

# Research Report

## Forgotten Wrecks of the First World War



**LOTTERY FUNDED**



LED BY **IWM**

During the Maritime Archaeology Trust's Heritage Lottery funded Forgotten Wrecks of the First World War project, scores of volunteers undertook online research into vessels that were lost off the south coast of England during the First World War.

Their findings were used to populate the project database and contributed to Site Reports. Both are publicly available via the Forgotten Wrecks website.

This Research Report was undertaken by one of our volunteers and represents many hours of hard and diligent work. We would like to take this opportunity to thank all our amazing volunteers.

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## **Maritime Wireless Telegraphy Communications Beyond Visual Range**

MAT volunteer Roger Burns takes a non-technical look at the development of maritime wireless telegraphy up to 1919.

We all have our own images of heliographs, semaphore flags and Aldis lamps being used to pass messages between ships in reasonable proximity at sea. Signal lanterns, apparently first used by the Royal Navy in 1867, led to the refinement of Aldis lamps, used by the Royal Navy in the late 19<sup>th</sup> century and light-based signalling with many refinements is still used today in appropriate circumstances. Whistles, bells and horns were also used in the early days, and horns still are used. (Wikipedia – Signal lamp). Wireless telegraphy transmitted through the atmosphere is very different and distinct from the network of the intercontinental undersea cable network laid mostly by British ships which spread worldwide in the second half of the 19<sup>th</sup> century and was dominated by British companies until well into the 20<sup>th</sup> century.

The history of early wireless telegraphy from the early 1800's owes much to the work and inventions of scientists and inventors such as Michael Faraday, James Clark Maxwell, Heinrich Rudolf Hertz, Nikola Tesla and Alexander Stepanovitch Popov who arguably was ahead of Marconi. But it was Marconi, with the support of Professor Augustus Righi, who had the imagination to channel his work to a commercial wireless telegraphy system which saw fruition and subsequently his name has become synonymous with early radio. (Wikipedia – Telegraphy).

Guglielmo Marconi, (1874 to 1937), was born in Italy where his work was not appreciated and, fluent in English, travelled to England in 1896. Wikipedia notes that *“Marconi arrived at Dover and the Customs officer opened his case to find various apparatus. The customs officer immediately contacted the Admiralty in London. While there, Marconi gained the interest and support of William Preece, the Chief Electrical Engineer of the British Post Office”*. Demonstrations for the British culminated with a breakthrough transmission over the Bristol Channel on 13 May 1897, the first such transmission over water. More demonstrations followed, and *“Marconi left for England on 8 November 1899 on the American Line's SS Saint Paul, and he and his assistants installed wireless equipment aboard during the voyage. On 15 November, Saint Paul became the first ocean liner to report her imminent return to Great Britain by wireless when Marconi's Royal Needles Hotel radio station contacted her 66 nautical miles off the English coast”*. (Wikipedia – Guglielmo Marconi)

Meanwhile, on 2 July 1897, there was acceptance of what is now regarded as a famous patent, number GB12039, filed in UK by Marconi which was the first description in print of a wireless telegraphy device, being entitled *“Improvements in Transmitting Electrical Impulses and Signals, and in Apparatus therefor”*. This patent is highly detailed with a fascinating manuscript and may be read on-line at <http://www.radiomarconi.com/marconi/popov/pat763772.html> being much too long to include here. This was followed by five more British patents over the next 10 years and numerous patents were lodged in America.

An appreciation of the value of wireless telegraphy at sea was first noticed on 3 March 1899, in the Forgotten Wrecks project area. Wireless telegraphy had been installed on the *East Goodwin* Lightship, and when a freighter collided with it, a distress wireless message for help was relayed to a land station at South Forland. (International Maritime Organisation.)

By 1899, the Mercantile Marine and Royal Navy accepted that wireless telegraphy was here to stay. There was rapid development and the first transatlantic signal, albeit a single letter, was accomplished on 12 December 1901. In the following two years, permanent wireless stations were established on the north eastern seaboard of North America. Some ships began to be fitted with rented Marconi equipment which could “speak” with these shore-based stations, but equipment in these ships had to be operated by Marconi personnel. (Marconi Collection).

The Royal Navy had been conducting its own experiments from 1897, notably by H.B. Jackson, RN officer, pioneer in wireless telegraphy, and eventually Admiral of the Fleet, to improve wireless transmission and reception, and in 1900 procured Marconi equipment for many of its ships plus UK and foreign land-based stations. (British Adoption of Radio Communication - The Dreadnought Project).

*SS Lake Champlain* of the British Beaver Line was the first British merchant ship to have Marconi wireless installed, and its first voyage with this new equipment was on 21 May 1901, creating much interest. Uptake was initially slow, but by mid-summer of 1907, 139 British and foreign vessels were fitted with Marconi’s wireless telegraphy, primarily passenger ships and some Trinity House lightships. The next few years saw reasonably rapid expansion of wireless telegraphy installed in passenger and mail ships, and tankers, including HMHS *Asturias* which in 1917 was torpedoed and sunk in the Forgotten Wrecks project area. (Wireless at Sea. The First Fifty Years: 29, 30, 47, 48) and (MAT “Asturias”)

Such was the pace of progress that it was difficult to be sure of numbers of mercantile marine ships fitted with telegraphy apparatus. It was assessed that by mid-1910, approximately 300 mercantile marine ships were fitted, and the importance of wireless telegraphy led to Lloyd’s Register being specifically marked for these ships. The development was characterised also by the relative importance attached to trade routes where advancements were also made by establishing shore stations, led by the North Atlantic route followed by the South Atlantic, South African and Asian/Far East routes. It was evident in mid-1910, that Great Britain led the way globally in the numbers of naval and mercantile marine stations. (“The Electrician”).

Events where wireless telegraph at sea demonstrated its value gathered pace with three examples:

- “In January 1909, wireless telegraphy saved over 4,000 lives when it was used to call for rescue when the *SS Republic* collided with the *SS Florida* off the shores of Nantucket”. (Marconi Collection). The details of what happened are expanded in an article featuring Jack Binns who subsequently declined an appointment on *Titanic*! (ETHW). But there was no call for improved safety as there was later after *Titanic* sank.
- In July 1910, Marconi wireless telegraphy’s Public Relations benefitted enormously when contributing to police work in the capture of the infamous Dr Crippen who was voyaging to

Canada with his new lover after murdering his wife. The captain messaged Scotland Yard, and they were arrested when docking in Canada. (Marconi Collection)

- The sinking of the *Titanic* whose two wireless operators were Marconi employees. (Encyclopaedia Britannica). This tragedy led to the first International Conference for “Safety of Life at Sea” convened in London in 1913 attended by 65 countries. There was a raft of recommendations, key ones being every ship to have a lifeboat space for each person on board, lifeboat drills every voyage, and 24-hour wireless watch as use of the wireless telegraphy had contributed to the saving of over 700 lives which would otherwise probably have been lost. (The Guglielmo Marconi Foundation, U.S.A., Inc.).

The above Convention led to the Merchant Shipping Convention Act, 1914 which was not enacted because the First World War intervened and the Convention Act required only ships with more than 50 persons on board to be fitted with wireless. During the war, vessels over 1,600 tons were required to be fitted with wireless pursuant to the Defence of the Realm Act. In 1919, and a bill entitled Merchant Shipping (Wireless Telegraphy) Bill [H.L.] was passed which required every passenger steamer or every cargo vessel exceeding 1,600 tons to be fitted with wireless telegraphy – not only was this a safety feature but it meant that many wireless operators from the war would still have employment.



Source: **The Yearbook of Wireless Telegraphy and Telephony, 1913, pages 323-326**

An article from Marconi’s annual “The Yearbook of Wireless Telegraphy and Telephony, 1913”, pages 323-326, entitled WIRELESS TELEGRAPHY AND THE MERCANTILE MARINE gives a comprehensive overview of the widespread benefits of wireless telegraphy, together with this image of a 0.5kw station for cargo vessels. (Yearbook, 1913).

Complementary to this early development of wireless, the UK government recognised the need to legislate for the advance of wireless telegraphy and, importantly, protection of UK interests. Accordingly, The Wireless Telegraphy Act 1904, subsequently repealed, and the Wireless Telegraphy Act 1910, also subsequently repealed were published. The Official Secrets Act 1911 included the words “telegraph or signal station” but an amendment in 1920 revised this to “wireless or signal station” as the original version referred to cable-based telegraph. There was the Merchant Shipping (Wireless Telegraphy) Act 1919 the reasons for which are highlighted in Hansard on 29 May and 30 July 1919. (Hansard).

In 1905, it became a requirement to be licenced to experiment using wireless telegraphy and a typical licence is shown on the website of the Science Museum Group Collection. (Science Museum).

Interestingly, the concept of “naval signalling” and “Admiralty” were defined expressions. In 1918, the Wireless Telegraphy Board was created to help avoid radio interference. (History of Telecoms Regulation).

In the period 1 August 1914 to 31 December 1919, the London Gazette published 31 notices relating to “wireless telegraphy”. (London Gazette). These briefly included:

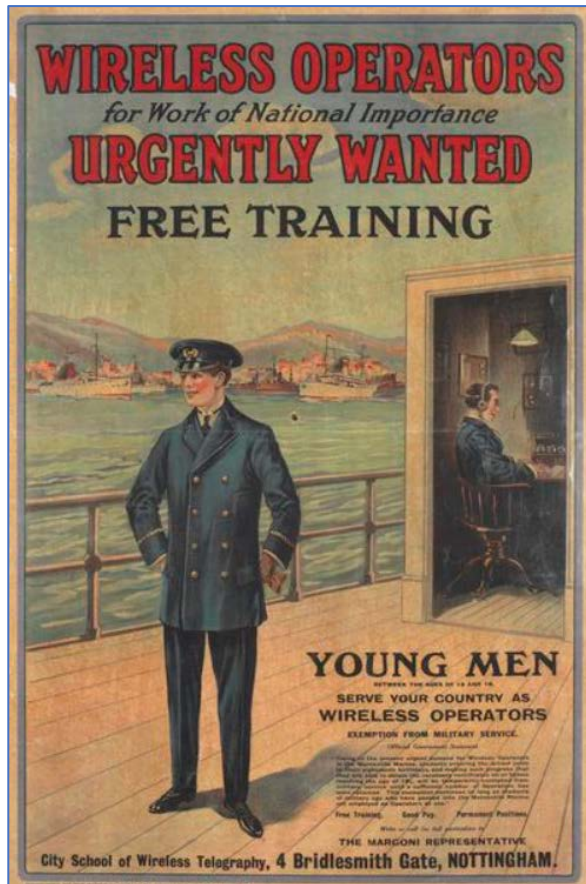
Issue	Included
4 August 1914. Issue 28860. Page 6068.	His Majesty's Government should have control over the transmission of messages by wireless telegraphy, and that the use of wireless telegraphy on board foreign ships whilst in the territorial waters of the British Isles will be subject to such rules as may be made by the Admiralty.
4 August 1914. Issue 28860, Page 6071	Merchant vessels: The use of wireless telegraphy is prohibited in the harbours and territorial waters of the United Kingdom and Channel Islands. Aerial wires to be lowered.
8 June 1915. Issue 29186. Page 5507.	For Royal Navy or Royal Marines: "And whereas we consider it desirable that an allowance of 2d. a day should be payable, at our discretion, to any qualified Ratings when employed as Coders and Decoders of Wireless Telegraphy Messages during and from the date of commencement of Hostilities". (2d in 1915 is approx. £0.81 in 2018).
14 March 1916. Supplement 29507. Page 2870.	Made Companion of the DSC: Lieutenant-Commander Ernest Loftus Colley Grattan, R.N. In charge of Wireless Telegraphy at Cape Helles since 1st May. Admiral de Robeck reports that the work carried out by this Officer has been of inestimable service.
18 August 1916. Issue 29711. Page 8173.	Vessels in the Firth of Forth: The use of wireless telegraphy is prohibited. You are to forthwith lower all aerial wires and disconnect them from their halliards and from the operating room. They are not to be re-hoisted whilst your ship is in British territorial waters, except by special permission from the Admiralty as laid down in Section V, "Instructions for Owners and Masters of British Merchant Ships, &c."
15 Sept. 1916. Supplement 29751 Page 9074.	Promotion to Commander: Geoffrey Charles Candy. Strongly recommended by Vice-Admiral Sir Martyn Jerram for his work in connection with the wireless telegraphy of the squadron.
3 October 1916 Issue 29772 Page 9583.	Repeat of 18 August 1916. There are repeats on 15 June 1917, Issue 30131, page 5892, 1 February 1918, Issue 30505, Page 1553, 2 August 1918, Issue 30825, page 9141, 16 August 1918, Issue 30846, page 9587, 27 September 1918, Issue 30923, page 11473, 11 October 1918, Issue 30947, page 11986, 31 January 1919, Issue 31157, page 1553.
23 October 1917. Issue 30348. Page 10900	Royal Navy and Royal Marines: "And whereas we are of opinion that a similar allowance should be granted to Commissioned Warrant Officers and Warrant Officers of the Wireless Telegraph and Signal Branches (and Lieutenants promoted from those ranks) when employed on Wireless Telegraphy or Signal Duties under similar conditions". The allowance referred to was 1s per day, effective as of 19 September 1917, equivalent approx. to £4.90 in 2018.
4 January 1918. Supplement 30460. Page 371	To become Commander of the Most excellent order: Edward Russell 'Clarke, Esq., M.B.E. Expert Adviser to the Naval Staff- on Wireless Telegraphy.
4 June 1918 Issue 30730. Page 6706.	To become an Officer of the Most excellent order: Henry Ashley Madge, Esq. Wireless Telegraphy Expert, H.M.S. " Vernon."

On 1 August 1914, the Postmaster General issued a notice that all experimental wireless telegraph stations in the UK be closed, although this did not apply to wireless stations conducting public business such as coastal stations communicating with ships at sea.

The First World War created a very strong demand for wireless operators and the Admiralty needed operators across the Service. Those who had trained with the Marconi company volunteered and the gap of trained personnel was met by a concerted effort to train young men whom by the end of the war numbered 3,300. One of the consequences for the demand of trained personnel was the transfer of Mercantile Marine wireless operators to the Admiralty as each ship, at this stage usually of over 3,000 tons with trained personnel, docked in home waters, thus leading to a never-ending demand amongst the Mercantile Marine. Additionally, because merchant ships which had not been fitted with wireless suddenly needed to do so, more demand was created not just of personnel exacerbated by the need to have two operators on board, but also of the necessary equipment.

Training tuition was free for what was typically a three-month course. The Marconi headquarters could not cope even operating 24/7, so arrangements were made in various provincial centres. Some of these centres included King's College, Birbeck Institute, Liverpool, Seaforth, Glasgow and Schools of Wireless Telegraphy at Nottingham, Leeds, Manchester (Fallowfield), Sheffield, Dundee, Edinburgh, Aberdeen, Ballinskelligs, Cardiff, and Bridlington. Those who passed out with a Diploma were called "Wireless Operators" or "Marconi Operators". The Royal Navy included facilities at Devonport, and HMS Vernon at Portsmouth. (First World War Centenary Commemorations and multiple newspapers from British Newspaper Archive).

In the period 1913 to 1918 inclusive, there were over 2,000 advertisements in the newspapers included within the British Newspaper Archive related to wireless training establishments, the peak being in 1914. Typical newspaper advertisements which appeared on multiple occasions include:



Text reads:

**YOUNG MEN  
BETWEEN THE AGES OF 16 AND 18,  
SERVE YOUR COUNTRY AS  
WIRELESS OPERATORS  
EXEMPTION FROM MILITARY SERVICE  
Official Government Statement.**

'Owing to the present urgent demand for Wireless Operators in the Mercantile Marine, students entering the school prior to their eighteenth birthdays, and making such progress that they are able to obtain the necessary certificates on or before reaching the age of 18 1/4, will be temporarily exempted from military service until a sufficient number of Operators has been obtained. This exemption continues so long as students of military age who have passed into the Mercantile Marine are employed as Operators at sea.'

**Free Training. Good Pay. Permanent Positions.  
Write or call for full particulars to  
THE MARCONI REPRESENTATIVE  
City School of Wireless Telegraphy, 4 Bridlesmith Gate,  
NOTTINGHAM.**

Source: <http://www.marconiheritage.org/fww.html>

**WIRELESS** Telegraphy.—Young men wanted to train as operators; posts at good salaries on ship and shore after training; fine chance to see the world; moderate fees; no previous experience necessary. Apply Instructing Engineer, **Wireless College**, 8 North Bridge, Edinburgh.

Source: The Scotsman 3 June 1913.

A GREAT demand for **WIRELESS OPERATORS** to comply with new **SAFETY-AT-SEA LAWS**. Thousands of ships being fitted. Lucrative positions awaiting qualified operators. Individual tuition on **MARCONI 1½ KW Set**. Special terms to experienced telegraphists. **NEW TERM** commences Monday, August 24th.—Apply **A. Furness**, The Liverpool **Wireless College**, 27, Lecece-street, Liverpool. 20332d

Source: Liverpool echo 7 August 1914

**IMMEDIATE VACANCIES**

Have been found for ALL OUR GRADUATES. Students now serving as Wireless Operators in the Royal Navy, Army, and Mercantile Marine.

OFFICER'S RANK.  
OFFICER'S PAY,  
and ALL FOUND.  
Short Training Course.

For Full Particulars Apply **SECRETARY**,  
**DUNDEE WIRELESS COLLEGE**  
11 NETHERGATE, DUNDEE



Source: Dundee Evening Telegraph  
21 June 1915

A typical training success story was a Mr David Stewart who was appointed as a Wireless Operator on board SS *Philadelphian* at the age of 16 years, having qualified within six months of taking up studies of Wireless. (Dundee Evening Telegraph 23 March 1915). On 19 February 1918, the *Philadelphian* was torpedoed by German submarine *U82* and sunk just to the south of the Forgotten Wrecks project area. (MAT “Equine article”)

Historic England commissioned Oxford Archaeology to undertake research to identify First World War wireless stations in England and an extract of identified sites bordering the Forgotten Wrecks of First



Source: Extract from Figure 1: National Distribution of First World War Wireless Stations (Contains Ordnance Survey data © Crown copyright and database right 2014)

World war project is depicted above. Additionally, wireless sites utilising Trinity House Lightships in the Forgotten Wrecks project area were identified at East Goodwin and South Goodwin. (Historic England)

Wireless communication requesting assistance featured in attacks on shipping. *Open Boats* by Alfred Noyes includes a graphic story of a record of wireless messages between SS *Anglo Californian* attacked by German submarine *U39* and a British source identified as “Cryptic”, and this may be read on-line. (Open Boats). This particular attack resulted in the posthumous award of the Victoria Cross to the Master of *Anglo Californian*, and Distinguished Service Cross to his sub-lieutenant son, and to crew member Chief Engineer. (MAT “Equine article”).

*Wireless at Sea – The First Fifty Years*: 98 (HE Hancock) includes accounts of bravery of several individual wireless operators whose ships were under attack. It includes a section on the participation of wireless operators in the post war memorial march of 19 July 1919, acknowledges the 183 Marconi

Radio Officers killed in action out of the approximate number of 6,000 operators, and acknowledges 165 other Marconi staff who lost their lives.

Those who wish to trace relatives who were wireless operators, together with their examination records, may be found via the Marconi Veterans Association and the weblinks therein. (Veterans Association)

Finally, this narrative has not included a technical discourse. However, a Marconi Spark Gap Transmitter Demonstration is available at [https://www.youtube.com/watch?time\\_continue=5&v=YSf93g0heUA](https://www.youtube.com/watch?time_continue=5&v=YSf93g0heUA)

The following is a list of suggested websites, all accessed on 13 May 2018, for those readers interested in additional reading, not referred to in the article narrative and in no particular order:

A selection from the National Archives available at:

POST 88. Post Office: Wireless Telegraphy and Telephony

<http://discovery.nationalarchives.gov.uk/details/r/C11805>

“Wireless Map of the World” 1916, 1917.

<http://discovery.nationalarchives.gov.uk/details/r/C3004825>

Wireless operators in the Mercantile Marine of enemy alien parentage

<http://discovery.nationalarchives.gov.uk/details/r/C9505297>

Admiralty. Reorganisation of boys' training: establishment of a new school for signalling and wireless telegraphy at Shotley Training Establishment. 1915.

<http://discovery.nationalarchives.gov.uk/details/r/C7675237>

Museum of Radar and Telecommunications, an extensive resource aligned with the Royal Navy, listing a very small snapshot of available material:

The National archives - Admiralty Notices –

<http://www.rnmuseumradarandcommunications2006.org.uk/CommsColRight/ADMs/adm.htm>

Wireless Telegraphy Appendix 1904 –

<http://www.rnmuseumradarandcommunications2006.org.uk/CommsColRight/WW1%20WT/1904/pdfs/1904%20one.pdf>

Wireless Telegraphy Appendix 1908 -

<http://www.rnmuseumradarandcommunications2006.org.uk/CommsColRight/WW1%20WT/1908/pdfs/1908%20one.pdf>

Wireless Telegraphy Handbook, Type 10 (Submarine) sets, 1915.

<http://www.rnmuseumradarandcommunications2006.org.uk/CommsColLeft/Transmitters/12%20Type%2010/pdfs/10%20type10photos.pdf>

20<sup>th</sup> Century pre-WW1 Wireless Telegraphy.

<http://www.rnmuseumradarandcommunications2006.org.uk/CommsColRight/WW1%20WT/ww1wt.htm>

A Brief History of Naval Radio Communications. [http://www.jproc.ca/rrp/nro\\_his.html](http://www.jproc.ca/rrp/nro_his.html)

Early Days of Wireless Telegraphy at Sea (its early development, pre-WW1), 1985-1. Jackson, the Father of Maritime Radio (its early development, pre-WW1), 1984-2. Wireless Telephony (including WW1 developments), 1921-1. [http://www.naval-history.net/WW1Books-Sources-Navy\\_Records-Naval%20Review.htm](http://www.naval-history.net/WW1Books-Sources-Navy_Records-Naval%20Review.htm)



United States Early Radio History. Radio During World War One (1914-1919).  
<http://earlyradiohistory.us/sec013.htm>

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Historic England. Former Royal Navy Wireless Station. Listed Building in Stockton. Accessed on 8 May 2018. <https://historicengland.org.uk/listing/the-list/list-entry/1444381>

A book, not a website: NEW MERCANTILE MARINE ATLAS: A Series of 35 plates Containing over 200 Charts & Plans, with Tables of 10,000 distances between ports, National & Commercial flags, cable & wireless telegraphy charts with lists of wireless stations, lists of United States & British consulates, and Complete index of 20,000 ports, etc. by Marine Atlas; Philip, George.: C.S. Hammond & Company, New York: FAMILY ALBUM, ABAA. View contents at <https://www.abebooks.co.uk/NEW-MERCANTILE-MARINE-ATLAS-Series-plates/17566004177/bd>

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