

RADIO AND AVIATION

A gap of 8 years



Pontecchio, 24.5.1895



Kitty Hawk, 17.12.1903

When the Wright brothers made their first flights, Marconi had already established wireless communications between North America and Europe. Radio stations were operational in land, along the coasts and on a number of ships.

1. Ships Show the Benefits of Radio

Since 1897 Marconi demonstrated wireless communications between ships and shore, over longer distances and regardless of obstacles.



July 1897
18 km

Battleship San Martino-La Spezia



December 1898
19 km

Lightship East Goodwin-South Foreland



November 1899
110 km

Liner St-Paul-Needles



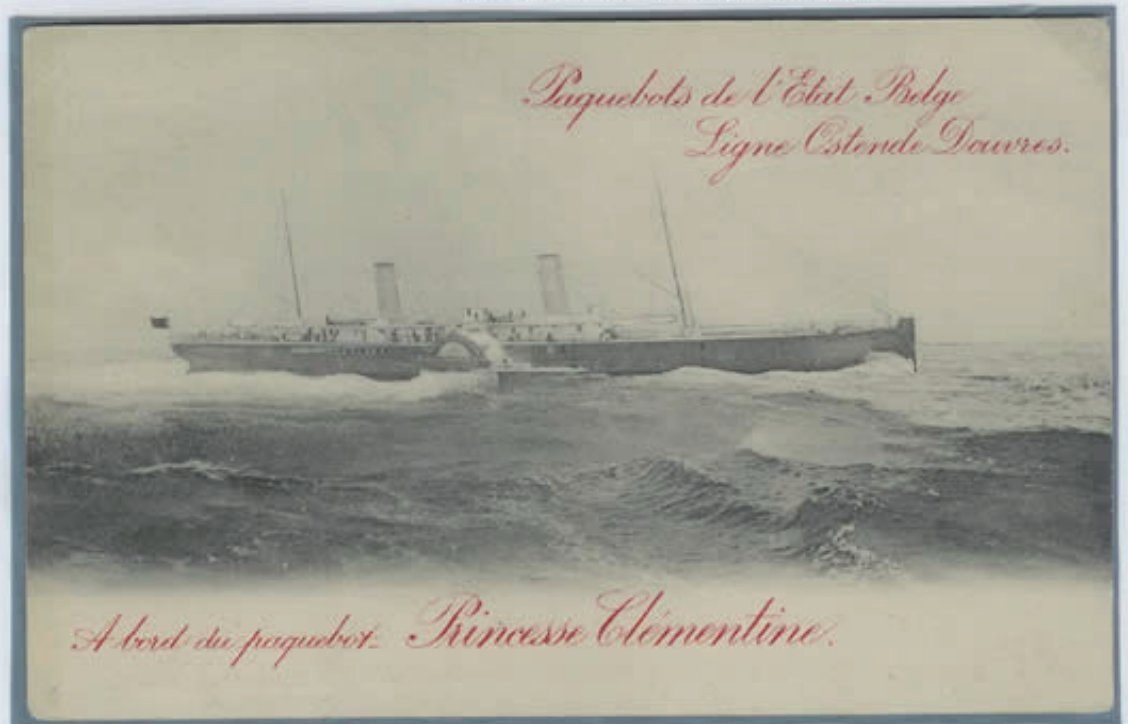
October 1902
3000 km

Cruiser Carlo Alberto-Poldhu

In 1901 the *Princesse Clementine* (line Ostenda-Dover) was rescued thanks to a distress call via radio.



"Paquebots"
postal card,
10 c.
(Belgium 1904)



1. Ships Show the Benefits of Radio	5. The Birth of Commercial and Postal Aviation
2. Balloons and Airships try Radio	6. Technology Jewels
3. At last, Radio on Aeroplane!	7. Success and Drama at the North Pole
4. The Big Test: World War I	8. Flights, Radio, News & Business

1. Ships Show the Benefits of Radio



The decisive Japanese victory in the battle of Tushima was made possible by the wireless report of the sighting of the main Russian fleet sent by the *Shinano Maru* on 27 May 1905.

Postmark of the Naval Commemoration Day (1905)



Admiral Heihachiro Togo acquired the latest wireless equipment from the Marconi Company, whereas Vice Admiral Stepan Makarov was unable to get adequate radio facilities, in spite of his contacts with Popov (on the center of the stamp).

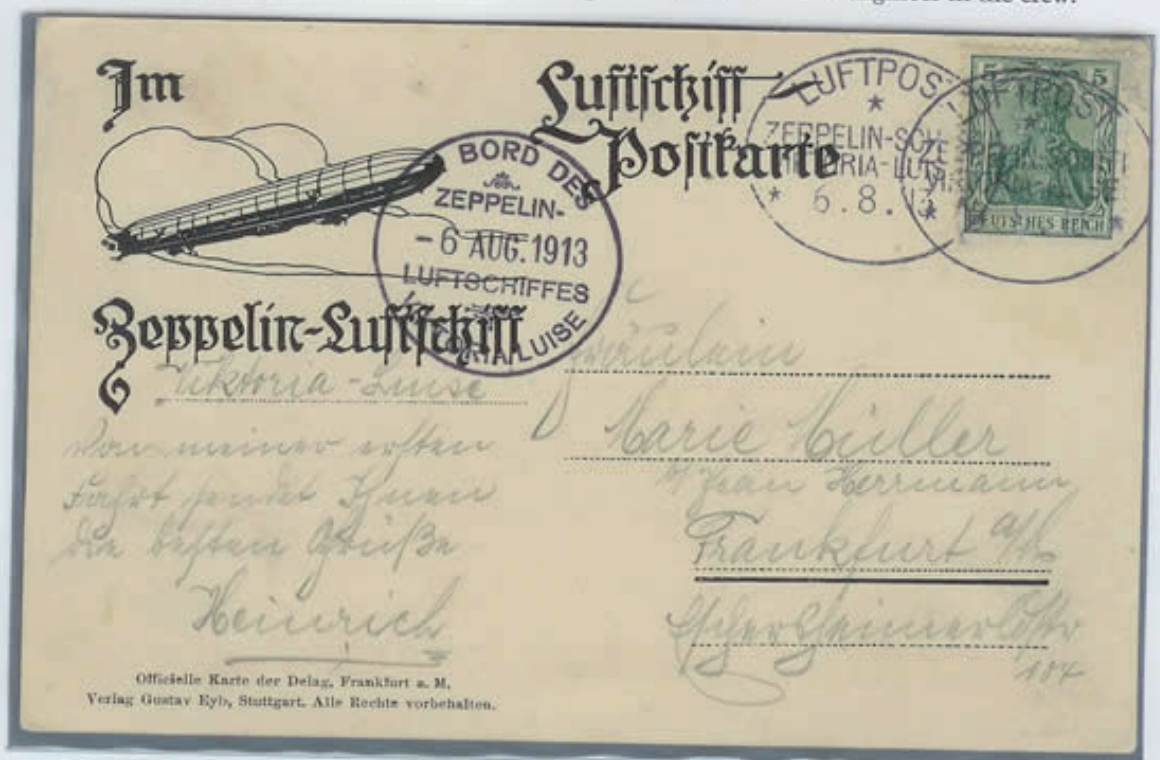
2. Balloons & Airships try Radio

Wireless was first tested on free flight balloons, and since 1909 was installed on airships.

In France General Ferrié equipped the Tour Eiffel as radio centre and supervised the first tests on the airship "*Clement-Bayard*" (1909).



On 15.10.1910 wireless was used for an air-sea rescue during the flight of the Wellman airship "*America*", that carried a Marconi equipment and had a radio engineer in the crew.



Airmail postcard with both the *Viktoria-Luise* postal cancellation and the board stamp, 6.8.1913

Ferdinand Graf von Zeppelin had Telefunken equipment onboard of the LZ 6 (1909). Important tests were made by the LZ 11 "*Viktoria Luise*", aimed at developing a more advanced wireless board station.

2. Balloons and Airships try Radio

Balloons help artillery to hit the target

The Libyan war showed another major advantage of wireless: the support to artillery operations.

In summer 1911 the Italian Army began to install Marconi's mobile radio stations, connecting Tripoli with 9 locations among them Zuara. Marconi was in Tripoli to supervise the operations.



Military Post date stamp, Zuara 5.10.1912 + Marking of Military Radio Telegraphic Service

Information about the position of the enemy was transmitted by an observer flying in a balloon to the Tripoli station and then forwarded to the first class cruiser *Carlo Alberto*, which used it as ranging aid for its batteries.



Postal cancellation of the *R. Nave Carlo Alberto*, 9.11.1915

3. At last, Radio on Airplane!

The first recorded use of wireless between an airplane and ground was on 27 August 1910 when J.D. Mc Curdy sent a wireless message from a Curtiss biplane 600 ft. over Long Island, U.S.A. The military started immediately testing radio on board of aircrafts: the U.S. Naval Aviation achieved some results in 1911. In the same timeframe Henry Farman made successful tests from his biplane.



Radio was still based on spark transmitters and receivers requiring adequate supply sources; furthermore messages were based on Morse telegraphic code. The weight of the equipment, the limited load of the aircraft, the noise generated by the electric circuits and the lack of amplifiers still inhibited the use of receivers onboard.



First blossoms of Radio technology

The developments based on Lee De Forest's Audion and Robert v. Lieben's "Amplifier Tube" (both 1906) changed the nature of radio from electrical to electronic equipment.

The electronic tube was born!



Special crystals (galena and silver-grey carborundum) were employed as detectors in radio receivers.



Reginald Fessenden defined the heterodyne principle (1902) and Edwin Armstrong the regenerative circuit (1912).

4. The Big Test: World War I

Stations overlapping: a "Waves salad"

In the Great War wireless telegraphy played an important role in tactical movements and in providing communication where no other means was possible.

All major powers used radio. Italy had Marconi's OPD system in series "M" military airships. Germany was the most confident in the role of wireless: early 1916 a total of 917 coastal, mobile and airship stations were supporting war operations. Unfortunately these stations were using a small number of frequencies, so that the stronger over-took the weaker ones; sometimes the result was a "Wellensalat" (Waves salad).



Military Post
Registered
Letter from
the Mobile
Radio Station,
Charleville
(France)
25.4.1917

Military Post
Letter from a
soldier of the
Radio Marine
Airship
Station,
Nordholz b.
Cuxaven
15.3.1915

*Kaus Oost
Funkenwaart
d. Luffflabtl.
Kortholz & Löwenfelsen*

4. The Big Test: World War I

Observing the enemy fleet in the Bosphorus

During the War airships and seaplanes were constantly engaged in patrol work; the use of wireless became a competitive advantage.

Early 1916 the German Navy built an airfield for the Zeppelin airships in Jamboli, next to the Turkish border. The wireless-equipped airship (at first the SLX and later the Zeppelin LZ 101) was reporting its observation of the enemy fleet and supporting the German ships in the region.



Military postal card from Radio Station Jamboli (Military post 177), 16.5.1916

The airship sent the findings of its observation to the base in Jamboli as well as to the German Radio Great Station in Damascus.



Receivers are onboard!

The strategic importance of wireless stimulated scientists and manufacturers who made tremendous progress in every area, and in turn the increased number of installations brought valuable knowledge.



Louis de Broglie, nacido en 1892

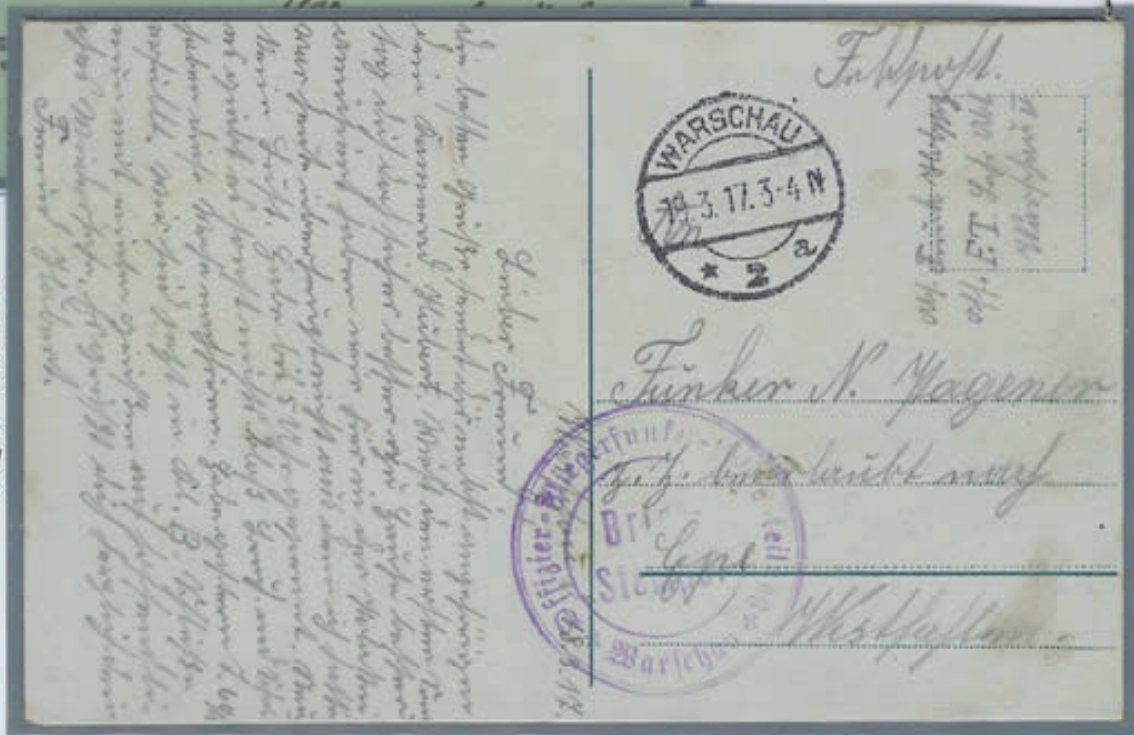
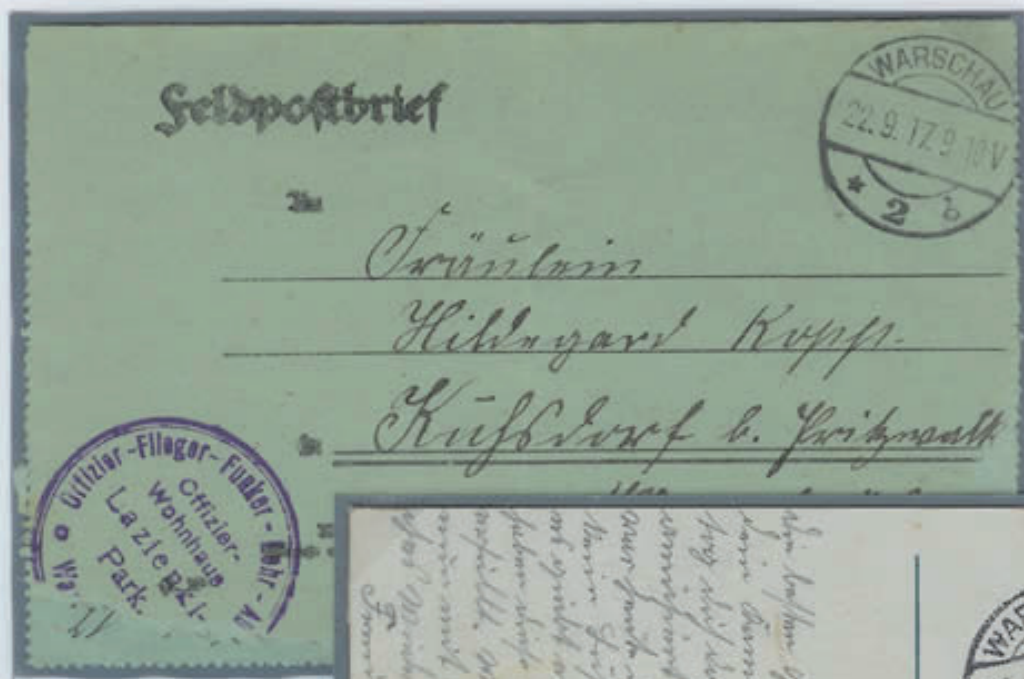
Luz, una forma de energía, puede comportarse tanto como partículas con semejanza a una bola y como ondas continuas. De Broglie descubrió al observar que las partículas elementales de las cuales está compuesta la materia, también tienen propiedades con semejanza a una onda. Su ecuación ha tenido efectos de grandes proporciones sobre la física, conduciéndonos a la óptica moderna y a los componentes electrónicos — transistores, por ejemplo — con grandes aplicaciones en radio, TV, computadores, naves espaciales, armas militares y otras cosas. También provee a los científicos con el poderoso microscopio electrónico.



In 1915 both Telefunken (under Hans Bredow) and Hut built the first aircraft receivers, after successful tests flying an Albatros biplane. In France a receiver was developed by the scientist Louis de Broglie. The device made by the Marconi Company's was tested at the Mirafiori airfield, with the supervision of Marconi and the advice of Francesco Baracca.

As a consequence, the importance of wireless within the military organization was recognized by establishing specific units.

In 1916 Germany created the *Fliegerfunktruppen* (Wireless flying troops) consisting of radio specialists boarded on airplanes.



Military post:
Postcard and Letter
with postmarks of
Officers Departments of
the
Fliegerfunktruppen
(Warsaw, 1917)

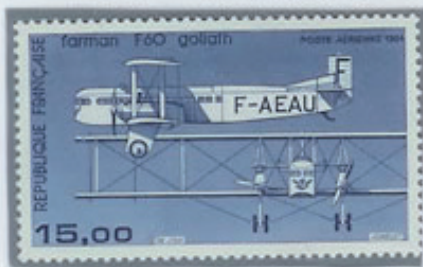
5. The Birth of Commercial and Postal Aviation

Newly established airlines adopt radio in their aeroplanes

By mid-1919 the airplane, a *Vickers Vimy* crewed by Alcock and Brown, and the airship, the *R.34*, had succeeded in crossing the Atlantic. Both carried Marconi wireless equipment; the *R.34* was the first aircraft to use a radio direction finder. A new industry was born: aircraft transportation.



In August 1919 the world first scheduled service was inaugurated by Aircraft Transport & Travel Ltd, operating from Hounslow Heath to Paris; the aircraft had a Marconi wireless equipment. The first airlines were established in the following years.



The *Farman Goliath F-60*, *Junkers F 13*, *De Havilland DH-66 Hercules* are among the airplanes which had radio installed on board. All major radio manufacturers of the time built radio aircraft stations.

Radio Amateurs track flight progress



After the war Marconi concentrated his research on short-waves, also using his laboratory on the *Elettra*.



Towards the end of the decade the adoption of short-waves on aeroplanes enabled radio amateurs to provide authorities with data on the progress of the flights. Very important was the support of members of the ARRL (U.S.A.) and of the REF (France).

5. The Birth of Commercial and Postal Aviation

The Pathfinders

The trend towards regular commercial and postal flights and the natural spirit of competition stimulated pilots to fly over new and longer routes and manufacturers to build more efficient airplanes.

The pilots of the French company Latécoere opened in 1923 the air mail routes to Spain and Northern Africa using hydroplanes *Breguet IV* on which radio was installed. However the pilots were taking pigeons to supplant the failure of their radio.



Jean Mermoz was the leader of the French pilots who opened postal routes to and in South America. In May 1930 he flew from Dakar to Natal with the *Laté-283 "Comte de La Vaux"*.

Equipment of Société Radioelectrique helped Mermoz as well as Dieudonné Costes who, with Joseph Le Brix, made the first non-stop crossing of the South Atlantic (1927) and the tour around the world (1928). In 1930 he and Maurice Bellonte became the first to link Paris and New York by flying east to west in the *Breguet* biplane "*Question Mark*".



A new transmitter was tested on the *S.64 (3-5.7.28)* used by Ferrarin and Del Prete for the flight from Rome to Bahia. Sir Charles Kingsford-Smith had a simple telegraphic equipment when he crossed first the Pacific and later the Tasmanian Sea, in the trimotor *Fokker "Southern Cross"* (1928).

Wireless: No, thanks!



A number of pilots decided not to install radio equipment onboard, as they preferred to have more fuel instead. Among them Francisco De Pinedo in his flight Rome - Australia - Japan - Rome (1925), Charles Nungesser and François Coli, who lost their lives attempting to cross the Atlantic westbound (May 1927), and Charles Lindbergh in his successful flight from New York to Paris (May 1927).

5. The Birth of Commercial and Postal Aviation

Establishing radio air traffic control

The start of regular flights set the immediate need for navigation aids along the route and at the airport stations and, hopefully, on aircrafts.

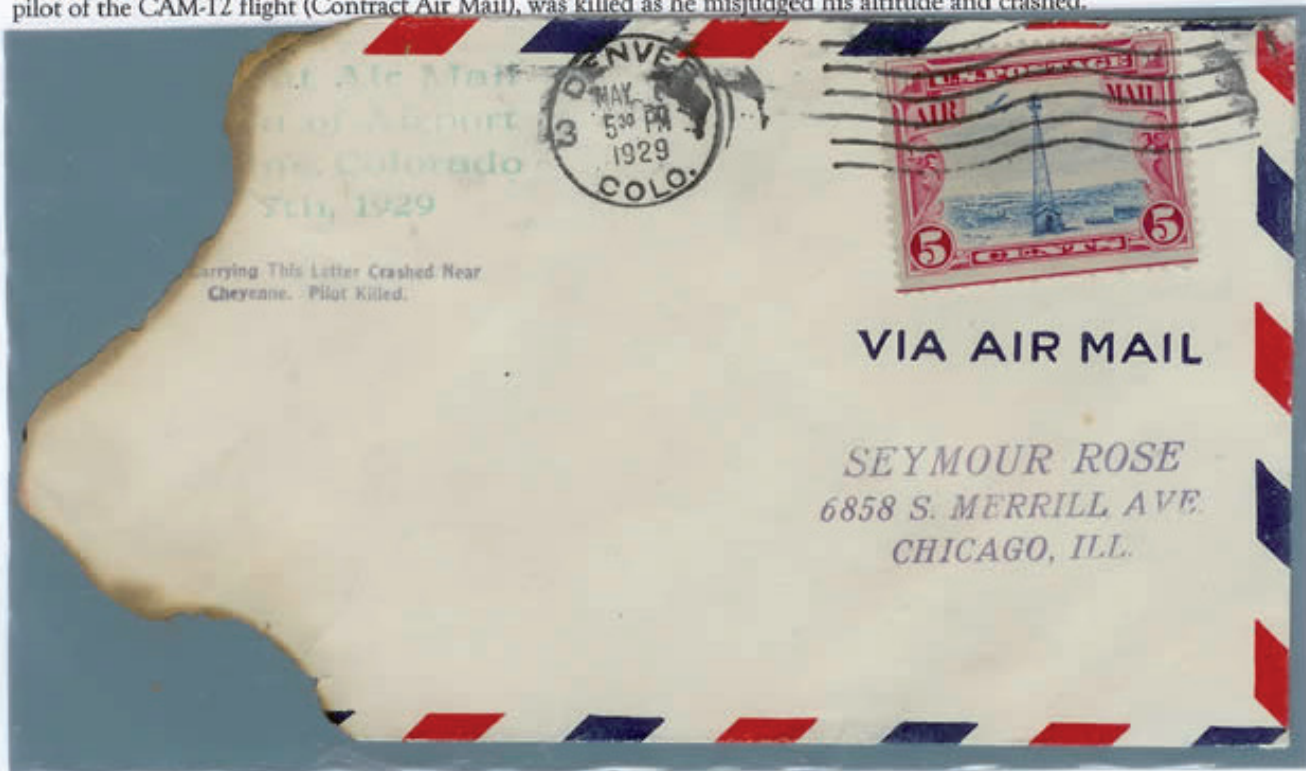
In 1920 Croydon became London's air terminal and Marconi installed the ground station equipped with a telephony transmitter and a Bellini-Tosi direction-finding receiver.



In the U.S.A. powerful beacon lights were installed (like that of Sherman Hill, Wyoming). Henry Ford was deeply interested in the development of air transport: a major contribution of his company was the radio beacon first installed in 1927 at the Ford Field in Dearborn.



In spite of these facilities accidents continued, also because of the poor information available on board. Vernon L. Huston, pilot of the CAM-12 flight (Contract Air Mail), was killed as he misjudged his altitude and crashed.



Crashed letter - flight Pueblo-Cheyenne, CO with private crash-cachet, 5.7.1929

Technology aids for Pilots

Pilots got better support thanks to more advanced long- and short-wave equipment, the direction finder on board, and voice communications (with improved headphones).

Short-wave antenna



Direction finder antenna



dispensation

6. Technology Jewels

Towards 1930 the industry developed aircrafts able of longer, safer and more comfortable flights. Some of these machines became a legend, also because of their raids across the continents and the Oceans.

The Zeppelin airship LZ127 was equipped with Telefunken long- and short-waves equipment and with a direction finder from the same company. This airship was flying quite often, visiting many European cities and flying over the Atlantic and the North Pole. The equipment was constantly upgraded over the decade 1928-1937.



Postcard carried on the Zeppelin flight to New York, October 1928



Commemorative cancellation showing the long-waves antenna.



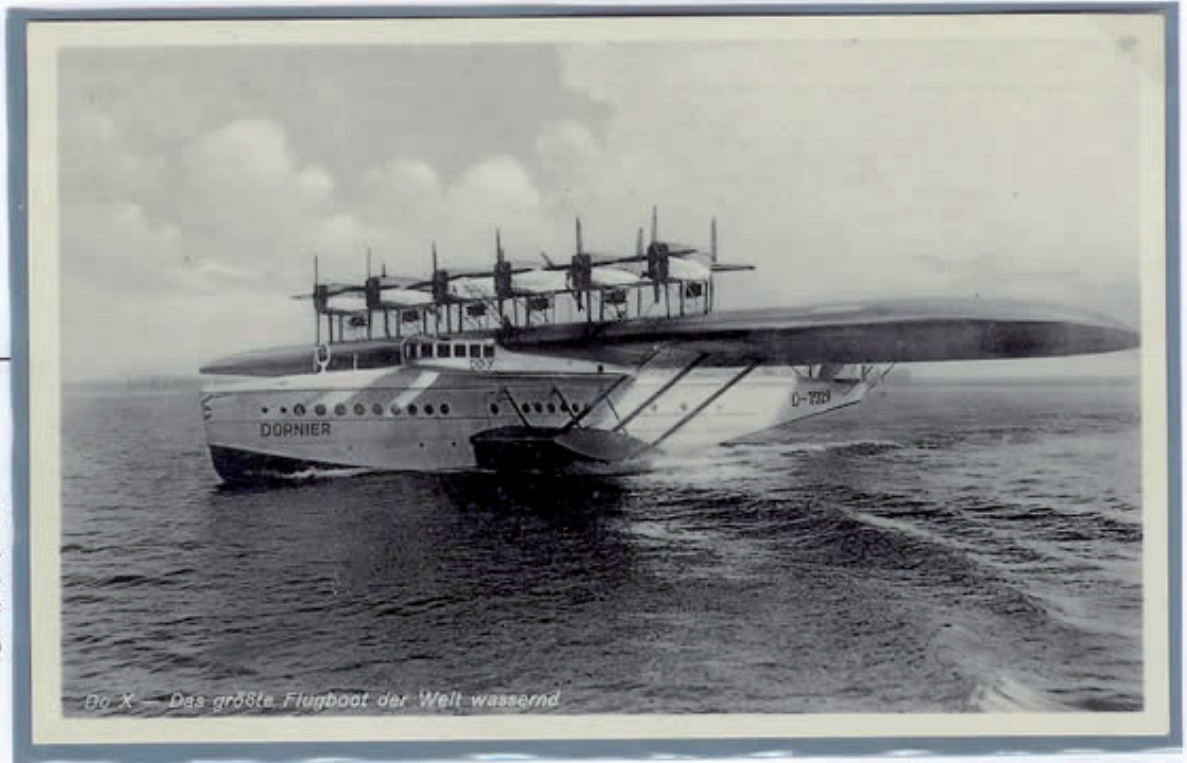
The giant aircraft Dornier DO X, the biggest hydroplane of the world, was built in 1929, and equipped with long- and short-waves devices from Lorenz and with a special direction finder from Telefunken.

6. Technology Jewels

The flight tests helped installing onboard the latest developments of wireless technology. The DO-X made an European flight in 1930 and a Europe-South America-New York raid in the following year.

Antenna of
the direction
finder
Telefunken
Spez 146 N

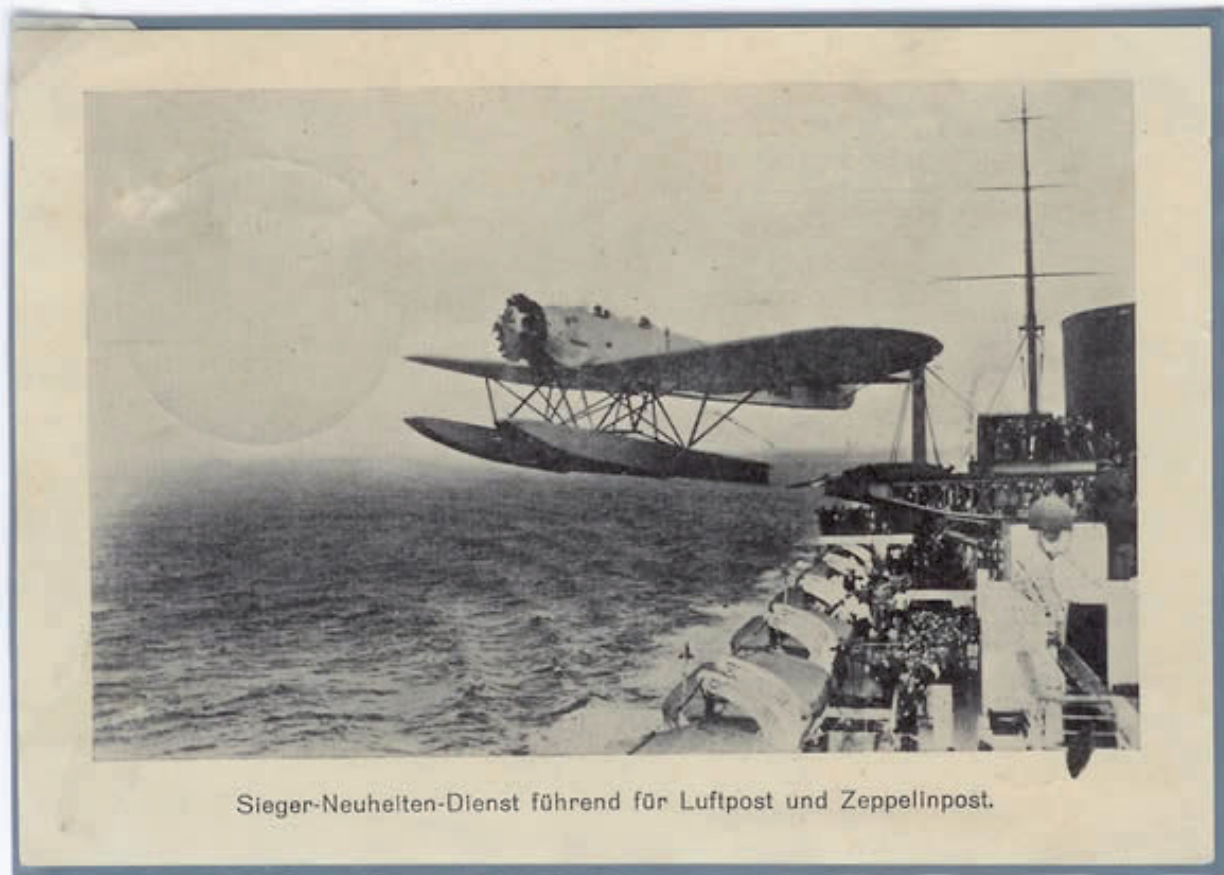
Postal card
on private
order
6 Pf
(Germany 1932)



Do X — Das größte Flugboot der Welt wassernd



The latest radio technology was available also to smaller planes, like the Henkel He 12 used on the S.S. Bremen (a liner with advanced radio facilities) for the Catapult Mail service. It brought the mail to destination from a distance of 400 km, gaining one day in delivery.



Sieger-Neuhelten-Dienst führend für Luftpost und Zeppelinpost.

Postal card
on private
order
(MOPHILA
Luftpost 1931),
10 Pf Airmail
+3 Pf
(Germany
1931)

7. Success and Drama at the North Pole

Since 1925 aircraft explorations of the Poles were supported by radio onboard and their frequent messages created a mediatic effect, so that any delay of news was considered a portent of disaster.



In 1925 William Lincoln Ellsworth and Roald Amudsen reached latitude 87° 44' N in two hydroplanes; an emergency landing without radio caused them to be given up for lost. Richard Byrd and Floyd Bennett made what they claimed to be the first airplane journey over the North Pole (1926).

In 1927 Ellsworth and Amudsen made the first crossing of the North Polar Basin in the airship "Norge" with Umberto Nobile: their radio suddenly became silent and the press for two days "feared the Norge lost in arctic wastes". In 1929 Byrd and three companions made the first flight over the South Pole.



In 1928 Nobile organized an expedition to the North Pole with the airship *Italia* fitted with long- and short-waves equipment and with an emergency short-waves transmitter.



Cover with the linear and round postmark of the *Città di Milano*, 25.5.28, the day of crash

The supporting ship *Città di Milano*, at King's Bay, kept daily in touch with the airship on both wave-lengths. On 25 May 1928 the *Italia* flew over the Pole and sent radio-messages, then it crashed on the ice north-northeast of Spitzbergen. The bulk of the airship flew away with most of its passengers.

7. Success and Drama at the North Pole

Before the crash the *Italia* kept regularly in touch with the Navy Radio station *Roma San Paolo*, operating on the 33 m length-wave. Nobile and his companions succeeded in collecting some equipment on the ice pack, including the emergency short-wave transmitter, the receiver and two batteries. It was assembled in the "red tent" and SOS messages were sent, but they were either not received or misunderstood.

Telegram sent from *Radio San Paolo*, Rome 17.1.1929.

The telegram is from the Radio Station management to Mr. Albertini, who was preparing an expedition in search of the missing members of the airship (1929) asking him when he would have been ready to start testing the radio equipment for the same.



(Mod. 30 - Teleg.)
UFFICIO TELEGR.
MILANO

di recapito - rimesso al fattorino ad ore
ING ALBERTIN VIA SARDÈGNA 46 MYLANO

Il Governo non assume alcuna responsabilità civile o amministrativa del servizio.
Le tasse riscosse in pieno per errore od in seguito a rifiuto o irrimediabilità del destinatario.
Il destinatario è invitato a firmare la ricevuta presentata dal fattorino ed a segnare la data
ritolto a reclamare in caso di ritardo della consegna.

Ricevuto il 17/1/1929 ore 19.20
Ricevuto 19.00

Le ore si contano sul meridiano centrale, e per telegr. si contano
mediante l'Europa centrale, e per telegr. si contano
vari paesi esteri di seguito da una mezzanotte all'altra.
Nel telegrammi impressi in caratteri rossi il
numero dopo il nome del luogo d'origine indica il
numero del telegramma, il secondo quello delle parole, gli
altri, l'ora e i minuti della presentazione.

QUALIFICA DESTINAZIONE
MILANC- 1489 SZIO MLN RADIO SAN PAOLO 49 18 17 15-

- DICA BUANDO PREVEDEI POTER ESÉGUIREI PRIME PROVE APPARTO TRASMITTENTE
- RADIO SAN PAOLO -

Chi è correntista della posta paga e si fa pagare mercè bancogiri, che costano per qualunque somma, solo 10 centesimi.

Abbon. Tim. M. FFI TRO A C. V. scosse . C.

7. Success and Drama at the North Pole

When the *Italia* crashed, Nobile and his companions collected some equipment on the ice pack, including the emergency short-wave transmitter, the receiver and two batteries. From the "red tent" SOS messages were sent, but they were either not received or misunderstood. On 3 June a Russian radio-amateur heard the call and the Russian icebreakers *Malygin* and *Krassin* were sent to help.



8. Flights, Radio, News & Business

Radio broadcasting developed in parallel to air transportation. So radio was instrumental to spreading timely news about the deeds of the pilots.

When Jack King's DH-4 landed in Chicago on 23 February 1921, completing the first transport of air mail entirely at night on the transcontinental airway, he was greeted by a joyful crowd that had followed his progress by radio.



During a test of the DO-X the *Süddeutsche Rundfunk* (a German broadcasting company based in Stuttgart) performed the first radio program from a flying aircraft.

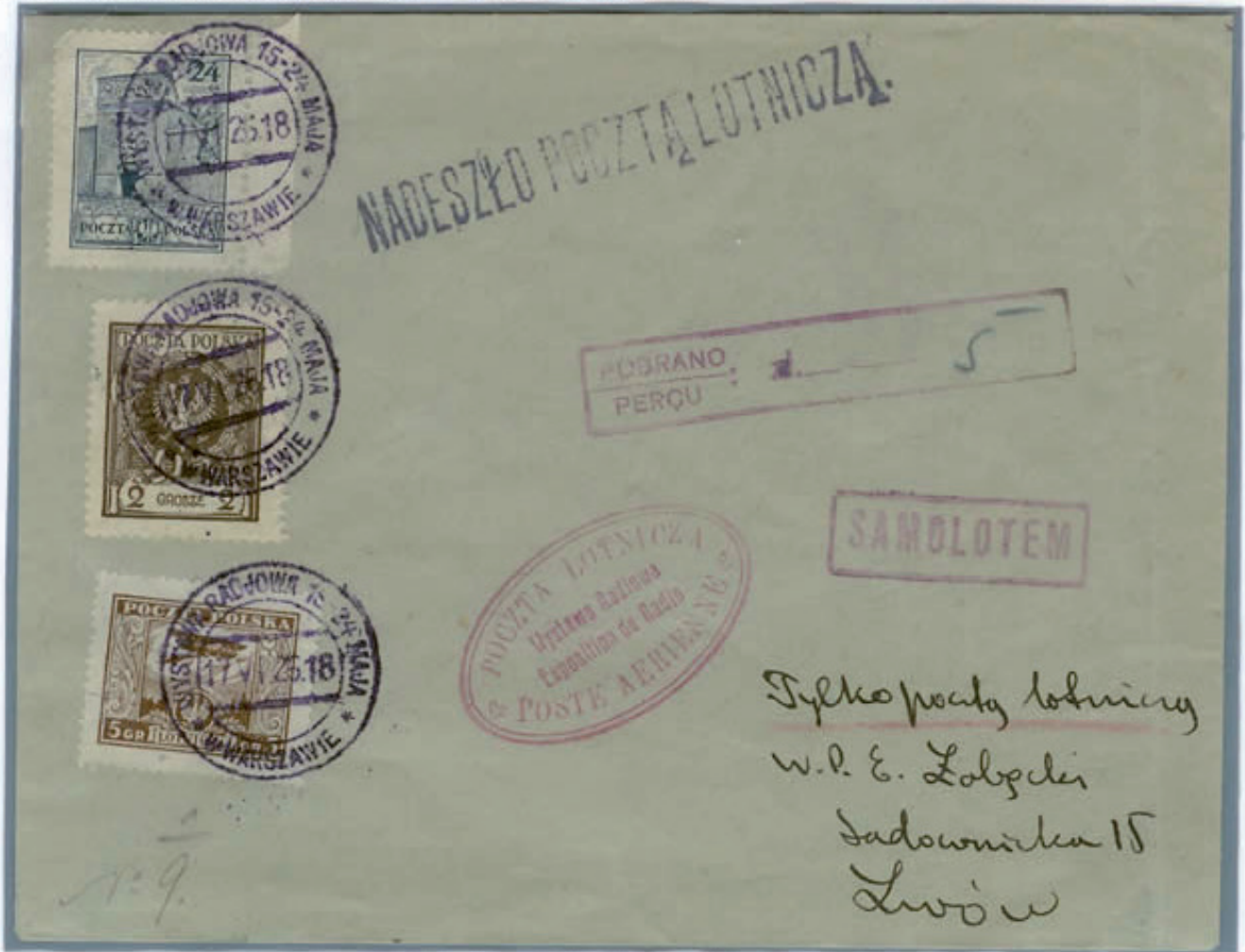


Markings of the *Süddeutsche Rundfunk* test, Friedrichshaven am Bodensee, 17.11.1929

8. Flights, Radio, News & Business

Development of radio industry originated shows, also in conjunction with new business areas, at first automobile, and later aircraft.

Cancellation of the Auto & Radio Equipment Show, Winnipeg, February 1923



Letter for the special flight to Luvov during the Warsaw Radio Exhibition - 17.5.1926
Rate 31 gr. (air mail incl. jobless tax) + 5 gr. "Tax due" - Cancellation and Air Mail cachet of the Exhibition



Letter with cachet of the Boston Radio Aero Show, October 1928