

Marconi - Wireless Telegraph Key

Marconi's Wireless Telegraph Co. Ltd. London, England

Serial No. 16676 Circa 1910



Great Lakes Museum
Kingston ON, Canada

Photography by: F R Reeve, VE3ORY



GREAT LAKES
MUSEUM

Celebrating 30 Years - 1973-2003

Early Marconi Radio Display onboard SS Keewatin at Great Lakes Museum - 2025

Radio's kindly gifted to GLM by the Toronto Maritime Museum archives - 2024



Great Lakes Museum
Kingston ON, Canada

Photography by: F R Reeve, VE3ORY





Marconi Magnetic Detector Receiver

Circa 1902 -1912

Marconi Spark-gap Transmitter

The MARCONI WIRELESS TELEGRAPH
Co OF CANADA LIMITED

Type No. 10301

Serial No. 51

Circa 1905

Marconi Wireless Telegraph Key

Marconi Wireless Telegraph Co.
Ltd. London, England

Serial No. 16676

Circa 1910



Great Lakes Museum
Kingston ON, Canada



Photography by: F R Reeve, VE3ORY

The MARCONI WIRELESS TELEGRAPH Co OF CANADA LIMITED
MONTREAL

Spark-gap Transmitter TYPE No. 10301 Serial No. 51



Great Lakes Museum
Kingston ON, Canada



Photography by: F R Reeve, VE3ORY

MARCONI WIRELESS TELEGRAPH Co OF CANADA LTD.

Circa 1905

Spark-gap Transmitter

Serial No. 51

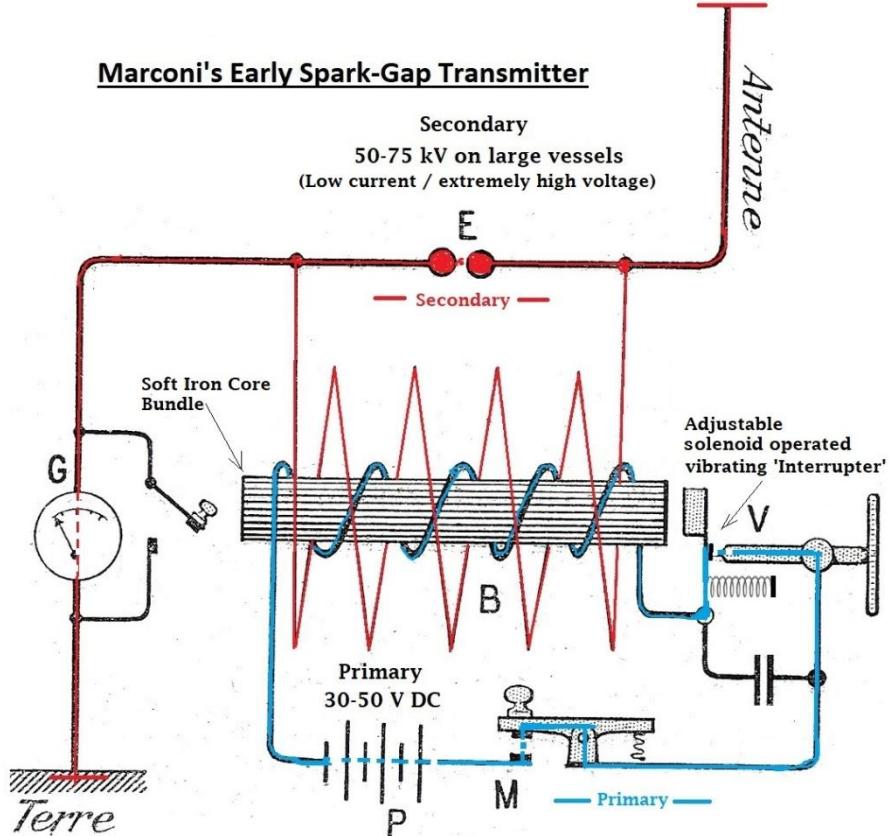


Great Lakes Museum
Kingston ON, Canada



Photography by: F R Reeve, VE3ORY

Marconi's Early Spark-Gap Transmitter



Spark-gap radio transmitter circuit used by [Guglielmo Marconi](#) in his experiments with radio transmission around 1895. It consists of an induction coil B which causes sparks to jump across a spark gap E, creating oscillating electric currents in the wire monopole antenna which are radiated as radio waves. The vibrating interrupter contact on the coil V broke the primary current from the battery B 30-50 times per second, creating the high voltage output from the coil. The radio operator used the telegraph key M to turn the power to the transmitter on and off rapidly, producing different length pulses of radio waves, to spell out text messages in Morse code. The hot-wire ammeter G measured the RF power radiated; when not in use the switch was closed to cut it out of the circuit. Marconi experimented with early radio links at the Villa in Italy Griffone wireless telegraphy Salvan (Valais) in the Swiss Alps in the summer of 1895

Principle of Operation for Marconi's Spark-gap Transmitter

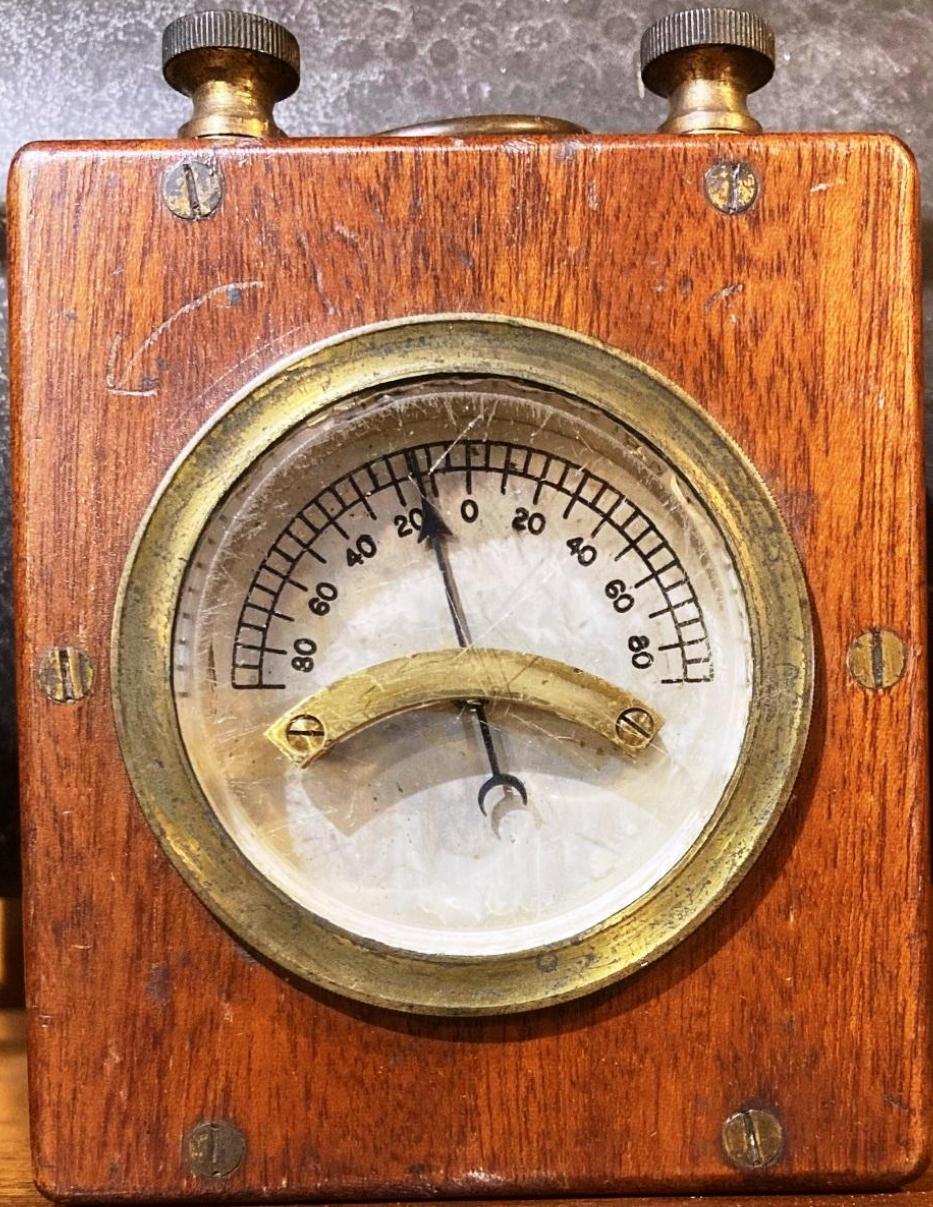
The vibrating 'interrupter' (solenoid) was critical for converting DC (battery) current to an alternately expanding and collapsing electro-magnetic field in the primary winding which was then coupled to the much larger secondary winding to produce a very high voltage...which would then discharge across the gap between the electrodes ...generating an oscillating current in the antenna.

Both the gap in the Interrupter solenoid and the gap across the high voltage electrodes is adjustable.

The interrupter solenoid vibrating at 30 to 50 times per second , generated a very broad-banded low frequency radio signal with a raspy / buzzing audio tone.

Improvements quickly evolved, to replace the vibrating interrupter with a rotating spark arrangement that produced a more evenly timed spark roughly 700 times per second resulting in a more pleasant audio tone at the receiving station. It is said that signals from a rotary spark-gap transmitter were easily distinguishable from those of the vibrating interrupter type of transmitter.

Further rapid developments added coupled tuned circuits to the output, to improve efficiency and narrowing bandwidth of the transmitted signal.



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Photography by: F R Reeve, VE3ORY





Power Supply for the Spark-gap Transmitter



Great Lakes Museum
Kingston ON, Canada

Photography by: F R Reeve, VE3ORY



Photograph ID: 1473 2023

MARCONI'S WIRELESS
TELEGRAPH CO LTD
No 24210 LONDON

The Toronto Marine Museum had this identified as a 'Battery Charging Resistance Panel'

I have been unable to find any further information online, regarding this device, other than photos of other early Marconi stations, clearly showing this as supplying DC power to the Spark-gap Transmitter.

The meter shows a full scale value of 30 Volts, which is in keeping with what typically was supplied via the Telegraph Key to the primary winding of the Spark-gap transmitter.

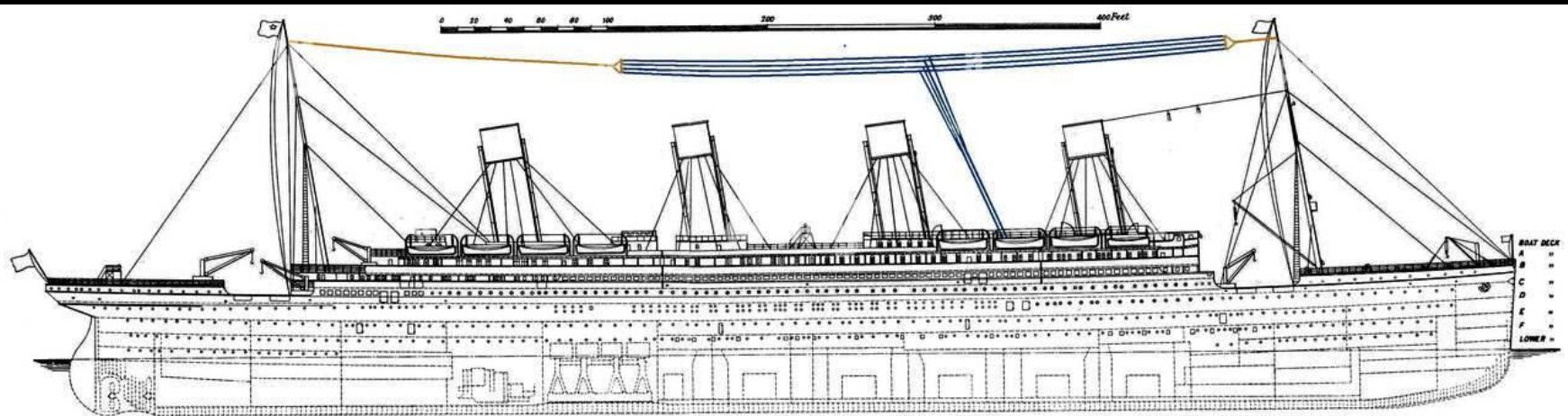
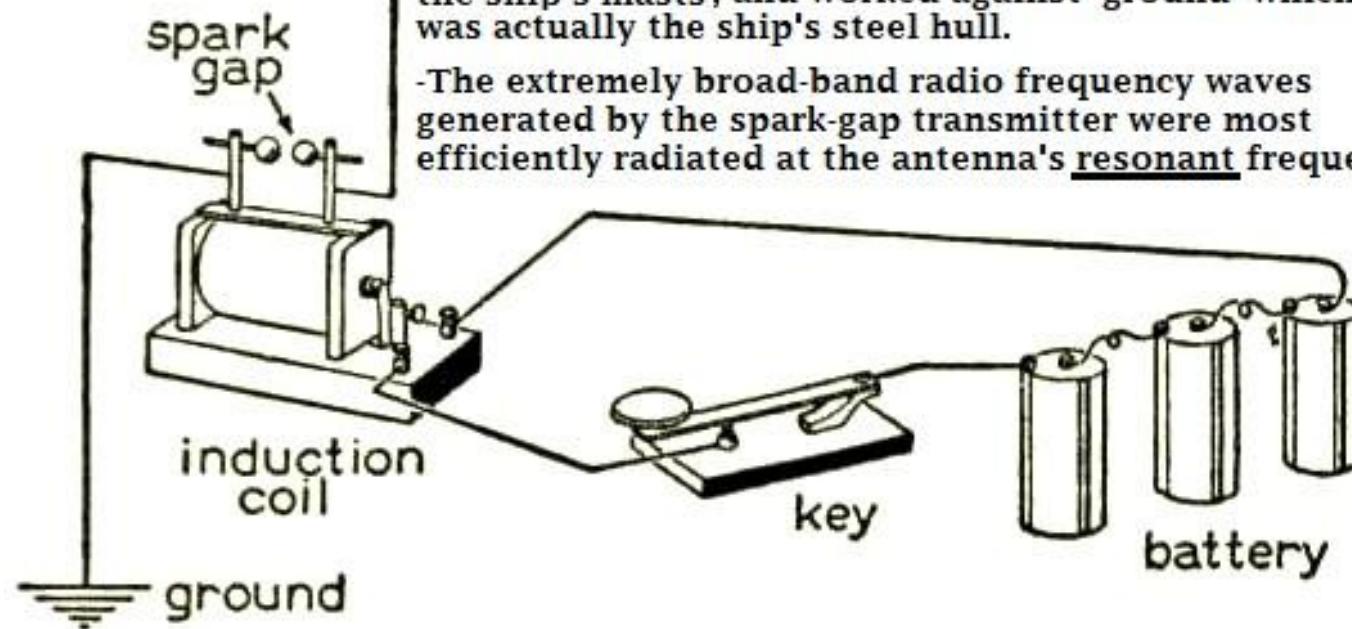
Wiring on the back of this unit is all visible. So I spent considerable time attempting to reverse engineer a schematic diagram complicated only by a few missing and broken wires.

Keewatin's main power was **120 V DC** produced by 2 steam-driven dynamotors in her engine room. So it makes sense that this might also have been used to power the radio equipment via this panel with its' series connected bank of resistance wires at the top of the unit.

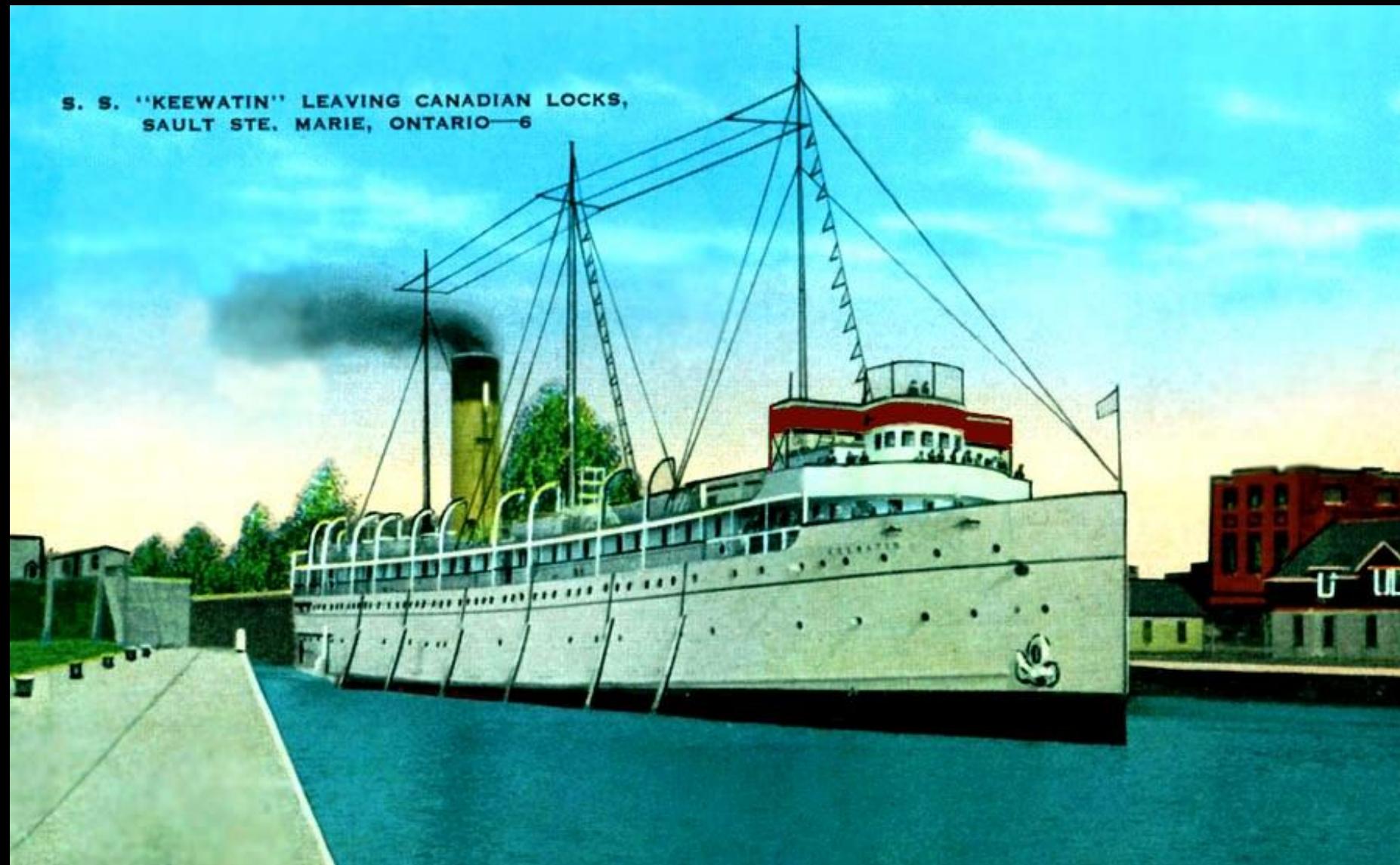
It also appears likely that this panel also might have provided for switching and charging a bank of back-up batteries...at least that is my theory. Perhaps one day I will discover more information on this interesting piece.

Ship's Antenna

- Antenna was essentially an end-fed vertical long- wire, with large capacitive top-hat elements ...strung between the ship's masts, and worked against 'ground' which was actually the ship's steel hull.
- The extremely broad-band radio frequency waves generated by the spark-gap transmitter were most efficiently radiated at the antenna's resonant frequency.



Artist's rendering of Keewatin at Sault Locks – Not certain how accurately this reflects the ship's configuration, however the antenna arrangement, as depicted, is likely how it would have been in the ship's very early days, with a Spark-gap transmitter installed...



While in Saugatuck MI, the Toronto Marine Museum had loaned Assiniboia's radio equipment to R.J. Peterson who had purchased Keewatin before she was due to be scrapped in 1967.

This photo shows the radio shack room that Mr. Peterson added on to the 'Boat Deck' stairwell enclosure , with the Toronto Marine Museum's radio equipment , as he had it displayed. On the right –hand corner of the bench you can see an example of the Rotary –type Spark Gap Transmitter.



When Mr. Peterson returned Keewatin to Port McNicoll, this radio equipment was returned to the Toronto Marine Museum, where it remained in their archives, until it was recently gifted to us at the Great Lakes Museum.

Most of this equipment is what we now have on display with the exception of the Rotary-type Spark-gap transmitter which was not included amongst the items gifted to the Great Lakes Museum.

Interesting also to note that the radio shack shown in this photo is now the current location for our VA3VGC amateur station (same location that was used for the station while it was operated in Port McNicoll).

The Marconi Wireless Telegraph Co. of Canada Limited

Magnetic Detector Receiver 'Maggi'

Patent No. 85277 Circa 1902

Great Lakes Museum
Kingston ON, Canada



Photography by: F R Reeve, VE3ORY



'Maggi's' heart...

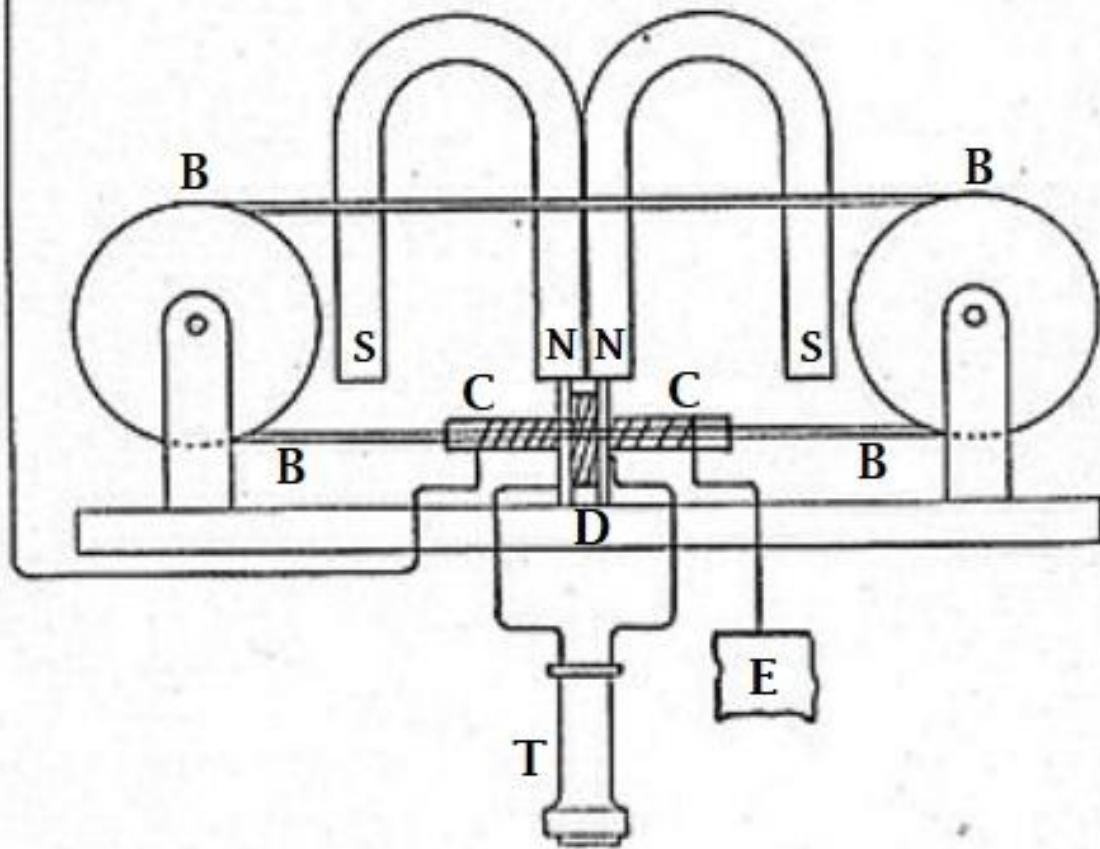
- stranded iron wire magnetized with permanent magnets... moving through a glass tube
- A Low Impedance Primary coil...one end connected to the antenna, and other end connected to ground
- A High Impedance Secondary winding connected to a high impedance Telegraph Earphone



Great Lakes Museum
Kingston ON, Canada



Photography by: F R Reeve, VE3ORY

A

[Wikipedia explanation of the Magnetic Detector Receiver](#)

The radio signal from a spark gap transmitter consists of pulses of radio waves (damped waves) which repeat at an audio rate, around several hundred per second. Each pulse of radio waves produces a pulse of current in the earphone, so the signal sounds like a musical tone or buzz in the earphone.

The radio signal from the antenna (A) is passed through the excitation coil C, the other end of which is connected to ground (E). The rapidly reversing magnetic field from the coil exceeds the coercivity H_c and cancels the hysteresis of the iron, causing the magnetization change to suddenly move up the wire to the center, between the magnets, where the field reverses. This had an effect similar to thrusting a magnet into the coil, causing the magnetic flux through the pickup coil D to change, inducing a current pulse in the pickup coil. The audio pickup coil is connected to a telephone receiver (earphone) (T) which converts the current pulse to audio sound.

(A) Antenna wire, (B,B) Iron band around pulleys, (C, C) RF excitation winding on glass tube through which the iron band travels, (D) Audio pickup winding, (E) Ground-plate, (S, N) Permanent magnets, (T) Telephone receiver.

History and Technical Aspects of Marconi's Magnetic Detector Receiver

The Marconi magnetic detector, affectionately nicknamed the “Maggie,” was a groundbreaking invention in early radio technology. Developed by Guglielmo Marconi in 1902. It was widely used on ships due to its reliability and resistance to vibration. Famously, it was part of the wireless setup on the **RMS Titanic**, helping transmit distress signals during the 1912 disaster.

From: Wikipedia:

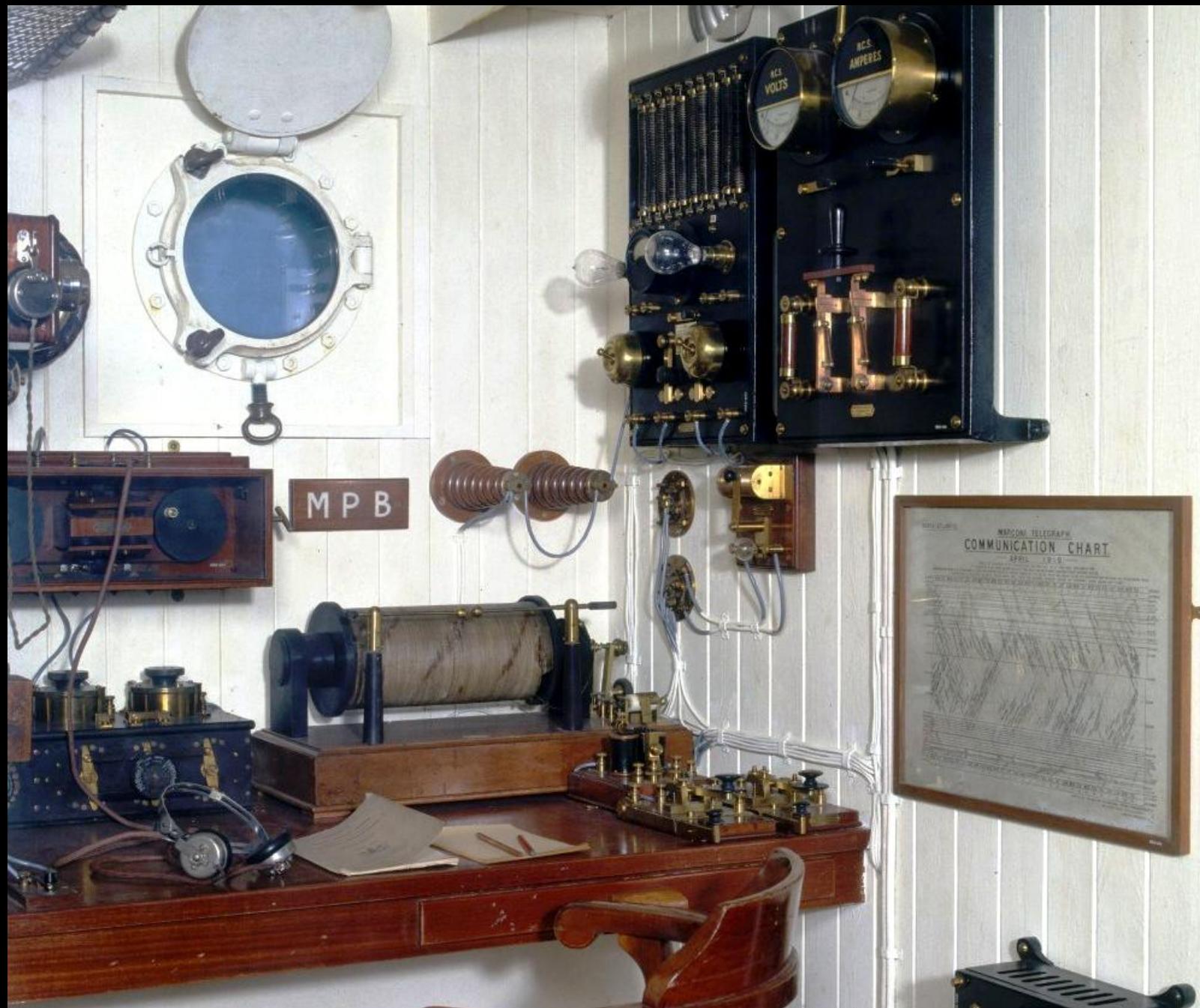
From a technical standpoint, several subtle prerequisites are necessary for operation. The strength of the magnetic field of the permanent magnets at the iron band must be of the same order of magnitude as the strength of the field generated by the radio frequency excitation coil, allowing the radio frequency signal to exceed the threshold hysteresis (magnetic coercivity) of the iron.

The iron band needed to be moving a few millimeters per second, and was driven by a spring wound clock mechanism.

Also, the impedance of the tuner that supplies the radio signal must be low to match the low impedance of the excitation coil, requiring special tuner design considerations. The impedance of the telephone earphone must roughly match the impedance of the audio pickup coil, which is a few hundred ohms.



VBA Port Arthur operating position ca. 1914-1918. Canadian Marconi Company / Library and Archives Canada / C-065134.









Antenna Change-Over Switch

(T/R switching simplified)



Marconi Crystal Detector Receiver Circa 1918

Marconi Wireless Telegraph Company of Canada, Inc. Montreal
Type: 248 Serial No. 212

- band switching and filtering, covering Medium and Long-wave bands (low frequency)
- 2 sets of Galena crystal detector units
- All passive components – no tubes



Great Lakes Museum
Kingston ON, Canada

Photography by: F R Reeve, VE3ORY



Marconi Wireless Telegraph Company of Canada Inc. Montreal

Marconi Radio Tuner -Type MST-2

Circa 1922

Marconi Detector / Audio Amplifier -Type MSA-5

** Detector uses (2) UV-200 tubes **

** Audio Amplifier uses (2) UV-201A tubes, to drive headphones or speaker **



Great Lakes Museum
Kingston ON, Canada



Photography by: F R Reeve, VE3ORY

UV-200 Circa 1920

- pure tungsten filament: 5V DC, 1 A
- argon gas filled



UV-201A Circa 1922

- thoriated tungsten filament : 5V DC, 0.25A
- vacuum and phosphorus getter



Great Lakes Museum
Kingston ON, Canada

Photography by: F R Reeve, VE3ORY



Marconi Wireless Telegraph Company of Canada

Radio Direction Finder

Type MDF-1A Serial No. 38

Patents: 1910, 1922, 1923





CALIBRATING CHOKES
TYPE 18564
MARCONI
CANADA

Form 459

CANADIAN MARCONI COMPANY
(LIMITED LIABILITY)

S.S. _____ No. 3

Date.....

Relative Bearing of..... Position of Shore Station Lat.
Long.

No.	Time	Swing A B	Mean	Cor- rec- tion	Relative Bear- ing	Remarks
1					*	
2						
3						
4						
5						
6						
7						

OTHER
REMARKS



Great Lakes Museum
Kingston ON, Canada



Photography by: F R Reeve, VE3ORY



Great Lakes Museum
Kingston ON, Canada

Photography by: F R Reeve, VE3ORY



Latitude 41° 50' N. - Longitude 76° 30' W.



SS KEEWATIN
VGMC

coni's Wireless Telegraph Co.
of Canada, Inc.

Crystal Detector
Receiver
Type 2843, Serial No. 112
Circa 1918



M & M.



OFFICIAL RADIO LOG
FOR SHIP STATIONS
(Radiotelephone)

NAME OF SHIP	OFFICIAL NUMBER	PORT OF REGISTRY	GROSS TONNAGE
Keewatin	125985 V G M C	Montreal Port N° 33 Res pt -OCT 1907	3856

Name of Operating Company.....
Can. Pac. Tel.
Period Covered by Log—From 7 Aug 1963 To 29 Nov 1963

Delivered to the Radio Inspector at the Port of
on day of 19.....

Countersigned

Radio Inspector

Master

Issued by
THE DEPARTMENT OF TRANSPORT
Telecommunications and Electronics Branch

Price 65 cents

41-3030 (2187-4)
2-61

OFFICIAL RADIO LOG
FOR SHIP STATIONS
(Radiotelephone)

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Great Lakes Museum
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Re: Composite Portrait (above) which was gifted to us by the Toronto Marine Museum archives, and is now part of our display...

Early Years 1910-1913

Port Arthur land and ship radio operators (1913) with OIC John Hopkins Bartlett (centre). This composite portrait was created just before the Marconi station was transferred to the Canadian government. The original print was donated to the Thunder Bay Museum by Mr. McCuaig (lower right of Mr. Bartlett) and his brother is to the upper left of Mr. Bartlett!

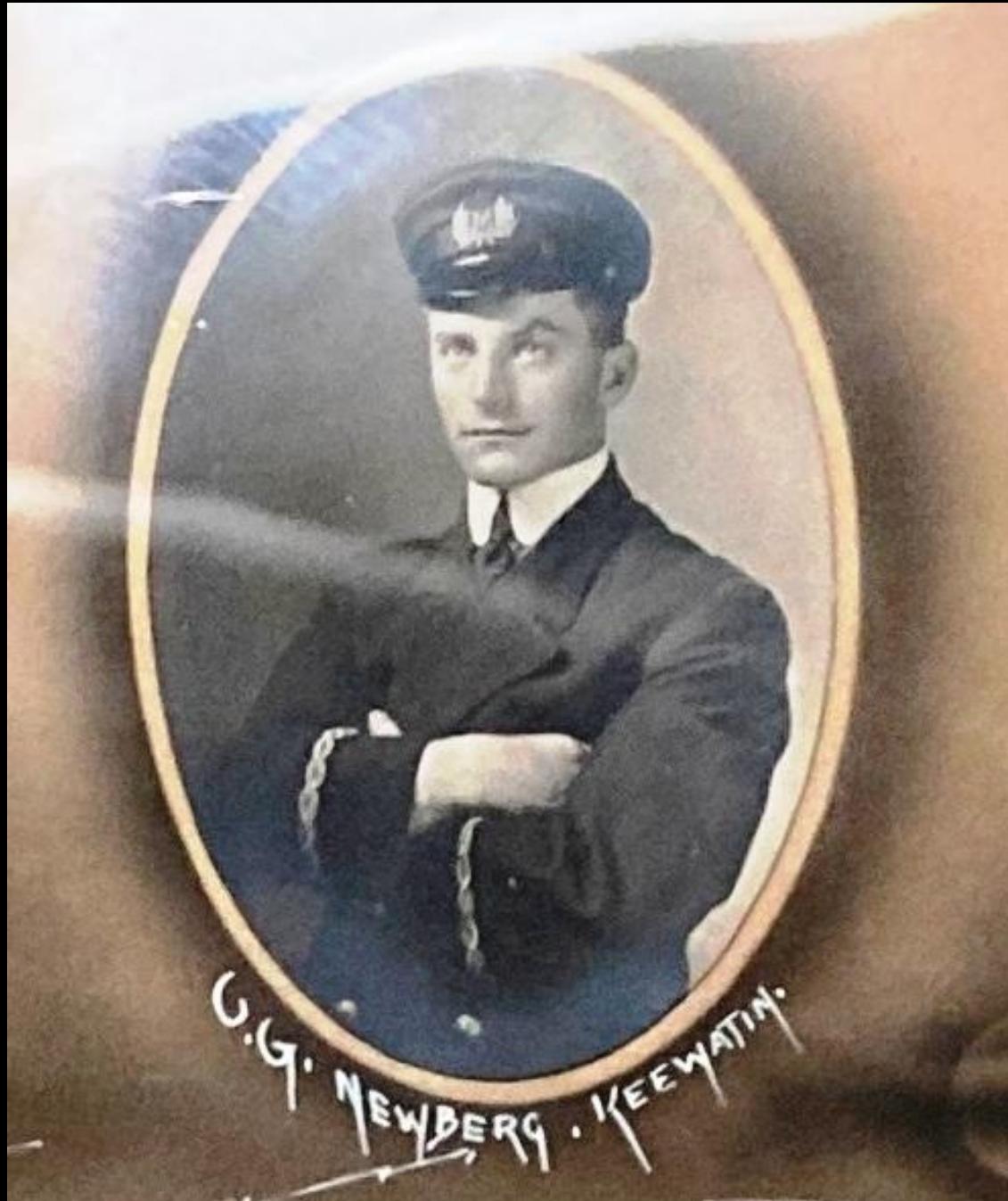
TBHMS 979.1.29



Great Lakes Museum
Kingston ON, Canada

Photography by: F R Reeve, VE3ORY





Marconi Telegraph Company of Canada, Ltd. (1913)

Marine Radio Operator

C.G. Newberg

Employed by Marconi Telegraph
Company and assigned to:

SS Keewatin



Great Lakes Museum
Kingston ON, Canada



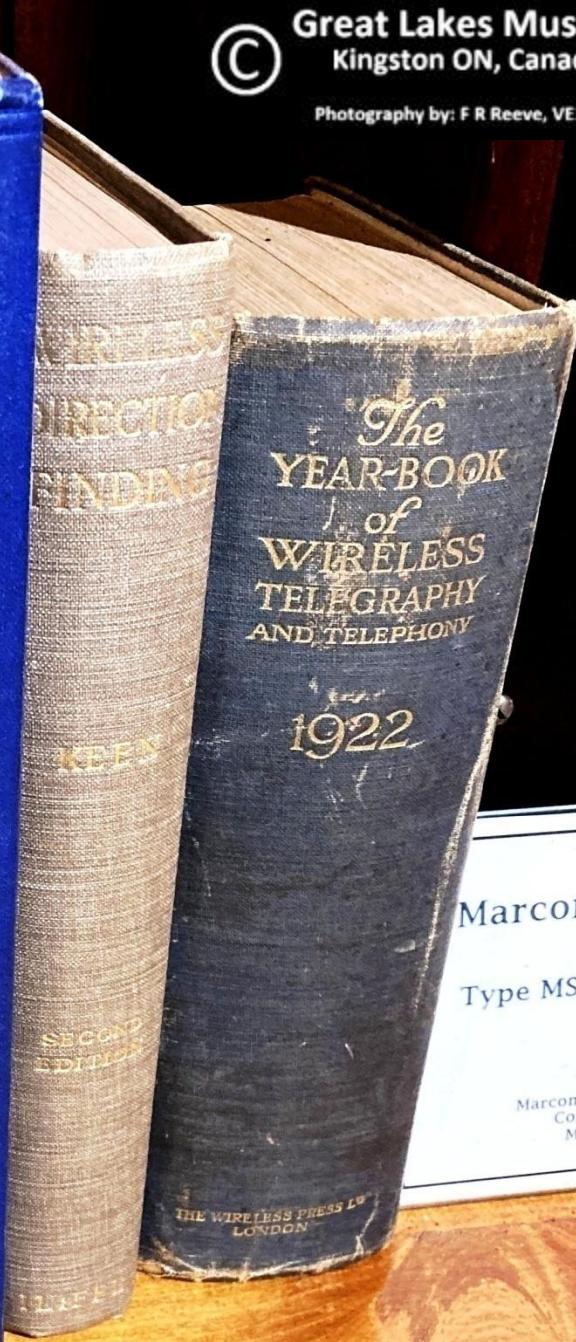
Photography by: F R Reeve, VE3ORY







Admiralty Handbook of Wireless Telegraphy. 1925





26 July 2025

SS Keewatin and Great Lakes Museum awarded 'Steamship of the Year for 2025' by the 'Steamship Historical Society of America'



**The Steamship Historical Society of America honors
SS KEEWATIN GREAT LAKES MUSEUM with its 2025 MUSEUM SHIP OF THE YEAR AWARD**

Built in 1907 by Fairfield Works in Glasgow, Scotland, SS KEEWATIN was designed for the Canadian Pacific Railways continental route linking C.P.'s Owen Sound depot to Fort William Port Arthur on Lake Superior, before moving to Port McNicoll, Ontario in 1912. With Port McNicoll established as the new 'super port' and rail terminus, SS KEEWATIN took two and a half days to make the trip each way, including half a day traversing the Soo Locks.

In the last fifteen years of her working life, KEEWATIN operated under stringent regulations for wooden cabin steamships following the NORONIC disaster in 1949. She worked from 1907 to 1965 and never missed a sailing. Then, in order to continue service, rebuilding of the wooden superstructures was required.

Instead, she was withdrawn from the passenger trade on 29 November 1965. The following year KEEWATIN operated a freight-only service but in fall of 1966, she was sold for demolition.

Fortunately, before scrapping, in January 1967 KEEWATIN was rescued by Michigan entrepreneur Roland J. Peterson Sr. He operated her as the Keewatin Maritime Museum for 45 years, docked in Douglas, Michigan, across the river from the popular summer resort town of Saugatuck.

In 2011 she was purchased by Skyline Investments, and later relocated to her original port in Canada as a tourist attraction. After several years of uncertainty, in 2023 SS KEEWATIN was towed to her new home at the Great Lakes Museum in Kingston, Ontario and opened in Spring 2024.

Today, she remains a unique Edwardian era Steamship, with an authentic quadruple expansion reciprocating engine, working steering gear and windlass. Of 3,800 similar ships in Great Britain between 1900 and 1920, she is the only remaining restored example in the world.



Ted Hsu MPP
Kingston and the Islands

SS Assiniboia - Keewatin's Sister Ship

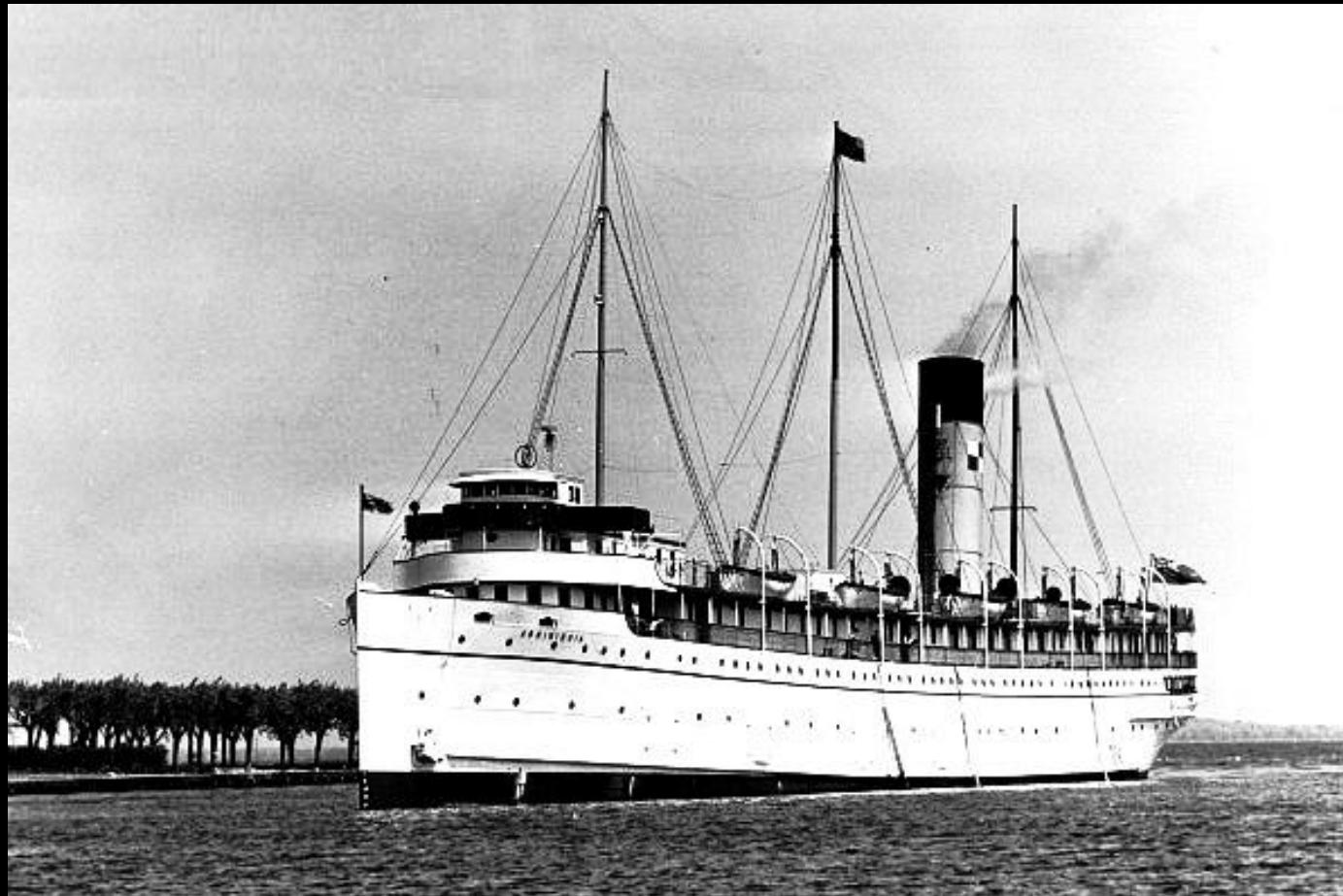
Also built for Canadian Pacific by Fairfield Shipbuilding and Engineering Co. in Glasgow Scotland, and launched just 2 weeks before SS Keewatin. Served same route as her sister ship...often opposing directions.

Converted to oil fired boilers in 1954 (Keewatin was never converted,...remained coal fired for her entire life)

Both retired from passenger service in 1965 due to increased fire safety requirements imposed by the Canadian government.

Both ships used for freight-only service for an additional 2 years before being permanently retired. Assiniboia sold in 1968, and burned in 1969 at her pier in West Deptford NJ. Scrapped in 1970.

It is believed that most of the radio gear gifted to us from the Toronto Marine Museum for our Marconi display, was originally installed onboard SS Assiniboia. Visible in this photo is what might well have been an antenna extended between the forward and midship masts.



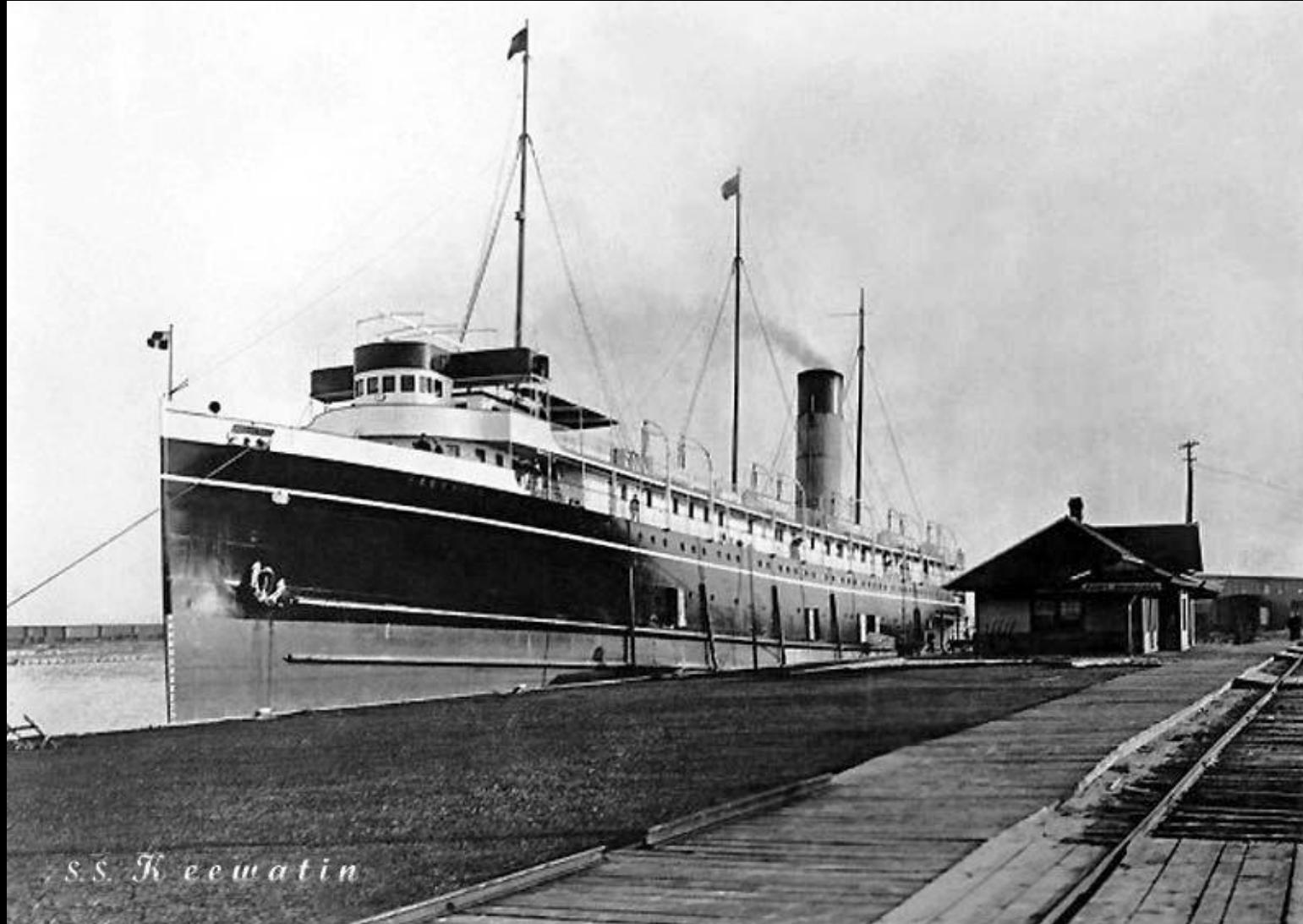
As built in Glasgow Scotland, both Keewatin and Assiniboia were knowingly too long to transit existing locks on the St Lawrence river and the Welland canal. So after transiting the Atlantic ocean, both ships stopped at the Davie Shipyard in Lauzon Quebec where they were disassembled into 2 halves and then towed to Buffalo NY, where they were re-assembled by the Buffalo Dry Dock Company. From there they were able to sail on to Georgian Bay where they began their careers with Canadian Pacific in 1908.

The forward section of either Keewatin or Assiniboia under tow (not sure which) . Note in this photo, the originally all- black hull with no name displayed as yet...

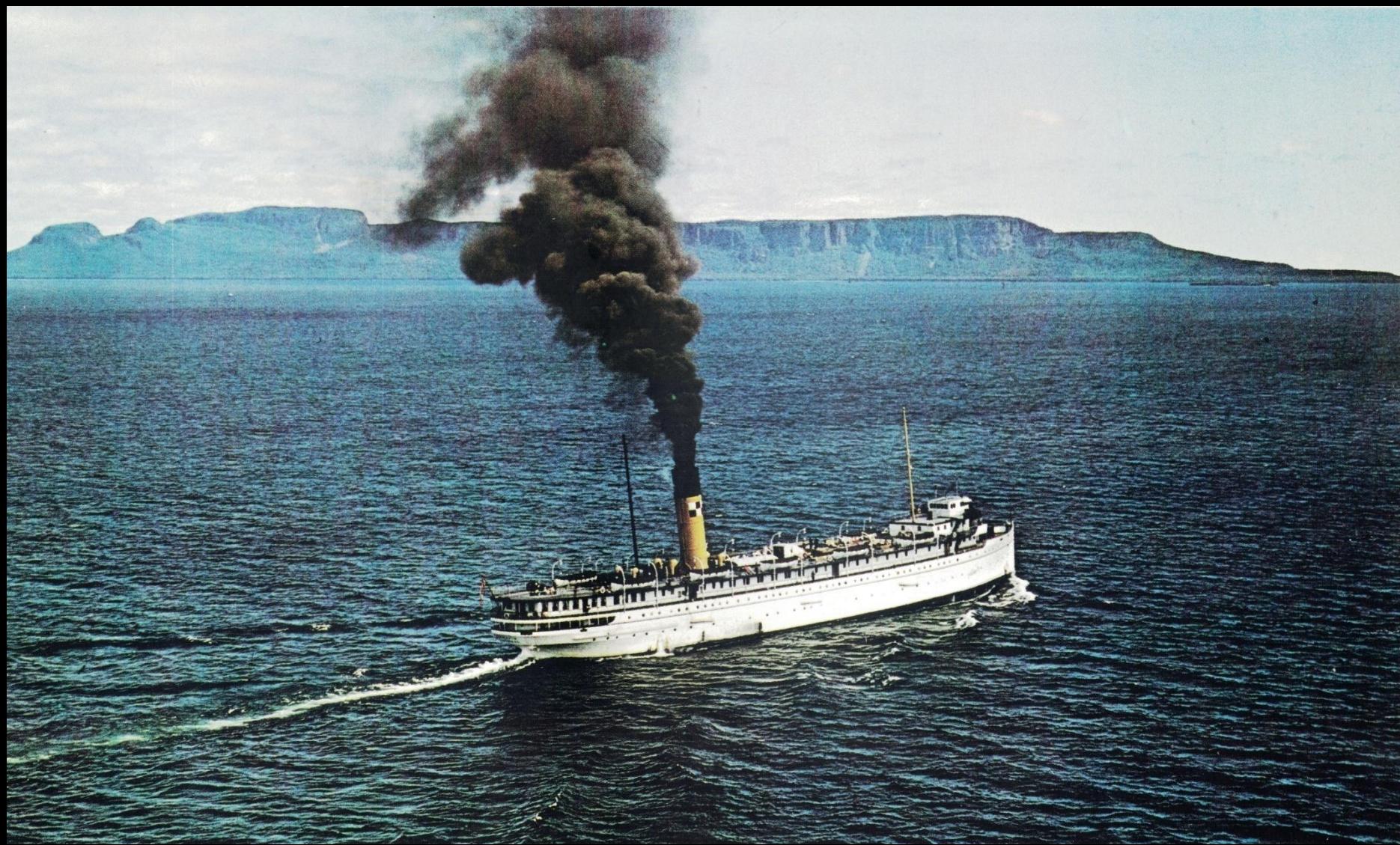


SS Keewatin docked at Port McNicoll. Early photo showing forward, midship, and aft masts...originally wood. At some point Keewatin was converted to only forward, and midship masts. Ultimately all of the wooden masts were removed and replaced with two steel masts forward and aft (and the midship mast removed altogether).

Also visible in this photo – CP Rail line connecting with their ships at the Port McNicoll terminal.



SS Keewatin steaming into Port Arthur (now Thunder Bay), with 'Sleeping Giant' island in the background.





SS Keewatin arrival at Great Lakes Museum, Kingston ON – 26 October 2023



Great Lakes Museum
Kingston ON, Canada



Photography by: F R Reeve, VE3ORY