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Visit to Rádio Nacional da Amazônia

Rádio Nacional da Amazônia, the largest complex of medium transmitters and shortwave transmitters in Latin America and the fifth most powerful transmitting station in the world.

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Photographs and Video (under study) by: Ligia Katze

Photographs and Video (antenna field) by: Mark Melzi

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1. Brief Introduction to the History of “La Rádio Nacional da Amazônia”.

The Rádio Nacional da Amazônia transmits to more than half of the Brazilian territory in short waves, within the frequency range of 11,780 kHz to 6,180 kHz.

The Rádio Nacional da Amazônia is a popular communication media channel that strengthens the link between Amazonian communities, valuing and spreading the cultural diversity of the region. These functional guidelines are born out of the demands of the Amazonian population for social inclusion.

Inaugurated on September 1, 1977, the station was established by the military government under the so-called National Security Doctrine. The objective was to prevent the Amazonian population from continuing to listen only to the sound of the radios of the communist countries, which escaped censorship, for example: Radio La Habana, from Cuba; Moscow International Radio of the former Soviet Union; Radio Tirana of Albania, among others

Two years before the start of the transmission of the Rádio Nacional da Amazônia, in December 1975, Radiobrás was established as a public company that began to centrally administer all radio and television stations throughout the country of Brazil. Under the command of General Lourival Massa da Costa, with the new station, the agency had the mission of “integrating the Amazon with the rest of the country”, through the medium of radio.

During the reign of the military government, massive human rights violations took place. The military regime crushed press freedom and severely repressed the political opposition. The military government formally adopted nationalism, economic development and anti-communism as official mission. Throughout its existence, especially during the 1960s and 1970s, the Brazilian military dictatorship received logistical and economic assistance from the United States government in what was called the Condor Plan, establishing similar dictatorships within the broader framework of the Cold War.

Beginning in the 1980s, military hegemony entered into crisis due to chronic inflation and the progressive collapse of military regimes in Argentina, Peru and other neighbours in South America. In 1985, the last indirect election was held, disputed only by civilian candidates, and the MDB candidate, Tancredo Neves, won by a wide margin. Neves, however, died before taking office, being replaced by José Sarney.

Sarney assumed the presidency on March 15, 1985, ending the military regime. After his election, he restored civil liberties and scheduled the approval of a new constitution in 1988, restoring the direct election of the president of the republic, and initiating the final transition to democracy.

The dictatorship that began on March 31, 1964, with the coup d'état of democratic president João Goulart, engulfed Brazil into two decades of darkness, which kept five military presidents in power, leaving behind a trail of hundreds of murders. Innumerable people disappeared and so many were tortured, of which there is still no exact figure due to the lack of records.

On June 12, 2008, Radiobrás ceased to exist and all the radio stations that were part of the company, including the Rádio Nacional da Amazônia, came under the control of the Empresa Brasil de Comunicação (EBC), which continues to function to this day.

Empresa Brasil de Comunicação (EBC), a public company organised as a private corporation, with 51% of its shares owned by the Union, created by Law 11.652 / 2008. The company's mission is to implement and administer the system of public communication as envisaged in the Federal Constitution in its article 223.

Time passed, the struggles for democracy was started and the broadcaster came to fulfill the strategic objective of dissemination of information in a democratic country, now bringing true messages and correct information to the population of the Amazon, a region that was previously forgotten.

Today, the station is a means to promote and safeguard the rights of the citizen and communication between listeners. "The Rádio Nacional da Amazônia, has managed to change one of the most shameful and sad times in the recent history of Brazil "the military dictatorship".

Thus, in 2012, with the report on crimes against indigenous peoples in dictatorship, published in August 2012, the Rádio Nacional da Amazônia won the 34th Vladimir Herzog Journalist Award for Amnesty and Human Rights, in the category of Radio. The reports of human rights violations, signs of torture, aggression and deaths that are hard to erase from memories marked the period of the military dictatorship in Brazil. The report was produced by the reporter Maíra Heinen, with the help of sound engineer Marcos Tavares.

The Vladimir Herzog Journalism Prize for Amnesty and Human Rights is a Brazilian journalistic award that is awarded annually to professionals and media that have excelled in the safeguarding democratic values, rights of the citizen and human and social rights, as

well as personalities, professionals and media communication that stands out in the defense of these fundamental values.

2. What is the Rádio Nacional da Amazônia?

Interview with the programme producers of the National Radio da Amazônia, Luciana Couto, Taiana Borges and Solimar Luz) – Photos and Video.



Photo: Martín Butera, while writing the report on National Radio da Amazônia, at the planning stage of the work of going through the studios to visualise the technical part as well as the interviews with different producers and broadcasters.



Photo: Martín Butera and the producers of the Radio Nacional da Amazônia, Luciana Couto, Taiana Borges



Photo: Martín Butera and the producers of the Radio Nacional da Amazônia, Luciana Couto, Taiana Borges

Here is a brief summary of the conversations with the producers Luciana Couto, Taiana Borges and Solimar Luz, about what the National Radio da Amazônia means for them (to find out more the reader can go to the link for the full video interview, conducted in Portuguese language)

Videos by Ligia Katze

<https://youtu.be/htnbACI6Qf0>

The producers mentioned that the programming pattern is almost entirely created by the listeners themselves, due to the close relationship maintained between them and the radio producers and announcers.

The producers impressed upon us that, we must think about the immensity of the peoples that inhabit the Amazon, that until today the radio is used to leave messages to the listeners themselves to their relatives and friends, since in those places the only message that is received is the radio transmission itself and such situation underlines the importance of maintaining the shortwave service.



Photo: Luciano G. Maia, in-charge of public relations of the company EBC, Martín Butera and the producers of the Radio Nacional da Amazônia, Luciana Couto, Taiana Borges and Solimar Luz.

3. Interview with broadcaster Beth Begonha

Presented from Monday to Friday from 8 a.m. to 10 a.m., the program carries the diverse views on education and struggle of the people related to the history and culture of the Amazon.

The listeners participate in the program through feedback via letters that offer suggestions, ask questions and request for songs. There is also regular participation of reporters and interviewees directly from the Amazon region.

The broadcaster Beth Begonha has been conducting the program called “Brazilian Amazon” since 2003. We were able to interview her in a relaxed atmosphere in the studio itself, during the intermissions in the transmissions.

Beth is a very sought-after announcer, since she herself made numerous trips to visit indigenous populations in towns and communities, establishing a strong bond and very beautiful relationship with them.

Through the microphones of the National Radio of the Amazon, Beth Begonha speaks with the awareness of a person who lived and experienced the reality of the Amazon. The program discusses environmental issues and highlights the need to assess the cultural identity of indigenous communities, and of all the people who live on the banks of the great Amazon River.

Graduated in journalism in an Amazonian city, Beth says she has been through adverse conditions and her story serves as a motivation to guide education in the Brazilian Amazon and encourage listeners to return to school. “I studied and completed my university course with great struggle, and I believe that this is also an important element in this endeavour, which has had many beautiful results.”

Beth Begonha tells me “Everything I know about the indigenous people is what I learned from them. When I started the project of the Brazilian Amazon, a program that I present and produce in the Rádio Nacional da Amazônia, I had very clear objectives that we should achieve as a media space : integrate the different peoples that live in the Amazon, with their cultural diversity, specific topics, promoting knowledge and increasing interaction among these populations, this also included indigenous communities, this space has always been designed to be occupied by the Indians, not for someone who speaks for them. ”

Beth Begonha rounds up: “It was not a difficult task, I must confess, for the receptivity of these communities, for their desire and need to be seen and heard. The greatest difficulty was mine, because despite working in communication for many years, even in the Amazon, I had no true knowledge of the Indians. ”

The Beth Begonha program performs unprecedented work, includes indigenous peoples into the production of the program, opening a space that values these Brazilians.

The musical part is not only dedicated to popular and successful Brazilian songs, here the listeners have the opportunity to listen to songs that are produced directly inside the core areas of Amazon.

Beth Begonha’s program has created a bridge of important relationship of other listeners with indigenous peoples, increasing empathy and respect for their culture.

This relationship with the indigenous population led Beth Begonha to produce among others a transmission from outside the studios, it was when I visited the Xingu Indigenous Park in 2007, where he covered the visit of the then Minister of Justice Tarso Genro (Brazilian

lawyer, journalist and politician affiliated with Workers' Party, who is currently the governor of the state of Rio Grande do Sul).

Beth Begonha's program not only had the brave idea of transmitting directly from the Amazon rainforest and different indigenous camps in Brazil, it has also transmitted from several meetings and conclaves that dealt with the biodiversity of the Amazon.

One of these transmissions was the transmission that took place from June 18 to 22, 2012 during "Rio + 20", the biggest environmental event of the last decade.



Photo: Ligia Katze, the photographer accredited, in the studios and Martín Butera, interviewing the broadcaster of the National Radio da Amazônia, Beth Begonha.



Photo: Martín Butera, interviewing the broadcaster of the National Radio da Amazônia, Beth Begonha, next to him is the photographer Ligia Katze.



Photo: Martín Butera, next to the broadcaster of the National Radio da Amazônia, Beth Begonha along with the shift operator.



Photo: Martín Butera, next to the main console table of the studio of the National Radio da Amazônia

Below a small fragment on video (Portuguese language) can be seen, about this talk with the announcer of the National Radio of the Amazon “Beth Begonha”.

Videos by Ligia Katze

<https://youtu.be/6OT7Gwunbt0>

4. Visiting the mixing room

Together with Mr. Luciano G. Maia, in charge of public relations of the company EBC, I had the opportunity to tour the entire modern facility. Here you can see the impressive mixing consoles of all radio and even television signals.

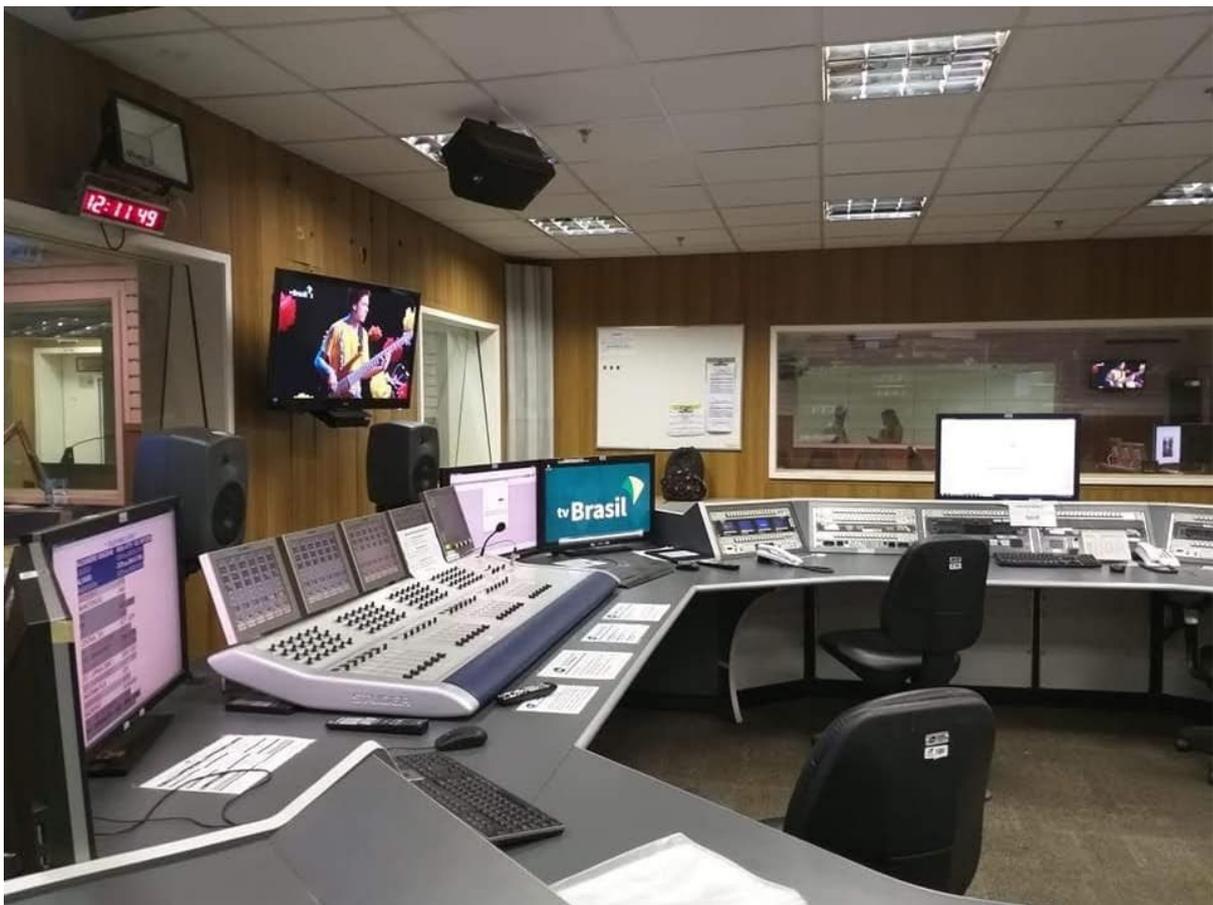


Photo: general mixing table of the company EBC



Photo: Martín Butera, with the EBC mixing shift operator



Photo: Martín Butera, alongside the modern mixing racks

Video by Ligia Katze:
https://youtu.be/TuN9nZT_-s8

5. Brief History of the Radio Nacional de Brasilia Park

The Rodeador Park in Brasilia Federal District. It is the largest complex housing medium wave and short wave transmitters in Latin America. It transmits the signals of the National Radio AM of Brasilia and the National Radio of Amazonia for whole of Brazil.

The transmitter of the National Radio AM of Brasilia works only during the night, when the signal is transmitted throughout the country. During the day, the Brasilia AM National Radio signal is transmitted from the SIA Transmitter Park, covering only the Federal District and its surroundings. This is due to the difficulty of transmitting a medium-wave signal throughout Brazil during the day.

The visit to the antenna field is absolutely incredible experience; the structure of the park without a shade of doubt is colossal.

From afar, you can already see the imposing towers each 150 meters high. Everything is perfectly well maintained and a team of very dedicated persons and professionals work round the clock in the field of antennas. These professionals are responsible for upholding and maintaining the quality of the signal.

While there is a great contrast between the modern studios located in the center of Brasilia to the transmitters and the antenna in a field located 34 kilometers away, the transmitters look like more museum pieces. But to be honest I must say that everything works perfectly well, thanks to the dedication of the professionals who maintain these transmitters on a permanent basis.

The antennas that are an elaborate and complex installation, assure the Brazilian government the possibility of having radio coverage to the remotest areas of the country, as well as the possibility of reaching all the five continents.

In the above backdrop, during the year 2018, the “Cabinet of Institutional Segurança da Presidência da República (GSI)”, the “Parque do Rodeador” officially classified the antenna field as vital support infrastructure during critical situations, natural disasters and emergencies, to be used as and when the Brazilian population encounters a situation of collapse in communications.

Installed on March 9, 1979, the areas of antenna field houses four sets of giant antennas, one of which is 142 meters high. The other three sets have higher towers, reach 147 meters and are used for transmitting in short waves (OC). In addition to the vertical antenna used for medium wave transmission, the park has the dipole curtain antenna reinforcement for short wave transmission.

6. Antennas

We were received by Ismar Do Vale Junior, who is the principal telecommunications engineer and the technical manager responsible for the maintenance coordination, of the “Parque do Rodeador” antenna field, we were also received by the Radio and Television Engineer Mr. Manoel Caetano dos Santos and finally we were escorted by a valued guest Orlando Perez Filho “PT2OP”, former Executive Director of LABRE DF (League of Brazilian Lovers of Rádio Emissão).

The antenna field has a set of antennas for the emission of short waves of Rádio Nacional da Amazônia, divided into 4 different antennas referred to as: C1, C2, C3 and C4.

The antennas are suitable for transmission of a maximum power of 300 kW, however it is always operated with half power of 150 kW. Currently such power was reduced to 75 kW, this was due to an event that occurred in March 2017, which we will go into detail of this when we talk about the electrical part.

Videos by Mark Van Marx (Marcos Melzi)

https://youtu.be/VEB_K_aOjl

<https://youtu.be/QERWmtaAJe8>

<https://youtu.be/5MptOV4iLI4>



Photo: a satellite image of the antenna field.

Photos by Mark Van Marx (Marcos Melzi)



Photo: The engineer Ismar Do Vale Junior displays the map of the antenna layout and discusses in detail one by one, to us.

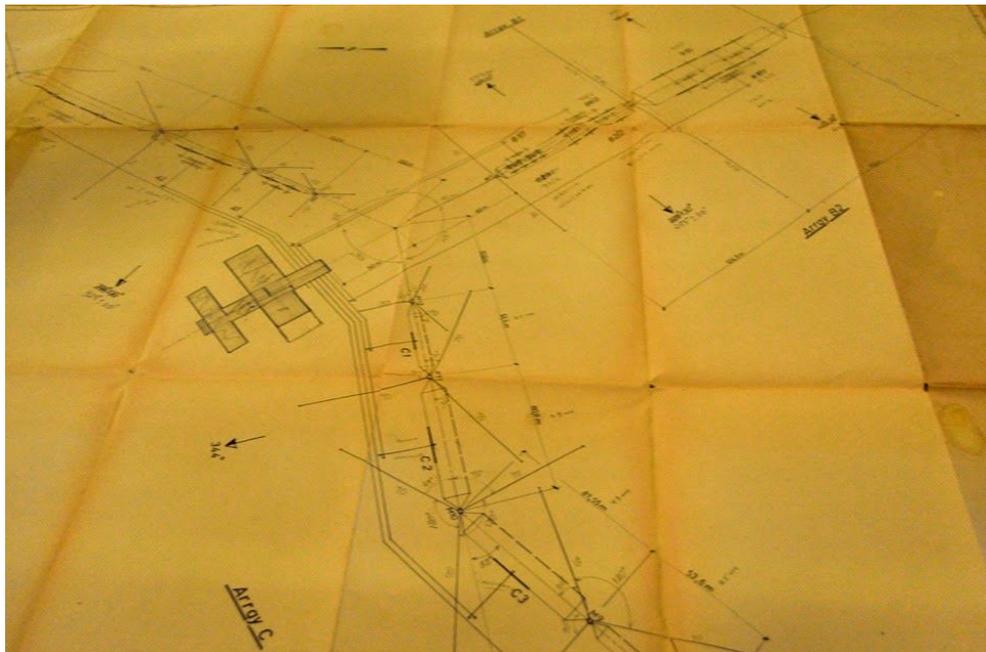


Photo: Original layout map of the antenna setup of the Rádio Nacional da Amazônia

As mentioned earlier, the set of short-wave “dipoles” of the Rádio Nacional da Amazônia consists of 4 different of antennas, which are called C1, C2, C3 and C4, each of which is fed separately. I will give the details now.

C2 and C3

The antenna installations C2 and C3 have the same structures and dimensions and are operated at frequencies close to 6 MHz. Currently, antenna C2 is used to transmit the signal from the National Radio of the Amazon at 6,185 kHz and the other antenna C3 is on standby and not transmitting.

C1 and C4

The structure and dimensions of antenna installations C1 and C4 are also identical. They are designed so that they can transmit on three frequencies that is on 9, 11 and 15 MHz. However, at present, only the antenna C4 is active, transmitting the signal from the National Radio of the Amazon on the frequency of 11,780 MHz.



Photo: Martín Butera, next to the sign, which prohibits access to the shortwave antenna field entrance, due to the presence of high RF energy.



Photo: from behind, Martín Butera, engineer Ismar Do Vale Junior, Orlando Perez Filho "PT2OP", former Executive Director of LABRE DF (League of Brazilian Lovers of Rádio Emissão) and Engineer Manoel Caetano dos Santos, beginning the tour of the antenna field

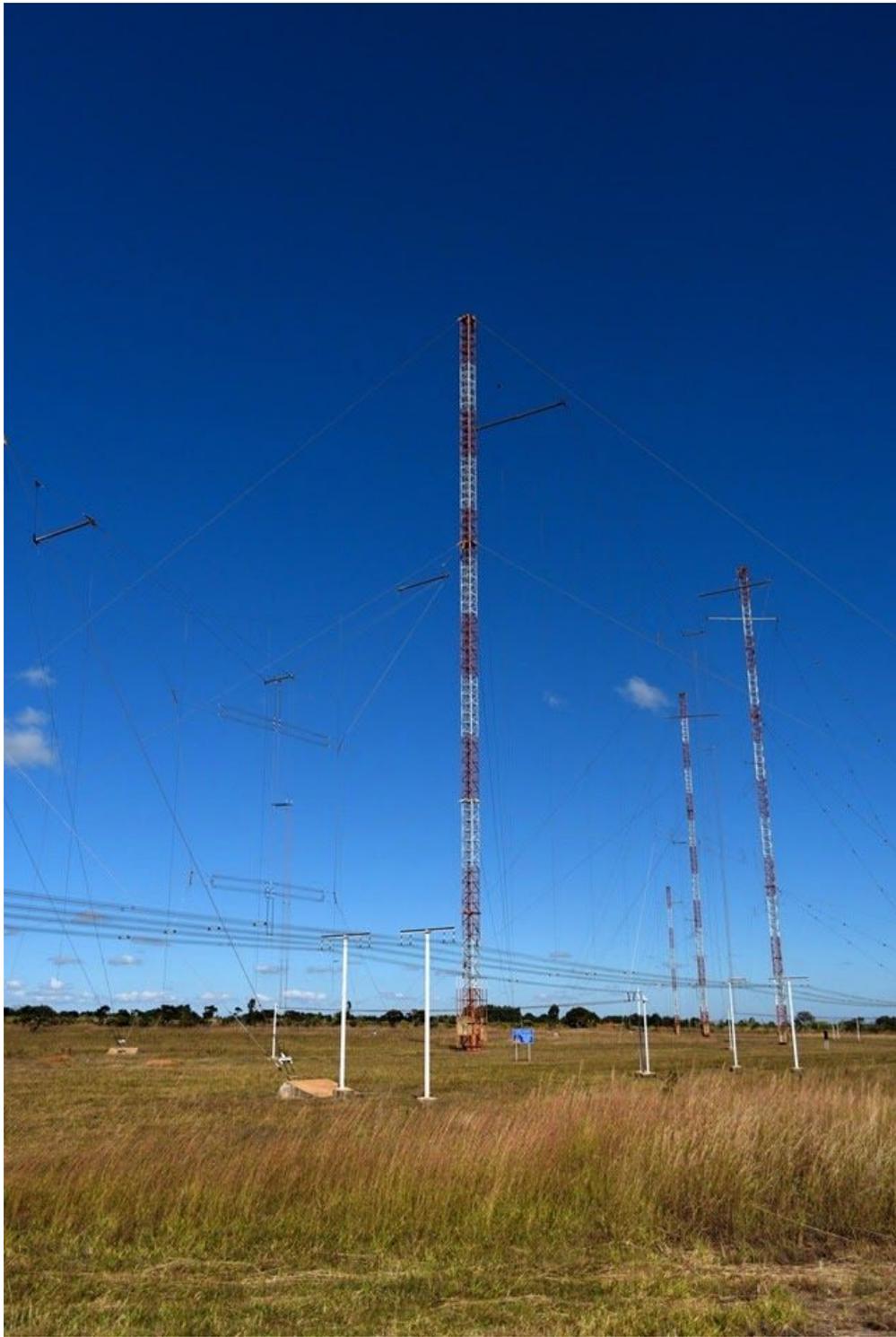


Photo: view of different angles of shortwave antennas



Photo: view of different angles of shortwave antenna

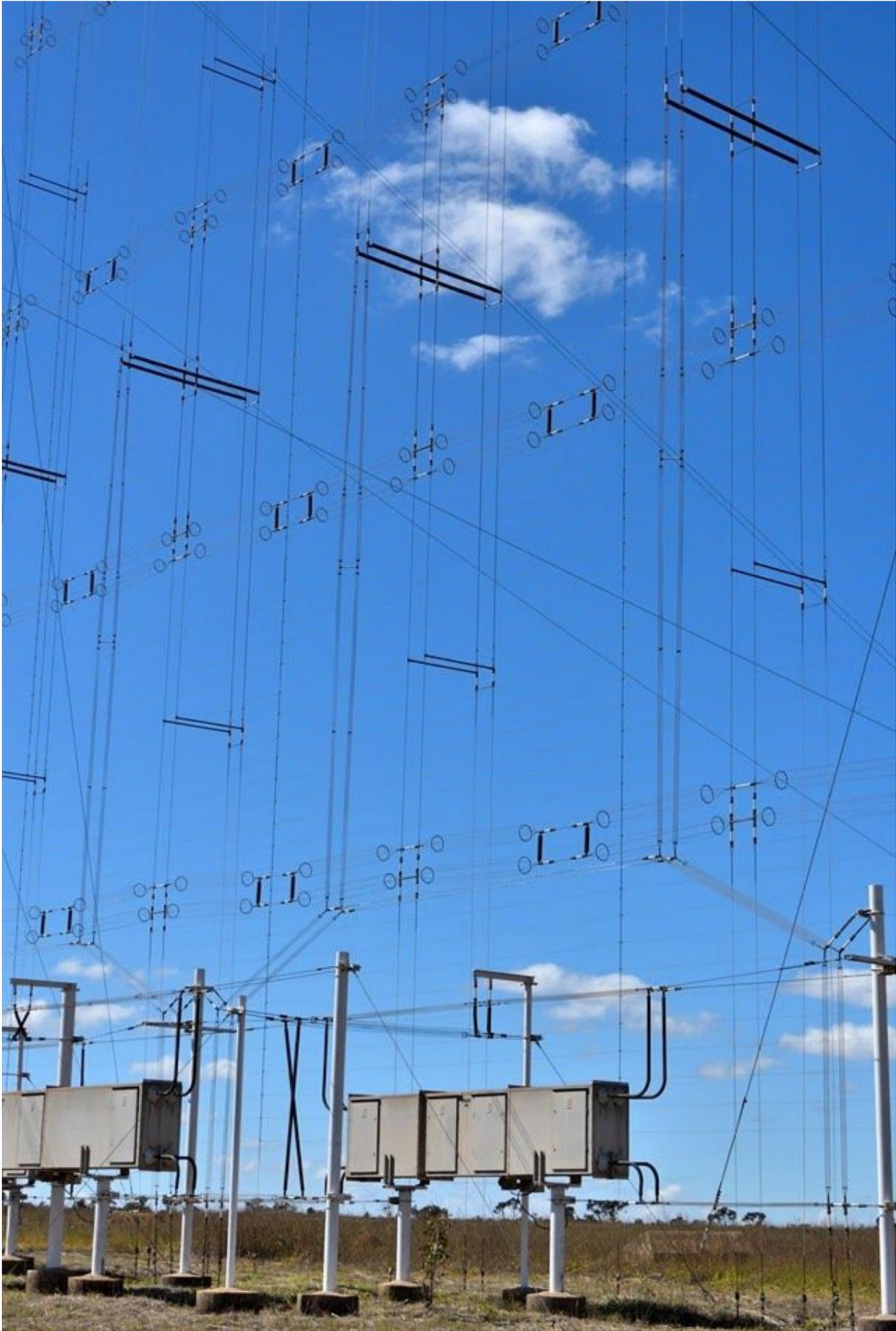


Photo: view of different angles of shortwave antennas



Photo: view of different angles of shortwave antennas

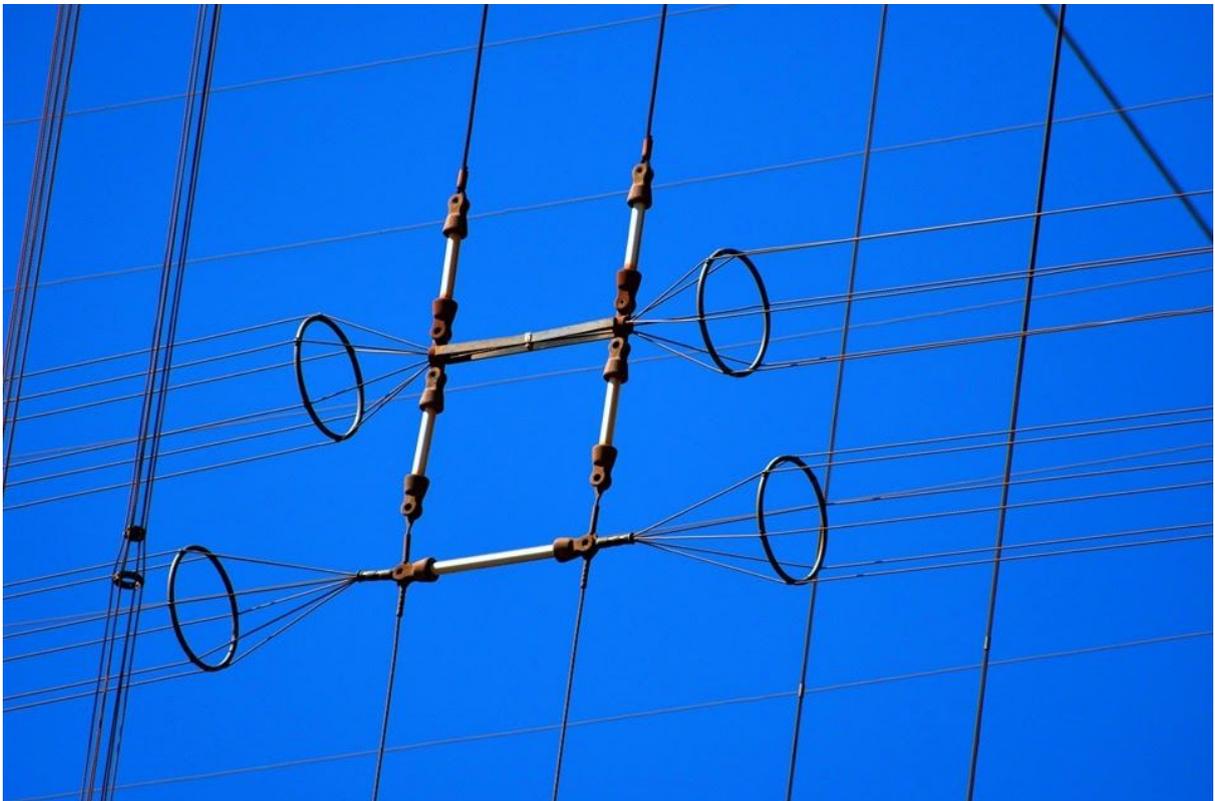


Photo: view of different angles of shortwave antennas



Photo: view of different angles of shortwave antennas

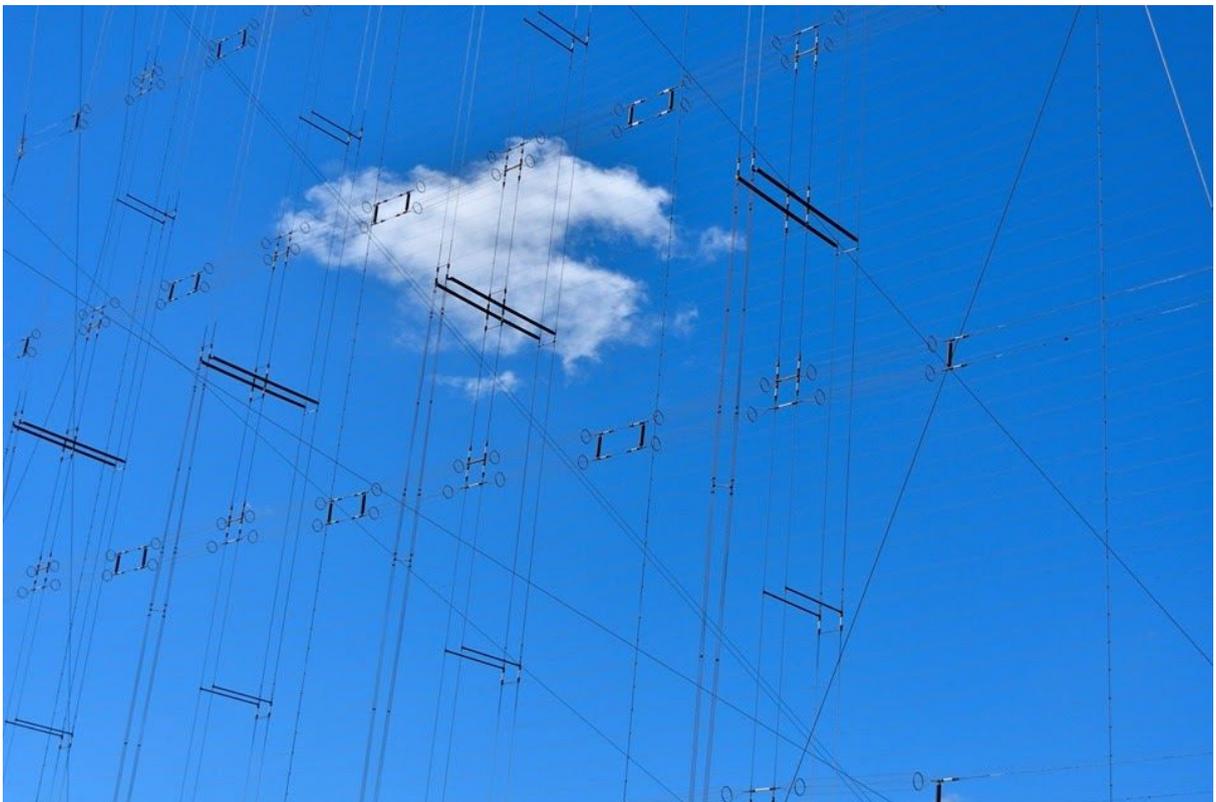


Photo: view of different angles of shortwave antennas

7. Transmission lines

Since each antenna system is fed separately, each of them has its own identical transmission line. In the photographs we can see that they are bifilar lines of the cage type.



Photo : different transmission lines for shortwave antennas leaving the transmitter building.



Photo: different transmission lines of shortwave antennas

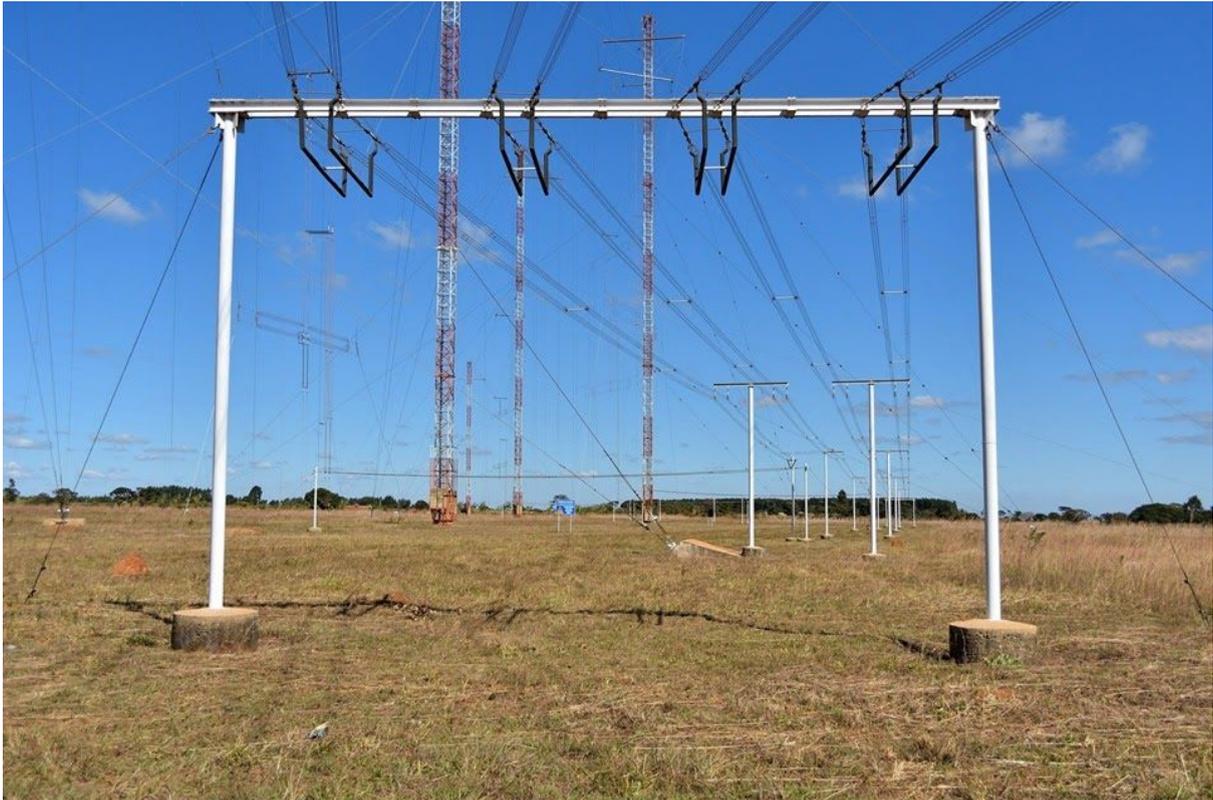


Photo: different transmission lines of shortwave antennas



Photo: different transmission lines of shortwave antennas



Photo: different transmission lines of shortwave antennas

8. Transmitter room

A huge corridor, from end to end of the building, houses the shortwave transmitters. There are six in total, where only two of them are currently operational, in the frequency 11,780 kHz and 6,180 kHz.

All transmitters are of Brown Boveri and Cie and of Swiss origin.

The engineer Ismar Do Vale Junior, interrupts the transmission for a few seconds and opened the doors of these true monsters. Thanks to this cut in transmission, I was able to see them from inside, otherwise it would have been impossible, because of the high level of RF radiation from them.

Once inside the transmitters we could see the heart of these beasts, their powerful valves and power modulators that are cooled by a complex water cooling system. They are located on the second floor of the building, near the return hot water tanks, which allows them to have a useful life of approximately 40,000 Hs.

Videos by Mark Van Marx (Marcos Melzi)

https://youtu.be/QnUCNI9N_HM

<https://youtu.be/ejvoM8xsGw4>

<https://youtu.be/zhHRBZwMx-c>

https://youtu.be/j_ynYLoyhP8

Photos by Mark Van Marx (Marcos Melzi)



Photo: The engineer Ismar Do Vale Junior, opens the doors of the TX-01 the imposing shortwave transmitter from Brown Boveri and Cie, of frequency range 11,780 kHz

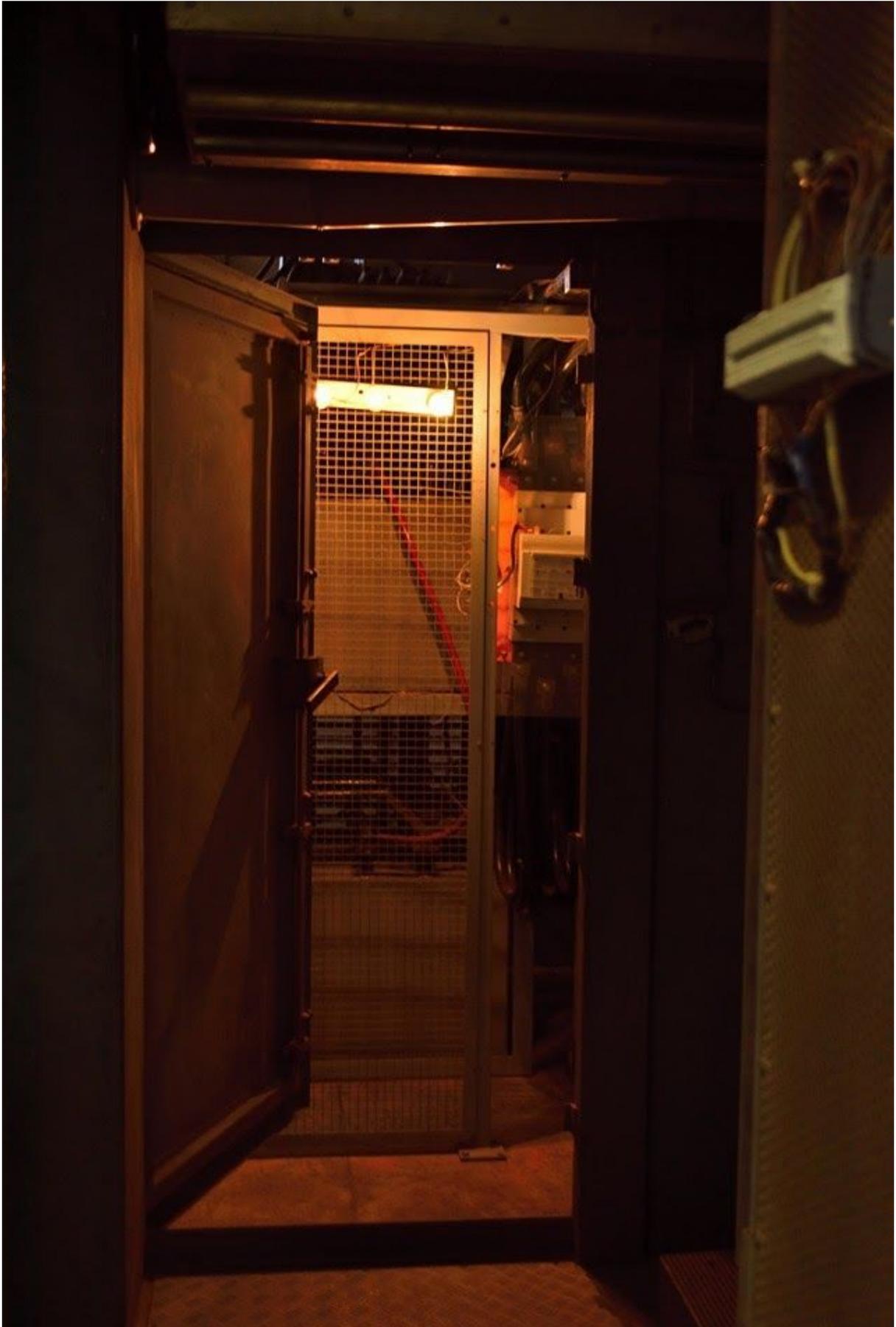


Photo: Open door of the imposing Brown Boveri and Cie shortwave transmitter



Photo: Image of the shortwave transmitter, Brown Boveri and Cie brand.



Photo: Martin Butera, next to the main shortwave transmitter from Brown Boveri and Cie

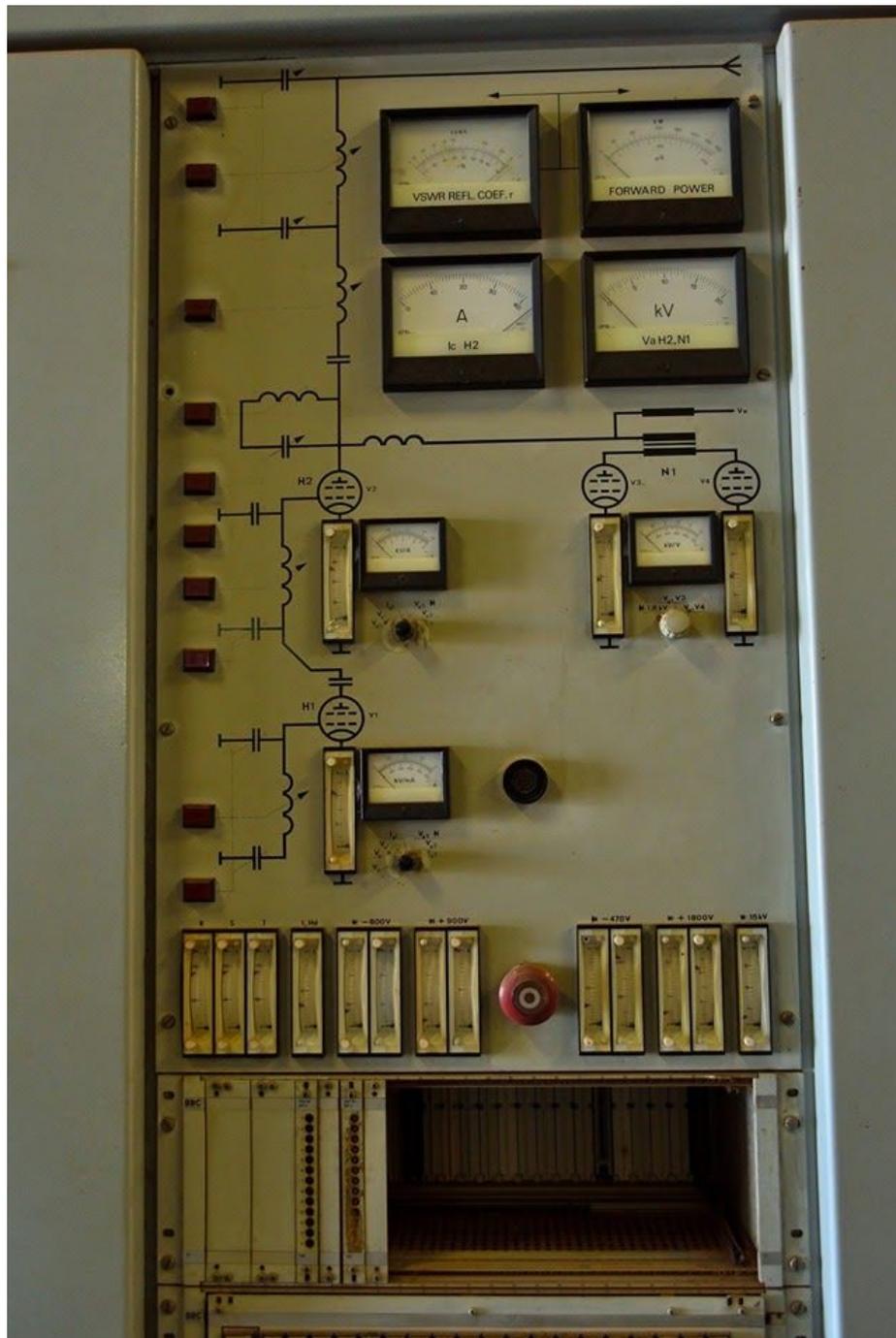


Photo: Image of the shortwave transmitter control panel of Brown Boveri and Cie brand.



Photo: TX-02 the imposing Brown Boveri and Cie shortwave transmitter, with a frequency range of 6,180 Khz.



Photo: Martin Butera, next to the powerful valves of the main shortwave transmitter of Brown Boveri and Cie brand.



Photo: Close-up image of the powerful shortwave valves from Brown Boveri and Cie.



Photo: Close-up image 2 of the powerful shortwave valves of Brown Boveri and Cie transmitter.



Photo: Martin Butera in the EBC truck, which were used to tour the site. The reader may have an idea of the immensity of the facility in the countryside.

9. Transmission monitoring and control room

The first thing we visited when entering the site, is the Hall of monitoring and transmission control room, this room houses a huge console where one can monitor the status of transmissions (power parameters and SWR).

There is also a spectacular switching console that allows you to connect any of the two transmitters with any of the antennas with the press of a button. Behind this console one can see different maps with the radiating lobes of the antennas, and the theoretical coverage of emissions from different areas of Brazil and the world.

These two consoles that control the parameters of transmitters and antenna switches are huge and as one can see they are a bit old, but nothing prevents their perfect performance, thanks to the technical maintenance of its dedicated personnel who maintain all the equipment correctly.

One can also see a huge rack with audio processors, modulators and satellite links for the programmes, which arrive from the studios located in Brasilia DF.

Videos by Mark Van Marx

https://youtu.be/3j_jcXcmS_0

<https://youtu.be/finoa5a8qyM>

Photos by Mark Van Marx (Marcos Melzi)



Photo: Power parameters console and SWR (75 Kw)



Photo: Power parameters console and SWR (75 Kw)



Photo: behind this console one can see different maps with the radiating lobes of the antennas, and the theoretical coverage of emissions from different areas of Brazil and the world.



Photo: Switching console that allows connection to any of the two transmitters with any of the antennas with the press of a button.



Photo: Martin Butera and the engineer Ismar Do Vale Junior next to the huge rack with audio processors, modulators and satellite links for programmes, which arrive from the studios located in Brasilia DF.

10. Electrical part

The entire park of “Parque Rodeador” antennas, always had its own electric power station, in March 2017, a strong thunder strike caused power outages and part of its own electric station was burned, that kept it out of the air for a long time (the shortwave service in 25 meters at 11,780 kHz and in 49 meters at 6,180 kHz as well as medium waves).

This problem led to installation of a large electric generator that feeds some of the power to the facility daily. Fuel is replenished daily to keep it operational.

While writing this report in July 2019, I could already visit the new electrical substation that was under construction, at the facility, to be equipped with the most modern technology. The accident totally altered the routine and lifestyle of thousands of people living in the Amazon. Even the listeners had begun to develop a plan to raise funds to help repair all the damaged equipment.

Photos by Mark Van Marx (Marcos Melzi)



Photo: electric generator, with the ability to power the entire facility.



Photo: another view of the electric generator, with the ability to feed the entire property



Photo: EBC truck, ready to supply the electric generator.

Two kilometers from the centre of the facility, I saw the new under construction captive electrical substation with the most modern technology.



Photo: Watch out for a lot of high voltage



Photo: Martín Butera, next to the equipment of the brand new electrical substation.



Photo: Orlando Perez Filho “PT2OP”, former Executive Director of LABRE DF (League of Brazilian Lovers of Rádio Emissão), engineer Ismar Do Vale Junior, engineer Manoel Caetano dos Santos and Martín Butera, together at the new under construction electrical substation.

11. Transmitter power supply panel

In the following photographs taken by Mark Van Marx, one can see the power supply part of the transmitters of the Rádio Nacional da Amazônia. There is also image of a large transformer that powers all the equipment.

Video by Mark Van Marx (Marcos Melzi)

https://youtu.be/U_Ws6T-DmZ8

Photos by Mark Van Marx (Marcos Melzi)



Foto: Power panel



Photo: Entrance to the electrical power supply facility of transmitters

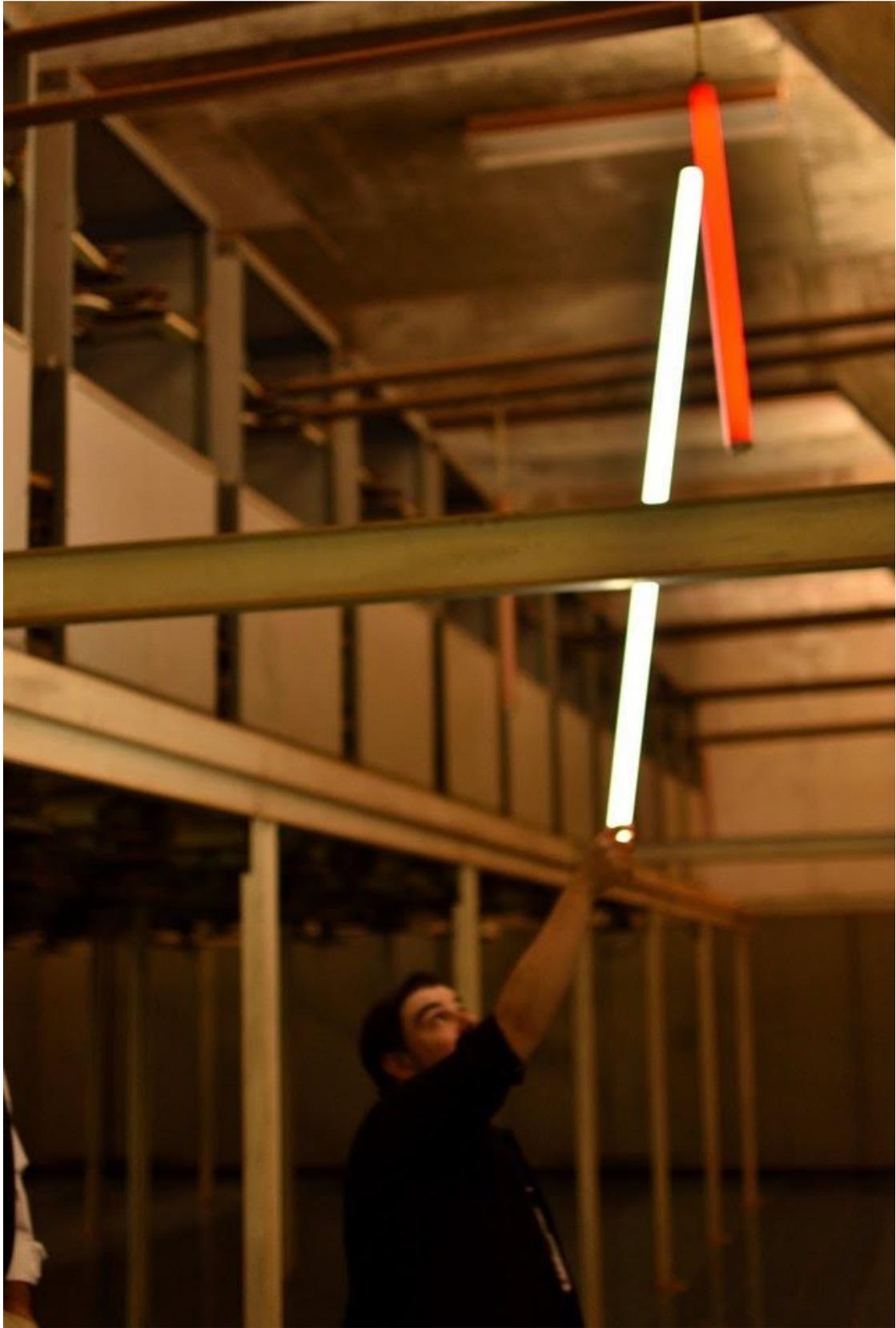


Photo: Martín Butera, playing with the RF. Please do not do this at home!

12. Rádio Nacional Brasília 980 kHz AM

Two kilometers away, the medium wave transmitter (OM) building is located within the short-wave antenna park.

The transmitter room is very similar to that of shortwave transmitter rooms. There are racks with satellite link receivers, audio processors and audio modulators of the signal that arrives from the studios situated in the capital. The signals are mixed before passing through the transmitter.

Also, apart from the Brown Boveri transmitters of 300 kW maximum power, for the medium wave (OM) signal, a modern transmitter from the famous American company Harris Broadcast is now being used, with an average power of 230 kW.

The transmitter of the National Radio AM of Brasilia works only during the night, when the signal is transmitted throughout the country. During the day, the Brasilia AM National Radio signal is transmitted from the SIA Transmitter Park, covering only the Federal District and its surroundings. This is due to the difficulty of transmitting a medium-wave signal throughout Brazil during the day.

The antenna, a monopole for the frequency of 980 KHz, has a height of 120 meters. Unlike the triangular towers that are normally found in this type of radios, it has a square shape and each side measures 1.20 m. This configuration makes the tower a really very robust structure.

Another interesting detail is that at the base of the tower there are 180 pieces of buried copper radials spaced at 360 degrees around the tower which form the ground plane of the antenna.

Photos by Mark Van Marx



Photo: Martín Butera, in front of the plaque that commemorates the foundation of the AM transmission building of the National Radio Brasília on 980 kHz AM.



Photo: Martín Butera, standing next to the Harris brand AM Broadcast transmitter.

WARNING WARNING

This equipment to be opened, operated, and maintained by
AUTHORIZED PERSONNEL ONLY.

Voltages and currents employed are sufficient to cause serious Injury or Death. With interlocks or other protective devices disabled; doors open, panels, or shield covers removed; electrical shock, radio frequency burns, or radiation exposure may occur.

OBSERVE SAFETY REGULATIONS AT ALL TIMES

ALWAYS disconnect power before opening doors, panels, or shields.
ALWAYS ground circuits before touching them. If making internal adjustments or if doing maintenance DO NOT WORK ALONE OR WHEN TIRED.

HARRIS



COMMUNICATIONS AND
INFORMATION HANDLING

Photo: Harris brand AM Broadcast transmitter safety notice.



Photo: Martín Butera, Engineer Ismar Do Vale Junior, Orlando Perez Filho "PT2OP", former Executive Director of LABRE DF (League of Brazilian Lovers of Rádio Emissão) and Engineer Manoel Caetano dos Santos, together at the 120 Mts high tower, of National Radio Brasília on 980 kHz AM.

13. Final notes by Martin Butera

Personally, it was a pleasant surprise for me to find such an imposing infrastructure in South America, along with the super technology studios of the highest level, giant antenna fields, all this being managed by a responsible company like the EBC, which understands the importance of investment and professionalism as regards to Brazilian public communication. I believe that Brazilian society needs to continue its efforts in discovering the indigenous peoples. The role of the Rádio Nacional da Amazônia is very essential in that task.

14. Acknowledgments by Martín Butera

I want to thank all those who supported me and collaborated to make this report, to my team of photographer and videographer – Ligia Katze (dear wife) and Mark Melzi (friend of the soul),

Anne Evers and Luciano Maia Luciano G. Maia (Coordination of Public and Financial Relations,

Executive Communication of Comunicação -Diretoria Geral EBC – Empresa Brasil de Comunicação,

To the producers of the National Radio da Amazônia, Luciana Couto, Taiana Borges and Solimar Luz,

To the broadcaster of the National Radio of the Amazon, Beth Begonha,

To the engineers Ismar Do Vale Junior and engineer Manoel Caetano dos Santos,

To Orlando Perez Filho “PT2OP”, former Executive Director of LABRE DF (League of Brazilian Lovers of Rádio Emissão), for honoring us with his accompaniment to the antenna field,

To the dear friend and listener from India, Sudipta Ghose (VU2UT) for his adaptation to English and correction, member of the Indian DX club International (www.idxci.in),

To my Finn friend Mäkeläinen editor <http://www.dxing.info/> , for sharing this article.

15. Author's review

Martin Butera

He is a listener of Shortwave Radio and Amateur Radio since 1992 with the Argentine callsign LU9EFO and the Brazilian PT2ZDX.

Martin is a Radio Amateur with more than 29 years of experience, and has participated in DXpeditions throughout South America, with the Argentine radio callsign LU9EFO and the Brazilian callsign PT2ZDX.

Martin collaborates and writes for several Radio newsletters that cover the theme of world radio.

Martin is the founder of CREW called 15 point 61 (15.61).

Martín Butera is a journalist, documentary filmmaker and founding member of Radio Atomika 106.1 MHz (Buenos Aires, Argentina) www.radioatomika.com.ar
He currently lives in Brasilia, capital of Brazil.



16. References

The following report was supported by different references and texts cited here

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URL: https://pt.wikipedia.org/wiki/Empresa_Brasil_de_Comunica%C3%A7%C3%A3o

Article title: Rádio Nacional de Brasília
Website title: EBC Rádios
URL: <http://radios.ebc.com.br/nacionalbrasiliam>

Author Rádio anos
Article title: Amazônia Brasileira
Website title: 35nacionalamazonia.blogspot.com
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Article title: Criança do Futuro : Waköpünska Karipuna!
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