 2 masc.
Título de viagem Nº 55728 expedido pelas autoridades de IRO
na data 5 de fevereiro de 1949 Comissão de Seleção de Deslocados na Europa
visado sob nº 1014 grátis de acôrdo com o art. 12, § 3º do Dec. No 7967.
Turin, em 24 de fevereiro de 1949
ASSINATURA DO PORTADOR
O CÔNSUL
NOTA: Esta ficha deve ser preenchida a máquina pela autoridade consular, sendo datilografada em original

Fig. 2. Ibolya Salkovits' Consular Qualification Card no. 95663, filled out in February 1949 at the Brazilian Consulate in Turin, Italy

The chief engineer for the National Mint/Printing Office's Production Department, Abel Tavares Fernandes, was responsible for the submission for the stamps' blueprints on 20 January 1964. The Portuguese Mint charged 42 300 escudos for manufacturing all stamps, and 20 batches of an initial one million units were shipped to Angola on the *Vera Cruz* ship in July 1965, when payment by the Ministry for Overseas Affairs was also confirmed by the head of the Directorate-General of Public Works and Communications. Extra issues of the stamps were ordered in 1966 and 1967.

Research at Lisbon's Communications Museum (*Museu das Comunicações)* has provided an extra piece of information, in the form of the original photographs — some of which bore jotted down instructions — sent to the artists (who most certainly did not travel to Africa!) for their renders. Some of these match copies at Lisbon's *Arquivo Histórico Ultramarino* (Overseas Historical Archives), and we have paired them with the stamps issued.

THE LUANDA OIL REFINERY

The stamp by Ibolya Salkovits, printed in yellow, light-blue, ultramarine blue (an appropriate colour for the set), red, black, brown, green and violet, shows the Luanda oil refinery, the importance of which became central to Angola's recent history.

According to *Breve história da pesquisa do petróleo em Angola* (A brief history of the search for oil in Angola) published in *Electricidade* no. 111, the first licence to explore petroleum and its derivatives in Angola was conceded to the company Canha & Formigal in 1910, for an area 114 000 sq. km. The management of the search for petroleum in Angola was then to be granted to Companhia de Pesquisas Mineiras de Angola–PEMA, until 1920. Prospection was carried out in the River Dande area, in N'Gondo and in Porto Amboim.

Meanwhile, the *Companhia de Petróleo de Angola* (CPA) was established in 1916, with its head offices in Rua dos Fanqueiros in Lisbon. Its major shareholder was *Banco Nacional Ultramarino* (the Bank which controlled all issues of currency in the Portuguese colonies), and it joined forces three years later with the American *Sinclair Consolidated Oil Corporation* based in Nassau Street, New York, which became responsible for the technical management (Gazeta, 1925: 32). CPA then signed a contract with the Angolan General Government in 1922, to carry out prospection across an extensive concession area in Northwest Angola, where it was granted exclusive rights to explore any petroleum, mineral oil, bituminous substances, and hydrocarbon gas fields, as long as those areas were demarcated, until 15 August 1936. Despite important evidence of oil and gas being revealed at almost every drilling, no commercial field was opened (Salgado b), 1975: 640 – 641).

Exploration was resumed after 24 March 1953, when a contract was signed between the Portuguese State and Companhia de Combustíveis do Lobito (Purfina) for a concession on the Cuanza and Congo sedimentary basins. The firm, which was a subsidiary of the Belgian *Petrofina*, sold petroleum products across Europe and Africa under the brand *Fina* — and, up until 1960, also as Purfina — and had established its Angolan operation for the distribution of oil derivatives in 1926.

The areas granted to the Belgian company were to be expanded in 1955: the year when the first oil field was discovered in Benfica, 40 km south of the Angolan capital and 4 or 5 km from the seacoast. According to records published in 1961 by General Horácio de Sá Viana Rebelo (1910 – 1995) for his term as Governor-General of Angola, news of the discovery ran wild back in Portugal (Rebelo, 1961: 123). Rumour had it that the Portuguese dictator, Oliveira Salazar, grumbled "this is really the last straw!" when the news reached him.

On 22 October 1957 — the year a new oil field was discovered in Luanda — the rights awarded to Companhia de Petróleos do Lobito – Purfina were transferred to the newly founded Companhia de Petróleos de Angola – Petrangol. One third of its shares were offered to the Overseas Province of Angola (Salgado b), 1975: 649), while Petrofina,[2] which provided technical, commercial, and financial support, was given an equal stake. The remaining shares were distributed amongst smaller shareholders (Herrick, 1967: 310).

The 1952 *Purfina* contract included and allowed for the installation in Angola of an oil refinery for the processing of crude oil resulting from local drilling, as well as imported crude. Said rights were to be passed-on to *Petrangol*. Refining operations at the facility began in 1958, with a processing capacity of 100 000 tonnes/year, in the same year oil was struck in Cacuaco, 15 km north of Luanda. The Galinda field produced a new well in 1959, and 1960 saw the refinery capacity grow to 220 000 tonnes/year. The strategic importance of the Luanda refinery was heightened by it being the first infrastructure of the kind established on the west coast of Sub-Saharan Africa (Boletim da Associação, 1963: 149).

Another well was opened in 1961 at Tobias, while the refinery's output grew to 600 000 tonnes per year in 1962. The refinery, of course, wasn't so much a fixed engineering construction as a mechanical assemblage adapting to organic change and improvement. For this reason, the contractors are harder to identify, and collective teamwork of variable constellation prevails over traceable individual authorship.

THE 1963 PRESIDENTIAL VISIT TO ANGOLA

The Luanda oil refinery was one of the final stops on the 1963 visit to Angola by the Portuguese President, Admiral Américo Tomás. According to the Angola Industrial Association Bulletin no. 57, which recorded his trip, the catalytic upgrade of the refinery, which allowed for a further increase of the plant's oil processing capacity, was inaugurated during his visit on 4 October, as commemorated by an engraved stone plate on site (Boletim da Associação, 1963: 271 - 272).

The presidential visit, with the entourage arriving in Luanda by ship on 16 September, is minutely described in the supplement to number 458/459/460 of *Boletim Geral do Ultramar*. In line with the practice for previous presidential visits to the colony, new batches of Bank of Angola banknotes — printed at *Thomas de La Rue & Co. Ltd. of London* — bearing

2. Petrofina eventually merged with the French giant Total S.A. in December 1998, producing TotalFina, the third biggest oil company in Europe, and sixth largest in the world.

Tomás' likeness came into circulation on the same day as his arrival; the new notes were for 50$00, 100$00, 500$00 and 1000$00. All of them happen to depict infrastructures in Angola.

The 100$00 note shows the bridge over the River Cuanza at Porto Condo (Fig. 3), while the 1000$00 note shows the Mabubas hydroelectric dam on the River Dande (Fig. 4). Both were also to be included in the stamp set dealt with herein (Figs. 5 and 6). The former serves the road running from Malanje down to Kuíto (the former Silva Porto), and was built to a project coordinated by engineer António Pais, who at the time was the interim head of the Malanje Province Public Works Department.

Fig. 3. Salazar Bridge over the River Cuanza. 100$00 Bank of Angola note. Printed at Thomas de La Rue & Co. Ltd. London. Issue date: 10 June 1962

Fig. 4. Mabubas Dam. 1000$00 Bank of Angola note. Printed at Thomas de La Rue & Co. Ltd. London. Issue date: 10 June 1970

Fig. 5a. Oliveira Salazar Bridge. 8$50 Angola Postal Service airmail stamp. Printed at the Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: Cunha Rocha

Fig. 5b. Oliveira Salazar Bridge over the River Quanza — Malange 30/7/63'. Photograph: Foto-Algarve/Silva Porto. Portuguese Communications Foundation. Picture Archives, Archive no. 8000355, ref. FT-622.J SVPU. Note handwritten remark: "To be made using both photos together"

Fig. 6a. Capitão Teófilo Duarte Dam [Mabubas]. 4$00 Angola Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: artist unknown

Fig. 6b. Partial aspect of the Mabubas Dam. Photographer: D.S.E — S. Publicidade de Angola. Overseas Historical Archives, Archive no. AGU/PG 757 ref. ID: 17883

The Mabubas dam, named after Capitão Teófilo Duarte (the Portuguese Minister of the Colonies between 1947 and 1950), was designed by engineer António Vecchi Pinto Coelho as the first modern investment of its kind in Angola, and was located some 60 km northeast of Luanda. This infrastructure was built between the official date for the start of the construction work, 18 February 1948, and June 1954, when it was inaugurated by the Portuguese President, Air Force General Francisco Higino Craveiro Lopes (Lisbon, 1894 – 1964). It provided the Angolan Capital with an important new source of energy through its twin turbines, which in 1957 were added with an extra pair of power turbines. The name of Craveiro Lopes, who held the presidential office before Américo Tomás (from 1951 to 1958), was likewise given to the Luanda airport shown on the 50$00 note (Fig. 7). The capital was also home to the country's major seaport, shown on the 500$00 banknote (Fig. 8).

Fig. 7. Craveiro Lopes Airport in Luanda. 50$00 Bank of Angola note. Printed at Thomas de La Rue & Co. Ltd. London. Issue date: 10 June 1962

Fig. 8. Port of Luanda. 500$00 Bank of Angola note. Printed at Thomas de La Rue & Co. Ltd. London. Issue date: 10 June 1970

The refinery Tomás visited corresponded to the drawing by Ibolya Salkovits for the 1965 postage stamp, although that same year the infrastructure increased its processing capacity to 700 000 tonnes/year. Meanwhile, a new oil field was discovered in Puaça in 1964, followed by others in Mulenvos (1966), and North Quenguela (1967). In 1971, a new well was drilled at Cabeça da Cobra, the same year the Petrangol facility was expanded again, creating a new processing capacity of one million tonnes per year. New oil fields were to be discovered in 1972, at Quinguila and Légua, while the refinery applied for authorisation for a further capacity increase of up to three million tonnes per year (Salgado b), 1975: 645).

The presidential visit originated a postage stamp as well, also printed at the National Mint/Printing Office, for the Angolan Postal Services,[3] according to an Ministerial Order published by the Ministry for Overseas Affairs which defined that the stamp should be for a price of 2$50 and be a 500 000 unit issue, displaying "the likeness of His Excellency, the President of the Republic, Rear-Admiral Américo Deus Rodrigues Tomás, in the colours blue, magenta, yellow, red, black, ochre and sepia" (Fig. 9).[4]

Fig. 9. Presidential Trip 1963. Rear Admiral Américo Thomaz. 2$50 Angola Postal Service stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: artist unknown

3. National Mint/Printing Office process 6210/59 'Viagem Presidencial – 1963', shelf 13, box 103.
4. Ministerial Order no. 20 067 published in the Government Legal Gazette 1st Series, issue number 214, on 11 September 1963.

An undated handwritten note on the reverse side of a letter from the Directorate-General of Public Works and Communications of the Ministry for Overseas Affairs to the National Mint/Printing Office (ref. 6429/32, dated 25 July 1963), proposes a shipment of 475 400 stamps to Angola; 20 000 were to be sent to an 'Agency' (probably, the *General Overseas Agency*); 2 600 were meant for "collections"; and 2 000 were to be dispatched to "Berna" (by which some civil service office located in Lisbon's Avenida de Berna could be meant).

A letter sent by the National Mint/Printing Office to the Minister of Finance on 15 October 1963 asked for clearance that Mr. Gustavo de Almeida Araújo, 'a specialised artist who has duly undertaken work for this Board of Administration',[5] be commissioned with the execution of the stamps' exemplary model, at a price of 2000$00. In addition to minor expenses, the National Mint/Printing Office costed the full batch of stamps at 21 600$00, according to invoice number 23 dated 27 January 1964.

The President's trip included a visit to Nova Lisboa, the youngest city in any part of the Portuguese Empire. It had been founded in 1912 in the heart of the Angolan interior, when it was named Huambo. The city regained this name in 1975, when Angola achieved independence, as it had been renamed after the Portuguese capital in 1928 by António Vicente Ferreira, the High-Commissioner of Angola. The first hydroelectric infrastructure in Angola had been built close to the city, the small Cuando Dam, which exploited the diminutive River Cuando/Cunene, a mere 20 km downstream from its source. It is featured on the 5$00 airmail stamp (Fig. 10), albeit in an erroneous way, as the dam — and river — were mistakenly identified as "Cuango".

Fig. 10a. Cuango Dam [a typo for "Cuando"]. 5$00 Angola Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: Cunha Rocha

Fig. 10b. Cuando Dam (undated). Photograph: Angola Information and Tourist Centre. Source: AHU/PI 725

The Cuando dam was built by the Companhia de Caminho de Ferro de Benguela (CFB or Benguela Railway) — whose factory Américo Tomás also visited (probably on 26 September). It was opened in February 1911, when it was also called "Varian Dyke", after the name of the engineer H.G. Varian, who had been engaged by CFB in 1907 as its chief resident engineer. The drawing for the stamp is by the artist Cunha Rocha, while the small dam it represented in the drawing and the correspondingly small reservoir were meant to:

5. Letter from the National Mint/Printing Office to the Minister for Overseas Affairs, dated 15 October 1963. National Mint/Printing Office process no. 6210/59.

> *Cover the requirements of its generation machinery; the basis for that generation [being] a powerplant at the Rio Cuando (a tributary of the Cunene, not to be confused with the great river in the southeast of the province), the capacity of which was recently increased. However, the dam's possibilities are dependent on a small retention basin, making it highly vulnerable to a lack of precipitation as was the case last year, when important restrictions had to be imposed during power supply periods, and the quantities placed at the disposal of customers had to be defined. (Colen, 1955: 14)*

INFRASTRUCTURE IN SOUTHWEST ANGOLA AND THE CAMBAMBE DAM ON THE RIVER CUANZA

The city of Lobito was Angola's second industrial hub and its most important seaport after Luanda. It featured on the 20$00 banknotes issued by the Bank of Angola (Fig. 11), also bearing a likeness of Américo Tomás, although there was no issue for the corresponding value on the occasion of his 1963 visit, unlike for the 50, 100, 500 and 1000 escudo notes. Lobito and Benguela were included in the presidential schedule, during which the airport in the latter city was inaugurated. The importance of this pair of cities justified that a modern hydroelectric dam be built close by: at Biópio, some 25 km inland from Lobito, on the important River Catumbela (the estuary of which is located halfway between the two cities).

Fig. 11. Silo in the Port of Lobito. 20$00 Bank of Angola note. Printed at Thomas de La Rue & Co. Ltd. London. Issue date: 10 June 1962

The Biópio dam, which was also named after Craveiro Lopes, was designed by the engineer António Barrancos Vieira, from the firm APAGEL (Aproveitamentos Hidro-agrícolas e Hidroeléctricos), and was built between 1952 and 6 September 1956 (when it was inaugurated). The works were supervised by engineer António Trigo de Morais, a seminal figure in Portuguese hydraulic engineering studies, who was then the Inspector-General of the Overseas Investment Fund. The dam is shown on the 4$50 stamp, based on a drawing by Cunha Rocha (Fig. 12).

Fig. 12a. Craveiro Lopes Dam [Biópio]. 4$50 Angola Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: Cunha Rocha

Fig. 12b. Craveiro Lopes Dam. Photograph: Angola Information and Tourist Centre (Film/photography Office). Portuguese Communications Foundation. Picture Archives, Archive no. 8000354 ref. FT-627.E SVPU. Note handwritten remark: "To be used with the other two together"

Fig. 12c. Lobito: Biópio: Presidente Craveiro Lopes Dam. Photograph: CIT Angola. Source: AHU, AGU/PI 646. ID number 18103

On 1 October, the presidential party paid a visit to the Matala Agricultural Colony, which used waters from the Cunene River, which were channelled south from the Matala Dam for some 30 km, to water farmland along an irrigation ditch. The established settlement plan included the foundation of the town of Folgares, where Américo Tomás's aeroplane landed, and the four villages of Freixiel, Algés-a-Nova, Alcácer (the present-day village of Camulemba) and Castanheira de Pera (some 6 500 km away from its namesake, situated at the centre of Portugal!). A visit to the Matala Dam — depicted on the 3$00 postage stamp drawn by Cunha Rocha (Fig. 13) — followed. The Head of State inaugurated a cylindrical granite block there, which bore the name of Prime Minister Salazar —the same name had also been given to the bridge at Porto Condo. Tomás was received at Matala by the same engineer António Trigo de Morais who had supervised the building of the Biópio Dam and was now the chairman of the *Overseas Investment Fund Higher Council*.

The presidential tour moved on to Moçâmedes, the capital of the Namibe province. The town was of great strategic importance in Angola, as its largest southwestern settlement, after which only the city of Tômbua (previously Porto Alexandre) existed along the coast stretching down to Namibia. Moçâmedes was also the starting point of the railway of the same name, which travelled for 756 km inland and crossed many pontoons and bridges, a number of which were designed by the famous professor and engineer Edgar Cardoso (Resende, 1913 – Lisbon, 2000), such as the concrete beam bridge for road traffic and the cantilevered concrete railway bridge across the Matala dam (Landerset, 1968: 56-58). The railway ended at Menongue (formerly known as Serpa Pinto).

Fig. 13a. Salazar Dam [Matala]. 3$00 Angola Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: Cunha Rocha

Fig. 13b. Salazar Dam at Matala. Photograph: Angola Information and Tourist Centre (Film/photography Office). Portuguese Communications Foundation. Picture Archives, Archive no. 8000354, ref. FT-625.F SVPU

President Tomás probably arrived at Moçâmedes on 2 October, from where he took a special seven-carriage train "filled with local people and children from the schools" (Boletim Geral, 1963: 141) to visit a fish cannery at a place called Saco, where a great port and wharf were to be built for the shipping of ores that arrived from the hinterland using the Moçâmedes Railway, such as the Cassinga Mines (which were reached by a special branch line). The mining port's jetty was also built to a design by Cardoso. Quite close to Saco, the railway cut across the River Giraúl, crossing the Capitão Silva Carvalho bridge shown on the 12$50 post stamp (Fig. 14). The structure was named after José Agapito Montalvão da Silva Carvalho, Governor-General of Angola between 1947 and 1955.

Fig. 14a. Capitão Silva Carvalho Bridge [River Giraúl]. 12$50 Angola Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: artist unknown

Fig. 14b. General View of the Bridge over the River Béro. Print 29 in: Angola, Pequena Monografia, General Agency for Overseas, Angola Information and Tourist Centre, sheet 164a. The print is wrongly titled in the book, as the bridge shown is that on the River Giraúl

Américo Tomás returned to Moçâmedes by car, arriving in the outskirts of the city at the Capitão Teófilo Duarte bridge spanning the River Béro (also subject to torrential rainfall), which he duly inaugurated by personally raising its double gates (Boletim Geral, id.). Teófilo Duarte was therefore twice a dedicatee in the stamp series, like Salazar, and the bridge carrying his name, designed for mixed use (railway and automobile), like that over the River Giraúl, is represented on the 7$00 stamp (Fig. 15), likewise based on a drawing of unknown authorship. Both bridges were initially designed by the chief engineer of Angola's Road and Railway Brigade, Gonçalves Malhado, assisted by Jorge Cândido Osório; they were later corrected by Manuel Brazão Farinha; and took on their final form according to designs by António José de Miranda Guedes, the chief engineer of the Supervision Brigade of the Béro and Giraúl Variant.

The climax of the presidential visit was Tomás's visit to the *Cambambe* hydroelectric power plant (Fig. 16) for its official inauguration, which took

Fig. 15a. Capitão Teófilo Duarte Bridge [River Béro]. 7$00 Angola Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: artist unknown

Fig. 15b. Capitão Teófilo Duarte Bridge over the River Béro at Moçâmedes. Photograph: Foto-Algarve/Silva Porto. Portuguese Communications Foundation. Picture Archives, Archive no. 8000354, ref. FT-622.G SVPU. Note handwritten remark: "Drawing to be done using the 2 photos together"

Fig. 15c. Aspect of the Capitão Teófilo Duarte Bridge over the River Béro. Photograph: Foto-Algarve/Silva Porto. Portuguese Communications Foundation. Picture Archives, Archive no. 8000355, ref. FT-622.D SVPU

place on 6 October 1963 — the day after he opened the Luanda Industry Fair, an event which included stands for the Hydroelectric Company of the Upper Catumbela (which operated Biópio Dam) and for Sonefe, which was the investor in *Cambambe*. This dam's power plant had already begun operating in November 1962, with power supply reaching the Luanda electrical public network on 8 December of that year, doubling the supply to Luanda and its neighbouring cities, while also providing the necessary energy for the burgeoning industrial developments in the Luanda metropolitan area. Its inauguration was therefore merely a formal celebration for propaganda purposes – which inaugurations are normally for anyway. Building it was a risky investment, and research into its construction provided much evidence of the difficulties it faced.

Fig. 16a. Cambambe Dam. 2$50 Angola Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing: artist unknown

Fig. 16b. Sluice Gate at Cambambe Dam – 1st Phase. Photograph: SONEFE Photography Office and Angola Information and Tourist Centre (Film/Photography Office). Portuguese Communications Foundation. Picture Archives, Archive no. 8000354. ref. FT-624.N SVPU. Note handwritten remark: "Drawing to be done using the two together". Probably for composition reasons, the designer chose to invert the photo

A bridge spanning the Cuanza, close to the city of Dondo, had been planned for quite some time, and ultimately a location was found at Quiamafulo — a sandy strip on the river's right bank, 3.5 km upstream

from *Cambambe*. It was again the work of Edgar Cardoso, but was labelled "provisional", as the Route 120 it served (known in colonial times as National Road 5), which heads south to Huambo, was expected to cross the crest of the dam, once the latter was finished. However, tectonic problems revealed in 1960 during work on the foundations for the dam interrupted the construction thereof for some time, leading to significant adaptations in the whole project, requiring, amongst other things, a lower level for both the reservoir and the dam wall, which was no longer to have a road crossing over it. The "provisional" bridge by Cardoso (Fig. 17) actually remained in use until 2017, when the dam was finally raised to the originally planned height, and its reservoir was much enlarged. As a result, the bridge still exists today, but is now submerged.

The inauguration of *Cambambe* was the final stop in the presidential visit. Tomás and his entourage arrived at the site by helicopter from Luanda, and the ceremony included speeches by the head of state, and by the Chairman of Sonefe, General David dos Santos. Decorations were awarded to a number of engineers (including the chief resident engineer, Fernando Braz de Oliveira), and also to lower-ranked workers. The next day, Américo Tomás' presidential visit came to an end in Luanda, from where he returned to Portugal, on the same liner, the *Infante Dom Henrique*, that had brought him from Lisbon.

Fig. 17a. Bridge over the Cuanza. 6$00 Angola Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1965. Drawing author unknown

Fig. 17b. A bridge over the River Quanza. Print 28 in: Angola, Pequena Monografia, General Agency for Overseas, Angola Information and Tourist Centre, sheet 156b

THE BOEING 707 AEROPLANE

All stamps in the series researched feature a Boeing 707 daringly flying over each infrastructure featured. The aeroplane certainly emphasised the modernity of the investments, and of the country making them. The 707 happened to be the first commercially successful jet airliner, and the first of its kind developed by the Seattle manufacturer, which built it from 1958 — the year Pan American inaugurated the plane's transatlantic flights from New York to Paris — to 1979.

The Portuguese airline company, Transportes Aéreos Portugueses (TAP), had begun operations in 1946, with two DC-3 Dakotas bought the previous year, one of which was used in TAP's maiden Lisbon-Madrid flight, on 19 September. Soon afterwards, the company started using the DC-3 on its *Linha Aérea Imperial* or Imperial Airline services to Portuguese Africa, with a 12-stop, 15-day, return flight to Maputo (then called Lourenço Marques), Mozambique, on 31 December 1946. With a total two-way dis-

tance of 24 540 km, it was the world's longest commercial route in aviation at the time (Jesus, 2005: 39).

The reason the aircraft is featured in every airmail stamp issued by Portugal for overseas use is self-explanatory, as regular flights to Portuguese Africa by the Portuguese flag carrier shortened time in terms of mail exchange. TAP started operating its four DC-4 Skymaster four-engine aircraft (which it had been using since 1947) to Africa in October 1954, with its first Lisbon-Luanda trip taking 17 hours (Jesus, 2005: 49). In August 1955, the company received the first of its five, long-haul, four-engine, Lockheed L-1049G "Super Constellation" aircraft, which it began flying to cities in Africa in November that year.

The tenth anniversary, in 1953, of the incorporation of TAP as a public limited company, in which the Portuguese State was the major shareholder (the company had previously been run as a state public service), was celebrated in a 1963 stamp for the São Tomé & Príncipe (for 1$50), Cape-Verde, Guinea-Bissau, Mozambique (all of which cost 2$50) and Angola (for 1$00) regular mail services (Fig. 18). The stamp, produced by Litografia Maia, in Porto, features a Lockheed "Super Constellation" and a Boeing B-707 flying over a map of Africa.

Fig. 18. 10th Birthday of TAP. 1$00 Angolan Postal Service stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1963. Drawing: José de Moura

Fig. 19. Chairman of TAP, Alfredo Vaz Pinto, signs the contract with Boeing represents for the acquisition of new planes (B-707s). 1964. Source: 'Vôa Portugal' (p. 58, fig. 54)

According to a TAP website that records the company in commercial aviation's history, seven B-707-320Bs were bought in 1964 (Fig. 19). These were immediately used in flights to Angola, Mozambique and South Africa in 1965, which explains why this aircraft was added as a 'late call' to the stamps issued that same year, albeit with an awkward consequence: while the Luanda refinery lies a few kilometres from the city airport — the upright orientation of the stamp also providing a more improbable angle for the Boeing flying overhead — no four-engine jet aeroplane ever flew over the other undertakings in the set, and the clumsy position in which the aircraft were placed would have made this dangerous in the extreme.

In the 1960s, airborne mail between Portugal and its former overseas possessions had become an absolutely vital service, since that was the decade when the Colonial War between the country and its colonies began, resulting

in the transport of shiploads of soldiers to the warfront. Airmail and its stamps were available to all, but the stamps in the set dealt with herein would have been mostly used by the white Portuguese writing to the homeland, even if that was more expensive than mail sent by ship. The ubiquitous B-707 also provides a unifying element in the stamps, where it is featured flying left to right. One could look for hidden meanings in this, such as having all aircraft flying to/from Portugal or unearthing political reasons for their moving left to right. The truth is, once placed in context with the infrastructure they are flying over, they all seem to be heading anywhere *but* Portugal.

Fig. 20. TAP airline routes to Sub-Saharan Africa in the late 1960s. Source: 'Vôa Portugal' (p. 18, fig. 53)

The company was to buy an additional five B-707s (of the 300C type), and this aircraft would remain the only four-engine jet aeroplane in TAP's fleet, until the company bought its first 747 Boeings, in 1972. The phasing out of the TAP B-707s began in 1982 (Jesus, 2005: 83). I myself have flown, for sure, on such an aircraft, to and from Africa, as an infant.

CONCLUSIONS

The (price) ranking of the infrastructures in the stamp series examined herein appears to have been outright arbitrary. Amongst the dams, the 5$00 stamp was awarded to that on the River Cuando, which is the only infrastructure featured in the set that was built before World War II. This exception was most definitely a consequence of the ground-breaking role said infrastructure played in terms of Angolan hydroelectricity. Built on a foundation of huge rock boulders, the cross-section of this gravity dam built in stone masonry isn't triangular, but is reinforced by a row of arches on the downstream side instead. Even though it was equipped only with two small turbines, it still played a fundamental role in Angola's modern history, as it supplied electricity to the workshops of the Benguela Railway, which guaranteed the only connection between the country and the global African rail system, through the Democratic Republic of Congo.

The Mabubas, Biópio and Matala infrastructures built during the 1950s are straightforward concrete gravity dams. Unsurprisingly, the first modern river dam (Mabubas), featured on the 4$00 stamp, was built to supply energy

to the Angolan capital. By today's standards, Mabubas provides a rather low output, but its importance for Luanda was still central, particularly before the *Cambambe* dam was built. The Biópio Dam's four turbines were to supply electricity to the neighbouring Benguela and Lobito, which were strategic cities in the development of the central Angolan coast, while the latter — as we have seen — is also where the Benguela railway begins.

The Matala Dam, depicted on the 3$00 stamp, which went into operation in 1959, played a prominent role in the Cunene River Plan, which included a number of other hydroelectric facilities. Bettencourt Fernandes Moreno, who had served as the chief resident engineer in the construction of Mabubas Dam, was in charge of the Cunene Plan Office. The construction of Matala was supervised by Eurico Rodrigues Corvo, who had performed the same role at Biópio. It is unique amongst the dams featured in the set, as it serves both hydroelectric and hydro-agricultural purposes, and because it is linked with the Moçâmedes Railway, which actually uses the dam to cross the river.

The original main purpose of Matala, i.e. that of irrigating a vast agricultural plain, explains why it only had two turbines, which were to supply electricity locally, but also to the capital of Huíla province, the city of Lubango (formerly known as Sá da Bandeira). The dam was developed by the same team, working under its major driving force, António Trigo de Morais, that drew up the Limpopo River Plan and designed the Limpopo Dam in Mozambique, an undertaking that shared most features with Matala, including the parcelling of agricultural land to distribute to the colonising farmers (of both black and white races) and the direct connection to a major railway line.

The Limpopo Dam was built at Macarretane in 1954-1956, while construction of its Angolan doppelgänger, which began in 1953, took six years. Incidentally, the Macarretane Dam is featured on a 5$00 Mozambican airmail stamp, from the 1963 set *Avião sobrevoando empreendimentos locais* ("aeroplane flying over local undertakings"), also issued by Lisbon's National Mint/Printing Office. The infrastructure is featured as the "Engineer Trigo de Morais Reservoir Bridge", which is the name it went by between 1961 and the independence of Mozambique in 1975 (Fig. 21). The Mozambican six-stamp set also includes two dams on the River Revué and the Sonarep oil refinery at Matola, Maputo (which at the time was called Lourenço Marques).

Fig. 21. Engenheiro Trigo de Morais Reservoir Bridge [Macarretane/Limpopo]. 5$00 Mozambique Postal Service airmail stamp. Printed at Portuguese National Mint/Printing Office, Lisbon, 1963. Drawing: Adolfo Rabanal

The construction of Cambambe helped its supervisor Fernando Braz de Oliveira establish himself as a Portuguese engineering star, and an international consultant in the field. It was also the largest dam built by the Portuguese in Africa, until a dozen years later it was surpassed by the largest concrete dam ever built in Africa, at Cahora Bassa, Mozambique, for which Braz de Oliveira was also the Chief Resident Engineer. The dam on the Cuanza was equipped with four power turbines, and its design, by engineer Henrique Granger Pinto (from the Hidroeléctrica do Zêzere company), is the only arch dam included in the set. The planning for the dam had anticipated that, in time, a second, or even a third, power plant could be added later; a second four-turbine hydroelectric plant was indeed inaugurated in 2017.

The stamps of higher value in the set correspond to bridges, which can be treated in pairs, as two of them span the Cuanza, while the others were designed and built simultaneously across two rivers close to the city of Moçâmedes, in southwest Angola.

The Porto Condo Bridge, featured on the 8$50 stamp, actually looks quite conventional, as it relies on fifteen solid reinforced concrete 'Monier' arches resting on solid piers, a solution that may be seen in narrower bridges elsewhere in Angola, such as that on the River Zambeze on Angola's National Road 190 just outside the village of Cazombo, or those built in 1961 across the River Onzo on the road from Ambriz to N'Zeto, and across the River Ueto on the road from Ambriz to Yembe (Landerset, 1968: 21).

The main distinctive feature of the Porto Condo bridge — which, according to information from the Directorate of Public Works dated 5 September 1951, was inaugurated on 15 August of 1951 — was a single arch closer to the river's right bank, almost double the length of the span of the other arches. It was, most certainly, designed to enable the passing of larger ships beneath it. Its strategic importance must be seen, however, in the context of the mighty river it crosses, which drains a surface of 152 570 sq. km (an area that exceeds the size of Portugal by 65%). The Cuanza historically served as the main path into the country's interior, up to the river port of Dondo, some kilometres below the *Cambambe* falls, which ruled out navigation further upstream (where the dam came to be built). The width of the Cuanza explains why it could only to be crossed on barges, either on the lower stretch of the river, between its estuary on the Atlantic coast and the *Cambambe* falls; in its middle stretch, reaching from *Cambambe* up to Porto Condo; or further upstream. The road bridge at Porto Condo was the second to span this river, while it was also the longest bridge built in Angola at the time (Dicionário, 1959: 32).

The third road bridge built across the Cuanza, at Quiamafulo, which featured on the 6$00 stamp, is very different from the one at Porto Condo, as was to be expected from Edgar Cardoso, arguably the leading engineer in Portugal of all time, particularly in terms of the design of bridges. All elements of the truss arch bridge were made of reinforced concrete, from its rib arches to its spandrel columns, deck, railings, etc. According to the December 1958 Overseas General Bulletin (*Boletim Geral do Ultramar*), the construction thereof also shortened the Angolan National Road 5 route to Huambo from Luanda, passing through Dondo, by some 170 kilometres.

The fourth road bridge across the Cuanza, which was built later close to its river mouth, is also the work of Edgar Cardoso. In this particular case, he designed a cable-stay metal-beam structure hanging from trussed concrete pylons. It obviously doesn't feature in the stamp set, as the design project was only begun in 1966; it was not completed until 1975, reflecting the harsh times Angola was living through at the time, in the run up to the Civil War. Given its location, some 60 km south of Luanda, it is by far the bridge with the most traffic crossing the Cuanza.

As the driest part of Angola, Moçâmedes is scourged by drought. The city outskirts immediately to the north are crossed by the Béro riverbed, a sort of 'wadi' that usually carries little water, but which occasionally overflows its banks as a result of torrential rainfall. Some 10 kilometres to the north of the mouth of the Béro, the River Giraúl— which is likewise susceptible to episodic violent flooding — discharges into the ocean. The port of Saco is located between both rivers, from where access to Moçâmedes could be made by boat whenever the River Béro flooded.

Whenever flooding occurred in the Giraúl (or when both rivers flooded), road and rail connections would be disrupted even further away from the city, and the tracks and bridges would be badly damaged. The twin concrete beam bridges, featured on the 7$00 and 12$00 stamps, were meant to resolve this inconvenience, even though, half a century later, the great March 2011 flood of the Giraúl resulted in the destruction of the bridge named after *Captain Silva Carvalho* at its inauguration. They were designed by the same engineers, built simultaneously by the same company under to a single contract, and designed for mixed use, as they could be crossed by train and car. Silva Carvalho, by the way, was fortunate enough to have his name given to another bridge in Angola, this time spanning the River Queve.

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Fig. 22. Luanda Oil Refinery "gouache" on 34,8×24,7 cm cardboard for «Empreendimentos de Angola» 1965 airmail set, with four-stamp sample attached. N.d., anon. [attributed to Ibolya Salkovits, most likely by Cunha Rocha]. CTT Correios de Portugal Collection, by permission: Fundação Portuguesa das Comunicações.