

Rádio Nacional da Amazônia, Brazil

By Martín Butera

Rádio Nacional da Amazônia has the largest complex of medium and short wave transmitters and transmitters in Latin America and the fifth most powerful in the world.

The Rádio Nacional da Amazônia transmits to more than half of the Brazilian territory on short wave frequencies of 11780 and 6180 kHz. Inaugurated on 1 September 1977, the station was created by the military government under the so-called National Security Doctrine. Its 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.

On 12 June 2008, Radiobrás ceased to exist and all the radio stations that were part of the company, including the Rádio Nacional da Amazônia, joined the Empresa Brasil de Comunicação (EBC). Empresa Brasil de Comunicação (EBC), a public company organized as a private corporation, with 51% of its shares owned by the union, was created by law No 11.652 / 2008. The company's mission is to implement and administer the system of public communication foreseen in the Federal Constitution in its article 223.

Today, the station is a means to promote citizenship and communication between listeners. 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 Crimes against indigenous peoples in dictatorship, issued 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 producers mention that the programming pattern is almost entirely led by the listeners themselves, due to the proximity with the radio conductors and announcers. The producers tell us that we must think about the immensity of the peoples that inhabit the Amazon, that even today the radio is used for messages from listeners to their relatives and friends, since in those places the only thing that arrives by air is the radio itself. The importance of maintaining this shortwave service is emphasised.



Martin in the EBC van, ready to tour the immense site

Beth Begonha's Brazilian Amazonia

We interviewed one of the main presenters of Rádio Nacional da Amazônia, the beloved Beth Begonha, of the *Brazilian Amazon* programme. Presented from Monday to Friday from 8 a.m. to 10 a.m., the programme carries news and education related to the history and culture of the Amazon.

Listeners participate in the programme through letters that give suggestions, ask questions and request music. There is also the participation of reporters and interviewees directly from the Amazon region. Broadcaster Beth Begonha has been presenting *Brazilian Amazon* since 2003. We were able to speak in a relaxed interview in the studio itself, during the programme intervals.

She is a very much in demand announcer, having made several trips to visit indigenous towns and communities, creating a strong and very beautiful relationship with them. Through the microphones of the National Radio of the Amazon, Beth Begonha speaks with the awareness of who lived the reality of the Amazon. Its programme talks about environmental issues and highlights the need to assess the cultural identity of indigenous communities, and all the riverside that live on the 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 effort, and I believe that this testimony is also an important element in this incentive, which has had many beautiful results."

Beth Begonha tells me, "Everything I know about the indigenous people I learned from them. When I started the project of the Brazilian Amazon, a programme 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 and diversity, specific topics, promoting knowledge and interaction among these populations, this also included indigenous communities, this space has always been designed to be occupied for the Indians, not for someone who speaks for them. 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."



Ligia Katze, photographer and Martín Butera, interviewing Beth Begonha

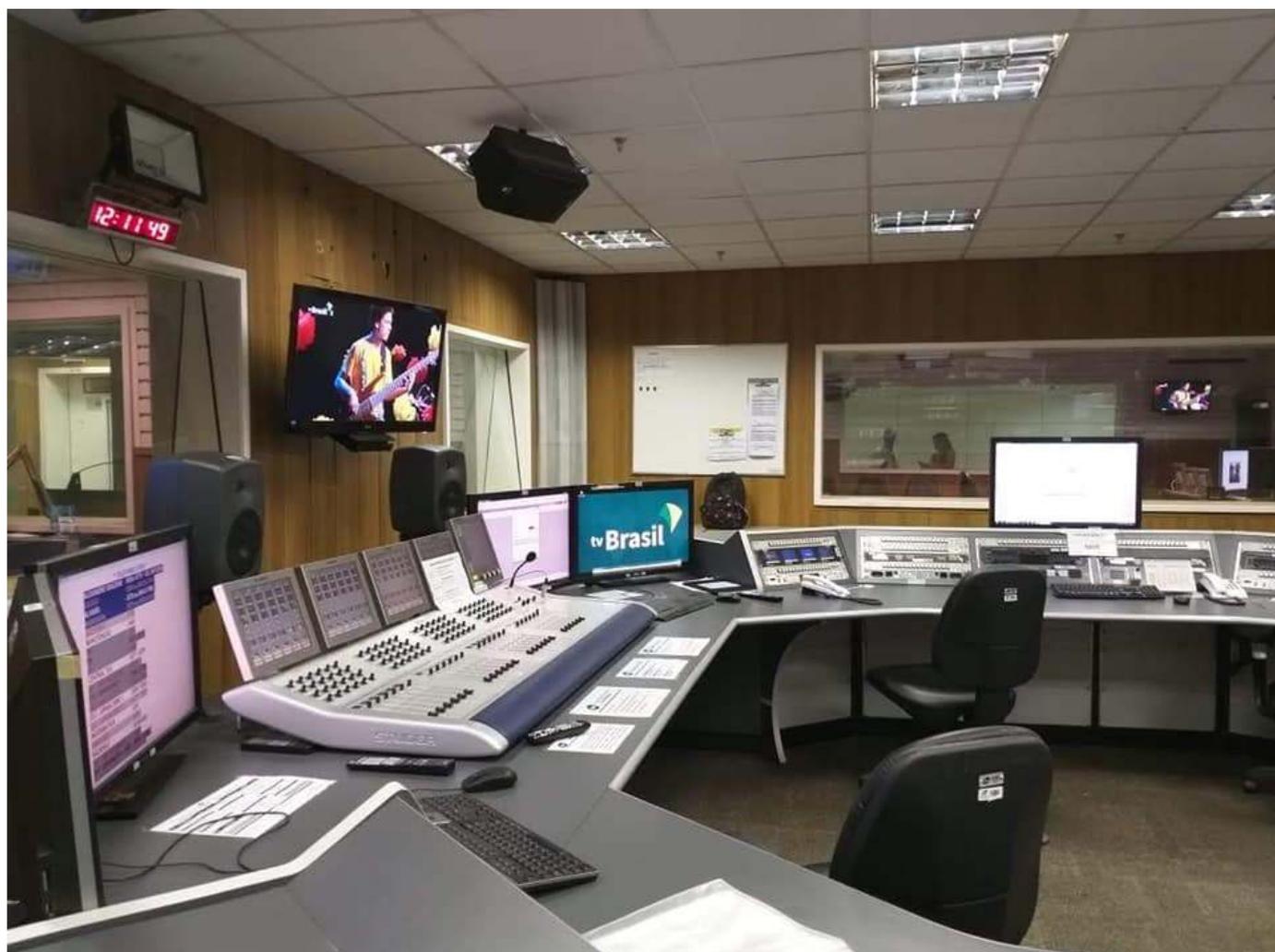
Beth's programme performs unprecedented work, inserts indigenous peoples into the agenda of the program, opening a space that values these Brazilians. The musical part is not only dedicated to popular and successful Brazilian songs, here the listeners have the opportunity to listen to songs that are produced directly inside the Amazon.

The programme has also generated the 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 a relevant transmission outside the studios.

It was when visiting the Xingu Indigenous Park in 2007, where she covered the visit of the then Minister of Justice Tarso Genro (Brazilian lawyer, journalist and politician affiliated with Workers' Party, currently the governor of the state of Rio Grande do Sul).

Beth Begonha's programme 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 that dealt with the biodiversity of the Amazon. One of these relevant transmissions was the one that took place from June 18 to 22, 2012. During "Rio + 20", the biggest environmental event of the past decade.

Together with Mr. Luciano G. Maia, in charge of public relations of the company EBC, I had the opportunity to tour the entire modern property, with an impressive mix of all radio and even television signals.



General mixing desks of the EBC

You can watch videos of the visit on Martín's YouTube channel, called Martín Mark, including this short video by Ligia Katze at https://youtu.be/TuN9nZT_-s8

Radio Nacional de Brasilia Park

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

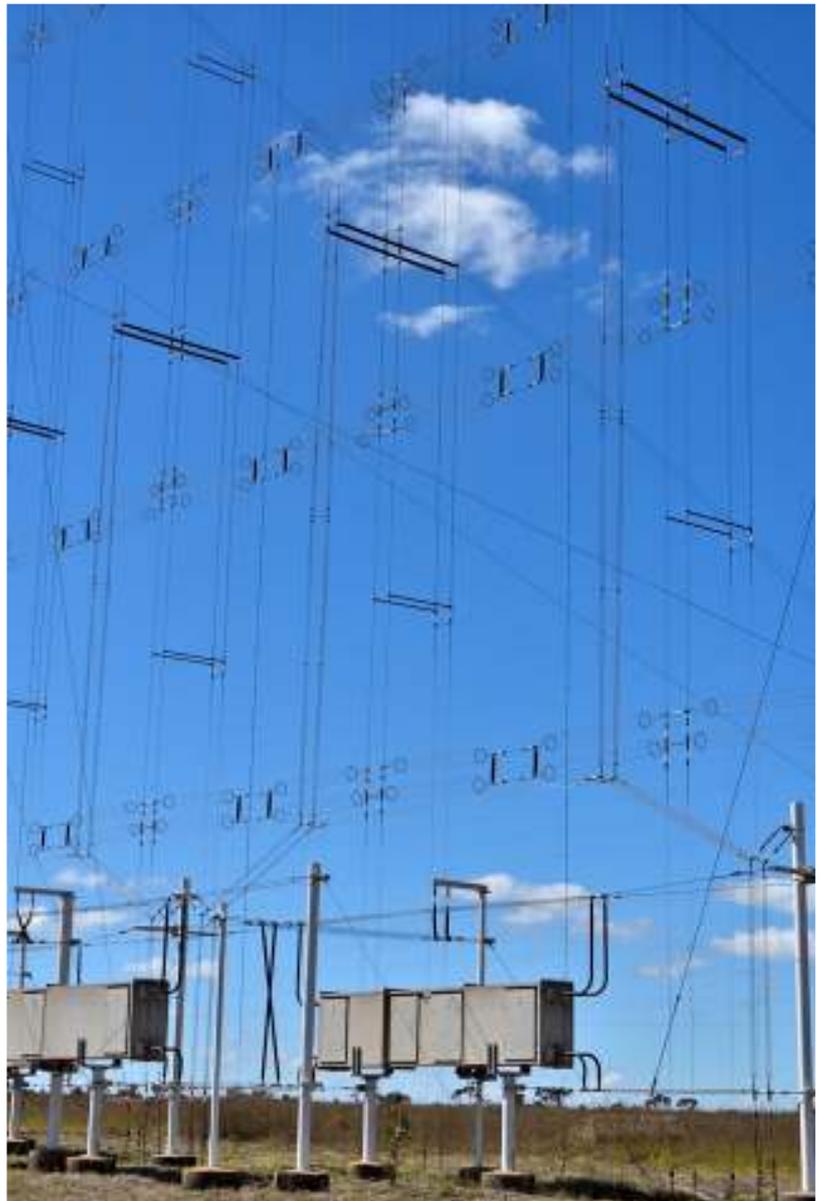
The visit to the antenna field is absolutely incredible, the structure of the park without a doubt is colossal. From afar, you can already see the imposing towers 150 meters high each.

Everything is perfectly well maintained and a team of well-dedicated people and professionals work in the field of antennas, these professionals are responsible for not neglecting the quality of the signal.

While there is a great contrast between the modern studios located in the centre of Brasilia to the transmitters of the antenna field located 34 km 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 permanently.

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

This led to the year 2018, named by the "Cabinet of Institutional Segurança da Presidência da República (GSI)", the "Parque do Rodeador" antenna field being officially classified as vital support infrastructure for critical situations and natural disasters and emergencies, to be used if the Brazilian population enters a situation of collapse in communications.



Installed on March 9, 1979, the area 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 responsible 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.

Antennas

We were received by the engineer 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 luxury 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 on short waves of Rádio Nacional da Amazônia, divided into four subsets, referred to as C1, C2, C3 and C4. The antennas are prepared to be able to transmit a maximum power of 300kW, however they always operate with half at 150kW. Currently this power was reduced to 75kW, this was due to an event that occurred in March 2017, which we will detail later, observing the electrical part.

The set of short-wave "dipoles" of the Rádio Nacional da Amazônia consists of 4 subset of antennas, Subsets C2 and C3 have the same structures and dimensions and are operated at frequencies close to 6 MHz. Currently, subset C2 is used to transmit the signal from the National Radio of the Amazon at 6,185 kHz and subset C3 is not transmitting.

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

You can watch videos of the visit on Martín's YouTube channel, which is called Martin Mark. Videos by Mark Van Marx include those at <https://youtu.be/5MptOV4iLI4> <https://youtu.be/QERWmtaAJe8> and https://youtu.be/VEB_K_aOjI



Right: View of the antenna field showing some of the shortwave masts

Lines of transmission

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

Transmitter room

A huge corridor, from side to side, houses the shortwave transmitters, there are six in total, where only two of them are currently operational, in the frequency range 11,780 Khz to 6,180 KHz. All the transmitters are Brown Boveri and Cie, of Swiss origin.

The engineer Ismar Do Vale Junior, interrupted the transmission for a few seconds and opened the doors of these true monsters. It was thanks to this cut that I was able to see inside them, since otherwise it would be impossible, because of the high radiation that is issued.

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 system. Located on the 2nd floor of the building, near the return hot water tanks, they have a useful life of approximately 40,000 hours.

Transmission monitoring and control room

The first thing we visited when entering the site, was the hall of monitoring and transmission control. This room houses a huge console where you 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 we could 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, the parameters of transmitters and antenna switches are huge and, as we could see, quite old, but nothing prevented a perfect performance, thanks to technical maintenance by workers who maintain all the equipment correctly. We also saw a huge rack with audio processors, modulators and satellite links, which arrived from the studios located in Brasilia DF.

Right: TX-01, the imposing Brown Boveri and Cie shortwave transmitter, for the 11780 kHz frequency.





By this console (above) we can see different maps with the radiating lobes of the antennas, and the theoretical coverage of transmissions from different areas of Brazil and the world.

Electricity

The entire park of Parque Rodeador antennas, always had its own electric power station. In March 2017, the strong rays caused power outages and part of its own electric station was burned. This kept it out of the air for a large time, the shortwave service (25 metre band on 11,780kHz and the 49 metre band on 6,180kHz) and also medium waves.

This problem led to some of the electricity that feeds the property to be operated by a large electric generator, which is replenished daily, so it is the reduction of power. In July 2019, I could already visit what will be the new electrical substation, typical of the property, equipped with the highest technology.

At the time this accident totally altered the routine 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.

An Empresa Brasil de Comunicação (EBC) truck, ready to supply the electric generator.





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 with what will be the new electric substation.

Rádio Nacional Brasília 980 kHz AM

Two kilometres away, the medium wave transmitter (OM) building is located in the shortwave antenna park. The room is very similar to that of short waves, there are racks with satellite link receivers, audio processors and audio modulators of the signal that arrives from the studios from the capital, where they are mixed before passing through the transmitter

Also Brown Boveri brand transmitters of 300 kW maximum power. However for the medium wave (OM) signal, a modern transmitter from the famous American company Harris Broadcast is 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 is a monopole for the frequency of 980 KHz, with a height of 120 meters high. Unlike the triangular towers that are normally found in this type of radio, it has a square shape and each side measures 1.20m. This makes the tower a really very robust structure. Another interesting detail is that at 360 degrees around the tower there are 180 copper radials buried to form the ground plane of the antenna.

Personally, it was a pleasant surprise for me to find such an imposing infrastructure in South America, with super technology studies 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 in regards to Brazilian public communication.

I believe that Brazilian society needs to continue discovering indigenous peoples. The role of the Rádio Nacional da Amazônia is essential in that task.



Martín Butera, National Radio da Amazônia presenter Beth Begonha and the shift operator

Acknowledgments

I want to thank all those who supported me and collaborated to make this report: to Ligia Katze (dear wife), for studio photographs and videos. Mark Van Marx (friend of the soul), photographs and video in the antenna field; 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; broadcaster of the National Radio of the Amazon, Beth Begonha; engineers Ismar Do Vale Junior and engineer Manoel Caetano dos Santos; Orlando Perez Filho PT2OP, former Executive Director of LABRE DF (League of Brazilian Lovers of Rádio Emissão).





More photos of Martín Butera's visit to Rádio Nacional da Amazônia: The Rodeador Park in Brasilia Federal District is the largest complex of medium and short wave transmitters and transmitters in Latin America. Martín (above) is pictured next to an EBC sign which states access to the shortwave antenna field is prohibited, due to the high RF.

Photo (left): left to right: Martin Butera, Ismar Do Vale Junior (engineer), Orlando Perez Filho PT2OP (former Executive Director of LABRE DF (League of Brazilian Lovers of Rádio Emissão)) & Manoel Caetano dos Santos (engineer).

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