

Numbered Marconi Relics: Official Replicas

The following pages present a selection of objects which arrived in Milan between 1955 and 1956, and which were referred to at the time as ‘Marconi relics’ (Casonato, Spada, *infra*). Many of them feature numbered white celluloid labels that certify their belonging to a specific series of objects selected to tell the public about the origins of wireless communication ‘according to Marconi’. It is not known when the labels were applied, but some of these artefacts are recorded in the list of replicas created for the 1933 Chicago World’s Fair as reported in the 1932 diary of George Kemp, Marconi’s assistant. Furthermore, identical labels are found on very similar objects, stored at the History of Science Museum in Oxford (where many artefacts were transferred from displays at the original Marconi Company headquarters in Chelmsford, Essex), and by the Griffin Museum of Science and Industry in Chicago, where they arrived at the same time as the World’s Fair in 1933. It is interesting to note that numbers are found on artefacts given to MUST by diverse providers.¹ The following pages reconstruct the ideal sequence of the artefacts according to their numbers. The list is to be integrated by the readers with objects ‘no. 14’ and ‘no. 4’,² visible respectively at the beginning of chapters 1 and 3.

¹ The information is obtained through comparison of correspondence in ASMUST, Allestimento sezioni museali, Telecomunicazioni, 1324 Cimeli Marconiani e Sala Marconi. See the lists written by F. Soresini on 3 and 7 April 1956.

² At the Oxford Museum a ‘no. 3’ is affixed to the reproduction of the tuned circuit that MUST labels ‘no. 4’, while here a ‘no. 3’ is absent. It is not unlikely that an inversion occurred during one of the objects’ numerous journeys. It is today unknown to which object the ‘no. 8’ was assigned, as it has not been found in any series.



Reproduction of experimental parabolic transmitter (no. 1) and receiver (no. 2)

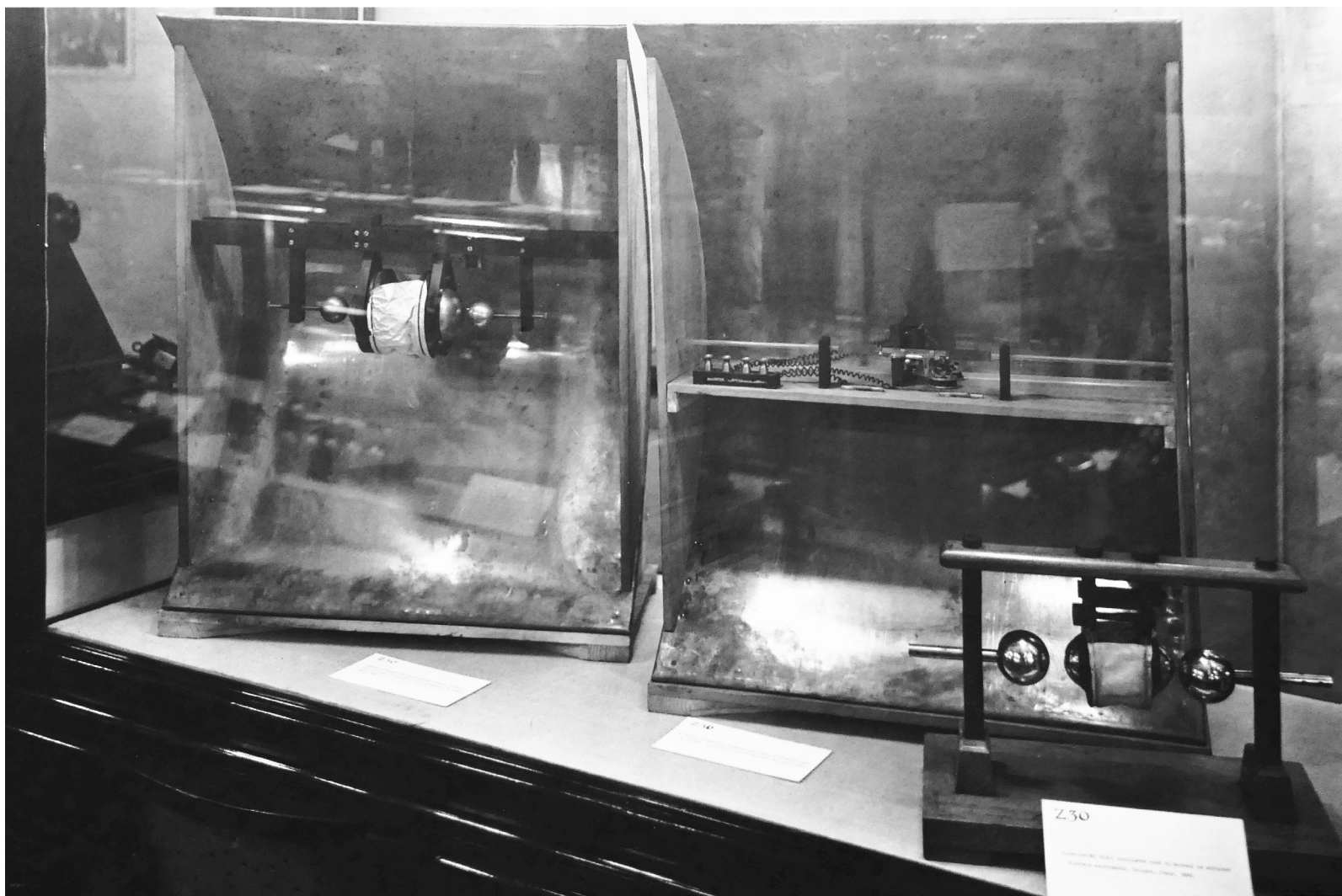
inv. D-000032 and D-000031

Era of technology: 1896

Manufacturer: MWTC (Chelmsford), 1932-33

Provenance: SIRM, 1955

Reproductions of a pair of transmitter and receiver with directional parabolic reflectors, for wireless telegraphy experiments. These devices bear the labels 'no. 1' and 'no. 2'. The originals were used by Marconi in 1897, under the auspices of the English General Post Office, to conduct demonstrations in the presence of the British Royal Navy at Salisbury Plain, south of London (Aitken 1976, 216). Identical artefacts with the same labels are housed at the HSM in Oxford (inv. 40344 and 59934). On the right, a display case of the Exhibition at the Albert Hall in London (22 September-2 October 1931) (OBL MS photograph d74).





Rotary Spark Discharger for wireless telegraphy station (no. 4), with brass toothed disc (no. 5)
 inv. IGB-012569 and inv. D-000034
 Era of technology: 1907
 Manufacturer: MWTC (Chelmsford), post 1907
 Provenance: CNR and SIRM, 1955 and 1956

This type of radio waves generator was created by Marconi in 1906 and patented in 1907 (Baker 1970, 117). Also referred to as a 'musical spark', due to the frequency and the regularity of the spark discharges producing clear notes (Fleming 1916, 246). It was installed in the first large transmitting stations on the Atlantic coasts and later also on ships (Simion 1927, 88). MUST preserves two samples, coming respectively from SIRM and CNR (with label 'no. 4'). A toothed disc with finer teeth was provided with the machine. Two disc samples arrived at MUST, accompanied by a wooden support for display purposes, both with label 'no. 5'. In the archival photo on the right, similar artefacts are portrayed together on a white background, positioned for documentation or perhaps promotional purposes (OBL MS photograph b61).





Reproduction of a multiple spark gap (ex no. 6?)

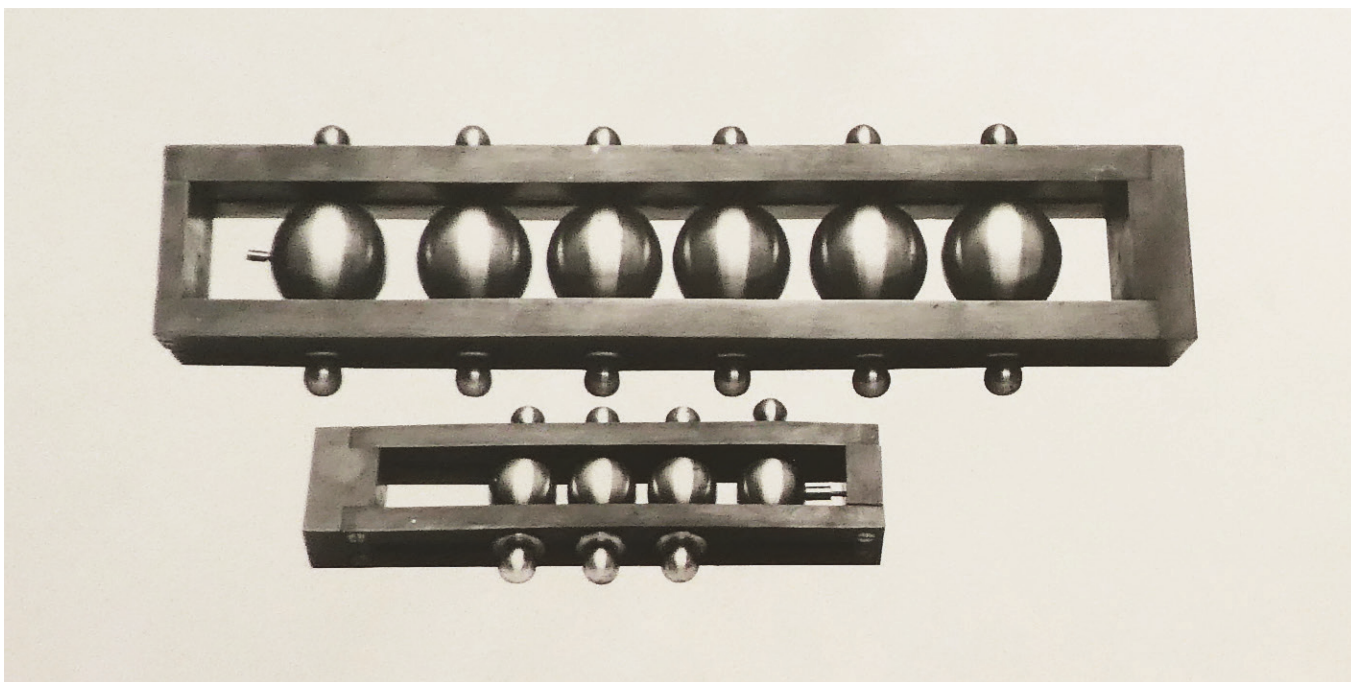
inv. IGB-002138

Era of technology: circa 1897

Manufacturer: Carlo Savio, Milano, 1956

Provenance: MUST, 1956

This artefact was produced in Milan in 1956 based on a replica which arrived from SIRM in 1955. This one, in fact, was stripped of its metallic spheres during the transfer of Marconi relics from Milan to Genoa for an exhibition and today only the wooden frame remains. This original frame still bears the visible circular mark of a label. Kemp listed this object among those to be replicated, and that there is an identical artefact at the HSM bearing a label 'no. 6' (inv. 59526; see also Casonato, Spada, *infra*, fig. 6), we can suppose that the original object that arrived at MUST bore the same label. The Oxford Marconi Archives preserves a photograph of the original artefact with its caption (adjacent, OBL MS photograph d74).



4036. TWO EXAMPLES OF THE MULTIPLE SPARK GAP WHICH WERE
USED IN MR. MARCONI'S EARLY EXPERIMENTS IN 1897.
THIS FORM OF SPARK DISCHARGER WAS EVENTUALLY
MODIFIED AND TOOM THE FORM OF TWO SPHERES OF STEEL.



Reproduction of a coherer receiver for wireless telegraphy (no. 7)
 inv. IGB-009862
 Era of technology: 1896
 Manufacturer: MWTC (Chelmsford), 1933?
 Provenance: CNR, 1956

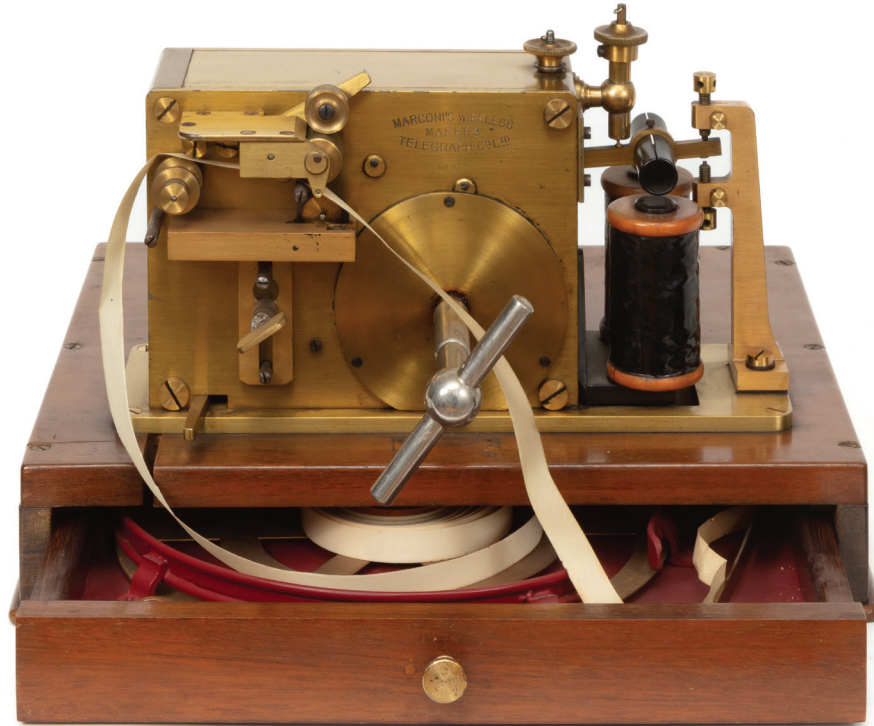
Reproduction of one of the first MWTC wireless receivers. Here we find, mounted on a wooden base the components from left to right are, a coherer (see adjacent); a small wooden box (the jig which should be housed inside is not in place, see Guagnini and Chard-Cooper, *infra*) with clamps for the jig of the tuned circuit; a larger container for the batteries (in the centre); and a relay. Identical artefacts also bearing the label 'no. 7', are housed at the HSM (inv. 67916) and GMSI (inv. 33.432). The object looks like the receiver pictured in the background in a well-known photograph of Marconi (OBL MS photograph c332), taken when the first transatlantic signal was transmitted from Poldhu (UK) to St. John's, Terranova (CA) in 1901.



Coherer (no. 11)
 inv. D-000027
 Era of technology: 1895
 Manufacturer: MWTC (Chelmsford), 1933?
 Provenance: CNR, 1956

The coherer, a small tube containing metallic filings and fitted with electrical contacts, was developed and used as electromagnetic wave detector by a number of inventors and scientists all over Europe in the nineteenth century. It was the first device used by Marconi in his experiments of transmission and detection of wireless signals. This exhibit features the first version used by Marconi. It has been isolated from the receiver and mounted on a wooden panel bearing a metal plate marked 'no. 11'. The object is very fragile and is damaged but still recognisable in form.





Morse inker for wireless telegraphic receiver (no. 9)

inv. D-000028

Era of technology: post 1897

Manufacturer: MWTC (Chelmsford), 1933?

Provenance: CNR, 1956

When connected to a wireless receiver, this device automatically wrote an ink trace on the paper tape imprinting the dots and dashes of the received Morse code signals. The tape was extracted from the drawer below. The apparatus is marked with the MTWC logo and the serial number 318. Morse inkers were already being used via cable in traditional telegraphy, but the company produced their own. They became obsolete with the introduction of the magnetic detector (Fleming 1916, 253-5).



Ruhmkorff induction coil (no. 10)

inv. D-000029

Era of technology: post 1897

Manufacturer: MWTC (Chelmsford), 1933?

Provenance: SIRM, 1955

The induction coil was an electrical transformer developed by the scientific instrument maker Heinrich Ruhmkorff (1803-77) in the mid-nineteenth century and was commonly used in laboratories for research on electricity and its applications. It was a component of Marconi's first transmitting system. The MWTC produced its own induction coils, marking them with its logo. The artefact with label 'no. 10' is missing the two small insulating rods on which a spherical spark gap was mounted. These rods are instead still present on a very similar object produced at the Officine Radiotelegrafiche Marconi in Genoa (inv. CMND-002539).



Marconi Magnetic Detector, wireless receiver,
commercial model (no. 13)
inv. D-000036
Era of technology: 1902
Manufacturer: MWTC (Chelmsford), 1933?
Provenance: SIRM, 1955

The magnetic detector was patented in 1902 by the MWTC. It was a new receiving system for wireless telegraphy, based on an iron wire moving inside two coaxial copper windings. Morse code signals were made audible throughout a headset, instead of being printed. This artefact has the remains of a customs import docket for the New York World's Fair in 1939 stuck on it. It possibly indicates that it was used for demonstration purposes. The object is also equipped with a wooden lid with a glass top (not photographed). This model was nicknamed 'Maggie' by its users.

Franklin Tuner
inv. D-000025
Era of technology: 1907
Manufacturer: attributed to the MWTC, post 1907
Provenance: unverified

Original device for the tuning of receiving apparatus. It allowed to operate on multiple frequencies by turning the knobs. It was designed by the MWTC engineer Charles Samuel Franklin (1879-1964) during the installation of a station in Russia and was patented in 1907. Together with magnetic detectors it was part of the standard equipment for large ocean liners (Baker 1970, 103). This sample has English labels but it was also marked by Officine Radiotelegrafiche Marconi in Genoa. It was possibly produced in the United Kingdom and was later serviced in Italy. Documentation of the period shows the tuner alongside the 'Maggie' in a wireless cabin setup on a ship OBL MS photograph d74.



The detector is mounted on the wall; the tuner is sitting on the table underneath



Reproduction of a variable capacitor 'Billi condenser' (no. 15)

inv. D-000033

Era of technology: 1901

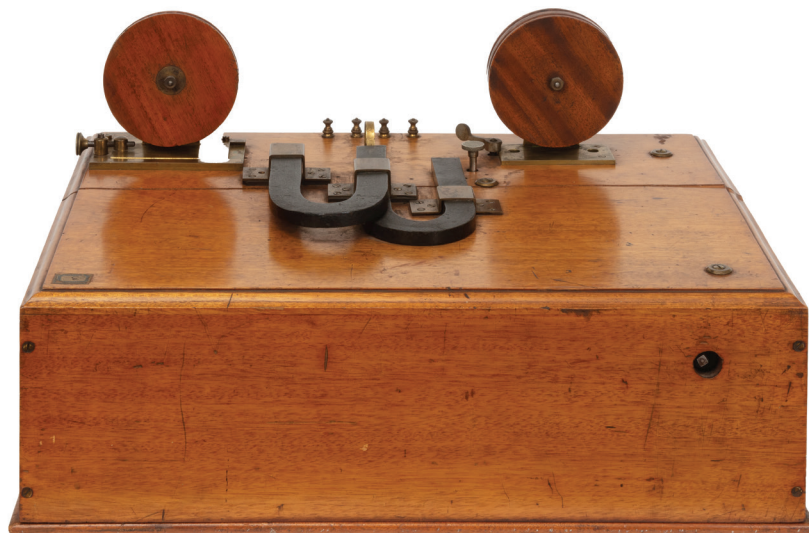
Manufacturer: MWTC (Chelmsford), 1933?

Provenance: SIRM, 1955

Reproduction of variable capacitor prototype known as a 'Billi condenser' used by Marconi in Terranova, probably to tune the kite antenna used for the first transatlantic transmission. The name may come from the word billifarad, that is a billionth of a farad, a unit of electrical measurement (Liffen 2013). The MUST specimen bears a circular disk featuring both the MWTC logo and 'no. 15'. An identical replica is housed at the GMSI in Chicago (inv. 33.427).



Students visiting the South Bank Exhibition during the Festival of Britain in 1951, in front of a display case entitled "The Birth of Radio" (OBL MS photograph b71). In the photo below we can see a Ruhmkorff coil and an industrial magnetic detector (mounted on the wall). Above: in the centre, a Morse printer and a jigger



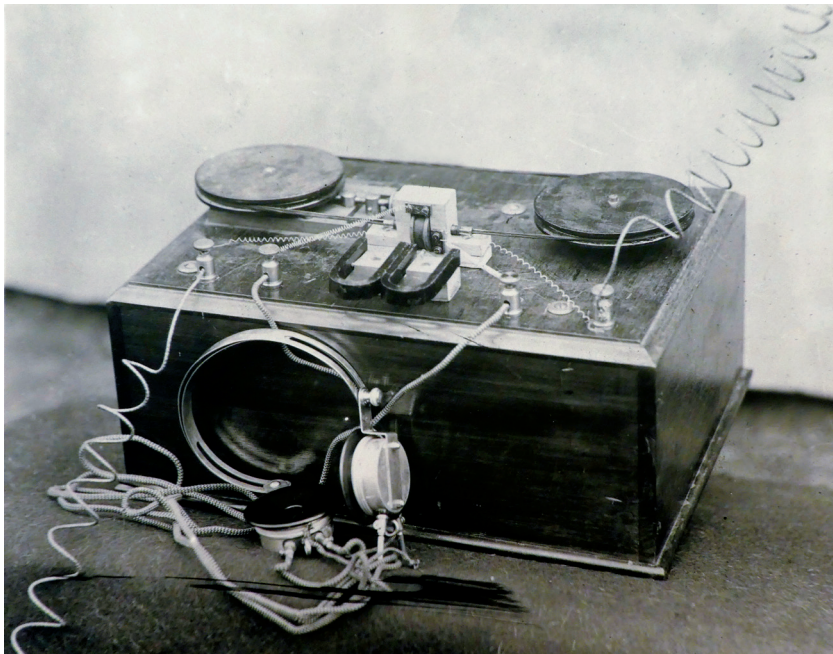
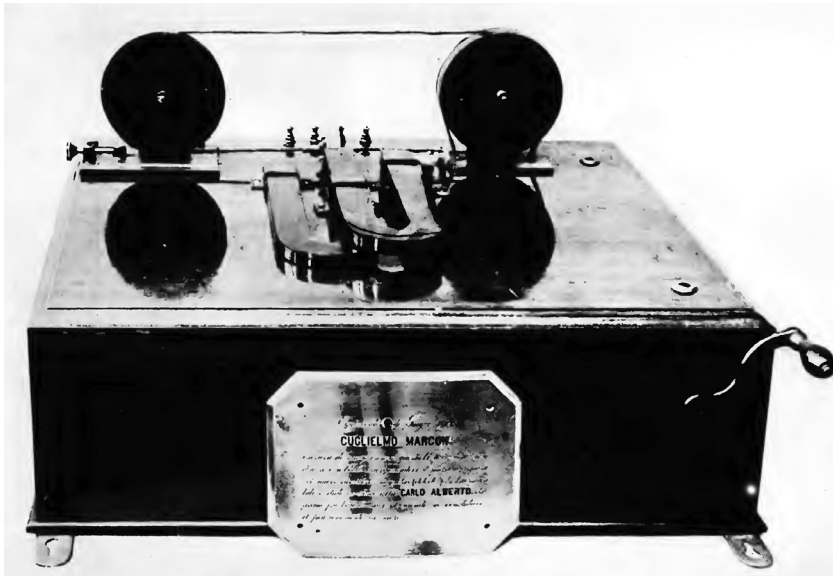
Receiver 'Prototype of magnetic detector' inv. D-000035

Era of technology: 1902

Manufacturer: unknown post 1902-ante 1939

Provenance: SIRM, 1955

The origins of this object are unclear: it could be an original prototype constructed in 1902 by Marconi (or more likely by his assistants), or it could be a subsequent replica. It bears a customs import docket for the 1939 New York World's Fair, indicating its connection to the other numbered artefacts used by the MWTC for fairs and exhibitions. An object designated as 'first magnetic detector (definitive reproduction)' arrived at MUST in 1955 along with the numbered 'artefacts', but it was not photographed. The curator F. Soresini maintained that it was the object mentioned in Admiral E. Simion's report on the contribution of the Regia Marina Italiana (Royal Italian Navy) to the development of radiotelegraphy. Simion described this as "the first detector model" presented by Marconi to Admiral Mirabello on 26 June 1902, when the inventor boarded the ship Carlo Alberto to conduct his famous experimental campaign. Comparison with Simion's photo, however, shows an inverted positioning of the horseshoe magnets (Simion 1927, 51 fig. 16; reproduced at the top of the next page).



According to its original caption this image from the Marconi Archives in Oxford shows a 'second model' with a slightly different configuration (OBL MS photograph d74), which could confirm that the MUST object is in fact an older prototype (or its reproduction)



'The Marconi Direct Reading Portable Decremeter'

inv. D-000020

Era of technology: 1909

Manufacturer: MWTC (Chelmsford), post 1909

Provenance: SIRM, 1955

Original portable instrument for the measurement of the frequency of electromagnetic waves, with calculation tables inside the lid. The instrument measured the wavelength in wireless transmitting stations. It converted them into sound signals through a telephone receiver (not present), allowing operators to test for correct operation. The detection of the waves was performed by a silicon carbide or carborundum crystal (not present). The device was equipped with an integrated sliding gauge, in the upper section, to facilitate wave measurement (*Description*, s.d., OBL MS Marconi 121). This article does not have a round celluloid label, but arrived at MUST in 1955 along with the numbered artefacts.



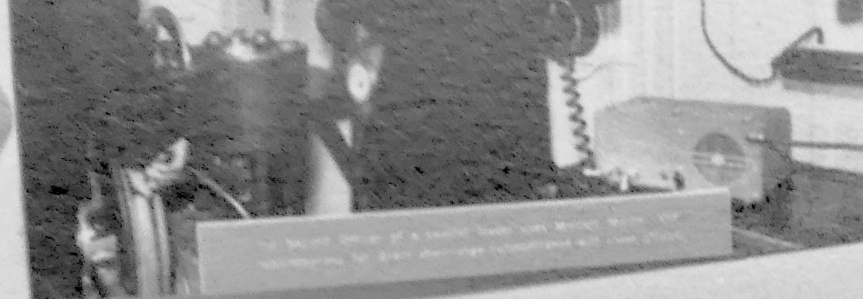
Double crystal receiver, with valve amplifier
inv. D-000022

Era of technology: post 1906

Manufacturer: MWTC (Chelmsford), post 1906

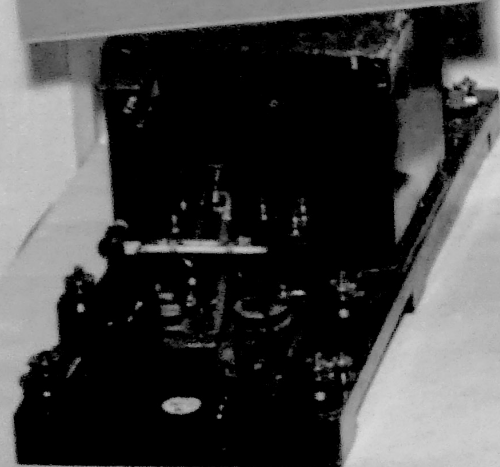
Provenance: SIRM, 1955

The receiving system used in this device followed the magnetic detector. The wireless signal was detected via silicon carbide (carborundum) crystals. The device used a 'Round triode' (see *infra*), as a signal amplifier. The crystals and the triode are missing from this artefact. The capacity of some crystals such as carborundum and galena (lead sulphide) to conduct current in only one direction was discovered in 1874 by Ferdinand Braun, winner of the Nobel prize alongside Marconi (Braun 1909). Crystal receivers were conceived by military engineers in the United States Army, such as General Henry H.C. Dunwoody, whose 1906 patent also prompted Marconi's engineers to develop receivers that "were to challenge the supremacy of the magnetic detector" (Baker 1970, 120). This relic does not have a round celluloid label, but arrived at MUST along with the numbered objects.



The "Secret" design of a "Secret" radio set. Marconi's "Secret" set was the first to use a "Secret" design. The "Secret" design was the first to use a "Secret" design.

**COHERER
RECEIVER
(1900)**



**10" COIL
TRANSMITTING
EQUIPMENT
(1900)**



**MAGNET
DETECT**



MARCONI MARINE RADIO EQUIPMENT OF FIFTY YEARS AGO.
MANY FAMOUS LINES USED THIS APPARATUS AT THE BEGINNING
OF THE CENTURY.



Typical set of 'Marconi relics' on display at the Post Office Engineer's Exhibition in 1958, Hull College of Technology, Yorkshire (OBL MS photograph c354)

Sources

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<https://doi.org/10.1179/1758120613Z.000000000026>