Associazione Italiana per la Radio d'Epoca

Narration of the historical re-enactment of the first Radio-Telegraphic Transmission with a spark transmitter from a hot air balloon and receiver on the ground. Event made for remember what was performed in England by Lieutenant C.J. Aston of the Royal Engineers Corps in 1908.

On that occasion, a radio-transmission was performed for the first time using a spark transmitter placed on board of a hot air balloon. The receiver, positioned on the ground for the entire transmission period, received clearly the transmitted signals.

Event organized by the members of A.I.R.E. Piemonte "Associazione Italiana per la Radio d'Epoca"
http://airepiemonte.org/orbassano-2022.html

History

Joseph Michael (26 August 1740 - 16 June 1810) and Étienne Montgolfier (6 January 1745 - 2 August 1799) are respectively the twelfth and the fifteenth of Pierre Montgolfier's, a rich fabric and paper manufacturer, 16 sons. Their company with 300 years of tradition was located in Vidalon di Annonay near Lyon and usually supplied its products to the court of the Sun King Louis XVI.

Both brothers were very cultured, Joseph, the eldest, brilliant person and dreamer but not very practical in business, in particular he dealt with experiences of physics and was very interested in problems related to the flight. The production of hydrogen was also known to him and fascinated him a lot. In particular, Joseph Montgolfier had inflated envelopes of cloth or paper with this very light gas on several occasions. Unfortunately, these very porous containers were unable to retain hydrogen and hence the failure of the experiments.

One evening Joseph Montgolfier stood in front of the fireplace and watched the sparks and flakes of ashes that rose pushed through the smoke. He had an intuition; with some light paper, he produced a kind of cup that was able to restrain the smoke. He slowly placed the cup on the fire and left it free to heave raised by the hot air produced in the fireplace and held by the cup itself.

The paper envelope used hot air, less dense than the surrounding one, to obtain a force or upward thrust necessary to lift it off the ground according to the well-known Archimede's principle.

Montgolfier was in seventh heaven, immediately wrote to his brother Étienne instructing him to prepare a large quantity of taffeta (shiny silk) and sturdy hemp ropes.

Étienne was also a brilliant man, with a lot of inventiveness, a lot of imagination and fascinated by the scientific discoveries of those times, he had a more regular and business-oriented character than Joseph.

We arrive at May 6th 1783 when the Montgolfier brothers made a rudimentary silk wrap, held in place by a hemp rope, which they placed over a wood fire. When the rope was loosened, the casing rose for about 20 meters and then moved and made a journey lasting about 30 minutes. In a small spacecraft tied to the casing there was a kitten that meowed insistently throughout the journey but when it landed it presented no visible problems.

Encouraged by this experience, the Montgolfier brothers produced other similar devices which they further perfected.
On June 4th 1783 came the fateful day of the presentation to the public of their discovery. In front of the convent des Cordeliers, in the main square of Annonay, a large audience of about 100 people was officially attending the event. The Montgolfier brothers had prepared a spherical balloon made of paper and silk of 11 meters in diameter, which they placed over a fire of straw and wool. Two men took care of the bonfire while 8 other men, with great difficulty, held the balloon until Joseph Montgolfier gave the order to let it go. The straw and wool produced a big black and stinking smoke, which however passed almost unnoticed in the face of the experiment. The balloon soared up to 1,000 meters in height, then moved slowly, and landed softly over 2,000 meters away in a vineyard near Annonay.
The experiment aroused great interest throughout France and the Montgolfier brothers were invited to repeat the experiment.

On September 19th, 1783, in front of the Royal Palace of Versailles, in the presence of the court of the Sun King Louis XVI, Queen Marie Antoinette and of a huge crowd, the Montgolfier brothers presented their latest creation: the Martia balloon (Photo N° 1), a 12.5 meter diameter balloon made with cotton and paper elegantly painted and decorated.
A rudimentary basket with inside a ram, a duck and a rooster, hangs under the balloon.

Photo N° 1 on September 19th 1783 the flight in the presence of the Sun King

The balloon with an undulatory movement rose to an altitude of up to 500 meters and then slowly descended and landed 3 km away in the Vaucresson wood. The three animals, the first astronauts in history, were unharmed, alive and well.
The first person who arrived at the landing site was the knight Jean-François Pilâtre de Rozier, a young physicist, a whimsical and original character.
On October 15th Pilâtre contacted the Montgolfier brothers and volunteered for a restricted ascension on the balloon; ascension that took place without problems in 5 minutes up to an altitude of 24 meters.

After this positive experience Pilâtre was a candidate for the following ascents and so on November 21th, 1783, at the castle of the Muette, in the bois des Boulogne a balloon with 14 meters in diameter and 21 meters high made of waterproofed cotton cloth was used. The balloon was a true work of art with gold decorations on a blue background depicting the sun, the insignia of the King, the zodiac signs and more.
The first ascension had to be constrained and had the purpose of verifying the correct distribution of the weights and that everything was working properly. In reality, tears were produced in the canvas which were immediately repaired within about 2 hours.

At around 2 pm took place the take-off of the first free flight. In addition to Pilâtre, in a diametrically opposite position there was also the Marquis of Arlandes, an army officer invited by King Louis XVI to support Pilâtre in the enterprise.
In front of a huge crowd estimated at over five hundred thousand people (Paris at that time had a million inhabitants) the balloon rose majestically to an altitude of 900 meters. After 25 minutes from take-off, about

8 km away, the balloon landed at the Coulebarbe mill in the place called Butte aux Calles. In present-day Paris, this place is located in Place d'Italie.
These two men went down in history for being the first human beings to have flown over and observed the earth from above on a man-made vehicle.
Throughout the flight Pilâtre and the Marquis d'Arlandes continued to burn the straw and wool in the brazier suspended in the center of the entrance in the the balloon base. Suddenly there were lacerations caused by the fire that advised the two pilots to be careful and not to overdo the burning of straw and wool.

This latest presentation was a huge success both in France and abroad, so much so that the Sun King Louis XVI conferred the Noble title to Pierre Montgolfier and all his descendants for the production of paper, cloth and for the inventions of the his sons Joseph and Étienne.

Joseph and Étienne were also named extraordinary members of the Paris Academy of Sciences while these flying objects around the world were called "Hot Air Balloon".

It is curious to note that the two Montgolfier brothers throughout their life were always present in all related activities but never got on their own balloon!

The way was now marked; all over Europe other hot-air balloons were made and attempts were made to establish other primates.

In Italy the first flight took place by Cav. Landriani in Monza on November 15th 1783.

In photo N° 2 dating back to 1888 you can see a large hot-air balloon anchored in Piazza Vittorio Veneto in Turin and behind the mole Antonelliana still under construction.
Almost simultaneously, other characters were experimenting with building balloons filled with hydrogen. This solution would have made it possible to create smaller balloons, with higher ascension capacity, but extremely dangerous due to the hydrogen characteristic of easily igniting. In those days, the difficulties were enormous, both for the production of hydrogen impermeable fabrics and for the production of hydrogen itself.

Photo N° 2 Piazza Vittorio Veneto in Turin 1888

On August 27th 1783 in Paris at the field of Mars where the Eiffel Tower stands today, the young physicist Jacques Charles reacted 250 kg of sulfuric acid with 500 kg of iron granules to obtain the necessary hydrogen. After three days, the time needed to prepare the hydrogen, in the presence of fifty thousand people, Charles's balloon, with no crew on board, rose to the applause of the crowd. The balloon with a diameter of 4 meters, contained 27 m^3 of hydrogen, rose up to about 900 meters and then landed at 20 km at Gonesse, the area where Charles de Gaulle airport stands today.
Later Charles started working on a balloon capable of carrying aeronauts.

On December 1st 1783, after 3 days of inflation, Jacques Charles and Marie-Noel Robert, a manufacturer of special fabrics, took off from the Tuileries garden using a perfectly spherical balloon with a diameter of about 8 meters inflated with 270 m^3 of hydrogen. The flight lasting 2 and a half hours allowed to reach the altitude of 250 meters and then land near Nesle, 43 km away.

Jacques Charles had been preceded by the Montgolfier brothers by a few months. Later his invention was carefully examined to evaluate the characteristics of the balloon filled with "flammable air" compared to the balloon filled with "hot air".

We begin to talk about the historical re-enactment

At the end of the historical re-enactment that we carried out last year, Surveyor Carlo Pognante, President of the Orbassano Pro Loco, promised to get us a hot air balloon this year. To tell the truth we all thought that Pognante was joking, instead in April he began to contact us making sure of our participation which we immediately confirmed.

We immediately began to think about the performance of this re-enactment, to carry out research on hot air balloons and on the tests of radiotelegraphic transmissions carried out on board these vehicles.

To be honest, apart from what follows, we have found very little documentation on this subject and no photographs; here are the facts:

Hot air balloons, balloons, braked balloons, probe balloons; these flying objects did not go unnoticed by the various armies. Particularly in England the Royal Engineers (RE) corps "the British Corps of Engineers" in 1892 were involved in the formation of the School of Ballooning near Aldershot. The RE used these balloons for observation beyond enemy lines as early as the second Boer War from 1899 to 1902.

These corps used to experiment and use technologically advanced techniques and materials. The REs were not indifferent to the birth of wireless telegraphy, several tests were carried out and in particular the balloons were used as a support to the experiments.

In the history, the first test of a radio receiver on board a captive balloon was carried out in England in 1907 by Lieutenant C. J. ASTON of the Royal Engineers.
It is also Lieutenant ASTON, in 1908, who installed a receiver on board a balloon to pick up the signals of a radio-telegraph transmitter on the ground at a distance of 35 km.
Towards the end of the same year ASTON repeated the test, this time with a small spark transmitter on board, which allowed him to send test messages that were correctly received at ground.
In this way, the radio-telegraphic transmission from the balloon to the ground and viceversa is to be considered an exclusive to be attributed to the British.

For our re-enactment we therefore began to work to repeat the experience of Lieutenant C. J. ASTON when he used the spark transmitter on board the balloon and the receiver positioned on the ground. There was no receiver on the balloon and there was no transmitter on the ground.

Equipment used
From the very beginning we wanted to carry out the historical re-enactment using original vintage equipment repaired and overhauled to make it actually working. After a period of 100 years and more, the difficulties encountered in making them operational were not indifferent; the satisfaction when we successfully completed the restoration paid off the difficulties encountered.

We come to the choice of equipment:

- **The transmitter** is a generator of sinusoidal damped waves with direct excitation of the antenna / earth and is composed of:

  ✓ Medium-sized Ruhmkorff coil (Photo N° 3), powered at 6 Volt by lead-acid batteries.

  The Ruhmkorff coil is directly connected to the Augusto Righi 4-balls oscillator and to the antenna circuit.

  The voltage interruption of the primary circuit is obtained mechanically by means of a vibrating metal sheet. An 8 μF capacitor was connected in parallel to the metal sheet to reduce sparking on the contacts.


Photo N° 3 Ruhmkorff coil

The discharge between the spheres is equal to 15 mm which corresponds to a voltage of about 40,000 Volt.

In order to increase the interruption frequency of the primary circuit we wanted to use a mercury switch, but the positioning of the transmitter on the basket of the balloon subjected to probable jolts and sudden movements made us desist from realizing this idea.

✓ 4 balls (or 3 sparks) oscillator Righi type (Photo N° 4) developed by Augusto Righi (1894), derives from that of Hertz (1886) designed to produce damped sinusoidal electromagnetic waves but with a shorter wavelength. Used by Marconi to produce oscillations with a higher wavelength.

The oscillator consists of two central balls with a diameter of 102 mm and two lateral balls with a diameter of 52 mm. Discharges occur in the air. The distance between the balls is adjustable. The oscillator is a capacitance / inductance circuit in series with distributed constants. The oscillator structure is made of very thick hard ebonite while the balls are made of solid brass and hence the considerable weight of 14 kg.

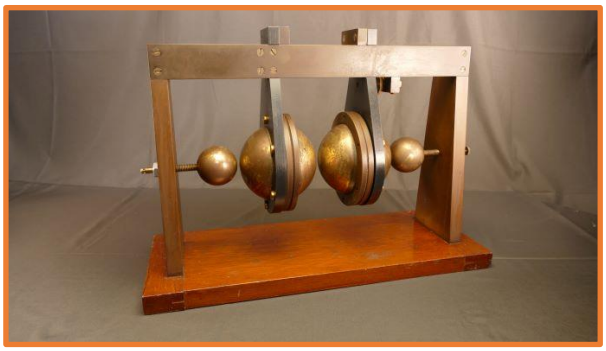


Photo N° 4 type Righi 4 balls oscillator

Augusto Righi in his study "L'OTTICA DELLE OSCILLAZIONI ELETTRICHE" Zanichelli 1897 wrote: *the effect of the oscillator depends enormously on the distance of the two balls that constitute it, but much less on the distance between them and the two balls communicating with the machine. Finally, I still recognized that, if the two balls are hollow, the effectiveness of the oscillator is less than when they are full*.

✓ Vertical morse key (Photo N° 5) with a large ebonite manipulation knob and large electrical contacts, actually a key not that easy to manipulate.

Photo N° 5 Vertical morse key

Photo N° 6 transmitter components fixed on a wooden surface

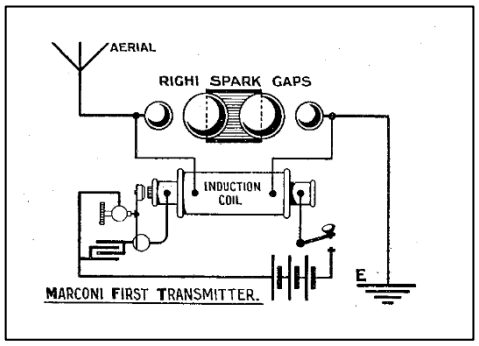
The transmitter with a total weight of 24 kg, during the re-enactment must be placed in the basket of the balloon which during the ascents could have strong movements and jolts. For this purpose, all the components of the transmitter, ie Ruhmkorff's coil, Righi-type oscillator, batteries and telegraph key were fixed with screws and straps on a wooden surface equipped with 4 legs (Photo N° 6). The table thus obtained was secured with straps to the wicker basket of the balloon ensuring its complete fixing.

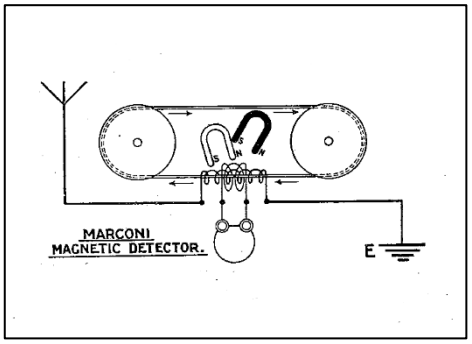
- **The most suitable receiver** for this experience was considered the Marconi Magnetic detector (Photo N° 7) produced by Marconi Wireless Telegraph Co Ltd since 1902.

Photo N° 7 Marconi magnetic detector

The magnetic detector was much more sensitive than the coherer receivers commonly used up to that moment but, of lower sensitivity than that of the Fleming valve which, starting from 1912, took its place.

Below are the basic diagrams of the transmitter and receiver.





Both devices, owned by the RAI Museum of Radio and Television in Turin, have been given to us in concession for the realization of the event.

Field tests

Now after having overhauled the Ruhmkorff coil and the magnetic detector, before operating on the balloon, it was necessary to verify, with field tests, whether the magnetic detector could detect and make listenable in the headphones the signals transmitted by the spark transmitter.

For this purpose, an experimentation field located at Camasco at 850 m a.s.l. was used. This town is located in Valsesia, in a mountainous area of the municipality of Varallo Sesia (VC) overlooking Monte Rosa (Photo N° 8).

Photo N° 8 Monte Rosa massif 4,634 m a.s.l.

In these remote valleys, silence and pungent air are ideal ingredients for doing these tests without disturbing any service, while the distance from civilian settlements allows you to do tests without recording disturbances. Only the crackling of our sparks broke this silence.

For the receiving antenna we made a long wire of 50 m in length obtained by a copper cable of 1.5 mm^2, while for the transmitting antenna, we made another long wire of 25 m also obtained by a copper cable of 1.5 mm^2.

The Marconi magnetic detector was connected directly to the receiving antenna and to the earth made of a large stake driven into the ground.
The transmitter was connected directly to the transmitting antenna while for the earth connection, we simulated an earthing using a cable of about 20 meters slightly above the ground.

On a day in mid-September, with the sun still hot but with a very strong and annoying wind, after connecting everything required, we started to revive Ruhmkorff and Marconi magnetic detector.
The test was carried out with the devices at a distance of about 350 meters from each others. By convention we have transmitted a series of S and V which were clearly received by the magnetic detector.
Subsequent tests were performed to understand the importance of the connection to the transmitter dummy earth, which proved to be important and strategic for the good reception of morse signals.

Measurements were also made on the radiated spectrum which actually occupied an impressive bandwidth, but in the early 1900s this was not a problem. The working frequency of our transmission system was about 1,200 kHz.

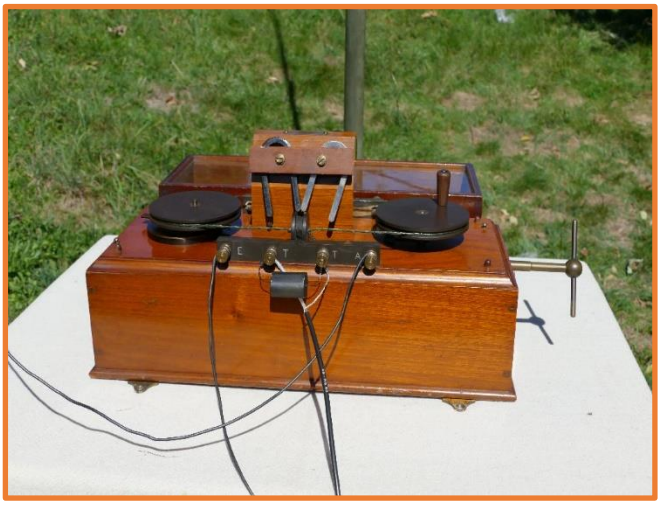


Photo N° 9 the magnetic detector in operation

Observe and listen the magnetic detector in operation was thrilling. Through the clockwork movement system, the band of stranded soft iron wire slowly rotated through the antenna and headphones coil. When the band was set in motion, in the absence of signals, a discreet rustling was heard which then left space to the decoded signals reproduced with a rather low sound.

When the band stopped, the last letter received was decoded, then the detector was finally muted. There are no further regulators and no volume control.

The usual position of the detector magnets with respect to the coils is shown in Fig. 1 (a), where it is seen that the like poles are together. This arrangement results in a slight hissing sound being produced in the headset all the time the band is moving.
If the magnets are arranged, as in Fig. 1 (b), this hissing effect is eliminated and at the same time the sensitivitiveness of the receiver is slightly lessened.
We have chosen to use the first solution.

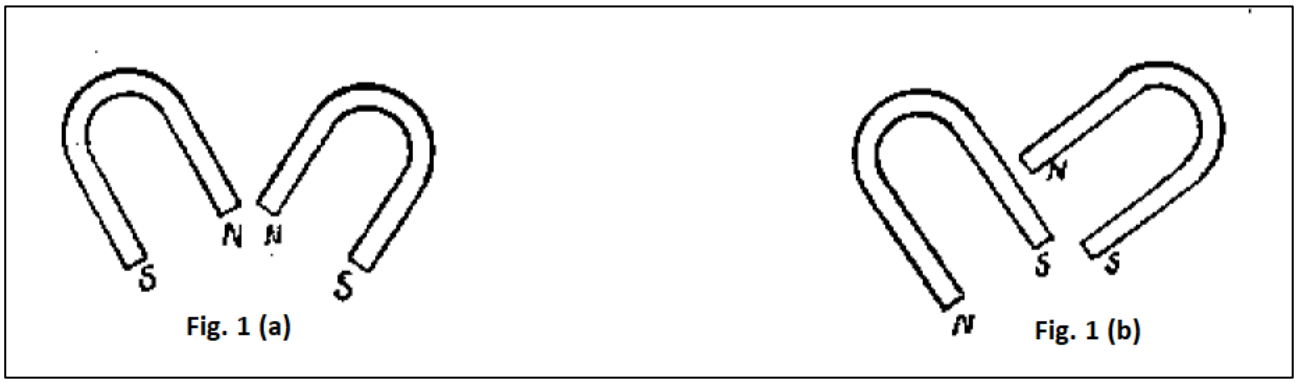


Fig. 1 (a) Fig. 1 (b)

Also the transmitter is very interesting. In the Ruhmkorff coil, the adjustment of the contact that interrupts the primary is very important, you must try to have a frequency as high as possible compatibly with the characteristics of the coil. To increase the frequency we also inserted a thin layer of plastic material into the hammer which actually worked wonders. The 6 Volt power supply ensured good operation, so it was not necessary to power it with higher voltage.

The 4 balls oscillator Righi type is the object by which the capacity and inductance of the antenna circuit is determined, therefore the transmitting frequency.

The side balls of small diameter have the sole purpose of transmitting the energy to be radiated to the central balls.

Photo N° 10 Powerful discharge between the central balls

The diameter of the central balls determines the capacity of the oscillating circuit, so large diameter balls mean high capacity, therefore low oscillation frequency and vice versa. The space between these balls is the dielectric of our capacitor so small dielectric means high capacity and vice versa.
During use, the balls are covered with an oxide layer and consequently, to ensure operation continuity, they must be kept thoroughly clean.

Now that the tests have ended positively we just have to wait for the day of the re-enactment

The big day has arrived

Sunday, October 16th 2022, early in the morning we reached the field that the Sport Paradise Club of Orbassano has reserved for us.

We then begin to place the receiving antenna and then the tent under which Captain Llewelyn Evans of the Royal Engineers sets up, on a table, the magnetic detector which he then connects to the antenna / earth (Photo N° 11).

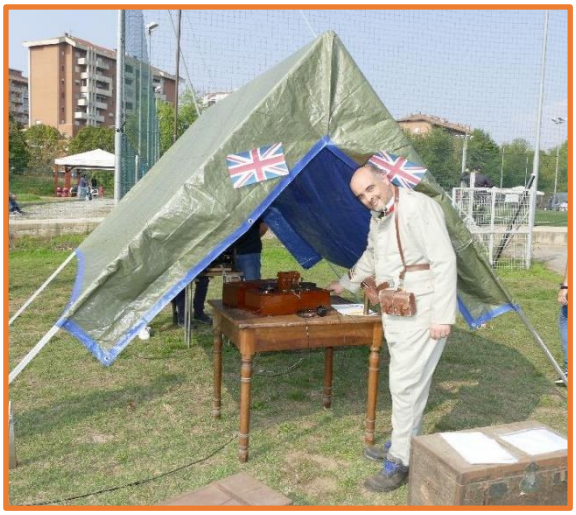


Photo N° 11 Captain Llewelyn Evans

Photo N° 12 the flag-wavers' tent and Captain Leonard Caster

Further away, we set up another tent under which the flag wavers will stand under the orders of Captain Leonard Caster of the Royal Engineers (Photo N° 12).

In the field we also find Colonel Capper also from the Royal Engineers who oversees all operations.

The role of the signaling flags in this hot air balloon transmission - ground reception activity is of primary importance. Lieutenant Aston of the Royal Engineers, aboard the balloon, waves an orange flag when the transmissions begin.
On the ground, Captain Evans in charge of the magnetic detector observes the balloon with the aid of a telescope. (Photo N° 13).
In case of bad reception he waves the red flag, and only in case of good reception he waves the white one. The flag wavers who carefully observe Captain Evans' tent wave their flags to validate the information to the balloon, red flag unacceptable reception or, white flag when everything is understandable.

Photo N° 13

The radio amateurs

In the meantime, coordinated by their President Mirco Gonella I1HNY the radio amateurs of the ARI Section of Turin have arrived at the camp. For this occasion they will use the Marconi Memorial call **IY1TO**.
They begin to place a gazebo and then an inverted V to operate in HF and a system of parabolic antenna for transmissions using satellite QO-100 (Photo N° 14).

Photo N° 14

At the same time, from the RAI Radio and Television Museum located in Via Verdi in Turin, in front of the Mole Antonelliana, other operators are ready to operate with the special call **II1TRM**. (Photo N° 15).

Meanwhile in Pontecchio Marconi, at the Marconi Foundation, the radio amateurs of the **IY4FGM** are already operational.
The **IY4FGM** station is located at Villa Griffone, paternal house of Guglielmo Marconi. From this place in 1895 the young Marconi, made the first radio telegraphic connection overcoming the nearby Celestini hill.

Photo N° 15

Due to the difference in the time zone, our friends from PARC "Poldhu Amateur Radio Club" are ready to go on air with their permanent call **GB2GM**.

On 12 December 1901 Guglielmo Marconi made the first transatlantic transmission from the super powerful station of Poldhu in Cornwall (England) to the location of Signal Hill near St. John's in Newfoundland (Canada).

Today the radio room and the PARC antennas are located in a building, located in the same Marconi Wireless field used in 1901. Outside you can still see the remains of the buildings and the bases of the antenna ties (Photo N° 16).

Given the importance of the participants in this round table, the radio day took place in a **truly exciting way.**

The participants were able to connect with each other, both on 20 and 40 meters in SSB and CW and offered to the radio amateurs around the world the possibility of making QSOs with important nominatives. Good guys!

Photo N° 16

Now everything is ready, only the **main interpreter is missing, the Balloon** which should arrive at 14-00, in the meantime I will provide you with some technical data:

- ✓ Manufacturer: Camerons Balloons England
- ✓ Hot air type
- ✓ Diameter 19 m
- ✓ Heigth 24 m
- ✓ Volume 3,000 m^3
- ✓ Heated with Pure Propane Gas (LPG) by means of 2 high capacity burners
- ✓ Wicker basket 130 x 70 cm
- ✓ Materials: the first 3 rings Nomex (like the F1 drivers' suits), the next 3 rings and the remaining part are made of special canvas also used to produce parachutes

On time, at 14-00, a large van arrives with Davide Morando, owner and pilot of the balloon.
Inside there is a large wicker basket, a large bag containing the balloon and 4 large LPG bottles.
Davide gives his collaborators a few but peremptory and effective orders.
In a flash all the material is unloaded. Immediately a small balloon is left free to rise in the air, it will be used to understand the direction and intensity of the wind.
The big bag containing the balloon is opened and the canvas is stretched over the field, and here we begin to see how big this balloon really is.

Photo N° 17, 18, 19 setting up the hot air balloon

The wicker basket is placed next to the balloon in a lying position. Initially through a large fan, through the opening under the balloon, the same is roughly inflated. Then two burners are used in oder to heat the air inside the balloon. Almost immediately the big balloon rises up to a vertical position and drags the wicker basket which is now in a vertical position position as well. The balloon can now be used.

I play Lieutenant Aston and I enter the basket, my collaborators Cap. Evans and Cap. Caster hoist on board the table with all the transmitter parts on it (Photo N° 20). When everything is correctly positioned in the basket I tie the table with the previously provided straps.

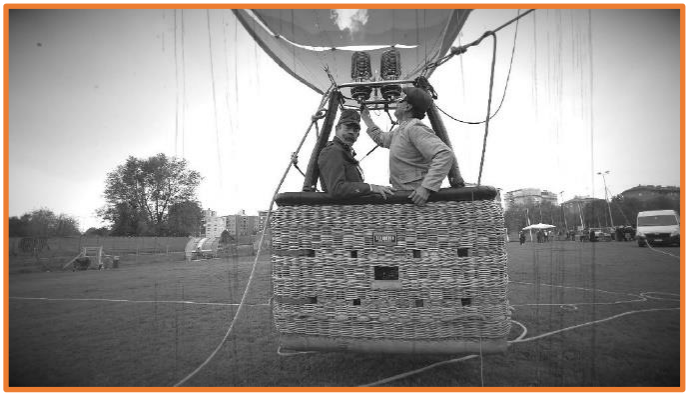
Photo N° 20 and 21 we hoist the Transmitter aboard

Now I have to arrange the antenna and earth cables by letting them out from two diametrically opposite holes in the basket (Photo N° 22). For this purpose, I use cardboard tubes to reduce losses and I attach a small weight to each cable to ensure that they remain under tension and do not affect each other.

Photo N° 22 arrangement of the antenna and earth cables

Photo N° 23 Lieutenant Aston a little perplexed

We're ready, we can get up, Corporal Scott, we can leave. Davide who plays Corporal Scott starts to make the burners work at maximum, to be honest I felt gusts of very hot air and I was afraid of losing those few hairs left by burning !!.



The balloon begins to rise swinging, then lowers and touches the ground, then rises again and then falls again to the ground; then a gust of wind moves the balloon that drags the basket and turns it over by 90°.
I am on the ground with the transmitter and with those heavy brass balls above my head, instinctively I try to support everything, luckily the fastening straps have done their duty, nothing has moved from their position and everything is in order for resume the adventure.
In this moment, it comes back to my mind that initially we also thought of using a mercury switch to interrupt the primary circuit of the Ruhmkorff, and I agree that the choice not to use it was the most correct and certainly also the one used by Aston in 1908.

Corporal Scott we can leave, the balloon rises quickly with hot air blows, the hair resist, the mustache as well so everything is going well. When we reach the maximum height of about 40 meters, I try to use the transmitter that doesn't want to work; what could have happened, the antenna and earth wires are twisted on top of each other we have to go back down.
Cap. Evans comes to my aid, his support is always providential and of great technical content. He begins to untangle the antenna and earth wires but a misunderstanding causes me to put the transmitter into operation when Evans was still holding the cables!!! I hear a scream and a series of curses; Fortunately, everything was resolved only with a fright, Evans passed the high voltage test and gained field experience on insulating materials!!!

Now, with the fault repaired, we can resume navigation, Corporal Scott we leave.

We go back up to 40 meters, immediately I check the transmitter which is now working correctly.
I begin to wave the orange flag (Photo N° 24) which by our convention means “”beginning of the transmissions ””.

Photo N° 24 Beginning of transmissions

And then with that big morse key, I start to irradiate a series of **S**'s in the ether, then a series of **V**'s, then the question **CAP EVANS COPY ASTON**?
The sparks that are produced and discharged on the Righi oscillator are powerful and noisy, the crackle you hear is only lower than that of the burners.

Cap. Evans on the ground with his telescope observes the signals on board of the balloon and when he sees the orange flag he starts the magnetic detector. Reception is initially difficult so there’s a waving with red flags but then, a waving of white flags by both Evans and Caster confirms that the signals are received correctly.

In the meantime, other transmissions have been made:
TEN ASTON ROYAL ENGINEERS CORPS
FIRST TRANSMISSION FROM HOT AIR BALLON K K K K

all correctly received by Capt. Evans and confirmed with the waving of the white flag.

Now the day comes to an end; with the imagination we go back in time to the end of 1908, Lieutenant Aston is radiant, the transmission tests have provided excellent results.

The air begins to moisten and our transmitter who loves dry weather suffers a slight drop in power, the sparks are slightly less full-bodied.
Corporal Scott we can get off, orders Aston, we have finished the assignment that Colonel Capper gave us, we have shown that the balloon / ground connection is possible.

All this has been an important piece of the history of radio communications which has advanced in tandem with technological discoveries. In the following years we have seen the application of radiotelegraphy on board of airships and then on airplanes but this is another story.

We too believe that the radio transmission tests are finished, the results obtained confirm that we have repeated, in the best possible way, what was done by Lieutenant Aston.

The balloon slowly descends to the ground, every now and then a tap of hot air to keep the balloon inflated, the photographer and the cameraman await us on the field for the photos to be transmitted to posterity.

For those who want to watch the YouTube video of the event, this is the link
https://www.youtube.com/watch?v=f4HcZSZhwIg

The interpreters, from left to right:

Cap. Evans (Alberto Erbea), Colonel Capper (Andrea Ferrero), Cap. Caster (Leonardo Castro), Lieutenant Aston (Alberto Genova), Serg. Gabriel Birocchs (Gabriele Birocchi)

At the camera Fulvio Birocchs (Fulvio Birocchi)

As the video camera operator of the company “Lumiere brothers”, Mr. Ours John Giaconé (Giovanni Orso Giacone)

Cap. Caster (Leonardo Castro), Cap. Evans (Alberto Erbea)

Re-enactment finished, **and which re-enactment will we do next year**? maybe the airship? we'll see, in the meantime hello everyone.

Thanks:

- ✓ Municipality of Orbassano
- ✓ Surveyor Carlo Pognante President of the Pro Loco of Orbassano for having conceived and realized this re-enactment with Andrea Ferrero
- ✓ Andrea Ferrero President of A.I.R.E. for having conceived and carried out this re-enactment with Carlo Pognante
- ✓ Museum of Radio and Television of Turin for the concession of use of the transmitter and the Marconi magnetic detector
- ✓ Davide Morando of Sport Promotion, owner and pilot of the balloon
- ✓ Amateur radio friends, of PARC "" Poldhu Amateur Radio Club "" with the permanent call GB2GM
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