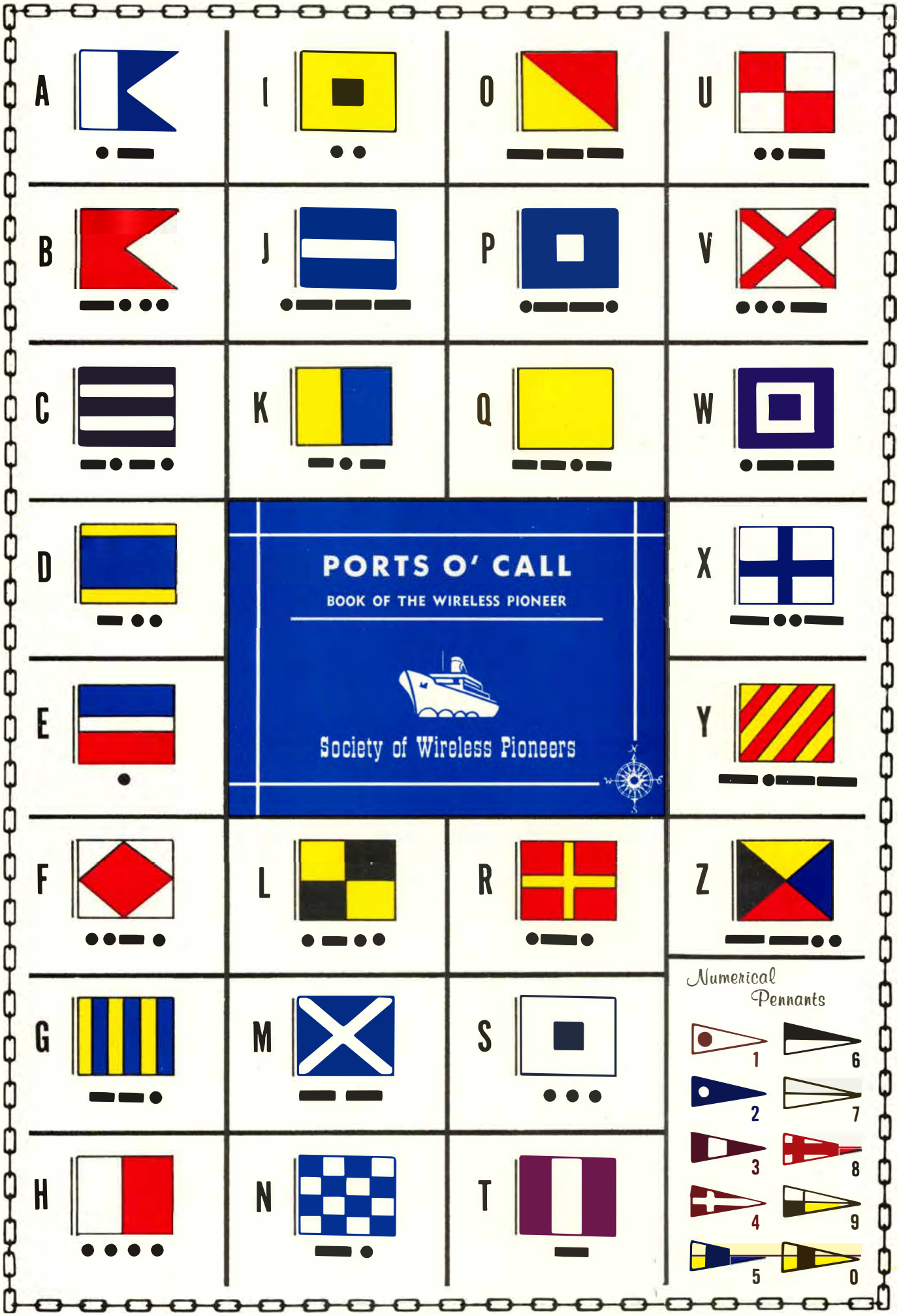

I would have sea-song in my ears,
The plaintive lay of waves,
The eerie shriek of herring gulls
Above the lonely caves.

I would have green-sea in my eyes,
And jib-like cloudlets flying,
And queenly ships descending west
Towards where the gold is dying.

I would be near the things I love;
Whose heart holds not this plea ?
I trade my share of fertile earth
For a stretch of barren sea.

Walden Garrett

(For Ports O' Call)

USCGC NORTHLAND - "NRUL"
"SAILES CRACKED ON"
BEARING SEA, ALASKA - 1932
STEPHEN PARKAN'S — 177-P

PLATE III

Preface

The objectives of this book and the Society of Wireless Pioneers are simple.

First, to record the colorful history and memorabilia of the early days of Wireless. To give credit due the hundreds of brave and dedicated men and women who saved thousands of lives and untold numbers of ships . . . often undaunted by the fact that sticking to their key for a few extra seconds or minutes might cost them their lives - which in fact it did on too many occasions.

In so doing, they have etched a heritage that should be cherished by all mankind. We salute these brave men who have brought so much honor to our profession.

The title "Sparks" is universally known over the 'Seven Seas'. This book will document their deeds for posterity.

The Society, through its world-wide organization, sponsors the fraternalism and fellowship of "Professional Brass-Pounders" everywhere - bringing and sharing the warm friendship and harmonious raport to all who have been or are still active in this field of communications.

From the provincialism of ancient modes of communications to the ultra-sophistication of today's art - members of our craft have played a dominant role in the advancement of civilization and cementing the bonds of humanity. We have speeded communications from days, months or years to . . . seconds ! Today almost every place on earth is in 'instant' contact with each other - and this highly developed degree of the art has even gone to the moon with our astronauts. Many of our members were in the vangaurd of this progress.

We feel justifiably proud of the heritage of our profession and the kind and type of men it has attracted over the years. We are not unmindful of the progress in other fields but to think in terms 'basic', Communications has tied it all together and still keeps it functioning at full capacity.

It will be a sad day when we experience a worldwide "communications-gap" . . . may that day never come ! Lets keep the lines open !

William A. Breniman
Founder & Director

Ports O' Call

DEDICATED — to the men who "went down to the sea in ships" as Wireless Telegraphers and all those who have earned their living "pounding brass" as wireless or radio operators since the days of Marconi.

Framed in the Halls of Time

STATION "PQ" Monterey, Calif., Picture taken by SOWP Member Gerald D. Carpenter, 2140-SGP of the operator he relieved circa 1908 at the United Wireless Telegraph Co., Station. Lady in picture is Mrs. Ida Hyatt who he turned over keys to Western Union's Pacific Grove Station when he joined United. Carpenter whose sine is "DX" does not recall name of operator he relieved at "PQ". VY

WIRELESS HAS COME A LONG LONG WAY !

PORTS O' CALL

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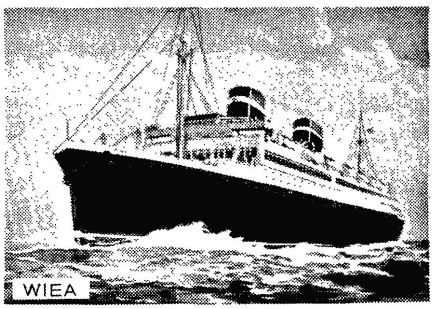
SOCIETY OF WIRELESS PIONEERS
P. O. BOX 530
SANTA ROSA, CALIFORNIA 95402

The SOCIETY OF WIRELESS PIONEERS is a non-profit, non-partisan and non-political organization of "PROFESSIONAL" wireless and radio operators (Active and retired) who have united for the purpose of recording the history and memorabilia of the early days of this mode of communications which has had great impact on world civilization and development. Since many of our members were the "pioneers" in this new field of electronic communications, we feel the heritage and accomplishments of these early years should be preserved for posterity. The Society hopes through its books and publications to record and document the technical and operational history of an era rich in accomplishment. The Historical Papers, Tales of the Wireless Pioneers and the Journal of nostalgic contributions by members will be bound in books and publications entitled "PORTS O' CALL" and "SPARKS."

Distribution is free to all sustaining members and copies will be furnished libraries and Technical Institutions, National Archives, etc., that indicate interest therein. While care has been exercised in reviewing historical manuscripts furnished the Society, we can not assume responsibility for their complete authenticity although care is taken to check validity. Permission is granted for reprinting of material in this publication provided credit line is given the Society and author (except on reprinted material). Please include S.A.S.E. with manuscripts or pictures for return. It may be noted that much material comes from SOWP members who donate it to the Society. Address all manuscripts and letters to address shown in lower left column. The Society extends an invitation to all "Professional" brass pounders who qualify to join our world-wide organization.

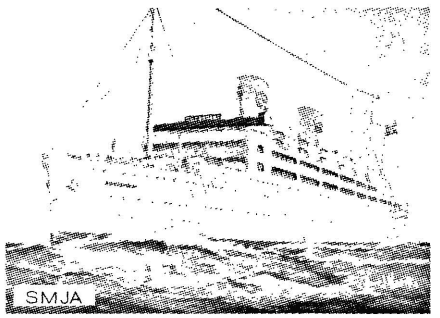
William A. Breniman

Beautiful Memories



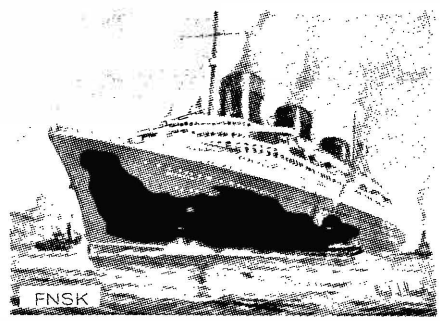
S. S. Manhattan

Manhattan, with a sister-ship, *Washington*, are the largest and most popular American passenger vessels in the North Atlantic trade. This beautiful ship, operated by the United States Line, has sumptuous accommodations in Cabin, Tourist and Third Classes for 1,150 passengers, and carries a crew of 500. *Manhattan* was built at Camden, New Jersey, in 1932; is 668' long; with a beam of 86'; a gross tonnage of 24,289, and a speed of 20 knots. In regular service, this vessel operates between New York and Hamburg, Germany, calling at Cobh, Ireland; also the English and French Channel Ports of Southampton and Cherbourg.



M. S. Kungsholm

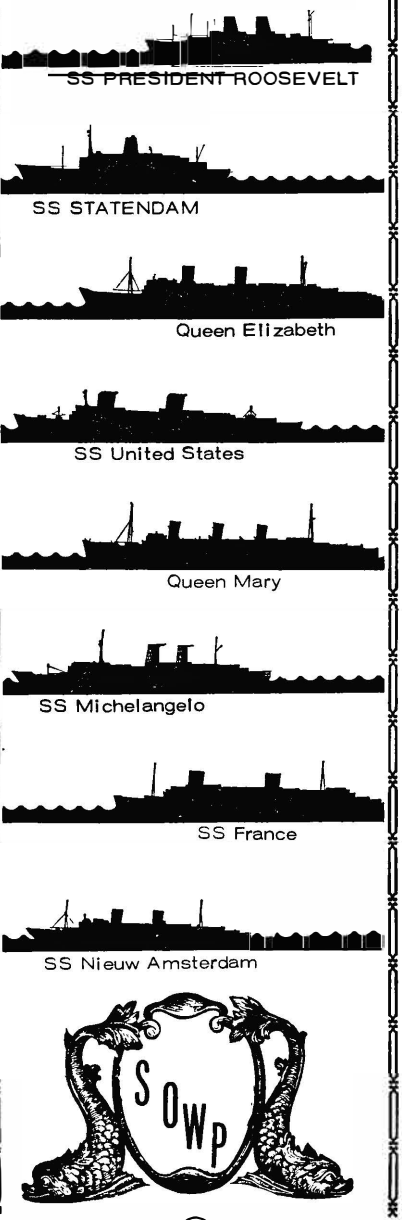
Kungsholm is one of the fine vessels of the Swedish-American Line, and was especially designed for Winter cruises to the West Indies and for Summer cruises to the North Cape. Built in Germany in 1928, *Kungsholm* is a vessel of 20,000 gross tons; 608' long; 78' beam; and is driven at a speed of 18 knots by Diesel engines. When not in cruise service, this fine ship is operated in Trans-Atlantic trade between New York and Gothenburg, Sweden. Excellent accommodations in three classes are provided for 1,400 passengers and the crew numbers 500.

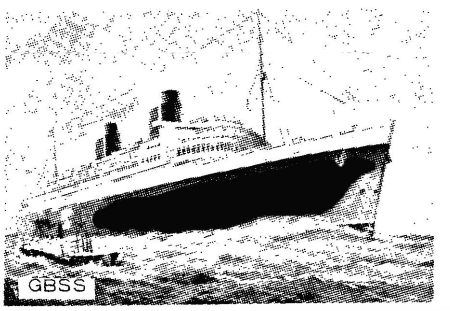


S. S. Normandie

The flagship of the French Line, *Normandie* is truly one of the Wonder Ships of today. The luxurious public rooms and passenger accommodations are outstanding examples of the artistry of French decoration and furnishing. A total of 1,600 passengers may be accommodated in Cabin, Tourist and Third Classes. *Normandie* is driven at the great speed of 29 knots by turbo-electric motors, connected to 4 propellers. The usual service is between New York, Southampton, England, and Le Havre, France, but occasionally this magnificent vessel is operated on cruises in the North and South Atlantic Oceans.

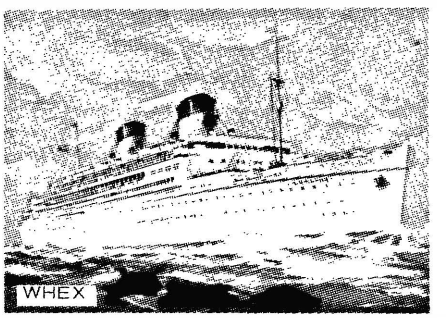
SILHOUETTES OF GREAT LINERS





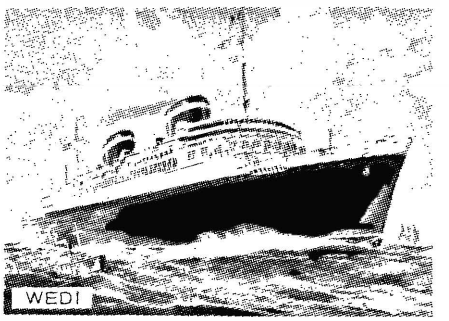
S. S. Queen Elizabeth

When this wonderful British ship, of the Cunard-White Star Line, goes into service between New York and the Channel Ports of Southampton, England, and Cherbourg, France, in June, 1940, *Queen Elizabeth*, will be the queen of the seas. Built at Clydebank, Scotland, in 1938, this huge vessel is 1,031' long; beam 118'; and will have the tremendous gross tonnage of 85,000. There will be 14 decks in which over 2,300 passengers will be accommodated in sumptuous quarters of three different classes. Over 1,200 people will be required for the crew, and the vessel will be driven by 4 propellers, at the great speed of 30 knots.



S. S. Lurline

An express Liner, flying the flag of the United States, and operated between the ports of Los Angeles, San Francisco, and Honolulu, by the Matson Navigation Company. This fine ship carries 638 passengers in two classes, and is operated by a crew of 250 persons. Built at Quincy, Massachusetts, in 1932, this ship is of 18,009 gross tons; 604' long; with a beam of 78'-3". *Lurline* is driven through the waters of the Pacific at a speed of 21 knots, by 6 steam turbines geared to 2 screw shafts.



S. S. America

America, the largest Liner ever to be built in the United States, is scheduled for service commencing in the early months of 1940, between New York, Cobh, Ireland, the English and French Channel Ports, and Hamburg, Germany. This proud American vessel will join the very popular United States Liners, *Manhattan* and *Washington*, and with these ships, will maintain an outstanding Trans-Atlantic Express, passenger and cargo service, under the flag of the United States. *America* is a vessel of 26,000 gross tons; with a length of 723'; and a beam of 93'. Magnificent passenger quarters will accommodate 1,219 persons in Cabin, Tourist and Third Classes. The crew will number about 600.

Development of Communications

By - Prof. Herbert J.Scott

Development of Communications

PART I

PRIMITIVE AND EARLY METHODS

From the beginning of history, men have struggled with the problem of communication between people some distance apart. Among the primitive people, fire and smoke signals were used. The aborigines of Africa used 'jungle drum' signals. These kinds of signals were used for centuries and all of them have played a part in the evolution of communications as we know it today. Historically, man's first recorded attempt at communication from a distance dates back some 3,000 years or more.

Homer, in the Illiad, describes the fire beacon as a method of communication. It signalled the Greek army that Ulysses and his men, who had entered Troy in the belly of the wooden horse had opened the gates of Troy so that the Greeks could enter and sack the city.

The great historian Herodotis tells that in 400 BC a signal was sent from Athens to Marathon (about 25 miles) by means of sunlight reflected from a soldier's highly polished shield.

It is also recorded that the Persians made use of both reflected sunlight in the daytime and beacon fires at night. The reliability of such signalling of course is dependent upon the conditions of sunlight and fog.

The Egyptian city of Alexandria, located at the mouth of the Nile, was founded by Alexander the Great in 332 B.C. Here in 300 B.C. was built the great lighthouse of Alexandria, one of the seven wonders of the world. Upon its top was a large reflecting mirror of burnished metal. This was for the purpose of signalling to ships at sea.

Now is we delve into the Bible, we find in Jeremiah 6:1 that it tells of the use of signal flares by the Jewish people:

> "Oh, ye children of Benjamin, gather yourselves to flee out of the midst of Jerusalem, and blow the trumpet in Tekoa, and set up a sign of fire in Beth-accerem: for evil appeareth out of the North, and great destruction!"

Tekoa was a town of Juda, six miles from Bethlehem, and now called Tekua. Beth-accerem was a beacon station near Tekoa.

In England communication by means of signal lights and fire beacons was widely used throughout the country up through the time of Queen Elizabeth (1600).

It was in the year 1588 that the Great Spanish Armada approached the coast of Great Britain intending to attack England and take it over for Spain. As a result of fire beacons blazing high into the sky from hill top to hill top, most all of England knew of the approach of the Armada. Realizing England to be thoroughly prepared for their proposed attack, the Spaniards chose the better part of valor and withdrew to the high seas from whence they had come.

The English poet Macauly, in describing the appearance of the Great Spanish Armada off the southern coast of England, wrote

> "From Eddystone to Berwick Bound, from Lynn to Milford Bay,
> That time of slumber was as bright and busy as the day.
> For swift to east and swift to west the ghastly war-flame spread
> High on St. Michael's Mount it shone, it shone on Beachy Head.
> Far on the deep the Spaniard saw, along each southern shire,
> Cape beyond Cape, in endless range, those twinkling points of fire."

At a still later date we had our own beacon light made famous by Longfellow in his immortal poem "Paul Revere's Ride." You may recall the following:

> "He said to his friend, 'If the British march
> By land or sea from the town tonight
> Hang a lantern aloft in the belfry arch
> Of the North Church tower as a signal light,
> One if by land, and two if by sea.'"

Later, and for many years to follow, the form of signal extensively used by the U.S. Army was the 'heliograph'. This word comes from the Greek helio meaning sun and graph meaning to write. So heliograph means literally, 'to write by the sun'. In 1890 the Army Signal Corps transmitted a signal by heliograph from one mountain peak to another over a distance of 215 miles!

In the 18th century shortly before the French revolution, a new system of communication was devised. It was called a 'semaphore system' and interestingly enough it was the result of a schoolboy prank wherein some schoolboys in two nearby schools devised a system so that they could send messages back and forth between the two schools.

The word semaphore comes from the Greek sema meaning 'a sign' and pherein meaning 'to bear' so literally semaphore means "to bear a sign."

The French government immediately applied the semaphore system to military signalling. In their system towers were erected every five miles or so. On top of each tower was erected the semaphore consisting of a mast on top of which were two movable arms, somewhat similar to our railroad semaphores.

The first semaphore message recorded in history was sent over the system on the 15th of August 1794, announcing the victory of the French arms over the Austrians. During Napolean's reign he extended the semaphore for a distance of 1,112 miles across France.

It was only natural that England, in order to keep abreast of the times, should install her own semaphore system of stations. However, they were not very satisfactory because of England's frequent dense fogs which prevented communication with London. And London was, and is, the nerve center of the nation.

Following the semaphore there were numerous other methods of communication devised: flags, colored lights, and many variations of these. All of them were relatively short lived, however.

The systems discussed here are all 'optical systems', they depend upon the ability of being seen for their success. In PART II we shall discuss the developments in electrical types of communications.

PART II

THERE WERE GIANTS ABROAD IN THE LAND

In the century following that of the beacon light and semaphore, where signalling was accomplished optically, we come to the era of the application of electricity to communications.

It was in 1837 that Samuel Finley Breese Morse, better known as Samuel F. B. Morse, invented and developed the electric telegraph. Congress appropriated money for the construction of an experimental telegraph line extending from Baltimore to Washington. Miss Annie Ellsworth, the daughter of the Commissioner of Patents, brought the news of the appropriation for the experimental line to Morse. He was so delighted with the news that he told Miss Ellsworth that she could frame the first message to be sent over the wires.

When the line was completed in May 1844, Miss Ellsworth, a deeply religious young woman, chose the now famous message, "What hath God wrought" which she selected from the Bible, Numbers 23:23.

However, man was never completely satisfied with the telegraph, as wonderful as it was. He always wnated to be able to transmit the human voice and speech.

It was in the year 1876 that Alexander Graham Bell first achieved success with his telephone: the transmission of information by the human voice. In the original experiment speech was carried by a pair of wires extending from upstairs in his house to the basement.

Now, in spite of all of this progress, man was limited insofar as he must either be limited by the extend of the visual horizon for optical transmissions, or he must be tied to his transmitting location by a pair of copper wires. This, as is quite apparent, posed a serious restraint of motion. So, if these connecting wires could be eliminated, a whole new dimension would be introduced into communication.

In 1865, James Clerk Maxwell, a brilliant mathematical physicist, of Scotch ancestry, wrote his now famous and profound mathematical essay on the electromagnetic theory of light. As a result of this analysis he came to the conclusion that electrical impulses travelled through space in the form of waves, similar to light waves, and with the same velocity as light. This was really the ovum from which came wireless after a long, long period of gestation.

Some twenty-two years later, in 1887, a young German physicist by the name of Heinrich Hertz succeeded in transmitting electromagnetic waves across his small laboratory. He was later able to observe the effects at a distance of several hundred feet. He also showed that they obeyed the laws of optics by reflecting them from metal mirrors, by focusing them through lens shaped cylinders made of pitch, thereby confirming Maxwell's predictions. These Hertzian waves as they were called became the subject of widespread experiments in all countries.

In 1892, Sir William Crooks indicated in a magazine article that it should be possible to utilize these waves to telegraph across space.

It is interesting to note that in 1885, both Edison in this country and Sir William Preece in England, came close to the practical utilization of electromagnetic radiations. Edison had covered the top of a railroad car with tin foil and was able to pick up signals from telegraph wires which ran alongside of the railroad track while the train was in motion. The system proved impracticable, however, because the signals picked up were all of the signals being transmitted over all the wires. Sir William Preece at this same time built a large square of copper wire one quarter of a mile on a side. Separated from this square by a quarter of a mile was another similar square of copper wire. In making and breaking the current in the first loop, he was able to observe the effects in the second loop.

Visualizing Hertzian waves as a medium of communication a young Italian man by the name of Guiglielmo Marconi developed a system of communication utilizing them. Young Marconi of Italian-Irish parentage was born in Bologna, Italy, on April 25, 1874. He was the son of a wealthy farmer and studied physics at Leghorn University under Professor Rosa who taught the science of electricity. He further pursued the subject under Professor Righi at the University of Bologna.

At the age of 18, having read the essay by Crookes, who you remember suggested the possibility of wireless telegraphy, he became greatly impressed with the predictions Crookes made. Then and there young Marconi made it his life ambition to perfect and establish wireless communication throughout the world.

Marconi's first experiments were carried out on his father's farm, across the rows of cabbages and corn. In his system he replaced the dipole radiating system of Hertz with a connection to ground and a connection to an elevated wire which he called an 'antenna'. To this he connected his transmitter. The wire loop receiver of Hertz he replaced with his antenna and ground connected to a coherer for his receiver. With these modifications and the insertion of a telegraph key he was able to send a message over a distance of a mile or so. This was phenomenal at that time ! (Circuit diagrams below show the evolution and development in the mode of wireless communications during its early years).

Evolution of ...

the 'Wireless'

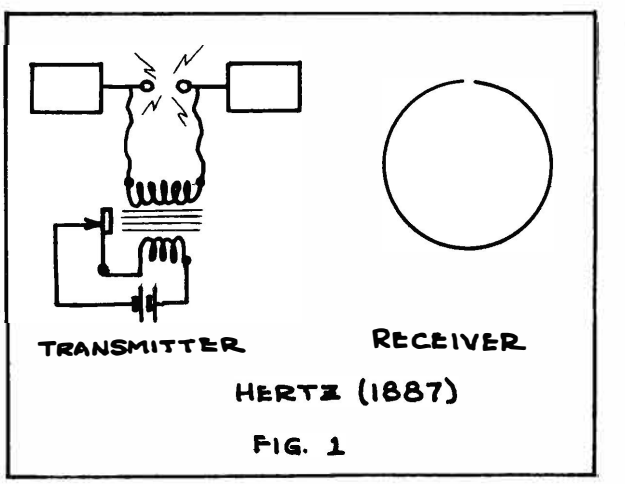
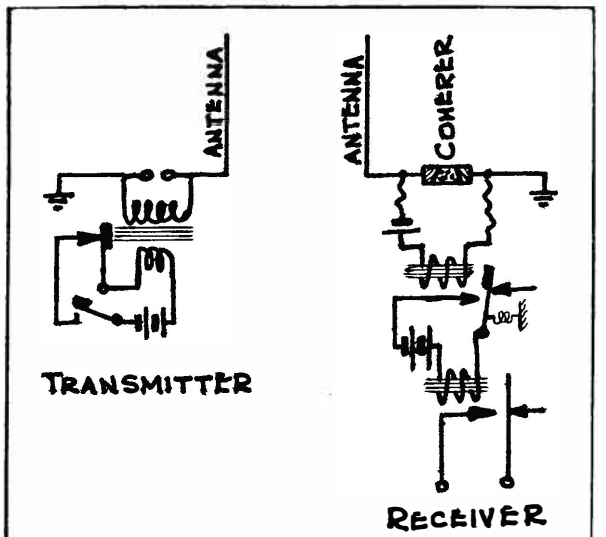
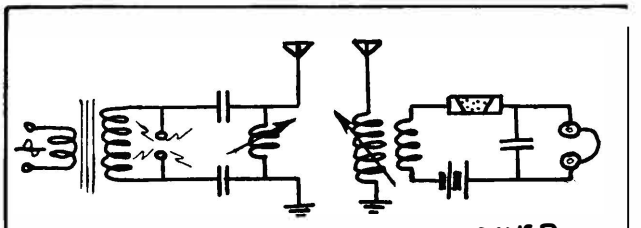


FIG. 1



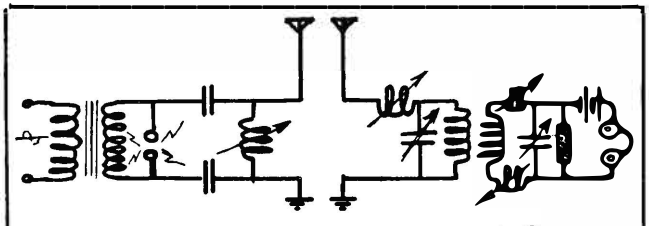
MARCONI (1896).

FIG. 2



SIR OLIVER LODGE
(1898)
TUNING APPEARS HERE

FIG. 3



MARCONI (1901)
TUNING FROM LODGE USED HERE.

FIG. 4

In 1896, at the age of 22, young Marconi went to England and took out the first patent ever granted for wireless telegraphy to anyone, anywhere in the world. The following year, 1897, the British Marconi Company was formed with the 23-year old Marconi as its Chief Engineer.

The English scientist, Sir Oliver Lodge, aided Marconi materially in the period 1897-1898 by developing the principles of tuning wireless circuits, and hence, the technique of being able to send out and receive signals of a definite wave length was developed.

In 1899, at the request of the United States Navy Department, young Marconi came to this country to test his equipment on the battleships New York and Massachusetts. Communication was established between them for a distance of 36 miles. While here in this country on this mission, he formed the Amer ican Marconi Company. (It was my distinct pleasure to work for this company as a wireless telegraph operator until it was bought out by the newly formed RCA in 1919 after which I worked for RCA until I swallowed the anchor in 1924.)

So rapidly and effectively did Marconi and his engineers work that they were ready to try their experiment of transmitting a signal across the Atlantic by December of 1901.

In order that this experiment could be carried out a transmitting station was erected at Poldhu, a small town on the Cornwall coast of England. The receiving station was located at St. Johns, Newfoundland.

It was on December 12, 1901, that the first signal was transmitted by wireless across the Atlantic Ocean. The signal was the letter "S" consisting of three dots (...) repeated at stated intervals. And again reception was accomplished the following day, 13 December 1901. Scientists over the world had said that it could not be done! However, it WAS done! (Of course, at that time no one knew about the Heaviside Layer.)

In his lifetime he was asked many times if he invented wireless. His answer was always an emphatic 'no'. He simply took some of the ideas of Hertz, a number of practical ideas of his own, a few items from other workers and put them together in the proper form to produce a workable wireless telegraph system. He received many honors in his time including Italian Knighthood in 1897, the Nobel prize (jointly with Professor Braun) in Physics in 1909. In 1929 the Italian government bestowed upon him the title of 'Marquis'. In Rome, on the 20th day of July 1937, he journeyed to that mysterious realm from whose bourne no traveller returns. He was laid to rest at the age of 63.

It is inevitable that in a new field of scientific discovery and endeavor that there will sooner or later be attracted to it a considerable number of investigators.

One of these was Professor R. A. Fessenden of the University of Pittsburgh. Wireless was no stranger to him, as in 1900 the U.S. Weather Bureau hired him to carry out experiments regarding the utility of Wireless telegraphy as an aid in weather forecasting and storm warnings.

By this time Professor Fessenden had come to the following two conclusions: first some substitute for the coherer must be found which would function with much smaller signal inputs than the coherer did; secondly, a way should be found whereby the human voice could be reproduced at the wireless receiver.

From here on wireless telegraphy progressed fairly rapidly from the spark and crystal detector phase to the vacuum tube era which held sway for many years, to the transistor stage where we find ourselves today.

The day came when a major sea disaster took place and wireless telegraphy was called upon to play an exceedingly important part. As many of you like myself can well remember, and others of you have read or heard of it, the TITANIC, a beautiful, enormous, new ship, supposedly 'unsinkable' was on her maiden voyage from England to New York. She struck an iceberg and sunk with a loss of 1,607 lives. Many of these persons were very prominent and well known people. There were 706 people saved through the aid summoned by wireless. The year was 1912.

The operator at Wannamaker's New York store on watch at the time was a young fellow by the name of David Sarnoff who later on took over as the guiding hand of RCA.

It was this dramatic part played by wireless in this disaster that gave great public impetus to wireless telegraphy, which in their eyes, became the 'marvel of the century'. Wireless had then hewed a place for itself in the world of communication

About this time the U. S. Navy decided that 'wireless' telegraphy was a misnomer as it could be taken to mean all forms of communication without the use of connecting wires. Orders were thence issued that from this time on the term 'radio telegraphy' should be used. The American public accepted the name almost immediately. However, our British cousins hung on to the older term and in fact still do to a large extent today.

It was in 1903 that Fessenden patented his 'electrolytic' detector. This consisted of a very fine Wollaston wire which dipped into a 20% solution of nitric acid and water. It was by far the most sensitive device up to this time and, in addition, it was capable of reproducing the audio tone of the signal.

Now Fessenden wanted a high frequency alternator of about 100kHz to be connected directly to antenna and ground and resonated. As a means of developing Fessenden's inventions, the National Electric Signalling Company was formed.

In the year 1903 a machine was developed by Steinmetz and was built by the General Electrical Company for Fessenden. Its output was about one kilowatt at a frequency of 10 kHz.

In 1904, Fessenden requested the General Electric Company to develop and build for him an alternator which would be capable of producing an output of 100 kHz.

A young engineer and a newly hired member of General Electric's engineering staff by the name of E. F. W. Alexanderson was assigned the task of developing such a machine. A generator of 1 kw. capacity producing a frequency of 50 kHz was delivered to Fessenden September, 1906.

On Christmas eve of 1906, wireless operators aboard ship at sea many miles away were astounded to hear first, the voice of a man speaking, then a woman singing, followed by a violin solo, after which came a speech. This was followed by a request to all receiving stations which had heard the program to please communicate with Professor R. A. Fessenden, at Brant Rock, Massachusetts. This was the first broadcast of speech and music in history.

About this same time another worker in the field was soon to become famous for his unique contribution to wireless. In January of 1907, Dr. Lee DeForest, a young graduate of Yale, applied for a patent on a three electrode vacuum tube, which he chose to call an 'audion'. This device was ultimately to play the most important part in the area of communications that any device had ever been called upon to play. It opened up a whole new area of fantastic proportions. This little evacuated bottle probably came closer to being an 'Alladin's Lamp' than anything ever devised by the mind of man.

From whence did this little 'might might' spring? In 1883 Thomas A. Edison, in trying to find ways to improve his electric light, noted that when a small metal plate was enclosed within the lamp bulb and was connected to the positive side of the filament, current would flow in the external circuit leading to the plate. However, when the plate was connected to the negative side of the filament no current flowed in the external circuit.

Edison reported this phenomenon in the scientific journals. It was known thereafter as the 'Edison effect'! He then concerned himself with other matters which in his mind were more important at the time.

In 1897, fourteen years later, Sir James Ambrose Fleming, at this time one of Marconi's technical advisors, an English physicist, applied the Edison effect to the rectification or detection of wireless telegraph signals. His device became known as a Fleming valve, consisting of what we call today a diode.

It was this device to which DeForest added the third element which resulted in his 'audion'.

Now in 1907 DeForest organized the "DeForest Radio Telephone Company" in order to market his audion and develop wireless telephony.

In the summer of 1907 DeForest carried out a test of his system on Lake Erie. The U.S. Navy Department became interested in wireless telephony. When the 'Great White Fleet' made its journey around the world, there were over twenty of the ships equipped with DeForest's wireless telephone!

As a result of many popular magazine articles on the subject, a number of amateurs built their own wireless equipment. My first set was put up in 1912. Since there were at that time no regulations governing the operation of wireless equipment, neither with respect to wavelength or power, pandemonium reigned in the air waves. Interference became a terrific problem. At times when an interfering station was taken to task by a shore station, the answer often was simply a bunch of vulgar obscenities!

Occasionally, and with increasing numbers, a prankster would cause no end of confusion. For instance, naval vessels would receive orders, presumably from some Admiral sending them to the Philadelphia Navy Yard instead of their original destination, the Brooklyn Navy Yard!

Frequently impossible docking orders were sent to incoming ships, vessels would be diverted from their destinations and routed elsewhere. False distress calls would be sent out!

This was all possible because at that time there was no law to prevent such antics and nothing could be done to the perpetrators.

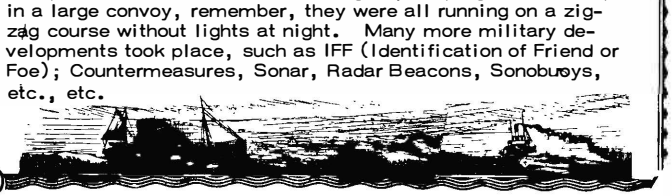
The U.S. Navy played an important part in the early development of wireless. Many systems were exhaustively studied and tested by the Navy and many inventors were financed by them. One of the greatest experimental stations in the early history of radio was the mammoth naval wireless station at Arlington, Virginia. With its 600 foot towers it was 3 years in the building and went into commission in February 1913.

Installed in this station, and each tested separately, were two rival systems. One was the 500 cycle, 100 KW synchronous rotary spark gap transmitter provided by Fessenden, and the other system was a 100 KW Poulsen arc, invented by Valdemar Poulsen of Denmark, and manufactured by the Federal Telegraph Company of San Francisco. In this test the arc system demonstrated greater coverage and much more freedom from static than did the spark system.

As a result of the foregoing tests the Navy used and tested arc transmitters in different sizes from 2 KW to 1,000 KW in its vessels and in its shore stations throughout the U.S., Panama, Hawaii, Guam, and Manila. At this same time the Navy was keeping a watchful eye on the Alexanderson alternator.

It was along about the early '20's that the spark and crystal detector gave way to the vacuum tube which occupied a position of preeminence for some years until the advent of the transistor which is with us today.

With the advent of WWII great strides were made in the radio field. Much of it of course was military in nature and use. For instance, RADAR, an acronym for Radio Detection and Ranging, was born. Without it we would have been in a much more difficult position than we were. It was used for many different purposes: for detecting the approach of planes, for detecting submarines on the surface, for detecting the presence of ships, for gun laying (gun laying is directing the fire in angular position and distance to the target), keeping track of ships in a large convoy, remember, they were all running on a zig-zag course without lights at night. Many more military developments took place, such as IFF (Identification of Friend or Foe); Countermeasures, Sonar, Radar Beacons, Sonobuoys, etc., etc.



A great deal of the above developments produced a tremendous knowhow with respect to pulse circuits that was of great help to Television as it exists today.

In the early development of television there were a number of systems proposed. Basically they divided themselves into two kinds. One was a mechanical scanning system, the other was an electronic scanning system. They both produced workable systems but the mechanical scanning had many disadvantages. To produce a picture such as we have today, would take an enormous scanning disc, the peripheral speed of which would have to be in the danger area, to say nothing of the noise such a device would create! Fortunately the electronic system of scanning prevailed. Prior to WW II the television system we had used 441 lines per picture frame, as of today we have a finer line structure which uses 525 lines per picture frame.

When color TV came in, the FCC made a very sensible ruling to the effect that whatever system was used for color, non-colo sets must be able to receive the picture in black and white without degradation.

It is my own personal and candid opinion that it will not be too long before we will be able to see TV in three dimensional pictures, based on the application of Holography to the system.

PART III

FEUDIN' AND FIGHT'N

When WW I began, all the powers involved directed their attention towards the military importance of radio communication. Practically all of the stations in this country were taken over by the United States Government. At the same time every amateur station was ordered closed down completely. Most of the equipment was stashed away in the attic for the 'duration'.

An officer of the Signal Corps of the U.S. Army, in the spring of 1918, was stationed in France. His name was Armstrong and his rank that of Major. He was assigned the job of developing a very sensitive receiver with which it would be possible to listen in on the German front line radio network. As a result of his efforts to produce such a receiver, he invented the system for which he is well known - the superheterodyne system!

As it happened, radio and Major Armstrong were old friends. Along about 1913 or so, he was a penniless student trying to put himself through Columbia University and to continue his experimental work with the audion. In fact, at this particular time, he was working on the ideas of feedback systems. However, he was severely handicapped financially. Fortunately, he was able to convince Professor Pupin of Columbia that in the course of his investigations he had discovered a most valuable principle, that of regeneration! Professor Pupin was a great help to him so that in October of 1914, Armstrong was awarded a patent on this circuit.

Now in the winter of 1918 the U.S. Navy had finished the installation of a 200 KW Alexanderson alternator at New Brunswick, N.J. At that time it was the most powerful transmitter in the world. Operating with the call letters NFF it could be heard all over the entire world. To those of you who remember hearing it, it had a beautiful clear, clean tone.

When the sudden ending of WW I came, quite unexpectedly, chaos reigned in the radio industry. With the ending of the war, radio communications in this country were still under the absolute control of the U.S. Navy!

At this time, President Wilson was gravely concerned with the possibility that the British might dominate world wide radio communication. It was a well known fact that the American Marconi Company had been incorporated with British money. In order to checkmate this, Admiral Bullard, who was then the Director of Naval Communications, requested a conference with the administrators of the General Electric Company. As a result, the General Electric Company agreed to create an all-American corporation to be called the "Radio Corporation of America."

The RCA was granted a charter in October, 1919, under the corporate laws of the state of Delaware.

It was on the 20th day of November, 1919, that the RCA bought out the interests of the American Marconi Company. On this day the American Marconi Company ceased to exist and the RCA took over.

Not only did RCA take over all of the ship and shore stations which had belonged to the American Marconi Company, but also ownership of the Marconi Telegraph and Cable Company, The Wireless Press, and the Pan-American Wireless Telegraph and Telephone Company was acquired. In addition, it entered into a cross-licensing agreement with the General Electric Company.

Like many other firms and industries, the Westinghouse Company of Pittsburgh also found itself hard hit by the sudden cessation of the war. Westinghouse decided therefore that if it was to be able to continue its international reputation as a great electrical manufacturing company, it was of the greatest importance that it also should take a vigorous part in the radio business. They adopted a policy of operation, following this decision, that today we would call "muscling in" on RCA!

The International Radio Telegraph Company was located in the city of Pittsburgh. This company was the successor to the original National Electric Signalling Company of Professor Fessenden. It so happened that at this time it was in a financial straight jacket. Westinghouse bailed it out of its troubles financially and as a result, entered into a cross-licensing agreement with it.

Unfortunately for Westinghouse, however, the International Company could not compete all the way with RCA because it completely lacked the essential parts of an entire system! International had no efficient transmitter and in attempting to overcome this dilemma, an agreement was entered into with the U.S. Government whereby the company was able to secure the license to use any and all Government held patents including the Poulsen Arc patents!

Additionally, Westinghouse entered into negotiations with and finally bought Armstrong's regenerative receiver patents. This turned out to be a most propitious deal inasmuch as now Westinghouse had a trading advantage with RCA. The result was that RCA would now be obliged to enter into trade negotiations in order to avoid complications.

In the meantime, RCA completed a cross-licensing agreement with the A.T. & T. Co. As a result, G.E. CO., A.T. & T., RCA, and Western Electric Company were all tied together by cross-licensing agreements. The next move on the part of the RCA was to obtain cross-licensing agreements with the United Fruit Co. and with the Wireless Specialty Co.

The G. E. Co., while the war was in progress, had been turning out very, very expensive radio equipment such as the Alexanderson Alternator. With the coming of the armistice, the war patronage was suddenly cut off and the G.E. Co. soon be obliged to dismiss a large number of skilled workers.

It was not long before the General Counsel for the British Marconi Company came to the G. E. Company and placed an order for 24 Alexanderson Alternators at a cost of $127,000 each. G.E. might have accepted the offer except that it was coupled with conditions that the G.E. Co. refused to accept. What they wanted was exclusive rights to the Alternator. To this G.E. countered with a proposal to supply the alternators on a royalty basis. This the Marconi Co. said "NO" to. Then the Marconi Co. was offered the machines outright and were then to pay $1,000,000 bonus in lieu of royalty.

However, just at this time, the G.E. Co. received a letter from the Navy Department. As a result, following this letter between Owen D. Young of the G.E. Co. and Admiral Bullard, an agreement was reached between the two to the effect that the G.E. Co. would not sell the alternators to the British Marconi Co.

The Great Men

PART IV

The following men all, each in his own way, directly or indirectly, in one way or another, contributed in some manner to the development of wireless telegraphy. Without their researches, their studies, and their painstaking experiments, we would not today have our telephone, our electric light, our generators, or motors, our radio and TV sets, or many, many more everyday devices that we sort of just take for granted!

● The list is not 'all-inclusive' since we are not listing the names of HERTZ, MARCONI, de FOREST, EDISON and many others whose inventions and record of achievement perhaps surpass many others. The list does include many of the "Avante-garde" who through the passage of time have in a sense become non-entities in the present day world.

The studies, findings, conclusions and philosophies of these great men helped to pave the way for the development of the wireless and electronic system of communications in all of its varying phases that we are acquainted with today.

Great credit is due to all of these great men.

JAMES WATT

James Watt, a Scottish engineer, was born in Greenock, Renfrew, Scotland, 19 January 1736. His father was a wealthy man, the owner of a shipbuilding yard and docks. Watt's mother was called by the village folks "the beautiful lady."

Because of ill health as a boy, he was unable to attend school, and so, left to his own desires, he used to walk through the hills and lakes nearby. However, he loved to go down to his father's shop and work with the tools available there. Young Watt became quite skillful with the tools and the workmen used to say, "James has a fortune in his hands and another in his head!"

He later went to London to learn scientific instrument-making, whereupon he was appointed mathematical instrument-maker to the Glasgow University. At this time he had occasion to become interested in a small model of a steam-pump from the University Laboratories. There came, as a result, Watt's development of the modern steam-engine. He also developed the ball-governor to regulate its speed. Watt's improvement over the previous engine made it more quick acting, more powerful and more controllable than the original engine.

The story of his putting his finer in the spout of the teakettle when a boy is pure fantasy, and simply a charming story for children. No one in his rightful mind would hold his finger where it was immersed in 212^{o} steam!

While James Watt had nothing to do with the philosophy of electromagnetism, we mention him here because the unit of electrical power, the watt, was named after him.

ALLESANDRO VOLTA

Allesandro Volta (1745-1827) was an Italian physicist and a pioneer in electrical science. He, it was, who discovered that electricity could be generated by means of what were called 'Voltaic Cells' in which two different metals such as zinc and copper were immersed in a weak solution of sulphuric acid.

In 1774, at the age of 29 he was appointed Professor of Physics at Como, Italy, and in 1779 was appointed to a similar 'chair' in Pavia. In the year 1775 he invented electrophorous. He was a master of electrostatic experimentation. In addition to the electrophorous, he invented the electrometer, electrical condensers and several other devices.

It was his invention of the battery, or Voltiac Cell, that brought him the greatest distinction. Actually, as it turned out, it became the basis of ALL electric batteries.

It was in recognition of his contributions to and early work in electrical science that the unit of electrical potential, the volt, was named after him.

ANDRE M. AMPERE

Andre M. Ampere (1775-1836) was a French physicist with an unusual aptitude for mathematics and science. He was born in Lyon, 20 January 1775. His father was a wealthy silk merchant. At the tender age of 14, Ampere had a very broad and phenomenal knowledge of mathematics and science. He was appointed a Professor of Physics at Bourg 1801-1803), a Professor at Ecole Polytechnique in Paris in 1804. Here he taught for the rest of his life.

Ampere was a most active and ingenious experimenter. He established the relationship between electricity and magnetism, and developed a rather profound mathematical relationship existing between electric current and the concomitant magnetic field.

Ampere died in Marseille on 10 June 1836.

It was in Ampere's honor that the unit of electric current was named the Ampere.

GEORGE SIMON OHM

George Simon Ohm was a German Physicist. He was born in Erlangen, Germany, on 16 March 1789. His father was a master mechanic and gave his son an early schooling in mathematics and physics. Ohm taught in a number of minor schools but in 1849 he was awarded a Professorship in Physics at the University of Munich.

In his studies and his experiments, he discovered the distribution of electro-motive throughout an electric circuit. As important as this finding was, his greatest contribution probably was in establishing the relationship between resistance, electro motive force, and the current flowing in a circuit. He stated that the current is directly proportional to the electromotive force, and inversely proportional to the resistance in the circuit. In more familiar terms he stated simply that, I = E/R which we familiarly know as Ohm's Law.

Professor Ohm died in Munich (Munchen) on 7 July 1854.

Joseph Henry.

John Ambrose Fleming.

Michael Faraday.

Avant-garde of the Wireless Pioneers

Yours truly
H. Hertz

HEINRICH RUDOLF HERTZ at Karlsruhe, Germany was the first to show that oscillating electric currents can produce ether waves, like those of light, and subject to the same laws. With the aid of a resonator, or oscillator, he was able to transmit an electromagnetic wave through space over a short distance. Hertz doubted that his discovery would have practical value, and said as much in a letter to a friend named Huber in Vienna. Yet in honor of Hertz, the wireless fraternity has continuously referred to wireless waves as Hertzian Waves.

The Hertz Resonator was a simple nearly-closed loop of wire which served as a wave detector at the receiving point. Marconi opened the loop, and made it into an aerial. The earth return circuit, or ground, had been used as early as 1880 by John Towbridge, of Harvard, who systematically studied the problems of propagation of electric current through "earth", either soil or water between places not connected together by wires.

H.W. Dickow

(Unpublished manuscript - "Tales of the Wireless Pioneers")

MICHAEL FARADAY

Michael Faraday (1791-1867) was the son of a blacksmith and was born in Newton Butts, Surrey, England, on 22 September 1791.

Until 1813 he was an apprentice bookbinder. He became interested in and studied chemistry and physics by reading books on these subjects that he was binding. He was appointed an assistant in the laboratory of the Royal Institute by Sir Humphrey Davy at the magnanimous salary of 25 shillings per week!

In 1833 he became a Professor of Chemistry at which post he stayed until his death. He eventually became the Institute's Director.

Faraday demonstrated electromagnetic rotation. It was on October 23, 1831 that he demonstrated the greatest electrical discovery of all time that of generating electricity by means of rotating a conductor in a magnetic field. However, this principle of the generation of electricity was not put to any use until about 40 years later when the first dynamo was built.

Faraday has been accredited with being the greatest experimentalist in the 19th century in electric and magnetic research.

It was on the 25th of August 1867 that Faraday died in the town of Hampton Court, not far from London.

JOSEPH HENRY

Joseph Henry was an American born physicist (1797-1878). He was born in Albany, N. Y. on 17 December 1797. He attended Albany Academy as a student and was later appointed an instructor in mathematics and in natural philosophy at Albany Academy in 1826.

It was one year later, in 1827, that he devised multi-layered electromagnets and showed that such a winding increased the strength of the electromagnet. The strongest one he built was capable of sustaining a weight of 3,500 pounds.

In 1831 he strung one mile of wire around his class room. He connected this to a battery on one end and a bell on the other end. He was able to ring the bell at the terminating. This was the first example of the electric telegraph with an audible signal!

In the same year, 1831, he also built an electric motor. The motion of the motor was reciprocating rather than rotational, but it did demonstrate the production of mechanical power from electrical power.

In 1832 he discovered inductance, self and mutual. Also in this same year he was appointed a Professor of Natural Philosophy at what has now become Princeton University.

Henry discovered the electric relay; non-inductive windings; the transformer principle; the variation of inductance between two coils as a function of distance between them.

The unit of inductance was named in his honor.

Joseph Henry died in Washington, D.C. on 13 May 1878.

SIR JAMES AMBROSE FLEMING

Sir James Ambrose Fleming, an English Electrical Engineer, was born in Lancaster, England, on 29 November 1849, and was the son of a minister. His family moved to London in 1853 and he attended the University College School and the University College. From here he received his BSc degree in 1870. He entered Cambridge University in 1877 in order to work under Maxwell in the then new Cavendish Laboratory.

In 1880, Fleming was made a Demonstrator and in the year following this he was appointed a Professor of Phvsics and Mathematics at University College at Nottingham. In 1885 he was appointed Professor of Electrical Technology at University College where he remained for 41 years.

He contributed to the design of transformers, to electrical measurements. He developed the 'right hand rule', a mnemonic aid relating direction of the magnetic field, the conductor motion, and the induced electromotive force. He cooperated with Marconi in many of his experiments and assisted in the design of Marconi's transmitter for spanning the Atlantic Ocean.

In 1904 Fleming received a patent on his 'thermionic valve' which he devised as an extension of the Edison Effect. Today we call this same device a diode. It was used by Fleming to replace the crystal detector then in use.

He died at the age of 95 at Sidmouth, England, on 18 April 1945.

NIKOLA TESLA

Nikola Tesla (1856-1943) was born on 9 July 1856 in Croatia. He was the son of a Greek priest. Tesla came to this country in 1884 and became a naturalized citizen. Tesla was a man of many inventions. He invented the induction motor and discovered the principle of the rotating magnetic field which he described as a 'whirlwind of magnetic force'. He also discovered the principle of the transmission of electric power, harnessed the water power of Niagara Falls and produced a goodly quantity of electric power therefrom. He produced the 'Tesla Coil', a variation of which is used in some radio transmitters today.

In addition he invented a radio control system to direct the course of a ship, and many, many other electrical devices. Besides the induction motor Tesla patented new forms of dynamos, transformers, induction coils, condensers and arc lamps.

In the course of his work on induction motors, he invented two phase, three phase, and polyphase systems. He produced also the three phase motor.

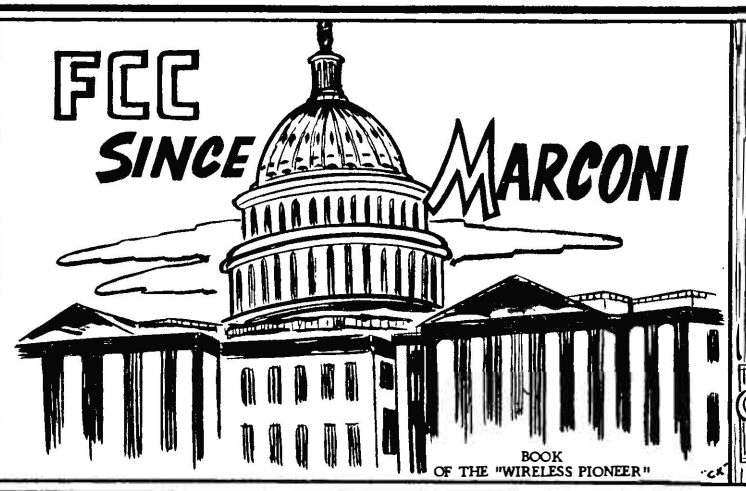
Toward the end of his life he was somewhat of a recluse, and was regarded by many as something of a man of mystery. He lived in New York and on 7 January 1943 he died.

It may seem to you a little far fetched to say that some of these men had anything to do with the development of wireless telegraphy. But--stop and think for a moment. Suppose we knew nothing of Ohm's Law, or anything about inductance, or capacities, or the Fleming Valve, the DeForest triode, alternating current, etc., etc.

We would have no radio, television, telephone, electric lights, electric power, motors, - you name it, we wouldn't have it!

PROF. HERBERT J. SCOTT

Professor "Herb" Scott (SGP-838) Needs no introduction to SOWP members as most are acquainted with this early day "Spark-Gapper" on both the East and West Coasts. He used money earned as a professional "Wireless Operator" to complete his course in Electrical Engineering at the Univ. of Washington. After a stint with the Bell Labs where he helped to design, build and install the first first 'ship-to-shore' radio-telephone installation (12-9-1929) he joined the staff of the Univ. of Calif.. where he became head of their Communications Laboratory, specializing in Electromagnetic Radiation and Propagation. He retired in 1963 as Professor Emeritus. We are fortunate indeed to have this dedicated member on our staff.



A BRIEF HISTORY OF THE RADIO DIVISION

BY WILLIAM R FOLEY

The following brief history of the Radio Division, formerly FEMB (now FCC), was compiled with the aid of Mr. Terrell, Benjamin Wolf, V. Ford Greaves, Edwin W. Lovejoy, Arthur Batcheller, Theodore G. Deiler, James M. Chapple, Joe McKinney, Geo. V. Wiltse, Charles C. Kolster, Walter Butterworth, Kenneth G. Clark, Emory H. Lee, H. D. Hayes, Joe Hallock, C. D. Guthrie, Robert B. Woolverton and Bernard H. Linden. Their assistance in documenting this report is appreciated.

FIRST PHASE

The Service originated with the Ship Act of 1910 which required radio-telegraph equipment and continuous watch by operators on ocean-going steamers which carried fifty or more persons. To enforce this first law four "US Wireless Ship Inspectors" were proposed. These men were to be assigned to groups of ports - New York and New England ports, Atlantic ports south of New York, Gulf ports, and Pacific ports. The Service was organized as under the Navigation Service, Department of Commerce and Labor.

The first appropriation requested was for $10,000 to cover the necessary instruments, travel expenses, and salaries. Only $7,000 was appropriated so the service was initiated by only two Inspectors. These were William D. Terrell and Richard Young Cadmus who took their oaths of office on July 1, 1911. Both had been telegraphers with the Department of Commerce and Labor.

The new Inspectors, together with Mr. Charles St. John Howard who was to be employed later if funds permitted, received several weeks of technical instruction. It began at the Navy Radio School, Brooklyn, under Arthur R. Rice (who later joined the Service), continued at the Bureau of Standards under Henry J. Meneratti and Dr. Louis Austin, and concluded at the Washington Navy Yard under George A. Clark.

Upon completion of this instruction Mr. Terrell took up his duties at New York and Mr. Cadmus went to San Francisco.

On the first of March 1912 Mr. A. C. Pickells was added to the force. He was assigned to New York and relieved Mr. Terrell when the latter went to London as Delegate to the International Radiotelegraph Convention.

In July Mr. Terrell resumed his duties at New York, Mr. Pickells went to New Orleans, and Mr. Howard was employed and assigned to Baltimore, thereby completing the original plan.

During this phase the duties consisted of inspecting ship radio stations and issuing "Certificates of Skill in Wireless Communication." Wavemeters were provided with which to measure wavelength and decrement, and ammeters were provided with which to estimate transmitting range.

Among the very early people to receive "Certificates of Skill" were Edwin Lovejoy and Bernard Linden. The latter also acquired an Australian certificate - probably the only one ever issued to a U. S. Citizen as the issuing office ascertained immediately afterwards that issuance was restricted to citizens of Australia.

SECOND PHASE

On August 13, 1912 Congress enacted the "Act to Regulate Radio Communication." It declared Federal jurisdiction over radio communication and required that thereafter operators and stations must have licenses. To enforce this broader law and to issue the necessary licenses required a more comprehensive organization.

The United States was divided into nine Districts, each under a "Radio Inspector" having a headquarters office. The four manned ports were established as District Offices on July 1, 1912. Additional personnel was recruited by a Civil Service Examination held on Sept. 25, 1912. Eight men were appointed on Oct. 18, 1912 and were at their posts by Nov. 18. These District Offices were now open.

District	Date Opened	Radio Inspector
#1 Boston	11-11-12	Henry C. Gawler
#2 N. Y.	7- 1-12	William D. Terrell (Asst. Insp. Robert H. Marriott assigned Nov. 1, 1912)
#3 Balto.	7- 1-12	Charles S. Howard (Replaced by Richard Y. Cadmus in Nov. 1912)
#5 N. O.	7- 1-12	A. C. Pickells
#6 S. F.	7- 1-12	Richard Y. Cadmus (Replaced by Robert C. Woolverton 11-8-12)
#7 Seattle	11-11-12	Arthur R. Rice
#8 Clev'd.	11-18-12	John F. Dillon
#9 Chicago	11-18-12	(Roy E. Thompson)

Also in this group were Mr. V. Ford Greaves who was given the title "Radio Engineer" and assigned to organize the Washington D.C. headquarters office, and Mr. Louis R. Krumm who was given the title "Chief Radio Inspector." Krumm was placed in travel status and assigned nominal headquarters at St. Louis.

This accounts for only eight of the nine proposed Districts. It is likely that there were insufficient qualified candidates as the appropriation of $45,000 which was requested was granted.

On Jan. 10, 1913 the Seattle office was closed and Mr. Rice transferred to New Orleans replacing Mr. Pickells who proceeded to Savannah to open District #4 on March 1, 1913. Seattle was temporarily placed under Mr. Woolverton at San Francisco and covered by occasional trips from that office. This was facilitated by the assignment of an Assistant Inspector to that port, Mr. Ellery Stone, on Jan. 29, 1913.

Early records show that an inspection trip was made in Puerto Rico. It seems likely that this was Mr. Pickells while enroute from New Orleans to Savannah.

During the fiscal year 1913 the M/V Tarragon had been so successful in enforcing navigation laws that arrangements were made to provide it with radio equipment. On July 21, 1913, Mr. Charles C. Kolster and on Sept. 13, 1913 Mr. Benjamin Wolf were added to the Washington staff for this purpose. Both had taken the original Civil Service examination but were in active military service and could not report for duty until released. Their assignment continued successfully for about a year.

In the fall of 1914 the equipment was removed from the Tarragon for exhibition at the Panama-Pacific International Exposition in San Francisco. The exhibit included a set of inspection instruments, a complete amateur station, and the quarter kw QG set from the Tarragon. Mr. Wolf was assigned as Special Agent in Charge of the exhibit, and Mr. Kolster went to New Orleans as Assistant Inspector.

Two additional Inspectors were added about this same time probably under the Deficiency Act of 1914. These were Mr. W. O. Hensgen who is believed to have been assigned to Chicago relieving Mr. Thompson; and Mr. R. D. Duncan, Jr. who was assigned as a second Assistant at New York. Mr. Thompson then went to Seattle and reopened that office on a permanent basis.

These shifts were not very permanent. In June 1914 Mr. Hensgen came to New York as an Assistant and Mr. Dillon took over both the Chicago and Cleveland offices. Mr. Thompson resigned Dec. 31, 1914 and was replaced by Mr. Marriott who was promoted from New York. Mr. Hensgen resigned Jan. 1, 1915; and a month later Mr. Marriott resigned leaving Seattle vacant.

Savannah, too, was closed when Mr. Pickells resigned on August 13, 1914. District #4 was combined with District #3 and handled by Mr. Cadmus at Baltimore.

On March 15, 1915 an important shift occurred. Mr. Greaves left Washington to become Travelling Inspector but retained his title "Radio Engineer"; Mr. Terrell replaced him at Washington; and Mr. Krumm went to New York retaining his title "Chief Radio Inspector."

In May two more men were added - Mr. Harry Sadenwater as Assistant at New York, and Mr. A. W. Desart at Seattle. Mr. Greaves took over the Seattle office to break him in, but by June 15, 1915 he had resigned. Mr. Wolf was now transferred from the Panama-Pacific Exposition to Seattle, and with an experienced man Seattle's troubles ended.

Mr. Stone replaced Mr. Wolf at the Exposition, and the post of Assistant at San Francisco was taken by another new man, W. F. Macomber, Jr.

In July Mr. Charles Blankenship was employed to reopen the Chicago office. This, too didn't last very long, as Mr. Gawler at Boston went on National Guard duty and Blankenship was assigned there to relieve him. Upon Mr. Gawler's return Blankenship went to New York for a few months and then resigned.

On Feb. 29, 1916, Mr. Woolverton resigned to build the 500 KW arcs at San Diego, Cavite, and Pearl Harbor for the Federal Telegraph Co. On completion of this work he left Federal to accept a Captaincy in the Signal Corps and remained with the Army for the rest of his career. Mr. Greaves took over the San Francisco office.

In June 1916 it appears that Mr. Dillon moved from Cleveland to Chicago, reopening the latter office and closing the former. He remained there until leaving for the Army in 1917.

In September 1916 Mr. Harold D. Hayes was added as temporary Assistant at San Francisco with a salary of $1200 per year. Even for those days it was a small sum as Assistant Inspectors normally began at $1200 and clerks received $900. The reasons for this unusual arrangement are not stated.

In Nov. 1916 Mr. Joseph H. Hallock was added to open a sub-office at Norfolk, Va. That office has been open continuously since that date.

On Dec. 1, 1916 Mr. Otto Redfern was added as an Additional Assistant at New York.

During World War I the Field was completely stripped and with the sole exception of Mr. Terrell (who was needed to replenish the organization) all of the original Inspectors received Volunteer Commissions in the Army or Navy. This necessitated the employment of a whole new Field force of inexperienced men.

In addition to their regular inspection work, these new men trained radio operators and encouraged former operators to enter the merchant marine and military services. Much of this work was performed outside of normal office hours.

Except for New York and San Francisco the District offices had only a single Inspector. This complement was continued until 1920.

In October 1917 the Cleveland office was moved to Detroit, a change which has proved permanent. The Chicago office seems to have been closed during the entire war, and was not reopened until Mr. Dillon returned in June 1919.

At the end of the war all except Mr. Stone returned to their posts. He remained with the Navy and now holds the rank of Rear Admiral USNR.

By 1920 the work was so far in arrears that Congress approved the Deficiency Act of 1920 allowing the employment of 20 additional Inspectors. The total Field Force at that time numbered 25, including clerks. My records show only ten names, but they were assigned one each to Boston, New York, Baltimore, Norfolk, New Orleans, and San Francisco. Seattle has two, and the assignment of the tenth man is not known but was probably Detroit.

Unfortunately the appropriation for the following year was smaller and four of the ten were dropped or resigned by June 30th.

THIRD PHASE

The wildfire spread of broadcasting in the early 1920's increased the inspection and licensing burden but above all added new technical problems. Sub-offices were established, additional Inspectors added to District headquarters. The Field Service was detached from the Navigation Service and organized as the "Radio Division," reporting directly to the Secretary of Commerce. The title "Radio Inspector" was changed to "Supervisor of Radio" on April 16, 1923 in recognition of the increased complexity of the duties.

SUB-OFFICES ESTABLISHED

Dist.	Sub-Office	Date Est.	Inspector
3	Phila.	1-23-25	John G. Leitch
4	Miami	8- 1-31	Joe H. McKinney*
5	Dallas	9- 29	Joe H. McKinney
6	Los Angeles	12- 28	Benjamin Wolf
	San Pedro	30	John & James Homsy
7	Portland,O.	6-12-30	Stacy W. Norman
8	Buffalo	(1927?)	(Martin W. Grinnell)
9	Kansas City	1927	George S. Turner
	Duluth/St.	(1927?)	
	Paul,Denver	10- 1-29	Glen W. Earnhart

*It is believed that McKinney holds the record for opening offices: Miami, Fla.; Dallas, Texas; San Juan, P.R.; Kingsville, Texas; and RM office at Houston, Texas.

The location of broadcast transmitters raised new problems. If too close to populated areas, listeners suffered "blanketing" and were unable to receive distant stations. If the transmitter was too far out the signal was too weak to serve the desired area. This and similar problems required field intensity measurements.

The precision measurement of frequency, modulation and field intensity required new equipment and skills. Field intensity was handled by "Test Cars" which had special all-wood bodies mounted on Packard chassis's. Their development required several years with the assistance of Bell Labs., and by 1929 six such cars were in operation. The equipment had a range of 200 kc to 6000 kc, a sensitivity of 4 to 10 microvolts per meter, and a self-calibrating accuracy of 5%. The principal drawback was the heat inside the black body. It made measuring a feat of endurance as well as of skill.

It was intended that the test cars include frequency measuring equipment but this proved impractical. Equipment of the necessary precision was too bulky and heavy to be moved. This lead to permanent installations of frequency measuring equipment which have become monitoring stations.

Sam Edwards pioneered in this work and was given the title "Supervisor of Development and Production" on July 19, 1930.

The first independent Monitoring Station was constructed at Grand Island, Nebraska and opened in 1929 by Benjamin Wolf. The site was chosen as being the approximate geographic center of the United States.

In 1923 the Secretary of Commerce secured a Court decision affirming his authority to assign frequencies to stations. This was challenged in 1926 by the Zenith Radio Corp., and the decision was reversed. With no control over broadcast station frequencies there was a chaotic situation for several months. Secretary of Commerce Hoover was a prospective Presidential candidate so Congress was reluctant to grant him such broad powers, and in fact Mr. Hoover himself recommending against vesting such authority in a single individual. The result was the "Radio Act of 1927" which established a five man Commission to assign frequencies and grant licenses to stations. Authority to grant operator licenses, inspect stations and issue call letters remained in the Department of Commerce.

This divided authority continued until 1932 when the Radio Division and its functions were transferred from the Department of Commerce to become the Field Section in the Engineering Department of the Federal Radio Commission.

ANNEX "A"

RADIO DIVISION SUPERVISORS PRIOR TO 1932

Dist. #1 Boston	11-16-12 Henry Gawler 4-3-17 Arthur Batcheller 10-7-19 Henry Gawler 9-30-20 Charles Kolster
Dist. #2 New York	7-1-11 W.D. Terrell 3-15-15 Louis Krumm 4-17-17 Charles Guthrie 10-9-19 Louis Krumm 8-23-20 Arthur Batcheller
Dist. #3 Baltimore	7-1-12 Charles Howard (Nov. 1912) R.Y. Cadmus 5-27-17* (8-7-18 K.H. Dunn? 9-16-18?) (11-8-18 J. H. McLevey 1-9-19?) 3-13-19 R.Y. Cadmus 5-7-29 L.C. Herndon *Cadmus was on Navy duty in Baltimore and continued to exercise some supervision over the office.
Dist. #4 Savannah	3-1-13 A.C. Pickells 8-13-14 (closed) Reopened as a sub-office at Norfolk, Va. Nov. 1916 Joseph H. Hallock May 1917 Fitzgerals 8-1-18 Walter Butterworth 1-23-20 Walter Van Nostrand 6-30-23. Reopened as District 4 at Atlanta 7-1-23 Walter Van Nostrand
Dist. #5 New Orleans	7-1-12 A.C. Pickells (Jan. 1913) Arthur Rice 12-10-15 Charles Kolster 4-19-17 Morris L. Grubman 1-30-19 Arthur Kopper 7-15-19 Charles Kolster 10-3-19 Arthur Kopper 3-16-20 Theodore Deiler
Dist. #6 San Francisco	7-1-11 R.Y. Cadmus 11-8-12 Robert Woolverton 3-1-16 V. Ford Greaves 4-17-17 Bernard Linden July 1919 V. Ford Greaves 10-1-19 John Dillon 3-15-27 Bernard Linden
Dist. #7 Seattle	11-11-12 Arthur Rice 1-16-13 (closed) (1914) R.E. Thompson 1-1-15 Robert Marriott 2-1-15 (closed) (5-3-15) V. Ford Greaves and A.W. Desart 6-16-15 Benjamin Wolf 4-7-17 7-1-17 Delos Martin 4-25-18 Francis Ryan 7-12-18 William Downey 7-1-19 Benjamin Wolf

	2-16-20 Otto Redfern Oct. 1928 Edwin Lovejoy 5-31-32 Geo. V. Wiltse
Dist. #8 Cleveland	11-18-12 John Dillon 6-1-16 (closed) Reopened at Detroit 10-1-17 Samuel Edwards 6-1-32 Emory Lee
Dist. #9 Chicago	11-18-12 (Roy Thompson?) (1914) W.O. Hensgen closed 6-15-14. Reopened 7-16-15 Charles Blankenship 6-1-16 John Dillon 7-29-17 Samuel Edwards 10-1-17 (closed?) 6-25-19 John Dillon 10-2-19 Charles Kolster 10-21-20 L.R. Schmidt 7-18-22 E.A. Beane 12-16-27 Harold D. Hayes

ANNEX "B"

ORIGINAL FOUR WIRELESS SHIP INSPECTORS

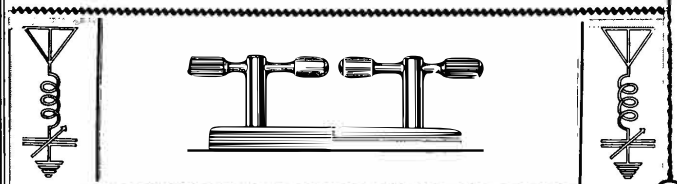
7-1-11	William D. Terrell	N. Y.	Retired, 519 N 95th Miami, Fla.
7-1-11	Richard Y. Cadmus	S. F.	Deceased 5-7-29
3-1-12	A. C. Pickells	N. O.	Resigned 8-13-14
(7-1-12)	Charles St. John Howard	Balto.	Deceased (1912)

FIRST CIVIL SERVICE GROUP

10-19-12	Harry C. Gawler	Boston	Resigned Oct. 1920 Pres. Gawler-Knopp Co., 1060 Broad St Newark, N.J.
10-21-12	Arthur R. Rice	Seattle	Resigned 12-9-15
10-21-12	Robert B. Woolverton	S. F.	Resigned 2-29-16 654 Twelfth Ave. S.F., Calif.
10-24-12	Robert H. Marriott	N. Y. (Asst.)	Resigned 2-1-15
10-25-12	Roy E. Thompson	Chicago	Resigned 12-31-14
10-30-12	Louis R. Krumm	St.Louis	Resigned 8-15-20
11-11-12	V. Ford Greaves	Washn.	Retired May 1946 Rt. 2, Box 2206 Paradise, Calif.
11-16-12	John F. Dillon	Clev'd.	Deceased 10-8-21
1-29-13	Ellery W. Stone	S. F. (Asst.)	Resigned 7-31-19 Pres., Amer. Cable & Radio Corp., 67 Broad St., N.Y.
7-21-13	Charles C. Kolster	Washn. (Asst.)	Regional Manager, N. Y.
9-13-13	Benjamin E. Wolf	Washn. (Asst.)	Retired 6-30-48 715 W. Koenig Grand Island, Neb.

DEFICIENCY ACT OF 1914

	(W. O. Hensgen)	(Chicago)	Resigned 1-1-15
8-25-14	R. D. Duncan,Jr.	N. Y.	Resigned 7-8-15

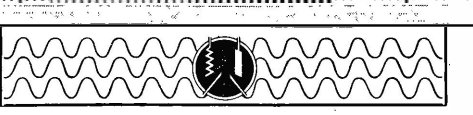


PRE-WAR GROUP

May 1915	Harry Sadenwater	N. Y.	Resigned 9-27-20
5-3-15	A.W. Desart	Seattle	Resigned 6-15-15
6-10-15	W. F. Macomber,Jr.	S. F.	Resigned 6-10-16
7-16-15	Charles Blankenship	Chicago	Resigned 3-15-17
12-8-15	William H. Priess	N. Y.	Resigned 4-15-17
9-11-16	Harold D. Hayes	S. F.	EIC Chicago
Nov. 1916	Joseph H. Hallock	Norfolk	EIC Portland
12-1-16	Otto Redfern	N. Y.	Deceased 8-17-28

WORLD WAR I GROUP

4-3-17	Arthur Batcheller	Boston	Resigned 10-7-19
4-14-17	Clifford Watson	Seattle	Resigned 7-3-17 Navy, San Diego
4-17-17	Bernard H. Linden	S. F.	EIC Los Angeles
4-17-17	Charles D. Guthrie	N. Y.	Resigned 10-9-19 138 Lefferts Ave. Brooklyn, N.Y.
4-17-17	D.B. McGown	S. F.	Resigned 1-31-27
4-19-17	Morris L. Grubman	N. O.	Resigned 1-29-19
Apr. 1917	-- -- Fitzgerald	Norfolk	(March 1919)
4-30-17	John W. Swanson	N. Y.	Resigned 1-15-28
6-25-17	R.C. Giesse	N. Y.	Resigned 10-15-17
7-1-17	Delos K. Martin	Seattle	Resigned 4-25-18 Bell Labs.
7-29-17	Samuel W. Edwards	Chicago	Resigned 5-31-32
8-7-17	A.R. Morton	N. Y.	Resigned 9-24-17
10-16-17	F. W. Mikkleson	N. Y.	Resigned 1-15-18
(Oct.1917)	John Stroble	N. Y.	(June 1918)
2-27-18	R.A. Batcher	N. Y.	Resigned 9-15-18
4-1-18	Francis M. Ryan	Seattle	Resigned 7-12-18 Bell Labs.
5-18-18	William E. Downey	Seattle	Resigned 7-1-19 Southern Hotel 6th Ave. at B, San Diego, Ca.
7-1-18	E. A. Schobbehar	N. Y.	Resigned 6-30-19
8-1-18	Walter Butterworth	Norfolk	Retired 1951
8-7-18	K. H. Dunn	(Balto.)	Resigned 9-16-18
10-8-18	Arthur H. Kopper	N. O.	Resigned 3-15-20
11-8-18	J.H. McLevey	(Balto.)	Resigned 1-9-19
11-12-18	A.C. Mott	S. F.	Resigned 4-2-19



DEFICIENCY ACT OF 1920 GROUP

11-1-19	Walter Van Nostrand	Norfolk	Resigned 7-1-33
11-3-19	Dudley B. McGown	S. F.	Resigned 1-31-27
11-17-19	William E. Downey	Balto.	Retired 1947
12- -19	Theodore G. Deiler	N. O.	EIC N. O.
1-2-20	Edwin W. Lovejoy	Balto.	R.I.F. 6-30-20
1-5-20	Henry L. Bogardus	N. Y.	Resigned 8-1-29
1-12-20	Kenneth G. Clark	Seattle	Resigned 5-12-20
1-16-20	H.E. Walton		Resigned 6-30-20
1-21-20	Edwin A. Beane	Boston	Resigned 11-30-27 328 S. Taylor Oak Park, Ill.
4- -20	Emory H. Lee	Seattle	R.I.F. 6-30-20

EARLY 1920 GROUP

8-23-20	Arthur Batcheller	N. Y.	EIC New York
(1920)	L.R. Schmidt	(Chicago)	
4-1-21	Louis E. Richevein	Balto.	Deceased 10-5-23
4-2-21	Emory H. Lee	N. Y.	Regional Mgr. Detroit, Mich.
(1921)	Walter J. Howell	(N. Y.)	Asst. EIC, N. Y.
(1921)	Landon C. Herndon	Norfolk	Deceased 1950
8-1-21	A. F. Parkhurst	Detroit	Resigned 8-23-24
8-16-21	L. N. DuTriel	N. O.	Retired, 204 Homedale Ave., N.O.
1922	Charles T. Manning	N. Y.	R M Alaska
7-27-22	M. Swartz		Resigned 12-18-22
8- -22	Edwin W. Lovejoy	S. F.	FEMB, Washn.
9-14-22	L.E. Dutton	Chicago	Resigned 12-15-23
1922	Eugene C. Cochran	N. Y.	Retired 1951
10-2-22	Myron A.Tong	Boston	Deceased 7-22-50
10-5-22	W. A. Peterson		Resigned 5-15-26
1922	Louis L. McCabe	N. O.	EIC Houston
7-1-23	James M. Chapple	Norfolk	Retired 1952
	George E. Sterling	Balto.	Commissioner
1-10-24	Robert E. Earle	Chicago	Deceased 9-29-27
2-16-24	Arthur S. Fish	N. Y.	EIC Miami
9-1-24	George S. Turner	Chicago	Chief, FEMB
9-4-24	James C. McNary	Detroit	Resigned 7-31-29

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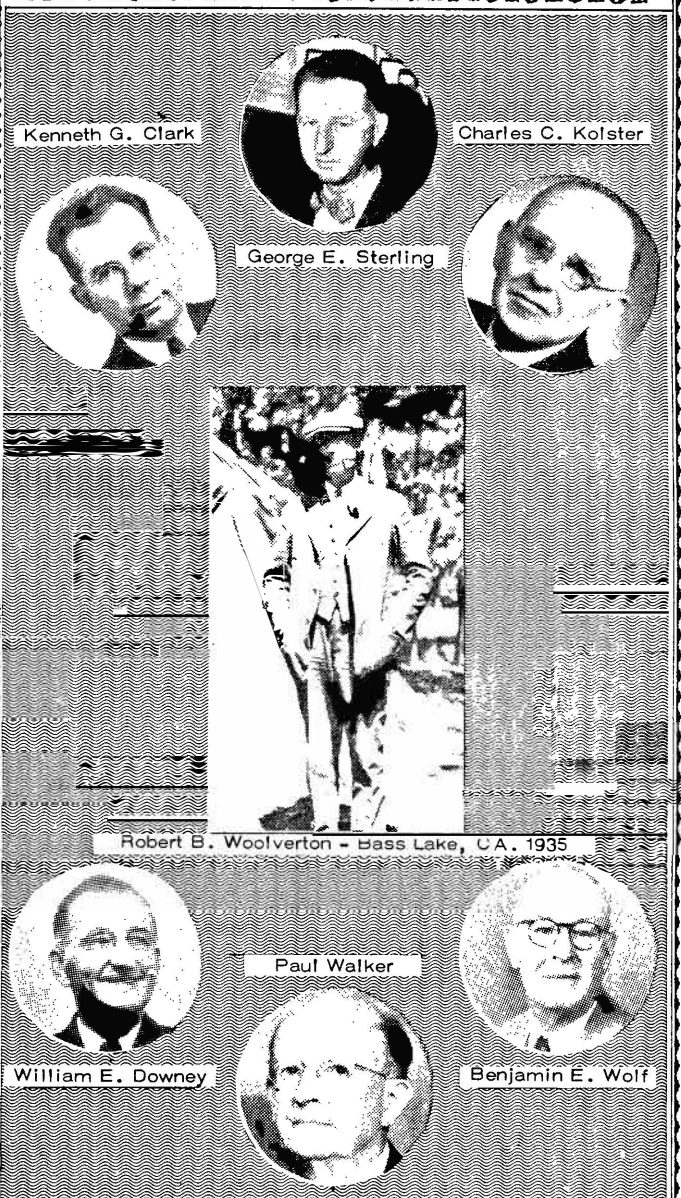
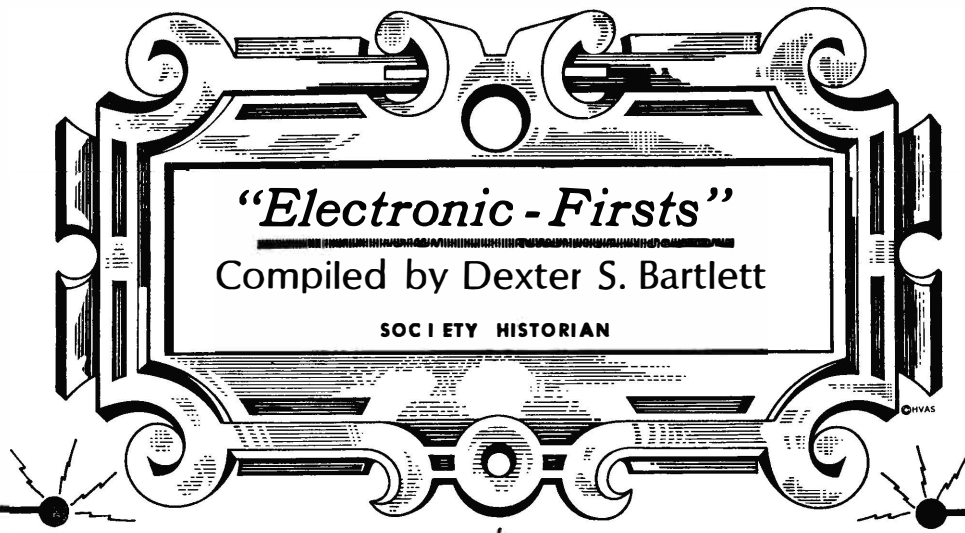
Early Radio Division Officials



9-9-24	John G. Leitch	Phila.	Resigned 12-31-28 vice President, WCAU, Philadelphia
10-1-24	Martin W. Swanson	Chicago	Resigned 3-31-25 BuShips, Washn.
8-17-25	Francis V. Sloan	Chicago	EIC, San Francisco



They say there is nothing new under the sun. Around the year 1488, Martha "Mother" Shipton is supposed to have arrived, conceived by the devil and born of a witch.

In the days of witchcraft, with her deformed body, she stirred up her witch's stew and made many spectacular and true prophecies. Around the year 1500 she wrote the following:

Carriages without horses shall go,
And accidents fill the world with woe.

Around the world thoughts shall fly
In the twinkling of an eye.

Under water men shall walk,
Shall ride, shall sleep, and talk.

In the air men shall be seen,
In white, in black, and in green.

Bartlett's Quotations

EDITORIAL NOTE

Author Bartlett has spent hundreds of hours checking and rechecking records and historical data in the compilation of these records. It is realized that the field of "FIRSTS" in any field of human endeavor is somewhat " challenge prone", however, we believe that the list is highly authentic.

We do however invite those who may wish to challenge facts listed to submit data and documentation supporting any change of listing/s recorded. Our desire and policy is that of recording the true facts and not promulgating inadvertant errors which may creep into records over the period of years. That is one reason we feel that data for serious consideration should come from early dated memorabilia. The assistance of those who who are "History Buffs" is solicited so that future reprints of the listings may be updated and/or corrected as necessary. Address your letters of Society Historian, Dexter S. Bartlett.

William A. Breniman

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"ELECTRONIC FIRSTS"

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1676	Olav Roemer discovered that light travels at a finite velocity.	
1725	Stephen Gray discovered that electricity could be conducted as a current.	
1745	Pieter Van Musschenbroeck discovered principle of electrostatic condenser. This led to invention of Leyden jar.	
1749	Benjamin Franklin demonstrated that lightning is an electrical phenomena.	
1795	Prof. Salva of Spain suggested Wireless by earth conduction.	FA
1797	Capt. Thomas Truxton, U.S. Navy, devised the first known American signal book.	
1800	Thomas Young & Augustin Fresnel adopted the ether theory. Volta discovered the electric battery.	TR EB SC MA
1802	The U.S. Navy issued the Barron Signal Book.	
1813	The first revision to the Barron Signal Book. Flags replaced pennants and shapes were added.	
1817	Baron Berzelive isolated selenium.	IRE
1819	Hans Christian Oersted discovered the magnetic properties of an electric current.	
1820	James Bowman Lindsay conducted experiments in communications utilizing the conductive properties of water.	
1821	Andre M. Ampere propounded the relationship between electricity and magnetism.	
1825	Jean F. Arago proposed sound waves for ocean soundings George Simon Ohm discovered the relationship between the flow of electric current, resistance, and voltage.	HR
1827	Sir Charles Wheatstone developed an acoustic device for the amplification of weak sounds.	
1831	Michael Faraday discovered electro-magnetic induction.	EB MR HR
1837	Samuel Morse patented his telegraph system.	EB HR SC
1838	Steinheil, a Bavarian, telegraphed fifty feet by earth conduction.	FA IRE AC
1839	Edmund Bequere discovered photo-electric effect.	IRE
1840	Joseph Henry first produced H.F. and discovered condenser discharges to be oscillatory.	MR EB HR CE
1842	Samuel Morse telegraphed one mile by earth conduction between Governors Island and Castle Garden.	MR FA EB
1843	Samuel F.B. Morse and Alfred V. Vail devised the Morse code. Alexander Bain developed the basic principles of facsimile.	HR EB CE DU HR
1844	Telegraph circuit between Baltimore and Washington placed in operation.	
1847	Gustav R. Kirchoff produced his therom of conducting networks. The Rogers and Black Semaphore Dictionary adopted by U.S. Navy but the Barron Signal Book retained for tactical purposes.	EB
1850	George Dering patented a lighting arrester.	FA
1851	First International Telegraph Conference in Berlin devised the Continental Code for European use. (11 letters of Morse code retained.)	HR CE
1853	A.H.L. Fizeau shunted a Leyden jar across the terminals of the interruptor of an induction coil, thereby increasing the width of the spark gap and the efficiency of the coil.	
1854	Cromwell Varley invented the gravity battery used in early W.T.	MV
1855	David Hughes invented a crude teletype.	FA MV
1856	S.A. Varley patented a transformer. (England) Henrich Geissler originated a Geissler tube, forerunner of the present neon tubes.	HR CE IRE
1857	Prof. J.T. Way demonstrated a mercury arc lamp, forerunner of mercury arc rectifiers. Leon Scott developed an instrument for recording sound. (France)	IRE
1858	Joseph Plucker of Germany, observed cathode rays. First transatlantic cable opened.	HR CE NP

1859	Julius Plucker observed cathode rays. (Germany)						
1865	Clerk Maxwell theorized electro-magnetic radiation.	EB	RE				
	Heinrich Daniel Ruhmkorff designed a radically improved induction coil.						
1866	S.A. Varley used a coherer for telegraphic lightning arrester.	FA	DU				
1869	Congress became desperate with loss of life at sea and was going to pass a law for all ships to carry carrier pigeons.	NP					
1870	Von Bezold discovered oscillations set up by a condenser discharge were of varying frequencies which created mutual interferences.						
1871	Elihu Thomson noticed sparks eight feet from Ruhomoff coil.	EB	WE	DU			
1872	First wireless by radiation, using grounded antenna, by Dr. Mahlon Loomis. Also took out first wireless patent.	FA	HR	LO	CE		
1873	Joseph May accidentally discovered selenium's photo-electric properties.	AC	IRE	CE			
1874	Braun noticed rectifying action of metallic suphides.	BL	HR	CE			
1876	Alexander Bell invented and patented telephone.	DU	HR	EB	CE		
	The U.S. Navy adopted the English Morse telegraphic code.						
1878	First radiophone over light waves.	AC					
	Sir William Crookes investigated cathode rays but did not use.	EB	HR	BU			
	Thomas Edison patented phonograph.	EB	IRE	DU			
1879	Hughes discovered coherer action, but did not use.	SC	CE				
1880	The Curies discovered the piezo-electric effect. (France)	HR	IRE	RE	CE		
	John Trowbridge predicted earth conduction wireless.	FA	WE				
	Elster and Hans Geitel experimented with diode tubes.	HR	MA				
1881	A.G. Bell signalled one mile between two ships by water conduction.	FA	TU				
1882	Prof. A.E. Dolbar took out second wireless patent an electro-static effair and worked thirteen miles; the second to use antenna.	FA	HR	DU	CE		
1883	Thomas Edison discovered electron flow in lamps. (Edison effect)	DU	MA	CE			
1884	Paul Nipkow of Germany, was granted patents on TV scanning disks.	DU	IRE	CE			
	Sir Oliver Lodge demonstrated an electric smoke precipator.	CR	RE				
1885	Thomas Edison patented induction wireless for railroad trains.	FA	DU				
1886	Alternating current utilized for first time in the United States in a commercial lighting system.						
1887	And 1888 Heinrich R. Hertz verified Maxwell's theories.	SS	IRE	SC	EB		
1889	Hertz theorized skin effect and proved this theory.	FA					
1890	Julius Elster and Hans Geitel developed first phototube.	HR					
1891	Prof. E. Branley discovered loose filings changed their resistance when sparks occurred nearby. (Developed coherer)	DU	TU	FA	AC	IRE	CE
	Nikola Telsa granted U.S. patent on his Tesla coil.	HR	BL				
	Prof. John Trowbridge theorized electro-magnetic wireless. (2/21/91)	FA	SA				
1892	Sir William Crookes suggested Hertz experiments for Wireless.	AC	HR	FA			
	Elsterand Geitel devised a crude photo-electric cell.	IRE					
1893	Sir Oliver Lodge used Branley's coherer with a clock decoherer.	TU	FA	IRE			
	J.J. Thomson suggested radio waves in hollow pipes.	IRE					
1894	S.W. Preece suggested working planet Mars by wireless Tel.	FA					
1895	Prof. Popoff, a Russian, made the first practical use of wireless as a storm detector.	FA	RT	HR			
	Von Long Victor propagated radio waves in hollow pipes.	IRE					
	Marconi sent and received his first signals.	MR	HR				
	Ernst Rutherford developed the magnetic detector.	FA	DU	MA			
	Emile Berliner obtained a patent for recording sound on a disc.	HR					
	Alexander S. Popoff reported he had transmitted and received radio signals 600 yards utilizing Hertz apparatus and a coherer.						
1896	Telsa patented a rotary gap, transmitted radio power and controlled torpedoes.	DU	RE				
	Lord Kelvin sent first paid wireless message.	MR					
1897	Karl F. Braun made first cathode ray tube capable of scanning.	HR	DU	IRE			
	Popoff noticed radio reflections from objects.	RT					
	J.J. Thomson showed that cathode rays were deflected by electric and magnetic forces and theorized electrons.	DU					
	Ernest Wilson granted patent on wireless controlled dirigible torpedoes.	SA					
	Oliver Lodge took out first patent on tuned W.T.	FA	FL	RE			
1898	Nikola Telsa transmitted power by W.T.	FA	HR	DU			
	Lloyds established three radio stations, one on northeast coast of Ireland, one on Rathlin Island Lighthouse and the other at Bally Castle. (England)	CE					

1899	S.G. Brown patented a direction finder by wireless using a reflector.	KE	IRE		
	U.S. Signal Corps established W.T. between Fire Island and lightship.	IRE			
	First wireless newspaper on ship on the SS St. Paul.	SA	CE		
	● East Goodwin Sands lightship received assistance by W.T.	MR	HR	SWP	
	The first American radio company, the American Wireless Telephone & Telegraph Co., was incorporated. This company obtained the Dolbear patents. Harry Shoemaker and John Greenleaf Pickard were its radio engineers. (Sept.)	CE			
	The first official U.S. Navy radio message, from Blish to the Navy Department, was transmitted by Marconi. (30 Sept.)	CE			
	Marconi Wireless Telegraph Co. of America organized. (22 Nov.)	CE			
1900	Marconi suggested direction finder with parabolic reflectors (12/29/00)	SA			
	Poulson invented first tape recorder, or rather wire recorder.(10/6/00)	DU	SA		
	Fessenden radiophoned one mile using 10,000 spark. Quality poor.	GO	HR	MA	
	K.E. Guthrie deduced coherer action due to ion transfer. (9/29/00)	TR	SA		
	M. Willet theorized RF left bottom of antenna instead out of top. (10/6/00)	SA			
	Nikola Tesla suggested W.T. to determine course, speed and position of moving objects.	DU	IRE		
	● First full time W.T. operator, F.S. Stacy, SS Princess Clementine.	SWP			
	Nikola Tesla granted a U.S. patent on control of distant objects by radio.	CE			
	The Wireless Telegraph and Signal, Ltd., reorganized as the Marconi Wireless Telegraph Co., Ltd. (England)	CE			
1901	Inter-island W.T. established Hawaiian Island.	MR	CE		
	Deforest applied for patent using inverted L for D.F.	DE			
	● Marconi sent first trans-Atlantic signal "S" sent by Sydney Maddams. (Dec. 12)	MR	IRE	SWP	
	First Morse code omigraph.	SA			
	Telsa patented Tikker for CW reception.	BL			
	Slaby invented duplex wireless. (3/9/01)	SA			
	Munday & Gray first to use underwater signalling.	HR			
	The Wireless Telegraph Co. of America (DeForest) organized.	CE			
1902	First news gathering by W.T. in Paris. (11/1/02)	SA			
	Fessenden patented electrolytic detector.	DU	RN	SC	
	Marconi introduced magnetic detector, based on Rutherford's work. (10/4/02)	RN	MA	SA	
	Valdemar Poulsen obtained RF from hydrogen arc.	BL	DU	SA	
	Cornelius Dehret patented FM system using spark.	HR	IRE		
	Stock promoters selling stock at $.75 a share.	DE	HR		
	Fessenden patented idea for recording signals on photo paper.	BL			
	John John Stone, Arthur Kennely & Oliver Heaviside theorized ionsphere.	DU			
	John John Stone patented a four circuit tuner.	DU			
	Francis McCarty first radiophone in Western America.	SWP			
	The De Forest Wireless Telegraph Co. incorporated. It absorbed the Wireless Telegraph Co. of America. (Feb.)	CE			
	U.S. Navy constructed radio stations at Annapolis, Md., and Washington, D.C., for testing and evaluating radio apparatus.	CE			
	Marconi introduced the magnetic detector. (England) He was granted four U.S. patents on this device. (25 June)	CE			
1903	Los Angeles - Avalon and Nome - St Michaels Alaska wireless opened.	DE	MR		
	Cooper Hewitt announced his mercury rectifier lamp.	IRE			
	First International Radio Conference at Berlin. All stations work each other, use SOS, all help in distress calls & no monopoly. (10/3/03)	HR	IRE		
	General Electric developed first R.F. Alternator.	HR	DU		
	First criminal arrest by wireless; Avalon - LA net.	RE			
	Slaby & Arco developed the German Telefunken system.	DU			
	The International Wireless Co. was incorporated and absorbed the Consolidated Wireless Co. (Feb.)	CE			
	Fessenden patented the "Barretter," an electrolytic detector. (5 May)	CE			
	Eight major ships of U.S. Navy were fitted with radio. Five naval shore radio stations of the North Atlantic coast were placed in operation.	CE			
	The SS CAMPANIA began publishing first daily shipboard newspaper from information and news items provided by radio.	CE			
	A radio school was established at the Brooklyn Navy Yard to provide electrician's mates instruction in radio operation and maintenance.	CE			
	De Forest was granted U.S. Patent on a magnetic detector.	CE			
1904	Fleming patented his diode tube.	DU	MA	IRE	
	U.S. Signal Corps finished installing 2,600 miles of cable, 1,400 miles of wirelines and many wireless stations in Alaska.	SQ	IRE		
	Shoemaker and John Forth formed the I.T. & T.	HR	CE		
	U.S. Navy started sending time signals. (Aug 9 - NAA)	HR	CE		
	Arthur Korn developed wire facsimile.	DU			
	McQueen received wireless signals in balloon at Worlds Fair.	DE			

* A historian ought to be exact, sincere, and imporatial; free from passion, unbiased by interest, fear resentment, or affection; and faithful to the truth which is the mother of history, the preserver of great actions, the enemy of oblivion, the witness of the past, the director of the future.

1905	U.S. Navy adopted the continental code. Before Morse code had been used frequently causing much confusion.	HR			
	The U.S. Navy issued the first "International Radio Call Sign Book."	CE			
1906	First ham radio shop; Hugo Gernsback's Electric Importing Co.	RE			
	First radio advertisement. Gernsback's Electric Imp. Co. (1/13/06)	SA			
	Prof. Ferdinand Braun perfected a DF antenna using phasing. (2/3/06)	SA			
	Admiral Togo won his historic naval battle against the Russians with a big assist from wireless. It was the first time WT was used in battle, although used in the Boer War, but not in battle. (2/3/06)	DE	SA		
	DeForest, with the assistance of Clifford Babcock, added his famous grid to the Fleming diode and electronics was on its way. (Oct. 25)	DE	DU	IRE	CE
	Fessenden broadcasted voice from Brant Rock, Mass., using a 80KC Alexanderson alternator.	HR	DU	MA	CE
	Dr. Arthur Korn, using selenium cell and geissler tube developed another facsimile system.	SA			
	Second International Radio Conference in Berlin.	HR	CE		
	First use of WT in a disaster, San Francisco earthquake. Via USS Chicago.	HR	CE		
	Amateur and commercial radio interferences in the Boston area prevented transmission of messages to President Roosevelt in the U.S.S. MAYFLOWER.	CE			
	De Forest applied for a U.S. patent on the three-element vacuum tube. (25 Oct.)	CE			
	General H.C. Dunwoody, USA (retired), discovered the rectifying properties of carborundum crystals.	CE			
	John Greenleaf Pickard discovered the rectifying properties of silicon.	CE			
	United Wireless Telegraph Co. organized by Abraham White (Schwartz).	CE			
1907	First radiophone broadcast by arc.	DE	RE		
	G.W. Pickard & Gen. Dunwoody simultaneously developed the first solid state device, the cat-whisker detector. (9/13)	DU	IRE	MV	
	Deforest & Marconi reported the International Yacht race by WT.	DE			
	Hugo Gernsback remotely controlled a motor by wireless.	RE			
	Boris Rosing and associates published a treatise on T.V.	HR	IRE		
	First trans-Atlantic commercial service started by wireless.	NP	IRE		
	Bellini & Tosi invented a D.F. system.	SC	EW		
	The U.S. Navy contracted for 26 sets of DeForest radio telephone equipment for installation on ships of the "Great White Fleet" prior to their departure on their "Around the World Cruise." (Nov.)	CE			
	Crystal detectors came into general use, replacing electrolytic detectors and coherers.	CE			
1908	Hans Knudsen demonstrated a crude wireless teletype. (10/31/08)	SA			
	First radio magazine, Modern Electrics started by Gernsbach.	RE			
	Hans Knudson also demonstrated facsimile, using a clock sync. (6/6/08)	SA			
	First Alaskan naval station "NPA" established at Cordova.	HR	CE		
	Nikola Tesla succeeded in lighting lamps ½ mile away by W.T.	RE			
	Valdemar Poulsen perfected an arc transmitter.	HR	DU		
	Herbert Wade demonstrated mechanical oscillograph. (3/14/08)	SA			
	Frederich Collins phones Philadelphia to Neward using an arc.	NP			
	The U.S.S. CONNECTICUT en route from Hawaii to New Zealand, exchanged messages with U.S. Naval Radio Station, Point Loma, Calif., at a distance of 2,900 miles.	CE			
1909	First SOS sent by an American ship -- SS Arapahoe (Aug. 11 1909 T.D.Haubner W/O) Previously CQD - come quick distress - had been used.	NP	SWP		
	Hugo Gernsback proposed sub-carriers for TV.	RE			
	First and probably only known case of a ham sending a false distress signal. No law against it then. (6/5/09)	SA			
	Bellini & Tosi perfected their famous D.F. system.	RE			
	Prof. J.E. Taylor also theorized the ionsphere. (6/5/09)	SA			
	Ernest Ruhmer developed a crude TV showing geometric figures. (8/7/09)	GI	SA		
	Time ticks started from "FL" Eiffel Tower.	BL			
	Frederick Kolster patented his radio goniometer.	DU			
	Telefunken Company produced a quench gap.	HR			
	● The SS REPUBLIC collided with SS FLORIDA off New York. Radioed calls for assistance resulted in keeping the loss of lives down to six persons and created such an impression upon the public that radio soon became looked upon as a seagoing necessity.	CE			
1910	First practical radiophone broadcast was an opera by DeForest.	DE	RE		
	First U.S. law requiring radio on all ships. Public Law 262.	CE	IRE	HR	PO
	First rescue of airship crew by wireless in attempted trans-Atlantic flight - Wellman expedition. Jack Irwin Op.	NP			
	First ham radio association. Wireless Assn. of America.	RE			
	Elmo N. Pickerill first wireless contact from plane to ground.	AP			
1911	James Baskerville received #1 Certificate of Skill, from Dept. of Commerce. This was before FCC licenses.	SWP			
	Federal Telegraph Co. incorporated with Poulson arc patents.	HR	SC	CE	
	Norman Bardon & Lyle Dobbs photographed bullets in flight.	MV			
	Hugo Gernsback predicted radar and gave essential elements.	RE			
	First scientific fiction, much of which has already proven correct published by Hugo Gernsback.	RE			

1911	Elmo Pickerell received first government radio license.	NP
	The Radio Ship Act of 1910 became effective. The Radio Division of the Department of Commerce and Labor was established to enforce this law.	CE
1912	Deforest and Armstrong both invented regeneration. Eventually De-Forest won the lawsuit after years of litigation.	DE SC IRE
	F.A. Kolster developed a decrometer for R.F. measurements.	DU HR CE
●	Titanic sank ,at 2.20AM Apr. 15 1914. Wireless saves over 700 lives.	NP MA RE
	John Hogan patented a single dial tuning system.	DU
	Lee Deforest was acquitted of all charges of fraud in stock sales.	DE HR
	With the help of J.J. Stone, Deforest used tubes in cascade.	DE HR MA DU
	Start of Institute of Radio Engineers, now IEEE.	IRE
	First International Radio Convention to be signed by the U.S.	IRE
	United Wireless bankrupt and assets taken over by Marconi Co.	HR SC CE
	First successful telephone amplifier.	DE MA
	Languir developed high vacuum tubes with thorated filaments.	HR SC IRE
	Navy established stations at Unalaga, Kodiak, St. George, Alaska.	HR
	Radio act of 1910 amended to require 24 hour watch on passenger ships.	SC IRE
	The U.S. Navy was directed to use the term "radio" in lieu of "wireless"	CE
	The Third International Radio Conference convened in London.	CE
	The Fessenden 100-kw. synchronous rotary spark transmitter was installed at the U.S. Naval Radio Station, Radio (Arlington) Va. (Dec.)	CE
	The Tropical Radio Co., subsidiary of the United Fruit Co., purchased the controlling interest in the Wireless Specialty Apparatus Co.	CE
1913	First wireless operator strike. (3/29/13)	NP
	First Beveredge 4,000 feet long above ground. (3/29/13)	SA
	S.F. - Honolulu high power circuit commissioned.	SC
	The U.S. Naval Radio Station, Radio (Arlington), Va., was commissioned. (13 Feb.)	CE
	Edwin H. Armstrong filed patent application on the regenerative circuit. (29 Oct.)	CE
	Radio received major consideration at the Safety at Sea Conference held in London. (12 Nov.)	CE
1914	● American Radio Relay League "ARRL" founded.	AA RE
	Dr. Langmuir invented thyatrons.	IRE
	NBA Darien C.Z. commissioned. 100KW first of high power chain.	CE HR SC
	The Marconi Wireless Telegraph Co. of America radio station at Siasconsett, Mass., ignored censorship and rendered nonneutral service to a British cruiser. The station was closed by the Navy. (Sept.)	CE
	The high-powered radio station at Tuckerton, N.J., was taken over and operated by the Navy. (9 Sept.)	CE
1915	First transcontinental telephone service.	NP
	NAA sent phone bdc heard in Hawaii and Paris. (500 VT-1 tubes) in parallel.	NP SC EW IRE
	F.A. Kolster invented first loop D.F. antenna.	IRE
1916	Charles Franklyn invented a H.F. beam antenna.	DU
	William Dublier manufacturing high voltage mica condensers.	DU
	NPO (300-KW), NPM (300-KW), and NPL (200-KW) commissioned.	HR
	The U.S. Naval Radio Station, Chollas Heights (San Diego), Calif., equipped with a 200-kw. arc transmitter, was commissioned. (1 May)	CE
	Transpacific commercial radio circuit was opened to traffic, by U.S.N. (5 Nov.)	CE
1917	Alexanderson 200KW R.F. alternator commissioned at NFF New Brunswick.	DU
	U.S. declared war on Germany. All ham & commercial stations closed.	NP
	Schools for the training of radiomen were established at Harvard University, Cambridge, Mass., and Navy Yard, Mare Island, Calif. The two schools had a combined capacity for training 5,000 men.	CE
1918	NSS Annapolis commissioned. 300KW XMTR	HR
	Three Naval D.F. stations established in New York vicinity.	HR
	Fessenden developed a crude sonar.	DU
	Oct. 12th, Germany surrendered.	NP
	The first successful flight of a pilotless aircraft achieved. It was launched by the impulse-type catapult, after which it climbed steadily and flew in a straight line for 1,000 yards, at which distance the automatic distance gear was set to cut the throttle.	CE
	The Navy acquired the patents of the Federal Telegraph Co. and their three high-power and five coastal radio stations for $1,600,000. (15 May)	CE
	Construction of the Lafayette transmitter station at Croix de Hins, France, was commenced by the U.S. Navy. (28 May)	CE
	The Navy installed the General Electric 200-kw. Alexanderson alternator at the Naval Radio Station, New Brunswick, N.J., making it the world's most powerful transmitting station. (June)	CE
	The Navy purchased all shipboard and shore station installations of the Marconi Wireless Telegraph Co. of America for the U.S. Government except those used for transoceanic communications.	CE

1919	R.C.A. incorporated. Marconi Wireless Telegraph Co. of America ceased operations.	NP CE
	Navy first to use voice between plane and ground.	HR CE
	NC-4 first trans-atlantic flight equipped with radio.	NP
	Frank Conrad made schedule broadcasts from his ham station, which became KDKA.	NP DU SC IRE
	W. Schottky, a German, perfected screen grid tubes.	IRE
	● First Air Mail Station WWX commissioned by Oscar Nauck. Now under the Federal Aviation Admn.	SWP
	The Radio Test Shop, USN, designed the SE 1420 (40-1250 kc.) receiver. This was thoroughly shielded and was the first radio receiver built with an amplifier as an integral part of the set.	CE
	The President, by Executive order, directed the Navy to return commercially owned radio stations as of midnight, 29 Feb. 1920. (1 July)	CE
1920	Armstrong received his super-hetrodyne patent.	HR SC
	Albert Hull invented the magnetron.	DU
	Frank Conrad broadcasted Harding-Cox election returns.	SC
	The Navy returned the commercially owned radio stations, taken over at the beginning of the war, to the Radio Corp. of America, which resumed commercial operations of them on the same day. (1 Mar.)	CE
	The Lafayette transmitting station, equipped with two 1,000 kw. arc transmitters, was completed and turned over to the French Government. (15 Nov.)	CE
1921	Federal Telegraph Co. completed their LA, SF, Hillsboro, Ore. arc circuit. Shortly after by Morse wire to Seattle. (9/3/21)	SA
	First network bdc; Dempsey - Carpentier fight.	NP
	First radiophone to ships; Deal Beach to SS America.	DU
	First town to be named Radio; NAA Virginia.	NP
	First religious bdc. Xavary Episcopal church via KDKA. (8/23)	NP
	Ham transatlantic tests. 27 U.S. stations heard in Scotland. (12/56)	HR QST CE
	Detroit police started broadcasting to patrol cars. Poor results.	HR
	LA-Avalon circuit changed from W.T. to radiophone. (11/21)	SA
1922	Major Armstrong announced his super-regenerative circuit.	HR
	W.G. Cady proposed a pieso-electric resonator for frequency control.	IRE
	V.K. Zworkin displayed a TV kinescope.	IRE
	J.L. Baird & Charles Jenkins both demonstrated a crude TV.	IRE DU
1923	Hazeltine announced his neutradyne receiver. (5/31)	DU IRE RE
	Someone emitting strange VLF signals. Some thought from Mars.	OWN
	Steinmats theorized no luminous aether.	LO
	Charles Jenkins transmitted facsimile pictures by radio.	DU HR
	Clarence Hansel developed a single sideband circuit.	DU
1924	H.C. Harrison patented an electronic phonograph. (4/51)	RE
	Vladimar K. Zworykin demonstrated his TV iconoscope & kinescope.	DU
	Harold Beveredge demonstrated a diversity antenna system.	DU
	First transatlantic transmission of radio photo made by the Radio Corp. of America. (6 June)	CE
1925	Prof. Eddington also said there is no aether. (8/25)	RE
	First AC tubes appear. (4/58)	RE
	Lt. Fred Schnell accompanied Pacific Fleet to prove H.F. useful.	HR
	Arthur Taylor probed the ionsphere and measured the heighth.	DU
	Charles Jenkins demonstrated a mechanical TV.	DU GI IRE
	Clarence W. Hansel used FM.	DU
1926	John Baird demonstrated an infrared detector, forerunner of modern snooperscopes. (5/27)	PR
	H.A. Wheeler developed AVC.	IRE
	National Broadcast Co. incorporated.	SC
1927	First commercial transatlantic phone link.	RE
	P.T. Farnsworth filed for a patent on an all electronic TV system.	HR DU
	Bell Telephone demonstrated a mechanical wire TV between New York and Washington.	HR IRE
	First successful radiophone system on a N.Y.C. freight train.	IRE
	Detroit police successful with patrol car radios.	IRE
	The Federal Radio Commission was appointed. Rear Adm. W.H.G. Bullard, USN (retired), was the first chairman of the commission. (2 Mar.)	CE
1928	First LF radio ranges for aircraft guidance being installed.	HR
	John L. Baird demonstrated another mechanical TV system.	DU
	Dr. V.K. Zworykin filed first patent on a color TV.	HR
	RCA W2XBS first to go on air with a mechanical TV system.	IRE
1929	Application filed for patent on co-ax cable system.	HR
	Fourth International Radio Conference. Mostly on frequencies.	NP NP HR
	Navy conducted experiments on radio-teletypes.	HR
	A.W. Hull & I. Langmuir introduced thyratrons.	IRE
	Stuart Ballantine developed variable mu tubes.	DU
	James Doolittle made first successful blind landing by plane.	F.H.
	Application for a patent on the Espenschied-Affel coaxial transmission cable was made. (23 May)	CE

1929	Rear Adm. R.E. Byrd, USN, (retired), flight over the South Pole was announced by radio from Little America, Antarctica.	CE
1930	E. Alexanderson demonstrated seven foot TV using neon light.	DU
	Wolf Hart applied for a patent on a radio altimeter.	IRE
	Direct commercial radio communications finally established between the United States and China.	CE
1931	L.A. Hyland and Albert Taylor developed their radar system.	HR
	First radio glide path landing device tested.	FH
1932	Julius Lilienfield demonstrated a solid state amplifier.	RE
	Fifth International Radio Conference at Madrid.	NP
1933	TV iconoscope - TV camera tube - perfected after ten years deep research by Zworykin and RCA lab. staff.	IRE
1934	Major Edwin Armstrong announced his perfected FM system.	IRE
	● Federal Communication Commission established.	IRE HR
	Supreme Court decided in Deforest's favor on feedback circuit.	DE
	Dr. Zworykin again proposed that the Navy investigate guided missiles, but was turned down.	HR
	The US Navy developed their first radar.	HR
1935	John H. Dellenger demonstrated that the sun's activity affected radio.	DU
	Ernst Alexanderson patented a DC to AC converter.	DU
1936	RCA demonstrated facsimile using U.H.F.	HR
	British Broadcasting Co. started broadcasting TV.	IRE
	Navy developed the radar duplexer.	IRE
	Bell Telephone developed co-ax cables and wave guides.	HR IRE
	Nils B. Lindenblad developed a wideband TV antenna.	DU
	● Frederick Stephens op. on first Pan American flight to Orient.	SWP FH
1937	Dr. Zworykin demonstrated a complete electronic TV system.	HR
	Philco demonstrated a TV system working three miles.	HR
	Navy drone plane completely controlled by radio.	HR
	First wholly automatic radio blind landing made successfully.	FH
1938	Navy demonstrated a successful pulse radar with duplexer.	IRE
	George Southworth working on wave guides.	DU
	Bell Telephone demonstrated a radio altimeter.	HR
	Sixth Radio Conference held in Cairo with frequency problems.	HR
	Alaska Aeronautical Comm. established six aviation stations in Alaska.	SWP
1939	● England & France declared war on Germany. Non-war radio stopped.	NP
	Russel H. Varian and associates developed the Klystron.	DU
	Robert Dutton op. on first transatlantic airmail flight.	SWP
1940	British Robert Watson Watt produced a magetron & Microwave radar.	DU
	FM broadcasting stations on the air.	HR
	Alfred L. Loomis suggested Loran	Loomis
	Regular TV inaugurated and first TV network.	HR IRE
	Western Electric awarded contract for fire control radar.	HR
1941	Dr. R.M. Page developed PPI radar.	HR
	Navy successfully tested guided missiles.	HR
	British scientists developed strapped magnetron.	HR
	● Japan attacked Pearl Harbor on seventh December.	NP
1942	Natl. Bureau of Standards developed printed circuits.	IRE
	Proximity fuse trials successful.	HR
	Several Loran stations commissioned.	HR
	Manufacturing of radios and phonographs stopped.	HR
	CAA commissioned overseas stations, SF, Honolulu, Everett, Anchorage.	FH SWP
1943	USS Helena fired first proximity fuse in combat.	HR
1944	Navy tested radio-teletypes for ships.	HR
1945	● Germany surrendered May seventh and Japan Aug. 14th.	NP

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HISTORICAL DATES

INTERNATIONAL "Q" SIGNALS

ALPHABETICAL LIST OF "Q" SIGNALS

Abbrev.	Question	Answer or Advice
QRA	What is the name of your station?	The name of my station is....
QRB	How far approximately are you from my station?	The approximate distance between our stations is....nautical miles (or kilometers).
QRC	By what private enterprise (or State Administration) are the accounts for charges for your station settled?	The accounts for charges of my station are settled by the private enterprise....(or State Administration).
QRD	Where are you bound for and where are you from?	I am bound for.....from.....
QRE	What is your estimated time of arrival at ..... (or .. over.....) (place)?	My estimated time of arrival at.... (or over....) (place) is....hours
QRF	Are you returning to ..... (place)?	I am returning to....(place) (or) Return to....(place).
QRG	Will you tell me my exact frequency (or that of.....)?	Your exact frequency (or that of....) is....kc/s (or Mc/s).
QRH	Does my frequency vary?	Your frequency varies.
QRI	How is the tone of my transmission?	The tone of your transmission is.... 1. good 2. variable 3. bad
QRJ	How many marine telephone calls have you to book?	I have....marine telephone calls to book.
QRK	What is the intelligibility of my signals (or those of....)?	The intelligibility of your signals (or those of....) is.... 1. bad 2. poor 3. fair 4. good 5. excellent
QRL	Are you busy?	I am busy (or I am busy with....). Please do not interfere.
QRM	Are you being interfered with?	I am being interfered with.... 1. nil 2. slightly 3. moderately 4. severely 5. extremely
QRN	Are you troubled by static?	I am troubled by static.... 1. nil 2. slightly 3. moderately 4. severely 5. extremely
QRO	Shall I increase transmitter power?	Increase transmitter power.
QRP	Shall I decrease transmitter power?	Decrease transmitter power.
QRQ	Shall I send faster?	Send faster (....words per minute).
QRR	Are you ready for automatic Operation?	I am ready for automatic operation. (Send at....words per minute.)
QRS	Shall I send more slowly?	Send more slowly (....words per minute).
QRT	Shall I stop sending?	Stop sending.
QRU	Have you anything for me?	I have nothing for you.
QRV	Are you ready?	I am ready.
QRW	Shall I inform....that you are calling on him.... kc/s (or Mc/s)?	Please inform....that I am calling him on....kc/s (or Mc/s).
QRX	When will you call me again?	I will call you again at....hours on....kc/s (or Mc/s).
QRY	What is my turn? (Relates to communication)	Your turn is Number....(or according to any other indication). (Relates to communication)
QRZ	Who is calling me?	You are being called by....on... kc/s (or Mc/s).
QSA	What is the strength of my signals (or those of....)?	The strength of your signals (or those of....) is..... 1. scarcely perceptible 2. weak 3. fairly good 4. good 5. very good.
QSB	Are my signals fading?	Your signals are fading.
QSC	Are you a cargo vessel?	I am a cargo vessel.
QSD	Is my keying defective?	Your keying is defective.
QSE	What is the estimated drift of the survival craft?	The estimated drift of the survival craft is....(figures and units).
QSF	Have you effected rescue?	I have effected rescue and am proceeding to....base (with....) persons injured requiring ambulance.
QSG	Shall I send....telegrams at a time?	Send....telegrams at a time.
QSH	Are you able to home on your D/F equipment?	I am able to home on my D/F equipment (on station....).
QSI		I have been unable to break in on your transmission. (or) Will you inform....(call sign) that I have been unable to break in on his transmission on....kc/s (or Mc/s).
QSJ	What is the charge to be collected to....including your internal charge?	The charge to be collected to.... including my internal charge is.... francs.
QSK	Can you hear me between your signals and if so can I break in on your transmission?	I can hear you between my signals; break in on my transmissions.
QSL	Can you acknowledge receipt?	I am acknowledging receipt.
QSM	Shall I repeat the last telegram which I sent you (or some previous telegram)?	Repeat the last telegram which you sent me (or telegram(s) number(s)....).
QSO	Can you communicate with....direct (or by relay)?	I can communicate with....direct (or by relay through....).
QSP	Will you relay to....free of charge?	I will relay to....free of charge.
QSQ	Have you a doctor on board (or is....(name of person) on board?	I have a doctor on board (or.... name of person) is on board).
QSR	Shall I repeat the call on the calling frequency?	Repeat your call on the calling frequency; did not hear you (or have interference).
QSS	What working frequency will you use?	I will use the working frequency.... kc/s (normally only the last three figures of the frequency need be given).
QSU	Shall I send or reply on this frequency (or on....kc/s (or Mc/s) with emissions of class....).	Send or reply on this frequency (or on....kc/s (or Mc/s) with emissions of class).
QSV	Shall I send a series of V's on this frequency (or.... kc/s (or Mc/s)?	Send a series of V's on this frequency (or....kc/s (or Mc/s).
QSW	Will you send on this frequency (or on....kc/s (or Mc/s) with emissions of class)?	I am going to send on this frequency (or on....kc/s (or Mc/s) with emissions of class....).
QSX	Will you listen to....(call sign(s)) on ... kc/s (or Mc/s)?	I am listening to.... (call sign(s)) on ....kc/s (or Mc/s).
QSY	Shall I change to transmission on another frequency?	Change to transmission on another frequency (or on....kc/s (or Mc/s).
QSZ	Shall I send each word or group more than once?	Send each word or group twice (or ....times).
QTA	Shall I cancel telegram number....?	Cancel telegram number....
QTB	Do you agree with my counting of words?	I do not agree with your counting of words; I will repeat the first letter or digit of each word or group.
QTC	How many telegrams have you to send?	I have....telegrams for you (or for....).
QTD	What has the rescue vessel or rescue craft recovered?	...(identification) has recovered.... 1.....(number) survivors 2. wreckage 3.....(number) bodies.
QTE	What is my TRUE bearing from you? or What is my TRUE bearing from....(call sign)? or What is the TRUE bearing of....(call sign) from....(call sign)?	Your TRUE bearing from me is.... degrees at....hours. or Your TRUE bearing from....(call sign) was....degrees at....hours. or The TRUE bearing of....(call sign) from....(call sign) was....degrees at....hours.
QTF	Will you give me the position of my station according to the bearings taken by the D/F stations which you control?	The position of your station according to the bearings taken by the D/F stations which I control was....latitude ....longitude (or other indication of position), class....at....hours.

(Extracted from APP. 13, Radio Regulations, Geneva, 1959)

QTG	Will you send two dashes of ten seconds each followed by your call sign (repeated ....times) (on....kc/s (or Mc/s)? or Will you request....to send two dashes of ten seconds followed by his call sign (repeated....times) on.... kc/s (or Mc/s)?	I am going to send two dashes of ten seconds each followed by my call sign (repeated....times) (on.... kc/s (or Mc/s). or I have requested....to send two dashes of ten seconds followed by his call sign (repeated....times) on.... kc/s (or Mc/s).
QTH	What is your position in latitude and longitude (or according to any other indication)?	My position is....latitude....longitude (or according to any other indication).
QTI	What is your TRUE track?	My TRUE track is....degrees.
QTJ	What is your speed? (Requests the speed of a ship or aircraft through the water or air respectively).	My speed is....knots (or.... kilometres per hour or....statute miles per hour). (Indicates the speed of a ship or aircraft through the water or air respectively).
QTL	What is your TRUE heading?	My TRUE heading is....degrees.
QTM	What is your MAGNETIC heading?	My MAGNETIC heading is.... degrees.
QTN	At what time did you depart from....(place)?	I departed from....(place) at.... hours.
QTO	Have you left dock (or port)?	I have left dock (or port).
QTP	Are you going to enter dock or (or port)?	I am going to enter dock (or port).
QTQ	Can you communicate with my station by means of the International Code of Signals?	I am going to communicate with your station by means of the International Code of Signals.
QTR	What is the correct time?	The correct time is....hours.
QTS	Will you send your call sign for tuning purposes or so that your frequency can be measured now (or at.... hours) on....kc/s (or Mc/s)?	I will send my call sign for tuning purposes or so that my frequency may be measured now (or at....hours) on....kc/s (or Mc/s).
QTT		The identification signal which follows is superimposed on another transmission.
QTU	What are the hours during which your station is open?	My station is open from....to.... hours.
QTV	Shall I stand guard for you on the frequency of....kc/s (or Mc/s) from....to.... hours?	Stand guard for me on the frequency of....kc/ s(or Mc/s) from.... to....hours.
QTW	What is the condition of survivors?	Survivors are in....condition and urgently need....
QTX	Will you keep your station open for further communication with me until further notice (or until....hours)?	I will keep my station open for further communication with you until further notice (or until....hours).
QTY	Are you proceeding to the position of incident and if so when do you expect to arrive?	I am preceding to the position of incident and expect to arrive at.... hours (on....(date).
QTZ	Are you continuing the search?	I am continuing the search for.... (aircraft, ship, survival craft, survivors or wreckage).
QUA	Have you news of....(call sign)?	Here is news of....(call sign).
QUB	Can you give me in the following order information concerning: the direction in degrees TRUE and speed of the surface wind; visibility; present weather; and amount, type and height of base of cloud above surface elevation at.... (place of observation)?	Here is the information requested: .... (The units used for speed and distances should be indicated)
QUC	What is the number (or other indication) of the last message you received from me (or from....(call sign)?	The number (or other indication) of the last message I received from you (or from....(call sign) is....).
QUD	Have you received the urgency signal sent by.... (call sign of mobile station)?	I have received the urgency signal sent by....(call sign of mobile station) at....hours.
QUE	Can you use telephony in .... (language), with interpreter if necessary; if so on what frequencies?	I can use telephony in....(language) on....kc/s (or Mc/s).
QUF	Have you received the distress signal sent by....(call sign of mobile station)?	I have received the distress signal sent by....(call sign of mobile station) at....hours.
QUH	Wiii you give me the present barometric pressure at sea level?	The present barometric pressure at sea level is....(units).
QUI	Are your navigation lights working?	My navigation lights are working.

(Extracted from APP. 13, Radio Regulations, Geneva, 1959)

Abbrev.	Question	Answer or Advice
QUJ	Will you indicate the TRUE track to reach you (or....)?	The TRUE track to reach me (or....) is....degrees at....hours.
QUK	Can you tell me the condition of the sea observed at ....(place or co-ordinates)?	The sea is....(place or co-ordinates) is....
QUL	Can you tell me the swell observed at....(place or co-ordinates)?	The swell at....(place or co-ordinates) is....
QUM	May I resume normal working?	Normal working may be resumed.
QUN	Will vessels in my immediate vicinity....? or (In the vicinity of....latitude ....longitude) or (In the vicinity of....) please indicate their position, TRUE course and speed?	My position, TRUE course and speed are....
QUO	Shall I search for.... 1. aircraft 2. ship 3. survival craft In the vicinity of....latitude ....longitude (or according to any other indication)?	Please search for.... 1. aircraft 2. ship 3. survival craft in the vicinity of....latitude.... longitude (or according to any other indication).
QUP	Will you indicate your position by.... 1. searchlight 2. black smoke trail 3. pyrotechnic lights?	My position is indicated by.... 1. searchlight 2. black smoke trail 3. pyrotechnic lights.
QUR	Have survivors.... 1. received survival equipment 2. been picked up by rescue vessel 3. been reached by ground rescue party?	Survivors.... 1. are in possession of survival equipment dropped by.... 2. have been picked up by rescue vessel 3. have been reached by ground rescue party.
QUS	Have you sighted survivors or wreckage? If so, in what position?	Have sighted.... 1. survivors in water 2. survivors on rafts 3. wreckage in position....latitude....longitude (or according to any other indication).
QUT	Is position of incident marked?	Position of incident is marked by.... 1. flame or smoke float 2. sea marker 3. sea marker dye 4. ....(specify other marking).
QUU	Shall I home ship or aircraft to my position?	Home ship or aircraft....(call sign).... 1. to your position by transmitting your call sign and long dashes on....kc/s (or Mc/s) 2. by transmitting on kc/s (or Mc/s) TRUE track to reach you.
QUW	Are you in search area designated as ...(designator or latitude and longitude)?	I am in the....(designation) search area.
QUY	Is position of survival craft marked?	Position of survival craft was marked at.... 1. flame or smoke float 2. sea marker 3. sea marker dye 4. ....(specify other marking).

COMMUNICATION CHART.

"PORTS O' CALL" (Vol. 4)

MARCONI TELEGRAPH

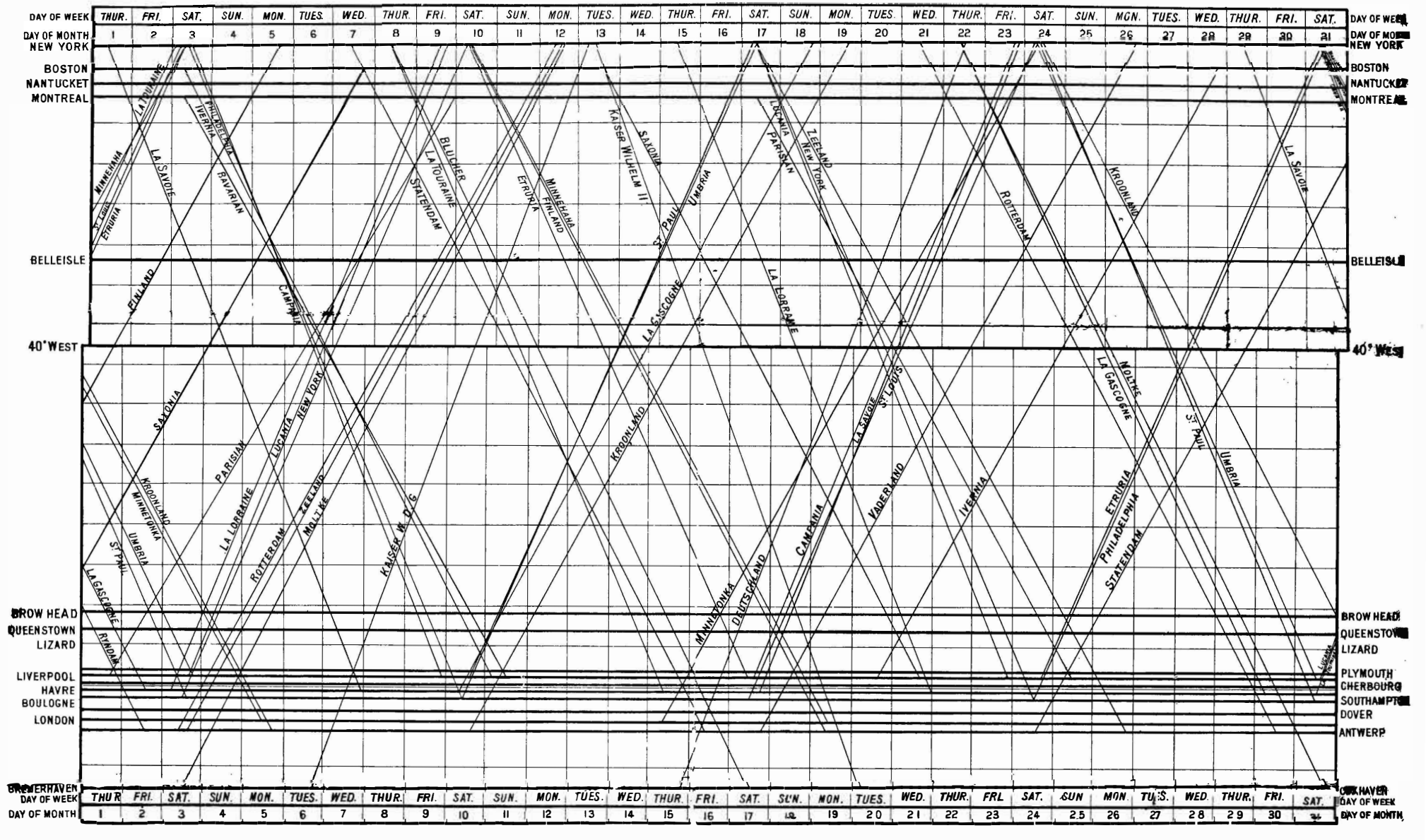
DECEMBER 1904.

THE MARCONI INTERNATIONAL MARINE COMMUNICATION Co LTD
18, FINCH LANE. LONDON .E.C.

24

TIME TO BE USED WEST OF 40° LONGITUDE NEW YORK TIME, EAST OF 40° LONGITUDE, GREENWICH TIME.
INTERSECTION OF LINES SHEWS EARLIEST TIME SHIPS CAN BE ABEAM AT BEST AVERAGE SPEEDS.

COMMUNICATION SHOULD BE ESTABLISHED AT EVERY INTERSECTION EXCEPT AT CERTAIN POINTS OF THE ROUTE WHEN ONE VESSEL IS ON THE NORTHERN AND THE OTHER ON THE SOUTHERN TRACK.
AN EXAMINATION OF A NORTH ATLANTIC TRACK CHART WILL SHEW THE DISTANCE BETWEEN ROUTES OF DIFFERENT SHIPS DURING ANY VOYAGE.



MARCONI TELEGRAPH.

COMMUNICATION CHART.

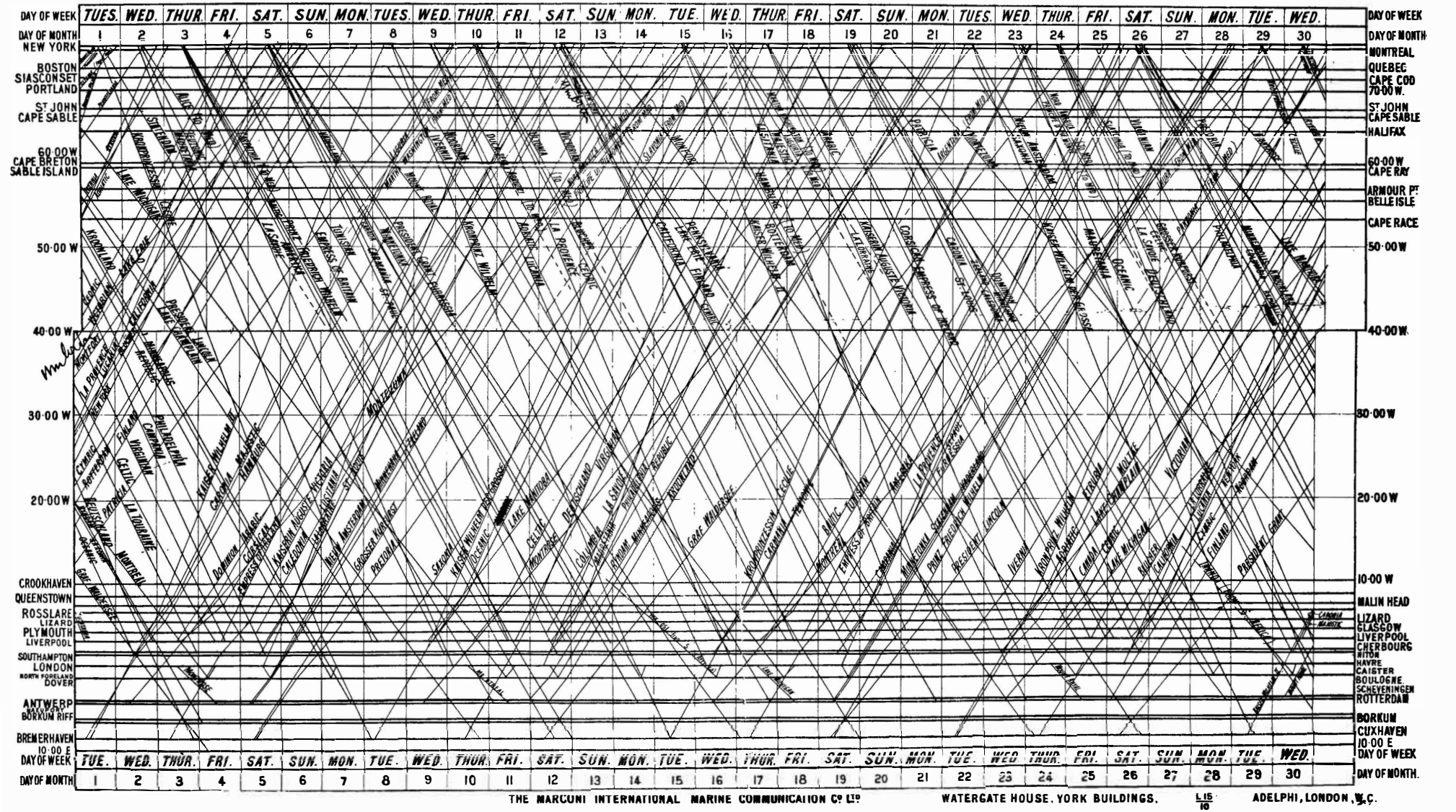
SEPTEMBER 1908.

25
"PORTS O' CALL" (Vol. 4)

EARLY DAY PROCEDURES

Wireless Men were supplied with these monthly charts for use in determining station and/or ship to work at given points of time and location while enroute over the North Atlantic bound to or from Europe to North America.

TIME TO BE USED WEST OF 40° LONGITUDE NEW YORK TIME, EAST OF 40° LONGITUDE GREENWICH TIME.
INTERSECTION OF LINES SHEWS EARLIEST TIME SHIPS CAN BE IN SAME LONGITUDE AT BEST AVERAGE SPEEDS
COMMUNICATION SHOULD BE ESTABLISHED AT EVERY INTERSECTION EXCEPT AT CERTAIN POINTS OF THE ROUTE WHEN ONE VESSEL IS ON THE NORTHERN AND THE OTHER ON THE SOUTHERN TRACK
EXAMINATION OF A NORTH ATLANTIC TRACK CHART WILL SHEW THE DISTANCE BETWEEN ROUTES OF DIFFERENT SHIPS DURING ANY VOYAGE.



THE MARCONI INTERNATIONAL MARINE COMMUNICATION Co LTD WATERGATE HOUSE, YORK BUILDINGS, L15/10 ADELPHI, LONDON, W.C.

Photo Credit - A.W. Filtness, VE7WZ

(Legend on Page 27 top

Staff...
Marconi Wireless Telegraph Co.,
of Canada, Ltd.
1923-24

TOP ROW (L/R):

C.J. CHANDLER started as boy learner in British Post office in 1902, telegraphist in 1903, became wireless operator in 1910; C.B. REESON not known; W.A. PIERCE lives in Victoria, B.C., approx 1915 to 1959, Empresses and Coast ships; LES M. SCOTT, 1918 to 1970, Empresses and Coast vessels, service man and office; W.S. MORSE, Empress of Australia about 1928, not known after that; W.I. BRUUM not known; C.C. SPRING, 1922 to 1960, Coasters and SS Canadian Transporter; H.A. HOOPER, Empress of Russia 1920 and left for DOT in 1924; C. BAILEY not known; R.W. WILLOUGHBY, Empress of Japan 1925 and left for Electric Co.; R.L. STEVENS, first manager for M.W.T. Co. of CANADA in Vancouver, temporary, went out on Empresses. Deceased.

2nd ROW:

I.B. PALMER not known; R.A. GREEN, Dollar ships, then to DOT; W.J. SHEEPWASH, Empresses and other deep sea vessels. Joined the COTC. Deceased; G. REES-THOMAS not known; L.S. HAWKINS, Australian went to Chelmsford, Eng. and took engineering in wireless and sent to Canada as Chief Eng. on Great Lakes. Came to Vancouver as Manager until retirement. Deceased; J.S. McLURE, Empresses and Coastwise; W.M. READE, Coastwise, reported died last week; C.H. GAGNON, Empresses; J. NEWBERG, Empresses, was C/O when Empress of Canada was torpedoed off African coast as troop ship WW-2. Joined COTC later, now deceased.

3rd ROW:

J.H. OLSON, Bessie Dollar 1922; W. NEWTON not known; J. HINDER, Empresses; A.V. SIMPSON, 1917 to 1970, Empresses and coastwise, now living in Penticton; E. HODGSON, deep sea vessels and left for the COTC, deceased; C.T. FOOT, Empresses and coastwise, deceased; C.F. CADIN not known; A. SUTTON not known.

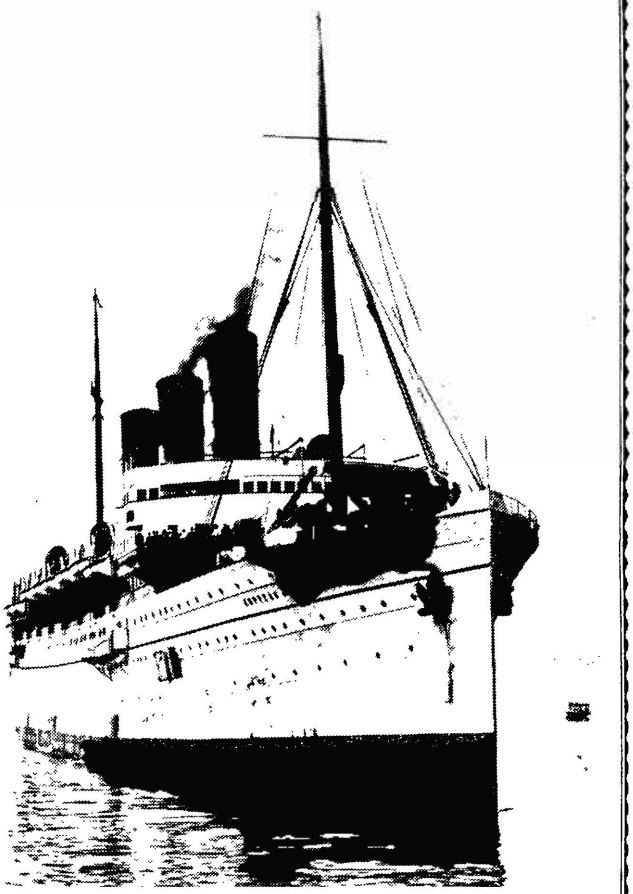
4th ROW:

W. HARKER, coastwise and went to DOT, retired last December 1971; H. LAKE, not known; W.G. TRICKER, Empresses and office, deceased; L. MAYNE, Head of Service Department about 1914 until retirement. Deceased; A.N. DENSEM, not known; MISS LACEY, L.S. Hawkins' secretary with CO until retirement. Deceased; A.W. FILTNESS, deep sea and coastwise until 1918 became assistant to L. Mayne. With Co. until 1964 retirement as technician, first class Wireless Certificate; A. HOOPER, Empresses and deep sea vessels. Left to go to Winnipeg Broadcast Stn.; P.A. LEONARD, 1910 to 1963. Deceased 1970; S.F. JONES, not known; R.D. THOMAS, Empresses and coastwise. Deceased.

5th ROW:

J.D. DOBELL, on Empresses and coastwise ships. Left after the WW-2 and joined the B.C. Police as R/O and when taken over by the Rcmp stayed with the RCMP until retirement as Sgt. Have tried to interest him several times in SWP; F. SHEEPWASH, Empresses and coastwise ships. Went to Port Alice as R/O until retirement. Was at the last Marconi Veterans meeting; B.H. ROBSON, not known; A. UNWIN, Empresses and coastwise ships, left to go to the DOT, still there; L.H. POCKETT, not known; G.H. HUDDELSTONE, Empresses and coastwise ships. Left for other employment; C.J. TEED, not known; L.G. BENT, Empresses and coastwise ships; E.J. McCRACKEN, not known; H.A. CONNELL, Empresses and coastwise ships. Deceased.

(◉) A.W. "Bill" Filtness is now the Area Director for Canada of the Society of Wireless Pioneers.



SS Empress of Russia

SS EMPRESS OF RUSSIA - VGKW

One of the first liners to have a cruiser stem, this ship was built at Govan, Scotland, and went into service in March 1913. For most of her years, she was operated by the Canadian Pacific Line in the trans-Pacific service, Vancouver to Yokohama.

She was refitted as a troop transport early in WW-1, and though chiefly engaged in carrying Canadian troops, occasionally sea-lifted U.S. troops. She then had a troop-carrying capacity of about 2,820 officers and men.

During World War Two, the "Empress" also did service as a trooper, her sailings being carried out under the direction of the British Ministry of War Transport. She was ruined by fire while refitting at the Vickers-Armstrong yard, in England. This happened in September 1945; in 1946 she was broken up for her scrap metal.

With an overall length of 590 feet and a 68-foot beam, the Empress of Russia had a gross tonnage of 16,810. She had a steam-turbine drive and four propellers. An extremely fast ship, she once held the east-bound trans-Pacific record of 8 days, 18 hours, and was rated at 20 knots (23.02 m.p.h.) The SS Empress of Asia, an identical sister ship was caught by Japanese aircraft off Singapore in February 1942, and was sent to the bottom with a heavy loss of life.

The "Empress" was HOME to many members of the Society's Chapters VI and XVI. These were sleek ships manned by very highly competant personnel, including the Wireless Officers.

Picture furnished by Harold R. Barger from his collection.

MARCONI IN CANADA FOR HISTORICAL TEST

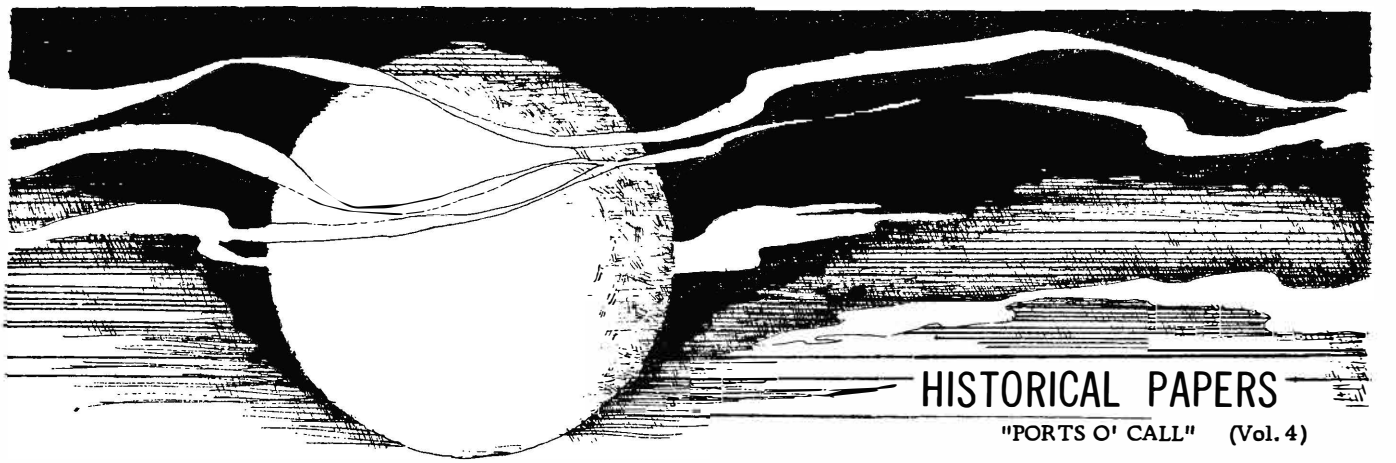
SIGNAL HILL, ST. JOHN'S, NEWFOUNDLAND, 1901

Top left:—Guglielmo Marconi

Top right:—Engineers preparing to fly the kite used by Marconi to support a long copper wire used as an aerial to pick up the radio signals from Poldhu, England.

Centre:—Signor Marconi seated before the coherer and other equipment used to receive the three dots of the letter "S" which was the radio signal received at Signal Hill from Poldhu, England. This was the first radio message to be received this side of the Atlantic.

Bottom:—On the steps of the Signal Hill station, G. Marconi with his engineers, G. S. Kemp (left) and P. W. Paget (right)



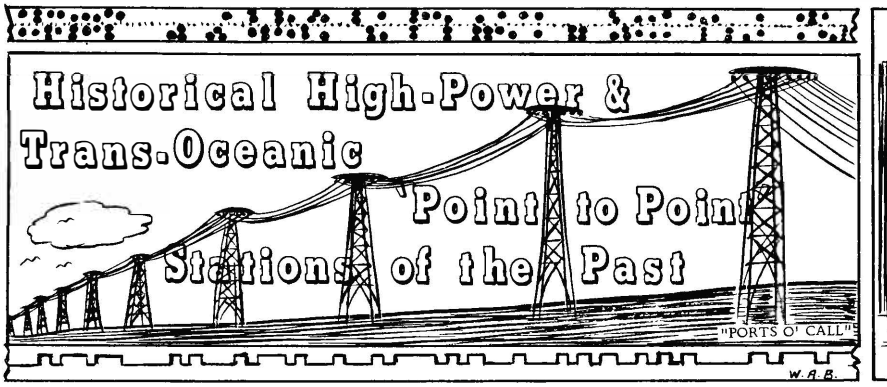
THE ALEXANDERSON 200-KW. HIGH-FREQUENCY ALTERNATOR TRANSMITTERS

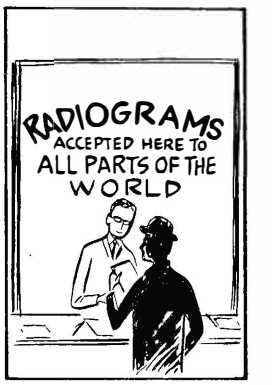
BY THORN L. MAYES

SOCIETY OF WIRELESS PIONEERS

"PORTS O' CALL"

DOCTOR ERNEST F. W. ALEXANDERSON—1878-1975





THE NEAR PERFECT SYSTEM

ALEXANDERSON ... AND HIS ALTERNATORS

By Thorn L. Mayes

Development of the Alexanderson 200 KW transmitters was a major breakthrough for wireless communication that was responsible for:

- The formation of the first major American controlled wireless communication company, Radio Corporation of America in 1919.

- Dependable day and night wireless contact with our allies in WW-1 through the Navy operated American Marconi station at New Brunswick, N.J.

- Our only reliable contact with Germany during the latter part of WW-1 as England cut the cables connecting the U.S. with Germany early in the War.

- R.C.A. setting up a world-wide communication system that superseded the British Marconi "Imperial Chain" of 300 KW timed spark transmitters.

This development has never received the credit it deserved for it came during a war time period when our main concern was with winning, and the relatively short life of the sets due to the early perfection of the short wave, high power, tube transmitters.

> The purpose of this paper is to review the design and application of these transmitters, show their importance in our building a dependable world-wide wireless system and their contribution to communication in both WW-1 and WW-2.

The Alexanderson 200 KW transmitters were built from 1918 through 1921 and were initially installed by the end of 1923, over 50 years ago, but several of the engineers who installed them are still with us and have supplied much of the information in this paper. A year ago I had an hour's meeting with Dr. Alexanderson who recalled many incidents dealing with the design and operation of these sets. Several days spent in the Schaffer Library of Union College, Schenectady, with Dr. Alexanderson's papers and letter books, furnished the material on early design and tests.

I am also especially indebted to the following who provided essential data on location of stations, performance and later use of the transmitters: Capt. Hedley Morris, retired R.C.A. and Navy executive, who helped install the sets at Kahuku, Hawaii in 1920 and was engineer of the station through 1927. Later while serving with the Navy in WW-2, he selected the VLF site in Haiku Valley, Hawaii. W.W. Brown who was the General Electric engineer in charge of all of the initial installations. G.J. Eshleman, engineer in charge of R.C.A. Tuckerton station until it was closed, then civilian engineer of the Marion station while it was operated by the Air Force. T.M. Linville, General Electric research engineer. Bruce Kelley and Lincoln Cundall of Antique Wireless Association who visited Marion and Tuckerton in 1955 to take pictures and make notes on their operation. And to General Electric and R.C.A. for use of pictures and printed material.

Theory of the high frequency alternator was not new. Dr. J.A. Fleming in his 1906 edition of "The Principles of Electric Wave Telegraphy" says: "Designs for high frequency alternators began to be considered about 1889 or 1890 when attention was being directed to arc lighting by alternating currents. It had been found that most forms of alternating current arc lamps produced a disagreeable hum when actuated by an alternating current of a frequency of the order of 100. The notion therefore arose that if a frequency could be used higher than the highest audible note, the defect would be annulled. Prof. Elihu Thomson and Mr. Tesla were probably the first to construct such alternators, and Tesla, finding that he had in his machine a source of electric current capable of exhibiting many interesting electrical effects, pursued the subject and devised several forms of alternator capable of producing alternating currents of a strength of 10 amperes or so, having a frequency as high as 12,000 complete periods per second."

> Dr. Fleming concludes: "The great defects of all extra high frequency alternators so far produced are their small output, and the extremely high speed they have to run. High speeds may be practical for small machines, but would be dangerous if the revolving parts were at all heavy. On the whole, the prospect of being able to generate by purely mechanical means, high frequency currents of 100,000. and upwards with large power output is not very great."

Fleming lists the 1KW-5,000. Hz alternators built by both Thomson and Tesla in 1889 with a 1 KW-10,000. Hz machine by Steinmetz in 1903. This latter machine was used by Fessenden in experiments with wireless telephony who in 1904 ordered from General Electric Co. a unit to generate A.C. at a frequency of 100 KHz. This order was given to E.F.W. Alexanderson to design as he came with G.E. in 1902 and was in their A.C. Engineering Department.

Alexanderson made tests on special Swedish iron strips 1½ mills thick in strong magnetic fields at high frequencies and found the iron would operate satisfactorily at frequencies of 100 KHz so designed the alternator with an iron core.

Fessenden rejected the design, #1fn, insisting that the machine be built with a wooden core as he was sure iron would be melted in a strong field at such high frequency.

General Electric built a machine by mid 1906 with wooden core, that generated 1 KW at 50 KHz frequency, which Fessenden used for his famous tests made at Brant Rock, Mass., Christmas Eve of 1906 when he broadcast voice and music, heard as far as Norfolk, Virginia. #2fn.

Alexanderson in a memo dated March 13, 1924, #3fn, states, "In the meantime I did not give up the idea of a high frequency alternator with an iron armature. I believed it was a mistaken assumption of Fessenden's that iron could not be used, and I expected a higher efficiency with an iron armature. I therefore obtained an appropriation from General Electric to build a model alternator in accordance with my own ideas. When Fessenden made a visit to Schenectady, I showed him this machine and convinced him of its merits and he placed orders for two 100 KHz alternators of this type.

Fessenden about this time severed his relations with National Electric Signaling Company but his work was carried on by the management of the company and orders were placed for two 100 KHz and one 200 KHz alternators which we built and delivered. Two 100 KHz units were also built for Mr. John Hays Hammond."

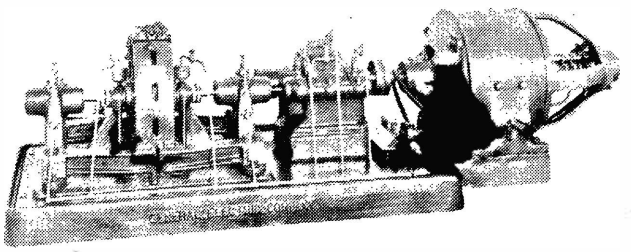


Figure 1 is of one of the 2 KVA-100 KHz machines with iron core driven by a 2,000. RPM direct current motor through a 10 : 1 increasing gear box.

Dr. A.N. Goldsmith in his book "Radio Telephony", page 118, makes these comments on these machines: "Since the speed of the rotor is 20,000. RPM or over 330 revolutions per second, the actual speed at the rim is nearly 12 miles per minute!! Such a machine must, accordingly, be considered a masterpiece of engineering design."

Dr. Alexanderson's memo continues: "Through Mr. John Hays Hammond, I became acquainted with the DeForest audion which is a three-electrode tube, and I saw in this device a possible realization of my ideas for telephonic modulation of the output of the high frequency alternator.

I bought a sample audion from Mr. Hammond, gave it to Dr. Langmuir explaining my intentions of developing it as a power modulator. Dr. Langmuir developed successfully the power tubes which we used for modulating the output of the high frequency alternators in our first radio telephone tests between Schenectady and Pittsfield, Massachusetts."

Based on these tests, a 50 KW-50 KHz experimental alternator was completed in 1915 and tested in Schenectady until Feb. 1917 when it was installed in the American Marconi station, New Brunswick, N.J. During these tests, Dr. Alexanderson and other specialists, perfected the magnetic amplifier with vacuum tube control for modulating with voice, and the design of the multiple tuned antenna.

Dr. Alexanderson continues, #4fn: "The 50 KW equipments were ready to test in the Marconi station the spring of 1917 at the time when America entered the great War. All radio stations including the New Brunswick station were taken over by the Government and it looked at first as if it would not be possible to carry out the tests of the 50 KW alternator. However we succeeded to convince the Navy that our experimental installation might be useful for military purposes and the station was placed at our disposal for experimental tests under the control of the Navy. The tests we made on both telegraphy and telephony proved very successful and the improvement in efficiency of radiation which we had expected from the use of the multiple tuned antenna proved to be correct. The signal reaching Europe from our experimental equipment proved to be better than any other American station.

Our tests of radio telephony and improvement of radiation efficiency were carried on during the summer of 1917 until the Naval Communications Department decided to take over the equipment for much needed communication with France. While the 50 KW alternator was thus used, work was in progress of installing a 200 KW alternator which in the meantime had been built in Schenectady. The 200 KW alternator was placed in service, superseding the 50 KW machine in the summer of 1918. Through the reliability and clearness of the signals sent out by the 200 KW set, the New Brunswick station became quite well known all over the world, and the press messages sent out by the station were copied by all the belligerant countries in Europe."

Because of its greater power, the 200 KW set was used by the Navy for communication as soon as it was installed in mid 1918 but it was released occasionally for short periods for testing. Dr. Alexanderson told me Oct. 2, 1974, that he and the installation engineer W.W. Brown were making some tests Oct. 20, 1918, when a Naval representative came in and said the Navy wanted to use the transmitter at once.

NFF, the call letters of New Brunswick under Naval control, immediately called POZ, the largest German station, and demanded the abduction of the Kaiser as a preliminary to Armistice negotiations. This was our first contact with the German radio since the War started, and NFF was used exclusively for the Armistice negotiations. Dr. Alexanderson said that because of the strong signals sent out by NFF, that all countries allied with Germany could easily hear our proposals and the German replies as all negotiations were carried out in English with no coded messages for our Government wanted all of Germany's allies to have the true story of the negotiations.

It is claimed, #5fn, that because of the power and coverage of station NFF that President Wilson's fourteen points and other pleas for termination of the War became known in spite of the censorship through all the countries of the Central Powers.

DESIGN

Four major elements contributed to the success of the Alexanderson transmitter, all four had to be developed and each required designs well ahead of current performances. They were:

1. Producing an alternating current generator that would generate sufficient power at radio frequencies.

2. An extremely precise speed control system.

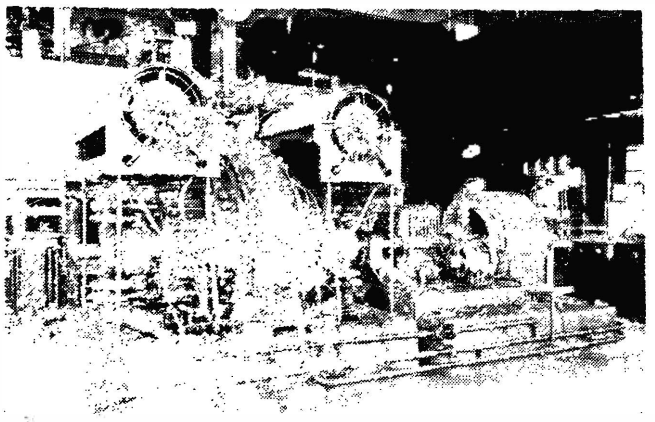
3. A modulation system that would control the full power of the generator, and

4. A multiple tuned antenna system that would result in a signal gain of 500% to 600% over the conventional flat top antenna.

Footnotes - 1fn, Etc.

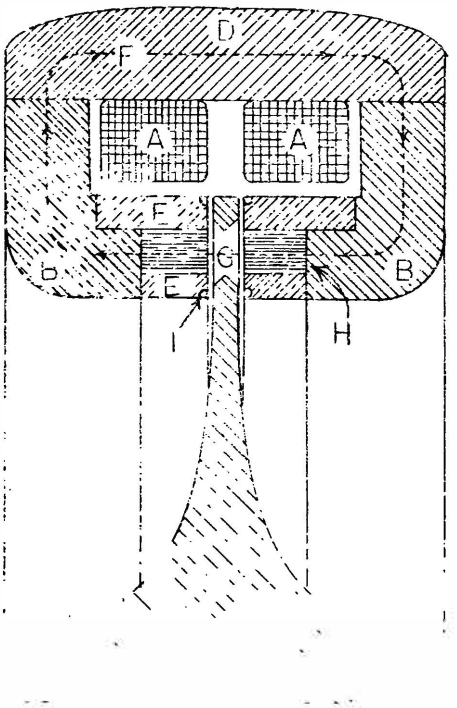
The author's footnotes - numbered from No. 1 to 17 are indicated in the text as... #1fn, #2fn, #3fn, etc. Explanatory notes will be found in keyed table at end of this paper.

'W I I' Transmitter New Brunswick



ALTERNATOR

This is the first 200 KW set built, which was installed in the New Brunswick, N.J. station, June 1918. It consists of the 600 horse power driving motor on the right, connected to a 1 to 2.97 speed increaser which could give a maximum alternator speed of 2700 RPM. The alternator is on the left with the two R.F. open core transformers mounted on each side. These transformers boost the generated voltage of 128 to 2000 volts.



Schematic Section of Inductor Alternator

FIGURE 3 - Legend

A - Field Coils	D - Frame	G - Rotor Slot
B - Armatures	E - Support Rings	H - Sheet Iron Core
C - Rotor	F - Magnetic Flux	I - R.F. Winding

The alternator is of the inductor type with stationary armature and field coils. It consists of a steel disc C with thin rim which is slotted at G, the slots filled with non-magnetic metal. Windings A-A located inside the frame, generate a strong magnetic field F which passes through frame D, the armatures B-B, thin sheet iron cores H-H, the air gaps and the steel disc. The cores H*H are supported by non-magnetic rings E-E and the slots are milled in them to support the radio frequency windings I-I.

As the disc "C" rotates, the alternate steel and non-magnetic poles cause the flux to pulsate in cores H*H thus inducing a radio frequency voltage in Windings I-I.

Rotor C is a steel forging 64 inches diameter, 3 inches thick at the rim. To generate the required frequency of 25.8 KHz in the Marion, Mass. alternator, a rotor speed of 2538 RPM is necessary. At this speed, the rim of the rotor is moving at 8.3 miles per minute or just under 500 miles per hour.

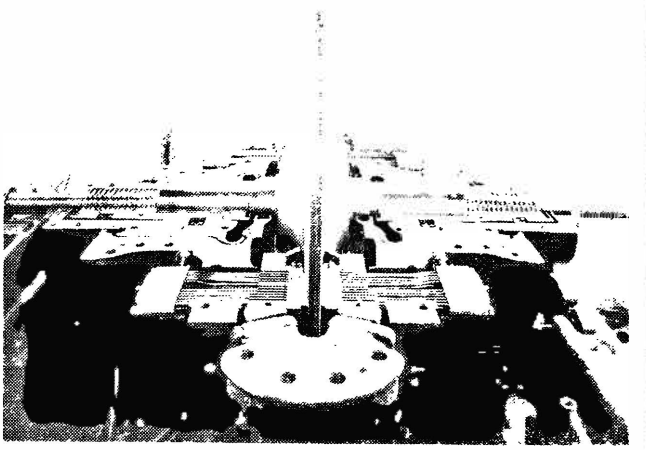


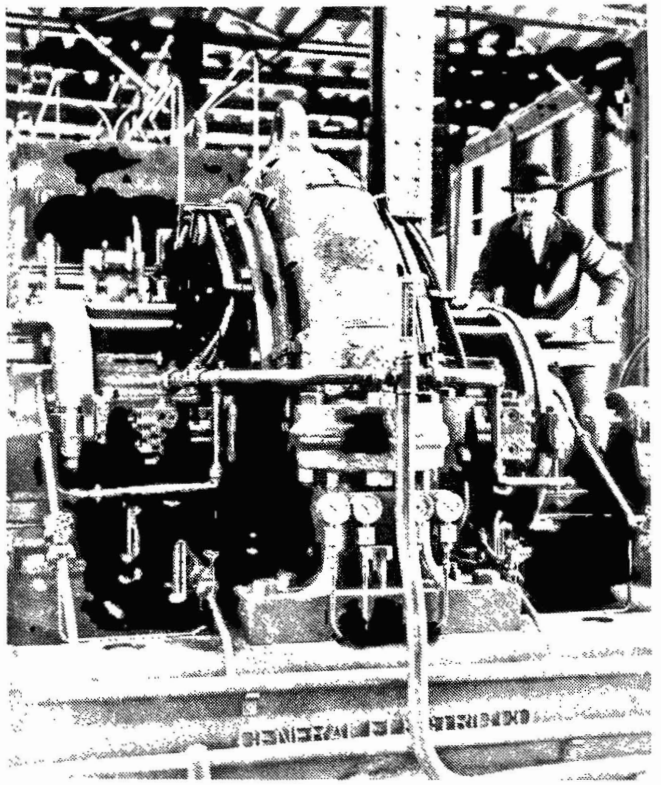
Figure #4. 200 Kilo-Watt Alternator, Top Half Removed.

Here is the 200 KW alternator with top half of stator removed but with rotor in place. Note leads on each side leading to radio frequency winding.

Dr. Alexanderson decided that a 200 KW size would be ideal for a high power transmitter. This meant 200 KW into the antenna whereas the spark and arc stations were rated in power input which with a 50% efficiency would mean only half the rated power to the antenna.

The sets were built to operate at wave lengths of 10,500 to 24,000 meters (28.57 to 12.5 KHz). This was accomplished by three design variables. The alternators were built with 1220 or 976 or 772 poles. Three gear boxes were available with ratios of 2.675- 2.973 and 3.324 and the 900 RPM driving motor was operated at slips of 4% to 20%, giving speeds of 864 to 720 RPM. Transmitters installed in Europe, operating on 50 cycle power, had a wavelength range of 12,500 to 28,800 meters because of the lower speed of the driving motor.

The Alexanderson Alternator Transmitters



Dr. Alexanderson watching his invention at Radio Central May 26, 1922

This picture, Fig. 5, shows Dr. Alexanderson with one of the 200 KW alternators installed at Radio Central, which gives an idea of its size. They were always installed in pairs and the base foundation for the two sets were 43 feet long by 11 feet wide. The main frame steel casting was 7½ feet in diameter by 19¼ inches wide.

Weights of one set were as follows:

One alternator with base	30.0 tons
600 horse-power driving motor	5.4 tons
Auxiliaries	11.6 tons
Detailed parts	3.5 tons
Total weight, one set	50.5 tons

In a letter to Roy Weagant, chief Engr. of American Marconi dated Nov. 12, 1919, Dr. Alexanderson gives the following power requirements:

Alternator delivering 200 KW, key down	385 KW
Average load telegraphing at 200 KW	307 KW
Key up, alternator excited	116 KW
Running full speed, no field excitation	82 KW
Auxiliaries (estimated)	40 KW

SPEED CONTROL

The antenna system was closely tuned to the alternator frequency and if that frequency changed as much as ¼ of one percent the antenna current would be reduced by fifty percent. A system of speed control had to be devised that would hold the speed of the 900 RPM driving motor to a change of less than one RPM from no-load to full-load.

Dr. Alexanderson told me that in 1920 he gave the Japanese a full set of alternator drawings. They built one but were never able to devise the necessary speed control so it was never put into commercial service.

Jack Napier who was engineer in charge of the Bolinas station 1930 through 1955 wrote, "Because the Bolinas antenna was small for VLF (about 2700 feet long) the voltage was rather high, running about 120 KV. If a southwest wind blew it would raise the antenna and change the antenna to ground capacity, which was considerable, and detune things and the insulators would flash over with a crack like a fifty caliber machine gun. At each support point there were two insulators in series, each being about five feet long with rain shields and corona rings."

MODULATION

Dr. Alexanderson was very familiar with the difficulties experienced by Fessenden and others who attempted to modulate the carrier of their radiophone transmitters, and knew it would not be practical to build a modulator that would carry the full current of a 200 KW machine.

He developed a magnetic amplifier that included a variable impedance in shunt with the external circuit of the alternator. By detuning this circuit, the antenna current could be reduced by ninety percent with a small control current. This construction worked satisfactorily up to code speeds of 500 words per minute.

As the antenna current varied directly with control current, this small control current could be easily modulated with a vacuum-tube amplifier for radio telephony.

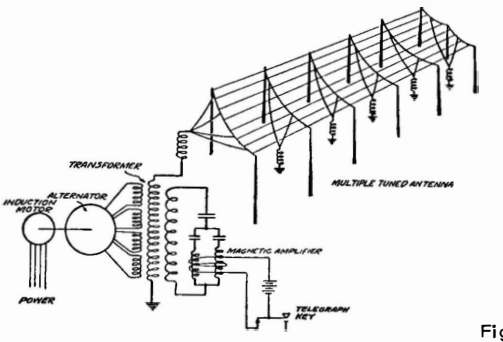


Figure 6

Alexanderson System Schematic

The Magnetic amplifier connected for telegraphy is here shown, Fig. 6, inductively coupled to the alternator.

MULTIPLE TUNED ANTENNA

This picture also shows the schematic diagram of the whole system feeding a multiple tuned antenna.

The objective of the multiple tuned design is to reduce antenna resistance which means reduction in loss. The New Brunswick antenna for example, which had a flat top over a mile long, had a resistance of 3.7 ohms. By multiple tuning this was reduced to 0.5 ohms. This was accomplished by connecting the antenna at six equally spaced locations, along the flat top, to ground through large inductances tuned to the required frequency.

The major loss in an antenna is equal to the current squared times the resistance. To maintain an antenna current of 600 amperes in the multiple tuned antenna requires 600 squared times 0.5 or 180 KW of power. To maintain the same current in the flat top design would require 600 squared times 3.7 ohms or 1330 KW, over seven times the power, and tests have shown that the signal strength was the same under both conditions.

For a detailed description of the design and operation of the 200 KW system, refer to Dr. Alexanderson's paper in the Proceedings of the AIEE for October, 1919, pages 1077 to 1094 or to E. E. Bucher's article in Wireless Age, July 1920, pages 10-17 and August 1920, pages 13-23.

THE FORMATION OF THE RADIO CORPORATION OF AMERICA

The War clearly demonstrated the importance of wireless communication to our nation. During the War, all commercial stations were operated by the Navy under Admiral Bullard. He realized an industry as important as wireless would soon be in the U.S. should be controlled by an American company, not the British dominated American Marconi Company. He knew from the performance of station NFF that whoever controlled the Alexanderson system would dominate world-wide communications. He knew that General Electric had paid for the development of the alternator and the various accessories and that the only company that could afford to buy the equipment was the British Marconi Company. He also knew that early in 1919 Marconi had offered General Electric an order amounting to five million dollars for Alexanderson transmitters.

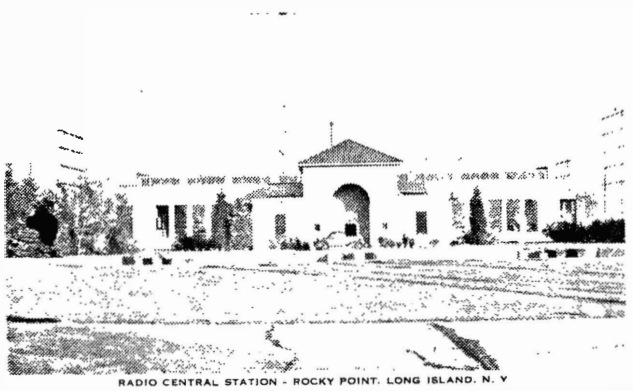
This story is told in the February 1921 Wireless Age in an interview with Admiral Bullard, who tells how he called a meeting of General Electric top management and asked them not to sell the sets and patents to Marconi on an exclusive basis as wanted. He then suggested that General Electric get into the wireless business by forming a separate company that would purchase control of the American Marconi Company, that could use the Alexanderson transmitters to set up a world-wide wireless communication system. (See Footnote fn-18)

General Electric did purchase the stock of American Marconi owned by the British Marconi Company, and turned down the Marconi order for transmitters. RCA was formed in October 1919 and in November the entire General Electric holding of American Marconi stock was taken over by RCA.

March 1, 1920, all stations were released by the Navy and RCA took over operation of the high power stations on both coasts. By this time preliminary plans had been made for installing Alexanderson sets in their main stations and setting up a Radio Central on Long Island for world-wide operation.

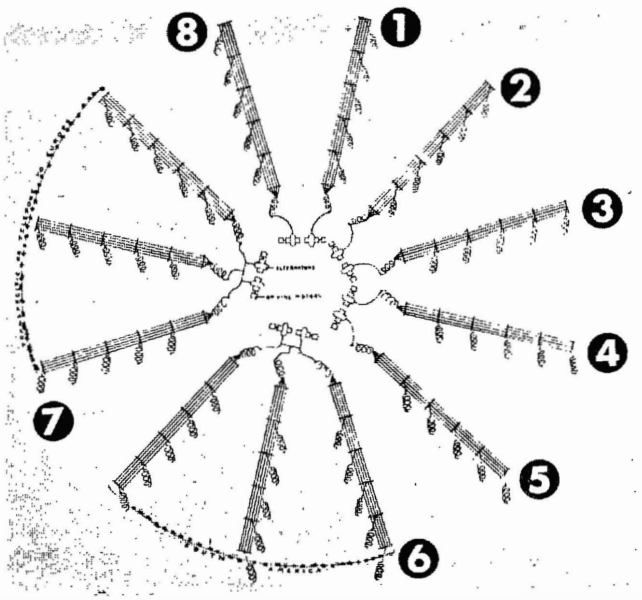
The original plan for Radio Central, #6fn, included central transmitter houses containing ten Alexanderson transmitters with twelve VLF antennas radiating out from the transmitters as shown in Fig. 7.

Work started at this Long Island site July 1920 and the formal opening of the station was held November 5, 1921, #7fn, when two antennas had been completed and two transmitters installed.



RADIO CENTRAL STATION - ROCKY POINT, LONG ISLAND, N. Y

Photo from collection of SOWP Member Arthur R. Anderson - 851-P



Following is the original plan for usage of each antenna or those coupled as noted in No. 6 and No. 7:

1. Denmark
2. Sweden
3. Germany
4. France
6. South America
7. Trans-Pacific or telephone to Europe.
8. Poland

(Fig.7)

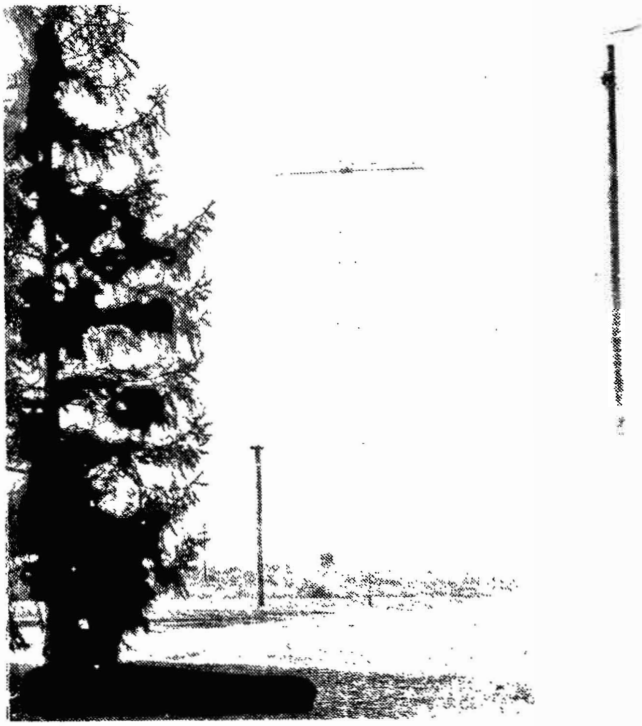


Figure 8.

Antennas at Rocky Point, Radio Central, 1959

Photo by Maurey Garber for RCA "Relay"

Because of the high speed transmission possible with these sets, initially over 100 words per minute, and the low down time for maintenance, the eight additional transmitters and ten VLF antennas were never added.

The towers supporting the VLF antennas were 400 feet high and the cross arms 150 feet long. Six towers spaced 1250 feet apart were needed for each antenna, a length of over one and one-third miles, Fig. 8.

Sites of former high power spark stations were selected for many alternator installations as they were in strategic locations and the costly masts could be used to support the multiple tuned antennas.

Marion, Mass. on Cape Cod had been a 300 KW timed spark station. Two alternator sets were installed there in 1921.

A second set was put in the New Brunswick station in 1921.

RCA took over the former German owned Tuckerton, N.J. station soon after the Navy released it in 1920, #8fn.

This picture of the Tuckerton mast, Fig. 9, 820 feet high, was taken by Hedley Morris In 1929. The guy wires show clearly, also the main antenna insulators above the guy wires. This antenna was converted to multiple tuned design and two alternator sets were installed in the station in 1921 and 1922.

The old timed spark sets at Bolinas, California, were scrapped in 1920 and two alternator sets installed in 1921, #9fn.

The station at Kahuku, #10fn, Hawaii had been a relay station to Japan and the Orient. Two alternator sets were installed there in 1920 and 1921.

To complete the world-wide network, the following sets were installed abroad:

Carnarvon, Wales, in April 1921, #11fn.
Warsaw, Poland, in 1923, #12fn.
Varberg, Sweden, in 1924, #13fn.

In 1924 two transmitters were shipped to Pernambuco, Brazil, but it took two years to find a contractor who could build the antenna towers and buildings and by that time, high frequency tube sets were available so the alternators were shipped back to Radio Central warehouse for storage, #14fn.

It was a tremendous task for the General Electric Turbine Dept. to build and test twenty of these transmitters in 1920 and 1921.

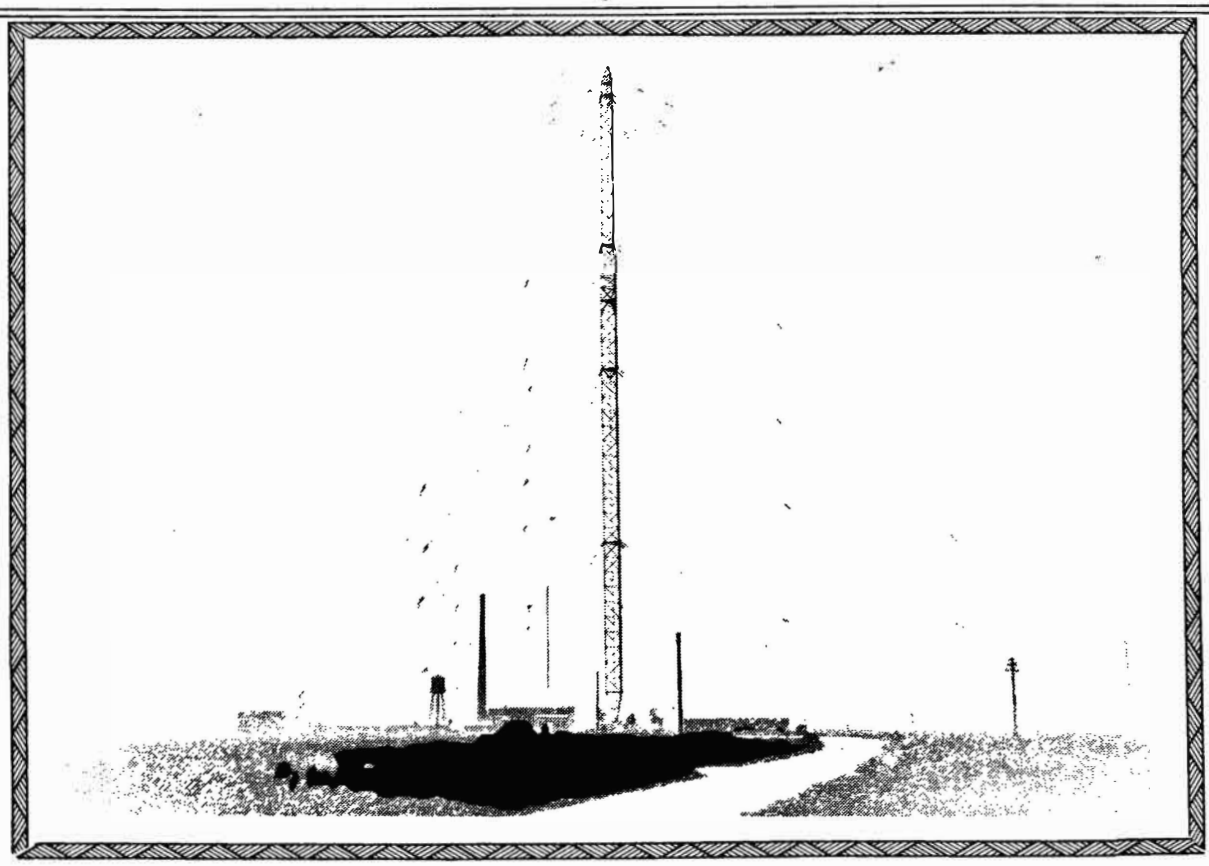
Fig. 10 is a picture of the radio test area during that period when four of the sets were in progress.

Performance of these eighteen VLF stations over the next ten years gave RCA an outstanding reputation for dependable, efficient, rapid handling of traffic. Regardless of weather conditions, or time of day, their signals came through on schedule.

High Frequency Tube Transmitters

An article by Irving Langmuir of the General Electric Research Lab. in September 1922 issue of Wireless Age, gives an indication of things to come. The title was "20 KW Transmitting Radiotrons," the most powerful tube ever made for use in radio communication.

Figure 9 below



Tuckerton Tower

Photo by Hedley B. Morris (195-P) while acting EiC circa 1929 for Gerald G. Eschelman. The 'umbrella' antenna of this Ex-German station was redesigned for the Alexanderson multiplex tuner.

Dr. Langmuir in this article states that by locating the large copper anode on the outside of the glass enclosure, rather than in the evacuated section, that it can be more easily water cooled which solves the problem of heat dissipation. They can be connected in parallel for generating high power. Ten of them will develop the same R.F. power as a 200 KW Alexanderson alternator, and in time they will probably replace the alternators as they are less costly, smaller in size, quiet in operation with lower operating cost. In addition the high frequency transmitter uses an antenna a fraction of the cost of the VLF antenna.

Radio News of August 1928 carries an article by Robert Hertzberg, "A Visit to Radio Central," which includes the picture of an Alexanderson alternator with its massive antenna almost a mile and a half long, and its long switchboard compared to a compact 20 KW tube transmitter with its low short antenna.

He comments: "Although great progress has been made in long distance communication on short waves with low power, the Alexanderson alternators, operating on wavelengths above 16,000. meters with an output of 200 KW each represent the backbone of transoceanic message service. The long waves are required for uninterrupted communication from daylight to darkness, for uniform and reliable transmission 24 hours a day regardless of weather. A single short wave transmitter working on one fixed wavelength cannot supply the same class of service; engineers are now conceding the necessity for a group of different transmitters which can be shifted at will to meet the peculiar effects of daylight and darkness on the carrying powers of their respective wavelengths. Marked economies are effected many times with the use of short waves instead of the longer ones, for less power is required and the transmitting speeds can be greatly increased.

At Radio Central short wave transmitters are handling more and more traffic to Europe and Latin America and are being used experimentally for directive transmission to selected countries.

Such have been the developments of a very few years; six since the inauguration of Radio Central, and twenty since the first commercial radio service was put in effect across the Atlantic between Clifden, Ireland, and Glace Bay, Nova Scotia."

By 1935 the bulk of all traffic had been taken over by tube sets and by 1940 the alternators were merely on standby. The sets at Kahuku, Hawaii, and Carnarvon, Wales, were scrapped before 1940 and the day of the VLF transmitters was thought to be over.

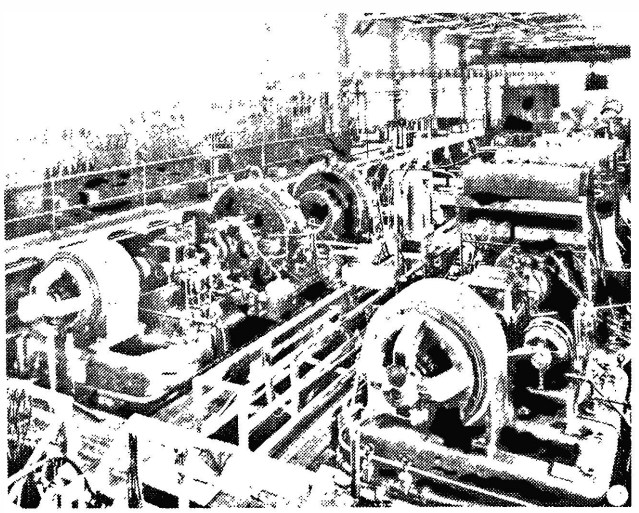


Figure # 10.
Radio Test at General Electric's Schenectady Works on Alexanderson Alternators circa 1920.

200 KW ALEXANDERSON ALTERNATOR TRANSMITTERS

(F-11)

No.	Location	Call	Wave Length	In-stalled	Idled	*Scrapped
1	New Brunswick, N.J.	WII	13,761	6-1918	1948	1953
2	New Brunswick, N.J.	WRT	13,274	2-1920	1948	1953
3	Marion, Ma.	WQR	13,423	4-1920	1932	
4	Marion, Ma.	WSO	11,628	7-1922	1932	To Haiku 1942
5	Bolinas, Ca.	KET	13,100	10-1920	1930	1946
6	Bolinas, Ca.	KET	15,600	1921	1930	To Haiku 1942
7	Radio Central	WQK	16,484	11-1921	1948	1951
8	Radio Central	WSS	15,957	1921	1948	To Marion 1949
9	Kahuku, Hi.	KGI	16,120	1920	1930	1938
10	Kahuku, Hi.	KIE	16,667	1921	1930	1938
11	Tuckerton, N.J.	WCI	16,304	3-1921	1948	1955
12	Tuckerton, N.J.	WGG	13,575	1922	1948	1955
13	Carnarvon, Wales	MUU	14,111	4-1921		1939
14	Carnarvon, Wales	GLC	9,592	1921		1939
15	Varberg, Swed.	SAQ	17,442	1924		
16	Varberg, Swed.			1924		
17	Warsaw, Poland	AXO	21,127	12-1923		
18	Warsaw, Poland	AXL	18,293	1923		
19	Shipped to Pernambuco, Brazil in 1924 then to					1927
20	Rocky Point warehouse in 1926.					

(*) disposition of each unit be scrapping or other action from records researched. *Scrapped or Disposition

Call letters and wave lengths in meters from RCA listing Long Wave Stations, Dec. 5, 1928.

The table Fig. 11 gives the story of commercial operation of the twenty transmitters that were built. All domestic units had been scrapped by 1953 except the ones that were used by the Military in WW-II.

World War II

During time of war, vessels of beligerants operate under "radio silence" to guard against their location by enemy radio direction finders. Routing Orders and other combat operational information must be given to silenced vessels by transmission from shore, receipt of which obviously cannot be acknowledged. Transmissions of utmost reliability must, therefore, be used, and VLF transmission at high power, not subject to fading and periodic dropouts are used to supplement simultaneous transmissions by high frequencies which are less subject to interference by noise. VLF is also by far the best means of communicating with our submarines when they are submerged.

Soon after the start of WW-II it became evident to the Navy that their high power VLF tube set in Hawaii was inadequate to carry the communications load in the Pacific and there was not time to build new transmitters and VLF antenna towers.

Hedley Morris was on active WW-II duty with the Navy in Hawaii and was given the assignment of finding in Hawaii, a suitable VLF station location. He selected Haiku, a narrow

U shaped valley approximately two miles east of Kaneohe, on the north side of the island of Oahu, that had cliffs on three sides that were 2500 feet high. Four copper-clad steel cables were stretched across the valley approximately 4000 feet long, making the antenna, and a bomb-proof concrete transmitter house was built in the center of the valley to house two Alexanderson transmitters. Both sets at Kahuku had been scrapped so one set was shipped from Bolinas and one from Marion to power the Haiku station. This VLF installation provided the contact with our fleet and submarines in the South Pacific during the War, #15fn.

The Navy took over operations of the alternators at Marion and Tuckerton to provide VLF communications in the Atlantic thru 1948. Tuckerton was closed in 1949 and sets scrapped in 1955.

Marion was purchased by the Air Force in 1949 and an alternator set was obtained from Radio Central to replace the one shipped to Haiku in 1942.

Mr. G. J. Eshleman was for many years engineer in charge of the Tuckerton station, transferred to Marion as civilian engineer for the Air Force operation 1949 to 1957. He installed the set from Radio Central and changed the controls so the sets could be keyed by teletype as the receiving stations were equipped for teletype reception. In a letter he stated that the station was used to transmit international weather and other material to Air Force stations at Tule, Greenland, Labrador, Iceland and on ice islands in the Arctic region where reception of short waves was very erratic, #16fn.

Marion station was sold in 1961, one alternator was scrapped and one went to the Bureau of Standards. Some of the tuning gear from this set was used at Boulder, Colorado, for building the WWV-VLF transmitter.

The Navy operated the single VLF transmitter left at Bolinas, California, 1942 to 1946, for communication in the Pacific. When the set went on the air it put out of commission a large radar station on Mt. Tamalpais six miles away. The trouble was soon located and Jack Napier the Bolinas engineer in charge made this comment: "A poor connection between an insulator metal end-cap and a rain shield caused a spark between the two, and the rain shield acted like a 100 MHz doublet and jammed the radar station on Mt. Tamalpais on 105 MHz. How is that for a 105 MHz spark set?, #17fn.

The Bolinas transmitter was scrapped late 1946. Here is its name-plate, Fig. 12.

Table 13 shows the WW-II service of the Alexanderson transmitters and gives their final disposition.

In conclusion, I quote an appropriate article that appeared in the RCA Relay of December 1946 by L. E. Smith, one of the VLF engineers.

"Our Bolinas staff cheered lustily when the Navy decided to shut the alternators down, and from actual experience they had good reason to cheer.

No more jumping on your car with both feet to avoid an unexpected jolt. No more avoiding wire fences and company-cottage clothes lines which snapped at you on occasions. No more corona discharge from the horns of local cattle, or metallic collar-buttons that would keep biting you in the back of the neck as you walked between the buildings. No more hot seats for the riggers while aloft in bosns chair. When the antenna system came down we cleared the atmosphere of the tremendous potential which prevailed when the alternator was in operation.

Who, having worked with an alternator, will ever forget the sound of the machine coming up to speed; listening to the gearbox noise; the pounding of the compensating contactors as they follow the keying under full load, or the sudden, comparative silence that accompanied a traffic lull? Then there was the warmth and peculiar fragrance--that's right, fragrance--that exuded from the whole contraption. The thing smelled good! And how many old timers have spent cold nights leaning against, or curled up alongside, the driving motor?

Yes, the Alexanderson's are through at Bolinas, and the masts are down. There is little possibility of the antenna ever being erected again. A period of radio history--some feel one of its greatest and most romantic--is gone.

Though the alternators are now classified as obsolete, those of us who have always had an inherent fondness for the massive contraptions will never admit it. For as late as 1945, in the age of VHF, UHF, and television, the Alexanderson Alternators put a steady signal through where nothing else would. They did it steadily, free of skip, fading, and most outage causing trouble, twenty-four hours a day.

Dr. Alexanderson's brainchild bows out with its head high. Science marches on!"

--T. L. Mayes

"PORTS O' CALL" (Vol. 4)

APPENDIX

INSTALLATION SITES—WW—II & LATER

200 KW ALEXANDERSON ALTERNATOR TRANSMITTERS USE IN WW-II AND LATER (Fig. 13)

LOCATION	ORIGINAL LOCATION	NAVY OPERATION	AIR FORCE OPERATION	SCRAPPED
Haiku, Hi	Marion, Mass.	1942-1946		
Haiku, Hi	Bolinas, Calif.	1942-1946		
Marion, Ma	Marion, Ma	1942-1948	1949-1957	1961
Marion, Ma	Radio Cent.		1949-1957	To Bu Stds.
Tuckerton, N.J.	Tuckerton, N.J.	1942-1948		1955
Bolinas, Calif.	Bolinas, Calif.	1942-1946		1946

NUMBERED FOOTNOTES

FOOTNOTES FOR WIRELESS PIONEER ARTICLE

1. Letter June 29, 1915. E.F.W. Alexanderson to A.G. Davis, General Electric Patent Dept., Schaffer Library.
2. History of Radio to 1926, by Gleason Archer, page 86.
3. Memo by E.F.W. Alexanderson, March 13, 1924. Our Radio Activities before 1920, Schaffer Library.
4. Same Page 2.
5. Same page 3.
6. Wireless Age, August 1920, page 10-11.
7. Wireless Age, December 1921, page 18-22.
8. Wireless Age, March 1920, page 10.

FOOTNOTES, CONTINUED FROM PAGE 38

9. Wireless Age, December 1920, page 7.
10. Wireless Age, September 1923, page 36-38.
11. Letter from Marconi Company Ltd. to T. L. Mayes, Feb. 19, 1975.
12. Wireless Age, October 1922, page 57-61.
13. Wireless Age, June 1921, page 11-12 and March 1923, page 39-40.
14. Letter December 16, 1974, A.W. Aird to Hedley Morris.
15. Letter May 23, 1974, Hedley Morris to T.L. Mayes.
16. Letter June 24, 1975, G.J. Eshleman to T.L. Mayes.
17. Letter July 8, 1974, C.J. Napier to T.L. Mayes.
18. (Page 35) Re: license situation and cross-licensing following World War 1. (Quoted from records).

At this time, the Alexanderson Alternator and the Poulsen Arc were the only types of high powered, efficient transmitting apparatus, except for a French system. Without one or the other of these transmitting devices, the British Marconi stations were at a great disadvantage in a competitive market.

Of all the problems existent at this time, the patent situation was by far the worst. As an example, the vacuum tube involved patents issued to Fleming, DeForest, Arnold, Langmuir, and several others. The British Marconi Co. had purchased some rights of some inventors; the G.E. Co. held some most important patents, not the least of which was the Alexanderson Alternator patents; the Westinghouse Electric and Manufacturing Co. possessed the heterodyne device of Professor Fessenden and also the Armstrong feedback patents. The United Fruit Co. with its crystal detector patents controlled that field.

Interestingly, the Westinghouse, A.T. & T., United Fruit Co., and G.E. Co., all had patents, but not a one of them had in its control a complete system!

Concerned about the formation of RCA by the G.E. Co., the Westinghouse Co. bought outright the International Radio Telegraph Co. which previously was the National Electric Signaling Co. The International Co. owned some very useful patent rights for Westinghouse to acquire. These were the rights to the heterodyne method of reception and the rotary spark gap.

In addition to the above, the Westinghouse Co. obtained from Major Armstrong and from Professor Pupin the rights to four patents and to 16 patent applications relating to radio. The Armstrong Feedback cct. was one of these. However, at this time it was in litigation with the De Forest interests.

These rights, the rights to the Armstrong, Pupin patents greatly strengthened the International Company's position. By now, the Westinghouse officials felt that they were in a very advantageous position. The result was they directed the International Radio Telegraph Co. to see, if by making overtures to RCA, the Westinghouse Co. could make some agreements with RCA. The result was that in June of 1921 the Westinghouse Co. joined company with the RCA, The International Co. was bought out by RCA and a cross-licensing agreement was consummated between Westinghouse and RCA. Additional cross-licensing agreements were agreed upon between Westinghouse and the Telephone Co. and with the manufacturing part of the telephone company, the Western Electric Co.

The General Electric Co. acquired one half of the stock of the Wireless Specialty Apparatus Co. from the United Fruit Co. in Feb. 1921. The result of this manuever resulted in cross-licensing which resulted in control by RCA of all the patents of the Wireless Specialty Apparatus Co. including the important patents of Pickard.

It was some years, however, before many of these companies with their cross-licensing, acting cannibalistically against competitors finally settled down. After a period of time the 'in-fighting' ceased and the industry finally rested on an even keel. By this time, many basic patents began to expire one after the other. As these began to expire, cross-licensing began to have less and less significance. This resulted finally in the field being pretty well opened up. Much of it by this time became available to anyone.

FIGURES—INCLUDES PICTURES,CHARTS,ETC.

0. Dr. E.F.W. Alexanderson
1. 2 Kilo-watt 100 kilo-Hertz alternator
2. First 200 kilo-watt set at New Brunswick station.
3. Schematic section of inductor alternator.
4. 200 kilo-watt alternator, top half removed.
5. Dr. Alexanderson with 200 kilo-watt set at Radio Central.
6. Schematic diagram of multiple tuned antenna.
7. Original plan for Radio Central.
8. Radio Central antenna support tower.
9. Tuckerton tower.
10. Radio test, Schenectady Works, 1920.
11. Original transmitter locations.
12. Nameplate from last Bolinas alternator.
13. Transmitter locations for WW-II.

DR. ERNST FREDERIK WERNER ALEXANERSON

1878——1975

Dr. Alexanderson was born on Jan. 15, 1878 at Upsala, Sweden the son of Prof. A.M. Alexanderson, then on the faculty of Upsala University. Early interest was expressed in Electrical Engineering, stimulated by a year of technical work at the Univ. of Lund in 1896. He was graduated in 1900 as an Electrical-Mechanical Engineer from the Royal Inst. of Technology in Stockholm followed by a year of postgraduate schooling at the Technical Univ. in Berlin, Germany.

Dr. Alexanderson's high-frequency alternator which he initially developed for Prof. Fessenden after two years of work at the General Electric plant, was installed at Brant Rock and made possible the first voice and music broadcast which occurred on Christmas Eve 1906.

Encouraged by his father who was a Professor of languages, Dr. Alexanderson learned English, German, French and Latin in addition to his native Swedish. Thus, he was able to read a copy of Dr. Charles P. Steinmetz's paper on Alternating Current Phenomena while attending the Technical University in Berlin.

He was so impressed that he decided to move to America and seek work with Dr. Steinmetz which he was able to do in 1902. His first work was on the drafting table but after passing the GE Test Engineering course he became a member of the engineering staff, designing generators in 1904 under Dr. Steinmetz. It was in this year that Professor Reginald A. Fessenden (who was also a pioneer in wireless transmission experimentation) asked the G.E. Company to design and build a high-frequency machine that would operate at high speeds and provide continuous wave transmission/s. The project was turned over to Alexanderson. This was a two-kilowatt, 100,000 cycle machine.

News of the success of the Alexanderson alternator (with many improvements to Prof. Fessenden's original concept) reached the ears of Guglielmo Marconi in England so he visited the G.E. plant in 1915 and after a talk with Alexanderson, arranged for a 50-Kilowatt installation to be made at the New Brunswick, N.Y. Marconi Trans-Atlantic Station.

Not content with his development, he further perfected the unit to provide 200-KW of power. This powerful transmitter was also installed at New Brunswick and was used by President Wilson in the transmittal of messages to the war theatres of Europe since the cables had been cut. The historical test came on Oct. 20, 1918, when President Wilson used this station and its transmitter to send the Peace Ultimatum which brought the war to a close.

CONTINUED ON PAGE - 40

DR. ERNEST FREDERIK WERNER ALEXANDERSON

(C O N T I N U E D F R O M P A G E 39)

During 1923, Marconi tried to buy the exclusive world rights to the Alexanderson alternator and its improvements but President Wilson had a deep desire to keep the inventions 'American'. The end result was the formation of the R.C.A. which became the progenitor of what is now R.C.A. Inc.

Dr. Alexanderson was a prolific inventor as his inventive genius touched many fields. Some of his inventions in communications included the Magnetic Amplifier, the Electronic Amplifier, the Multiple Tuned Antenna, the Anti-Static Receiving Antenna, the Directional Antenna, Radio Altimeters, His inventive genius touched many other fields including TV (1928), First Facsimile used Trans-Atlantic on June 5, 1924. He sent a 'hand-written' greeting to his father in Sweden via Fax.

In other fields such as Power & Control, he designed single-phase motors for railway electrification (used on Pennsy R.R. System); worked out a system for regenerative braking by D-C series motors (used on CM&SP Railway locomotives); the Amplidyne and Thyratron motors were among some of the more than 320 patents issued during his 46-years with G.E., (one for every month, give or take a few days).

Dr. Alexanderson retired in 1948 but continued as consultant for another year. He was 97 when he died on May 14, 1975, at his home in Schenectady, N.Y. Dr. Alexanderson was widowed twice, is survived by his third wife Thyra and son Verner; also three daughters and nine grandchildren.

The honors and awards bestowed on Dr. Alexanderson were so many it would take quite a lengthy column to list them all.

Our Technical Editor, Thorn L. Mayes, was indeed fortunate in having been associated with this great man through various assignments with the General Electric Company. He has had a number of interviews with Dr. Alexanderson about the early days of the alternator and his experiences, therefore, able to bring a 'first-hand' report on many phases of the communication/s art including the alternators developed by him. Dr.

Alexanderson indeed stands tall among those in the field of invention and as a benefactor to all mankind--resulting from his brilliant ideas and his ability to translate them into practical use.

--W.A.B.

SOCIETY OF WIRELESS PIONEERS
P. O. BOX 530
SANTA ROSA, CALIFORNIA 95402

Thorn L. Mayes

It is unfortunate that our Technical Editor and Technical Consultant was so preoccupied in his early days with the 'learning process' that he did not have the time or opportunity to 'pound-brass' professionally, so he could qualify as a regular member of SOWP.

He did manage to take time out to receive his amateur call (6AX) back in 1921 and during his high-school days in Oakland bought or made equipment to commission station 6JR (1-KW spark transmitter and single audiotron regenerative receiver) which he operated until graduation in 1923. Thorn graduated from the University of California with a degree in Elec. Engineering in 1927.

Thorn has maintained an over-riding interest in communications all of his life and since retirement from the General Electric Company where he spent most of his professional years, he has devoted his time and attention to compiling a history of early day wireless and radio - especially the organizations involved in the field, tracing the fortunes of these organizations over the years--as has already been brought to the members in past issues of "SPARKS" and other Society releases.

"Thorn" has held some very important assignments with G.E. over the years, including that of Manager of Engineering in the motor plant at Lynn, Mass. and in 1952-58 at Fort Wayne, Ind. where first he was in charge of the building and equipment where induction motors (1-5HP) were built and then as General Manager of the plant. When this plant was combined, he moved to Shelbyville, Ind. as Manager of Engineering of the GE Industrial Heating Plant at that location.

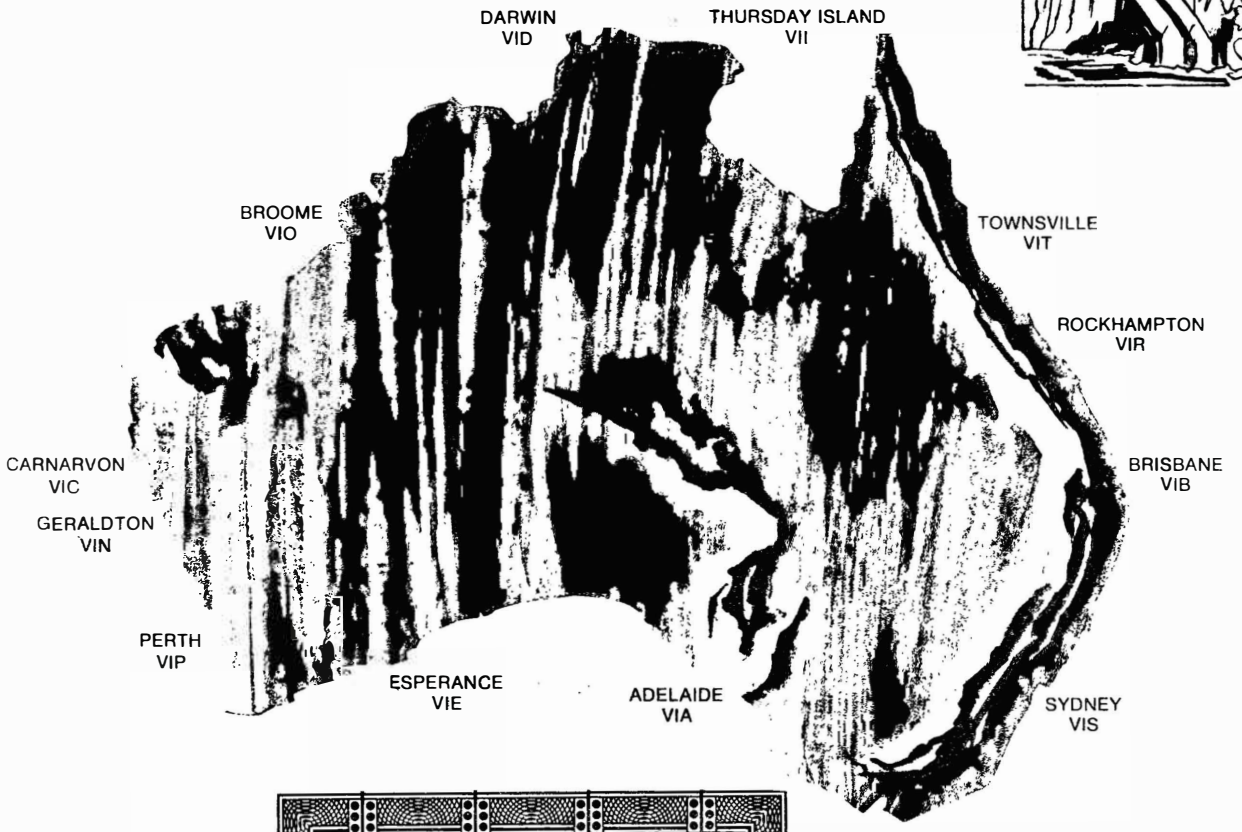
His interest in radio and amateur radio never waned. He held call W2CE in Schenectady, then W1CX at his home in Marblehead, Mass. This was followed by W9AX at Fort Wayne and after his return to California, found his old call 6 AX vacant so now holds W6AX. He has received his 50-year award by QCWA and was a Director of OOTC. He was one of the Charter members of A.W.A. and has presented a number of papers at their annual meetings.

Thorn is also a collector of early communication/s artifacts. He has been most charitable with his time and has on many occasions brought some of his choice receivers and other pieces of early equipment for Society of Wireless Pioneer members to inspect - bringing back nostalgic memories of bygone days.

Mr. Mayes with his wife Lygia lives in Saratoga, California. He is an active member of the Space Science Center Advisory Committee of the De Anza & Foothill Community College and Vice President of the Perham Foundation of the Foothill College Electronics Museum.

The Mayes have a son living in Phoenix who has been an amateur since 1946. Their daughter, married to an Orthopedic Surgeon, also has held an amateur license for many years, hence the Mayes hold family reunions via the air-waves several times weekly - a wonderful way to keep in touch.

AUSTRALIA



AUSTRALIAN RADIO STATIONS

24-Hour Service

VIS Sydney
VIP Perth
VID Darwin
VIT Townsville
VII Thursday Island
VIO Broome
VIM MELBOURNE
VIA Adelaide
VIB Brisbane

Limited Hour Service

VIA Rockhampton
VIN Geralton
VIE Esperance
VIK Cai rns
VJU Norfolk Island
VIH Hobart, Tasmania

OTC AUSTRALIA

THE OVERSEAS TELECOMMUNICATIONS COMMISSION (AUSTRALIA)

AUSTRALIAN WIRELESS

Meet the Coast Radio Service

On a green headland at La Perouse, overlooking the entrance to Botany Bay, nine miles (14.5 km) south of Sydney G.P.O., stands a small brick building which at first glance appears to be an ordinary suburban house. At second glance you might begin to wonder why it occupies this isolated position amid the coastal scrub, commanding an unbroken view of the bay. If you were to look very closely, you would observe that it has a number of tall, slender poles planted in what should be its back yard and that these support a web of wires.

This is the home of Sydney Radio, principal station of Australia's Coast Radio Service. Despite the tranquillity of the outside scene, inside the building you find bustling activity. Receivers crackle and hiss, Morse keys stutter, voices murmur into microphones and typewriters clatter. A dozen or so men sit at desks operating the equipment — pressing switches, turning tuning knobs, pressing Morse keys, speaking into the microphones, rattling away on typewriters or teleprinters, and listening. This is the kind of bustle that goes on twenty-four hours a day at Sydney Radio, Australia's busiest coast radio station. It is the bustle that accompanies constant ship/shore communication.

The variety of business being handled might astonish you. A passenger liner steaming down the English Channel might report its estimated time of arrival (four weeks hence) at Sydney. A trawler skipper off the south-east coast sends a telegram to his company's Sydney agent

BELOW: Sydney Radio.
RIGHT: Operators at Sydney Radio exchange communications with ships at sea all around the world by means of HF Morse telegraphy.

reporting his catch. A rating on a RAN ship telegraphs a wedding anniversary greeting to his wife. Storm warnings are broadcast to small craft in New South Wales coastal waters. A Newcastle-bound tug reports sighting an empty life-raft. A message from Lord Howe Island carries the results of a council election. All ships are warned of naval gunnery exercises to be conducted in an area off Jervis Bay. A Greek freighter requests wharf facilities at Sydney. A telephone call from a man in Canberra is put through to his wife, cruising on a luxury liner somewhere near Fiji. A seaman on an ore carrier heading for Port Kembla gets the news that he is now the father of twins.

Meanwhile, similar communications are passng through stations of the CRS right around Australia. There are fourteen stations in the mainland network. Nine of these, including Sydney Radio, stay 'on air' day and night, right around the clock. Five are open seven days a week during limited hours, usually from 7.0 a.m. to 8.0 p.m. (The OTC establishment at Norfolk Island also has a limited function, related to communication with small ships in the vicinity of the island, and operates by prior arrangement only.)

The stations are located so as to provide a communications 'umbrella' around the whole Australian coastline. Each of the six state capitals has one. Darwin has one. Plugging the gaps around the long north-eastern and north-western shoulders of the continent there are further stations at Rockhampton, Townsville, Thursday Island, Broome, Carnarvon and Geraldton. There is also a station at Esperance, on the southern shore of Western Australia, which helps to provide coverage in the Bight. Between them, the stations of the network make it possible for any suitably radio-equipped vessel, large or small, sailing anywhere in or near Australian waters, to maintain radio contact with the shore at all times. Additionally, the Sydney and Perth stations are equipped for long-distance transmission and reception, so that communications can be exchanged with ships anywhere in the world.

Operators at the coast stations spend the major part of their time handling commercial traffic — telegrams and telephone calls between people at sea and people ashore — like most of the examples quoted above. All this traffic is paid for by those using the service. However, the most vital communications of all are handled free of charge. These are communications concerned with the safety of life. At any CRS station, when a distress message is received from someone at sea, other business is suspended and all efforts concentrated on helping those in

Operator at work, Carnarvon Radio.

distress. This — helping to save lives — is what the Coast Radio Service, essentially, is all about.

We have already noted that, on any day of the year, at least one of Australia's coast radio stations is likely to receive an emergency call. A CRS operator must always be prepared for the unexpected. All stations maintain constant listening watches on the internationally recognised distress frequencies for both Morse (radiotelegraphy) and speech (radiotelephony). Every operator in the service knows that the most important action of his whole career might well be to pick out from among the succession of routine messages, the jumble of Morse or voices, the crackle of static, that one unheralded, lonely, perhaps faint signal that is somebody's cry for help.

Emergencies

If you could look through the log book of any CRS station you would find many more stories of human dramas at sea than ever get into the newspapers. They would tell of private yachts or fishing trawlers whose engines had failed, of lost rudders, of fires, of the sighting of distress rockets, of crewmen or passengers taken ill, or injured, or washed overboard. Sometimes the emergency is all over in a very short space of time. Perhaps rescue was close at hand, or perhaps all that was needed was advice from a Commonwealth Medical Officer on how to treat an injury. At other times the period of the emergency may extend over several days, as in the case of a search for a missing ship or a life-raft, or when a ship has run aground on an off-shore reef and rescue operations must await a change in the weather.

During any maritime emergency period, the coast station concerned becomes an arm of the Search and Rescue Organisation operated by the Australian Government's Department of Transport. All emergencies involving ships or aircraft anywhere around the Australian coast become the responsibility of this organisation as

soon as they are reported. All search and rescue efforts are controlled from Canberra by the Marine Operations Centre.

As soon as possible after receiving a distress call, a CRS operator must report the call to the Marine Operations Centre. From then on, for as long as the distress period lasts, the operator must keep the MOC informed of every communication received in connection with the emergency, and he must carry out the instructions he receives from the MOC. This way, the efforts of all engaged in the rescue operation — including, perhaps, units of the defence forces or of the police — are controlled and co-ordinated to the best effect. The CRS provides the vital communication links between the Operations Centre and assisting ships.

A special red telephone and a dedicated telex machine at each of the continuous-watch stations is reserved for use in such emergencies, providing direct communication with the MOC, in Canberra. The Centre itself is manned all round the clock, so that a Search and Rescue operation can be mobilised at any time, day or night, within minutes of receipt of a distress call by a CRS operator.

International Convention

Safeguarding the lives of those who travel the seas is a matter of international concern. Every maritime country shares this responsibility. That is why Australia is a signatory to the International Convention for the Safety of Life at Sea (usually abbreviated to SOLAS). The operating procedures followed in our Coast Radio Service are in accordance with the relevant recommendations and regulations of the current SOLAS Convention.

About the time that Australia's original chain of coast radio stations was being established, just before the First World War, moves were afoot on the other side of the world to bring international uniformity into maritime communication and safety procedures. The first SOLAS Convention, drafted at a conference in London in 1914 and adopted by sixteen nations, laid down basic procedures to be followed by ship and coastal wireless telegraph stations. The object was to ensure, as far as possible, that distress calls would never go unanswered. As is so often the case in human affairs, this reform came in the wake of a tragic accident.

The British Government called the conference in an atmosphere of public shock, indignation and grief following the greatest peace-time maritime disaster ever known — the loss of the luxury passenger liner *Titantic,* with fifteen hundred lives.

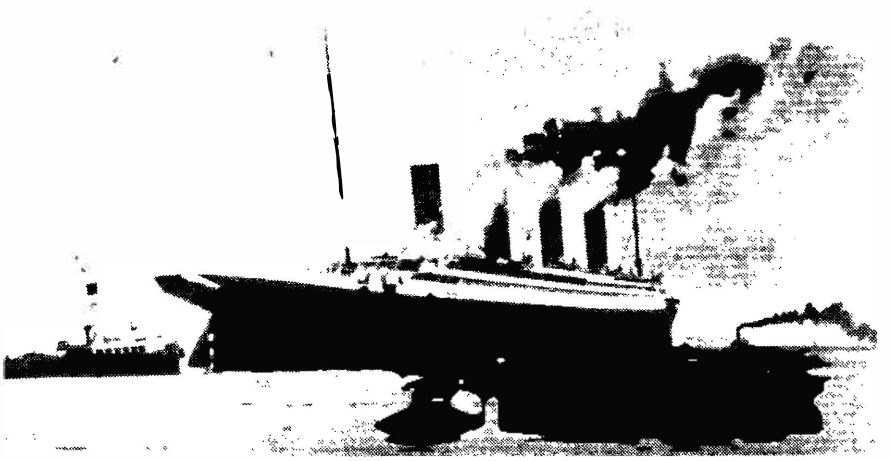
The *Titantic,* 46,328 gross tons, designed to take out the prized Blue Riband of the North Atlantic passenger run and believed to be unsinkable, struck an iceberg just before midnight on 14th April 1912 while on her maiden voyage from Southampton to New York. She quickly sank, and 1,517 people perished with her. That 712 people were saved can be attributed mainly to the fact that the liner carried wireless. The operator bravely stayed at his post as his ship went down, tapping out Morse messages, telling the outside world what was happening. His signals were picked up by several other vessels and by many American wireless amateurs.

The *Carpathia,* first ship to reach the scene in response to the call for help, arrived more than four hours after the collision, having steamed through hazardous waters, in darkness, from fifty-eight miles away. Another ship had been close by the stricken liner throughout the night, stopped because of the ice, and its officers had actually watched as the lights of the *Titanic* disappeared into blackness, but had assumed it to be heading away from them. They knew nothing of the tragedy until the following morning because their only wireless operator had been off duty.

Out of this appalling disaster, and the conference which followed, came the first moves towards the creation and acceptance of a universal code of standards in matters concerned with maritime safety, including the use of ship/shore radio. It was agreed by the sixteen nations, for example, that all merchant ships carrying fifty or more persons must be equipped with wireless. Ships in certain categories had to maintain a continuous wireless watch and so were obliged to carry more than one operator.

At the official inquiry into the loss of the *Titanic,* Marconi suggested a system which would enable a ship carrying only one operator to intercept distress calls even when the operator happened to be off watch. This required an apparatus

The 'Titanic' leaving Southampton at the start of her ill-fated maiden voyage.



The passenger liner 'Oriana' is a regular visitor to Sydney.

not then developed but which Marconi had worked upon experimentally. The apparatus embodied an automatic alarm system which would cause a bell to be rung, possibly on the ship's bridge, when an unattended wireless telegraphy set received a distress call. This system eventually came to be adopted internationally. The auto-alarm system continues in use to this day.

Australia was one of fifty-five countries represented at the conference in London in 1960 which drew up the present, updated SOLAS Convention.

Under the terms of the SOLAS Convention, Australia has an obligation to provide a number of services to shipping of all nations, without charge, through the stations of its Coast Radio Service. These include maintaining a continuous listening watch on the agreed international distress and safety frequencies, receiving reports from ships on storm and navigation hazards, and receiving ships' position reports, so that operators at coast stations may know what ships are within radio range. Additionally, distress, urgency or safety messages are given priority over other business and are received, acted upon and rebroadcast, in accordance with procedures specified in the SOLAS Convention, without charge. This includes handling all related communications with authorities ashore and with assisting ships. (See p.10 for details of the three categories of priority message.)

The SOLAS Convention is an important example of international co-operation at work — co-operation for the protection of human life. The maritime nations of the modern world are co-operating more closely than ever before in such matters. Since 1959, a specialised agency of the United Nations known as IMCO (Intergovernmental Maritime Consultative Organisation) has provided a forum in which nations sharing a common concern for all aspects of maritime safety may meet and consult together on a regular basis. IMCO convened the 1960 conference which produced the updated SOLAS Convention now in force. Expert committees set up by IMCO are currently discussing ways and means of introducing such technological advances as satellite communications to the commercial shipping field. OTC officers are among Australia's representatives taking part in these discussions.

CRS operator at his desk, with receivers and controls ranged around him.

Commercial services

Did you know you can send a telegram to a person aboard ship, or even telephone someone aboard a big cargo or passenger liner, practically anywhere in the world? The only limiting factor is the capability of the ship's radio equipment. For example, many thousands of small ships, such as trawlers and ocean-going yachts, are equipped with a radiotelephone set which enables them to exchange spoken communications with coast stations, though they cannot be linked to the public telephone network. These small ships can, however, send or receive spoken telegrams via coast stations.

Modern passenger liners, on the other hand, are equipped to provide radiotelephone calls connecting a person on the ship with a telephone subscriber ashore. To call someone on a ship at sea you simply dial the number for international calls (or ask your local exchange to connect you with the international operator) and name the person and the ship. The CRS usually knows where the ship is. A station of the CRS will call up the ship (by Morse telegraphy) and arrange for the call to be established at a specified time.

You send a telegram to someone on a ship at sea — any ship — in exactly the same way as you send a telegram to any other destination. The address consists simply of the person's name, the ship's name and the appropriate coast radio station. The CRS compiles a 'Ships in Range Advice' every day, which is circulated to main telegraph accepting

The Brisbane station of the CRS.

offices throughout the country, listing all the ships within radio range of each coast station for that day. Any message to a ship not listed goes via Sydney Radio.

Morse telegraphy is still a standard requirement for 'big' ships (those over 1600 tons). Consequently a considerable proportion of the CRS operator's work involves transmitting and receiving in Morse Code. New systems at present under development seem likely, however, to displace Morse telegraphy within the next few years.

One of the alternatives is radio teletype, which means communication by teleprinter between the ship and a coast station. This system is already being used for some communications with oil rigs operating off Australia's northern coast. It has been in use for years for communication between Sydney Radio and Lord Howe Island, Perth Radio and Christmas Island, and on some other international channels handled by particular coast radio stations. Radiotelephony is the more usual mode of communication with oil rigs.

How do all the messages reach the right people, the right ships? How does a ship's operator know when a telegram for someone on his ship is about to be transmitted? The answer to both questions is 'skeds'.

The word 'skeds', in coast radio circles, means 'schedules'. More particularly, it means regular broadcasts of information by a coast station at scheduled times. Most importantly, the information broadcast includes a list of names (or the callsigns) of all ships for which the station has a telegram. A ship's operator tunes in to receive the nearest coast station's traffic list at these scheduled times and learns whether the station is holding a message for him. The operator then calls the station, once the scheduled broadcast is over, to advise that he is ready to receive the traffic.

Big-ship schedules are transmitted every two hours, by Morse telegraphy, on a number of frequencies. Weather forecasts are scheduled at least twice daily. Small-ship schedules are transmitted by speech on the small-ship radiotelephone frequencies two or three times a day, at advertised times, usually following routine weather forecasts.

Various CRS stations handle one or two other jobs also. One of these consists of receiving information from fourteen automatic weather stations located on off-shore islands in the tropics (these stations often provide the first warning of a cyclone) and relaying this, in telegrams, to the Bureau of Meteorology. Another is conducting a spoken telegram service, by radiotelephony, with certain isolated outpost stations. This outpost radio service is provided for a number of cattle and sheep stations and several fishing and mining settlements beyond the reach of the Australian Post Office telephone network. In addition, all coast radio stations accept telegrams addressed to anywhere in Australia or overseas when local post offices are closed.

As you can see, life in the CRS is a busy affair. But never too busy to pick up any call for help. The most important function of all for our CRS stations is to act as listening posts. CRS operators are expert listeners, especially sensitive to the signals that indicate 'emergency'. Just to make absolutely certain that nothing is being missed, all stations observe a silence period every half-hour. Then, for three minutes, all transmissions cease on international distress frequencies and the operators concentrate solely on listening. This provides an opportunity for anyone who might have been unable to make his emergency call heard during a busy traffic period to have the use of the distress or safety frequency all to himself. In addition to all the other measures, a listening watch is maintained constantly, at Sydney Radio, on the frequency allocated to ships' lifeboats, known as the international survival craft frequency.

Life in the CRS

The Coast Radio Service is a far-flung empire, its stations scattered widely around the perimeter of Australia. The word 'empire' is perhaps a shade on the pretentious side for an organisation that has little more than 150 people in its ranks. (Why, more people than that work at OTC's Head Office!) Yet it could be said to command many thousands of miles of ocean. And to radio operators on ships of many nationalities, the CRS is a chain of Australian outposts, meeting them half-way as they move across the oceans towards our shores, maintaining contact with them after they have left our land behind.

For some CRS operators, life is relatively lonely. They spend their working days (or nights) in a room alone, or with another operator for company, their only contact with the outside world being through their communications with shipping. Some of the stations are miles from the nearest town. At many, kangaroos or emus wander about the station grounds at night, eagles nest atop aerial masts, sometimes a goanna or snake lurks among the shrubbery. Days can go by without another soul coming within

AUSTRALIAN WIRELESS

sight except the relief operators who turn up at the change of shifts.

Yet every operator finds himself very much involved in the life of the community he serves. He comes to know the trawlers of the local fishing fleet like personal friends, learns when the fishing season is on, relays news of the trawlermen's successes or tribulations, and finds that they turn to him when they strike trouble. He knows when oil drilling is taking place in the coastal waters within his station's reception range, or when oceanographic surveys are being conducted there. He learns which foreign ships make regular calls at the ports in his area, what their business is, where they come from and where they will go after leaving Australia. He becomes accustomed to the idiosyncrasies of ships' operators of many nationalities and comes to recognise their varied Morse transmission styles like the handwriting of old friends.

An OTC Supervisor at Sydney Radio tells it this way:

'Every ship that enters or leaves this harbour uses us as a link. We pick them up weeks away and usher them in, and when they leave we follow them towards their destinations. A British tanker with blistering decks coming out of Mina al Ahmadi is given his discharge orders. A Russian from the cold fog of Vladivostok wants to know where he'll pick up his wheat. A Japanese ore carrier wallowing in a low-pressure area sends his weather report. And a liner just leaving Southampton calls up to say he's on his way.

'An interesting feature of our work is that we are able to feel the current economic pulse of the country by the number of foreign "bottoms" we work with. A decrease in the number of "J" callsigns could indicate the Japanese are taking less coal and iron ore; an increase in "U" callsigns could mean we're selling more wheat to the Soviet Union.

'There is also an opportunity to study national characteristics. Anglo-Saxon Morse varies from the sublime to the ridiculous, indicating a certain self-satisfied individuality. The Japanese are correct and cautious, almost copy-book, but can be thrown into turmoil by anything outside the norm. Russians send Morse at blistering speed, trying perhaps to be better than anyone else, and the Greeks add little flamboyant touches, as though playing a bouzouki.'

30

EMERGENCY SIGNALS

By internationally accepted usage, messages which must be given priority attention by a ship or coast radio operator fall into three classes, the level of priority being indicated by a 3-letter code (in Morse), or a spoken code word, at the commencement of the transmission, as follows:—

Distress

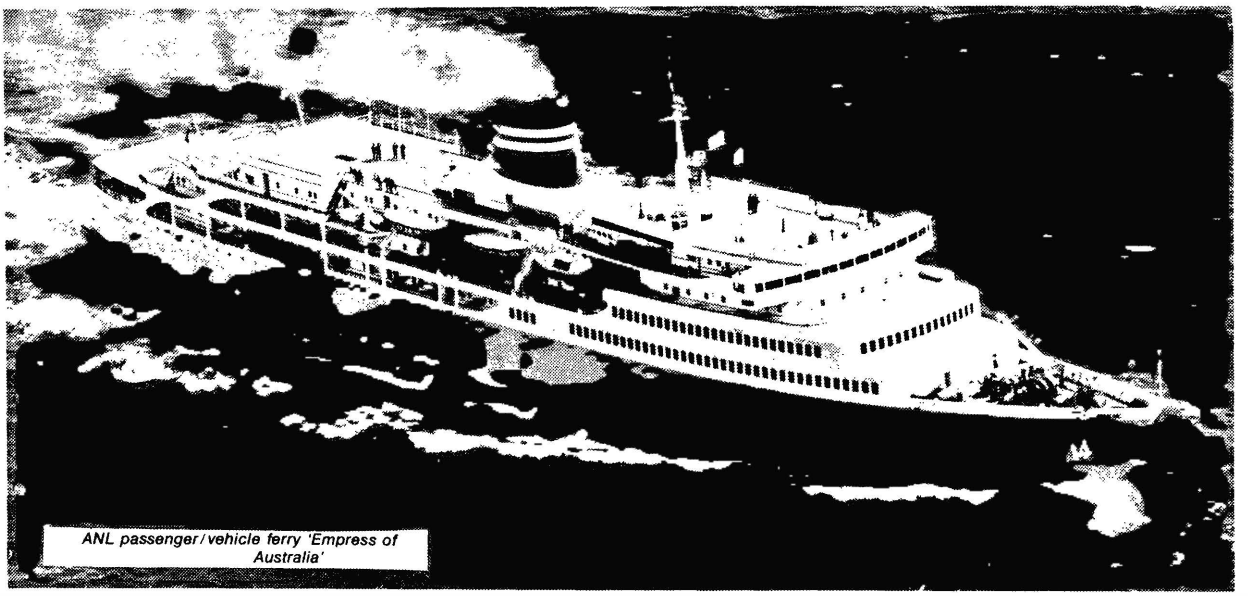
— prefixed by: SOS (Morse) or Mayday (radiotelephony). Use of the 'distress' symbol indicates that a ship (or an aircraft) is threatened by grave and imminent danger and requests immediate assistance. Distress calls have priority over all other business. Such calls must be answered and acted upon immediately.

Urgency

— prefixed by: XXX (Morse) or Pan (radiotelephony). The urgency signal indicates that the calling station has a very urgent message to transmit concerning the safety of a ship, aircraft or person. Urgency messages come next after distress messages in order of priority.

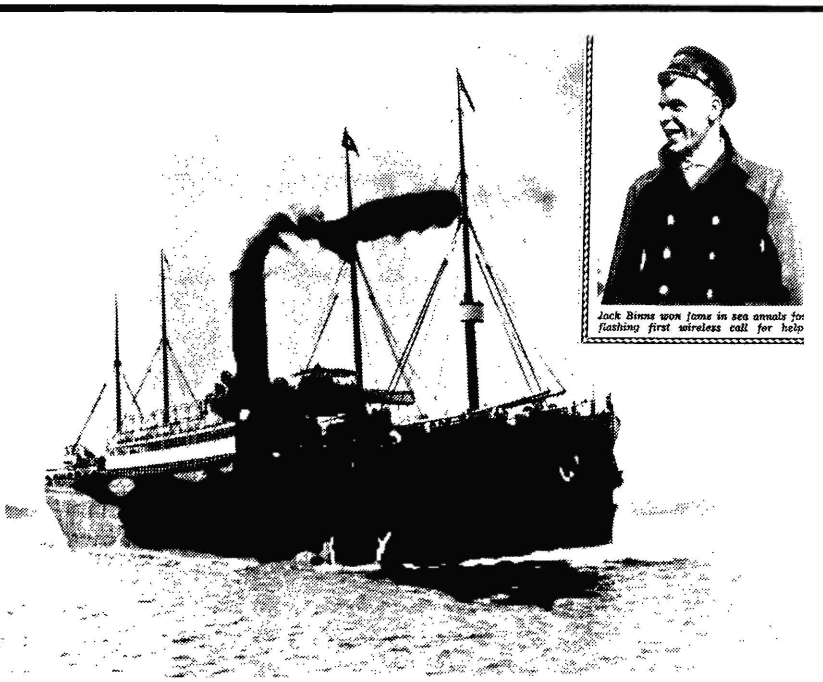
Safety

— prefixed by: TTT (Morse) or Securité (radiotelephony). Safety messages, such as urgent navigation warnings, are third in priority and must be broadcast by a coast station immediately upon receipt and repeated at intervals. Such messages may originate from a ship at sea (for example, when a dangerous derelict is sighted) or from the Department of Transport.

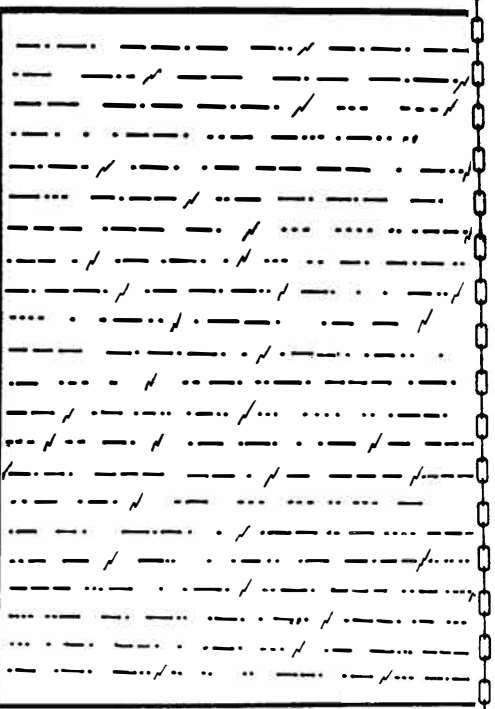


ANL passenger/vehicle ferry 'Empress of Australia'

THE SS. REPUBLIC'S "C.Q.D."



Jack Binns won fame in sea annals for flashing first wireless call for help



By Lieut. Harry E. Rieseberg

Many are the great periods of history where a brief moment of risk, inspiring great courage over overwhelming odds has necessitated heroic action. Here is such an incident at sea, where an unknown wireless operator's heroic action went down in maritime history, and who saved more than a thousand lives during the first use of wireless communication at sea! But failed to save the ship itself and the consignment of more than $3,000,000 in "golden eagles!"

SIXTY-SIX years ago--- January 23, 1909 -- the huge White Star liner Republic, of the Oceanic Steam Navigation Company, met her final anchorage off Martha Vineyard, Massachusetts. The catastrophe marked indelibly the opening of a new epoch in the long history of news dissemination as well as becoming one of the great periods in maritime heroism where a brief moment of risk, inspiring great courage over overwhelming odds brought home to the general public, who, at that period were not usually interested in happenings very far afield of their own immediate horizons something of the actual drama of real life.

True, at the time, numerous ships had been equipped with wireless apparatus, but nothing so far had occurred to either shipowners and ships' masters as to the full extent of the potentials of such equipment in the saving of life at sea, or to inflame the popular imagination with such enthusiasm and response for a great new scientific discover. For, not only did wireless communication play its part in aiding stricken ships and saving lives at sea, but the entire civilized world was kept acquainted with the moving acts and dramatic scenes of action as they were actually taking place.

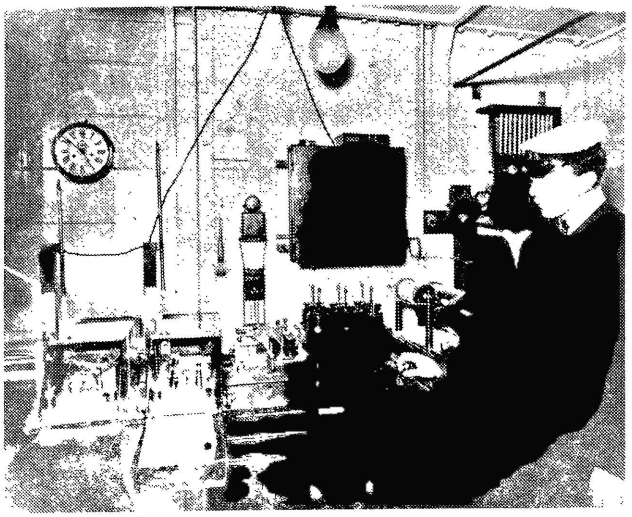
And those of the reading public who bought the numerous editions of the daily newspapers as they appeared on the streets with their blaring headlines, were, for the first time, able to follow hour by hour the sequence of events and happenings with all their doubts, fears, hopes, suspense, and eventual triumph almost as closely as if they, themselves, were actually present on the scene of disaster watching with their own eyes.

The Republic, a huge British steamer of the period, of some 15,378 tons gross displacement, had sailed out of New York harbor on the morning of January 22, 1909, to engage in a lengthy winter cruise in Mediterranean waters, carrying a passenger list of 300 seamen and officers.

Within a few short hours out of port the liner ran into a thick and terrific dense fog, misting heavily, which had suddenly descended over a wide stretch of the North Atlantic waters, just offshore the New England coast. The vessel's speed was quickly reduced, and the usual precautions taken in such emergencies for safe navigation in what is undoubtedly one of the gravest dangers to be encountered at sea. However, in spite of such precautions, the Republic suddenly collided with another steamer, the Italian liner Florida.

On the morning of the second day out, at 5:30 A.M., when the Republic was approximately 175 miles due east of the Ambrose Light, with but a few seconds' warning ~~and almost~~ simultaneously with the lookout's cry, her officers suddenly saw the oncoming Florida loom up out of the fog like some ghostly apparition and crashed into the Republic's side. The impact was terrific! The Republic was cut down to her water-line, and the sea, in swift torrents, began to pour into the shattered hull.

At the moment of collision, the passengers, of whom three were immediately cast overside and drowned and a number seriously injured, were asleep in



WIRELESS ROOM -- SS. BALTIC

The Marconi Wireless room aboard the rescue liner "BALTIC" which rescued the passengers and crew from the ill-fated liner, "REPUBLIC"

their cabins when the crash came, but, being roused from their bunks by the deafening roar of the crash, they ran swiftly up the companionways to the decks above in their night clothes, expecting the ship to sink immediately. There was, however, no panic, but they were horror-stricken by the unexpected collision.

But below, in the hold, the conditions were most serious and grave, for within a few moments the engine-room was quickly flooded to the top of the cylinders. It was obvious from the damage that the Republic was in great danger, and an ominous unseen peril seemed to permeate the air throughout the entire vessel. There was a hazard, too, that at any moment the huge liner's boilers might suddenly explode. But in spite of the terrific risk, the engine-room crew to a man continued to stick to their posts, closing the steel bulkhead doors and opening the steam valves, each man up to his neck in the incoming rushing waters.

On the deck above, efforts were being made for the safety of the passengers, together with that of the huge consignment of gold and silver which the steamer carried. The Republic's master, Captain Sealby, seeing his ship's predicament and feeling that the liner was doomed, quickly gave orders for the preparation of the small lifeboats to take the passengers off, and for the abandonment of his vessel. Then, quickly ordering his wireless operator, Jack Binns, to send out a call for assistance and help. Fortunately, when the steamer was struck, the wireless and aerial were safe, and though the dynamos had ceased to function, they had plunged the entire ship into complete darkness; the accumulators were, however, undamaged, and the wireless messages were able to be sent out.

There, buried amidst the litter and strewn wreckage of his tiny alcove cabin sat Jack Binns, the operator, a man whose name and deeds were later to take their place in the history and annals of maritime lore, and become a household word of heroic status on land. Binns immediately began to send out his famed "C. Q. D." -- the distress letters and signal code which gave place to the later "S.O.S."

Within a few moments he had contacted the wireless station at Siasconcett on the mainland where operator A.H. Ginman picked up his call for help. In turn Siasconcett alerted the French steamer La Torraine, the Cunard liner Lucanin and the SS Baltic of the White Star line plus furnishing all ships at sea as were within reach, news of the disaster, giving the doomed Republic's position, and within a few short hours at the most, the entire world in general became aware of an occurrence of which, only a few years earlier, it would not have heard about until long hours after it was all over for good or ill.

The steamer which had so suddenly and unexpectedly struck the Republic, the Italian liner Florida, a ship of 5,018 gross tons, incoming en route from Naples to New York carrying 800 Italian emigrants aboard, became considerably more alarmed by the passengers than those aboard the Republic, who

ENDURANCE & COURAGE

HENRY G. TATTERSAIL

The Marconi Wireless Operator of the Steamer "BALTIC", who remained at his post in his wireless room for fifty-two hours without sleep, aidingthe work of calling continuously for assistance and helping in directing the course of the rescue liner "BALTIC".

SOCIETY OF WIRELESS PIONEERS

JACK BINNS

JACK BINNS, Hero of the "REPUBLIC" catastrophe, shown in ship's uniform at the time of disaster. Binns died at the age of 74, in a New York Hospital.

The Pacific Northwest Chapter of the Society of Wireless Pioneers is called the "JACK BINNS CHAPTER" in honor of this early day pioneer whose devotion to duty under great stress was responsible for the saving of hundreds of lives and by his action, made the world conscious of the great potential of 'wireless' communication. We are proud to have a "JACK BINNS" Chapter in the Society.

panicked, their nerves had already been most severely shaken being refugees arriving from a terrific earthquake which had but a short time before occurred in Italy. However, the officers were soon able to calm their fears for the moment, reassuring them that there was no immediate danger of the Florida going down.

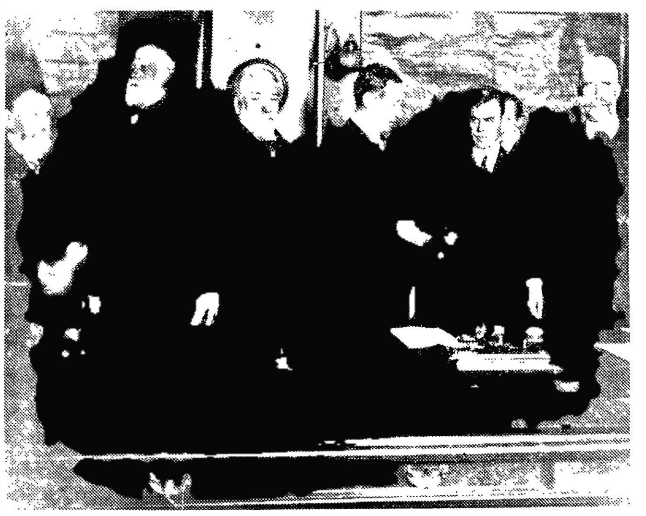
Shortly thereafter, the Florida's master, Captain Ruspini, contacted the Republic by wireless and agreed with Captain Sealby that, considering the state of the latter's ship, a transfer of the passengers to his own vessel should be made immediately fearing that the ships which, by now, were known to be searching for them might be delayed by the heavy fog and not arrive in time.

Meanwhile, during the process of transferring the passengers from the Republic, which was a most difficult undertaking in such a dense fog and high seas running, Jack Binns was still at his wireless apparatus, keeping in close contact with Ginman at Siasconett. Unfortunately, his spark was now too weak to reach out to other craft, however, he easily overheard a number of ships talking, and to report to Captain Sealby that the ships New York, Lorraine, Furnesia, Lucania, and the Baltic were all aware of the disaster that had taken place, and were desperately striving to grope their way through the fog to assist the Republic.

Within a half hour of the collision, Captain Ransome of the Baltic, passing Nantucket Island inward bound, picked up the Siasconett's wireless message at 6:00 A.M. in the morning. He gave orders for his steamer to turn about, and steam directly toward the scene of the collision. Though the distance was not too great, conditions were most difficult for him, enshrouded in the thickening fog, he was unable to locate the Republic. And Binn's wireless spark was too weak to reach the Baltic direct, but he could hear quite clearly the vessel's operator talking with the shore station. It was undoubtedly a nerve-tacking experience to witness, as it were, the groping in the fog of the would-be rescuer, while hours passed and the Republic was slowly sinking beneath his feet.

It wasn't long before Binn's began to receive the Baltic's message direct, and he was kept busy relaying to her the Republic's position. Later, in the afternoon, Binns got in touch with the steamer Lorraine, but the vessel was unable to locate the fast-sinking liner. Eventually, about 6:00 P.M. in the evening, the Baltic arrived on the spot.

Now, Jack Binns, who had stood by his post in the wireless room without a break since the collision, and had sent out more than 200 messages over his apparatus, had the difficult task of directing the course of the Baltic, as the ship maneuvered for position. While the lights on the oncoming steamer could not be seen from the Republic, the Baltic was more or less enshrouded in darkness, her oil lamps barely penetrating the fog for more than a hundred feet. But Binns continued to keep his wireless directions to the Baltic with such instructions as "NOW YOU ARE ON THE PORT BOW" -- "NOW DEAD AHEAD" -- "YOU ARE COMING TOO CLOSE NOW" -- "BACK AWAY OR YOU WILL RAM US," until, finally, the officers and crew still aboard the Republic suddenly saw a faint green light looming through the fog and heavy mist.



HERO'S AWARD

Marconi presents Jack Binns with gold watch in token of bravery and heroic service while Directors of the Marconi Wireless Telegraph Company look on.

Then the Baltic had safely arrived on the spot; and her slow groping search was at an end!

By this time the sea had risen considerably, and both Captains Sealby and Rispini, over the wireless, decided to take off the passengers from the Republic. The decision appeared to have had quite a bad effect on many of the Italians aboard the Florida, causing considerable panic among them, for shortly after the transfer had begun a number of the emigrants made a quick rush for the lifeboats, brushing, in their fears, both women and children aside; and had it not been for the second steward of the Republic, named Robert Spencer, jumping in among them and knocking down one man after another, then announcing through the interpreter that he would throw the first man who became ungallant overboard. With that threat, order was quickly restored, and the transfer became orderly throughout the night and into the early hours of the morning. Then the Baltic, laden with all the passengers, proceeded back to New York.

The Republic was still afloat but in dire danger and, Captain Sealby decided to make a last effort to save his ship, if possible. He called for volunteers and obtained a crew, including wireless operator, Jack Binns. Returning to the bridge, he ordered Binns to send out a call for tugs. As news of the catastrophe had already been picked up along the New England coast by the wireless stations, there started a great race of tugs and other craft to be the first to reach the doomed and sinking vessel, for she presented a most unusual opportunity of recovering salvage money, to say nothing of the consignment treasure cargo. The first to arrive on the scene were the revenue cutter Gresham and the derelict-destroyer Seneca, who quickly took the Republic in tow, being convoyed by the steamer Furnessia.

When the Republic and the towing craft were just a few miles south of Martha Vineyard Island, Massachusetts, it was discovered that the shattered steamer was rapidly sinking and was now down below her water-line. Lifeboats from the Furnessia and the two cutters were quickly launched, but not quickly enough, for the Republic suddenly plunged down stern first, and the crew members were forced to throw themselves into the sea to avoid being sucked down in the vortex. Captain Sealby, however, remained with his ship, but when the searchlights from the vessels were sprayed across the water they revealed him climbing up the foremast, to which he desperately clung until the topmast disappeared along with the ship beneath the surface. Fortunately both the master and all members of the crew were picked up without loss.

In the meantime the Baltic had arrived and docked in New York harbor on the 25th. There, on the docks, a huge crowd was waiting and witnessed the arrival of the rescued passengers. They gave Captain Ransome a rousing reception, but most enthusiastic as the scene was, it was little compared to that which was enacted when Captain Sealby and Jack Binns arrived later; they both were seized by a group of seamen and stewards of the White Star Line, who were almost mad with enthusiasm, and the two, perched on the broad shoulders of the stronger of the black squad, were carried through the streets of New York City and shown off to the thousands of cheering crowds before finally being deposited in the steamshi company's offices. Too, much of the same enthusiasm was displayed when Captain Ruspini, of the Florida, arrived safely in port a few hours later.

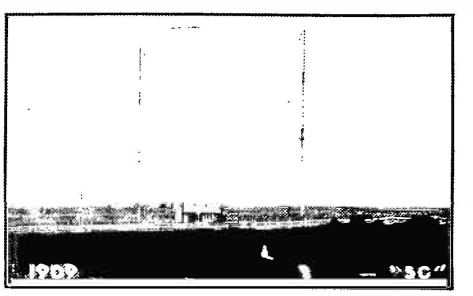
The entire world had now been worked up to a high pitch of elation through their first look behind the actual scenes of such a disaster at sea, as it were, by and through the use of wireless; not only had the general public's mind been fired by the ever fascination and dramatic details of a tragedy of a shipwreck, but the fact that nearly a thoudand lives had been snatched from the very jaws of death by an entirely new and heretofore untried means of communication gripped its imagination.

Later, when the steamer Baltic, on her return passage, arrived at Liverpool, England, on February 8th of the same year, and docked with Captain Sealby and Jack Binns, the wireless operator were literally mobbed! Too, when Binns made a visit to his native city of Peterborough, thousands of the city's inhabitants welcomed the now famed wireless operator as the hero of the day. The Mayor greeted him and made a speech praising him for the coolness and promptitude with which he had used in the face of adversity; and, in turn, Binns answered, stating that he had done nothing more than his duty, giving full credit to the engine-room crew of the Republic for the part they played in saving all of the passengers.

At a reception in London in honor of Binn's heroic services, given by the Board of Directors of the Marconi Wireless Telegraph Company, Binns was presented with a gold watch by Marconi himself, and then was congratulated on being the first to demonstrate to the world what wireless communication at sea could do in saving life at sea.

Another honor was given to one of the principals in the Republic's disaster, when Lloyd's — Lloyd's of London — presented to Captain Ransome a silver plate by the owners of the White Star Line "as a mark of their appreciation of the fine seamanship and resourcefulness displayed by him under such trying conditions when rendering assistance after collision."

However, there now remains but three things to mention. There should not be forgotten that there was another wireless operator who, too, did his duty on this momentous occasion. One Henry G. Tattersail, the wireless operator of the steamer Florida, had remained at his post for a period of fifty-two hours without sleep whatever, aiding in the work of calling continuously for assistance and helping in directing the course of the steamer Baltic through the almost impenetrable fog. Neither must we overlook the fact that all of the ships engaged in the rescue of the Republic's passengers and crew were able to fix their positions with the aid of the submarine bell of the Nantucket Lightship, and the rescuing ship Baltic, was also guided by the submarine bell of the Ambrose Lightship, which was heard, like some devil's tattoo with its mournful reverberations no less than sixteen miles away. And, finally, that of the gold and silver consignment which the Republic had carried down when she made her final plunge to the bottom, sinking in forty fathoms of water in Latitude 40° 25' 30" north, Longitude 69° 40' west, approximately twenty miles southwest of Nantucket South Shoals Lightship, off the Massachusetts coast. = 30 =



Wireless station, Siasconset, Mass., where the "C Q D" message was received from the *Republic*

HOW WIRELESS HAS SERVED THE SEA

'Heritage of the Professionals'

CHRONICLED FROM PAGES OF . . .
"THE WIRELESS AGE" back in 1916

A nostalgic review of the early days of the Wireless and the historical record of the lives and property it has saved, in those early days.

PART ONE—THE NARRATIVE

HOW WIRELESS HAS SERVED THE SEA

A remarkable record of achievement is presented by wireless telegraphy since the service was first utilized in controlling the forces of nature for the benefit of mankind. It shows what the aerial message has done to safeguard lives on board vessels disabled by storm or mishap; that come into collision in the ocean fog; that are wrecked on rocks or swept ashore. It shows how fire in mid-ocean has been robbed of much of its historic dread and how rescue is brought to the helpless victims of warfare on merchant ships.

In no single instance on record has the Marconi system failed of its purpose, and even where sea or storm or fire or collision have temporarily disabled the apparatus, it has been quickly set aright and its intended work fulfilled.

All through this serial story of the sea's happenings runs the record of men living up to the traditions of the Marconi service. The list of such men who bravely gave up their lives to duty tells a story of courage amid difficulty and danger, of men who braved death to save the lives of others, men who were the last to leave the sinking ship.

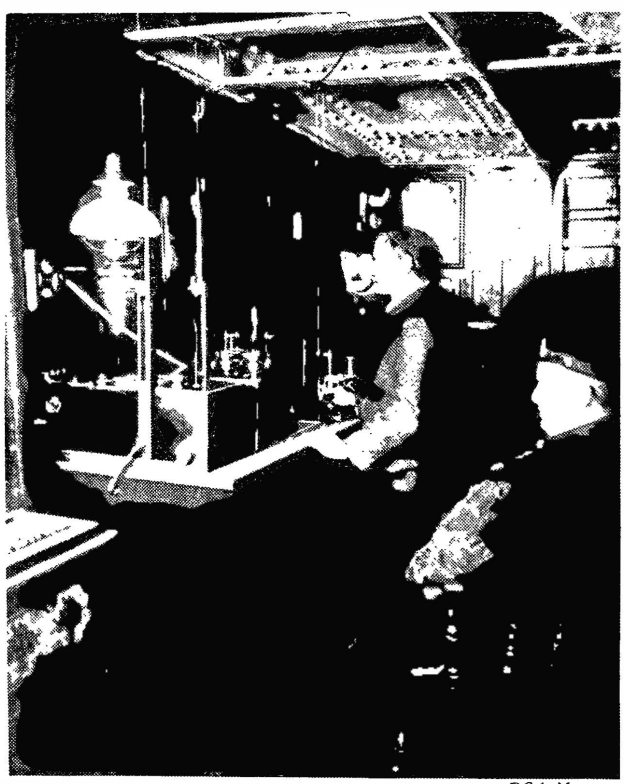
● The first recorded use of the wireless in rendering assistance to a ship endangered by collision, was on March 3, 1899, when the steamship R. F. Mathews ran into the East Goodwin Lightship. This accident was reported by wireless telegraphy to the South Foreland Lighthouse, and lifeboats were promptly sent to the relief of the lightship. It was an incident of small importance in itself, yet a harbinger of great deeds to come.

Years passed, and then suddenly occurred one of the greatest shipwrecks of modern times--one, indeed, in which the Marconi wireless service first impress-

HOW WIRELESS HAS SERVED THE SEA

ed its overwhelming importance upon the public mind, through being the means of saving nearly 1,500 lives. With thirty feet of her bow cut away, the Italian steamship Florida, of the Lloyd Italiano Line, came slowly into the port of New York on January 25, 1909. Three days before, near Nantucket, she had run down and sunk the White Star liner Republic. The Baltic, also of the White Star Line, brought the survivors of both steamships into port. Thanks to the utility of the ether-waved call for aid, it was a story of lives saved rather than of lives lost.

The collision occurred in a dense fog shortly before six o'clock in the morning, while both vessels were out of their courses. While the passengers were huddled on the deck of the Republic, water pouring into a rent in her port side, one whose task was all-important was John W. (Jack) Binns, Marconi operator, to whom the survivors owed the swift summoning of distant ships, and the world owed what news it received within a few hours of the collision. A few moments after the Florida faded back into the mist whence she had come, the air above the ship was transmitting the code signal C Q D, which apprised the world of what had happened. The Republic's whistle kept going, and this brought the Florida back out of the fog to the aid of the vessel she had wounded. The passengers were then transferred to the Florida.



RCA Museum

Wireless room of the Goodwin Sands lightship from which the first distress call was sent, March 3, 1899

On board the Republic there remained only the Captain, the second officer, the boat's crew and the Marconi operator. Distant vessels, which had picked up the call for aid, were guided by Binns to the scene of the accident. And the cheering news had gone out to the world that the passengers were safe, the ships had not sunk and that there was no immediate danger. The wireless told its story all the livelong day and well into the night, until the electricity in the storage batteries gave out. The dynamos had gone when the engine room was flooded. But the great Baltic then hove in sight, and the Gresham from Wood's Hole.

The world was forced to marvel at the now historical story told by Captain Ransom, of the Baltic. "We got notice at six o'clock on Saturday morning," said the Captain, "that the Republic had been in collision and needed assistance, and we turned. We went back and commenced the search. It began at eleven o'clock and continued until eight at night. She was found finally by means of wireless. She heard our whistle and steered toward us, guided by wireless. As fast as our Marconi operator got a message, he rushed it to me. I have all the copies. One of them reads: 'You are now on our port bow. Can you see us? Republic.'

"Other messages read: 'You are now very close. Can you see our rockets? Republic. Steer east-southeast. Listen to our bell. Republic.'

"It was a sort of blindman's buff, with the wireless messages coming, 'Now you are hot, and now you are cold.'"

The Republic rescue stands out in the lay mind as the first collision at sea to receive wireless aid.

Only two days previously, on January 20, the steamship Hamilton, of the Old Dominion Line, had been in collision with a car barge of the New York, Philadelphia & Norfolk Railroad, in Hampton Roads. The distress call was sent out by wireless, and soon after tugs were towing the badly battered steamer back into port. Then, on March 10, blanketed by a dense fog and proceeding at half speed, the coastwise steamship of the Maine Steamship Company, the Horatio Hall, Portland for New York, and the H. F. Dimock, of the Metropolitan Line, New York for Boston, met in the middle of the narrow channel known as Pollock Rip Slue, with a crash that sent the Hall to the bottom within half an hour and caused the Dimock to run ashore six hours later on Cape Cod Beach. The two steamships, looming out of the fog, had met in a crushing jar, the sharp, nose of the Dimock going through the side of the Portland boat. The wireless operator on the sinking Hall managed to transmit a brief message calling for aid, and then the passengers on the Hall were dragged to the deck of the Dimock, which began to list. Six hours of silence ensued, during which half a hundred wireless stations, commercial, government and amateur along the coast from Portland to New London, endeavored to obtain news of the accident. Revenue cutters, scouring the waters up and down the coast, managed finally to reach the place of the disaster and rescue the men and women on the disabled Dimock. The wireless next served its purpose in the rescue of endangered passengers on the steamship Ohio, which was rammed and sunk by a craft off the Alaskan coast on August 27. Vessels which responded to her calls for help saved 200 lives.

Lowering fogs, through which the helmsman guides the ship's uncertain way, are the most prolific causes of collisions, as can be seen in this summary of such events. The siren's voice is deadened and the location of the oncoming vessel is rendered uncertain by the ocean haze. It is the wireless only that can bring help to the stricken ships. Such was the case with steamer Merida, of the Ward Line.

which, on May 12, 1911, while off the Virginia Capes in a heavy fogbank, bound for New York from Vera Cruz and Havana, was struck midships by the Admiral Farragut, on her way from Philadelphia to Jamaica. The wireless distress call was launched, and responded to by the steamship Hamilton, to which vessel all persons on board the two colliding ships were transferred before the Merida sank. The Admiral Farragut was helplessly disabled.

Next occurred the greatest marine disaster in world's history, when the Titanic, the largest passenger liner of her time, on April 15, 1912, came into collision with an iceberg and went to the bottom of the Atlantic, carrying down with her 1517 lives. More than half that number of persons were saved, however, through the steadfast courage and self-sacrifice of the Marconi wireless operators, Phillips the senior, and Harold Bride his assistant.

Bride described the scene in the wireless room of the Titanic as follows: "Phillips and I were in the room. 'Send a call for assistance,' ordered the Captain, barely putting his head in the door.

"'What shall I send?' asked Phillips.

"'The regulation international call for help. Just that,' was the reply.

"Phillips began to read C Q D. 'Send S O S,' I said. 'It's the new call, and it may be your last chance to send it.'

"We picked up first the steamship Frankfurt. The Carpathia answered then, and we told her our position and said we were sinking by the head. Phillips told me the wireless was growing weaker. The Captain came and told us our engine rooms were taking water and that the dynamos might not last much longer. We sent that word to the Carpathia.

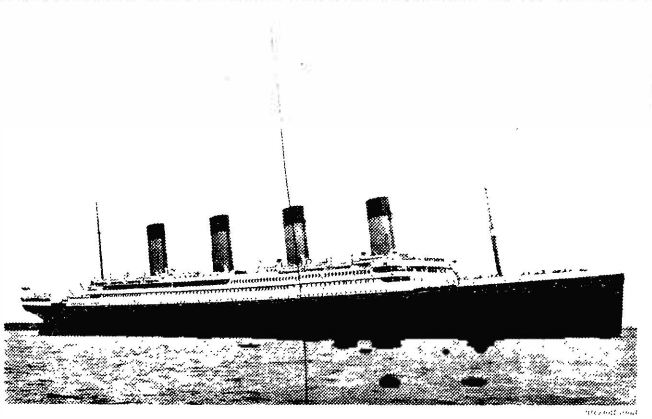
"How poor Phillips worked through it I don't know. He was a brave man. We picked up the Olympic and told her we were sinking by the head. As Phillips was sending the message I strapped his life belt to his back. Then came the Captain's voice: 'Men, you have done your full duty. You can do no more. Abandon your cabin. Now it's every man for himself.' Phillips clung on, sending and sending. He clung on for about ten minutes or maybe fifteen minutes after the Captain had released him. Water was then coming into our cabin. Phillips ran aft, and that's the last I ever saw of him alive."

Bride was washed off the foundering vessel, swam to the surface and was pulled aboard a boat and saved. His senior went with the other souls to the bottom.

Another scene of this ocean drama is related by Howard Thomas Cottam, wireless operator aboard the Carpathia, the ship of rescue:

"I got the Titanic C Q D call at 11:20 o'clock on Sunday night. It was this: 'Come at once. We've struck a berg. It's a C Q D call, old man." Then the Titanic operator followed with his position, which was latitude 41:46 north and longitude 50:14 west. I think I received the C Q D seven to ten minutes after the Titanic struck. It was only by a streak of luck that I got the message. After hearing the Frankfurt, then I heard the Olympic calling the Titanic with a service message.

"All this time we were hearing the Titanic sending her wireless out over the sea in a last call for help. 'We are sinking fast,' was one which I picked up being sent to the Olympic. Just before we reached the Titanic I got this message, and it was the last one I received: 'Come quick, our engine room is flooded up to the boilers.' I answered



SS. *Titanic* leaving Southampton on her maiden and fatal voyage, April 10, 1912

that our boats were ready, and for them to get theirs ready also, and that we were doing our utmost to get there in time. Until we reached the spot where the Titanic foundered, I was listening for a spark from his emergency set, and when I didn't hear it, I was sure he had gone down."

Owing to its speed and the vast distances it travels, wireless aid is distinguished from all other forms of safeguard at sea by the promptness with which it communicates the story of disaster, and brings rescuers to the stricken ship. It was this feature of prompt service that saved all the lives aboard the steamship Madison, on February 22, 1912, when she was rammed by the Hippolyte Dumois; and resulted in the preservation of the El Sud in April, of that year, when she came into collision with the steamship Denver off Galveston Bar. The El Sud was not equipped with wireless, but, fortunately for her, the Denver was, and in response to calls sent out by the latter, assistance came and the injured steamship was towed into Galveston.

Similar promptitude on the part of Arthur Ridley, of Ridge Hill, Mass., the Marconi operator on the Millinocket, in summoning a tug and a lighter, when that vessel was struck by the steamship Persian on July 24, 1913, resulted in the successful docking of the injured ship. A wireless appeal for assistance brought an equally prompt response to the steamship Pleiades, in October of the same year, when she was struck by an unknown steamship off the Pacific coast. A tugboat appeared in answer to the call and towed the Pleiades to port in safety. There would undoubtedly have been great loss of life in an accident which occurred ninety-five miles south of Hatteras on November 1, had there not been a speedy response to the radio call. The steamship Norwega came into collision with the schooner Glenlui, tearing a hole in her side of such enormous size that she rapidly filled with water. A passenger vessel, two revenue cutters and a battleship were soon at hand and saved all on board.

The fine spirit of devotion that typifies the Marconi service was next exemplified by the heroic conduct of a wireless operator, who sacrificed his life in humanity's cause. It was in a heavy fog off Hog Island, sixty miles from Cape Charles, on the morning of January 30, 1914, that the Old Dominion Line steamship Monroe came into collision with the smaller ship, the Nantucket, of the Merchants' and Miners' Transportation Company. Ferdinand J. Kuehn, chief wireless operator on the Monroe, who was in the operating room when the accident occurred, notified his assistant, R. S. Etheridge, and sent the S O S call. Etheridge fetched two life preservers, and while one was being put on by Kuehn, Etheridge continued sending out the S O S,

giving the position of the Monroe which was sinking rapidly.

Etheridge then dashed for a lifeboat and was picked up by the Nantucket. Kuehn was standing on deck when a woman ran toward him. "Where is your life preserver?" he asked. "I have none. Oh, I am lost," she cried. ● Kuehn took off the one he wore and fastened it upon her. Then he led her to the rail and helped her over. Attempting to enter the boat, Kuehn missed his footing and fell into the water. He managed to keep afloat for a while, during which time efforts were made to rescue him, but the water was too cold and he finally sank, after having given up his life to save another. The Monroe sank ten minutes after the collision. Forty-three lives were lost and ninety-eight persons rescued as a result of the help that arrived in answer to the distress call.

Again this lesson of courage and strict attention to duty was heralded to the world, several months later, when two wireless telegraphers on a sinking liner, at the risk of their lives, sped the message of disaster to the nearest shore. ● The Empress of Ireland, bound for Liverpool, had left Montreal on May 27 in a thick fog. When in the St. Lawrence River, 150 miles from Quebec and ten miles from Rimouski, she came into collision with the Danish collier Storstad, with fifty men aboard, feeling her way through the fog, inward bound. The collier crashed into the liner and tore her side open to the stern. The two Marconi operators on board the Empress were Ronald Ferguson, senior, and Edward Bamford, his assistant. While the vessel began to list, the operators quickly sent out the S O S, reaching the land operator at Father Point. Then the lights went out aboard the Empress, she careened and sank.
Meantime, the operator at Father Point sent word to the Canadian government boats Eureka and Lady Evelyn, which steamed to the scene of the disaster. They found 452 survivors in the lifeboats of the Empress, among whom were the two operators. The death list of the disaster was placed at 1,024, and the prompt work of the Marconi operators undoubtedly served to save those who were rescued from the foundered vessel.

On the morning of August 25, of the same year, the steamship Admiral Sampson, owned by the Pacific Alaska Navigation Company, was feeling her way carefully along her course, off Point-no-Point, near Seattle, Wash. The greater number of the passengers were asleep in their berths, but some of them, aroused by the siren, had come on deck. The Princess Victoria, of the Canadian Pacific Line, was also making her way through the fog in much the same cautious manner as the Sampson. Fog whistles on both vessels sounded continuously, but the thick mist blanketed the warnings. The Victoria rammed the Sampson, a steel vessel, directly on a line with the after hatch, cut three-fourths of the way through her, and opened a twelve-foot gash in her own steel plates, in which the cover of the Sampson's hatch was still jammed when the Canadian Pacific liner arrived in Seattle with the survivors.

The vessels were so close together that the majority of the Sampson's passengers were able to climb on board the Victoria. The bow of the Victoria entered the side of the Sampson at a point where a considerable quantity of fuel oil was stored and crushed several large containers. They were set ablaze, and in an instant both vessels were enveloped in flames. When the Victoria backed away, the Sampson's side was left uncovered and she began to settle and went to the bottom four minutes after she was struck.

● W. E. Reker was the senior wireless operator on the Sampson, and while the vessel was foundering, he made his way to the Captain on the bridge, preferring to share whatever fate overtook his commander rather than seek safety by leaving the doomed craft. The two men faced death fearlessly in the line of their respective duties, and were drowned. ● Not less praiseworthy was the conduct of H. F. Wiehr, the junior Marconi operator. He stayed on the Sampson until the last, finally being compelled to jump over the side, and was picked up by one of the lifeboats.

Meantime the wireless operator on the Victoria had sent out the S O S call, which was picked up at the Marconi station at Seattle, and established communication with the steamship Admiral Watson, which came to the aid of the injured vessel.

The steamship Metapan, of the United Fruit Company's Line, on October 15, was rammed in the fog by the freighter Iowan, of the Hawaiian-American Line, at the entrance of Ambrose Channel, New York Harbor, and sank. When the collision occurred the wireless operator on the Metapan sent out a call for assistance, which was responded to by vessels in various parts of the harbor, and all on board were rescued.

On January 24 of the following year, the Washingtonian, of the Hawaiian-American Line, came into collision with the five-masted schooner Elizabeth Palmer, off Delaware Breakwater. The Washingtonian sank, and the schooner was abandoned with her decks awash, only one life having been lost. Captain E. D. Brodhead, of the Washingtonian, ordered the lifeboats to be made ready, and into them the crew of forty-odd men tumbled. There were also thirteen men and one woman on the schooner. All made their way safely to a lightship, and wireless messages sent from the station there summoned the steamship Hamilton, of the Old Dominion Line, which stopped and took aboard the victims of the wrecks, and conveyed them to New York.

But it is not only in the solitude of midocean or in the perilous channel that the wireless teaches the lesson of its superb value. Its service is as efficient on the lake or the inland water course. This was shown on March 25, 1915, when the steamship Parisian grounded in the Mississippi River. While in this position she was struck two days later by the Heredia, of the United Fruit Company, which had 164 passengers aboard. Wireless brought prompt aid to the two distressed vessels.

On May 26, 1915, the S O S aided in the rescue of 230 passengers who were aboard the Holland-American liner Ryndam, which was in collision with the fruit steamer Joseph J. Cuneo, south of the Nantucket Shoals. Water poured in torrents into the hole which the Cuneo tore in the side of the Ryndam, and the bows of the fruit steamer were stove in, she also taking water rapidly. On board the Ryndam were two Marconi operators, B. Moore, senior, and A. T. A. Le Clercq, his assistant. They sent out the distress signal while the passengers were being transferred to the Cuneo, which was the least damaged of the two vessels. The battleships South Carolina, Texas, Louisiana and Michigan responded to the call, and the South Carolina took aboard the passengers who had sought safety on the fruit steamer. No lives were lost.

Even in casualties at sea, where the wireless is not the direct means of saving life, or ship or cargo, the mere fact that the service is at hand, ready for immediate use, brings solace and hope to those endangered. This is made evident in the following list of accidents: On June 13 of the same year there was a collision between the Metropolitan Line steamship Bunker Hill, bound from New York to Bos-

ton, with 250 passengers, and the steam yacht of C. K. G. Billings, the Vanadis, in a fog off Eason's Neck, L. I. Two persons were killed and several injured as a result of the accident. Ingalls and Pitts, Marconi operators on the Bunker Hill, sent Marconigrams to New York, giving news of the accident. The Bunker Hill returned under her own steam, and several vessels which had received the wireless message volunteered their aid, which, however, was not needed.

The pilot boat New Jersey was rammed and sunk by the United Fruit steamer Marchioneal at the eastern entrance to Ambrose Channel on July 10, 1915. The crew was saved by the Marchioneal, and S O S calls brought assistance, which, again, was not needed.

The presence of wireless apparatus lent courage and steadiness to those aboard the steamship Dorchester, when, on May 28, she was rammed by the schooner J.A. Palmer, off Annapolis, Md., and the aerial message was utilized to apprise the world that no lives had been lost. And when, on June 16, the steamship Alabama was struck by the Delaware, fifty-three miles south of Scotland Lightship in a dense fog, and neither vessel suffered serious damage, wireless was used to relieve the anxiety of the owners. Also on February 1, 1916, when the Takata Maru came into collision with the Silver Shell, the fact that that last-named vessel had rescued the former's crew was sent by wireless to the Marconi stations at Boston and Cape Race.

There is probably no danger that is dreaded more by the seaman or the sea traveler, than the ship afire. Storms may be outlived, and the ship with broken propeller blades may drift, but flight, as a rule, is the only salvation from the burning ship. But the aerial message brings aid so swiftly to those marooned on flaming vessels of late years that the dread of this form of calamity has been materially lessened.

Plying between Panama and Peruvian ports, the steamer Huallaga, of the Peruvian Dock & Steamship Company, took fire at sea on July 20, 1910, off the north coast of Peru. In fighting the flames, three of her seamen perished. Wireless operators flashed the S O S which was received by the steamship Ucayali. Making all haste, the rescuing vessel arrived in time to take off all the passengers and the remainder of the crew. Three days later, July 23, the Momus, of the Southern Pacific Company, bound from New York to New Orleans, took fire south of Cape Hatteras. Under the directions of Captain Boyd, the crew fought the flames for hours, but the fight becoming hopeless, the Captain summoned aid by means of the wireless. The steamship Comus responded to the call, not only taking off the passengers safely, but assisting in subduing the flames. The cargo and vessel, valued at $3,000,000 were saved. Again, on January 25, 1911, the Queen of the Pacific Coast Steamship Company, while off Point Reyes, Cal., developed fire in her forward hold. The distress call brought four steamers to her assistance and the crew and eighty-seven passengers were saved.

The year 1913 was one in which there occurred an unusual number of fires at sea. Never before did the Marconi wireless service have a better opportunity to prove its utility. On June 10 of that year, the Olinda, of the Munson Line, with five passengers aboard, caught fire at sea. In response to the S O S call, the U. S. S. Nashville went to her assistance and took off the passengers in safety. Fire started on the British steamship Templemore on September 29 while she was on a voyage from Baltimore to Liverpool. ● Raphael Emanuel, the Marconi operator on board, sent out the distress signal, which was picked up by the steamship Arcadia, fifty miles away. While the Arcadia was hurrying to the burning ship's relief, the Templemore was consumed by the flames, 800 miles east of the Virginia Capes. Passengers and crew were in the lifeboats when the rescuer arrived and took them aboard. During October the steamship Berkshire was burned off Lookout Cove, N. C. The S O S call was heard at Wilmington, 164 miles away, by the revenue cutter Seminole, which reached the scene of disaster in time to take off all the passengers. After the flames were extinguished the following day the vessel was towed to a safe anchorage.

Of all the marine disasters of that fateful year, the most sensational was the burning of the immigrant ship Volturno, which was ablaze from stem to stern in a terrific storm in the Atlantic, 450 miles east of Newfoundland, on Thursday, October 9. Wireless calls fleeting over the ocean, brought ten vessels to the rescue, but for more than twenty-four hours they were compelled to cruise about the flaming vessel, incapable of rendering help because of the fierce wind and turbulent sea. It was not until the next morning that it was found possible to transfer passengers. Of the persons aboard, 521 were rescued. The others, numbering 136 souls, lost their lives in the raging seas, which smashed the lifeboats against the sides of the Volturno and spilled their human freight into the water.

The Marconi wireless operators on the Volturno were Walter Seddon and Christopher Pennington. ● Pennington performed his duties courageously while menaced by peril and escaped from the vessel by leaping into the sea. Seddon was an occupant of the last boat that left the doomed craft.

With seas running so high that it was seemingly impossible for small craft to live in the waves, 103 passengers of the Spanish steamer Balmes, which was threatened with destruction by flames, were taken from the burning vessel by the Pannonia, of the Cunard Line, on November 14, after aid had been summoned by the Marconi wireless. The rescue occurred 600 miles east of Bermuda. While Captain Ruiz, of the Balmes, and his men battled with the flames, Inocencio V. Michavila, senior Marconi operator, began sending the S O S. The Pannonia was 287 miles distant from the burning ship when the call of distress was received by the senior Marconi operator, Stanley G. Rattee. His assistant, Edward Murphy, who was in the ship's hospital, crawled from his berth to the wireless room to aid his comrade in gaining the location of the distressed vessel. The Pannonia rescued 125 persons from the burning ship. At the time of the rescue the crew of the Balmes was reduced to the last degree of exhaustion, and the firemen lay about the deck so overcome, as a result of asphyxiation, that they had to be relieved every fifteen minutes.

The freighter Columbian, bound from Antwerp to New York, caught fire on May 3, 1914, while 300 miles south of Cape Race. The members of the crew were driven to take refuge in the lifeboats, and fifteen of them perished. Thirteen of the survivors were picked up by the steamship Franconia, of the Cunard Line, fifty hours after the men aboard the ship had been driven to the boats by a serious explosion of unknown origin. Among those taken on board the Franconia was James Drohan, the Marconi operator on the Columbian. This rescue was made possible by the receipt by wireless of news of the disaster by the Franconia's Captain from other ships that had passed the burning Columbian after she had been deserted by her men. The Cunarder searched for the boats of the survivors and picked up the one containing the thirteen men. The Cunarder, by wireless, then cautioned other vessels to be on the lookout for the missing boats of the Columbian, which resulted in the rescue of the remaining survivors by the Manhattan and the Seneca. In all thirty-one lives were saved.

HOW WIRELESS HAS SERVED THE SEA

On September 1, while the City of Chicago, twelve miles out from Chicago, was learned to be on fire, apprehensions regarding the ~~safety of~~ those aboard were quieted by the comforting assurance, transmitted by wireless, that the vessel was in no danger, and in time she returned safely to port.

Another spectacular marine disaster. which caused much anxiety to the friends and relatives of those aboard the vessel, was the fire of mysterious origin on the French liner La Touraine, bound from New York to Havre, with a cargo of ammunition. An S O S call sent out by the liner on March 6, 1915, apprised the world that a serious fire had developed on board and that the flames were spreading at an alarming rate. The call was promptly answered by the steamships Arabic, Cornishman, Swanmore and Rotterdam. The Rotterdam was the first to arrive, and announced her readiness to take off the passengers, but by that time the crew had made headway against the flames. The Rotterdam, however, remained nearby, ready to lend aid, and escorted La Touraine as far as Prawle Point, where two French cruisers came in sight and convoyed the injured vessel to Cherbourg.

This year also was one prolific of fires. In the month of May two vessels were saved from destruction by the prompt summoning of aid by wireless. The steamship Standard was at sea in latitude 22:50 north, longitude 88:18 west, on May 18, when fire was discovered in her oil-fuel bunkers. The distress calls brought the steamships Bradford, Winifred and Alfonso to the scene. They fought and extinguished the flames and the Bradford towed the disabled vessel into Key West. On May 28 the steamer Mackinaw was on fire off San Francisco, and wireless calls brought tugs to the assistance of the burning vessel.

Alarm occasioned by a fire on board the steamship Sucha, on July 22, while in the Gulf of St. Lawrence, was emphasized by signals for help sent out from the ship and received by the Royal George. The latter proceeded to the rescue, but received word later that the fire had been controlled and help was no longer needed, which cheering information was promptly sent to shore by wireless.

Nearly 500 persons, abandoning a burning vessel in midocean, were rescued from their distress through the beneficent aid of the Marconi wireless service on September 11, when the Greek liner Athenai, bound from New York to Piraeus, caught fire. The vessel was entirely destroyed. The passengers and crew, numbering 470 souls, crowded in lifeboats, were rescued by the Tuscania and the Roumanian Prince. ● Two days later the lives of more than 1.700 persons were saved through the summoning of assistance by aerial messages. The Fabre Line steamship Santa Anna, from New York to Naples, was thronged with 1,700 Italian reservists when she caught fire in midocean. The S O S call brought the Ancona to the scene. She took off 600 persons and convoyed the distressed vessel to port.

On November 1 the steamship Rochambeau sent out wireless calls, stating that she was on fire, which were immediately answered by nearby vessels. The ship, however, sent messages subsequently, stating that the fire was under control and that assistance was not required. In this instance, as in others, failing in the wireless service, the world would have undergone anxious days of waiting before this cheering news could have reached land.

Another instance occurred, where, without the prompt assistance obtained by wireless, a vessel and her cargo would have been a total loss, when, on November 9, the steamship Lievatta, loaded with cased kerosene and gasoline, caught fire sixty-five miles east of Sabine Bar, Texas. The danger was reported by aerial message to the steamship Gulfstream, which arrived and stood by the burning ship until other assistance, summoned by wireless, arrived from Port Arthur and Galveston.

Such is the record to date of the value of the Marconi service in lessening that dreaded danger of navigation, "the ship afire at sea."

The aerial message serves unexpected ends. Many an injured seaman owes his well being, if not his life, to the fact that aid was summoned on his behalf from some doctor or surgeon hundreds of miles distant, when no other help was available.

While the oil steamer Asuncion was off the port of Eureka, Cal., on March 11, 1909, the Humboldt wireless station received from her a message saying that one of the sailors had fallen from the rigging to the deck, sustaining injuries resulting in severe internal hemorrhages. Medical advice was solicited for the injured man. The wireless station at once communicated with the marine physician, Dr. Charles Falk, who prescribed treatment. The vessel remained hove to until the directions of the physician had been received by wireless, when she proceeded on her way, while the remedies presumably were applied.

Captain McGray, of the steamship Herman Frasch, was stricken with ptomaine poisoning and at the point of death, January 2, 1911. A wireless message was promptly sent to physicians of the United States naval station at Dry Tortugas, Florida, about 100 miles away. The operator of the Merida, which was leaving the harbor of Progreso, Yucatan, about 800 miles away, caught Captain McGray's message asking for a prescription and method of treatment. The reply, written by the surgeon on the Merida was received on board the Herman Frasch before the naval station at Dry Tortugas could respond. Captain McGray, following directions, prepared a remedy from his medicine chest and soon recovered.

Dr. Ernestus O. Kuhr, of Brooklyn, New York, was aboard the Ward liner Esperanza, in March, 1913, when, on nearing Havana, the vessel's wireless caught a call for medical aid. The call came from the Altastad, a Norwegian freighter. It was explained that William Murray, a Marconi tester aboard, had his arm badly infected. The doctor told him that the case was one for immediate operation, and advised the opening of the arm with a sharp, properly sterilized penknife. He instructed the patient to use carbolic acid freely, and sent detailed instructions for dressing the wound.

A wireless call for a surgeon was sent out by the Marconi operator on the steamship John A. Hooper, in September, 1915. The appeal brought aid to Miss Annie Christiansen, a passenger who, during a severe storm, fell to the floor of her stateroom, sustaining a fractured leg. Aid was rendered by a surgeon on the steamship Alliancia, which, although thirty-five miles away, responded to the call. The sufferer received directions by which she could alleviate her distress temporarily. The doctor, however, advised that the patient be sent to the nearest hospital, which was at Kingston, Jamaica, where the young woman was taken.

A wireless call was sent out from the steamship "Radiant," on October 11, 1915, asking for the proper treatment to be extended to the ship's

engineer, who, for three days, had remained unresponsive to medicines administered by the captain. The Marconi operator, William C. Thompson, communicated with the station at Tampa, Florida, and then with the Southern Pacific steamship Comus, from which the doctor's advice was obtained, and the sick man was greatly relieved.

These are only a small part of the achievements of the wireless message, which insures comfort and safety to those who go down to the sea in ships.

"Big White Star Liner Baltic Aground In Fog!"

One day in May, 1907, this alarming headline was paraded on the front pages of all the New York newspapers. The news of a great passenger vessel being aground in a busily frequented channel embraced all the potentialities of danger. For years such accidents had been sources of deep concern to those whose loved ones were aboard outbound or inbound ships. Mishaps of this nature so frequently had dangerous consequences.

But scarcely had the newspapers sent word of this happening broadcast on May 8, 1907, when all alarm for the safety of the vessel and its passengers was suddenly banished. The Marconi wireless message had sent its cheering note ashore, asking assistance for the distressed vessel, and giving the public assurance of the well-being of all on board.

The Baltic had left the foot of West Eleventh street, New York, bound for Liverpool, but two hours later she had gone aground while passing out of the Swash Channel. News of the grounding was at once received in the White Star Line offices, and passengers began to use the wireless to notify their friends that the vessel was fast in the mud and could not proceed, but that there was no need for worry since help was coming and safety was assured.

Captain Smith, the marine superintendent of the White Star Line, and several officials were already on their way on a tug to inspect the distressed vessel, and found her hard and fast on the shoals off Sandy Hook. The wrecking tug William E. Chapman was also proceeding to the Baltic, and soon the great passenger steamship was set afloat and steamed without further mishap to her port across the ocean.

Of all sea happenings, probably the most numerous are those in which vessels strike submerged rocks, or are stranded on the everchanging sands of narrows or treacherous bays and coasts. Here also, as in the case of fire at sea, or collision in mid-ocean, or other casualties braved by floating ships, the Marconi system has stood the test with honor, the wireless never failing to bring aid to craft and crew and passengers. And the men of the Marconi service here also unhesitatingly face danger and death, living up to the fine unbroken tradition of efficiency that typifies the service.

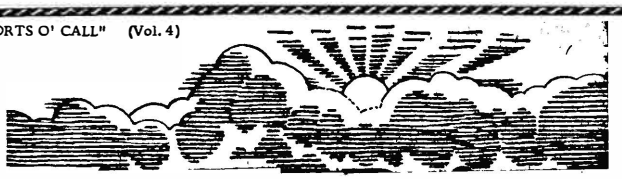
It was only several months before the mishap to the Baltic that, at a foreign port, a like service was rendered to a distressed vessel, when the steamship Preston, on January 20, was stranded in similar fashion on Courtown Gays, St. Andrews Island, about 170 miles from Port Limon, Costa Rica. Assistance was summoned by wireless and all on board were rescued.

An accident of like nature also happened to the steamship Seminole of the Clyde Line, on March 25, 1908, when she ran ashore at Point Pleasant, N.J., in a dense fog. The Clyde liner was in a more precarious position than the Baltic, however, for she began to pound heavily on the bottom, to the great alarm of the passengers. The distress call was sent out along the Jersey coast, speedily bringing wrecking tugs and life-saving crews to her assistance.

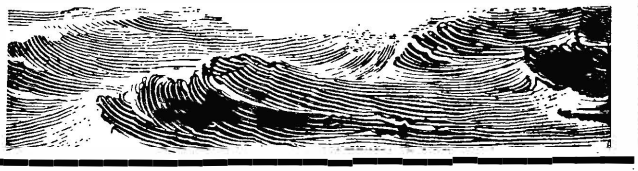
The United States revenue cutter Mohawk would probably have been pounded to pieces on the rocks of Hell Gate, on February 26, 1909, had not the appeals for help sent out by her wireless operator met with a prompt response. After having been buffeted by heavy gales and seas for six days, while searching for a derelict off Nantucket Shoals, the Mohawk, while on her way to Tompkinsville, struck on the Little Hogback, one of the rocks in Hell Gate off Ward's Island, and remained there leaking badly, her bow resting on two dangerous rocks, which threatened to tear a hole in her bottom with the fall of the tide. News of the accident was flashed to the Brooklyn Navy Yard by the wireless operator aboard the cutter a few minutes after the vessel struck. On behalf of Captain Landry, Commander of the Mohawk, he asked that the Navy Yard tug Powhatan and a transfer lighter be sent to the wreck as soon as possible. A second message was afterward sent to the Navy Yard for the Merritt-Chapman Company, requesting that two pontoons and a diver with a lighter be dispatched to the Mohawk without delay. A vessel situated as the Mohawk then was, could not possibly have summoned such varied and expert assistance in any other way than by wireless, which made her salvage possible.

The dense fogs that drift along the New England coasts are prolific sources of danger to coastwise steamships that creep their way through them, sounding their sirens. The steamer Massachusetts, owned by the New Haven Railroad and bound from Boston to New York, was suddenly in a precarious plight on the morning of March 11, 1909, when she grounded near Cedar Tree Neck, Vineyard Sound, Mass., while groping her way through the thick fog. She struck on the rocky bottom, and her forward compartments immediately sprung a bad leak. Her wireless operator quickly sent the calls for help to the Point Judith station, through which they were transmitted to Newport and New York. The revenue cutter Acushnet, stationed at Wood's Hole, went to the steamer's assistance shortly after dawn, and her passengers were safely transferred.

The quick summoning of aid by Stanley Coles, Marconi operator on the Cunarder Slavonia, on June 10, 1909, resulted in the rescuing of 410 lives, which would undoubtedly have been lost had it not been for the wireless message service. The Slavonia, then one of the crack carriers running from New York to the Mediterranean, went ashore on a reef off the southwest end of the Flores Island, one of the Azores group. The steamer Princess Irene, of the North German Lloyd, was 180 miles away when she picked up the help call--C Q D. Her operator answered and



HOW WIRELESS HAS SERVED THE SEA



immediately received a reply, stating that the Slavonia was ashore and where, and asking the Princess Irene to come to her assistance. Calls had in the meantime been heard also by the Hamburg-American Line steamship Batavia, and 300 passengers were transferred to her. The other passengers and the crew were saved before the Slavonia became a total wreck.

Then within a few weeks of each other, two vessels went ashore, one on the Atlantic and the other on the Pacific coasts, in each case both ships and cargo being saved by the summoning of aid by radio messages. On June 29 the steamer Mackinaw, of the Schuback-Hamilton Steamship Company, ran aground on the Yukon Flats. A wireless message to the steamship managers at St. Michael brought lighters to remove a portion of the cargo, after which the vessel was floated. On August 14 the steamer Helen, of the Atlantic Fruit Company, went ashore off Poplar Island, Chesapeake Bay, while heavily laden with a perishable cargo of bananas. The Helen was not equipped with wireless, but was sighted by the tug Savage, which at once sent out a distress call, bringing the necessary aid.

Less than two weeks later, on August 26, occurred off the coast of Alaska one of those ocean tragedies in which it falls to the lot of one man to sacrifice his life for the others who are dependent on his efforts for their rescue. ● The hero of this disaster was George C. Eccles, wireless operator, who stuck to his post in the radio room of the sinking ship until passengers and crew were assured of safety.

The steamer Ohio of the Alaska Steamship Company, while en route from Seattle, Wash., to Valdez, Alaska, via what is known as the inside passage, struck a rock at Steep Point, at the northern end of Finlayson Channel, British Columbia, sinking in thirty minutes. Two hundred lives were saved, and five lost, among the latter being Eccles.

Eccles, the operator, had been in wireless conversation with Booth, the operator at Ketchikan, Alaska, just before the Ohio struck a rock. Suddenly Eccles interrupted the inconsequential talk with Booth to flash this message: "Ohio struck a rock--steamer sinking--send aid immediately or everybody will be lost."

Booth and Eccles at once sounded the S O S, to which responses came soon from two steamers, the Humboldt and the Rupert City.

Then came another message from Eccles to Booth: "Ohio sinking fast--can't hold out--passengers being taken off in small boats--Captain and crew will stick to last."

After a pause came a third message from Eccles to Booth: "Passengers all off and adrift in small boats--Captain and crew going off in last boat--waiting for me now. Goodbye * * * * *."

They were the last words that Eccles ever addressed to a fellow being. He went down with the vessel while the Captain and crew were waiting for him.

Next three vessels at short intervals ran ashore on the South Atlantic coast and managed to gain assistance by means of wireless. The steamer Zeeberg, on September 25, ran ashore on the south jetty of St. John's Bar, near Jacksonville, Fla., and was pounding on the rocks when the Clyde liner Arapahoe, which was equipped with radio apparatus, sighted her distress signals, and sent out calls which brought the much needed aid. On November 20 the steamer Breakwater, of the Atlantic Fruit Company, ran ashore in a gale six miles from Diamond Shoals lightship. The wireless station at Cape Hatteras received the distress messages from the lightship and summoned the wrecking tugs Merritt and Coley, which took off all thirty persons before the vessel was ground to pieces by the shoals. The third accident occurred on December 1, when the steamer Nueces of the Mallory Line, while bound from New York for Key West and Galveston, ran aground on French Reef, off the Florida coast, in a thick rain squall. Wireless distress calls sent through the Key West station brought the Lampasas and the Government tug Osceola to her assistance.

It would almost appear that whether through fortuitous circumstances or elemental disturbances, stranding accidents are prone to occur in groups on similar coast lines. The next four accidents of this character took place on the Pacific coast of North America. The first of this series occurred on October 28, 1910, when the steamer Charles Nelson of the Charles Nelson Lumber Company went ashore a few miles north of Point Arena, Cal., in a thick fog. The sending of a wireless call resulted in bringing the United States revenue cutter McCullough to the rescue. Then, on December 1 the steamer Northwestern of the Alaska Steamship Company was wrecked off Falee Bay, San Juan Island, Wash., while bound from Seattle to Cordova, Alaska. The steamer Teos responded to the S O S call and all on board were saved. Nine days later the Olympic, also of the Alaska Steamship Company, was wrecked on a reef off Bligh Island, Alaska. In this instance Government launches answered the S O S call and 123 persons were saved. The fourth of the series occurred on January 26, 1911, when the steamship Cottage City of the Pacific Coast Steamship Company was wrecked on a reef off Quadra Island, North British Columbia, in a blinding snowstorm and heavy fog. The S O S call brought aid from Victoria, British Columbia, and Port Townsend, Wash., and all on board were rescued.

In another Pacific catastrophe, on April 11, wireless aid was responded to by Japanese and Chinese ships when the Asia of the Pacific Mail Steamship Company sank off Finger Rock, South China. Her wireless distress signals were answered by the American Maru and the Chinese vessel Shang Siu. The passengers, crew and mails were saved.

The last two stranding events during 1911 occurred at widely distant points. The steamship Prinz Joachim, on November 22, struck rocks at Atwood Bay, Samana Islands. Wireless communication was established direct with New York City, and all on board were carried to safety. On December 13 the steamship Delhi was reported in distress off Cape Spartel, on the coast of Morocco. Assistance was obtained by aerial messages, and eighty-six passengers, 235 members of the crew and 3,500 tons of general cargo were saved.

In the year 1912, as though by a compensatory dispensation of Providence, owing to the great tragedy of the Titanic, there were comparatively fewer sea tragedies. Only two stranding accidents were recorded, and these, thanks to the wireless, were not of a serious nature. The Pleiades on August 16, ran ashore at Magdalena Bay. The operator, G. Bennett, summoned aid by aerial message, and all on board were taken off. On December 5 the steamer Easton, of the United States & Dominion Transportation Company, struck on Iroquois reef in Lake Superior. Wireless calls were answered by stations at Port Arthur, Ont., and Duluth, Minn. Tugs sent to the assistance of the stranded steamer released her from her predicament with slight damage.

During the following year, however, many vessels were driven ashore and were wrecked on rocks, with heavy losses in life and property, but notwithstanding the year was a notable one in demonstrating the humanitarian value of the Marconi service and the promptitude and heroism of its vigilant operators. The Pacific coast of North America took an unusually heavy toll of the year's casualties, beginning on January 7, 1913, when the steamship Rosecrans was wrecked. ● Despite the distress calls which were sent out by L. A. Prudhunt, Marconi operator, only one life could be saved, while thirty-eight were lost. Then the Robert Dollar, while crossing the Columbia River bar, struck heavily, but, not locating any damage, proceeded on her voyage to Japan, only to find, when 100 miles off shore, that her stern post and rudder had broken off close to her counter, leaving her helpless in a big sea and a high wind. The Marconi operator on board established communication with shore, and a tug was sent to the aid of the helpless steamer within a few hours.

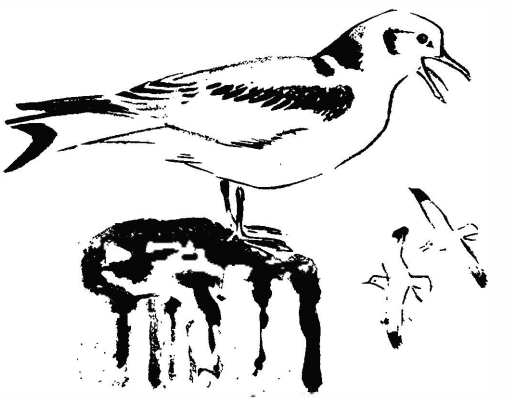
Quick action in summoning aid by wireless on the part of C. F. Hutchins and E. G. Bicak, Marconi operators on board the steamship Yukon, on June 13, when the vessel struck a reef off the Alaskan coast and sank, resulted in the saving of all who were on the wrecked vessel. The same efficiency on the part of the Marconi operator, R. H. Brower, six days later, resulted in the rescue of all on board the steamer Riverside, when she was wrecked and sunk off the California coast.

Another Alaskan reef, this time one in Gambier Bay, caused the loss within three minutes of the steamship State of California. ● Donald C. Perkins, the Marconi operator on the vessel, stuck to the sinking ship long enough to send out the S O S call, which was picked up by the Jefferson of the Alaska Steamship Company which fortunately was only a short distance away. The Jefferson saved seventy persons found in life boats and on rafts, although there was a loss of thirty-three lives in the disaster.
The steamer Spokane on October 3 went ashore on the beach off Cape Lazo, B. C., and the Marconi operator on board promptly summoned the freighter La Touche to the scene. Other vessels, the Dolphin, the Alki and the Minnesota also responded, but not until after the survivors of the stranded vessel had been picked up from the life boats.

Again, when the steamship Merced was wrecked off Point Gorda, Cal., on October 15, Marconi Operator ● Phair pluckily remained in the wireless room, sending out the S O S until he had received responses from three vessels, which sent word that they were hastening to the relief of the stranded steamship. Not until then did Phair leave the Merced. All on board had already taken to the small boats, and after the Marconi man joined them the ship was broken to pieces by the surf. Of the three rescuing steamships, the Atlas was the first to arrive, and took all the survivors on board.
Similar bravery was displayed by Marconi Operator Orth on the Stanley Dollar, when that vessel, on October 23, struck the Viti rocks on the Pacific coast. Orth kept sending out distress calls from the wrecked vessel until he received replies from the Tahoma, which sped to the rescue. The latter vessel two days later succeeded in hauling the Stanley Dollar off the rocks.

It is not only the ocean travelers on passenger liners, the crews of freighters or tank steamships that base their hope for aid on the Marconi service when the hour of trouble comes. Many a pleasure yacht, sailing southern waters, struck by squalls or run ashore in a tempest, has to thank the wireless for the boon of safety when danger threatens. On November 13, the yacht Wakiva ran ashore 180 miles south of Galveston. In response to the SOS call from the wireless operator on board, the Galveston station of the Marconi Company promised immediate aid, and soon after sent the tug Senator Bailey to the rescue of the yacht. A similar timely rescue was effected when the Vanderbilt yacht Warrior ran aground near Savanilla, on the coast of Colombia, on January 26, 1914. The wireless call was answered by the United Fruit Company's steamship Fruitera. Eight of that vessel's lifeboats were crushed like eggshells or overturned in the sea in vain attempts to reach the yacht.
Then the steamship Almirante, forty miles distant, was summoned, and she succeeded in taking off all the Warrior's passengers, among whom were Mr. and Mrs. Frederick W. Vanderbilt, the Duke and Duchess of Manchester and Lord Arthur George Keith-Falconer.

Nearly two weeks previous to this, on January 13, the Royal Mail Steamship Cobequid lost her bearings in a blinding blizzard and stranded on Trinity Rock, in the Bay of Fundy. ~~Thirty-six~~ hours after the first wireless appeal was sped over the waters, the 108 persons on board had been rescued. Help came to the vessel just as the cannonading of the terrific seas was beginning to break her to pieces. The crash had come just before dawn, and a few minutes later the S O S was flashed out by the Cobequid's chief operator, J. W. Hitchner, who was unable to give her exact location, since no one on board knew it definitely. The flood tide and the gales broke the vessel's back and flooded the engine room, putting out the fires and interrupting the wireless service. The Westport, a coastal steamship, was the first vessel to reach the stricken craft, and in conjunction with another rescuer's timely arrival, all on board were saved as by a miracle. ● The rescue was one of the most remarkable known to ocean history, and it was remarked at the time that, since wireless telegraphy first triumphed over the forces of nature, its effectiveness was never more forcibly demonstrated. In the circumstances of the wreck, every other manner of signaling device would have proved inefficacious. Sirens could not have made themselves heard nor could "flare-ups" have been seen through the thick blanket of fog that lay on the water.



HOW WIRELESS HAS SERVED THE SEA

This year--1914--was one also notable for the numerous casualties due to the stranding ships. One of the most perilous adventures was experienced by the Roma of the Fabre Line, bound from Marseilles for Providence and New York, with 427 passengers and a crew of 100 aboard. The vessel was in peril for hours on No Man's Land, south of Gay Head, Martha's Vineyard, when, on February 16, she struck in a blinding snowstorm. No Man's Land loomed ahead, and suddenly the vessel was ashore. The Captain directed the operator to send out a wireless call, asking that a towboat be sent to the scene. The revenue cutters Acushnet, Itasca and Gresham, as well as towboats at New London, were rushed to the aid of the steamer, which was soon freed from her perilous position.

While seas were threatening to demolish the Red Cross liner City of Sydney, which ran on Sambro Rocks, twenty-five miles east of Halifax, N.S., March 17, wireless messages brought the tug Rosemary and other vessels to the rescue of those on the stranded craft. Fifty-three persons were taken from the ship and landed at Halifax.

Marconi Operator Dickow, on the steamship Pectan, managed to save that vessel from a dangerous predicament in April, when she ran aground off Adam's Cove, Cal. ● Dickow sent a wireless call for assistance to the Argyl. This vessel and the Lansing promptly arrived at the scene, but to the general dismay it was found that the rescuing ships were too large to enter between the perilous rocks on the coast. The wrecker Iaqua was then summoned and succeeded in pulling the distressed vessel off the rocks.

Two Marconi operators on the Northland of the Maine Steamship Line, H. Bondeaux and Carl Krech, were prompt in taking measures to save the passengers aboard the vessel when she ran hard aground on the rocks of Bartlett's Reef in Long Island Sound in the fog on the morning of June 5. The passengers were taken off by the Tasco, an ocean-going tug, which responded to the wireless summons from New London, Conn.

Wireless again saved all the passengers and crew in a midsummer wreck when the Prince Albert, on August 17, went ashore on Butterworth Rocks during a dense fog. Then in October, the Almirante of the United Fruit Company, the steamer which played the part of the rescuer to the Vanderbilt yacht Warrior in October of the previous year, herself was stranded at Cartagena Harbor. Through the use of her wireless, the sixty-six passengers and ninety members of the crew were rescued, not a single life being lost.

Marconi Operator H. C. Rodd was of prompt service to his ship, the Lakeland, which went ashore eight miles from Alpena, Lake Huron, on November 10. Rodd sent distress signals, which were answered by Marconi shore stations at Cleveland, Buffalo and Tobermory. The tug Favorite was informed of the accident and was quickly on hand to aid the distressed vessel. Constant wireless communication was maintained between the tug and the Lakeland while the former was on her way. The Lakeland was later towed into Port Huron.

Loren A. Lovejoy and Adolph John Svenson, Marconi wireless operators, distinguished themselves by unusual heroism on November 23, during the wrecking of the steam schooner Hanalei, which struck a reef opposite the transmitting station of the Marconi trans-Pacific service at Bolinas, Cal. Pounded by seas until the wireless cabin was washed away and the apparatus was placed out of commission, the vessel broke up almost in the very shadow of the Bolinas towers. Svenson, who had stuck to the wireless cabin to the last, managed to have his S O S picked up by the Marconi station at San Francisco, and the revenue cutter McCullogh and the oil tankers El Segundo and Richmond were soon at the scene of the wreck. But heavy seas and the surrounding reefs prevented their going to the relief of the distressed vessel. Darkness came on and communication with the shore was cut off. ● But the quick wit of Lovejoy found a way to overcome this difficulty, and for many hours through the night he managed to signal to the watchers on the beach by means of his pocket flashlight. Through his efforts the work of rescue was considerably facilitated and the courage of those on the wreck was strengthened.

When the vessel was abandoned Lovejoy had a thrilling experience on a raft, but was picked up and saved. His fellow operator on the Hanalei, Svenson, was not so fortunate. ● Svenson, who had remained in the cabin to the last, sending out the S O S call that summoned the steamers, and who later did all he possibly could do to prevent loss of life was hurled into the sea when the ship broke in two and was drowned.

The Marconi men on shore were not idle during all this time. The flashlight signals of Lovejoy were answered by Manager Baxter of the Bolinas station. He and others from the station waded into the surf, and while the seas were demolishing the ship, they snatched drowning folk from the waters. Bonfires were kindled on the beach to warm and cheer the rescued, and the Marconi Company's hotel was thrown open as a refuge. There were sixty-three persons on the Hanalei, of whom forty-three were saved.

The year wound up with an accident to the steamship Isthmian, on December 19, when the vessel struck the rocks off San Benito Island. In response to the S O S call, the cruiser West Virginia, torpedo boat destroyer Perry and the Navy tug Iroquois arrived and effected a rescue.

The shipping disasters of the year 1915 opened on January 1, when the steamship Obidense struck the Shipwash Sands. The call for assistance was sent by radio, and several ships responded, resulting in the saving of the entire crew, numbering forty-two persons. Then a week later, another accident occurred to the steam yacht Wakiva, which went on the rocks off the Tampico, Mexico, breakwater at night. The vessel was abandoned and those on board were rescued by means of the breeches buoy. Marconi Operator P. Daniels was in charge of the wireless on board the yacht. He at once sent out the S O S which was picked up by the operators on several vessels. Guy H. Hawkins, the Marconi operator on board the Brabant, bound from Tampico for New York, received the S O S. The Brabant reached the wreck just as the breeches buoy had been rigged up from the foremast of the yacht and anchored to a large concrete rock at the end of the jetty. This enabled all on board to reach the shore in safety.

Two days later there occurred another accident at the Tampico breakwater, when the Mexicano of the Pierce Navigation Company went ashore there. The Marconi operator sent out wireless distress calls, which were answered by the Mexican Government station at Tampico. The vessel was floated by tugs. With aid summoned by wireless, the passengers and crew of the steamship Colon, which was stranded off the bar at Topolobampo on February 4, were safely taken off by the United States steamships Maryland and Annapolis. A wireless summons also was effective in salving a cargo of 40,000 sacks of sugar from the steamship Balmes, which, on March 30, stranded on a reef thirty miles west of Key West. The wireless request for aid was answered by the

Key West Naval wireless station, which was instrumental in sending salvers to the wreck. The wireless message for aid also succeeded in saving the steamship Mexico of the Pacific Steam Navigation Company, which, on April 1, ran aground near Southwest Pass, La. Tugs summoned by wireless managed to float the vessel.

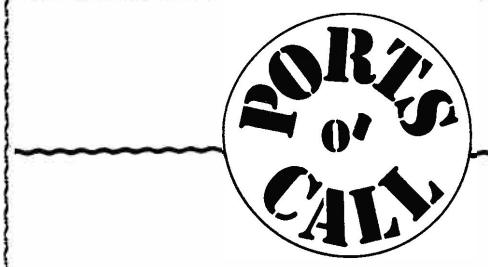
Charles F. Trevatt was the Marconi wireless operator on board the steamship Minnesota, when, on April 11, she ran on a reef at the entrance to the Inland Sea in Japan. The vessel struck with a terrific jolt. No sooner had the disaster occurred than Trevatt flashed the S O S. The call was taken up by the Blue Funnel liner Onfa, which, within an hour, was anchored within three miles of the wrecked vessel. Steps were at once taken to pull the Minnesota off the reef, and suddenly with an immense splash she slid safely into deep water, and was enabled to proceed on her voyage.

Wireless brought powerful tugs to the assistance of the steamship Asuncion on May 7, when she went ashore off Fraser River, and she was soon set free. Tugs were also summoned by aerial message to the assistance of the Alliance, when she was stranded at Richmond Beach, Washington, on June 3. The tugs that responded to the S O S call succeeded in taking off all on board, numbering forty persons.

L. F. Whitehead and H. D. Phillips were the Marconi operators on the steamship A. W. Perry of the Plant Line, plying between Boston, Halifax and Prince Edward Island. On June 8, during a fog, the vessel went on the rocks at Chebucto Head, N. S., with a crash and a bump, while she was two days out from Boston. The two wireless men flashed the S O S signals. Shore stations answered the calls for aid and summoned the relief vessels. A wrecking boat was soon on the scene through the promptness of the wireless operators, and it took off the forty-two passengers and crew. The Perry went down.

There followed in swift succession during the summer months six strandings, in each of which the wireless was of great service in saving passengers, crews, cargoes and vessels. The California of the Anchor Line on June 28 ran ashore at Tory Island, the wireless calls bringing a British destroyer to the assistance of the wrecked vessel, from which the passengers were removed. On July 2, the steamer Panuco grounded at the entrance to South Pass, La., with a crew of thirty-five men aboard. The wireless promptly brought aid in floating the vessel. On July 11, the aerial calls brought rescuers to the steamship Invermore, which was wrecked near Brig Harbor, Labrador, and the crew was taken off. On August 2 wireless brought help to the Georgian, which went ashore near San Francisco in a fog. The Harvard responded to the call and all on the stranded ship were saved. On August 18 the El Sud of the Morgan Line grounded on Galveston Bar during a Gulf hurricane. Wireless calls brought immediate assistance and the vessel was towed into Galveston harbor after the weather had moderated. Finally, on August 23 the steamer Metapan grounded at Cartagena Harbor, with forty-five passengers and a crew numbering ninety-two on board. Assistance summoned by wireless facilitated the discharging of the cargo into lighters, and the steamer was subsequently floated.

A later series of accidents wound up the events of the year. On October 8 the steamship Mariposa of the Alaskan Steamship Company grounded and sank on a rocky shore in Llama Passage, off Pointer Island, British Columbia. Wireless operators dispatched the S O S, which was responded to by two vessels. The Despatch, being within thirty miles, was on the scene in time to save the lives of the 139 persons on board. On November 2 the steamship Santa Clara was wrecked near the entrance to Coos Bay, 170 miles



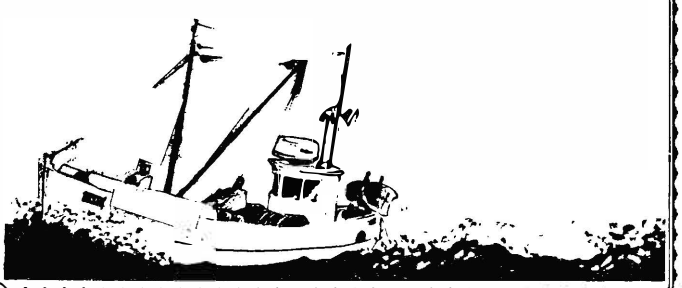
south of Astoria. Wireless calls succeeded in bringing out a vessel to the rescue. Ninety-three persons were thus saved, but not before fifteen passengers and twenty-four members of the crew were drowned. Three days later the steamer Fort Bragg grounded in the Gulf of California. The U. S. S. San Diego responded to the distress call in time to save the lives of forty-seven persons.

It had been a year of serious and numerous disasters. Small wonder at the statement issued by the radio inspectors of the Bureau of Navigation, who reported twenty-six cases of vessels leaving our ports, which had met with accident or disaster requiring the use of wireless to summon assistance. Of these four summons were for fire; twelve for running ashore, stranding or getting into ice jams; three for breaking machinery; four for collisions; one for shifting of cargo; one for a vessel which had been storm-battered and one which had been torpedoed.

The Marconi wireless continues to prove its humanitarian offices in the reports of stranding accidents ushered in by the present year. On January 17, the Car Ferry Pere Marquette No. 19 went aground four miles north of Ludington. Wireless communication was established with Ludington and Pere Marquette Car Ferries No. 17 and No. 18, which were advised not to come in close on account of shoal water. Wireless continued to be used, however, throughout the salvage operations.

The big trans-Pacific passenger ship, Chiyo Maru, grounded in a fog on the morning of March 31, on one of the Lema Islands, south of Hong Kong. A wireless call for assistance was sent out, and a British destroyer, which was in the vicinity came to the rescue at full speed. There was a heavy swell, and oil was poured on the water. There were 229 passengers on board who were rescued from the lifeboats, to which they had taken, by the destroyer.

The one accident that the best of navigators cannot foresee and the finest nautical skill cannot avert, is that caused to the vessel which crosses the path of a hurricane. In one fell swoop the proudest craft has become a crippled plaything of the waves, with a broken propeller, a ruptured shaft of her steering gear awry. To many a tempest-tossed ship, whose brine-soaked and exhausted crew have been working day and night in the effort to keep a deck under their feet, the silent voice of the wireless message has come as a harbinger of help from heaven.



HOW WIRELESS HAS SERVED THE SEA

One may well imagine the unexpected joy of the crew on the water-logged bark Medora, on New Year's Day, far back in 1901, when a tug came steaming out to tow them into port. The plight of the bark had been reported by the wireless operator aboard the steamship Princess Clementine. That was one of the first instances on record of wireless saving a disabled craft.

Nearly three years after in December, 1903, the passengers on a large trans-Atlantic liner, which had been disabled in mid-ocean, were cheered by the wireless messages that were interchanged with land stations, apprising friends and relatives of the safety of all on board, and telling them that the vessel was returning to the nearest port. This was the Red Star Line steamer Kroonland which on December 5, had steamed from Antwerp on her passage to New York. The Kroonland was one of the four large Red Star Line steamships that had just been equipped with the Marconi system, and was the first of the number to make use of the wireless in her distress. The weather was hazy and a gale was blowing. On the afternoon of December 8, the Kroonland communicated by marconigrams with Brow Head stating that she was then seventy-eight miles west of Fastnet, returning to Queenstown with her steam tiller smashed and her steering gear disabled. She steered her way to port with the use of her engines. And thus the wireless message demonstrated its usefulness by ending all anxiety as to the fate of the big passenger steamer and the men, women and children she carried.

The incalculable service rendered by the radio message was next demonstrated in the case of the Clyde Line steamer Arapahoe, which, in April, 1907, broke her propeller while coming up the coast from Jacksonville. At the time of the accident the vessel was in the vicinity of Winter Quarter Shoals. The weather was thick but the captain figured that the steamer Apache of the same line, bound south, must be in the neighborhood, so he began to call her by wireless. His calculations proved correct, for soon there came back the answering signal. The Apache ran down to her disabled sister ship and succeeded in passing a hawser to her. The Apache towed the Arapahoe to within thirty miles of Five Fathom Bank off the Delaware coast, where the lines parted and both vessels went ashore. Wireless distress calls were immediately sent to land, and the Iroquois rescued both vessels from their predicament.

Plunging slowly through a tremendous seas stirred up by a westerly gale, the schooner Ann J. Trainer was reported on the night of March 11, 1909, creeping up the Jersey coast at the end of a stout steel hawser attached to a sea-going tug. The vessel was almost dismantled, and the skipper, Captain Derrickson, and his crew were exhausted from days and nights of toil to keep the deck under them. The salvage of the Trainer was but another proof of the efficacy of wireless at sea, for it was through the exchange of messages between ship and shore that help was obtained for the stricken craft. The first news that came to shore of the plight of the schooner was when a party of fishermen, after a hard battle with wind and wave, made a landing at Egg Harbor Life Saving Station, N. J., and told of having sighted a schooner in distress. The life savers, unfortunately, could not get their boat through the surf, but they sent word to the wireless station on the pier at Atlantic City. The wireless operators there sent out a call for help with the result that the Marconi operator on the Old Dominion liner from Norfolk for New York picked up the message. The Jamestown obtained general directions and was soon racing to the schooner's aid. As she steamed along, guided by information from shore, the operators at the respective instruments talked together, and the Atlantic City man told of the fishermen who had reported the distressed vessel and gave the steamer clearer directions to guide her on her search. Two hours later, the Marconi man on the Jamestown flashed back to Atlantic City: "We have found her."

The Trainer was sighted wallowing about in a sea that rolled her rails under and sent tons of water thundering upon her decks. Two of her masts were gone and all her upper rigging torn out. Captain Derrickson thanked the officers on the Jamestown, and signalled that he was going to stick to his vessel. He had put up his flag, Union down, to notify passing craft that he needed a tug. The Jamestown flashed this information to Atlantic City and the station there passed word on to Philadelphia. From that city word was sent to Delaware Breakwater, and the ocean-going tug Atkin Hughes started out in search of the derelict, found her and towed her to New York.

In the same month of March, the steamer City of Racine was disabled in Lake Michigan, and the wireless was instrumental in saving the lives of 200 passengers aboard her. It effected a similarly brilliant rescue on the same waterway on June 27, of the same year, when the steamer City of South Haven, of the Chicago & South Haven Steamship Company, had her rudder torn away en route from Chicago to South Haven, Mich. The vessel was then placed at the mercy of a heavy sea. Assistance was quickly obtained through wireless, and the steamer was towed to port with her 100 passengers.

In this year another accident happened to the Clyde Line steamer Arapahoe, which had been served to such good purpose by wireless two years before. On this occastion the Arapahoe was bound from New York to Charleston and Jacksonville, heavily laden and with many passengers on board. This was on August 11, 1909. The wireless station at Beaufort, N. C., received a message from the Clyde liner that she had broken her tail shaft near Diamond Shoals and was drifting helplessly. The Arapahoe at the time flashed her S O S, which was now being used in place of the C Q D as a distress signal. An hour later the steamer Huron of the Clyde Line arrived to the aid of the disabled steamer and stood by her until her rescue was effected.

The fall and winter of 1909 was one prolific of accidents to lake and coastwise steamers. On September 21 the steamer Caris of the Clyde Line, bound from New York to Wilmington, N. C., and Brunswick, Ga., with passengers and cargo, was compelled to come to anchor off Cape Hatteras after her machinery had become disabled. She sent out the S O S call, to which rescuing vessels responded and towed her into port. In the next month, October 13, the steamer Georgia of the Goodrich Transit Company was rendered helpless by the loss of her propeller blades in a heavy sea and high wind when off Kewauness, Wis. A wireless message was sent out asking for assistance, in response to which a tug was dispatched from the harbor, which towed the Georgia into Kewaunee. There were two accidents in the following month, one to the steamer Alliance of the California & Oregon Coast Company, which, on November 1, lost her rudder at the entrance of Goose, Ore. Tugs were summoned by radio and the vessel was towed into port. Then, on November 22, the steamer Puritan of the Graham & Morton Transportation Company, when off Benton Harbor, Lake Michigan, in a winter gale, was disabled by breaking her steering gear, and the vessel was buffeted about in the rough seas. The steamer Benton Harbor and a tug were dispatched from Ludington, Mich., in re-

sponse to the distress call which the Puritan had sent, and the disabled steamer was promptly towed into St. Joseph, Mich.

The year's record wound up with an accident to another Clyde liner during the Christmas holidays, when, on December 27, the Iroquois, while bound from New York to Jacksonville, lost her propeller just north of Frying Pan Shoals. Wireless distress calls brought responses from nine steamers, and the San Marcos of the Mallory Line towed the Iroquois, which herself had been a rescuing steamer in the past, to Charleston, S. C.

From the very beginning of the year 1910 the Marconi wireless system inaugurated a record of brilliant service to vessels disabled on lake and sea. Two sister ships of the Clyde Line again figured as rescuer and rescued on January 3, when the Algonquin, while bound from Boston to Galveston, broke her tail shaft off Cape Hatteras in a blizzard. The Apache picked up the wireless distress call, went to the assistance of the Algonquin, and towed her back to port.

Four days later, in the middle of Lake Michigan, and at night, the steamer Arizona of the Goodrich Transit Line, burst her cylinder heads, and found it impossible to make progress through the ice floes. She sent out distress calls by wireless. The steamer Indiana came to her aid and towed her to dock in Chicago.

A remarkable instance of the instrumentality of the Marconi Wireless Service in saving life occurred on February 5, when the steamer Kentucky, a wooden vessel, bound from New York to the Pacific Coast, via Cape Horn, to enter the Tacoma-Alaska service, sprang a leak off Cape Hateras. The Marconi operator on board sent out a distress call just before the vessel sank, 210 miles east of Charleston. The steamer Alamo responded to the call and reached the spot just in time to prevent the captain and forty-six men aboard the Kentucky from going down with her. Similarly effective was the rescue of ninety-five persons from the steamer Santa Clara of the North Pacific Steamship Company, which foundered off the coast of California on April 13. The persons whose lives were saved were taken off the sinking Santa Clara by the tug Ranker, which had been summoned by the wireless distress call.

The casualties continued. It was a bad year in the shipping world. On May 9 the steamer Preston of the United Fruit Company, plying between Mobile, Ala., and Central America, lost her propeller and was rendered helpless. A wireless message to Mobile notified the home office of the trouble, which was soon remedied.

Next occurred a tragedy in the middle of Lake Michigan, in which a Marconi operator, S.S. Sczpanck, lived up to the splendid traditions of the Marconi service in spending his life that others might be saved. ● It was on September 9 that the Pere Marquette Car Ferry No. 18 sank in the lake. Operator Sczpanck stuck to the sinking craft long enough to send out the S O S call, and then went down to his death. The call, however, was received by the Ludington wireless station and the steamer Pere Marquette No. 17. The latter arrived at the scene of the accident in time to rescue four of the passengers and two members of the crew.

Shortly afterward another accident occurred, this time in Lake Erie, in which there was a happier ending. On September 21 the steamer Western States of the Detroit & Buffalo Steamship Company while on her eastern trip from Detroit to Buffalo, was disabled off Long Point, Canada. By means of the wireless apparatus on board, her captain was enabled to communicate with the owners, who promptly sent relief to the helpless ship.

On October 18 occurred the first instance in which the passengers and crew of a distressed dirigible airship were rescued in midocean from their craft by a steamer through the medium of wireless telegraphy. On the night of October 18 the Wellman dirigible balloon America was drifting helplessly over the Atlantic Ocean. ●Irwin, the wireless operator on the airship, was sending out the S O S. The lights of the dirigible were sighted from the deck of the Royal Mail steamship Trent, just about the time when Marconi Operator Ginsburg, aboard the Trent, picked up the marconigram. Communication was had from the deck of the Trent with the Morse code of signals, and after that the wireless was used in all further communication between ship and airship. Walter Wellman soon sent word to the captain of the Trent that the airship could not put her lifeboat in the water and asked the steamship to keep close. Shortly afterward, Operator Irwin, on the dirigible, informed Ginsburg, the operator on the Trent, that the airship America's crew wished to abandon the balloon. The rescue of Wellman and his men was made without mishap, and the news of the disaster to the America and the safety of her crew was flashed to shore stations 500 miles distant and was published in all the newspapers of the country.

Sea casualties were fewer in number during the year following. Wireless telegraphy, however, played a prominent part in saving life on April 11, 1911, on the steamer Western States of the Detroit & Buffalo Steamship Company, which only nine months before had met with mishap in Lake Erie. It was on June 15 that the same steamer was disabled by the blowing out of a cylinder head while in the middle of the lake, bound for Buffalo. Two vessels responded to her distress call, and all of the passengers, 200 of whom were members of the Michigan Bankers' Association, were rescued.

Wireless again was the savior of the coastwise liner Camino, which arrived at San Francisco in October, 1912, in tow of the steamship Watson, six days out from Portland, Ore., with a story of furious weather danger and disablement. The Camino had cleared from Portland with eighty passengers. Off Astoria she ran into a stiff southeast gale, eighty miles an hour in velocity. Heavy seas swept the decks and the terrified passengers gathered in the saloon, praying and weeping. Meanwhile the S O S call was being sent out continuously. The gale raged all night and at half-past five o'clock on the morning of October 19 the propeller dropped to the bottom of the sea from a broken shaft. The vessel was at this time fifteen miles off shore, with the wind carrying her farther to sea. Suddenly, to the immense relief of all on board, word was received by wireless from the steamer Watson, and in three hours that vessel was standing by, and the suspense of those on board the Camino was ended. In the same year the steamship Advance of the Panama Line, with seventy passengers on board, had part of the pilot house and bridge torn away during a storm. The S O S call brought assistance from three liners and a vessel of the revenue cutter service.

HOW WIRELESS HAS SERVED THE SEA

Radio messages flashed between ship and shore were the means of saving the cargo schooner Frank B. Witherbee on February 14, 1913. Without the wireless aid, the vessel and those on board of her inevitably would have been lost. For three weeks the gales had made a target of the three-masted schooner, which was loaded with stone. On February 14 the schooner was still in a howling gale off the New England coast, with the water rushing into her strained hull. She managed to creep within ten miles of Highland Light, where her signal of distress was sighted. A wireless appeal was flashed to Captain Broadbent of the Revenue Cutter Service. In turn, the cutter Itasca, cruising near Cape Cod, was notified by wireless and went promptly to the rescue. She not alone saved all those on board the imperilled schooner but safely towed the disabled craft into Boston Harbor.

Passengers and crew of the steamship Texas, bound from Christiania to Galveston, were battling with a severe storm on the evening of Good Friday, 1913, when suddenly the propeller was wrenched off. For a day and a night the vessel rolled helplessly in the sea, but at length the C. F. Tietgen of the Scandinavian-American Line received the wireless call for aid and came to the rescue of the distressed ship.

The steamship Riverside was wrecked and sunk off the California coast on June 19. Marconi Operator R. H. Brower sent out continuous calls for aid which were finally heard and rescuers arrived to save all on board.

In November, 1913, storms on the Great Lakes destroyed nineteen vessels, none of which was equipped with wireless. All those vessels which were wireless equipped, however, received warning of the coming storms and sought and found safety.

Through the heroic efforts of Marconi Wireless Operator William Davis, on board the oil tank steamship Oklahoma, in January, 1914, one-third of the crew were saved, who otherwise would have perished. The S O S call sent out by Davis reached out over miles of mountainous seas and brought rescuers to the scene after the Oklahoma broke in two about seventy-five miles south of Sandy Hook on January 4. Twenty-seven members of the crew of forty were lost when small boats were launched in a raging gale. The Spanish steamship Manuel Calvo sighted the wreck, but itself was helpless to go to the assistance of the crew. It sent the message it had received to the Marconi station at Sea Gate, however, and rescuers started on their way. But on January 5 the Hamburg-American liner Bavaria sighted the signals from the small boats and took off all the men, among whom was Davis, the Marconi operator.

The lumber schooner Yellowstone, in distress in a storm off the Pacific coast, on February 14, hailed a passing vessel and asked that a wireless call for assistance be sent out. This was done, and another lumber vessel responded and succeeded in towing the Yellowstone to San Francisco.

The account of the sinking of the steam schooner Francis H. Leggett, sixty miles south of the Columbia River, in September of this year, provides the world an example of self-sacrifice that will live long in the memories of those who record and appreciate acts of heroism on the sea. Clifton James Fleming, the young senior operator on the doomed craft, was clinging to floating wreckage when he saw a woman struggling in the water. The wreckage would not support two persons, but was sufficient to hold one above the water. Fleming, knowing that he was going to his death, deliberately relinquished his grasp and gave up his place to the woman. Harry F. Otto, the junior operator, remained on the ship so long as there was opportunity of rendering assistance, winning a place among the wireless men who have died in fulfilling their duty.

The Leggett, which was owned by the Hicks-Hauptman Navigation Company of San Francisco, was bound for that city with a full passenger list and a cargo of lumber. She cleared Gray's Harbor and ran into seas which tossed her here and there and battered her mercilessly. She arrived off the mouth of the Columbia River on September 17, and on the 18th the effects of the pounding she had received began to tell. Captain Charles Maro, commander of the vessel, realized the danger which confronted them, and took measures to protect the passengers and crew. He ordered the cargo to be jettisoned, but this measure was to no purpose, since the ship was being struck with terrific force by large waves which washed over the decks and tore open the hatch, causing water to pour into the hold. Efforts made to use the lifeboats were rendered fruitless. So soon as they struck the water they capsized and the occupants were drowned.

The Leggett, beginning to list, lurched suddenly and capsized before the majority of those on board had the opportunity to jump into the water. Alexander Farrell, of Sacramento, Cal., was on the bridge and was carried down by the suction of the ship. When he again came to the surface he was pulled to safety on a railroad tie by Operator Fleming, who had remained on board until the last and was among some thirty persons afloat on wreckage after the vessel sank. These survivors disappeared one by one until only Fleming, Charles Pullman, a member of the crew and three women were left. One of the women lost her hold on the wreckage which was keeping her afloat and was washed against Fleming. He helped her to grasp the tie, and realizing that it could not support them both, he let go and sank. Harry F. Otto, the junior Marconi operator, had been carried down by the suction of the ship.

The Marconi station at Astoria, Ore., intercepted a message containing information of the sinking of the Leggett, which had evidently been sent from a foreign cruiser to a Canadian station. The Astoria station notified all ships in the vicinity to look for survivors. Only two persons were rescued, among them being Alexander Farrell, who was picked up by the oil tanker Frank H. Buck. The steamship Beaver, which had intercepted one of the wireless messages from the Leggett, ran into the wreck and rescued the only other survivor.

Four further accidents to disabled steamships wound up the events of the year. The steamship Proteus of the Southern Pacific Steamship Company, en route to New Orleans from New York, broke her main shaft and lost her propeller. The steamship El Oriente answered her wireless distress calls and towed her safely into New Orleans. This was on October 28. On December 8 the steamship Momus sent out an S O S call when her steering gear became damaged. The tug El Ray went to her assistance in response. Three days later the steamship Centralia asked for assistance by wireless and the steamers Harvard and Bear went to her aid. On December 30 the steamship Colorado had her machinery disabled while off Little Egg Harbor, New Jersey. There was aboard a crew of thirty-five persons, but no loss of life ensued, since tugs brought the vessel in safety to New York in answer to her wireless calls.

There were numerous marine disasters in the year 1915, in which many disabled vessels were succored by the wireless service. At the very beginning of the year, the steamship Iowa was crushed in the ice of Lake Michigan, off the mouth of the Chicago River. Marconi Operator Keefe sent out the S O S signal and remained at his post until five minutes before the steamer sank. The vessel foundered before the rescuing tugs arrived to respond to the call. But all the members of the crew were fortunate enough to be able to walk safely across the ice to shore.

On January 18 another accident occurred to the steamship Camino, which had suffered an accident in 1913, when she found herself helplessly adrift at sea. The Marconi operator on board sent out the S O S, which brought the Canadian Government steamer Lady Laurier and several other vessels to her rescue.

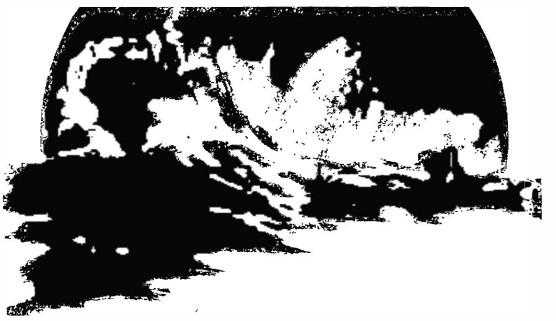
The oil tank steamship Chester, her superstructure demolished by the waves, was drifting where it pleased the seas to hurl her, on February 4. She was not equipped with wireless, but she did have among her officers one, name Waale, who holds a cargo grade wireless certificate. All of the tanker's signal lights, excepting one, having been extinguished through saturation with water, it devolved upon Waale to send out the S O S by flashlight. While the Chester's men were hoping and waiting for rescuers to appear, the American Line steamship Philadelphia was making her way, unknown either to her commander or to that of the tanker, toward the wreck. The Philadelphia reached a point to within a few miles of the Chester, so near, in fact, that the officers of the former could distinguish Waale's S O S spelled out in the darkness. On the Philadelphia were Marconi Operators Jones and Moore. The latter was summoned to the bridge to respond to the signals of Waale and he then received the messages which told of the hopeless fight the crew of the Chester had been making against the sea. The men on the wrecked tanker were at once informed that the Philadelphia would "stand by," and soon after, the tanker's entire ship's company of thirty-three men was transferred safely to the Philadelphia.

On March 18 the steamship Santa Anna was disabled on account of boiler trouble off Kodiak Island, Alaska. The steamship Windber responded to the S O S call, and no lives were lost.

Another triumph for the Marconi service was achieved by the Marconi operators who sent out and received the news of the sinking of the Mallory Line steamship Denver, thus being instrumental in the saving of the lives of sixty-five persons. Buffeted by the seas until she was in a sinking condition, the Denver sent the S O S call broadcast over the ocean when she was in the mid-Atlantic, 1,300 miles from New York, on March 22. Despite unfavorable weather conditions, aid was at hand in less than twenty-four hours after the appeal had been flashed, and those on the distressed craft were rescued. Eighteen ships were at hand, ready to give assistance, when the rescues were effected. The Marconi operators on the ill-fated craft were Henry McKiernan, first operator, and Frederick H. Crone, his assistant.

On April 29 the Edgar H. Vance was in danger of sinking just outside of San Francisco harbor, her rudder having broken. A distress call was sent by radio and the vessel that responded brought the necessary assistance. No lives were lost.

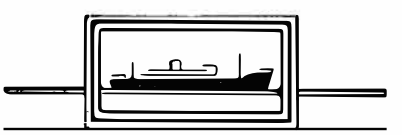
On May 31 the steamship Seward, when thirty-five miles off Cordova, Alaska, began to list badly because of the shifting of her cargo. She sent out a wireless call, and two ships, fifty and eighty miles distant, answered immediately. The Seward was wrecked, but all on board were saved.



On August 4 the steamer Emma Angel was storm-battered and water-logged forty-five miles southeast of the Highlands. She signalled to the Bermudian near by, which sent out a wireless distress call, to which the Seneca responded, and all on board were saved. Several weeks later the Edith of the Alaska Steamship Company, when forty miles northeast of Cape St. Elias, listed badly on account of the shifting of her cargo of copper concentrates. Her S O S call brought the necessary aid, and all on board were saved. The vessel was abandoned to her fate.

On December 21 of this year the steamship Minnesota, when 760 miles south of San Francisco, sent out a wireless stating that her machinery was disabled. The necessary aid was rendered by the Iroquois and the tug Dauntless, which responded promptly upon hearing the distress call. Similar assistance was rendered by means of the wireless to the steamship Shabenee, which broke her propeller off Newfoundland. Her call for assistance was answered by the steamship Muskogee and the disabled vessel was towed into St. Johns.

The casualties of the year were wound up by two accidents that occurred to the Greek Line steamship Thessaloniki. The wreck of this steamer was marked by the devotion to duty of the Marconi wireless operators on board of her, Aristotelis Vranicas, Kimon Paleologos and James Lambros. Vranicas, the chief operator, Paleologos, his assistant, and Lambros summoned rescue ships to the aid of the battered Greek craft to take off her passengers. The Thessaloniki at the time was west of the Azores in heavy weather, with her engine room flooded and her lifeboats carried away. On December 22 the S O S was sent out and was heard by the Italian steamship Stampalia, which came to the scene and stood by until the pumps on the Greek ship were got working again. Then the Stampalia steamed away. On December 26 the storm broke again. The vessel's wireless was crippled but was repaired. On December 28 the Thessaloniki found herself again in distress and again sent out the S O S call. This was responded to by the steamship Florizell, the United States revenue cutter Seneca and the steamship Patris. The latter took off 215 passengers and began towing the Thessaloniki, but the hawser broke in the gale. The Thessaloniki was again left alone, and the wireless men on board were compelled to send out further calls for help. Then the steamship Perugia came and rescued the ninety members of the crew from the ill-fated vessel.



HOW WIRELESS HAS SERVED THE SEA

Thirty-five souls, members of the crew of the British steamer Pollentia, were rescued from the vessel through the medium of the S O S signal, while she was in distress 706 miles off Cape Race. A wireless message was received from the disabled ship at Halifax, Nova Scotia, on January 19, stating that she was in a sinking condition in latitude 36.30, longitude 35.04. The calls for help were almost immediately answered by several vessels, among them being the Giuseppe Verdi, the America, the Moncenisio, the Westerdyk and Narragansett. For four days the Giuseppe Verdi stood by, giving all the assistance possible. At no time was there any hope of saving the Polentia, but attempts to take off the crew were deferred because of the gale and the tremendous seas. The captain and crew of thirty-five were finally rescued by boats from the Giuseppe Verdi while the Narragansett poured oil on the waves.

Marconi Operator Earl Diamond did yeoman's service on board the steamship Centralia when the ship became disabled and the aerial was carried away by heavy seas. In the midst of the tossing sea, Diamond repaired the damage and then called the S O S signal. The accident occurred on January 22 off the Columbia River. The waves washed away the deck load, broke the rudder and flooded the engine and wireless rooms. The calls for assistance was answered by the steamships Governor, Adeline Smith, Yosemite, Admiral Schley, Eurana, and land stations at Marshfield and Eureka. The weather and sea finally moderated and the ship made San Francisco safely without assistance.

Two days later the oil tanker Frank H. Buck lost her rudder, 355 miles north of San Francisco. This was the same craft that had gone to the rescue of the Francis H. Leggett during September of the previous year and rescued one of the two persons saved from that unfortunate vessel. The Buck, however, met with no more dangerous mishap, since the use of her wireless brought immediate aid.

The month of March produced many shipping casualties, the first of the number being an accident to the steamship Apache, which had her machinery disabled forty-five miles south of Cape Henry, and was compelled to anchor in twenty-five fathoms. In answer to her wireless message, wrecking tugs arrived and towed her to port. On the following day, March 5, the steamship Principe de Austrias foundered off Ponta Boi near Santos. She had 1,000 souls aboard at the time and in response to frantic calls for aid by wireless, the steamship Vega arrived and succeeded in rescuing most of those on board. Passengers to the number of 338 and eighty-six members of the crew were lost, however.

One of the most remarkable wireless exploits of the year was that performed by L. A. Hooke, the wireless operator on the auxiliary bark Aurora of the Shackleton antarctic expedition, who sent the first tidings to the world of the plight of that vessel. The message, published on March 25, was made possible by a "freak" performance on the part of the wireless equipment of the Aurora. The message was received by the Naval Radio Station of Williamstown and the radio station at Melbourne when the ship was at least five times more distant than the normal range of her transmitting equipment.

The Aurora, which was the relief ship of the expedition, broke from her moorings in Ross Sea on May 6. 1915. and was adrift in the ice for ten months. The wireless equipment, a gift from the people of Sydney, Australia, had originally an effective transmitting radius of only 200 miles. A month before the ship started on her long drift, there were added twenty feet to the aerial masts of the Aurora. As soon as she broke away from her moorings, Hooke endeavored to get in touch with the members of the marooned party ashore, hoping that they had been able to erect the receiving set previously landed and it is just possible that the land party learned by these signals of the Aurora's ill fortune and were able to make the earliest possible provision against an unexpected twelve months on land.

On June 1, 1915, Hooke, basing his hopes on the fleeting possibilities of abnormal wireless conditions, commenced to call Australia, but without success. He attributed his total failure to electrical phenomena peculiar to the polar regions, and he made exhaustive experiments with all sorts of makeshifts in the hope of getting definite results. It is well, perhaps, for Hooke and his fellow adventurers that they did not know the real reason for their non-success, as the hopes of relief which buoyed them up until their return might have been shattered.

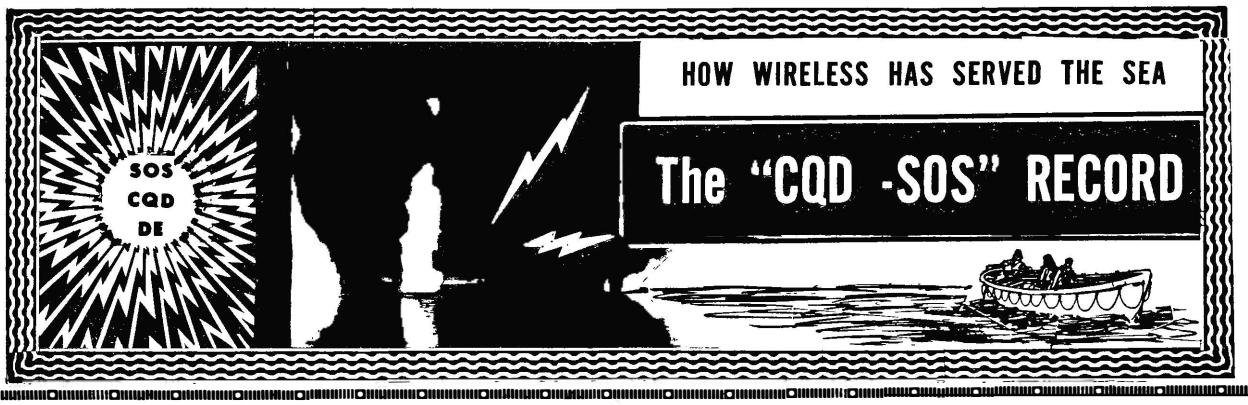
In the first place, the Commonwealth of Australia, in the interests of economy, had recalled the staff of the wireless station at Macquarie Island. This removed the first possibility of intercommunication with the little party drifting in the antarctic ice. Secondly, owing to military reasons, the transmitting apparatus at Awarua had been transported to a more distant place, so that had it been possible for the Aurora, by a combination of favorable circumstances, to send distress signals as far as New Zealand, she would not have received any reply.

Hooke, however, stuck to his post. It was on July 22, 1915, that the Aurora was terribly crushed in the ice. The vessel was then 100 miles from land and 500 miles from the nearest food depot. Hooke again overhauled his apparatus, even to the extent of lowering and re-erecting his masts, in the hope that by doing so he might help those on shore and his fellows on what appeared to be a doomed ship. Night after night he sat in his cabin with the telephone receivers strapped around his head, straining to catch sounds which would tell of the world's knowledge of their fate and efforts at rescue. Twice he heard faint signals, on August 17 and 26, but they were unintelligible.

Then there came the blizzard. On September 5, 1915, the Aurora was dismasted, the wireless aerial going with the debris. Twice were new antennae devised by linking up the mainmast with ice hummocks, but Macquarie Island remained silent--no one had been left to listen. At the end of February, 1916, with the ice breaking, the Aurora was freed to drift with her broken rudder. But the wireless operator's story now changes from sadness to joy. On March 25, with a quadruple aerial eighty feet above deck, he succeeded in obtaining definite signals from stations in Tasmania and New Zealand, 900 miles distant. ● Then followed the message which startled the globe. This message was transmitted 900 miles with an apparatus normally suitable for about 200 miles radius, and eclipsed for a day at least the interest in the great world war. Hooke admits that navigation was greatly assisted on the return journey by the time and other signals received by him from the New Zealand wireless stations.

- 30 -

End Part One "Narrative"



THE RECORD—PART II

Part II - The Record of "HOW WIRELESS HAS SERVED THE SEA" and mankind has been compiled by the Director and Historian of the Society of Wireless Pioneers. We have felt there is great need in preserving this memorabilia. It is a legendary chronicle of an historic era which richly documents the heritage of those of our craft in the vanguard of its development and use. It should be preserved for history and posterity.

Many months of research, checking and correspondence have gone into the records delineated in the following pages of "PORTS O' CALL." Credit and thanks must be given many members of the Society for furnishing facts and details. There were many occasions when the "CQD" or "SOS" call (or other recognized emergency signals) were flashed in the supreme effort to save ships and the brave souls on them from the rampaging elements, errors in judgement or enemy action which left no other recourse.

No one realizes more than the authors that this list is merely the STARTING POINT of the complete record, if indeed such a record can ever be fully compiled.

The calamitous emergencies occurring between the date of March 3, 1898, when the East Goodwin Lightship reported being rammed by the SS Matthews and the year 1916 have been fairly well documented by such publications as "Wireless Age" published by the Marconi Company and the "Reports" issued by the United States Department of Commerce.

During the early years of the wireless, records were maintained with greater accuracy and in more complete detail than the years starting with and following World War 1.

After the turn of the century Wireless had become a "magic" word and any time it was used, the event became of world-wide importance with full news coverage by the media and subsequent documentation for the records.

It is likely that the Marconi Company and other competitive organizations promoting this new communication mode spent much time and care in recording all factual information and statistics for the purpose of using the material in a persuasive effort to sell their equipment and service to the Steamship Companies. Regretfully, it may also have been used by some stock-promoters and manipulators of those days, in the promotion of worthless stocks.

The number of ships had not as yet reached the volume and density that WW-1 brought nor the proliferation of shipping that followed the war years with the progression of trade and travel - hence there was less to report.

We have found many conflicting records and inconsistencies which have consumed hours of time checking in an effort to furnish a record of the utmost accuracy. This has not always been possible. For example, in checking the date one ship sank, we have found at least five conflicting dates listing the same disaster - varying as much as three years in time. Another example is the number of passengers lost and saved on the Steamship Titanic. We have found as many as ten conflicting reports recording casualties and those saved. The most exacting figures seem to read 1517 lost and 707 rescued. All still do not agree.

Mention is also made that one of the projects of the Society is that of furnishing each member, who has ever been called upon to SEND an "SOS" or "CQD" (or other emergency call), a certificate which will certify that fact with pertinent details. ~~We believe~~ that this recognition will be greatly valued by all who qualify.

The preservation of historical data and memorabilia has always been a challenge. We know the report presented in Part II is far from accurate or complete but it is a "start." Those who have supplemental, corrective or additional documentation are invited to furnish it so that future editions may be updated. The cooperation of those who can assist will be appreciated.

William A. Breniman
(Founder and Director)
Dexter S. Bartlett
(Society Historian)

1975

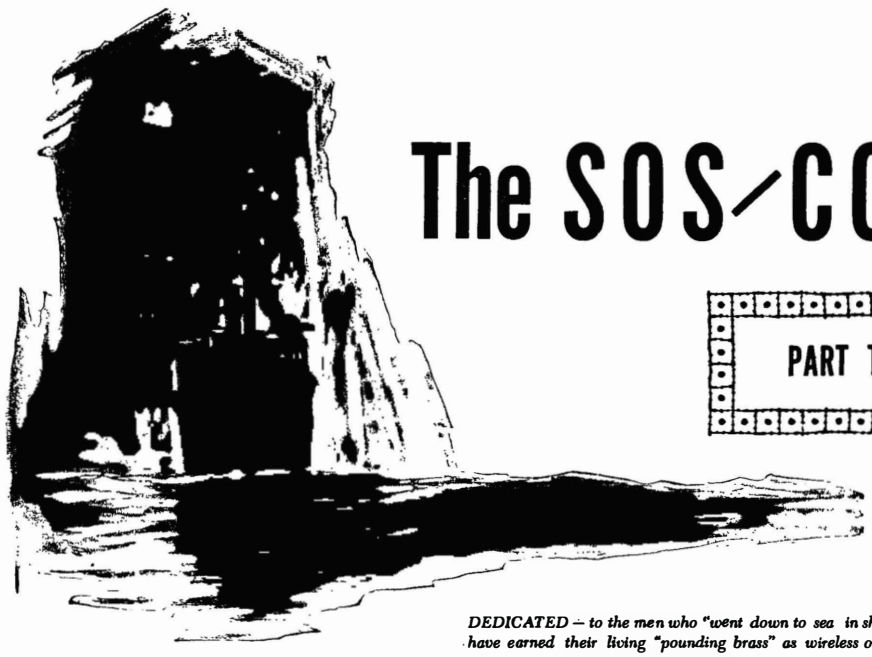
ABBREVIATIONS USED IN THE FOLLOWING PAGES

NR	No record (or) exact date, cause, etc. not available
DSV	Date subject verification (in question)
NA	Not available
LR	Listed for records only (Wireless did not play a part in this report)
MA	Medical Assistance requested via Wireless
SS	Steamship
MV	Motor Vessel
S/V	Sailing Vessel
HMS	Her Majesty's Ship
RN	Royal Navy
NRS	Navy Radio Station
WIX	Wireless
W/T	Wireless Telegraph
COMSTA	Communication Station
RS	Radio Station
USAT	U.S. Army Transport
USSB	United States Shipping Board (ship)
USN	United States Navy
USCG	U.S. Coast Guard USCGC (add Cutter)
D/M	Deceased Member of SOWP
M	Member - Society of Wireless Pioneers
NATIONALITY:	Am. Br. Nor. Sw. Fr. It. Jap. Lib. Gr. Dan. Cdn. Sp. USSR Arg. Bzl. Mex. Ys. Gr. Fin. (etc.)
CHOP	Chief Operator
OIC	Operator in Charge
EIC	Engineer in Charge
R/O	Radio Officer
M/O	Marconi Operator
A/O	Assistant Operator
REO	Radio Electronics Officer

CU - Call Unknown

● "FIRST"

● Important Event.



The SOS/CQD Record

PART TWO—THE RECORD

DEDICATED – to the men who "went down to sea in ships" as Wireless Telegraphers and all those who have earned their living "pounding brass" as wireless or radio ops since the day of Marconi.

1898

SS MATHEWS/CU March 3 1899
R/O Unk. Collision w/East Goodwin Light ship. Accident reported by wireless to the South Foreland Lighthouse and lifeboats sent to relief of lightship. (South Coast of England).

1900 TO 1909

1900

SS ERMAK/CU. 1900
Message sent from St.Petersburg, Russia to the Icebreaker Ermak in Baltic to rescue fisherman stranded on an ice flow in Gulf of Finland.

1901

SS PRINCESSE CLENTINE Jan. 1, 1901
Reported Bark Medora waterlogged, resulting in tug being sent to assi st

SS PRINCESSE CLENTINE Jan. 19th
Ship ran ashore. News of accident sent to Ostend via wireless. ship wrecked at Mariakerke during fog. Crew saved due wireless

1902

No accidents recorded.

1903

SS KROONLAND Dec. 18 1903
Ship disabled 130 miles from Fasnet Light Ireland. Passengers saved great inconvenience by radio communication being established with Crookhaven.

1904

SS NEW YORK SS FRIESLAND 1904
Accidents to these ships reported via wireless (Wireless at Sea by H. Hancock of the Marconi Co.) No details.

1905

RELIEF LIGHTSHIP #58 Dec. 10th

On Station at Nantucket Shoals. Sank in bad gale. Crew rescued by LHS Tender Azalia. Operators C.J. Blankership and William Snyder sent the first distress call "HELP". (SOS & CQD unknown at that time). (SOS To Rescue)

1906

USS CHICAGO/NDI April 18th
This Navy ship provided the only reliable communications during the San Francisco earthquake. (USN Comm. History).

1907

SS PRESTON January 20th
Stranded on Courtown Gays, St. Andrews Island, about 170 miles from Port Limon, Costa Rica. Assistance was summoned by radio and all on board saved.

SS ARAPAHOE April 10th
Of Clyde Line, lost her propeller off Cape Henlopen, Del. The APACHE and IROQUOIS responded to wireless call for aid. Vessel was towed to port.

SS PRINZ AUGUST WILHELM May 8th
Stranded on Middle Ground, Kingston, Jamaica. Aid secured by radio and the ship with all persons on board was saved.

USS DOLPHENE July 7th
Operator Oliver A. Wyckoff. (D/M) NR.

1908

SS ST. CUTHBERT February 3rd
En route Antwerp to New York. Caught fire. SS Cymric removed crew of 38. First report of fire at sea handled by wireless.

1908

SS SEMINOLE March 25th
Of the Clyde Line. Ran ashore at Point Pleasant, N.J., in heavy fog. Distress call sent out bringing wrecking tugs and life-saving crews.

SS PROTEUS/NMG August 18th
Of the Morgan Line. Operator Louis J. Gallo, 804-SGP (D/M). Ship en route NYC to Texas with 300 boots and crew of 45. Collided with the CUSHING 31 miles so. of Diamond Shoals, N.C. Sank in 20 minutes. One life lost.

1909

SS HAMILTON January 20th
Of the Old Dominion Line. Collided with car barge of the N.Y., Phila. & Norfolk Railroad in Hampton Roads. Distress call sent out by radio and in short time tugs were towing badly battered steamer back to port.

SS REPUBLIC/MKC January 22nd
British White Star Liner collided with Italian immigrant ship SS FLORIDA off Nantuckett. Lone operator JACK BINNS made history as the first operator to send "CQD" in a major disaster with probable saving of 1500 lives by use of the wireless. The SS BALTIC 64 miles distant answered call as did "SC" Siaconsett, Mass. (Jack Irwin on duty who helped relay the

SOS—CQD REPORT

call for distress). Operator TATTERSALL of the SS Baltic stood continuous watch for some 52 hours before being relieved. The Florida's bow rammed wireless shack on the Republic but Binns was able to use emergency batteries. This brilliant use of Wireless brought Congress to the attention of wireless for ship safety. The Pacific Northwest Chapter of SOWP is named in honor of Jack Binns.

1909

U.S. MOHAWK — February 26th
Revenue cutter ran aground on Hog Back at Hell Gate. Leaking badly, resting on two bad rocks which threatened to tear a hole in her bottom with fall of the tide. Wireless distress calls brought tugs and lighters to her assistance.

CITY OF RACINE — March 8th
Disabled in Lake Michigan. Radio was instrumental in saving 200 lives.

HORATIA HALL — March 10th
Collision in fog in Lake Michigan. The SS H.F. Dimock wireless for aid 150 persons were saved by means of radio.

SS SLAVONIA — June 10th
Stranded in the Azores. Stanley Coles, operator, sent CQD which was heard by PRINCESS IRENE/NGL & BALAVEA. 410 passengers & crew rescued. (Wireless at Sea by H. Hancock of Marconi.)

CITY OF SOUTH HAVEN — June 27th
Of the Chicago & South Haven Steamship Co., had her rudder torn away en route from Chicago to So. Haven, Mich. Assistance by radio and vessel towed to port. 100 passengers on board.

SS MACKINAW — June 29th
Of the Schubach-Hamilton Steamship Co. Ran aground on Yukon Flats. Wireless message brought lighters to remove part of cargo and vessel was floated.

SS ARAPAHOE — August 11th
Of the Clyde Line bound from N.Y. for Charleston & Jacksonville with many passengers. Broke tailshaft near Diamond Shoals. An SOS sent by T.D. Haubner brought SS HURON to her assistance. First American vessel to use SOS.

SS HELEN — August 14th
Of the Atlantic Fruit Co. Went ashore off Poplar Island, Chesapeake Bay. Not equipped with wireless but was sighted by the tug SAVAGE which sent a distress call bringing out the necessary aid.

SS OHIO — August 26th
Of the Alaska Steamship Co., en route from Seattle to Valdez, Alaska, struck a rock at Steep Point sinking in 30 minutes. SOS call had been sent out by Opr. Eccles, answered by SS HUMBOLDT and SS RUPERT CITY. Of the 200 persons aboard only 5 lost their lives, Opr. Eccles being among the missing.

SS CARIS — September 21st
Of the Clyde Line, en route N.Y. to Wilmington, N.C. & Brunswick, Ga.. Had to anchor off Cape Hatteras when machinery was disabled. SOS sent and responding ships towed the CARIS into port.

SS ZEEBERG — September 25th
Ran ashore on St. John's Bar, near Jacksonville, Fla. Clyde liner ARAPAHOE sighted her distress signals and sent distress call which brought aid.

SS GEORGIA — October 13th
Of the Goodrich Transit Co. Helpless by the loss of her propeller blades in heavy sea and high wind off Kewaunee, Wis. Wireless message sent in response a tug was sent from the harbor which towed the GEORGIA into Kewaunee.

SS ALLIANCE — November 20th
Of the Calif. & Oregon Coast Co., lost her rudder at entrance of Goose, Oregon. Aid summoned by radio and vessel towed into port.

SS BREAKWATER — November 20
Of the Atlantic Fruit Co. Ran ashore in a gale 6 miles from Diamond Shoals lightships. Radio Station at Cape Hatteras received distress messages and sent wrecking tugs MERRITT & COLEY which took off 30 persons before vessel was ground to pieces by the shoals.

SS PURITAN — November 22nd
Of the Graham & Morton Trans. Co., off Benton Harbor, Lake Mich., in a winter gale, disabled by breaking the steering gear. SS BENTON HARBOR and a tug sent from Ludington, Mich. in response to distress call and ship towed to Joseph, Mich.

SS NUECES — December 1st
Of the Mallory Line, bound from N.Y. for Key West & Galveston, ran aground on French Reef in thick rain squall. Wireless distress calls brought the LAMPASAS & Govt. tug OSCEOLA to her assistance.

SS IROQUOIS — December 27th
Of the Clyde Line, bound from N.Y. to Jacksonville, lost her propeller north of Frying Pan Shoals. Wireless distress calls brought responses from 9 steamers. The San Marcos, of the Mallory Line, towed her to Charleston, S.C.

ANN J. TRAINER — 1909 DSV
The schooner was sighted by the Egg Harbor, N.J., life-saving station, dismantled and in a sinking condition. Wireless distress signals flashed, in response to which rescuing tugs came to her aid.

USS MACHIAS /NQL — 1909 DSV
On trip to Hudson-Fulton Centennial in N.Y. harbor ship dragged anchor due to anchor chain getting fouled up with propeller. CQD sent by Franklin M. Doolittle, 1130-SGP. Brooklyn Navy Yard/NAH sent 2 tugs to rescue.

1910

SS ALGONQUIN — January 3rd
Of the Clyde Line, bound from Boston for Galveston, broke her tailshaft off Cape Hatteras in a blizzard. Wireless distress call sent, in response to which the Apache came to her assistance and towed the disabled vessel back to port.

SS ARIZONA — January 7th
Of the Goodrich Transit Line, burst her cylinder heads during the night in the middle of Lake Michigan. Wireless distress calls brought out the SS Indiana which towed her to dock in Chicago.

SS KENTUCKY — February 5th
Bound from N.Y. to Pacific coast, via Cape Horn, sprung a leak off Cape Hatteras. SS Alamo responded to the distress call and reached them just in time to prevent the captain and 46 men aboard from going down with her.

SS SANTA CLARA — April 13th
Of the North Pacific Steamship Co., foundered off coast of Calif. Before vessel sank, 95 persons were taken off by the tug Ranker which answered wireless call.

SS PRESTON — May 9th
Of the United Fruit Co., plying between Mobile, Ala., and Central America, lost her propeller and rendered helpless. A wireless message to Mobile notified the home office of the trouble, which was soon remedied.

SS HUALLAGA — July 20th
Of the Peruvian Dock & Steamship Co., plying between Panama and Peruvian ports, was burned at sea off the north coast of Peru. No passengers' lives were lost but 3 of her seamen died. SOS call brought out the steamship Ucayali which rescued the passengers and remainder of the crew.

SS MOMUS — July 23rd
Of the Southern Pacific Co., bound from N.Y. to New Orleans, took fire south of Cape Hatteras. Capt. Boyd summoned aid by means of wireless, the SS Comus responding, resulting not only in the saving of many lives, but also in saving the cargo and ship, valued at $3,000,000.

PERE MARQUETTE #18 — Sept. 9th
Car Ferry foundered in Lake Michigan under peculiar circumstances. Operator Stephen C. Sczpanck sent CQD. Night opr. Durffe at Lundington received call at 4:15 a.m. Ship sank in mid lake. Opr. Sczpanck and 24 others perished. His type "D" receiver floated ashore a while later. (SOS To Rescue).

SS WESTERN STATES — Sept. 21st
Of the Detroit & Buffalo Steamship Co., en route from Detroit to Buffalo, was disabled off Long Point, Canada, in Lake Erie. Wireless message sent to owners who promptly sent relief to the ship.

AMERICA (Dirigible) — October 18th
The Wellman dirigible balloon was helplessly drifting over the Atlantic Ocean when the radio opr. on the Royal Mail SS Trent caught the wireless call for help sent

from mid-air and rescue soon followed. News of the rescue was flashed to shore stations 500 miles distant and was soon published in all the newspapers.

Jack Irwin, opr., of the Wellman dirigible balloon "America", undoubtedly sent the first aircraft distress call. He was later manager of the Seattle Marconi branch for several years.

SS CHARLES NELSON October 28th
Of the Chas. Nelson Lumber Co., went ashore a few miles north of Point Arena, Cal., in a thick fog. Distress call sent and U.S. revenue cutter McCullough came to her assistance.

SS BRINDILLA December 1st
At sea. Boris M. Dutko, operator. NR. (Battery Monument.)

SS NORTHWESTERN December 1st
Of the Alaska Steamship Co., was wrecked off Falee Bay, San Juan Island, Wash., while bound from Seattle to Cordova, Alaska. SS Tees responded to the SOS call and all on board saved.

SS OLYMPIC December 10th
Of the Alaska Steamship Co., wrecked on a reef off Bligh Island, Alaska. Govt. launches answered the SOS call and 123 persons were saved.

1911

SS HERMAN FRASCH Jan. 2nd MA
Ships' Captain McGray was stricken with ptomaine poisoning and at the point of death. Wireless message sent to physicians of the U.S. naval stations at Dry Tortugas, Fla., about 100 miles away. Opr. on the Merida, leaving the harbor of Progresso, Yucatan, about 800 miles away, caught Capt. McGray's message asking for a prescription and method of treatment. Reply by the surgeon on Merida received on board Herman Frasch before Naval stations could reply and Capt. McGray following directions, prepared a remedy and soon recovered.

SS QUEEN January 25th
Of the Pacific Coast Steamship Co., while off Point Reyes, Ca., discovered fire in her forward hold. Distress call brought 4 steamers to her assistance and the crew and 87 passengers saved.

SS COTTAGE CITY January 26th
Ashore in snowstorm near Cape Mudge, B.C. Operator sent one of the first SOS in North Pacific. All saved but ship lost. (Disaster Log of Ships)

SS ASIA/WWT April 11
Of the Pacific Mail Steamship Co., sank off Finger Rock, South China. Opr. George Hubbard, 41-SGP, sent the SOS. Answered by the American Maru and the Chinese vessel Shang Siu. Ship lost but the passengers, crew and the mails were saved.

SS MERIDA May 12th
Of the Ward Line, off the Virginia Capes in heavy fog, bound for N.Y. from Vera Cruz & Habana, struck amidships by the Admiral Farragut, from Phila. for Jamaica. Wireless call brot SS Hamilton, to which all persons on board both ships were transferred.

SS SPOKANE/WGE June
Struck an Alaskan rock but survived. Opr. Lewis H. Clement got off his SOS and crew saved. The Spokane survived many years on Alaska run, finally sent to Japan to be junked.

SS WESTERN STATES June 15th
Of the Detroit & Buffalo Steamship Co., was disabled by the blowing out of a cylinder head while in the middle of Lake Erie, bound for Buffalo. Two vessels responded to the distress call, and all the passengers, 200 of whom were members of the Mich. Bankers' Ass'n., were saved.

SS SANTA ROSA July 7th
Went ashore near Point Arguello, Calif. All passengers and crew were saved. (Disaster Log of Ships).

SS PRINZ JOACHIM/SP Nov. 22nd
Wrecked off Samana Island at Catwood Bay 60 miles SSE Watling Island. Opr. G.N. Robinson. Rescued by SS Seguranca, opr. Bernstein. W. Jennings Bryan aboard Joachim. Second SOS answered by Bahama Pirates.

SS DELHI/WGD December 13th
Reported in distress off Cape Spartel with the Duke and Duchess of Fife on board. Assistance obtained by wireless and all on board saved. (Wireless at Sea).

H.M.S. CORNWALL 1911 DSV
Reported by radio as being ashore at Cape Sable, Nova Scotia, and the Donaldson liner Saturnia as having struck an iceberg 175 miles east of Belle Isle. Both vessels were brought safely to port.

SS SATURNIA/MBF 1911 DSV
Struck Iceberg 170 miles east of Belle Island Straits. Assistance via wireless saved crew and ship. (Wireless at Sea)

SS LUCY NEFF/KNQ 1911 DSV
En route Jacksonville, Fla., to N.Y., ran aground on banks of St. Johns River. Slid off bank of river and proceeded. Operator Arthur E. Ericson, 70-SGP.

1912

SS MADISON February 22nd
Rammed by Hippolyte Dumois. NR

SS EL SUD April 1912 DSV
El Sud rammed by SS Denver off Galveston Bar. SS Denver operator sent calls. El Sud towed to Galveston.

SS TITANIC/MGY April 15th
Of the White Star Line, struck iceberg in North Atlantic going full speed in fog knowing it to be infested with huge bergs but it was supposed to be unsinkable. Operators John (Jack) Phillips and Harold Bride sent both CQD and SOS. Phillips along with 1517 others went down with the ship. Only 707 rescued. Not enough lifeboats plus many other defects was the cause of such a huge loss. (World Almanac, etc)

SS PLEIADES August 16th
Ran ashore on Magdalena Bay. Opr. G. Bennett sent SOS. All rescued.

SS OLINDA/OA Sept. DSV
Lost her propeller in the Gulf of Mexico during a severe hurricane. The tug Rescue "RSQ" got a line aboard just as the Olinda was entering the surf. Opr. Ray Greene on Olinda sent his CQD which was received by Jay Quinby at "US" Swan Island during heavy static.

SS CAMINO/WQC October 18th
Sailing from Portland, Oregon, ran into an 80-mile gale. Heavy seas swept the decks. The next morning at 5:30 the propeller dropped to the bottom of the sea. SOS call answered by the SS Watson. Opr. LEWIS H. CLEMENT on SS Camino. In 3 hrs. Watson was standing by ready to render relief.

SS ORAVIA/MJB November DSV
Struck rock on the Falkland Islands in the South Atlantic. By means of wireless all passengers, crew and mail were saved. The ship was lost. (Wireless at Sea.)

SS EASTON December 5th
Struck Iroquois Reef in Lake Superior. SOS calls answered by Pt. Arthur out of Duluth. Ship released.

SS ADVANCE/KMV December DSV
Of the Panama Line, with 70 passengers on board, had part of the pilot house and bridge torn away. SOS sent by Ernest A. Cyriax (D/M) brought assistance from 3 liners and a vessel of the Revenue-Cutter Service. Proceeded to Port Colon at reduced speed. Cyriax, Jr., Opr., F.L. Murphy, Sr., Opr., but did not send emergency call.

1913

SS ROSECRANS/WTL January 7th
Lost bearings and hit Peacock Spit at mouth of the Columbia. SOS sent by Opr. Larry Prudhont who bravely went down with the rest. (Graveyard of the Pacific).

SS VERONESE January 16th
Wrecked on the Boa Nova Rocks about a half mile outside Leixoes Harbor. SOS signal sent out and through the aid secured all but a few of the passengers rescued.

MIMI (German Bark) February 14th
Ran ashore in thick fog on the North Spit of the Newalem River, Oregon. With calm weather they removed ballast and towed her out to sea. During a mild storm the MIMI, without ballast, capsized. 18 lives lost, only 4 saved. (Disaster Log of Ships).

SS TEXAS April DSV
Bound from Christiansand to Galveston, lost her propeller and rolled helplessly about in a heavy sea for a day and a night. The C.F. Tietgen, of the Scandinavian-American Line, responded and effected a successful rescue.

SS OLINDA June 10th
Of the Munson Line, with 5 passengers and crew, caught fire at sea. USS Nashville responded to the SOS call. All the passengers were safely carried away.

SS YUKON June 13th
Struck reef off Alaskan coast. Radio Officers C.F. Hutchins and E.G. Becak sent SOS. Ship sank but all were saved.

SS RIVERSIDE June 19th
Wrecked and sank off California coast. R.H. Brower, MO. All saved.

SS MILLINOCKET July 24th
Collided with the SS Persian. Operator Arthur Ridley sent call and vessel docked.

SS STATE OF CALIFORNIA/WGL Aug. 7
Crashed onto a reef in Gambier Bay, Alaska, and sank within 3 minutes. Operator Donald C. Perkins sent SOS but went down with 31 others. Asst. Walter Chamberlain saved with 58 others. SOS answered by the Jefferson who saved those in lifeboats and on rafts. Capt. T.H. Cann of the State of California. (World's Almanac)

SS TEMPLEMORE September 29th
Caught fire on a voyage from Baltimore to Liverpool. Radio Officer Robert Emanuel sent SOS by candle light. J.H. Miller assistant on SS Templemore. Rescued by SS Arcadia who Opr. was Alfred Freeman. MO Emanuel and Capt. Jones last to leave SS Templemore. Wireless saved 54 men Ship sunk.

GLENESSLIN (British) October 1st
Full rigged British ship crashed on rocks in a clear day near Neahkahnie Mtn., Oregon. Blame laid to drunken crew, incompetence, green hands and a calm spot. Crew saved, ship lost. (Disaster Log of Ships).

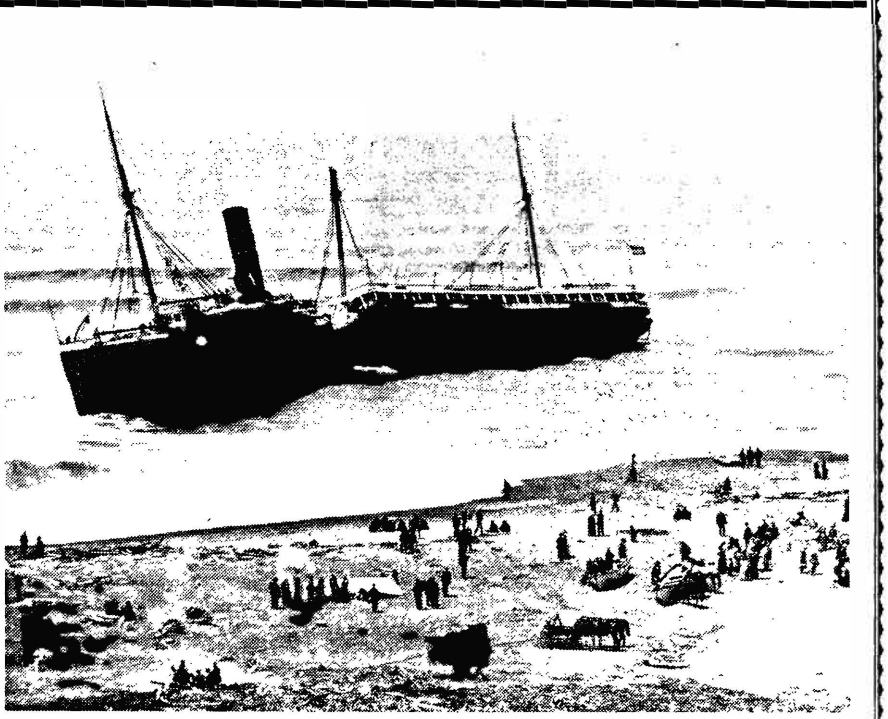
SS SPOKANE October 3rd
Went ashore on the beach off Cape Lazo, B.C. Freighter La Touche answered wireless call. Steamships Dolphin, Minnesota and Alki also responded. Rescued 108 passengers.

SS VOLTURNO October 11th
A small immigrant ship with 657 aboard. Caught fire in a bad storm 1000 miles west of Ireland. 10 vessels came to her rescue and 520 saved including the captain and operators Walter Seddon and Christopher Pennington who were the last to leave.

SS MERCED October 15th
Wrecked on Point Gorda, Cal. and completely destroyed. P.J. Phair, OIC, and Hull was 2nd RO. Three replies to the SOS sent out, the Atlas being the first vessel to arrive, safely transferred all on board the doomed vessel from the small boats.

SS STANLEY DOLLAR October 23rd
Struck the Viti Rocks on the Pacific coast. Distress call sent by E.N. Orth, Marconi opr. Call responded to by the Tahoma and the wrecked ship was successfully hauled off the rocks.

SS. SANTA ROSA



SS. SANTA ROSA

The Santa Rosa was built in 1884 at Chester, Pa. for service on the West Coast of the U.S. She was 326 feet long and originally a 'two-stacker'. One funnel was removed however in 1904 when she was given a major overhaul. She was a shallow draft vessel built for the bar at San Pedro. She was wrecked on July 7, 1911, near Point Arguello. Photo from collection of Joe D. Williamson.

SS PLEIADES October DSV
Met in collision with an unknown steamship off the Pacific coast. Wireless appeal for assistance met with prompt response and the ship reached port.

SS NORWEGA November 1st
When 95 miles south of Hatteras, collided with the schooner Glenlui, tearing a hole in her side and she rapidly filled with water. Assistance summoned by radio, a passenger ship, two revenue cutters and a battleship responding, and all on board were saved.

GREAT LAKES STORM ● Nov. 9, 10, 11
19 vessels wrecked: SS Fulton, D.O. Mills, Victory, W.G. Pollock, F.G. Hartwell, H.R. Hawgood, J.T. Hutchinson, J.H. Shadle, Mathew Andrews, L.C. Waloo, Wexford, Regina, H.M. Hanna, LS-82 Buffalo - none of ships equipped with wireless. Total 100 lives lost plus much damage.

SS SUNGNIVALD JARL (NOR.) Dec 23
Ashore on Lofoden Islands 600 miles north of Bergen, Norway. Bergen Radio picked up distress call. ● First SOS from Arctic.

SS BALMES November 16th
Ship caught fire. The steamer Pannonia responded to the SOS call and 125 lives were saved. At the time of rescue, crew of the Balmes was reduced to the last degree of exhaustion and the firemen lay about the deck so overcome as the result of asphyxiation, they had to be relieved every 15 minutes.

SS SANTA MARIA Thanksgiving Day
Struck reef at Kahukie, Maui, Hawaii. Lester J. Tappan, 245-SPG, sent SOS. KPH responded. Navy tug in HU called. Ship lightened load enough to get off reef. No loss of life.

SS BERKSHIRE DSV
Was burned off Lookout Cove, N.C. Distress call heard at Wilmington, 164 miles away, by revenue cutter Seminole, which reached scene of disaster in time to take off all passengers. Flames extinguished following day and vessel towed to safe anchorage.

SOS CQD RECORD

SOS—CQD RECORD

SS ROBERT DOLLAR DSV

While crossing the Columbia River bar struck heavily and later discovered that her rudder had been broken off, leaving her helpless in a big sea and a high wind. SOS call sent out and a tug in the vicinity made a rescue in a few hours.

1914

SS OKLAHOMA January 4th

Broke midships 75 miles south of Sandy Hook. Distress call brought rescuing vessels which were responsible for the saving of 13 out of the 40 persons on board. William Davis, R.T. saved.

SS COBEQUID January 13th

Royal Mail Steamship Packet Company's ship lost her way in a blinding blizzard and went ashore on Trinity Rocks in the Bay of Fundy. 36 hours after the first wireless calls for help were sent out the 108 persons on board were rescued. J.W. Hitchener, C.O., E.T. Shimpton, Asst. Rescued by SS Westport. Most remarkable rescue known in ocean history.●

WARRIOR (Yacht) January 26th

Owned by Frederick W. Vanderbilt, ran aground near Savanilla, on the coast of Columbia. Assistance summoned by radio and the owner and his guests were taken off the stranded yacht by the Almirante.

SS MONROE/KOM January 30th

Collided with the SS Nantucket off Cape Charles, Va., in dense fog. Ferdinand J. Kuehn with J.L. Etheridge, Asst., sent SOS.●Kuehn would have been saved but he gave his life belt to a woman passenger. Operators on the SS Nantucket were A. Doehler, Sr. & F.L. Smith, Asst. 43 lost and 98 rescued.

SS ROMA February 16th

Of the Fabre Line, en route France to Providence, went ashore on Martha's Vinyard during heavy snow storm off Nantucket Lightship. Visibility 50 feet. Revenue cutters Acushnet, Itasca and Gresham responded to distress call. With engines going reverse liner freed itself and slid off into deep water and reached Providence safely.

SS YELLOWSTONE February DSV

In distress in a storm off Pacific coast, hailed a passing vessel and requested wireless call for assistance. This was done, a lumber vessel responded, and ship towed to San Francisco.

SS CITY OF SYDNEY/WWG Mar. 17th

Pounding to pieces on Sambo Rocks, near Halifax, N.S., W. R. Organ's SOS brought tug Rosemary and after a tough struggle she rescued all 57 aboard.

SS SOUTHERN CROSS March 31st

Wrecked off Belle Island Strait. 171 lost.

SS COLUMBIAN May 3rd

En route Antwerp to New York was destroyed by fire in mid-Atlantic. SOS sent by James Drohan. Three vessels, the Franconia, the Manhattan and the Seneca responded to the SOS call. Some adrift 40 hours in lifeboats. 31 saved, 15 died. Op. Drohan last aboard.

SS EMPRESS OF IRELAND● May 29th

Collided with the collier Storstad in St. Lawrence River in dense fog. Oprs. Ronald Ferguson & E. Bamford sent radio call for assistance. The SS Lady Evelyn and SS Eureka rendered considerable aid, resulting in 465 saved. 1024 lost. Both operators saved. (Ferguson had previously survived collision on SS Ambrose when rammed by Beta R. Mersey Jan. 9, 1913.)

SS NORTHLAND June 4th

Ran aground on Bartletts Reef off coast New England near midnight in dense fog. SOS sent by Opr. Karl G. Krech (337-SGP), & H. Bondeaux. The tug Tasco responded to call and took off passengers.

SS NEW JERSEY/KNJ July 10th

Sank between Scotland and Ambrose Lightships off NY/NJ coasts when rammed by Mancheoneal, Nor. Fruit ship, in dense fog. Opr. Jay Edwin Quinby, 402-SGP, sent SOS call which was answered by Tony Tamburino, 460-SGP, on duty WSC Seagate L.I.; who alerted Navy Yard Brooklyn (NAH) who dispatched Raritan to rescue. All hands saved including ship's cat. Ship sank in 5 minutes. This was operator's first assignment.

SS PRINCE ALBERT August 17th

Went ashore on Butterworth Rocks in dense fog. Passengers and crew saved by wireless.

SS ADMIRAL SAMPSON/WAS Aug. 25

Rammed by Canadian Princess Victoria/MCM off of Point No Point, Puget Sound, in dense fog. Walter E. Reker, C/O on SS Sampson sent SOS and went down with ship plus four others. Henry F. Wiehr (M) A/O on watch saved.

SS PECTAN August DSV

Union Oil tanker, struck reef in Santa Barbara Channel, then ran ashore on San Miguel Island. Henry W. Dickow (D/M) got off SOS call which brought great response. First SS Yale, Union Tanker Lansing and Revenue Cutter McCulloch - all responded. After 2 weeks pulled floated ship in deep water. Both ship and crew saved.

SS FRANCIS LEGGETT/WSB● Sept. 18th

Steam Schooner wrecked in a severe storm on coast just south of Columbia River which broke her up. Harry F. Otto and Clifton J. Fleming got off their SOS. Fleming clinging to floating wreckage gave it to a woman and drowned. Otto also lost. All 89 on board lost. Tanker Buck to rescue, also Beaver. A.M. Greenwell was OIC on duty at Astoria Marconi Stn.

USCG TAHOMA September 20

Ship struck an uncharted island south of Attu Island, Alaska. They took to the life boats and after 6 days of rowing and bailing in bad weather made land. After starving for a few days, were rescued by the SS Cordova and C&GS Patterson. Without wireless they would have starved on that bleak island. E. Spicer's SOS was the first in the North Pacific and without his work they would have all starved.

SS METAPAN October 15th

Rammed by freighter Iowan at entrance to Ambrose Harbor, New York. All rescued. Operator sent SOS which was answered by various ships nearby.

SS PROTEUS October 28th

Sent SOS call which was answered by the revenue cutter Miami. Later found that assistance was not needed.

ALMIRANTE, UFCo. October DSV

Stranded in Cartagena Harbor. 66 passengers, 90 crew rescued without loss of life.

WAKIUA (Yacht) November 4th

Heustica Petroleum Co. yacht ran ashore in fog. George Uzmann, W/O from Brooklyn, N.Y., on cable ship Relay answered the distress call.

SS LAKELAND November 10th

Enroute Port Huron to Alpena, Mich., ran ashore on South Point about 18 mi. from Alpena. H.C. Rodd, R/O, sent SOS, Answered by Cleveland and Buffalo stations. Wrecker Favorite went to rescue. No loss.

SS HANALIE/WHN● November 23rd

Struck reef off Bolinas, CA. in a bad storm. Loren A. Lovejoy and Adolph J. Swenson were operators. Power failed so they used flashlight to cummunicate with men of the radio stations. Twenty-eight were saved but 20 lost including Swenson. (SOS to Rescue)

SS MOMUS December 8th

Sent out SOS call because of damaged steering gear. The tug El Ray went to her rescue.

SS CENTRALIA December 11th

Requested assistance by radio. The steamships Harvard and Bear responded to the distress call.

SS ISTHMIAN December 19th

Struck rocks off San Benito Island. In response to the SOS call the cruiser West Virginia, torpedo boat destroyer Perry and the Navy tug Iroquois proceeded to the rescue.

SS HONOLULAN December 22nd

Ran aground. Accident reported by wireless and six tugs went to her aid.

SS FRANK B. WITHERBEE/KNM DSV

A cargo schooner, badly damaged and in a sinking condition when her signal of distress was sighted 10 miles off Highland Light. Wireless appeal sent by A.E. Ridley, Opr., to the Revenue-Cutter brought out the Itasca and all on board were rescued and wrecked vessel safely towed to Boston Harbor.

Society of Wireless Pioneers

1915

SS OBIDENSE January 1st
Struck Shipwash Sands. Call for aid was sent by radio and several ships responded, resulting in the saving of the entire crew, numbering 42 persons.

WAKIVA, Yacht January 8th
Ran ashore on breakwater at Tampico, Mexico. P. Daniel OIC sent wireless call . Opr. Guy H. Hawkins of the SS Brabant assisted in relaying. Call responded to by several ships and all on board were saved.

SS COLORADO January 13th
Wilson Line ship reported to her agents by radio that she had been damaged in collision. She was able to return to port under her own steam, assistance not being required.

SS CAMINO January 18th
Was helplessly adrift at sea. Canadian Government steamer Lady Laurier and other vessels which heard her call for aid proceeded to the rescue.

SS DELHI January 18th
Struck one of those uncharted Alaskan rocks in Sumner Straits, Alaska. Crew saved, ship lost. (Disaster Log of Ships)

SS WASHINGTON January 26th
Honolulu enroute Delaware Breakwater. Schooner Palmer rammed her aft on beam, sank in 10 minutes. Albert H. Randow, Opr. Unable to send SOS due captain's orders. (LR) Rescued by SS Hamilton, one life was lost, 53 persons rescued.

SS CHESTER (Oil Tanker) ● Feb. 4th
2nd Officer Jacobus W. Waale sent SOS by flashlight attracting the SS Philadelphia Amn. Line. In Mid-Atlantic, very heavy weather. J. Edward Jones, 1st Opr., Wm. V. Moore, 2nd on SS Philadelphia assisted in rescue.

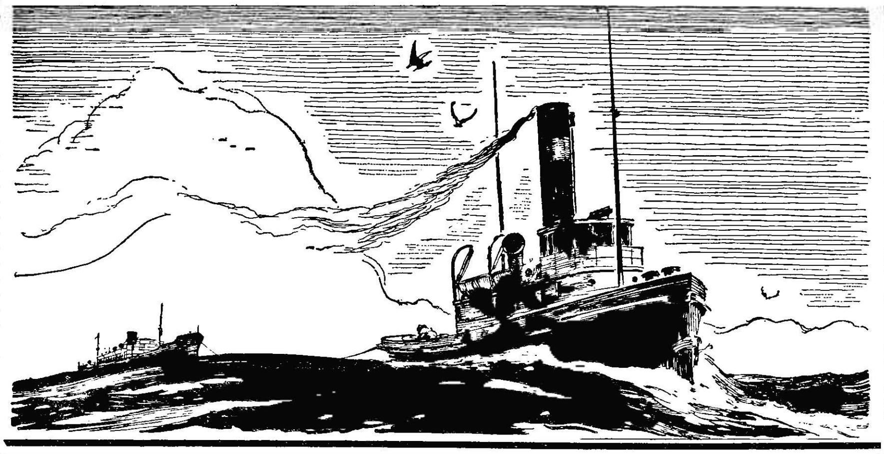
SS COLON February 4th
Stranded on bar near Guaymus. W.R. Lindsay sent SOS. Passengers and crew rescued by Am. Maryland & Annapolis.

SS IOWA February 4th
Crushed by an ice jam off Chicago Harbor. Tugs were summoned by wireless and the entire crew of 25 was saved.

TANKER TUSCARORA February 5th
Caught fire near Singapore. George B. Dewing (M) sent SOS which was answered by VPS. Chinese crew panicked and started throwing everything overboard. Fire contained and ship reached Singapore. Ship had high inflamable benzine. Broken oil line cause of fire.

SS SANTA MARTA February 19th
Lost rudder in a gale and was in need of assistance. SOS call summoned aid.

SS LA TOURAINE March 6th
Bound from New York to Havre, with an inflammable cargo, was discovered on fire. The vessel was 400 miles west of



"SOS Answered, We have a tow ...Thanks to Sparks and his Wireless" !

the Irish coast. SOS call answered by the steamships Arabic, Cornishman, Swanmore and Rotterdam. Fire gotten under control by the crew. She was convoyed as far as Prawle Point by SS Rotterdam.

SS SANTA ANA March 18th
Was disabled on account of boiler trouble off Kodiak Island, Alaska. The SS Windber responded to the SOS and no lives lost

SS DENVER/KED March 23rd
of the Mallory Line sank in mid-Atlantic in heavy seas and gale force winds.
SOS by Henry McKiernan CHOP and Fred Crone, A/O brought 18 ships. All 65 on board saved

SS BALMES March 30th
Hit reef 30 miles west of Key West, Fla. SOS answered by Key West Naval Station. All on board were saved.

SS MINNESOTA April 11th
Hit reef at entrance to Japanese Inland Sea. SOS sent by Opr. Charles F. Trevatt and 3 vessels responded. All on board saved.

EDGAR H. VANCE April 29th
Was in danger of sinking just outside San Francisco Harbor on account of rudder breaking. Distress call sent by radio. Vessel responding brought the necessary assistance; no lives lost.

SS GULFLIGHT/KUA May 1st
Shelled and sunk by sub. Opr. Charles Short and all hands lost. (SOS To Rescue)

SS LUSITANIA/MFA ● May 7th
Enroute from New York to England was torpedoed by a German submarine 10 miles off Old Head of Kinsale, Ireland. Operators Robert Leith, CHOP, and Davis McCormick, A/O. Capt. W. T. Turner in charge of ship. Ships Narragansett (Opr Thomas Smith), Etonian, SS City of Exeter, all attempted rescue but sub frightened all off. Finally tugs Warrier, Stormcock and Julia plus 5 trawlers effected rescues. Opr. Leith lost but McCormick rescued. Estimated 1157 lost lives, 764 saved.

SS STANDARD May 18th
Caught fire off Miami, Fla. Opr. David Karp radioed for assistance. Four vessels responded and the Bradford towed the Standard Oil Tanker into Key West.

SS RYNDAM May 26th
Collided with SS Joseph J. Cuneo south of Nantucket Shoals. B. Moree, CHOP, and Le Clercq, A/O, sent SOS call which was answered by the battleships South Carolina, Texas, Louisiana and Michigan. The South Carolina took aboard the 230 passengers of the Ryndam who has been transferred to the Cuneo. No lives lost.

CHIYO MARU May 31st
Grounded in fog on Lema Island off of Hongkong. 229 passengers rescued by Br. destroyer summoned by WIX.

SS SEWARD May 31st
When 35 miles off Cordova, Alaska, listed badly on account of shifting of cargo. Two ships, 50 and 80 miles distant, answered and all on board were saved.

SS ALLIANCE June 3rd
Stranded at Richmond Beach, Wash. Tugs responded to the SOS call and all on board, numbering 40 persons, saved.

SS A.W. PERRY June 9th
Ran ashore at Chebucto Head, Nova Scotia. L.F. Whitehead, CHOP, and H.D. Phillips, A/O sent call for aid. Shore stations answered call and arranged relief vessels. Ship sank but all on board, 82 persons, saved.

SOS --- — — — ---

SOS/CQD REPORT

BUNKER HILL June 13th
Collided with yacht Venadis off Eaton's Neck, Long Island Sound, as a result of which two persons killed and several injured. Operators Ingalls & Pitts summoned aid by radio and remainder of the passengers and crew were saved. Bunker Hill returned to New York under own steam.

CALIFORNIA June 28th
Ran ashore at Tory Island. Distress call sent by radio and a Br. destroyer responded bringing necessary assistance.

PANUCO July 2nd
Grounded at So. Pass, La. Crew of 35. WIX brought aid.

NEW JERSEY, pilot boat July 10th
Rammed and sunk by the United Fruit steamer Manchioneal at the eastern entrance to Ambrose Channel. The SS Manchioneal saved crew but the SOS calls brought assistance which was not needed.

SS INVERMORE July 11th
Wrecked near Brig Harbor, Labrador. The distress call sent by radio and necessary aid was obtained.

SS BERTHA July 19th
Hit Harvester Island, Alaska, and caught fire. Crew saved but ship lost. She was an old timer on the Alaska run.

SS SUCHA July 22nd
On fire in the Gulf of St. Lawrence, sent WIX which was received by the Royal George which ship proceeded to the rescue but later received word by WIX that fire had been put out and help not needed.

SS EASTLAND/AD ● July 24th
With 2,000 passengers bound on a picnic she capsized in the Chicago River with an estimated loss of 839 lives and 142 missing. Marconi opr. C.M. Dibbell was unable to get off an SOS and being docked it would have been useless. He did live up to his calling by heroically rescuing many passengers.

SS GEORGIAN August 2nd
Went aground off Duxbury Reef near S.F. in fog. The SS Harvard responded to the SOS and all on board were saved.

EMMA ANGEL August 4th
Was storm-battered and water-logged 45 miles southeast of the Highlands, and signaled to the Bermudian near by, which sent a wireless distress call, to which the Seneca responded and all on board were saved.

SAN JACINO/KES, dredge Aug. 16th
Collided with dredge Sam Houstan. Opr. got off his SOS but 106 lost.

EL SUD August 18th
Grounded on Galveston Bar. The tug Senator Bailey responded and brought necessary assistance.

SS METAPAN August 23rd
In Cartagena Harbor, South America. Severe storm, lightning hit steamer. 92 on board saved. Ship beached and refloated.

SS EDITH August 30th
Of the Alaska Steamship Co. When 40 miles northeast of Cape St. Elias, listed badly on account of shifting of cargo of copper concentrates. The SOS call brought the necessary aid and all on board were saved. Ship was lost. (Disaster Log of Ships.)

SS ATHINAI September 19th
Was destroyed by fire in mid-ocean. The Tuscania and Romanian Prince responded, resulting in the saving of 470 lives.

SS MARIPOSA October 8th
Grounded and sank on rocky shore in Llama Passage off Pointer Island, B.C. The SOS call was heard by 2 vessels. The Despatch being within 30 miles responded and safely carried off the 139 persons on board. The ship broke in two. She was captained by the famous "Dynamite" Johnny O'Brian. (Disaster Log of Ships)

SS MAROWIJNE ● October 13th
Vanished without a trace in the Gulf of Mexico. No hurricane warnings had been issued, although there were rumors of German subs. (LR)

SS SANTA CLARA/WRS Nov. 2nd
Was wrecked on jetty at Coos Bay, Oreg. Opr. Claude E. Goodwin sent wireless which brought out a vessel to their aid, and 93 persons saved. Ship a total loss.

SS FORT BRAGG November 5th
Grounded in Gulf of California. USS San Diego responded to the distress call and 47 persons were saved.

SS ROCHAMBEAU November 8th
Caught fire at sea and sent SOS call by wireless; later sent another message stating fire was under control.

SS THESSALONIKI November 27th
Sprung a leak about 400 miles southeast of Sandy Hook. Several vessels responded to the distress call and 300 persons were saved.

SS MINNESOTA December 1st
Sent wireless stating that machinery was disabled when 760 miles south of San Francisco. Necessary aid rendered by the Iroquois and the tug Dauntless.

THE WIRELESS PIONEER

1915

SS PHILADELPHIA/KSM 1915 DSV
Collided with sailing ship without lights in Irish Sea. 500 passengers aboard. Ship started to leak so Oswald M. Shaw (M) sent SOS. All got back to Liverpool.

26 SHIPS ● 1915 DSV
During unprecedented storm on Great Lakes 26 ships leaving U.S. ports met with accidents or disasters due to weather conditions and needed to summon assistance. 4 Fire, 12 Ashore, 4 Collisions, 1 Shift Cargo, 1 Storm Battered, 1 Stranded by Ice, 3 Breaking Machinery. (Reported by Buo. of Nav.)

1916

HMS POLLENTIA January 24th
In distress about 700 miles off Cape Race. Wireless message received at Halifax, N.S. Several steamers came to her rescue. Captain and crew saved by boats from the Giuseppe Verdi but disabled vessel sank.

FIFIELD/WRF (Stm Schnr) Feb. 21st
Wrecked on south jetty of Coquille bar, Oregon. Crew and passengers saved, ship lost. (Disaster Log of Ships)

SS ROANOKE/WRR May 9th
Bound for Valparaiso to France lost in storm. All went down including operator George E. Chamberlan. (SOS to Rescue

SS DORA June 5th
Enroute Uyal from Kodiak struck reef in Ouzinkie Straits about 50 miles from Kodiak. Ship immediately began taking in water. Operators Walter L. Lachelt, 163-P, and Cyril H. Pemberton, 225-P, sent SOS. At high water able to free from reef and refloat. Beached at Uyak for repairs and later towed to Seattle by SS Cordova for more repairs.

SS BEAR/WWD June 14th
Went on beach near Humbolt City, Ca. Leon S. Grabow, Sr., 421-SGP, sent SOS. They were in dense fog. Only four lost. (Shipwrecks of Pac. Coast)

SS RAMOS/KER July 11th
Enroute from Philadelphia for Cartagena, Columbia. Sprung leak due heavy weather. Raymond J. Green, 395-SGP, sent SOS which was picked up by Miami. SS Van Hagendorp and tanker Illinois answered call. All left ship in lifeboats and after many hours picked up by the SS Jose. (Wireless Age, Sept. 1916)

USS MEMPHIS/KDVY Aug. 29th
Wrecked at Santa Domingo. 22 lost. (World's Almanac)

SS CONGRESS Sept. 14th
On fire off Coos Bay, Ore., but SOS not sent until fire became uncontrollable. Then 428 passengers and crew took to life boats and all saved. After an expensive rebuild she became the SS Nanking, KKAE, and later the Emma Alexander. (Disaster Log of Ships)

1917

USS MILWAUKEE January 13th
U.S. Sub H3 went ashore on Samoa Beach Calif. After several Coast Guard and tugs tried to pull her off, without success, the Navy brass sent the big cruiser Milwaukee which was unable to maneuver in the surf and went ashore herself for good. Luckily no loss of life in either ship. Operator Stanley E. Hyde, 343-SGP, sent SOS.

SS CANADIAN MARU January 31st
Japanese ship struck rocks off Cape Flattery, USA, in a dense fog. SOS brought five tugs who rescued all passengers and crew, and by unique salvage operations saved the ship.

SS PRINCE RUPERT March 23rd
Canadian ship. Ashore on Genn Island B.C. in a whole gale. USCG Cutter McCullough saved all aboard by wonderful seamanship.

ST. FRANCIS/WHH April DSV
Sailing ship. Driven ashore in Unimak Pass QRD Bristol Bay during a storm. "Dad" Wampler sent SOS which was received by Cyril Pemberton, 225-P, on the SS Norwood and Dexter S. Bartlett, 145-P on Tug Goliah. With good work by life boat crews all were saved including about 150 Chinese reeking with opium.

SS RUSH/WNR May DSV
Ship under gunfire but no details. Opr. Howard S. Pyle, 50-P (D/M), got off his SOS.

SS STANDARD/KIC (Bark) May DSV
Enroute Nushagak, Alaska, for Libby ML for assignment KMG. Ran ashore on Cape Etolin off Nughagak River. Howard Cookson, 140-SGP (D/M), sent SOS on little spark coil and receiver. Call picked up by Ernest Danielson KVT at Kvichak. Party adrift in open boat 4 days in Bering Sea. Ship sank but crew saved.

SS MORENO/KNX June 12th
Torpedoed on east coast of Spain with a load of gasoline. Opr. Dwight Howland sent SOS while Opr. J. Curran helped the guncrews. Sub shell knocked chair out from under Howland. Another shell exploded gasoline cargo and caused an inferno. Curran died but Howland jumped overboard and was saved.

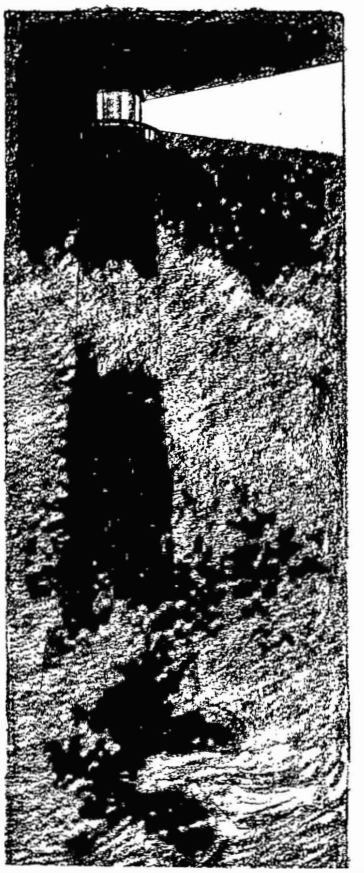
USS OLYMPIA July 17th
Enroute to Gardiners Bay, south of Newport, R.I. Hit rock in Gardiners Bay which cut big gash in bottom of ship. Opr. Leo A. Price, 802-P, sent rush message to the USS Raleigh to send aid. One casualty, rest saved.

SS MOTANO/KSB July 31st
Torpedoed near Queenstown in English Channel and sank in one minute. Opr. Russel A. Williams did not have time for SOS. (SOS To Rescue)

SS CAMPANA/KOM August 6th
Enroute La Rochelle, France, from N.Y. Ship sunk by German sub. gunfire after 9 hours during which Operator George W. Pope, 1782-P, sent out SOS calls at 3 minute intervals. Ship abandoned and lifeboats picked up by Fr. Cruiser Audacious.

USATC JOSEPH CUDAHY Summer DSV
Several hundred miles SE Nfld. Attacked by sub and sank sub. No answers from convoy ships to SOS sent by Haydn P. Roberts, 179-SGP. On return trip from France torpedoed twice and spent 4 days in lifeboat. Picked up by Br. ship and taken to Newport News.

USCGC MOHAWK/NRM Oct. 1st
Ship making circles around a convoy. Br. ship SS Saxaline cut into the Mohawk amidships. She began to fill with water. SOS sent by Richard Schell, Jr. 1055-P, and USS Sabalo SP225 and



USS Mohican SP117 came to rescue and all hands and mascot saved. Mohawk sank.

SOMERSET/KSU (Tanker) Oct. 3rd
Enroute Tuxpan Mexico to West Coast Peru/Chile. Went aground on coral reef off Old Providence Island. SOS sent by Ernest D. Fabian, 113-P (D/M). SS Paresmina responded. Also Br. ship Ohava, USS Sand Sucker and USS Hanabil. Merritt Chapman Tug Rescue finally pulled tanker off reef Oct. 22nd. Went to N.Y. under own steam. All saved.

SS ANTILLES October 17th
Torpedoed. NR.

SS HARBURG October DSV
Ship leased by USSB to the Russian Volunteer Line to transport munitions to Murmansk and Archangel, Russia. Ran aground in dense fog near entrance to White Sea. William H. Jones, Opr., 700-SGP, sent brief SOS and a Br. cruiser responded with "QRT" use code. At high tide ship released and proceeded into Archangel.

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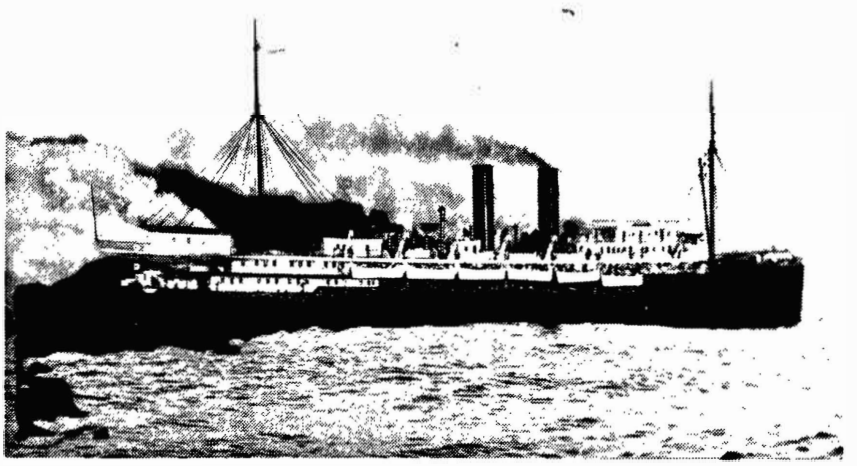


SS CONGRESS - (F),WGT - Intense fire destroyed ship Sept. 14, 1916 off Coos Bay Oregon. CHARLES A. LINDH, 676-SGP sent out SOS for help. 253 passengers and 175 crew saved. Ship later rebuilt became SS NAKING/KKEE and then SS EMMA ALEXANDER/WGCN.

SOS—CQD RECORD

1917

SS ALKI/WNK November 2nd

This ship made history during Alaska gold rush days. During snow storm piled up on Hoonah Reef at Pt. Augusta, Alaska. Opr. Raymond S. Kimberk, 127-P, got off his SOS which was responded to by Juneau Station. The Alki stayed on the beach but the crew was taken by the Burnside to Juneau with the passengers and then the Princess Sophia took them to Vancouver. One year later Princess Sophia hit rock same place and sank.

HMT THORNHILL/BDE Nov. 27th

Cargo ship enroute Gibraltar to Genoa. Torpedoed south of Oneglia (northern Italy) SOS sent by John K. Holland, 818-P, which was answered by Radio ICB Genoa. 37 in crew, 1 man killed by explosion. Crew abandoned ship leaving Captain, officers, engineers and Op Holland to beach ship near Oneglia. Captain's report to Admiralty:● "Wireless Op. Holland was one of a very few to stand by the ship until she was beached."

SS SINOLA 1917 DSV

Wrecked near Cape Blanco. NR.

1918

SS HARRY LUCKENBACK/KGX Jan. 6

Torpedoed in Atlantic. All lost including Opr. Alfred B. Robinson. (SOS to Rescue)

SS ROSECRANS/WTL● Jan. 7th

Stranded on Peacock spit, Columbia River 31 lost, 3 saved. Opr Lawrence Prudhunt lost after sending SOS.

SS OREGON/WDG● January 18th

Ship unmanageable in fierce gale 200 miles north of Koko Head, Hawaii. Ship and crew rescued by SS Lurline after SOS sent by J. S. Knowles, 18-P (D/M), who stayed at key for 55 hours.

USCGC MORRILL/NRC February 7th

After harrowing trip from Halifax following explosion of SS Mont Blanc, the Morrill became ice-locked at Cove Point, Chesapeake Bay, without fuel, food or water.● Harry C. Olsen, CHOP, Irl V. Beall, 399-P, 2nd Op., Maurice Rice, 3rd Op. Capt. Wilcox ordered SOS sent. Collier Transportation came to the rescue.

USS HOPKINS/NHC February DSV

A destroyer enroute Norfolk to Philadelphia Navy Yard. Went ashore in heavy sea off Lewes, Del. Henry A. Pierce, 1707-P, sent call for assistance but a Delaware River and Bay Pilot was able to assist in freeing the destroyer and it proceeded under its own power.

USS CYCLOPS/NDV● March 4th

Sailed from Barbados and disappeared without a trace.

SS UMATILLA/WGU March 5th

Off course went ashore 10 miles from Choshi, Japan. Beached. Big gale hit her March 12th. SOS sent by Loyd A. Peek, 45-P, but ship abandoned due to breaking up in heavy seas. Crew returned to U.S. on Empress of Russia.

USS MANLEY March 19th

Collided with Br. Merchantman SS Motagua 100 miles west of France. Explosion and fire followed. Many killed on both vessels. SOS sent by Art Johnson, Opr., 44-P (D/M). All hands abandoned ship. Fires continued for 16 hours; finally picked up by H.M. Sloop Bluebell and taken to Devonport, England.

SS TURRET CROWN/ZDH Mar. 8, 1918

Enroute NY to Naples, 300 miles East of Boston ship's rudder and engine trouble developed. Call for help answered by Siasconset and USCGC Androscoggin who located ship only after Chief Engineer used last of wooden bulkheads for fuel to power emergency wireless after oil became useless. Ship towed to Boston. SOS sent by Edward H. Wolfe, 1960-P

SS CITY OF ATHENS/GJVC May 1st

In collision off the Virginia coast. Opr. Francis J. Doherty sent SOS and died at key. He was the only one lost.

USS PRES. LINCOLN May 31st

Troopship. Torpedoed with a loss of 29.

USS VON STEUBEN● June 18th

(Former German Liner Kronprinz Wilhelm Enroute France for N.Y. Stopped to check 7 lifeboats adrift when sighted torpedo coming from them at ship. SOS sent by Raymond W. Zerbe, 279-P, to alert reporting attack and survivors in boats. Nearly floored by reaction of 300 ash cans exploding which probably sank one sub. Survivors in 7 boats from SS Dwinsk, Br. transport. Called BZR Bermuda who QSL'd. Adm. Gleaves, Cmdr. USNTF Atlantic, boarded and congratulated crew.

SS ALAMANCE/WRZ June 18th

Enroute Liverpool for Baltimore. Torpedoed off Ireland. SOS sent by Harvey R. Butt, Opr., 257-P. Crew rescued.

SS EDWARD PEIRCE/KMOU Aug.

(DSV) Enroute from Boston to Norfolk. Fifty miles south of Nantucket, running without lights, ship was fired upon by what was thought to be a German sub. Ship not hit. Captain requested Melville W. Ghen, 650-P, to send SOS but he refused as he thought by so doing he would give their location to the Germans. Land station at Cape May contacted and given the occurrence, time and position.

SS TAMESI/WTE (Tanker) Sept. 16

Ship ran ashore on bar off Texas coast in dense fog. Opr. Lena Michelson ordered by her father who commanded the ship, to send the SOS. Answered by Station NBK, Galveston. By dumping oil in the Gulf, ship floated free and proceeded under her own power.● Miss Michelson first woman to send out SOS.

SS GEORGE G. HENRY/WIT Sept. 28

Operator Frank J. Shannon, 699-P. Details NA.

USS TICONDEROGA Sept. 30th

Torpedoed by U-152 off Azores. Opr. Albert Elmer Snow, 192-P, sent SOS.

SS DUMARU/KPEO October 16th

Struck by lightning near Guam. Gasoline cargo caught fire and burnt out the radio receiver. Opr. sent his SOS blind with shack on fire. All crew members got off in 2 boats and a raft. Stray steamer picked up one boat and raft containing the R.O.●After 24 days the other boat landed in the Phillipines after several had jumped overboard due to hunger and thirst and were eaten by sharks.

SS PRINCESS SOPHIA/VFI● Oct. 25

Went ashore during snowstorm near Juneau Alaska. SOS was sent and 3 vessels came to assistance. Captain refused help believing the company ship Princess Alice would soon arrive and take off everyone and save hotel bills. Wind increased during night and ship slipped off reef and went down with 398 passengers and crew members. None saved. Radio operators stayed to the key until water entered shack.

SS TUCKAHOE/KJOU 1918 DSV

Ship sprung a leak in North Atlantic during heavy storm. Opr. Rome Montle, 12-P, got off his SOS and Navy tug came to the rescue and ship towed to Halifax.

USS CELEBES/NAFQ 1918 DSV

On convoy duty from U.S. to Europe. Fire developed in forward hold. Left convoy and headed for Brest, France. James E. Knight, Opr., 1714-P, sent distress signal, which was picked up by an Amer. destroyer. Convoyed to port where fire was extinguished.

1919

SS SANTA ISABEL/WHN March 25th

Enroute to Chile. Went ashore on rocks at Punta Coles, Chile, 90 miles SE of Mollendo, Peru. Opr. Arthur C. Jacoby, 62-P, sent SOS but no response. Rising tide freed ship and proceeded to Arica, Chile. On April 8th tail shaft broke and ship limped into Balboa CZ.

SS DESOTA (S.O. Tanker) June 13th

Aground 100 yards from Flekerro Lighthouse Norway. Operator Jack Kramer. Details NA.

SS SANTA CRISTIANA/WHO June 5th

Ship on fire. Opr. Charles M. Morenus, 30-P (D/M), got off his SOS but generator went out during call. Ship abandoned. Crew picked up by fishing boat.

SS SEWICKLEY September 20th

Engine shaft broke. Opr. Alfred K. Robinson, 200-P, sent SOS. Towed to Salina Cruz, Mexico.

SS KITTEGAUN/KITG October 23rd

USSB ship operated by American Export Line. Enroute Piraeus, Greece, for Salonika with cargo and 'misplaced' persons. 20 miles south of Panomi fire discovered in cotton bales stowed in No. 3 hold. Op.

J. Donald Haig, 1836-SGP, sent SOS. NWC USS Dupont responded immediately which convoyed ship to Salonica where fire extinguished. (Edward Doidge, naval radioman, on a destroyer picked up distress call from SS Kittegaun. Later Haig met him at Cooper Hospital where he was an electrician.)

SS POLAR LAND/LCWQ Nov. 9th
Lost in storm off Savle Island. No survivors. M. Love and S. Helfond were the operators. (SOS To the Rescue)

SS GUARANY/LLS August 26th
Brazilian Gov't cargo ship. R/O Geo. W. Pope - 1782-P Ship QRD Santos from NY ran into series gales and became waterlogged. Sent SOS which was picked up by Radio Martinique and rebdc. SS Saxon and Montara answered. SS Montara escorted LLS partway to Bridgetown Hbr BWI. Later ship caught fire at wharf and was abandoned 10/24.

SS WAHKIAKUM/KNIA Dec. DSV
Ship enroute Rotterdam to Philadelphia. Low grade coal burned grate bars making it impossible to maneuver during hurricane in No. Atlantic. Opr. George C. Vieth sent SOS. Answered by several ships including USCGC Gresham which put line aboard and towed to Savannah.

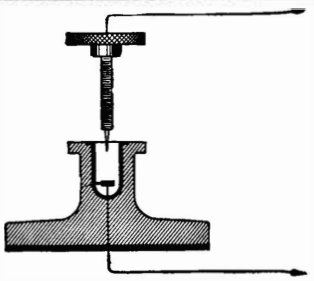
USS NISHMAHA/KEVM Dec. 1st
Disabled vessel somewhere between Destruction Island off Wash. coast and mouth of Columbia River. Carl E. Braun, 1025-SGP (D/M), sent SOS which was heard by C.G. Cutter Snohomish who went to assist. Algonquin standing by but too small; Snohomish unable to tow Nishmaha so bar tug Onconia went to her aid.

SS KERWOOD December 1st
Struck mine in English Channel. Opr. A. Pasquale sent SOS. They took to boats and were rescued by Ger. fishing trawler Arnold.

SS BRINDILLA December 1st
Opr. Dutko. Details NA.

SS MANXMAN/GDZ (Br.) Dec. 18th
Foundered in mid-Atlantic. Operator Wm. T. Gorham of Athol, Ma. went down with ship.

SS J.A. CHANCELOR/WTK Dec. 18
Wrecked near Cape Blanco, Ore., due to fog and strong currents throwing her off course. Only three out of her 39 crew saved.



Ye Olde Electrolytic Detector

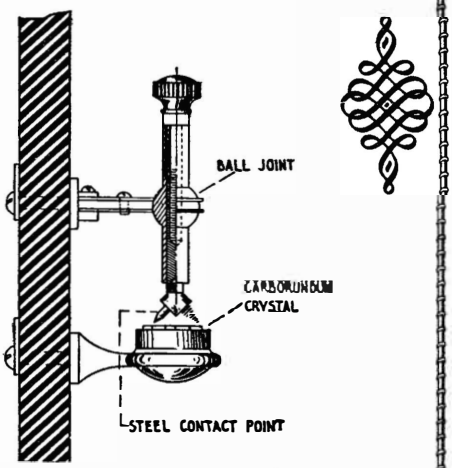
CANADIAN RECRUIT December 20th
Ship sprung a leak 500 miles east of Cape Race. Pumps used. Cargo jettisoned to lighten ship. SOS sent by Opr. Cyp Ferland, 770-P. Neighboring ships kept on the alert but ship able to make port.

SS F.A. KILBURN 1919 DSV
Enroute Havana for New Orleans. Fire 25 miles off Key West. Opr. J. Bodin sent SOS and was nearly left on the burning ship. All saved by the Tanker Irish.

1920

SS CITY OF TOPEKA January 2nd
Ship lost rudder and part of stern post which held rudder upright near Columbia River bar. W. Earle Wohler, CHOP, 4-P sent SOS. Northhead NPE alerted. SS Oneonta arrived, also SS Curacao/KCK. Towed into Astoria.

SS WEST AVENAL/KENG January 9th
(Oriental Nav. Co.) Rammed by the SS Lancastrian in dense fog. Inbound N.Y. from Valencia, Spain. Opr. Alexander Snyder, 1725-SGP, sent SOS. Ship sank in shallow water off Stapleton S.I. within a ~~few~~ minutes. All saved. Captain of West Avenal J.J. Anderson. Lancastrian under command of Capt. Thomas J. Wood.



Marine Carborundum Detector Set

SS WEST WIND February DSV
Fire developed in engine room while ship was anchored about 3 miles outside harbor of Yokahama, Japan. Ship carrying 10,000 gallons of gasoline. SOS sent by Maurice L. Muhleman, 1241-P and answered by shore station. Fire boat appeared about an hour later and fire under control by midnight.

SS WEST HEPBURN February DSV
A disabled propeller during a storm in north Pacific necessitated Opr. Raymond Offield to send SOS. Answered by SS Ida, Opr. E. Jay Quinby, 402-SGP, which ship towed them to S.F.

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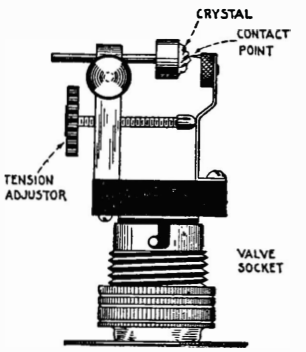


CARBORUNDUM "XTL" HOLDER IN FLEMING VALVE SOCKET

SS WM. HENRY WEBB February DSV
On fire off Tonkin Beach, N.J. Rescued by SS Panama.

SS CUBALIST/KNV March 7th
Her reported position was 110 miles SW of Diamond Shoals on January 29th and never heard from again. Opr. Emile H. Hulsemann. (SOS to Rescue)

SS TWEKESBURY March 17th
En route to Cape Race ship piled up on the rocks near Cape Pine. SOS sent by Francis J. Christie, 952-P. Heavy seas made rescue difficult so ship abandoned. Messages received at Cape Race sent rescue ship from St. Johns, N.F. All saved.

SS WAR SOLDIER/BBW March DSV
Enroute to South Africa, Cape Town. In St. Lucia harbour, West Indies, crew mutinied. Opr. John K. Holland, 818-P, Sent request for armed assistance which was provided by HMS Constance. One killed and 1 severely injured. Mutineers taken to Bermuda prison. About 74 in crew including Bob Suhr and R/O.

SS POLAR STAR May DSV
Disappeared with all on board off Canary Islands. Operator Albert Bombe. Reported by Albert G. Dick, 1136-P.

SS MACONA/KFC June 17th
She broke up in bad storm off the coast of Sweden. All lost including Opr. Lawrence B. Robinson. (SOS To Rescue.)

SS HEREDIA/KDH 1920 DSV
Off coast of Panama in Caribbean sprung leak in a hurricane. Rome Montle, 12-P, got off his SOS and ship and crew were saved. (Ship torpedoed May 19, 1942 in Gulf of Mexico - half lost.)

SOS/CQD RECORD

1921

SS KLAMATH/WSX ● February 4th
Twenty miles south of Pt. Arena, CA., went ashore in bad 85 mile gale. Oprs. Bernard W. La Fetra, 138-P, and Ernest F. Wilmshurst, 126-P, got off the SOS. Sailor swam ashore with small line rigged breeches buoy and all passengers and crew saved. Ship total loss. SS Curacao, Opr. Halle Medcalf, answered SOS and stood by.

USS EAGLE #29/NEXN (Feb.,Mar.) (DSV) Enroute Boston to Key West. While off Hatteras fireroom lost its air pressure and no steam for the engines. In danger of capsizing due to heavy seas. Frederick J.H. Wallace, 1594-P, Operator, sent SOS and ships arrived and gave aid. Air pressure finally restored and ship continued on to dest.

SS SANTA CRUZ/WBD Feb 8 1921
Enroute Manila/Honolulu with cargo raw jute and largest menagerie ever carried across the Pacific ("Bring 'em back Alive F.H. Buck) some 5000 rare birds, 350 monkies in 10 varieties, orang-outangs, elephants, gibbons plus scores of snakes including pythons 25 ft in length, ship ran into foul weather 2600 miles west of Honolulu. Fire broke out in No. 1 hold due spontaneous combustion of jute. Stations NPN Guam, KHK, NPM Honolulu alterted plus few ships in area. (No SOS sent). Ship reached Honolulu after 6 days with crew unable extinguish. Fire put out on dock by Honolulu firemen. Operators Wm A. Brenjman and Vernon Goldsmith. Only casualty were 1 Minah bird (which Buck gave Goldsmith) plus score of monkeys. (LR)

SS MULTNOMAH/WMA Early August
Went aground in heavy fog in Straits Juan de Fuca, Puget Sound. Opr. Frank Geisel, 5-P, got off his SOS and both crew and ship were saved.

FUKUI MARU October 27th
1200 miles west of Cape Flattery in heavy seas. Rescued by West Ivan.

SS WILLIAM M. BURTON 1921 DSV
Tanker for Atlantic Refining Co. In ballast from Hamburg, Germany to the U.S. Capt. instructed Opr. Henry A. Pierce, 1707-P, to send SOS due opened valve feeding water into tanks from ocean. Several ships replied, louding being the SS Wurtenberg. Position was south of Cape Race and east of Sable Island. Trouble corrected by Capt. and crew.

SS GOVERNOR COBB/KRB 1921 DSV
Passenger ship en route from Boston to Yarmouth, N.S. Ashore Green Island N.S. in dense fog. Opr. Gerald E. Travis 217-SGP, sent SOS. Tide rose and ship reversed into deep water. No casualties.

SS MARNE 1921 DSV
Opr. Joe H. McKinney, 237-P. Danger beaching. Lost engine.

USS SUBMARINE "S-5" 1921 DSV
Harrison O. Byers, 824-P, aboard SS General Goethals, Panama RRSS Line, "KMZ" and CHOP Charles F. Asche effected the rescue of the submarine.

MS SANTA FLAVIA 1921 DSV
Ship loaded with caps and dynamite bound for Iquique, Peru, piled on rocks. Opr. Virgil V. Munhollon, 841-P (D/M), sent SOS which was answered by Lima Station OAR.

SS GOVERNOR/WGR April 1st
Collided with West Hartland/KEGS, off Pt. Wilson, Juan de Fuca Straits. The West Hartland Opr. Leonard E. Belfi, sent SOS, with Ernie Wolcott, 32-P, and Ralph Butler on the Governor. Eight lives lost.

PLEASE NOTE - CHRONOLOGICAL listing out of order. The following 5 listings should follow the SS MULTNOMAH in column at immediate left.

SS PHOENIX BRIDGE/WFOU May 1st
Ship enroute Mediterranean ports from Savannah. New engineers turned salt water in boilers which popped the tubes and brot ship dead in water in gale force winds. Capt. E.R. Pearson ordered Opr. Gordon H. Pascoe, 33-P, to send SOS which drew response from 6 or 7 ships, one being the company ship Easterr Light/WKH which towed Phoenix Bridge to Gibraltar, a distance of 800 miles.

SS TOKYO MARU May 3rd
Caught on fire 60 miles SW of Columbia River. The Santa Alicia rescued all but eight of crew members.

SS COLLEDA July DSV
Ship adrift off Azores. Opr. LeRoy A. Mullin, 1755-P, on ship which picked up Colleda and towed her to Lynn Haven Rds.

SS ALASKA/WWS August 6th
Ashore on Blunts Reef, CA., during heavy fog. Two boats capsized dumping them in cold oil covered water. Tug Anyox did yeomen service in rescue work, but 48 were lost out of 207 passengers and crew.

SS SAN JOSE August 8th
Ashore on San Roque Island, 400 miles south San Diego. CHOP Arthur Enderlin, 183-P, 2nd Opr. Fred A. Lane, 277-P, sent SOS, answered by NPL, sent Destroyer USS Farquhar/NANZ to rescue. Passengers taken off. Salvage vessel SS Homer unable to pull ship off. Crew returned to S.F.

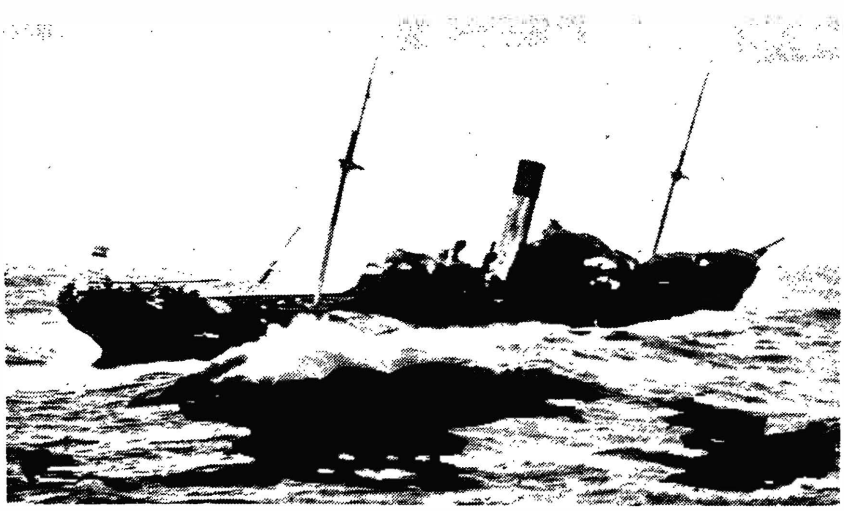
1922

SS LORD STRATHCONA/MBY Mar. 15
British ship. Lost propeller and battered by heavy seas in North Atlantic. Opr. sent SOS which was answered by the SS Wm. M. Burton whose operator was Henry A. Pierce, 1707-P. Capt. C.R. Lanner of the Burton towed Strathcona to Hamburg.

SS GRØNTOFT ● March 22nd
Foundered in storm 600 miles east of Cape Race. Opr. John Frantzen sent SOS with many fatalistic remarks: "This is no weather without an umbrella, Where did I put my hat and then Skial (Goodby)" as he went down with the ship. SOS answered by SS Esthonia, opr. Edward Hansen.

SS EGYPT (Br.) May 21st
In a collision. ● Opr. A.W. Hardwick (London) died at key refusing to leave post.

SS IOWAN/WKJ May 28th
WELSH PRINCE (Br.)
These two ships collided off Astoria, Ore. due to fog and mixup in signals. Seven men died on the Welsh Prince which became a hazard to navigation and had to be dynamited.



SS. *Antinoe* just before she sank in mid-Atlantic

SS BELLA/WAX ● June 18th
Enroute Baltimore to Port Maria, Jamaica for bananas. Near Watling's Island, about 175 miles south of San Salvador, ship was taking on water. Captain ordered Opr. George Staffa, 2123-P, to send SOS which was answered by the SS Bordestadt and relayed to SS Tamaroa. Ship abandoned--opr. last man off sinking ship. Picked up by Tamaroa and taken to Kingston, Jamaica.

SS WILLAMETTE/WSW June DSV
Went aground in a storm in dense fog on Point-No-Point. (Probably would have been hit by SS Princess Victoria if they had not been ashore.) ● Opr. Eben K. Cady 54-P got off his SOS. 36 pgrs. rescued by Princess Victoria. Fireboat came out and assisted ship to Todds Drydock.

SS CHARLES BRADLEY July 2nd
Ship racked by internal explosion 75 miles NE of Tampico, Mexico. R/O James Schultz. Men took to the boats.

SS H.F. ALEXANDER/KDYK Aug. 7th
Struck Cake Rock off Washington coast at high speed, badly caving in the bow. Watertight bulkheads kept her from sinking. A story was told that a crew member appeared among the passengers dressed only with socks. Nobody paid attention to him in the panic.

SS LYMAN STEWART/WTL Oct. 7th
SS WALTER LUCKENBACH
Two ships collided in dense fog just below the Cliff House, S.F., in dense fog. All saved but the Stewart was a total loss.

SS CITY OF HONOLULU/KUSD Oct. 12
Caught on fire 700 miles west of San Francisco. CHOP Walter P. Bell, 2nd Opr. H. Duke Hancock, and 3rd opr. Norris C. Kumler, 380-SGP (D/M) handled SOS. No loss of life. Rescued by West Farolon Transf. to USAT Thomas.

SS SWIFTSTAR/KDPF Oct. 12th
Ran ashore in dense fog and grounded 40 miles from Fall River, Ma. Opr. Thomas B. Case sent SOS.

SS FIRMORE October 18th
Hit rock north of Panama Canal in Gulf of Mexico. SS Marore to the rescue. Fred Salim, opr., on Marore.

SS CONCORD (Colonial Line) Oct. 19
On fire off Watch Hull, Long Island Sound. R/O Elmer G. Weaver sent SOS and saved 116 lives. Passengers put on SS Mohegan.

SS WEST HELIX/WSUA 1922 DSV
In English Channel ship's engines broke down and ship drifting on rocks. Rudy Asplund, 57-P, (D/M)sent SOS for help but engineers corrected trouble in nick of time. SOS cancelled.

1923

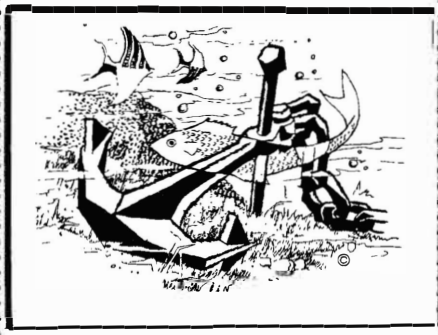
SS TUSCAN PRINCE (Br.) Feb. 15
Ashore in snowstorm in Barkley Sound, B.C. Crew saved, ship lost.

LURLINE February 28th
Matson passenger liner, Captain E.H. Sandelin. Went ashore at Bush Point, Whidby Island, 33 miles north of Seattle, in dense fog. No psgrs. aboard. U.S. Coast Guard life-saving tug Snohomish, the Lillico tugs Sea Monarch and No. 20 and tug Tyee ordered to her assistance. Got ship off following day.

SS BRUSH/KDHV April 26th
Grounded off Cape Arago, Oregon, in fog. Crew saved, ship lost.

SS LAKE GEBHART/KOGV May 9th
Ran ashore in dense fog on reef at Toleak Point south of Hoh Head, Washn. Ship slipped off reef 4 days later into her watery grave. Crew had abandoned. Ship had been purchased by Alaska SS Co. from USSB.

SS SWIFT STAR/KDPF July 15th
August ninth an ice box marked Swift Star drifted ashore at St. Andrews Light, 300 miles north of Colon. It contained the body of a man. That is all that is known of the Swift Star. Opr. Ernest F. Dorsey probably was unable to get off his SOS due to the tanker exploding. (SOS to Rescue)



USS DELPHY/NEZQ ● ● Sept. 9th
The Delphy, plus 6 other destroyers in a dense fog and 30 miles off course ran ashore 75 miles north of Santa Barbara, CA. Some 630 men saved and 22 lost. Just a stupid blunder in running 20 knots in a dense fog not using DF and many other mistakes.

SS CANADIAN BEAVER Sept. 20th
Opr. Joseph Devereux, 1774-P. Details NA.

MS KENNECOTT/KDPP Oct. 9th
Got off course in a bad storm and wrecked on Graham Island, B.C. Crew miraculously got ashore on tiny Hippo Island where they were marooned. Much credit for no loss of life given to 2nd mate P.F. Kleeman and 3rd mate W.C. Cover for rigging a breeches buoy to the mainland. Opr. Everett Lasher given a gold watch by the crew for sending his SOS and helping the crew.

OS...._...SOS...._...SOS.

SS CONEJOS/KUKT December 28th
Another ship that disappeared during a bad storm on the Black Sea with loss of all the crew including Opr. Fred Salim.

1924

SS COLUMBIA/WBH February 17th
Ran aground on Coos Bay Jetty 7A. Opr. Lewis D. Chilson, 222-P, sent SOS. After it was sent it was found antenna lead-in broken. Another ship called KEK. Ship lost but crew rescued.

SS TATJANA (Nor.) February 27th
Wrecked in gale in Barkley Sound, B.C. After a nerve wracking 27 hours the crew was rescued.

CGS ARCTIC/VDM ● July 13th
100 miles off Labrador, 150 miles north of Belle Isle, hit by a NE gale causing high seas which came aboard. Due to heavy loadseas went down companionways putting out fires. Capt. J.E. Bernier ordered Opr. W.F. Choat, 1490-P, to send SOS. No answer received. Gale subsided and 48 hrs. spent pumping out ship by hand. (Arctic built in Germany in 1901 as the Gruss.)

M/V ARCTIC August 10th
Shipwrecked off Point Barrow, Alaska. Captain was famous ocean skipper Capt. Bartlett. Propeller hit a chunk of ice and ship drifted into the ice fields. Operators Wm. P.T. Nottingham, 733-P, and Virgil D. Munhollon, 841-P (D/M).

1925

SS MACKINACK August 18th
Opr. Herbert F. Spenard, 1754-P. Details NA.

SS CITY OF ROME/KQZ Sept. 25th
Collided with USS Submarine S51 off Block Island, R.I. 34 lost. (Note: SS City of Rome - namesake, burned May 7 1914 off Ripley, about 30 miles West of Dunkirk NY. This ship was built in 1881 and 1908 tons.

SS COMANCHE/KVC October 17th
Enroute from New York to Jacksonville burned to water's edge. SOS sent by Opr. Charles H. Singer, 242-P (D/M), ship abandoned. 100 psgrs., 74 crew in lifeboats picked up by rescue ships. None lost.

SS LENAPE/KVL November 11th
Opr. John C. Ochocki, 1922-P. Details NA.

SS COTOPAXI/WMEI Nov. 29th
Sailed from Charleston, N.C. for Havana with a cargo of coal. Opr. Lawrence E. Waring sent his position report the next day but nothing more was heard from him. He was one of the 32 members lost. (SOS to Rescue)

DEDICATED – to the men who "went down to sea in ships" as Wireless Telegraphers and all those who have earned their living "pounding brass" as wireless or radio ops since the day of Marconi.

1926

SS ANTINOE/GKJY (Br.)● Jan. 24th

Sunk in a terrific storm in Atlantic. Opr. Arthur K. Evans sent SOS which was answered by SS Pres. Roosevelt. Roosevelt Operaters were: Kenneth Upton, CHOP, 512-P, Nelson Smith 2nd, and Mr. Ransom, 3rd. They took radio bearings every 15 minutes. Dead reckoning position SS Antinoe in error. Everyone saved.◉ Operator Evans praised by Capt. Fried of the Roosevelt for his valor. One of most thrilling rescues made on Atlantic. Two men on Roosevelt lost in making rescue. (See thrilling picture on Page 80 of the SS Antinoe just before the angry North Atlantic claimed her). Thanks to Karl H.W. Baarslag - 175-P)

SS SUDUFFECO/KDDO March DSV

Disappeared without trace. All lost including opr. Frank Dunning. (SOS to Rescue)

SS ADMIRAL WATSON July 30th

Went on rocks due to fog. Opr. George A. Freeman, aboard SS Adm. Rogers took the SOS and went to her aid. Passengers transferred to Adm. Rogers and captain and a couple of officers took the Adm. Watson to Ketchikan. Freeman member # 1104-V.

SS HOWARD S. GERKIN Aug. 21st

Sprung a leak 6 miles north of Erie, Pa. W.H. Jones, 700-SGP, R/O aboard SS Maitland #1/WLE, went to the rescue. Ship foundered, 16 rescued, 4 lost.

SS MADISON October 28th

Collision with the SS Louisiana at mouth of Mississippi River. H.J. D'Aquin, R/O.

SS COTOPAXI December 2nd

Off Florida coast. Lawrence M. Waring, Jr. lost.

SS BARLOW/WLAC December 20th

Opr. Milo R. Maiville, 1821-P. Details NA.

SS CANADIAN COASTER 1926 DSV

Hit Pine Island, Queen Charlotte Sound. Took water. Jim Kitchin, 84-P, Opr. Master ordered abandon ship. Made repairs as water lowered and managed to reach Prince Rupert for drydock & repairs.

1927

SS SUBOATCO/KURZ January DSV

Adrift without power and close to rocks off Bodega Head, CA. Opr. W. G. Simpson 26-P, got off his SOS. Coast Guard Cutter answered SOS and towed ship out of danger. (Note: Ship had 47 breakdowns before reaching N.Y. which included 5 tow jobs, 1 mutiny and 1 fight with Navy in Caribbean. Also nearly sank off Hatteras.

SS COMMERCIAL GUIDE February 14th

(Former German ship Nyanza, sunk Hawaii WW1) Enroute Buenos Aires to New York. Boiler breakdown. Opr. Andrew B. Lopez, 246-P, sent SOS which was answered by SS Hollywood and ship towed to Port of Spain.

SS ELKTON/KOFK February 16th

Ship disappeared between Guam and the Philippines. Opr. Charles F. Ruble, his first trip to sea, got off his SOS and position but no details as to trouble. The next day rescuers saw nothing but oil welling up out of the sea.

SS BAYRUPERT June 27th

Struck uncharted rock off Cape Harrigan in Hudson's Bay. R/O John Holland, 818-P, on M/V Moveria picked up call and relayed to Belle Isle. Gov't. ships Kyle and Stanley removed survivors.

SS HALEAKALA/KORL● September 8th

Another case of a ship disappearing without a trace somewhere off the coast of South America. Opr. Peter Bacuinka worked several ships on Sept. 7th and reported no trouble but was never heard again. (SOS to the Rescue)

SS COOS BAY/KFTV October 22nd

Lumber schooner ran aground in fog near San Francisco. Crew saved but ship lost.

SS CATALA/VGNY (Can.) Nov. 12th

Crashed on Sparrow Rock Reef, B.C. Crew and ship saved.

SS LEMUEL BURROWS/KLY Nov.

(DSV) Engine exploded near Nantucket R.I. Ship helpless in storm.◉ Opr. Gerald E. Travis, 217-SGP, sent SOS and was 72 hours at the key. After a hard struggle with tow lines the Coast Guard Cutter Mojavi towed ship to safety.

SS NORTHWESTERN/WAN Dec. 11

Wrecked in Straits of Georgia, B.C., in a bad storm. SOS sent by Dexter S. Bartlett, 145-P, with Mr. Gilman, Asst. Fish boat rescued pgrs. and crew. Refloated and became barracks ship in Dutch Harbor, Alaska, where she was bombed by Japanese pilot after Pearl Harbor. Built in 1883 she survived some 18 Alaskan rocks during service.

1928

SS ROBERT E. LEE March 10th

Ran ashore near Manomet Point, Mass. John F. Smith, Jr. Operator.

SS ARTIC PRINCE (Eng.) Mar. 24th

Sailed from Los Angeles for Yokohama and got in bad weather. SOS sent but unreadable. Several ships searched the area but no wreckage. All 48 lost.

SS WEST CAJOOT April DSV

Enroute from Manila to San Francisco. Was off course and ran onto Yakushima Reef south of southern tip of Japan. Tore off bottom from bow to bridge. SOS received by VPS at Hong Kong and Army Transport General Sherman. By reversing engine and weaving the ship, they managed to get her off reef. By running pumps managed to reach Kobe.

SS TASHMOO/KOXD April 29th

Sailed with radio apparatus haywire and no radio operator, carrying less than 50 passengers. Decrepit engine broke down in terrible storm in the Gulf of Tehuantepec on the Mexican west coast. Arthur Finch, a stowaway, had been a signalman in WW1 and knew the code but nothing about repairing the gear. After 24 hours finally got off an SOS which was picked up by 3 ships After breaking hauser three times in the gale, the Tashmoo reached Salina Cruz, Mexico. (SOS to the Rescue)

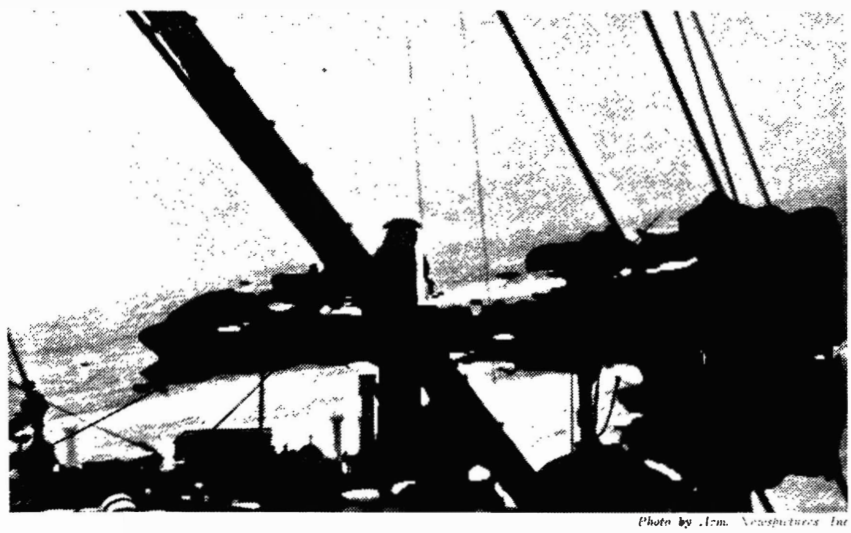


Photo by Acme Newspictures Inc

The Japanese freighter *Raifuku Maru* sinking with all hands in North Atlantic
Taken from S.S. *Homeric*

SS MOHAWK May 19th

Thomas F. Nugent, 294-P, D/M, 2nd opr. on 3-man job. Details NA.

STAR OF FALKLAND/KFFM May 22nd

Piled up on Akun Head near Unimak Pass, Alaska. All but one crew member saved. Ship lost.

SS PRINCE GEORGE (Can.) July 7th

Rammed by USCG vessel 65 miles east of Boston. Call monitored by Eugene B. DeTurck, "DK", 327-V, D/M, on his first trip as R/O. Ship made Boston under own power.

SS TANPAISEN MARU (Jap.)● Sept. 9

Ashore at Copalis Beach, Washington. Crew saved miraculously by Breeches Buoy in heavy surf.

SS DAVID C. REID October 14th

Lost in a storm near the Azores, South Atlantic. Opr. Maurice Black went down with all hands after sending his SOS.

1928

SS VESTRIS/MJZ ● November 12th

Was badly overloaded and when she encountered a severe gale 200 miles SE Sandy Hook she listed at 40 degrees. She capsized and sank. Captain delayed in ordering SOS.◉ Michael J. O'Loughlin, Opr., sending perfect code even to the last "AR" went down with the ship. Oprs. R.L. Etheridge and James T. Mac Donald were saved. 153 needlessly lost out of a crew of 326. (SOS to Rescue)

1929

SS FLORIDA January 23rd

Italian freighter. Enroute Texas to Italy with cargo of pine pitch. Ran into difficulty 800 miles off Virginia Capes. Oprs. on the SS America picked up SOS and went to rescue.◉Capt. Harry Manning put out in life boat in teeth of gale. All rescued.

SS LAUREL/WTUE June 16th

Steering gear broke and she went ashore on that infamous Peacock Spit at the entrance of Columbia River. Her deck lumber went over the side causing dangerous rescue operations in the surf. However, the cutter Redwing saved all but one crew member.

SS GOLDEN FOREST/KEXJ July 24th

Aground on Avatanak Island in the Aleutians. Crew saved but ship lost.

SS SAN JUAN/WFDE August 29th

SS S.C.T. DODD/KDML

Two ships collided in dense fog fifty miles south of San Francisco. San Juan sank in a few minutes. Opr. on SS San Juan was Paul O. Hillsman, 505-V. The SS Dodd was able to save 42 from the San Juan but 87 went down.

SS SEIYO MARU Nov. 2nd

Abandoned due shift wheat cargo at L 50-30N, 176-48E during one of worst storms of record in North Pacific. Opr. Ralph Hazelton 11-P on SS California KUKV relayed call. SS Hakuha Maru rescued 43 men after all life-boats on SS Seiyo Maru smashed.

SS SUTORPCO/KDBQ Nov. DSV

Ship ran aground in Juan de Fuca Straits. SOS sent by Vernon P. Bourg, 1020-V, but later determined ship not in danger and company sent tugs next day to pull ship off. After inspection at Estevan, B.C., ship repaired and proceeded to Dollarton, B.C.

1930

SS EDW. LUCKENBACH/KGQ Jan. 10

Enroute New York to Boston hit North shore of Block Island. Holes ripped out bottom. Power out due engineer room flooded.● Opr. Robert P. Brown, 92-P, used Mesco buzzer hooked directly in receiver antenna line to send SOS. WCC picked up SOS. USCGC Henley heard call and responded. Crew saved. Ship refloated about 3 months later.

SS ADMIRAL BENSON/WQOA Feb 15

Wrecked on Peacock Spit, Columbia River, in thick fog with heavy swells running. Frederick Robert sent the SOS. Motor lifeboats removed crew with some rescued by a dangerous breeches buoy.

ORIENT/KOLC (Halibut str.) Aug. 31

Cut in half by SS Admiral Nulton in Gulf of Georgia, B.C. Ten out of a 13-man crew drowned. Ship lost.

SS TIGRIS (Belgian) ● Sept. 18th

Left Antwerp and vanished with no trace and no SOS.

SS CHRISTOS SIGALAS Dec. 10th

(Greek Reg.) QRD Acetta, France, with cargo coal. During gale ship started to leak. Unable to pump water out due ashes in bilges. Obtained assistance from It. Monfiore which located them through DF bearings. Irvine Finver, 287-V, operator. Crew taken off, left ship sinking.

1931

LMS CALDER● April 17th

Passed Cuxhaven and vanished.

TUG CORMORANT May 3rd

Harry R. Cheetham, Operator. Details NA.

SS HARVARD/WRH May 30th

After surviving subs and raiders during WW1, she was wrecked near Point Arguello, USA. Operators Charles Martin and Elmer J. Stenman. All lives saved but ship lost.

●

SUBMARINE "NAUTILUS" June 13 1931

Trans-Polar submarine (Ex USS 0-12) used by Sir Hubert Wilkins lost power in mid-Atlantic (45-15N, 31-20W) SOWP Member Raymond E. Meyers - 89-SGP ● hooked up oscillating receiver to antenna and sent SOS. The SS Independence Hall/KDCG answered after 16 hours continuous calling (Operator Marshall now SK on KDCG). calls for assistance were answered by USS ARKANSAS/NACT and USS WYOMING/NITR. NACT finally took the Nautilus in tow after extreme difficulties due high-seas. Tow line parted due heavy weather but Nautilus was able to proceed under own power to Queenstown, with the USS WYOMING escorting (June 22nd). This was one of the thrilling "Saga's" of the North Atlantic. Entire crew and expedition saved.

SS COLUMBIA October 13th

Lost on Point Tasco, Lower California. Details NA. Operators E.A. Hatch and W.H. McClub.

BROOKLYN (Steam Schooner) Nov. 8th

Broke up on the Humbolt, Oregon bar. Only one saved out of 18 crew members.

SS DIGNITAS (Greek) Nov. 8th

Left Bizerta, Tunis and passed Ushank, then just disappeared.

SS ALAMEDA/WAA Nov. 23rd

No SOS was sent as she caught fire at Pier Two, Seattle, but she was a noted Alaska passenger ship for many years. No lives lost but old "WAA" was shortly scrapped. (LR)

1932

SS NEVADA/WFD Sept. 27th

Struck reef off Amatignak Island, Alaska and broke up. Opr. William Robertson◉ sent SOS and went down with the ship. Oregon Maru and Pres. Madison to the rescue - 3 saved, 34 perished.

SS SEA THRUSH/WBCW Dec. 4th

Went ashore on Clatsop Spit, Oregon. Operator W.J. Kirchoff got off his SOS. All 33 passengers and crew saved by cutter Redwing.

1933

SS VELMA LYKES/KUFG Jan. 28th

Details NA. Operator John H. Livingston, 865-V, D/M.

SS PERALTA/KDMJ May 6th

Wrecked in San Francisco Bay and burned. Details NA.

SS CONSTANCE CHANDLER /WFEI● June. Isthmian Line. Ship loaded with nitrates, cotton and carbide enroute East Coast to Panama. Fire in #3 hold about 100 miles from Panama. Ship crew could not contain so SOS sent by Cmdr. Gerald A. Estep, 93-V. Concern re:bbls. of carbide so volunteers carried out hot carbide cans and tossed overboard. Steering gear affected by fire but reached canal and fireboats took over. Tug from Colon towed ship to port while fire raged. Newspapers made heros of firemen who risked their lives but no mention made of ships' crew who risked their lives to throw cans of carbide overboard.

SOWP, SOS—CQD LOG

1934

AMER. WEST HIKE/KOZK March 10th

In Bay of Biscay with a lost rudder riding out a hurricane. City of Omaha towed ship to Mobile Bar, Mobile, AL., across Atlantic in less than 30 days. Only one operator aboard ship.

SS CHILDAR (Norwegian)● May 3rd

During a severe gale she was driven on that Graveyard of the Pacific, Peacock Spit, Columbia River. By remarkable seamanship the USS Cutter Redwing got a line on her in the surf and pulled her off. Opr. J. Likebakken got off his SOS. Crew taken off by shore motor lifeboats. All saved except four who were killed by lumber. The Redwing towed ship to Esquimalt, B.C.

SS PRES. LINCOLN/KDUY June 8th

Enroute Honolulu from L.A. Fire broke out 180 miles from Honolulu. Opr. Paul S. Means, 408-V. Details NA.

CHESAPEAKS L.S./WRO Aug. DSV

Ship stationed about 15 miles from land at entrance of Chesapeake Bay. Anchor chain broke and ship tossed about in a hurricane. SOS sent by Ray L. Bowers, 1369-V. Answered by NAM (Navy Norfolk) and RCA (New York). Coast Guard cutter came to their assistance. Ship towed safely to port.

SS MORO CASTLE/KGOV ● Sept. 8th

Burned in a terrible holocaust off Asbury Park, N.J. Oprs. were George Rogers, George Alagna and Charles Maki. They waited half an hour to get orders for sending SOS but it was turmoil on the bridge. On their own initiative they sent a CQ to await an SOS, all the time the floor was too hot to stand on. Capt. Robert Wilmot died. 228 out of 318 were saved, including the operators, who were the last to leave. (SOS to the Rescue)

L.A. CRESCENTA (Br. Tanker)● Dec. 5

Enroute San Luis Obispo, Ca., for Japan. Sent a TR on Dec. 5th and just vanished with no trace. She only had a crew of 37 instead of 42, was overloaded, and money came before lives.

SS USWORTH December 11th

Lost rudder in bad storm 850 miles east of Cape Race. The SS Jean Jabot used the new radio compass to good effect and were able to save 11 men but seven were lost, including the unnamed radio man.

1935

SS MOHAWK/KFYU (Tallsman) Jan 24

(Clyde Line) Collided off New Jersey. Operator Russell L. MacDonald. 45 lost. Details NA.

SS VENTURA January DSV

Opr. Gerald K. Wright, 1435-V. Details NA.

USS MACON February 12th

Off California coast. Opr. Ernest E. Dailey. Details NA.

SS BLAIRGOWRIE/GFYD Feb. 26th

Opr. Charles John Taylor got off his SOS and went down with ship in north Atlantic. Details NA.

SS DENALI/WQCA May 19th

Ashore Zayas Island, Northern B.C. In answer to SOS the USCG Cyane rescued all 42 of the crew including 4 stowaways.

SS VARDULIA ● October 18th

Left West Hartpool, England, with crew of 37. She sent SOS in Lat 58 N, 18.30 W and listing. Last heard.

SS ONEIDA/KEZJ Nov. DSV

Lost prop during Northeaster while outbound from Jacksonville. Joe Falbo, 660-V, sent SOS in vicinity St. Johns Light. Answered and towed back to Jacksonville.

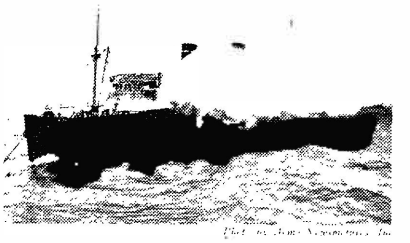
1936

SS IOWA/KFLT January 12th

She attempted to cross out over the Columbia River bar in a smoking gale and Peacock Spit claimed another ship, plus all of its heroic crew. Operator Frank M. Caldwell got off a faint SOS as probably the masts went out.

SS ALBERT HILL/WFCV Feb. 22nd

Enroute Philadelphia for Port Arthur, Tex. Fire and explosion about 250 miles east of Charleston, S.C. Opr. Frank



SS. *Morro Castle* afire off Asbury Park, N. J.

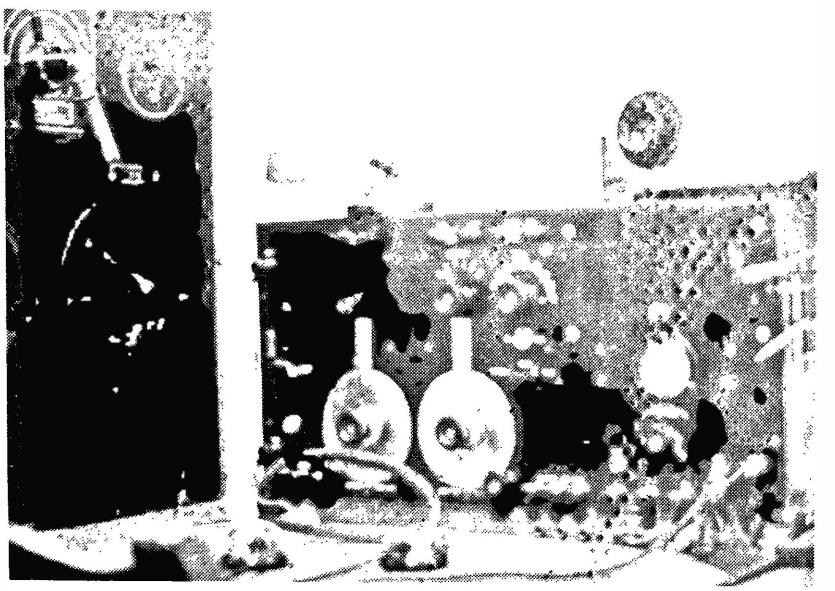
W. Convery, 1463-V, Relief operator on voyage. His SOS first answered by KFIW, next by KUCQ, KDHR, KGAC, WQBI, KGBG and SS Dorchester, KCUQ only 11 miles away proceeded to their aid. The USCGC Modoc and USS Yamacraw sent to their aid. Master was Capt. Allen D. Tucker. SS Burdell/KCUQ, a Pure Oil Co. tanker stood by until CG cutters arrived. R/O on USS Burdell was Glenn Kuhns. Four men were killed in explosion.

KHBCM/NC16932 April 26th

Enroute Cuba for Kingston, Jamaica. Failure of port engine necessitated emergency landing off Morant Bay, Jamaica. Acf badly damaged in landing due heavy swells. Carl L. Mason, 273-PA, sent SOS; ZET Kingston sent out info. SS Cavina picked up passengers. Acf sank about 1 hour after landing.

SS OHIOAN/WKQ October 6th

Wrecked on Seal Rocks off Golden Gate, California. All crew rescued by breeches buoy which was not a joyous trip.



SS MORRO CASTLE after fire, taken by SOWP Member Howard H. Zwicker 1850-V at drydock in Baltimore. Picture was printed from a damaged negative no other being available. It shows equipment installed. Mystery of cause of fire and Capt. Willmot's death unresolved after 40 years. Some facts known.

SS PRES. HOOVER/KDMW ● 1936 DSV
Bombed by Chinese in Yangtse River. Operator Robert L. Shrader, 157-V. Details NA.

PHYLLIS/KFGR (Steam Schooner) DSV
Wrecked near Port Orford, Oregon. All crew saved. Ship lost although most of her cargo salvaged.

SS PARINGA ● 1936 DSV
Just disappeared between Melbourne and Sydney, Australia.

1937

COTTONEVA (Steam Schooner) Feb 10
Went ashore in bad gale off Port Orford, Oregon. Crew removed by breeches buoy. Ship lost.

SS ZAPORA/WPQ February 12th
Climbed up into the timber on Admiralty Island, Alaska. Seven passengers and 19 crew members saved. She had been a well known halibut fish boat.

SS PRESIDENT COOLIDGE/KDMX

SS FRANK H. BUCK/WTO March 3rd
Collided with SS Frank Buck in thick fog off Point Lobos, Calif. in sight of Cliff House. All saved. All saved on Frank Buck but ship lost. (SS Pres. Coolidge mined in So. Pacific on Oct. 26, 1942. Five lost.)

PATRICK J. O'HARA (Trawler) Mar. 26
Fishing the Sable Island Banks when winch broke and they started for Halifax for repairs. Shaft coupling gave out off Sambro Lightship and they were almost on rock bound coast of Chebucto Head. Richard T. Lahey, 967-P, sent SOS which brought help from the Canadian Coast Guard who towed ship into Halifax.

SS PORT ANTONIO August 25th
Ivan A. Leo, 1046-V, took SOS from Port Antonio, while he was stationed at the Tropical Radio Telegraph Co. at Santa Marta. Ship went aground at Cartagena, Col., S.A. She received assistance after 3 days.

SS HAIDA/WGDC (Br.) ● Oct. 24th
Sailed from Seattle for HongKong with a Chinese crew and a Norwegian skipper. Just vanished without a chance for the radioman to get off an SOS. During Sino-Japanese War and possible sabotage.

SS AGWIDALE/KHCA Nov. DSV
Reefer ship carrying fruit from N.Y. to Jacksonville. Near entrance to St. Johns River in northease wind with poor visibility suddenly ship was in surf. Gerald E. Travis, 217-SGP, sent SOS, answered by NMV. Engines reversed and ship freed itself. SOS cancelled.

USS PANAY/NEDB ● December 12
Bombed and sunk in the Yangtze River by Japanese planes. One of the many reasons for WW-2. Two lost. Daniel S. Babb was one of the operators.

ADMIRAL RODMAN/WOA 1937 DSV
On fire near Seattle. Details NA.

EMPRESS OF ASIA/VGKT 1937 DSV
Operator William G. Harker, 1586-V. Details NA.

1938

SS KYELINE April 11th
Opr. Papas Theodoron got off his SOS and went down with the ship on the Atlantic coast.

SS CARL D. BRADLEY/WGN Nov. 18
Sank in Lake Michigan. Details NA.

SS VELUSIA 1938 DSV
Opr. Edward M. Stetson, 918-V. Details NA.

CAVALIER (Flying Boat) Jan. 21st
Imperial Airways Seaplane enroute N.Y. to Bermuda. Engine trouble forced it to ditch - broke apart. SOS sent by R/O Patrick W. Chapman. Ten survivors picked up Jan. 22nd by Esso Baytown.

SS TEMPLE BAR/GNQJ April 8th
Hit reef, ship sank in 10 minutes off Carroll Island, Washn. SOS sent by R/O W.J. Gibson. Answered by USCGC Daphne/GRGD, Charles A. Myers, 1571-PA, operator. USCGC Onandago from Port Angeles picked up survivors.

1939

SS KING JOHN (Br.) July 13th
Intercepted by a German raider. Opr. got off his SOS-RRR - denoting raider - when the bridge was shelled, starting a fire. Crew got off safely but ship was sunk.

SS DEPERE/KDBA August 6th
Struck base of light beacon in Wrangell Narrows, Alaska, during dense fog. Crew and ship saved. (Maybe no SOS sent)

SS REGENT TIGER (English) Sept.
(DSV). Torpedoed 300 miles SW of Dingle Bay, Ireland. Flames shot a thousand feet in air. Other details NA.

M.V. PANAMA November DSV
MV Panama rammed the Isthman Liner Memphis City off coast of Panama. Opr. Eugene H. Violino, 910-PA. Accident happened approx. 30 miles off shore between Costa Rica and Panama. No lives lost but some injuries due to ammonia burns to crew. Ship a total loss and burned all night before sinking.

SS KING EGBERT (Br.) Dec. 12th
Sunk by a mine off Haisboro Light Vessel off the coast of Norfolk, England.

1940

SS EL OSO (English) January 11th
Mined and sunk about 16 miles from Liverpool or 6 miles from the Bar Light vessel

SS HELLENIC SKIPPER (Greek) July 10
Suffered a peculiar explosion 125 miles off Grays Harbor, Wn. All saved but the

crew were in life boats for two days. (The Hellenic Skipper was well known as the SS Curacao/WGK, on the Alaska run. She had been sold to the Greeks just a few weeks before.)

SS REGENT LION (English) Sept. 15
Bombed and machine gunned by aircraft off the Mull of Kintyre, North Ireland. (1942 - Dec. 16th. She was torpedoed and damaged by U-boat 500 miles from Limerick, Ireland. 1945 - Feb. 17th. She was torpedoed and sunk by U-boat near the Straits of Gibraltar.)

SS PARISMINA/KDAG Nov. 20th
Ship torpedoed enroute from Iceland to the U.S. ● Operator Anthony J. Thuma, 780-PA. Ship went down in 3 minutes. Survivors picked up by the Perth (Br.) and landed at Halifax. Twenty-five of the 75 aboard lost among them Master E.T. Davidson of Valley Stream, N.Y.

SS LISIEUX/VCRP November 27th
(Formerly Amer. SS Lake Fernando, Munami, etc.) Ship foundered in a late Nov. North Atlantic storm. George M. Schuthe, 1379-PA, sent distress calls. En route from No. Sydney, N.S. in convoy for U.K. Captain Marcel Perrin. 29 in crew. Rescue of 16 survivors by MS Bernhard, Capt. Asbjornson. One survivor picked up by SS Kathariotissa/SVGG, Capt. Dragonicos. Capt. Perrin and 9 others missing. 2 crew members died of exposure in boat. R/O in MS Bernard was Bert Harris, Canadian.

1941

USAT KVICHAK/WYAI Jan. 25th
Ashore in Finlayson Channel B.C. All 59 crew members saved.

VASLAV VOROVSKY (Russian) April 3
Ran aground on Peacock Spit, Oregon. She was crossing the Columbia River bar in moderate weather when her steering gear broke. The Coast Guard took off her 37 crew members including two women.

YACHT RENE April 3rd
Ship enroute from Cat Island, via Little San Salvador Island, Bahamas, to Nassau, when ship's hull struck rocks. Opr. Frank E. Reb, 1099-SGP, sent SOS which was acknowledged by WMR (Palm Beach). Ship lightened and rising tide helped to float her clear. Proceeded to Cherokee Sound on Abaco Island and then to Nassau.

SS CHOMEDY/VGDF May 17th
Enroute West Indies to Montreal, caught fire north of Bermuda. Opr. Benjamin Hassell, 1640-PA, sent SOS, answered by WIM and also company ship SS Lady Nelson/VGZN. Had a cargo of molasses. Fire brought under control by crew. Several vessels answered the SOS.

SOWP SOS—CQD LOG

1941

M.V. IMPERIAL STAR ● June DSV

Malta Convoy in Mediterranean - famous force H commanded by Adm. Somerville. Hit aft by a torpedo from an Italian torpedo bomber just before they were due in Grand Harbour, Malta. Imperial Star only ship sunk. Operator on the Star George A. Partridge, 604-P. He was rescued by Br. destroyer "Heythrop."

SS DELFINA/KIVS June 4th

Torpedoed near Puerto Rico. Ship exploded. Opr. William N. Hayton, 130-PA, got off his SOS. Ship sank but crew saved.

SS ETHEL SKAKAL ● Sept. 28th

(Ex-Libby Maine/KDV) She was a jinxed ship from the start. In 1941 she was condemned by the USCG and sold to Norwegian interests. In the Gulf of Mexico got caught in a hurricane and slowly disintegrated. Opr. Smith got off his SOS and his shack went overboard and that was the last heard from him. 38 crewmen were saved by hanging onto wreckage with sharks snapping at them, some for 48 hours. But 19 of Puget Sound's finest went to their grave.

SS EMPRESS OF JAPAN Nov. 9th

Ship carrying dependents and troops bombed by Nazi acf off coast of Ireland. Heavy damage but eventually limped into port. Operator Eric Leslie Hammer, 404-V.

SS WILLAPA/KLDF Dec. 2nd

Wrecked near Cape Blanco, Oregon. All saved after harrowing experiences in lifeboats and a fish boat. Ship lost. She was about the last of those famous steam schooners.

●

SS PRESIDENT HARRISON/KDMR 12-7

Captured by Japanese about 20 hours before Pearl Harbor. Opr. Roy E. Madden, 306-V.

SS MAUNA ALA/WQEU Dec. 10th

Went ashore on that dangerous Peacock Spit, Columbia River, due to all navigation lights being out. Blackout on account of Pearl Harbor attack a few days before. Crew saved, ship lost.

SS VINCENT/KIJC ● Dec. 12th

Last ship captured by Japanese and all aboard taken prisoners by Japs and ended in POW camp in Shanghai, China. Opr. Eugene B. DeTurck, 327-V, D/M, spent entire war as POW and not civilian internee.

MONTE BELLU (Tanker) Dec. 23rd

Torpedoed by Jap sub off Piedras Blancas Point, Calif. Survivors were machine gunned by sub but no loss of life.

SS ADMIRAL Y.S. WILLIAMS/KJZT (DSV) Vessel ran aground in the Philippines near Mindanao Island. Opr. Loren A. Disper, 1139-PA, sent SOS. Salvage tug came to their aid and it took them a couple of weeks to get them off. Towed to drydock at Kowloon, China - ship and crew captured by the enemy at the start of WW-2.

1942

SS POLLUX February 18th

USS TRUXTON/NUGK

Both ships went ashore off Newfoundland. All told 204 were lost. Details NA.

SS LIHUE/KISF February 23rd

Bound for the Red Sea from Baltimore with mil. cargo. Torpedoed in Mona Pass entering Caribbean Sea. SOS sent by Steadman Lidell, 888-PA, which was received by all coastal stations from WCC to Venezuela. Sub hit when surfaced and later put into Martinique for repairs and med. assistance. Martinique then cordoned off by U.S. Navy as it was a German supply base. Ship sunk but crew picked up by a British tanker. R/O on tanker was Eric Hayward. All hands saved.

SS MOUNT McKINLEY/KTEV Mar. 18th

Wrecked near Scotch Cap, Alaska. Passengers and crew saved. Ship lost.

RAF HUDSON (Bomber) May DSV

Shot down by Vichy French while it was looking for German subs hiding in the lagoons of the (then) French Ivory Coast. SOS sent by Victor James Reynolds, 1129-PA. Details NA.

HMS MEDWAY June DSV

Destination Haifa - hit simultaneously by 4 torpedos and sunk immediately with loss of over 100 men. Opr. George A. Partridge, 604-P, picked up by destroyer Hero and landed at Port Said.

SS COAST TRADER June 7th

Attacked by Jap sub 43 miles west of Cape Flattery, USA, 6 months after Pearl Harbor. No SOS was sent. Crew jumped into a life boat and 2 life rafts. Rescued by a Canadian covette. Some controversy that an explosion sunk her but after the war Japanese naval records reported the sinking.

SS CHEROKEE/WTCI June 15th

Sunk by enemy naval action in the North Atlantic. Details NA.

SS FORT CAMOSUN (Br.) ◉ June 19th

Torpedoed by Jap sub and operator got off his SOS while the sub was pumping shells into her to make her sink. She stayed afloat due to her lumber cargo. Ship and all hands saved.

SS BIRINGHAM/PDDL June 30th

Sunk by enemy action in North Atlantic. Details NA.

SS ALEXANDER MACOMB/KEYE 7-3

Ship loaded with dynamite and TNT enroute for Murmansk with supplies for Russian army. Torpedoed and sunk. Opr. Bernard J. Swandic, 901-PA, got off in one piece. 10 lost. Survivors picked up by Canadian Corvette "Tiger."

SS ALCOA RANGER/WLAA ● July 7th

23 ships including the Alcoa Ranger lost near Novaya Zemlya in the Barents Sea from German U-boats and bombers with loss of 152 men. Sunk by U-255, Commander Reche of Ger. Navy. Operator William L. Smith, 516-V. Crew landed on Nova Zembla from ship's life boats. Laplander found and helped crew to settlement, then to Arkangel, thence to Iceland on HMS Middleton and USS Tuscaloose; later to Scotland and then N.Y. on SS Siboney. ("The Destruction of Convoy PQ17" by David Irving)

SS ROBERT E. LEE/WTCH July 30th

Sunk by enemy naval units in the Gulf of Mexico. Oprs. M.D. Holland and J.F. Smith.

USCG MUSKEGET ● Sept. 9th

Disappeared in South Pacific. 120 lost. Details NA.

SS WACOSTA ● Sept. 12th

Ship sunk by enemy action on the Murmansk convoy run where 33 ships of a convoy of 35 were destroyed in a 3 days running battle. Opr. William A. Hanks, 931-V, was wounded and decorated by U.S. Maritime service for this action.

SS NEW YORK/DJNY Sept. 25th

Sunk by enemy action in the NW Atlantic. Details NA.

SS PRESIDENT COOLIDGE Oct. 26th

Mined in South Pacific. Five lost. Details NA.

SS COMAO/KGA Dec. 9th

Enemy units sank her in the North Atlantic. Details NA.

SS MT. HELIKON/SVHH 1942 DSV

(Greek Reg.) Ran aground in Suez Canal northbound just north of Ismalia. Opr. Israel Kandel, 1999-PA, sent SOS. (Concerned that German Luftwaffe might be monitoring.) Help was furnished.

SS PIPESTONE COUNTY ● 1942 DSV

Opr. Ray Tangen survived 17 days in lifeboat. Details NA.

1943

SS SEMINOLE/WNCX January DSV

Transport attacked by 4 subs on return from Iceland to east coast of U.S. in convoy with 60 ships. Left convoy to proceed to Boston with 4 other ships. Left 4-ship convoy and proceeded to N.Y. 500 military passengers arrived safely in N.Y. harbor. Opr. Gerald Travis, 217-SGP received WSA Award combat bar after the Seminole encounter.

SS DORCHESTER/KGBC Feb. 3rd

Sunk by enemy action in the NE Atlantic off Greenland. 600 lost. Details NA.

SS GEORGE ROGER CLARK/KKGT DSV

(Early Feb. 1943) S.F. to Sydney near Rarotonga. Approached by unidentified Raider (armed) who did not show ident upon req. ● Opr. George L. Meek, 1290-V sent QQQQ on 600 meters with psn and vital info. Radio Rarotonga ak. Raider changed course. Planes from Rarotonga located and sank her. Here is an occasion when an operator sent a QQQQ which saved his ship and sank an enemy.

USS MINESWEEPER YMS-133 Feb.

(DSV) Capsized in heavy breakers in crossing Coos Bay bar. 16 out of the 29 crew saved.

SS BENJAMIN WILLIAMS Feb. DSV

Left N.Y. with load of war material for Murmansk. Lost convoy off Greenland. Left Reykjavik in convoy and cargo of bombs and tanks broke loose. Convoy left them to drift so Jacob Dubofsky, 1151-V, sent an SOS. Canadian covette towed vessel back to Reykjavik.

EMPRESS OF CANADA/GFXQ Mar. 15

British. Torpedoed off Freetown West Africa. 400 lost. Details NA.

SS LAMUT (Russian) March 31st

Crashed on Teahwhit Head, Washington, in a bad storm. SOS brought coast guard and they heroically saved all 44 men and 8 women.

SS KATHA April 2nd

Torpedoed by U-99 in North Atlantic. Details NA.

SS CAPE NEDDICK May 13th

Ship was torpedoed. Operator Frank C. Krushina, 856-PA. Details NA.

USCG ESCANABA/NRFG June 13th

Exploded in the Atlantic. 103 lost. Details NA.

SS ALICE F. PALMER ● June DSV

(Dollar Line) Enroute Bombay for Durban. Torpedoed 400 miles south of Madagascar. ● Opr. Reginald W. Baer, 339-SGP. Spent 16 days in open boat; made village of Morombe on W. coast of Madagascar. Truck to Tulear and then Tananarive, 6 weeks. (Trip took 9 months.)

SS HERMAN MELVILLE/KHCN Oct.

(DSV) ● Ship heading up Thames River to the Queens Docks in London when they were under air attack. Opr. Edward L. Hayden, 1117-PA. Details NA.

SS JOHN H. GAINES/WHFE Nov. 25

Broke in two and foundered south of Chirikof Island, Alaska, in a bad storm. Ten crew members lost but the remaining 80 on the aft section were saved.

SS ETHAN ALLEN/KFEV Nov. DSV

Ship grounded during high seas on east coast of Sicily. Opr. Russel E. Curry, 1709-V, sent SOS which brought Br. DE and tugs which helped float ship free after 30 hours, then docked for repairs.

SS ROBERT PEARY/KFGE Dec. 25th

Operator Ralph E. Benson, 2107-PA. Details NA.

HMS MEDWAY 1943 DSV

Sunk by enemy action in eastern Mediterranean. Opr. George A. Partridge, 604-P Details NA.

1944

SS TURNER January 3rd

Exploded off N.Y. harbor. Details NA.

SS EL GRILLO (English) Feb. 10th

Bombed and sunk at Seidis Fjord, Iceland. Details NA.

US LIBERTY/WCDO April 9th

Exploded off Bari, Italy. 360 lost. Details NA.

SS GEORGE HAWLEY/WRAJ Oct. DSV

Opr. Clarence D. Brownell, 1612-PA. Details NA.

SS ANTIGUA/KDCJ Oct. DSV

Crew abandoned ship due to 45° list, almost capsized, was towed back and beached off Waikiki. Main and emergency antennas grounded and out due list. Opr. Fred E. Huntley, 385-PA, sent SOS on HF to S.F. who handled.

PAN-AM AIRWAY CLIPPER NC-30095/KHJSO Nov. 14th

Enroute Guatemala City to Cozmuel Island. Perfect landing but immediately following takeoff URD U.S. port engine malfunction requiring ditching about 40 miles north. (Landing made at night.) Opr. Louis C. Skipper, 504-V, sent out SOS using long wire kite antenna. Response from WNU, USCG New Orleans, many ships in area including another Pan-Am flight. Contact finally made with Station TGE Pan-Am Guatemala City who dispatched tug to give aid. No casualties. Acf overhauled and put back in svc. Acf rescued in 4 hrs.

USS HENRY BERG ● 1944 DSV

Besides a crew of 100, she had 1300 sailors and battle worn soldiers eagerly waiting for Frisco bright lights. Steaming at 10 knots in a dense fog she piled up on the Farallons, Calif. A frantic SOS sent as she started breaking up. By superb seamanship all went ashore in lifeboats, through heavy breakers. A big air-sea rescue crew were helpless in the dense fog.

1945

SS CLUMBERHALL/GQZJ Jan. DSV

Enroute Philadelphia for Swansea fully loaded with lumber. Coming to anchorage in Barry Roads, Bristol Channel, captain put ship across bow of another ship in a full gale. Anchor ripped hull and ship started taking water. Capt. ordered SOS which was sent by CHOP Geoffrey S. Hayes, 1643-PA. Capt. placed ship aground on the Mumbles to stop from sinking. Eventually tugs pulled her off and she took to drydock at Barry, So. Wales.

HERITAGE OF TRUST AND COURAGE PROVEN AGAIN AND AGAIN !

IMPORTANT NOTE

RE: SOS CQD—LOG

SOS LOG—1946 to DATE

We originally planned to include the reports of all CQD/SOS calls from 1898 to 1975 in this book.

We found it would have been necessary to have abbreviated or to have eliminated considerable pertinent material which we think members would enjoy and are necessary to complete the record.

We therefore decided to issue the RECORD in two parts. Part I dating from 1898 to 1946 will be found starting on page 69 of this book and the records from 1946 to 1975 will be published in the next volume of SPARKS.

Members observing errors in any listing are invited to furnish corrections. Also any who note omissions are also invited to send in information on same in order that they may be included in the next volume.

— 30 —

SS JOHN DEERE/KHSS Feb. DSV

Enroute from Noumea, New Caledonia to Solomon Island, another liberty ship struck her amidships. Hole poked into engine room way below waterline. Ship abandoned and all went over to other vessel. Opr. on John Deere was Dee M. Eddy, 574-V, who did not send an SOS.

ALVARADO/KJBF March 17th

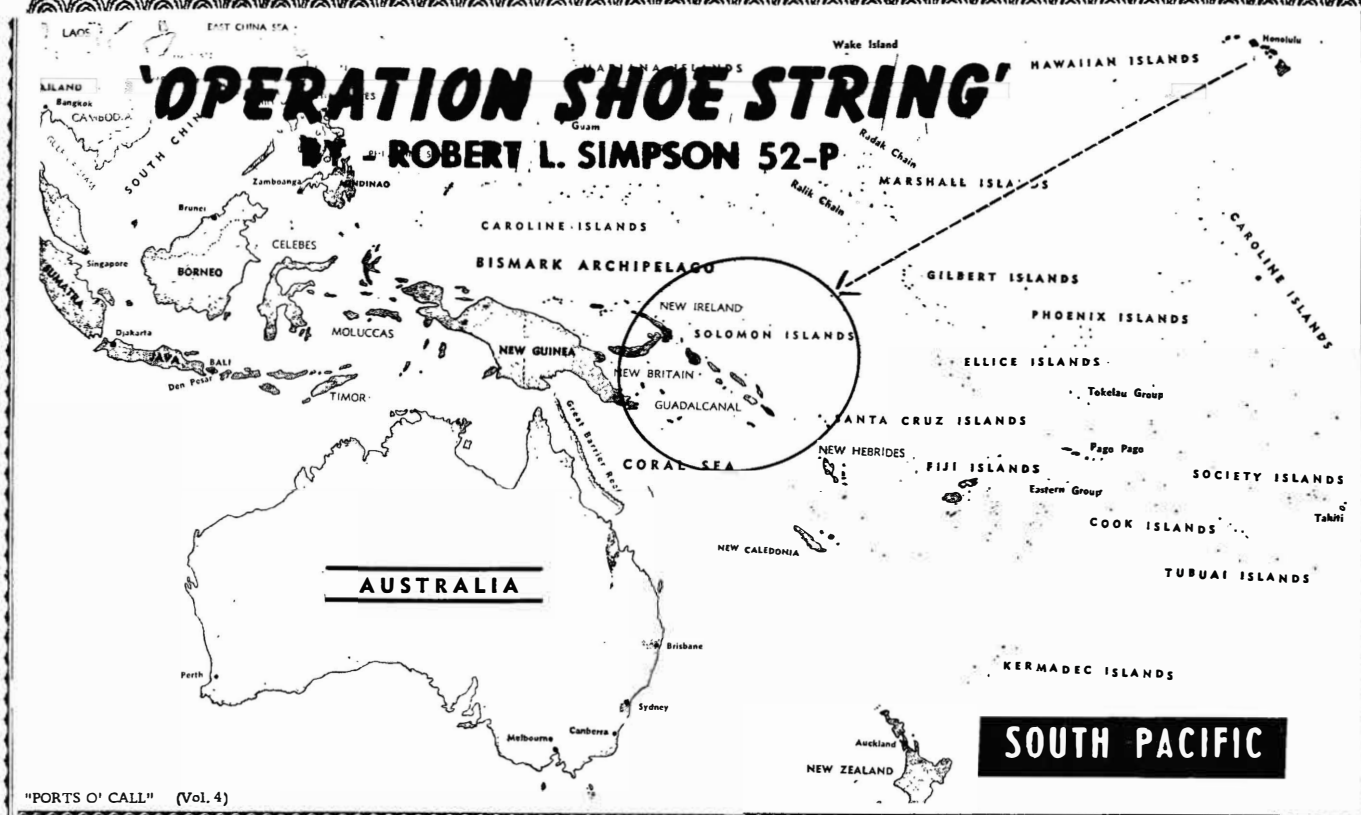
Steel Steam Schooner. Driven ashore in storm 8 miles north of Coos Bay, Ore. Crew saved but ship lost.

AAL TRANSATLANTIC FLIGHT C-54 #2170 June 11th

After departing Santa Maria, Azores, for Bermuda w/full load mil. personnel returning from European theatre, about an hour airbourne, outboard No. 4 engine caught fire. SOS ordered by Capt. Hall and sent by Theodore W. Morris, 1884-PA, R/O. Crew able to contain fire and acf returned Santa Maria. Engine found to have cracked allowing oil to spill out and ignite. Emergency call on route fcy answered immediately. No response SOS on 500 kHz.

SS SANTA MARIA HILLS/ANQZ June

(DSV) Ship was a big tanker fully loaded with aviation gas for the SW Pacific, out of San Pedro. Stiff wind blowing and just off San Clemente Island had a power failure and ship was being blown ashore. SOS sent by James M. Tasker, 570-V, D/M, picked up by KFS. Power restored before any damage done and ship returned to San Pedro for repairs.



"PORTS O' CALL" (Vol. 4)

ADVANCED BASE JOINT ARMY - NAVY RADIO STATION INSTALLATIONS. SOLOMON ISLAND CAMPAIGN, SOUTH PACIFIC FORCE, 1942 - 1944.

BY - ROBERT L. SIMPSON

In accordance with orders from the Chief of Bureau of Navigation, I was transferred from the Twelfth Naval District, 22 April 1941, to the Pacific Fleet at Pearl Harbor, USS Argonne (AGC) Amphibious Force flagship. As Warrant Officer, radio electrician, I served as Assistant Radio Officer and Division Officer.

Our armament consisted of two 5 inch guns, six 3 inch antiaircraft guns and 50 cal machine guns. Radio #2 aft, had eight HF CW radio transmitters, 500 to 2KW output. Radio #1 forward, control center, was equipped with eighteen HF Navy standard receivers.

After surviving the Pearl Harbor attack, I was appointed commissioned Warrant Officer, and served as ship's Radio Officer. We sailed for the South Pacific, arriving in Noumea, New Caledonia, June 1942. Vice Admiral Ghormley, USN, transferred his command to the Argonne, July 1942. We were Flagship Commander South Pacific Force (COMSOPACFOR).

We were known as "OPERATION SHOE STRING", in our efforts to keep the communication lines open to Australia. Very little equipment was available for COMSOPAC. A transmitting station was constructed in the hills behind Noumea. Rhombic and other types of antennas were constructed for the circuit to CINCPAC "NPM", and the South Pacific Area. The Argonne was moored to an anchor buoy, about one mile off shore. Army twisted pair telephone wire was used as a submarine cable, to key the transmitters. Every time the ship swung around the anchor buoy, the keying lines would break, requiring more army twisted pair. The combination of shipboard and shore based transmitters increased our maintenance problems.

I was able to construct an electronic keying system, so that the shore based transmitters could be keyed from the Argonne with a navy TBX 10 watt

EDITOR'S NOTE

Normally the experiences of our members is carried in the "E&E" Chapter of our SPARKS series of books.

This account, as related by ROBERT L. SIMPSON who was Lieut. Cmdr. USNR chronicles a period of time during the early days of WW-2 when "COMMUNICATIONS" to the South Pacific and Australia was vital to survival.

Member Simpson played a vital role in establishing and maintaining communications into the dangerous battle areas which are now recorded in the history books.

Time and Place hold no claim on "valor". It can be on the stormy North Atlantic when "Sparks" sticks to his key beyond the time he can safely leave his ship to save the lives of passengers and crew - or it may be that of trying to establish and maintain communications when you are under fire from bombers overhead or hostil ships firing a salvo at your installation. We salute them all.

SHOE-STRING—COMSOPACFOR

transmitter operating on about 3,000 KC. More transmitters were required for our expanding communications.

USS Boise, Captain "Mike" Moran, USN, supplied us with some equipment, after an engagement with Japanese heavy cruisers in the Guadalcanal Area. Boise was alongside for emergency repairs. A large 8 inch shell hole in her starboard bow at the water line, flooded her forward compartments. The entire superstructure was riddled with shell holes. The nearest available Navy yard was Brooklyn, 10,000 miles via the Panama Canal. The Society of Wireless Pioneers, former Secretary, Albert C. Fox (455-V), Commander USNR (Ret.), was the Boise Communication Officer.

Due to the rapid expansion of COMSOPAC, it was necessary to move ashore at Noumea. March 1943, I was assigned as Officer in Charge of the COMSOPAC transmitting station at Noumea, now a three building complex. The old French prison in downtown Noumea was taken over for Admiral Halsey's headquarters and communication center. Vice Admiral Ghormley, USN, was relieved of his command after the loss of heavy cruisers USS Astoria, Quinch, Vicennes and HMAS Canberra in the Guadalcanal area, during a surprise attack, by Japanese heavy cruisers.

COMSOPAC transmitting station had approximately 25 HF radio transmitters, 500 watts to 5KW output. RCA, Collins, Westinghouse and General Electric transmitters. The Army had one 20 KW press wireless, Inc. HF transmitter, plus other lower power transmitters.

I supervised the installation of COMSOPAC control center, at COMSOPAC headquarters, and the diversity receiving station a few miles from the transmitter site. Rhombic antennas and two RCA triple diversity receivers were installed. Navy "RBP", provided excellent reception.

I worked with Lieut. Robert Sarnoff, USNR, who arranged news programs with NBC, for the "Army Hour Program," scheduled each Sunday. The Army did not have the necessary equipment to handle the job in the South Pacific. We used a Collins TCC and large "V" antenna to transmit to RCA San Francisco. It was a pleasure for me to work with the RCA staff at Geary Street, Point Reyes, Bolinas, and Honolulu. We made numerous tests in setting up the circuits.

All programs originating in the South Pacific area were relayed via COMSOPAC. It was a very complicated program. NBC Radio City New York would advise me that I was to take my cue from BBC London, "We now take you to the South Pacific." Our newscaster would transmit a ten minute program, and say, "We now take you to Algiers. Then Algiers to Guadalcanal, Guadalcanal back to NBC New York, then back to Munda New Georgia in the Solomon Islands, then back to NBC Hollywood, then to Noumea, Admiral Halsey's headquarters, etc. etc.

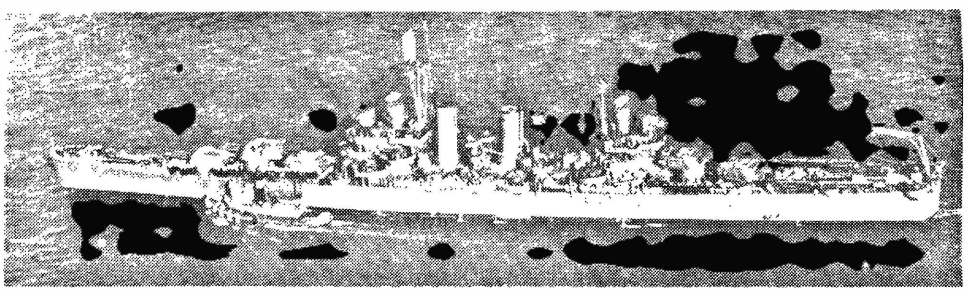
I was patched into the NBC nationwide cue circuits. The cue circuits for all the South Pacific area were handled via CW. All the various islands were patched through a make shift patch panel. I wish NBC could have seen our "Studio Facilities"!

Some Solomon Island programs were relayed through a maximum of five stations. Really had my hands full, making all the necessary patches. Radio equipment and technicians were removed from military circuits to satisfy NBC. The world wide switching arrangement being used by NBC certainly presented many problems for us, split second timing, etc. I worked with many war correspondents. They were a fine hard working group!

NBC demanded more circuit time than we could handle. Finally I called the COMSOPAC Public Relations Officer to come out, and see how difficult the situation had become. He immediately cancelled all programs. I then returned to full time duty at the transmitting station, and Lieut. Cmdr. Thomas, USNR, an RCA engineer, was assigned as Officer in Charge of the receiving station.

I received temporary additional orders on 30 January 1944 to proceed via air priorty one, to commander advanced Naval base, Torokina, Empress Augusta Bay, Bougainville Island, with the necessary radio technicians and equipment to complete the installation of the Navy transmitting station. Lieut. Ralph Stevenson, USNR, was the Officer in Charge and procurement officer of the group. I as a commissioned Warrant Officer, Radio Electrician, was in charge of the installation, maintenance and operation of the Bougainville station. I selected a group of volunteer technicians, who were well qualified for this job.

The Marine Corps Supply Officer supplied each technician with Springfield rifles and ammo. Lt. Stevenson and myself were issued Winchester .30 Cal carbines, .45 Colt automatics, hunting knife, first aid kits, etc. etc. We looked more like a squad of Marines, with Marine field uniforms, than radio technicians.



U.S.S. BOISE CL-47 NAQG

Launched 1936. Flagship CIC Southwest Pacific Area, General of the Army, Douglas Mac Arthur Jan.to June 1945. Battle of Cape Esperance - Oct. 11/12 1942 (Sank Six Japanese Ships). She also saw action in the European Theatre, Philippine-Borneo Operation (1944-45) taking part in Battle of Surigao Straits Oct. 25 1944. She was sold to Argentina in 1951 and renamed " NUEVE DE JULIO" and continues as an active ship in the Argentina Navy.

At this time I did not realize that my Winchester carbine would be my most important "tool" in advanced base radio station construction.

We flew via the Marine Corps South Pacific combat air transport group (SCAT), to Henderson Field, Guadalcanal. I spent the night at the "Hotel De Gink," a quonset hut occupied by Marine fighter pilots, made famous by James Michener in "Tales of the South Pacific."

Bougainville requested us to bring a gasoline operated water pump, to pump the water out of the transmitting station dugout. They also required more space parts for transmitter repairs.

While at Henderson Field, I inspected the dugout radio station, consisting of caves and tunnels, in a hill side, to ffer some protection from the Japanese battleship, and heavy cruiser gun fire, during the 1942 period of the Marine Corps landings.

When we loaded all equipment aboard the old C-47 transport, we were heavily overloaded. In order to be air borne, it was necessary to move spare parts and all personnel to the tail section. We finally took off, when we reached the end of the runway!

We rendezvoused over Munda, New Georgia, with four Marine Corps F4F "Wildcats," who provided fighter escort for the remainder of our flight to Bougainville, via Vella Lavella and Kolombangra.

We landed at the Air Force bomber strip on 1 Feb. 1944, Bougainville. We were greeted by Japanese artillery fire from the mountainside. We proceeded immediately to the Naval base to relieve the radio installation team. The Officer in Charge of the group was on the verge of a nervous breakdown, and many of the radio technicians were suffering from shell shock, and battle fatigue.

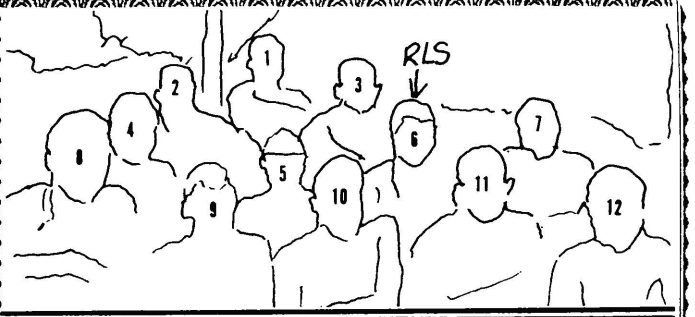
They were immediately flown back to the states.

Our inspection of the Navy dugout station revealed about two inches of water on the floor. This was a joint Army-Navy station. The water was almost up to the lower terminal strips on the Army BC-610 transmitters. We pumped out the water and constructed a suitable drainage system, to prevent future flooding. The other radio station building was on higher ground and was fairly dry. The Navy radio transmitters were in terrible shape! Excessive moisture was on all insulating material.

All the transformers were saturated with moisture. It was necessary to remove the transformers and place them in improvised ovens to boil out the moisture. Each transmitter required a complete overhaul, and partial rebuild job depending upon their condition. When we were able to get one transmitter on the air, after blowing many fuses, we never shut it down. To do so would allow moisture to cause short circuits, etc.

All the Army transmitters had balanced antenna outputs for dipole antennas, etc. Each operational frequency required a resonant dipole! The station was surrounded by dipole antennas.

The Navy transmitters were designed for shipboard installation, with unbalanced output for short vertical antennas. Internal antenna tuning circuits made it possible to use only one antenna for each transmitter. We had to modify Navy high power transmitters for balanced output for 600 ohm transmission lines. The lower power transmitters were operated with 60 foot vertical antennas.



COMMANDER SOUTH PACIFIC FORCE RADIO INSTALLATION GROUP, MAJOR ISLAND NAVY RADIO COMMUNICATION STATION. ISLAND OF EMIRAU, BISMARCK ARCHIPELAGO
MAY - 1944

Reading from Left to Right, Top Row:

1. Lt.Cmdr L.J. MALNATI, USNR, Naval Base Com. Ofcr.
2. Lt. M. LEARY, USNR, Obsr. Buo. Ships, Washn.
3. Lt. RALPH S. STEVENSON, USNR, OIC InstIn. team.
4. ALAN HENRIKSON, R/Tech.
5. Lt. (JG) E.M. Hecht, USN, I/C Pwr. Plant InstIn.
6. LT.(JG) ROBERT L. SIMPSON, USNR, OIC Rdo. Xmtrs & Rcr. Stns plus Antenna and Ctl. line instIns.
7. JACK ROY GISH, R/Tech. USNR. XMTRS.
8. GEO. F. JOHNSON, R/Tech. XMTRS.
9. E.C. LEDNER, Radioman 1/C USNR, Xmtrs.
10. ELMER L. PEALES, R/M 2C. Rcrs.
11. GEO. B. SHRIGURE, Elec. Mate 1/C. Antenna Rigger.
12. RONALD W. VOSBURGH, R/Tech. USNR COLLINS, Xmtrs.

Note re: officers top rows: 1. Just arrived from Stateside as OIC of Station. #2. Just arrived from Washn.DC. BuoShips. (He was amazed at how we were able to construct large radio stations in the jungles. I explained how we had to "scrounge" and make 'midnight' requisitions, for necessary materials. It was not shipped to us. The Rest of us were tired after making three major island invasions without rest. However we were able to smile for the camera, because this was the LAST RADIO INSTALLATION !!! Notations by R. L. Simpson.

No antenna insulators were available for our transmission line system. The Army Signal Corps had completed their installation. They had boxed up their surplus insulators for shipment to Guadalcanal, and refused to give us any of their spares.

I had an old time Chief Radioman, "A Plank Owner" from the Argonne. He was an old hand on making "moonlight requisitions." The next morning I found that we had an adequate supply of Army insulators, which made it possible to complete our antenna system.

SOUTH PACIFIC

Every day Japanese artillery fire would shatter trees in the immediate area. This made it a little difficult to shoot transmitter trouble. During the artillery fire we would lie down beside motor generator sets, which provided some protection.

Every night Japanese bombers made air raids on our small beach head, about four raids each night. This made it impossible to obtain much sleep.

I slept under a small canvas awning, serving as a tent, about 25 feet from the wreckage of a Japanese zero plane. An Army "AA" battery and fox hole was about 200 feet from my tent. The fox hole was made of empty 50 gallon oil drums, covered with logs and earth.

Each night was like a repetition of the Pearl Harbor attack, with the Army "AA" battery blasting away, and the ships off shore with all their guns in action!

We all lay on the ground close together in our fox hole. One night during an air raid, a young mess boy lying beside me said, "Dear Lord, if you are ever going to do anything for me, do it now!" Every time the ground would heave, we did not know if it was a bomb hit or concussion from the near by Army "AA".

After about a week of daily artillery fire and nightly air raids, we soon realized why the original radio installation team had to be relieved!

A few nights later, between air raids, I dreamed that the pilot of the wrecked Japanese zero plane close by, was approaching my tent with his pistol loaded and ready to fire. Suddenly I heard the air raid alarm sound and the local Army battery go into action. I immediately awoke and found that I was sitting upright on my cot with the slide of my .45 Cal. Colt automatic pulled back and ready to fire! Fortunately none of the men running by my tent were in the line of fire. I released the hammer, holstered my gun and ran for the fox hole.

The Navy radio installation was completed and operational 13 Feb. 1944. Approximately 20 HF CW transmitters and 22 HF receivers were installed at Bougainville. The commercial radio receivers had failed due to excessive moisture. They were replaced with Navy standard receivers.

The daily combat operation conditions and lack of sleep had effected our entire installation team. We were exhausted!

The Commanding Officer of the advanced Naval base, Bougainville, in appreciation of our efforts, forwarded a letter of commendation to Commander South Pacific force. The text of this letter in part read as follows:

Performance of duty of Lt. Ralph S. Stevenson; USNR, and of Chief Radio Electrician, Robert L. Simpson, USNR. These two officers with an insufficient number of enlisted men to assist, by strenuous efforts, completed the installation and put the plant in commission on time. Without their knowledge and hard work this would not have been accomplished. It is requested that a copy of this letter be filed with each officer's fitness report. Signed, O.O. Kessing, Commander Naval Advanced Base, Navy 158. (Torokina, Bougainville.)

We were then flown back to COMSOPAC Noumea, arriving 16 Feb. When I reported to COMSOPAC Communication Officer, he was shocked at my appearance. My skin was yellow from daily doses of Attabrine tablets for malaria. I was unshaven, my Marine field uniform showed the effects of nightly fox hole duty, and I needed a good clean up job!

The commander said, "Get a good night's sleep, and select a fresh group of volunteer radio technicians for the next major island invasion force."

We flew back 21 Feb. 1944 to the Russell Islands via C-47 "Scat", and boarded LST-446 in company with other ships for the invasion of Nissan Atoll (Green Island), 120 miles northeast of the main Japanese base at Rabaul, New Guinea.

The U.S. hydrographic chart of Nissan Atoll showed that the south entrance channel we were to enter, had a mean water level of three and on half fathoms. Inside the lagoon the water depth was approximately 25 fathoms in the central area.

As we passed through the channel over the coral reef, our heavily laden LST ran aground on the reef but we continued banging along over the reef until we reached deep water.

Our destination was Beach #34, the most southern and isolated beach on the Atoll. We dropped our stern anchor as we approached the beach head, which was covered by very dense jungle hanging over the water. After the bow doors were opened, and the landing ramp lowered, two D-8 bull dozers were the first vehicles ashore to clear an area in the dense jungle for unloading operations. Army trucks loaded with approximately 150 tons of radio equipment, including 4 75KVA diesel generators, cables, etc. etc. were disembarked. Our radio equipment was thrown out into the heavy jungle mud. An air raid had been in progress. Fifty Japanese soldiers had been killed in the mopping up operations by the New Zealand troops. The unloading operation was completed as quickly as possible so that the LSTs could pull off the beach and get out before the next air raid.

That night I slept in a small tent near the beach head. It rained all night. During flashes of lightning, I noticed that a man had sneaked into the doorway of my tent. While he was crouching there, I thought he might be a Japanese soldier, so I pulled out my .45 Colt and said, "Who is there?" He said, "I am a Sea Bee just trying to get out of the rain." I invited him in and advised him never to sneak into a tent again. The mopping up operations were still in progress. I was loaded for bear. I always slept with my .30 Cal. Winchester carbine, Colt, jungle knife, and 200 rounds of ammo.

The next morning I drove through the dense jungle following a D-8 bull dozer to the remote site selected for the transmitting station. It was so remote that the final mopping up progress was under way when we arrived. New Zealand troops were in the immediate area. They had blackened their faces and had jungle foilage on their helmets. It would be difficult to distinguish them from the Japanese. Sporadic rifle fire was heard as the troops were running in and out of the jungle. We were advised to be on the lookout for Japanese still in the area.

My bull dozer driver refused to move his dozer unless I "rode shot gun!" We were really in a very tough spot. We worked all day clearing an area in the jungle for our antenna and building area. Certain mahogany trees were selected for our antenna system. It was a very hectic day! I now

Robert L. Simpson

realized that my old Winchester was my most important tool. It was a hazardous spot to be in, never knowing when you would be caught in cross fire from the New Zealand troops.

The Sea Bees constructed two buildings for the transmitting station. Logs and coral were piled against the side of the buildings to provide protection from near hits.

We installed thirty radio transmitters, 200 watts to 2000 watts output. We used an assembly line procedure. One row of transmitters on each side of the building. Power panels were not available. We ran our 240 volt three phase power line around the building, tapping off at each transmitter, running directly to the transmitter on/off switches via the fuse panels.

Radiomen assigned to operate the station assisted each radio technician in the installation. The available trees were used for an unterminated "V" antenna beamed on COMSOPAC Noumea. Extended dipoles and vertical antennas used on the other transmitters. 600 Ohm transmission lines were used where required.

My most difficult job was the installation of the General Electric TBA-10 2,000 watt transmitters. These transmitters arrived in twenty boxes of components and two cabinets. These transmitters were push pull PA output feeding a complex unbalanced single wire output for shipboard use. I modified these transmitters to provide balanced output for balanced 600 ohm lines, which was very satisfactory. This was strictly against Navy regulations but being in a state of war, it was permissible.

These transmitters were well designed and excellent transmitters. However saboteurs did an outstanding job in their sabotage activities. For example, one TBA arrived without the high voltage motor generator set and all the screen grid potentiometers were open in each intermediate stage due to acid having been applied to the pots. All the spare pots were also defective. The bias and high voltage meters were also damaged by placing iron filings in the meter cases. The Westinghouse TBK transmitter spare parts resistors and meters were used to place the transmitters in operation.

This made the TBA a rebuilding job plus installation. Due to damaged transmitters and lost component boxes, two transmitters were necessary to build one complete transmitter.

None of the other transmitters were sabotaged, including RCA, Westinghouse and Collins. Parts were missing and damaged but we were able to make replacements and improvise as necessary.

Every day one of our men became sick due to some jungle disease, etc. We were living on emergency rations. Each man was rationed a small amount of distilled water each day. We tried to bathe in the lagoon but due to the lack of salt water soap we were never clean.

Our receiving station was about one mile from the transmitter site. Thirty Westinghouse "RBM" receivers were installed. Various type of receiving antennas were used. The "RBM" receivers arrived in water tight aluminum cases and were in excellent condition.

No receiving or transmitting patch panels were available. We made up the necessary panels with plywood and Australian jacks, etc. We really had to scrounge around for parts.

A 50 KVA diesel generator supplied power for the receiving site. Four 75KVA 240V. 3 phase diesel generators were installed at the transmitting station. We had a good chief electrician mate who could phase the generators when maximum power was required.

The fighter and bomber field was at the other end of the island. It was rumored that Col. Lindberg flew a few missions from Nissan Atoll to Rabaul, New Guinea.

After a 30 day period, we finally completed the installation and had trained the radiomen stationed at Nissan how to operate and trouble shoot the transmitters. Their knowledge was limited.

We arrived back in Noumea 25 March 1944. The communication officer looked me over and could see that I was showing the effects of Bougainville and the Nissan Atoll installations. I was unshaven and wearing a pair of ragged Marine shorts made with my jungle knife. The long period of living on emergency rations caused me to lose weight. He advised me that I was now Lieut. (JG).

We had one more invasion, the Island of Emirau, in the Bismarck Archipelago on the "Tokyo Express Run" Truk to Rabaul. The Marines had landed and had been relieved by the Army.

We departed from Noumea aboard USS Drako (AK-29) Navy cargo ship on 1 April 1944. We had a fresh crew of volunteer technicians. It was a pleasure to be back aboard ship and out of the Solomon Island mud. We were able to obtain plenty of sleep and enjoyed excellent Navy chow. A real treat! We carried a cargo of 200 tons of radio equipment, power plants, cables, etc.

Thirty-five radio transmitters were installed at Emirau, including a 10 KW Collins auto-tune transmitter, and four 75 KVA 240V. 3 phase diesel generators. 22 Navy standard Westinghouse "RBM" receivers were installed at the receiving station, and power plant. Various types of antennas were installed at both stations using selected mahogany trees. Our old friends, the Marine Corps South Pacific Air Transport group flew us back to Noumea, arriving 24 May 1944.

I received orders from the Bureau of Personnel ordering me to proceed back to the continental U.S. for assignment.

I arrived at San Francisco on 3 July 1944 after three years in the South Pacific. Due to the San Francisco fog I could only whisper. I had bronchial asthma and laryngitis. I was in poor physical condition. The Twelfth Naval District Communication Officer was concerned about my health and wanted to transfer me to the Mare Island Hospital. I declined, saying that all I wanted was to go home to my wife Winnie and two small daughters Nancy and Pat living in San Francisco. Due to strict censorship they thought I was still in the South Pacific. My five year old daughter Pat who had not seen me for three years recognized me immediately thanks to her mother having shown her my picture every night before going to sleep.

After 30 days leave I was transferred to the U.S. Navy Radio Receiving Station, Skaggs Island, near Vallejo, California, as Electronics Officer.

——— 30 ———

Fastnet Light, off the coast of Ireland

'WHAT LIGHT . . . IS THAT ?'

WHAT LIGHT IS THAT ?

'Our brows are bound with spindrift and the weed is on our knees; our loins are battered neath us by the swinging smoking seas;
From reef and rock and skerry — over headland, ness and voe — The Coastwise lights of England watch the ships of England go."

Rudyard Kipling

By - David L. Brown*

It would be hard to imagine a more descriptive and dramatic introduction for any Lighthouse story than Kipling's poem called, "The Coastwise Lights". This has, of course, been used many times for this purpose, but I still selected it because I could find nothing more appropriate.

Lighthouses, Ships, and Marine Communications are subjects in which I have always had a great interest and I expect this interest is shared by most Seagoing Radio Operators. All three are closely associated and interdependent. I am occasionally asked how I happened to gather such an extensive library of marine data and photographs.

One can never be sure what started any special interest but I often remember that as a boy at home on the Island of Martha's Vineyard, a lighthouse beam swept through my bedroom window every forty seconds all night long. Strangely enough, this never kept me awake, but it may well have left a deep impression on my subconscious mind.

In these days of interplanetary travel and Satellite communications, it might appear that the Lighthouse had become as obsolete as the Dodo Bird and just and just another Antique Institution. Nothing however could be further from the truth. To ships, shipmasters, and ship owners, lighthouses are of vital and continuing importance. This, in spite of the new electronic guidance systems such as Radar, Loran, Sonar, Direction Finders, and now Inertial Navigation Systems. A ship must still find and enter a harbor, often having to thread her way through dangerous approaches and many ships are not equipped with these more sophisticated systems due to the costs involved. Therefore, lighthouses are still tremendously important aids to navigation.

In meeting the more modern requirements for the safety of ships at sea, lighthouses are changing their forms, equipment, and particularly upgrading their light sources and optical systems, as well as their Radio Direction Finding Transmitting equipment. However, lighthouses back over the years may well be called an Antique Institution because their history reaches back into antiquity.

The concept of, and necessity for, a light to guide mariners in the dark of night goes back to the earliest days of man's ventures on the Seas. During those early days the first lights consisted simply of wood fires built on the Headlands or on small towers. For Day Marks they used piles of stones placed in useful locations. There seems to be no record of any Sea Beacon before the year 300 B.C. when the Egyptians built a structure on the Island of Pharos, near Alexandria, on the top of which a fire was maintained for the guidance of ships. It is generally presumed that Ptolemy 2nd, King of Egypt. 283–247 B.C. had this primitive lighthouse built.

The next known structure of record was the Colossus of Rhodes; a gigantic statue of Apollo in bronze across the entrance to the Harbor of Rhodes; circa 280 B.C. It is said that small vessels sailed in and out of the harbor between the legs of the statue, which at that time was considered to be one of the Seven Wonders of the World. Historians are doubtful however, as to whether fires were ever burned in the Torch except for ceremonial occasions. The Colossus was destroyed by an earthquake in 224 B.C.

The third Antique Lighthouse appears to have been at Ostia, the Port for Rome, said to have been built by the Emperor Claudius about 50 A.D.

As nearly as can be determined, England was the first government to have organized a real Lighthouse Establishment. Prior to 1512 there was no single authority in 3ngland having jurisdiction over lighthouses except the King. An individual could petition the King for a license to build a lighthouse wherever he wished and if granted, that person could not only build a lighthouse but could levy a tax on all vessels passing his lighthouse. This was, of course, a highly impractical system, so in the year 1512 King Henry the Eighth issued a decree to a group of Master Mariners charging them with the responsibility for creating a Guild to be known as Trinity House, which would have complete jurisdiction over all British Lighthouses. From this time onward, order came slowly out of chaos. Later in 1566 Queen Elizabeth 1st, bestowed additional responsibilities upon the Brethren of Trinity House who then took over the administration of all British Harbor Pilots. Later all Scottish Lights were under the jurisdiction of The Commissioners of Northern Lights. And from the time of Henry the Eighth until today, Trinity House has had continuous jurisdiction over the building and maintenance of British Lighthouses.

The Lighthouses of today, that is the large, important first order lights, were mostly built between the years 1850 and 1925 and at present these structures remain as rugged and enduring as when they were built because their walls were constructed of stone and granite from three to four feet thick to withstand the brutal forces of wind and sea of the Western Ocean in winter. This is particularly true of the European lights and those located on the Out Islands of the Shetlands, the Orkneys and the Hebrides.

The early technical development of light sources and optical equipment for lighthouses was very slow and inefficient, but for the record, the first truly effective break-through was made by the French Lighthouse Authorities, when between 1819 and 1823, directed by Augustin Fresnel, they created the highly efficient Fresnel Dioptic system of large prisms and lenses so arranged as to focus the light source

(Continued on next page)

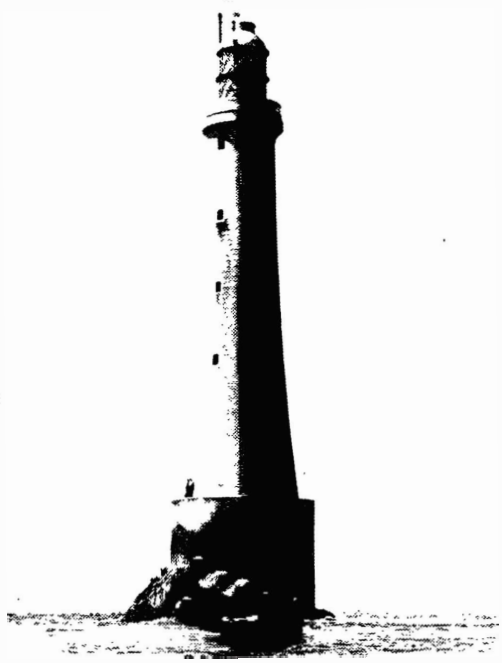
DAVID L. BROWN *

Our Chief Operator called " Dave" from his earthside station on April 10th 1972 and assigned him to Station Peace on the Sea of Tranquility near one of the lighthouses that he loved so much.

Before "Dave" became a silent-key" he had furnished the Society with a wonderful article on his favorite subject. It has beer long delayed but we think you will find it very interesting --- and if you do, remember this dedicated man who was outstanding his field and made many contributions to the Society. His number was 647-P.

While we have said "Thirty" to Dave, he will always be remembered as one of the Society's loyal outstanding members --- always willing to lend a hand and deeply interested in our affairs.

BISHOPS ROCK LIGHT



Located Extreme Western Rocks of the Scilly Isles. Cornwall England. Guards North West Entrance to English Channel. Lat. N 49-42: Long. 6-27'. Two White Flashes iver 18 Sec.

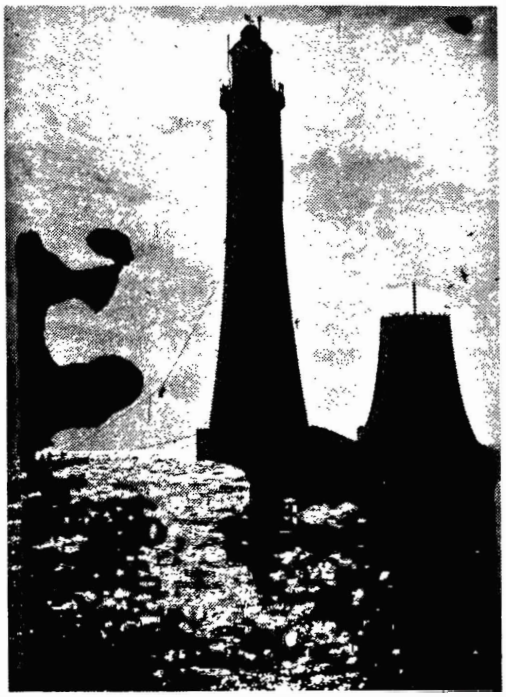
EUROPA POINT – GIBRALTAR

Located Extreme end of South Point of the Rock. Important to all vwssels passing through the Straits of Gibraltar, Eastern end of the Straits. 1 Double Osc. white with red arc.

HONG KONG

CAP ROCK on Kypong Islands. South end of Rock. For ships approaching Hong Kong Harbor. Lat. 21 - 49'N, Long. 113 - 56'E. Characteristics: White Flash every 30 second.

EDDYSTONE



Located on group of red rocks about 12 miles S.W. of Plymouth Harbor, Devonshire, Eng. Lat. 50-11', Long. 4-6'. White group flash, two every ten seconds.

optically into a single beam of maximum brilliance. This beam was now entirely capable of providing various light characteristics such as fixed, flashing, revolving or occulting and when controlled by the new timing devices, opened up the possibility of individual lighthouse identification. While some further refinements were made by various lighthouse authorities, the Fresnel Optical System is still in use by the majority of the world's most importand lighthouses, including our own American lighthouses. Now, however, the more recent electronic Flash Systems are beginning to be used for lighthouse purposes as well as Aircraft Beacons.

While this statistic is difficult to pin down because of constant change, there are about 12,000 large first order Lighthouses lighting the oceans of the world. This figure does not include many of the lower order lights in harbors or inland waterways. Most of the larger lighthouses are remote, some inaccessible, except for the official lighthouse Tenders which visit them periodically to replenish supplies and relieve the keepers.

By day they seem somnolent, their curtains drawn in the Lantern Towers to protect the great lenses from the sun's rays, and they wear an air of withdrawn mystery. When darkness spreads across the oceans, each tower in its turn comes dramatically to life and the great beam of brilliant light sweeps out across the sea to give its own name and special danger signal to the ships that pass.

However, 12,000 are a great many lighthouses and at first glance many of them look alike, so how does a Ship's Officer know Who is Who among the lighthouses? Lighthouses are like people and kittens. Each is different from the other and each has its own identity. By day their color painted patterns, shape and location identify them. By night, they have personality plus light characteristics of great variety including fixed white lights, flashing, group flashing revolving and occulting, so that each lighthouse has its own exactly timed light characteristic. Also when atmospheric conditions are poor, each lighthouse has its own sound warning, again keyed to its specific location, including monstrous raucous diaphone horns, sirens, guns, and rockets and coded Radio Direction Finders. The light vessels use submarine signals. A world of Flashes, Beams, Hoots, Dots and Dashes.

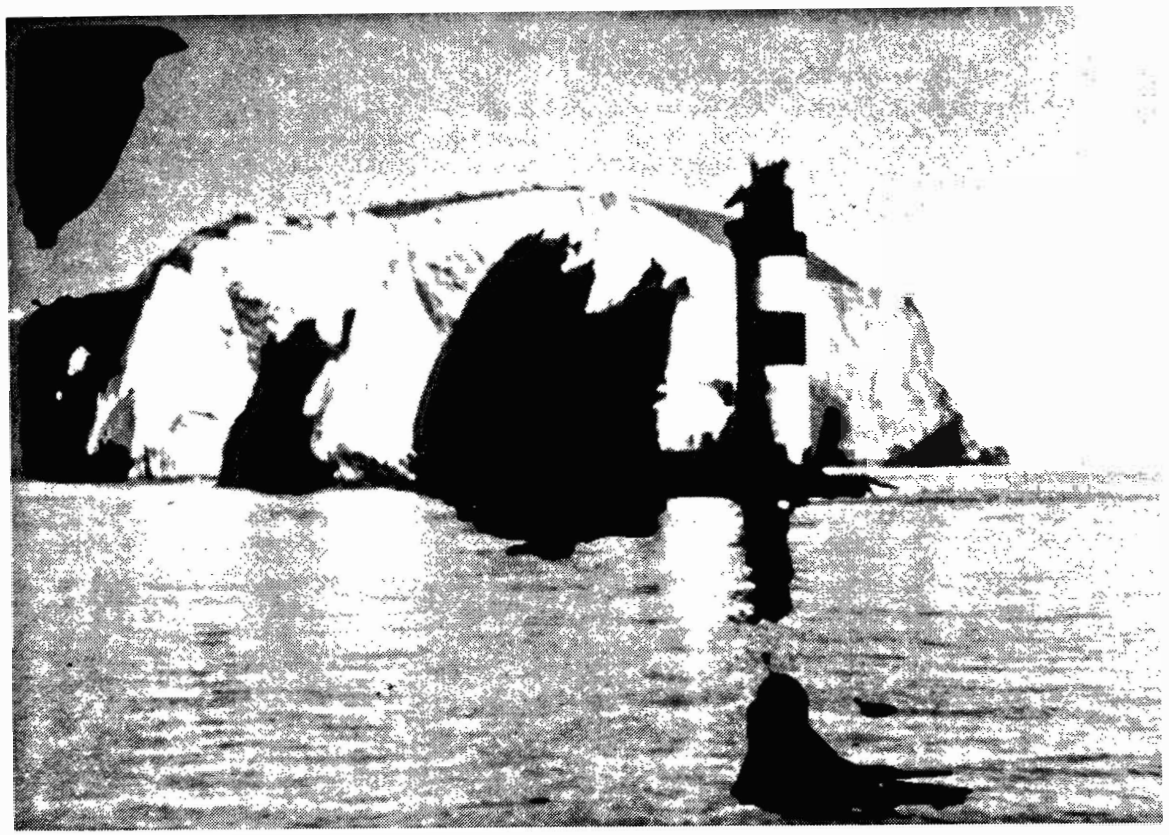
At night these different light characteristics are of vital importance when a ship is approaching the coastal areas on her way into port. The Watch Officer knows, of course, what lighthouse he is headed for and should soon see.

Out over the bow, where the sea meets the sky, the Watch Officer's eyes search constantly for the first faint wheeling glow of light in the sky or against the clouds while the lighthouse itself is still below the horizon. Then, a few minutes later, a tiny diamond-like flash is there, clear but still not identified because now he has three lighthouses within the range of his binoculars. So he steps into the chart room and checks the Light list carefully, Now, again on the bridge, Stop Watch in hand, he checks the characteristics of all three lights. By now the lighthouse off the port bow is flashing brilliantly (Group Flashing white, twice every eighteen seconds) O.K.

Flashing white, twice every eighteen seconds) O.K. that is the Bishop's Rock, the Lighthouse he is looking for, and fortunately just in the correct position with reference to the ship's course on her way into the English Channel.

Just before he turned in, the Captain ordered that he be called when the ship raised the Bishop's Rock Lighthouse. So the Skipper was called. The Bishop's Rock is the most Westerly of all British lighthouses and guards the Northwestern approaches to the English Channel. It is a tremendous round tapered granite structure 167 feet high, warning ships away from the Western Rocks, the Retarier Shoals, and the Scilly Islands which constitute a brutally dangerous coast. The other two lights visible as the ship drew nearer were Penninis Head and the Round Island, both located on the Scilly Island Group which lies about twenty miles West of Lands End, Cornwall. The Captain stepped on the bridge at 0000 and the Bishop's Rock was then directly off the port beam. The flashes from the big light were casting a bright path across the water and the movement of the waves was molding them into pools and runnels of rich gold and black patterns. After a look around him, the Skipper said to his Chief Mate, "Mister, it looks like a fine night, haul her up for the Lizard Head and send someone down to the Radio Officer with these messages for the Lines and our ETA at Southampton. We will take a berthing Pilot at the NAB, as usual and find out which side he wants the ladder on."

The geography of the English Channel has been blessed with strikingly beautiful scenery but its rocky coasts and Chalk Cliffs are dangerous in the extreme and here there is no room for faulty navigation. Then too, the Channel has an unpredictable disposition. Its weather is often inhospitable, ranging from gray days through high winds and seas or dense fog.



THE NEEDLES

THE NEEDLES Located on the outmost rocks on the S.W. Point of the Isle of Wight, England. Used by smaller vessels entering the Solent and Southampton Waters from the English Channel. Lat. 50-40'N L 1-35'W. Characteristics of light: White, Red and Green group Osc. Two every 20 seconds, Occ. 2 seconds.

Add to these hazards the fact that the Channel is a high density travel area and is used by most of the world's shipping for access to and from the large European seaports, as well as those of England. For these reasons, ship Masters usually elect to be present on the Bridge while passing through these waters.

Tonight our Skipper was lucky. It was one of those rare, beautifully clear, autumn nights and it seemed as though the stars hung down from the sky on strings. Rising before us was the grandeur of the winter star pattern, led by Aldebaran and on down through the glittering jewelry of the Constellation Orion, plus Sirius, the Dog Star, the brightest of all the stars in our Northern Hemisphere. The blazing brilliance of an October sky at sea has always seemed to me to be an enormously stirring sight.

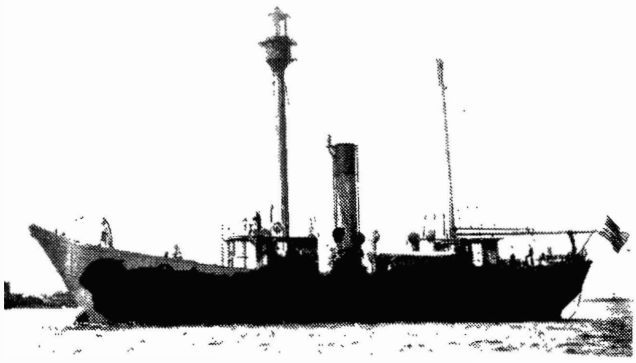
To return once again to our lighthouse story, I realized that for anyone interested in lighthouses we were now to see a most unusual and interesting display. Because of the dangers of these coasts, I know of no other body of water anywhere so carefully and thoroughly lighted on both the English and the French sides of the Channel. As we proceeded Eastward it seemed as though the Channel was lit up like a ballroom. Here one can experience and have demonstrated the whole theory of lighthouse Identification by means of the different light characteristics assigned to each lighthouse. Surely, they are on all the Charts but here you see them in real life; to be observed, and checked, identified and marveled at.

So the lighthouses came up over the horizon, came abreast, and fell astern into the star splattered wake, And now for all of you who have made this run professionally, I thought I would drop some names which just might bring back a few memories of your days at sea and in the Channel. On the way in there is the Wolf Rock, the Longships, the Lizard Head, Eddystone, Start Point and the Bill of Portland. St. Catherine's Point, The Nab, Calshot Spit, and by that time you should have had your bags packed to catch the London train from Southampton.

Dave Brown

U.S. LIGHT-SHIPS WE REMEMBER

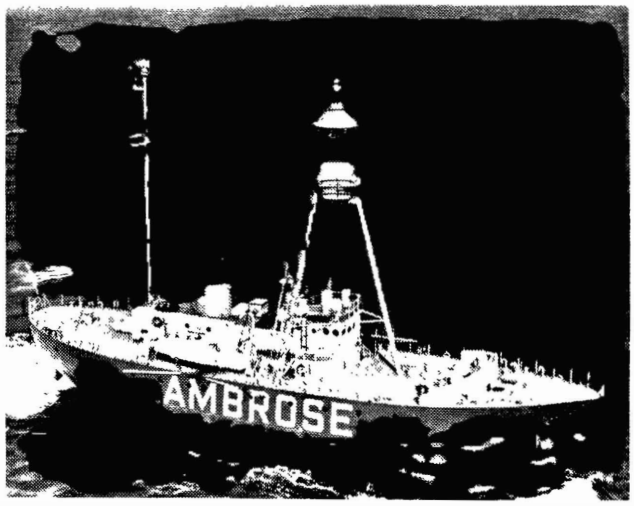
THE WIRELESS PIONEER



-WSD-

FRYING PAN SHOALS LIGHTSHIP No. 94 – from Nov. 1911 until 1930 when she was replaced by Lightship No. 115 to 1939 then replaced in 1964 by the New Frying Pan Shoals Off-Shore Structure.

"OFFICIAL U.S. COAST GUARD PHOTOGRAPH"



-WRG-

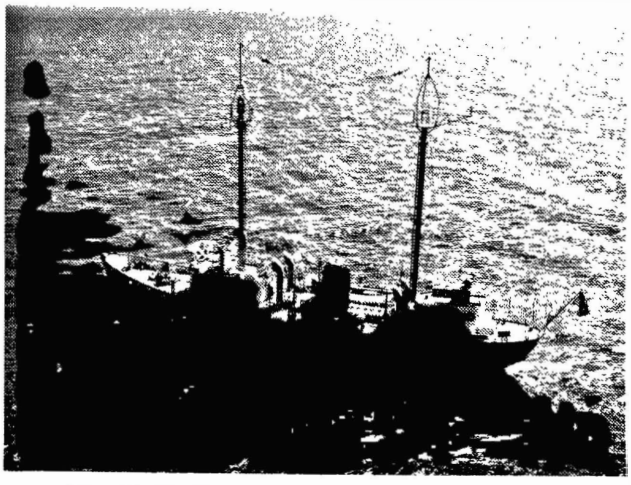
AMBROSE LIGHTSHIP. Since Oct. 1952 this Lightship has guided ships from all parts of the globe into New York Harbor from her station at the entrance of Lower New York Bay. A permanent USCG Offshore Light Structure replaced the light circa 1967.

"OFFICIAL U.S. COAST GUARD PHOTOGRAPH"

-WRE-

FIVE FATHOM BANK LIGHTSHIP (taken Oct. 1963).
Station: Five Fathom Bank at entrance to Delaware Bay anchored in 90 ft of water.

"OFFICIAL U.S. COAST GUARD PHOTOGRAPH"



NEW ORLEANS LIGHTSHIP – on station at the mouth of the Mississippi River Outlet. Taken in 1965.

"OFFICIAL U.S. COAST GUARD PHOTOGRAPH"

ANATOMY OF A LIGHT-HOUSE

AMERICA'S OLDEST LIGHTHOUSE

The Boston Light Station -- America's oldest and most famous lighthouse -- is 259 years old in 1975. Since September 14, 1716, it has been the scene of storms, shipwrecks, and heroic rescues. Benjamin Franklin wrote a ballad, " The Lighthouse Tragedy", about the drowing of the first keeper and his family.

When the British captured the light druing the Revolutionary War George Washington sent 300 men to engage them in a bloody battle. Near these rocks Captain James Lawrence gasped, "Don't give up the ship," before he died aboard the USS CHESAPEAKE, battling HMS SHANNON in the war of 1812. Three U. S. Coast Guardsmen live on Little Brewster Island today (1966) to tend the two million candlepower light and station.

Boston Light was established on Little Brewster Island in Boston Harbor and first lighted on September 14, 1716. When rebuilt after the American Revolution, in 1783, the tower was 75 ft. high with walls 7-1/2 ft. thick at the best, tapering to 2 ft. 6 inches at the top. In 1856 the tower was raised to 89 feet. Because of cracks reported in 1809, the tower has six iron bands around it for reinforcement.

Boston Light was designated a National Historical Landmark on May 13 1964. Credit - Official U.S. Coast Guard Photo from the collection of David L. Brown.

Copy type-set by Stanley J. Belliveau Member 1302PA
We all thank "Stan"for this professional 'touch'.

"OFFICIAL U.S. COAST GUARD PHOTOGRAPH"

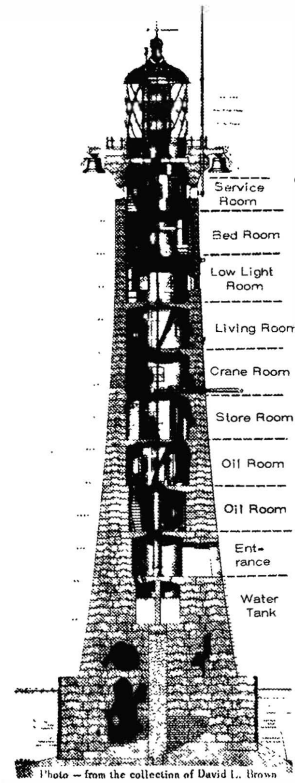


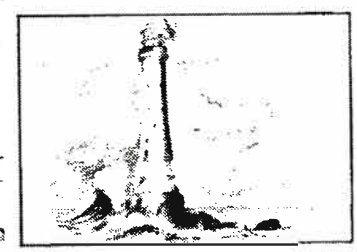
Photo -- from the collection of David L. Brown

EDDYSTONE LIGHTHOUSE

This is a profile of the Eddystone light built by Sir John Douglas in 1882. It is the fifth lighthouse to be built on the same location.

Utilization of space in the light-house starting at base of the structure include 1. Water tanks; 2. Entrance gate; 3. Oil Room; 4. Second oil storage room; 5. Store room; 6. Crane Room; 7. Living room of attendants, 8. Low light room; 9. Bed room; 10. Service Room for cleaning and adjusting lights and other work required.

The top section houses the automatic bells, the lights (a white group flashing every ten seconds); Staff for signal flags and weather vane at top.



WORLD RENOWNED EDDYSTONE LIGHT

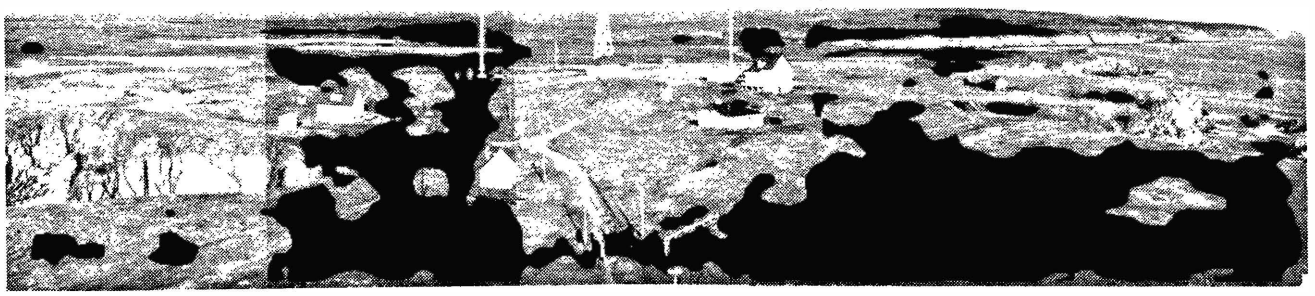
MAN AGAINST THE SEA!

The need for lighthouses to mark hazards to navigation or for use in making landfall has existed since the dawn of antiquity but probably nowhere else in the world has the volume of seabourne traffic justified a greater call for a light to warn mariners against the submarine pinnacles and fearful dangers of the Eddystone reef and shoals about 12 miles from Plymouth, England on the Devonshire Coast than this.

The red rocks of Eddystone has caught thousands of ships in its web and until the first lighthouse was built and commissioned by Henry Winstanley on Nov. 14, 1698 - nearly 300 years ago. Since then there have been four replacements, the last structure being built and commissioned in 1882 by Sir James Douglas.

The first two lighthouses were swept away without a trace by severe storms with the lighthouse keepers and the builder. The third, built by John Rudyerd in 1708 which served nearly 50 years, was destroyed by fire while number four built by John Smeaton and lit on Oct. 9, 1759, burned for 123 years before it was replaced. The hazards the builders of Eddystone had to overcome with the tools and knowledge then available made the undertaking one of the world's great engineering miracles and accomplishments over the forces of nature.

View of Cape Race installations seen from lighthouse. Radio beacon, located ½ mile to left, not shown.



Picture and article furnished by John A. Weir - 1878-PA.

Farewell to Cape Race Marine Radio

Cape Race Marine Radio station goes off the air this fall.* After 61 years of continuous operation it has been made obsolete by modern equipment at St. John's and St. Lawrence. (*) 1965

Tucked away at the southeast tip of Newfoundland, Cape Race juts out into the Atlantic steamer routes and presides over vast stretches of ocean on three sides. In the early days of magnetic and crystal detector receivers, most westbound vessels plying the Atlantic came within range of Cape Race station and its call letters VCE.

Geography, though, had to give way to technology and as telecommunications methods improved Cape Race lost much of its built-in advantage as a radio station site.

But the intervening years were crammed with marine history—epitomized by the sinking of the Titanic. News of that 1912 tragedy first reached the world via Cape Race.

The first distinctive, wavering note from Cape Race was sent in 1904 by the Marconi Company, which built and operated the station. Within five years it had been levelled by fire. Rebuilt, it was again razed in 1913.

A need for a direction-finding station prompted the Canadian government to build one less than a mile to the west in 1918. At the beginning VCE handled the work because the new station had no transmitters. But soon station VAZ was on the air.

Increasing use of ship radio following World War 1 meant VCE was a very busy station. Not too many years passed, however, before Cape Race began to feel the progress in radio development. Larger ships were being fitted with long wave radio telegraph apparatus allowing direct mid-Atlantic to Europe or America communication.

In 1930 the Marconi station closed down. The government station (VAZ) took on the job of coastal station as well as direction finding. The latter service had already gained some distinction by guiding the R 34 and other Trans-Atlantic flights. By 1931 it was apparent that the old Marconi buildings and masts offered better facilities. VCE and the government station moved back to its old home where it has remained ever since.

Cape Race has many memories, but none to match April 14, 1912. W. J. Gray, officer-in-charge, after a busy day, was chatting with a personal friend aboard the White Star line's newest ship, the Titanic. His friend, Mr. Phillips, the ship's chief radio officer, transmitted the gay spirit of the maiden voyage of the world's biggest ship into his key. After a brief chat, Gray closed down his set. He went to check his equipment before going to bed. Shortly after his assistant Herbert Harvey came running.

The Titanic was calling "CQD, CQD".

(This was the international distress signal before the adoption of the clearer and easier SOS.)

Gray raced back to his set and called the Titanic—a proud ship crippled by an iceberg and even then dipping deep into the chilling Atlantic. Phillips replied: "We are now sinking by the head—putting women and children off in boats—weather clear and calm."

Signals were good for the next two hours. Phillips, true to the traditions of the "brass pounders", remained at his key to send the messages needed to direct the rescue ships. Every tilt of the ship was felt in his radio cabin, but he never stopped. Signals started to fade. There was one very weak CQD. Then they stopped.

Ashore, Mr. Gray did all he could. He picked up the Titanic's calls and relayed them to ships he knew were closest. His friend Phillips was facing death, but Gray noticed his hand never skipped on the key.

History records that the Carpathia got there in time to pick up many of those in the boats and those floating in the water. But still 1,502 perished.

Gray's work wasn't done. From the Carpathia he got a list of the names and addresses of survivors. These he flashed to shocked relatives and a stunned world. Four days after the first distress call was heard the last name was sent—and for the first time in 96 hours the officer-in-charge of the Cape Race marine radio station laid down his earphones and went to bed.

Members of the SOCIETY OF WIRELESS PIONEERS Rededicate Famous Landmark

MARCONI MEMORIAL

MARCONI MEMORIAL SET ON TELEGAPH HILL

Bronze and Granite Bench Stands in View of Pathway of Vessels Whose Voyages the Wireless Inventor Made Rapid and Safe Through His Genius and Science

Reprinted from —THE SAN FRANCISCO CALL-BULLETIN— Saturday, July 8, 1939

Young America today, and for many years hence, may beam upon the Marconi memorial bench with pride and wonderment, as does Lunence Lapera, above. The plaque's Latin inscription, "Fulgura Praevertens Vacuam Vox Permeat Aethram," literally translated, means "Outstripping the lightning, the voice races through the clear, empty sky." This is a tribute to the man whose bronze profile faces out upon the Golden Gate, through which ply vessels whose crackling wireless sets bear testimony to the honored man—Senator Marconi—whose genius made it possible for vessels to give and receive information over the seven seas.

Perpetuated in bronze and stone, the features of Guglielmo Marconi, father of wireless telegraphy and benefactor of mankind, looked out toward the Golden Gate today from a place of prominence on Telegraph Hill.

The Marconi memorial bench, tangible materialization of the great esteem in which San Franciscans hold the late Italian inventor, nobleman and senator, was completed and in place at its vantage point on the most famed of the city's seven hills, which Marconi once likened to those of his own Rome.

Paid for with the pennies, dimes and dollars of thousands of San Francisco and northern California residents wishing to honor the great man, the monument loomed as only slightly less lasting than the invisible memorial which his genius wrote in empty space on ether waves.

STARTED BY CALL-BULLETIN

Funds for the monument were raised by popular subscription, started by The Call-Bulletin as a tribute to Senator Marconi on the day of his death two years ago. San Franciscans planned it, designed it, built it and paid for it.

Today the monument, a thing of beauty and utility, is there for San Franciscans and visitors to enjoy.

Delay in erecting the memorial was the result of a desire on the part of the citizens' committee for the memorial fund to co-ordinate its construction with other plans of the San Francisco Park Commission, which furnished the site.

This site is on the newly landscaped northern face of Telegraph Hill, rising from North Beach, the Italo-American colony which contributed heavily of funds and efforts to realize construction of the memorial.

PROFILE IN BRONZE

From this site, Marconi's profile in bronze, on a medallion executed by Sculptor Raymond Puccinelli, looks out toward the gate through which ply ships whose safety at sea Marconi's invention of the wireless made possible.

The bench itself, of gray-white Raymond granite from the Knowles quarry in Madera County, was constructed by the McGilvray - Raymond Corporation and has a back more than six feet tall, in which the medallion is set. Gracefully curving arms of the bench reach out symbolically toward the sea.

About the circular rim of the medallion is inscribed in bronze:

"Guglielmo Marconi — 1874-1937."

LATIN INSCRIPTION

Just under the medallion and over the seat of the bench, the following Latin inscription is chiseled:

"Fulgura Praevertens Vacuam Vox Permeat Aethram," which translates:

"Outstripping the lightning, the voice races through the clear empty sky."

At the base of the bench is the legend:

"To the Memory of
Guglielmo Marconi
Erected by Popular Subscriptions
Inaugurated by The San Francisco Call-Bulletin."

Completion of the monument marks fruition of the efforts of leaders in the movement, notably Andrea Rainaldi, Italian consul general, who took charge of the subscriptions; Mayor Rossi, honorary chairman, and Herbert Fleishhacker, chairman of the citizens' committee; Captain B. P. Lamb of the Park Commission, and Ottorino Ronchi of the Art Commission.

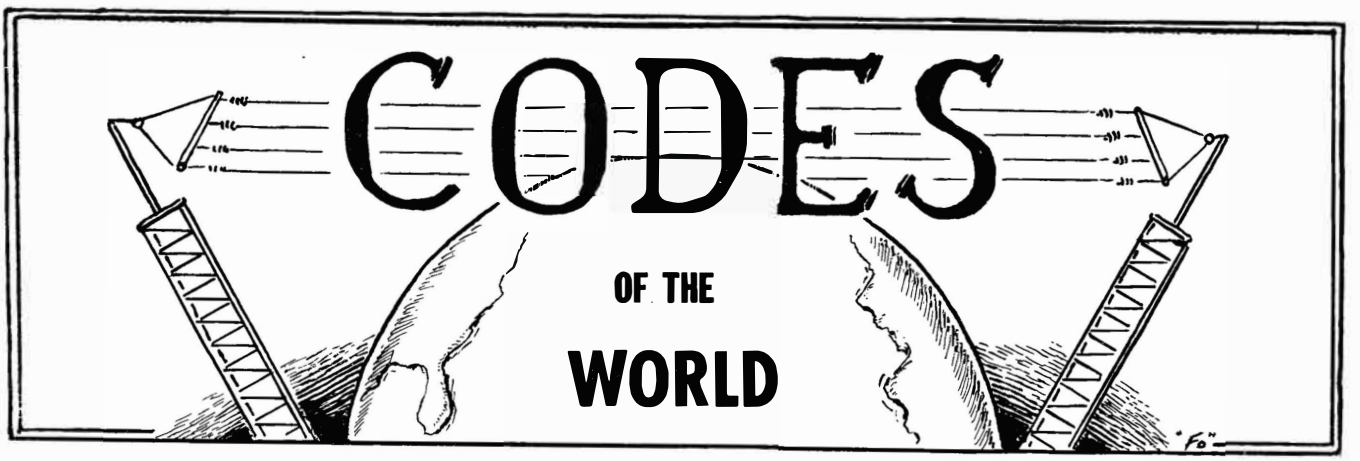
1974

The beautiful medallion/Monument honoring Senator Guglielmo Marchese Marconi)1874-1939) was initially dedicated Sept. 11 1939. It was rededicated by members of the Society of Wireless Pioneers at its new site on December 10. 1974 in a ceremony honoring this great man.

The Memorial was removed from its original site in 1972 due to heavy rains undermining its foundation. The relocatic of the Memorial has been one of the Society's projects since that time. The new site is beautifully located on Lombard Street where it starts up Telegraph Hill.

Speakers at the dedication included Mario J. Spagna, M/C. President Eben K. Cady and the Society's Executive Dirctor who gave the Rededication address. News Media included Press, Radio and several TV Stations.

Many members of the Golden Gate Chapter attended the dedication - representing the several thousand members of the Society around the world - many yet sailing the "Seven-Seas"



deNEUF. KITCHIN. WALTERS. ANDERSON. FOLKMAN. DICKOW. MUNDT. GEISEL. CADY. COOKSON. WILLIAMS. MILLER

GREEK

GREEK LETTER	MORSE SYMBOL	
A	.-	Alpha
B	-...	Beta
Γ	--.	Gamma
Δ	-..	Delta
E	.	Epsilon
Z	--..	Zeta
H	....	Eta
Θ	-.-.	Theta
I	..	Iota
K	-.-	Kappa
Λ	.-..	Lambda
M	--	Mu
N	-.	Nu
Ξ	-..-	Xi
O	---	Omicron
Π	.--.	Pi
P	.-.	Rho
Σ	...	Sigma
T	-	Tau
Y	-.--	Ypsilon
Φ	..-.	Phi
X	....	Chi
Ψ	--.-	Psi
Ω	.--	Omega
HY	....-	Eta Ypsilon
YI	-.--	Ypsilon Iota
OY	---.	Omicron Ypsilon
AI	.-.-	Alpha Iota
AY	.---	Alpha Ypsilon
EY	-..-	Epsilon Ypsilon
OI	-.--	Omicron Iota

RUSSIAN

RUSSIAN LETTER	MORSE SYMBOL	
А	.-	A
Б	-...	B
В	.--	V
Г	--.	G
Д	-..	D
Е,Э	.	E
Ж	...-	J
З	--..	Z
И	..	I
Й	.---	Y
К	-.-	K
Л	.-..	L
М	--	M
Н	-.	N
О	---	O
П	.--.	P
Р	.-.	R
С	...	S
Т	-	T
У	..-	U
Ф	..-.	F
Х	....	H
Ц	-.-.	TS
Ч	---.	CH
Ш	----	SH
Щ	--.-	SHCH
Ъ,Ь	-..-	Mute
Ы	-.--	I
Ю	..--	YU
Я	.-.-	YA

ARABIC

ARABIC LETTER	MORSE SYMBOL	
ا	.-	Alif
ب	-...	Ba
ت	-	Ta
ث	--..	Tha
ج	.---	Jeem
ح	....	Ha
خ	---.	Kha
د	-..	Dal
ذ	--..	Dhal
ر	.-.	Ra
ز	--.-	Zay
س	...	Seen
ش	----	Sheen
ص	..-.	Sad
ض	..-.	Dad
ط	-..	Ta
ظ	-.--	Za
ع	.-..	Ain
غ	--.	Ghain
ف	..-.	Fa
ق	--.-	Qaf
ك	-.-	Kaf
ل	.-..	Lam
م	--	Meem
ن	-.	Noon
ه	.....	He
و	.--	Waw
لا	-....	Lam-Alif
ي	..	Ya

TURKISH

A	.-
B	-...
C	-.-.
Ç	-.-..
D	-..
E	.
F	..-.
G	--.
H	....
I	..
J	.---
K	-.-
L	.-..
M	--
N	-.
O	---
Ö	---.
P	.--.
R	.-.
S	...
Ş	...-
T	-
U	..-
Ü	..--
V	...-
Y	-.--
Z	--..

INTERNATIONAL CODE

A	.-
B	-...
C	-.-.
D	-..
E	.
F	..-.
G	--.
H	....
I	..
J	.---
K	-.-
L	.-..
M	--
N	-.
O	---
P	.--.
Q	--.-
R	.-.
S	...
T	-
U	..-
V	...-
W	.--
X	-..-
Y	-.--
Z	--..

Figures

1	.----
2	..---
3	...--
4	....-
5	.....
6	-....
7	--...
8	---..
9	----.
0	-----

Punctuation

(.)	.-.-.-
(,)	--..--
(?)	..--..
(:)	---...
(;)	-.-.-.
(-)	-....-
(!)	-.-.--
(')	.----.
(/)	-..-.
( )	-.--.-
(")	.-..-.

MORSE CODE

Used on land lines

A	.-
B	-...
C	-.-.
D	-..
E	.
F	..-.
G	--.
H	....
I	..
J	.---
K	-.-
L	.-..
M	--
N	-.
O	---
P	.--.
Q	--.-
R	.-.
S	...
T	-
U	..-
V	...-
W	.--
X	-..-
Y	-.--
Z	--..
&	.-...

Figures

1	.----
2	..---
3	...--
4	....-
5	.....
6	-....
7	--...
8	---..
9	----.
0	-----

Punctuation

(.)	.-.-.-
(,)	--..--
(?)	..--..
(:)	---...
(;)	-.-.-.
(-)	-....-
(!)	-.-.--
(')	.----.
(/)	-..-.
(	-.--.-
)	-.--.-
(")	.-..-.
(")	.-..-.

Codes of the World

The story about the "CODES OF THE WORLD" is of great interest to many of us. Regretfully, it would take many books to do the subject full justice. We think that the full history of codes is a very absorbing one and we plan to bring further coverage of the subject in future books that we will issue from time to time. We wish to thank the many authors who contributed material to this edition. Some of their names are noted above.

Students of the subject may note some apparent innaccuraces in the codes listed here and those they may have available for checking or comparison. Please keep in mind that many changes and refinements have been made over the years for one reason or another in many codes, hence you can expect to find code listings which do not agree with those you may read in another book.

Bill Brian

KA TA KA NA

The Japanese Code

カタカナ

ア カ サ タ ナ ハ マ ヤ ラ ワ イ キ シ チ ニ ヒ ミ イ リ キ ウ ク

THE KATA KANA CODE OF THE JAPANESE

The Kata Kana Code commonly referred to as simply "Kana" is the code used by the Japanese in radio and telegraphic communication. It is based on what is known as Romaji, a form in which an abbreviated Japanese alphabet appears phonetically in English - as for instance, Sayonara (goodbye). This word consists of 4 letters, SA YO NA RA, and is written on Japanese typewriters by 4 keys.

The Romaji alphabet uses all English vowels and the one consonant(N) as complete individual characters. With a few exceptions which will be noted later, other Romaji characters consist of a consonant followed by a vowel, in some cases followed by one of two modifiers known as the Nagori and the Hanagori, also explained later. The Japanese typewriters use the Hiragana characters and the Japanese operators who become proficient on the mill use it instead of the brush or pencil. Hiragana is a sort of shorthand language.

Actually, there are four forms of writing Japanese, ie: 1. Kanji characters derived from Chinese, 2. Katakana or "stiff hand", 3. Hiragana, the cursive form and 4. Romaji, the English rendition of the Japanese character. A combination of the first with either the second or third can be used as, for example, tomodachi (friend): Katakana hiragana but katakana should not be mixed with hiragana.

Kanji is of Chinese origin and comprises some 1812 characters, each usually representing an entire word or idea, whereas Katakana and Hiragana are Japanese and in reality sylabarys. Katakana is used as a rule for all foreign phrases and words. All messages presented in Japan for transmission are presented in Katakana - at least by the Japanese.

Basically Japanese is one of the world's simplest languages to pronounce. All 5 basic vowel sounds are without variation. They are pronounced as in Italian, Spanish or other "Romance" Languages. The hard sounds and semi-hard sounds are characterized by a small mark written to the top right by two small short lines (") A small circle indicates a semi-hard sound (°). When Xmtg CW., the addition of two dots sent as a separate letter indicates the preceding letter or syllable is hard and consequently two short lines are added to it.

add: (Honogori ••)
(Negori •• — — •)

In the code table on the right, the table at left is Romaji, center is the code groups and at right is Hiragana characters:

Kata Kana Radio Code

A	--.--	ア	あ	HA	....	ハ	は
I	.-	イ	い	HI	--.--	ヒ	ひ
U	..-	ウ	う	FU	--..	フ	ふ
E	-.---	エ	え	HE	.	ヘ	へ
O	.----	オ	お	HO	-..	ホ	ほ
N	-.-.-	ン	ん	MA	-..-	マ	ま
KA	-.-.	カ	か	MI	..-.-	ミ	み
KI	-.-..	キ	き	MU	-	ム	む
KU	...-	ク	く	ME	-.---	メ	め
KE	-.--	ケ	け	MO	-.---	モ	も
KO	----	コ	こ	YA	.--	ヤ	や
SA	--.-.	サ	さ	(Y)I	.-	イ	い
SHI	--.--	シ	し	YU	-..--	ユ	ゆ
SU	---.-	ス	す	(Y)E	-.---	エ	え
SE	.---.	セ	せ	YO	--	ヨ	よ
SO	---.	ソ	そ	RA	...	ラ	ら
TA	-.	タ	た	RI	--.	リ	り
				RU	-.--.	ル	る
CHI	..-.	チ	ち	RE	---	レ	れ
TSU	.--.	ツ	つ	RO	.-.-	ロ	ろ
TE	.-.--	テ	て	WA	-.-	ワ	わ
TO	..-..	ト	と	(W)I	.-.--	ヰ	ゐ
NA	.-.	ナ	な	(W)U	..-	ウ	う
NI	-.-.	ニ	に	(W)E	.-.-.	ヱ	ゑ
NU	....	ヌ	ぬ	(W)O	.---	ヲ	を
NE	--.-	ネ	ね				
NO	..--	ノ	の				

NIGORI: By adding the nigori sign (like a ditto mark) to any character the following changes are made in the groups with the letters shown below. That is, HA" changes HA to BA, HI" changes HI to BI, HU" changes HU to BU, etc.

H" changes to BA BI BU BE BO
K" changes to GA GI GU GE GO
S" changes to ZA JI ZU ZE ZO
T" changes to DA JI DZU DE DO
H° changes to PA PI PU PE PO

The code signal for nigori is •• and it follows the character thus — ••• •• which is written BA. The small circle used with H in the last line of the table opposite is called "maru" or "handaku" and is signalled — •• •—•—• thus indicating that HO is to be written PO.

There are of course grammatical rules, such as verb conjugations, as in any language which are too complex to be dealt with in a brief listing of the code.

However, if the code signal is written down in romaji a romaji-English dictionary will be a great help in translating although the grammatical construction will not be apparent.

FIGURES: For the numbers 1 to 10 inclusive there are two sets of words, the code signals being the same as in English. The characters for the figures are the same as those used by the Chinese therefore by learning the characters one can read price tags in both China and Japan although, of course, the Chinese give them different names.

1	ichi	hitotsu	一
2	ni	futatsu	二
3	san	mitsu	三
4	shi	yoku	四
5	go	itsutsu	五
6	roku	mutsu	六
7	shichi	nanatsu	七
8	hachi	yatsu	八
9	ku	kokonotsu	九
10	ju	to	十

Above 10 there is only one set: ichi, ni, san, etc., and 11 therefore becomes ju, ichi; then ju ni, ju san, etc.

Hundred (hyaku) 百

Thousand (sen) 千

Examples of writing numbers:

15 十五

27 二十七

238 二百三十八

496 四百九十六

Following are some of the code abbreviations that may be used to express yourself in the Japanese code as furnished by members George R. Mackin and Robert J. Miller:

HA " TU	Departed
HA " TA	Service Dispatch
U NA	Priority sign
YO RE	From
HO SO	At ___time I am going to Bdc. on ___Kc.
FU NA	Answer quickly, I have rush traffic.
U NA	Urgent - Priority
SA RA	I am going to repeat
HA YA	Send faster
HO U SO U	Bdc coming up (for)
FU	No - Negat
FU A	Very bad - (Static or QRM)
KA N	Do you hear me?
KU 2	Send double
KO N	I am being interfered with
MA TE	Wait
MU NI	Repeat back
TO YU	I am shifting to ___ KCS.
WO TU	Answer on ___ KCS.
YU FU	I have traffic for you.

Expressions - run together code groups

Thanks	(Arigato)	MW G LI UI U
Yokohama	-----	M OT B X
Kobe	-----	OT U EI
G.M.	(Ohayo)	AS B M
G.N.	(Oyasumi)	AS W OA UA

CREDIT

Special thanks and recognition to the following members for furnishing data on the Japanese Code. They are all experts in the field of communication intelligence for the American or Canadian governments during the war periods.

KITCHIN, James E.
MACKIN, George R.
deNEUF, Don
ANDERSON, Ray
WALTERS, Dr. John E.
MILLER, Robert D.
WILLIAMS, Paul
MUNDT, Carlos S.

CONVERSION of KANA to—from INTERNATIONAL

MERCHANT CODE

Cont.	Jap.	Cont.	Jap.
A	I	ND I	GI
AA	NO	N I	DA
AS	WO	NN	NI
AU	WI	NG	RU
AW	TE	NS	NU
AWI	DE	NU	ME
		O	RE
B	HA	OA	SU
B I	BA	OA I	DZU
B UN	PA	OG	GO
D	HO	P	TSU
D I	BO	P I	DZU
DM	YU		
DN	MO	Q	NE
D UN	PO		SHI
E	HE	R	NA
E I	BE	RA I	JA
E UN	PE	RN	NG
		S	RA
F	CHI	T	MU
F I	DJI		
G	RI	U	U
GA	HI	UA	MI
GI	BI	UI	TO
GN I	JI	UI I	DO
GM	PA	UN	O
IM	NO	V	KU
J	O	W	YA
K	WA	WI	YE
KA	SA	WN	SE
KI	KI	WN I	ZE
L	KA	X	MA
L I	GA	Y	KE
		Y I	GE
M	YO	YT	YE
MM	KO		
MN	SO		
MN I	ZO	Z	FU
	GU	Z I	BU
		ZDG	PI
N	TA	Z UN	PU

JAPANESE CODES

MILITARY CODE

Cont.	Jap.	Cont.	Jap.
GM	A	Z	GU
L	KA	ZI	BU
L I	GA	Z I I	PU
KA	SA	T	MU
NK I	ZA	NW	YU
N	TA	NG	RU
N I	DA	NO	E
R	NA	Y	KE
B	HA	Y I	GE
B I	BA	AG	SE
B I I	PA	WN I	ZE
X	MA	RM	TE
W	YA	RM I	DE
S	RA	Q	NE
K	WA	E	HE
A	I	E I	BE
KI	KI	E I I	PE
CE I	EI	DA	ME
OE	SHI	WI	YE
OE I	JI	O	RE
F	CHI	RA	YE
F I	JI	AS	O
C	NI	MM	KO
ZT	HI	MM I	GO
ZT I	BI	MN	SO
GA I I	PI	MN I	ZO
UA	MI	UI	TO
RA	YI	UI I	DO
G	RI	IM	NO
U	U	D	HO
V	KU	DI	BO
V I	GU	D I I	PO
TO	SU	DN	MO
MK I	DZU	M	YO
P	TSU	AA	RO
P I	DZU	J	WO
H	NU		

SOCIETY OF WIRELESS PIONEERS

THE RUSSIAN CODE

By James E. Kitchin 84 P VE7KN

The Russian letters below are given in the "printed" style as used in books and newspapers. Handwriting varies, as in any language. Where no "small" letter is given these are the same as the "capital" letter but smaller in size. No code for ё and ь as e is used for ё. ъ and ь have no pronunciation as they only indicate that the preceding consonant is pronounced hard and soft respectively. й is called ee-kratkohyeh· ъ is tvyordeeznak ь is myahkeyznak. The English equivalent letter "y" is pronounced as the y in "boy". Pronounce the equivalent English J as the S in "pleasure". E and э are both one dot as the difference in pronunciation is almost negligible.

Russian letter
Name
Code
English equivalent

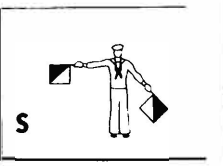
А а	ah	·–	ah	Р р	er	·–·	r
Б б	beh	–···	b	С	ess	···	s
В	veh	·––	v	Т	teh	–	t
Г	gheh	––·	g	у	oo	··–	oo
Д	deh	–··	d	ф	eff	··–·	f
Е е	yeh	·	eh	Х	khah	····	kh
Ё ё	yoh		yoh	Ц	tseh	–·–·	ts
Ж	zheh	···–	j	Ч	chah	–––	ch
З	zeh	––··	z	Ш	shah	––––	sh
И	ee	··	i	Щ	shchah	––·–	shch
Й		·–––	y	Ъ		–·––	
К к	kah	–·–	k	Ы	yehree	–·––	ih
Л	ell	·–··	l	Ь			
М	em	––	m	Э	eh	·	e
Н	en	–·	n	Ю	yoo	··––	yu
О	oh	–––	o	Я	yah	·–·–	ya
П	peh	·––·	p				

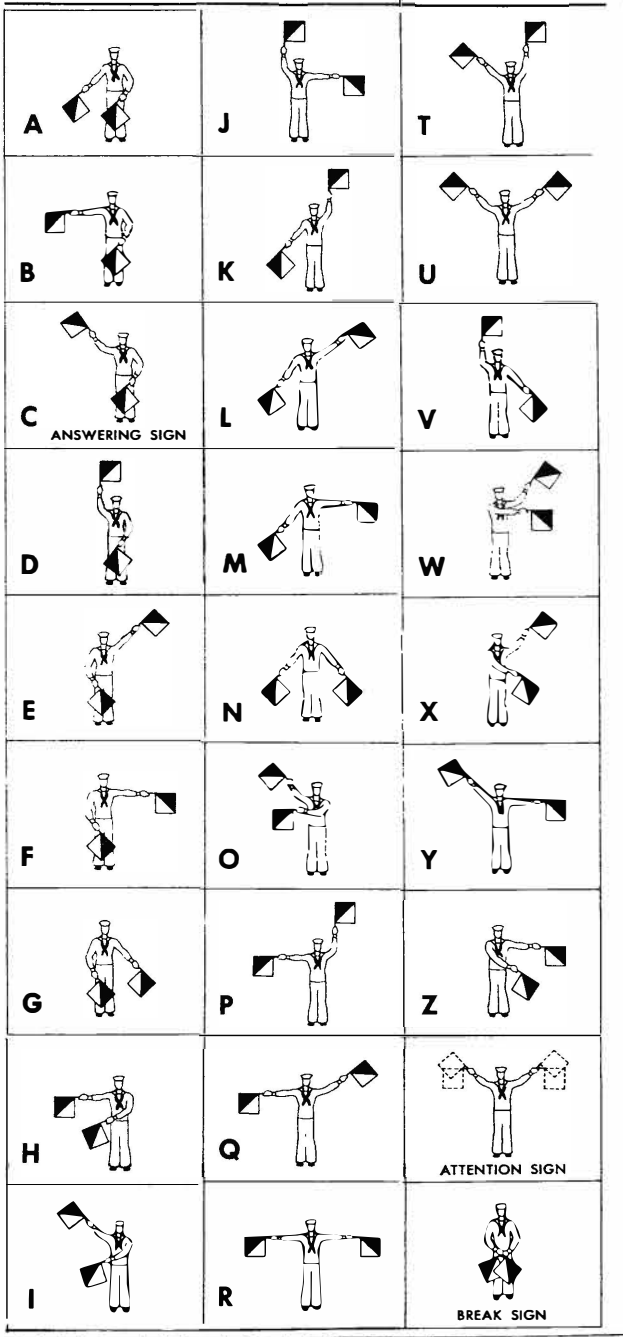
Conversion Chart

A	А	·–
B	Б	–···
W	В	·––
G	Г	––·
D	Д	–··
E	Е	·
V	Ж	···–
Z	З	––··
I	И	··
J	Й	·–––
K	К	–·–
L	Л	·–··
M	М	––
N	Н	–·
O	О	–––
P	П	·––·
R	Р	·–·
S	С	···
T	Т	–
U	У	··–
F	Ф	··–·
H	Х	····
C	Ц	–·–·
MN	Ч	–––
MM	Ш	––––
Q	Щ	––·–
Y	Ы	–·––
X	Ь	–··–
UI	Э	··–··
IM	Ю	··––
AA	Я	·–·–

THE VISUAL CODE SYSTEM

SEMAPHORE





Telegraph Codes of the World

SOCIETY OF WIRELESS PIONEERS

The following story about the "Codes of the World" was written some sixty years ago and appeared in a publication called "Railroad Man's Magazine. (Vol. 28, No. 4 of Dec. 1915). Its author was Mr Donald McNicol who at the time was an engineer for the Postal Telegraph Co. "DM" was an outstanding authority on World Codes in the early days. He later became editor for Telegraph & Telephone Age, circa 1925 and later was an instructor in Communication Engineering at Columbia Univ. of New York. His collection of books (over 1000) on Communication Engineering and associated subjects was donated to the Kingston Univ. Kingston, Ontario - one of the world's largest, on the subject.

Mr. McNicol became a "Silent Key" in Sept. 1953. He was a very brilliant man and a true gentleman.

The story "TELEGRAPH CODES OF THE WORLD" was furnished to us by member Donald K. de Neuf, (117-P) as it records for history and posterity an important segment of our heritage. We owe "Don" a debt of gratitude for sending us this early day record from his historical collection. Those who read it will always honor the name of Donald McNicol in their memories.

From the beginning the mind of man has ever been concerned with the problem of devising symbols or signs which could be used in conveying thoughts and ideas to the minds of other men. History tell us that in all ages and in all lands the people of the period had their own peculiar methods of communication--in the less civilized countries by means of signs manifested by gesticulation of the hands and arms, and among more highly developed peoples by means of inscribed marks or symbols.

In the writings of Homer "the lambent flame which shone round the head of Achilles" is compared to the signals made in besieged cities by clouds of smoke in the daytime, and by bright fires at night--signals which were employed in calling for assistance and in notifying friendly cities of the imminence of hostile attack.

Signaling-systems employing alternately obscured and exposed lighted torches were used by Polybius in the Punic war, B.C. 264. Flag and semaphore signaling systems were employed by Washington's army in the War of the Revolution; and before and immediately after that time many ingenious signaling-systems were proposed which consisted mainly of symbols representing certain prearranged groups of words.

The necessity for a universal signaling-alphabet having a symbol for each of the letters that form the elements of written language had been recognized from very early times.

The Francis Bacon alphabet of 1605 A.D. is the first successful attempt of which there is record, having as its basis "dimension" and "duration" of the elements of the signal. It was a far cry, however, from this early alphabet to the scientific arrangement adopted by Morse in the year 1844.

It would task the comprehension of a seer to grasp the wealth of significance contained in those three simple words, "the Morse Alphabet." Today the language of the wire, the language of the rail. the universal language of the sea are made up of the mystic symbols which comprise the telegraph alphabet.

In the minds of many the idea prevails that the first telegraph code was devised by Professor S.F. B. Morse, the inventor of the electromagnetic telegraph, with the aid of his assistant, Alfred Vail. It is true that both Morse and Vail performed a vast amount of painstaking labor in devising a satisfactory signaling-code for the Morse telegraph system introduced in the year 1844; but it has since been learned that had Morse known of the work along the same lines done by prior scientists he would have found ready at hand an alphabet answering his requirements better than the first code arrangement which he employed.

In the year 1605 Francis Bacon, in his "Advancement of Learning," discussing cryptography. submits a form of biliteral alphabet which may be made up of all things which are capable of two differences.

Employing dots and dashes in the composition of this alphabet, the letters were designated as follows:

BACON'S CODE OF 1605

A	·····	I	··—··	R	·—···
B	····—	K	··—·—	S	·—··—
C	···—·	L	··—··	T	·—·—·
D	···——	M	·—·——	V	·—·——
E	··—··	N	·—·—·	W	·—···
F	··—·—	O	·—·——	X	·—·——
G	··——·	P	·———·	Y	·—·——·
H	··———	Q	·————	Z	·—·———

The omission of the letters J and U is due to the fact that these letters of the English alphabet had not at that date been differentiated from I and V.

REE'S CODE

In a cyclopedia published by Dr. Abraham Rees in 1809 there appears an alphabet in which the first nine letters are represented identically with Bacon's code. In the Rees alphabet the inclusion of the letters J and U necessitated a shift forward of the signs. With the exception of the letters X, Y, and Z, this alphabet is the same as that of Bacon.

WORLD CODES

SWAIM'S CODE

James Swaim, of Philadelphia, in the year 1829 described an "acoustic" alphabet which could be employed in telegraphing along or through a wall. As shown herewith this alphabet is represented in conventional dots and dashes; but as originally devised the dots were represented by a letter T (meaning "tap"). while the dashes were represented by a letter S (meaning "scratch").

A •	J • ••—	S • •—
B —•••	K • •	T •• ••—
C —•—•	L • ••	U •• •
D —••	M • •••	V •• ••
E •	N • ••••	W •• •••
F •—••	O • —	X •• ••••
G ——•—	P •——	Y •• ——
H •———	Q •—•—	Z ••——
I ••	R •—•••	

It is evident that this alphabet was not carefully designed, as with four signs only a sufficient number of combinations could have been made to represent thirty letters or characters. The employment of spaces between the elements of two-thirds of the total number of letters makes this alphabet somewhat cumbersome and difficult to memorize.

LOST CODES

The alphabet employed by Lomond in France in the operation of his pith-ball telegraph in the year 1787 has evidently been lost to telegraphic history, as also is that used by Harrison Gray Dyar in the United States in the operation of his electrochemical telegraph in the year 1828.

SCHILLING'S CODE

The alphabet employed by Baron Schilling, whose telegraph was constructed in St. Petersburg, Russia, in the latter part of 1832, consisted of elements indicative of the position—to the left or to the right—of a vertical pointer whose movements were controlled electrically from a distant station.

As usually shown this alphabet consists of combinations of the letters R and L, meaning "right" and "left." For example, in transmitting the letter N the sending lever is moved to the left once and to the right once. At the receiving-station the indicating-needle would swing first to the left and then to the right; this would be translated as the letter N.

The Schilling alphabet as shown herewith is made up of dots and dashes so that the various letter-combinations may be compared with later alphabets made up of similar elements. A dot represents a swing of the needle to the right, and a dash a swing to the left.

A •—	J •••—	S ——
B •••	K •••—	T —
C •—•—	L —•••	U ——•
D ••—	M —•—	V ———
E •	N —•	W •—•—
F ••—•	O •—•	X —•—•
G ————	P ——••	Y •——•
H •———	Q ———•	Z •—••
I ••	R —••	

GAUSS & WEBER'S CODE

In 1833 Gauss and Weber, of Germany, introduced a telegraph system employing a galvanometer with a reflecting mirror, the movements of the mirror to the left or to the right being observed by means of a telescope. The alphabet used is shown herewith, a dot representing a movement of the mirror to the right and a dash a movement to the left:

A •	H ———	P ••••
B ——	I ••	R •••—
C —•—•	K —•—	S ——•
D ••—	L ——••	T —•—•
E —	M ———	U ——•
F •—••	N •——	V •—•—
G ——••	O •—	W —•••
		Z ———

In this alphabet C and K have the same symbol, as also have F and V.

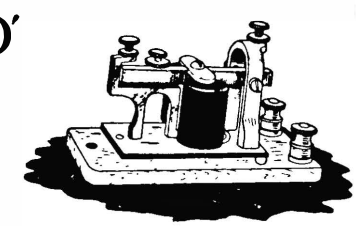
STEINHILL'S CODE

The alphabet employed by Steinhill in Germany in 1836 was as follows:

A —•—	I •	R ——
B —••—	J •	S ——••
C ——•—	K ——•—	T —•
D •——	L •—•—	U •—•—
E —	M •••	V •—•—
F ——•—	N ••	W •—•—
G ••——	O ———	Z ••——
H ••••	P •——•—	

It will be noted that I and J have the same symbol, also U and V, and that the letters Q, X and Y were dispensed with.

PORTS O' CALL



DEVELOPMENT OF MORSE CODE

Professor Morse's first idea of a telegraphic alphabet was that a dictionary of words could be made up, giving to each word a numerical reference, thus: Alabama, 123; Arkansas, 321, et cetera. The dot-and-dash code used to represent each figure was as follows:

1	•—	6	—••••
2	••—	7	——••
3	•••—	8	———••
4	••••—	9	————•
5	•••••	0	—————

It is apparent that a very long list of words may be arranged with these ten figures in different relations; but the time required, first to compose the words of the message to be transmitted into groups of figures, and then to translate these groups into written words at the receiving station, caused delay which resulted in the early abandonment of this method of telegraphing.

The first complete alphabet devised by Professor Morse in which each letter was given a dot-and-dash symbol was that used in the year 1838.

MORSE 1838 CODE

A	•—	J	•— — —	S	•••
B	—•••	K	—•—	T	—
C	—•—•	L	•—••	U	••—
D	—••	M	——	V	•••—
E	•	N	—•	W	•——
F	••—•	O	———	X	—••—
G	——•	P	•——•	Y	—•——
H	••••	Q	——•—	Z	——••
I	••	R	•—•		

It will be noted that the same symbol has been given to G and J, to I and Y, and to S and Z. The Morse alphabet used in the year 1844—which is still in use unchanged in the United States and in Canada—consisted of a rearrangement of the symbols, avoiding duplication.

MORSE 1844 CODE

(Present Day Commercial Use)

A	•—	J	•———	S	•••
B	—•••	K	—•—	T	—
C	—•—•	L	•—••	U	••—
D	—••	M	——	V	•••—
E	•	N	—•	W	•——
F	••—•	O	———	X	—••—
G	——•	P	•——•	Y	—•——
H	••••	Q	——•—	Z	——••
I	••	R	•—•	&	•—•••

MORSE'S 1844 ALPHABET (Cont.)

1	•————	6	—••••
2	••———	7	——•••
3	•••——	8	———••
4	••••—	9	————•
5	•••••	0	—————

.	Period	•—•—•—
:	Colon	———•••
	Paragraph	•——•—
–	Fraction line	—••—•
;	Semi-Colon	—•—•—•
,	Comma	——••——
?	Interrogation	••——••
()	Parenthesis	•———•
!	Exclamation	————

A person might well be pardoned for not at first sight observing that the Morse alphabet is a scientific arrangement of dots and dashes composed with the object of providing short signals for those letters which occur most frequently in English words, and also with the object of arranging letter-signs sufficiently dissimilar to prevent or at least lessen the likelihood of confusion.

The symbols are arranged from three elements—the dot, the dash, and the space—having the following relative values:

The dot	1 unit
The space between the elements of a letter	1 unit
The space employed in the "spaced" letters	2 units
The space between letters	3 units
The space between words	6 units
The short dash	3 units
The long dash	6 units

THE BAIN CODE

Edward Davy in England in 1839, and Alexander Bain of Scotland in 1846, employed the alphabet shown herewith:

A	•—	J	•———	S	——••
B	—•••	K	—•—	T	———••
C	—•—•	L	•—••	U	——•
D	—••	M	——	V	———•—
E	•	N	—•	W	——•——
F	••—•	O	———	X	—••—
G	——•	P	•——•	Y	—•——
H	••••	Q	——•—	Z	——••
I	••	R	•—•	&	———•—

In the years 1849 and 1850 Bain electro-chemical telegraph-lines were in operation between New York and Boston, New York and Washington, and New York and Buffalo.

WORLD CODES

The numerals used with the Bain alphabet were:

1	•— — — —	6	— — — —•
2	••— — —	7	— — —••
3	•••— —	8	— —•••
4	••••—	9	—••••
5	•••••	0	— —•— —

AUSTRO-GERMANIC CODE OF 1854

The alphabet and system of notating numerals and punctuation, as employed in European countries, is given herewith:

A	•—	J	•— — —	S	•••
Ä	••••—	K	—•—	T	—
B	—•••	L	•—••	U	••—
C	—•—•	M	— —	Ü	••— —
D	—••	N	—•	V	•••—
E	•	O	— — —	W	•— —
F	••—•	Ö	— — —•	X	—••—
G	— —•	P	•— —•	Y	—•— —
H	••••	Q	— —•—	Z	— —••
I	••	R	—•—	CH	— — — —

1	•— — — —	6	—••••
2	••— — —	7	— —•••
3	•••— —	8	— — —••
4	••••—	9	— — — —•
5	•••••	0	— — — — —

.	Period	••••••
,	Comma	•—•—•—
:	Colon	— — —•••
'	Apostrophe	— — — —•
?	Question mark	••— —••
!	Exclamation	— —••— —
;	Semi-Colon	— •— •— •
-	Fraction mark	— — — — — —

CONTINENTAL (INTERNATIONAL) CODE

The Austro-Germanic alphabet was first compiled at the telegraph conference held in Berlin, Germany, in 1851. This alphabet is still in use and is known variously as the Continental, international, or universal code. It is employed on European Morse lines, and is used almost universally in radiotelegraphic service as well as in submarine cable service throughout the world.

CONTINENTAL CODE SIGNALS

In addition to the symbols shown as constituting the Austro-Germanic code, the Continental alphabet of the present day includes the following signals:

-	Fraction line	—••—•
-	Hyphen	—••••—
/	Shilling	•••
.	Decimal point	•— — •
"""	Quotation	•— ••— •
	End of Quotation	•— ••— •
%	Percent	— — —••• — — —
	Italics or underline	•— •• •— ••
	Paragraph — — — —	— —• —• —
()	Parenthesis	—•— —•—
	É (French)	••— ••
	Ñ (Spanish)	— —•— —
	Å (Spanish-Scandinavian)	•— — •—

The Continental alphabet as made up in 1851 was supposed to embody the best features of all then existing telegraph alphabets. As an indication of how the various alphabets were picked over to form the international code it may be seen that the symbols for E, H, O, and P were taken from Steinhill's alphabet; the letter X and the numerals 1, 2. 3. 4. and 5 from the Bain alphabet, while the numerals 6, 7, 8, and 9 also were taken from the Bain alphabet, but were arranged in reverse order. The letters C, F, L, and R were taken from an obsolete pamphlet used in Germany and known as Gerke's while twelve of the remaining letters were taken from the American Morse alphabet of 1844.

Operators in submarine cable service use abbreviated symbols for the numerals of the Continental code, as shown in the subjoined table:

1	•—	6	—••••
2	••—	7	— —•••
3	•••— —	8	— —••
4	••••—	9	— —•
5	•	0	— — —

UNITED STATES NAVY CODE

Until a few years ago when the Continental code was adopted as standard in the radio service of the United States army and navy the navy had a code of its own, as follows:

A	— —	J	•— — —	S	— •—
B	—••—	K	—•— •	T	—
C	—•—•	L	•— —•	U	••—
D	— — —	M	— — •	V	•— — —
E	•—	N	—•	W	•— —•
F	••—••	O	— — —	X	—•— —
G	— —••	P	•— —•	Y	—•— —
H	••••	Q	— —•—	Z	— — —•
I	••	R	•—•		

1	6
2	7
3	8
4	9
5	0

PHILLIP'S CODE PUNCTUATIONS

As before stated the Morse alphabet of 1844 is at present the standard telegraph code used on the land lines, both commercial and railroad, in the United States and Canada. The punctuation marks and special symbols employed, however, are those composed by Walter P. Phillips in the year 1876. They are shown herewith:

. Period	
: Colon	
, Comma	
-- Dash	
- Hyphen	
/ Shilling	
d Pence	
$ Dollars	
¢ Cents	
% Percent	
"" Quotation	
() Brackets	
:-- Colon Dash	
' Apostrophe	
End of Quotation within Quotation	
Italics or Underline	
Capitalized Letter	
End of Quotation	
Quotation within a Quotation	
() Parenthesis	
:" Colon followed by Quotation	
? Interrogation	
-- Fraction Line	
; Semi-Colon	
£ Pound Sterling	
. Decimal Point	
Paragraph	
! Exclamation	

JAPANESE TELEGRAPH CODE

The Morse symbols employed in transmitting telegrams which are written in regulation Japanese characters are fifty in number, in addition to those used to represent figures and punctuation marks.

Approximately 3.6 Japanese letters are equal to one English word of 4.67 Morse letters.

The 50 symbols making up the alphabet have been taken from the American Morse and Continental alphabets, to which additional combinations of dots and dashes have been added to represent the extra 24 letters of the Japanese alphabet.

TURKISH TELEGRAPH CODE

In the Turkish Empire two telegraph codes are in use. One of these, the Continental code previously shown, is employed in communication with foreign telegraph administrations, and when necessary in internal communication. The other alphabet used is known as the Turkish government private code, being used chiefly for official business. It is shown herewith:

A	ZE	K
B	S	Q
P	SH	L
T	X	M
C	DAT	N
DJ	TI	V
H	ZI	E
D	AIN	LA
ZELL	CAIN	I
R	F	O

Since the adoption of the Continental alphabet on European land lines in 1851 there has been an almost continual, although unofficial, agitation in the United States, having for its object the substitution of the Continental alphabet in place of the Morse alphabet on American lines. On March 20, 1873, a vote was taken in the main operating-room of the Western Union Telegraph Company at 145 Broadway, New York, to determine whether or not American telegraphers favored a change to the Continental alphabet. The result of the ballot indicated a pronounced sentiment in favor of retaining the Morse code.

On various occasions in the past fifty years the controversy has resulted in the production of a mass of testimony and opinion for and against the adoption of the Continental alphabet as a universal code. Sifted down, the chief arguments favoring the retention of the Morse alphabet seem to be based on sentiment and upon the slightly superior speed possibilities of the Morse alphabet, while those advocating the adoption of the Continental code base their opinions upon greater accuracy of transmission and upon the desirability of having but one alphabet in use on telegraph lines, cables, and in radio service throughout the world.

The American Morse alphabet--26 letters--has a total of 77 elements, or 2.9615 average signals per letter and 14.807 average signals per word of five letters--an average English word. The Continental alphabet--26 letters--has a total of 82 elements, or 3.1538 average signals per letter and 15.769 average signals per word of five letters.

Including spaces, the average five-letter word--American Morse--contains 36.59 dot elements, or practically five per cent less than a five-letter word composed of Continental signs. A sending speed of 25 words per minute means 394.22 signals per minute in the case of the European alphabet, and 370.17 signals per minute in the case of the American Morse, exclusive of space elements between words.

Regardless of the fact that a considerable amount of the opinion favoring the change to the Continental alphabet comes from highly intelligent and progressive sources, nothing has so far been done in an official way to bring about the change. In-

deed the deadlock is such at present that compromise alphabets are being proposed.

In August, 1914, Mr. W. P. Phillips proposed the following code as a substitute for the American Morse. believing that its adoption in America would not violate the prevailing sentiment attached to the Morse alphabet and that its make-up successfully disposes of the objections to the spaced dot letters of the Morse code--C, O, R, Y, and Z.

PHILLIP'S PROPOSED CODE

A	·—	J	—·—·	S	···
B	—···	K	—·—	T	—
C	···—·	L	····—	U	··—
D	—··	M	——	V	···—
E	·	N	—·	W	·——
F	·—·	O	———	X	·—··
G	——·	P	·····	Y	—····
H	····	Q	··—·	Z	—··—
I	··	R	——··	& And	· ···

Numbers

1	·——·	4	fr·—· ——··	7	sv ··· ···—
2	··—··	5	fv·—· ···—	8	ait·— ·· —
3	— —·· ·	6	······	9	nin—· ·· —·

PRINTING TELEGRAPH CODE

Most modern printing-telegraph systems employ a code having symbols made up of five elements or current impulses, each letter, figure, and punctuation-mark requiring the same amount of line-time for transmission. It is not intended that these signals shall be intelligible on a Morse sounder, as the alternate positive and negative impulses transmitted from the sending end are required only to operate type-printing mechanism at the receiving end.

In the three following alphabets the letter P represents a positive impulse and the letter N a negative impulse, each impulse having unit duration:

MERKRUM CODE

A	ppnnn	L	npnnn	W	ppnnp
B	nnpnp	M	nnnpn	X	pnpnp
C	nnppp	N	pnnpn	Y	nnnnp
D	pppnn	O	nnnnn	Z	nppnp
E	pnppn	P	nnppp	,	nnnnn
F	npnpp	Q	pnnpp	Space	pppnp
G	ppnpp	R	nnppn	Figure	npppp
H	pnnnn	S	npnpn	Release	ppppp
I	pnpnn	T	ppnpn	Back	ppppn
J	pnnnp	U	nnpnn	Line	npppn
K	npnnp	V	pnppp		

In both the Morkrum and W. U. multiplex alphabets the figures and punctuations are made by means of an upper-case shift, employing symbols which are duplicates of those used in forming some of the letters.

BUCKINGHAM OR BARCLAY CODE

A	—··	J	·——	S	——·
B	·—·	K	———	T	· ··
C	—·—	L	· ·—	U	· · ·
D	—··	M	——·	V	——
E	·—·	N	· —·	W	—·—
F	—· ·	O	·· ·	X	·—
G	·· —	P	· ——	Y	— · ·
H	·——	Q	— ——	Z	—· —
I	··—	R	·— ·	Space	···

Type shift —·—

Paper feed — — —

Car. ret. ·——

As in the case of the other printer alphabets, punctuations, figures, and special characters are made by means of the type-shift key. By this means the same symbol serves for C and colon, Q and 1, R and 4, T and 5, et cetera.

The symbols shown above are those composing the Barclay arrangement of the Buckingham alphabet. In the original Buckingham alphabet the symbol for V was – – . . and for X . . –

TELEPOST CODE

The alphabet used in the operation of Delaney's chemical automatic system of telegraphy is the American Morse, or that hereinbefore described as the Morse alphabet of 1844.

WESTERN UNION MULTIPLEX CODE

A	ppnnn	J	ppnpn	S	pnpnn
B	pnnpp	K	ppppn	T	nnnnp
C	npppn	L	npnnp	U	pppnn
D	pnnpn	M	nnppp	V	npppp
E	pnnnn	N	nnppn	W	ppnnp
F	pnppn	O	nnnpp	X	pnppp
G	npnpp	P	nppnp	Y	pnpnp
H	nnpnp	Q	ppppp	Z	pnnnn
I	nppnn	R	npnpn		

FIGURES	(1)	↑	⊕	○	↗	3	→	↘	↓	8	↙	←	↖	·	⦶	9	Ø	1	4	BELL	5	7	⦶	2	/	6	+	–	LETTERS	FIGURES	SPACE	CARRIAGE RETURN	LINE FEED
	(2)	—	5/8	1/8	$	3	1/4	&		8	'	1/2	3/4	·	7/8	9	0	1	4	BELL	5	7	3/8	2	/	6	"	BLANK					
	(3)	—	?	:	$	3	!	&	#	8	'	(	)	·	,	9	0	1	4	BELL	5	7	;	2	/	6	"	≀	Ѱ	Λ	■	<	≡
LETTERS		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	SYMBOLS ABOVE ON TAPE ONLY					
	1	●	●		●	●	●				●	●						●		●		●		●	●	●	●		●	●			
	2	●		●				●		●	●	●	●				●	●	●			●	●	●					●	●			●
	3			●			●		●	●		●		●	●		●	●		●		●	●		●	●			●		●		
	4		●	●	●		●	●			●	●		●	●	●			●				●		●				●	●		●	
	5		●					●	●				●	●		●	●	●			●		●	●	●	●	●		●	●			

(1) WEATHER (2) FRACTIONS (3) COMMUNICATIONS

Car. ret. nnnpn
Line feed npnnn
Let.shift ppppp
Fig.shift ppnpp
Space nnpnn

Ode to Code

By - Don de Neuf

The word "Ode" is not really correct. The following isn't going to be poetry in any sense.

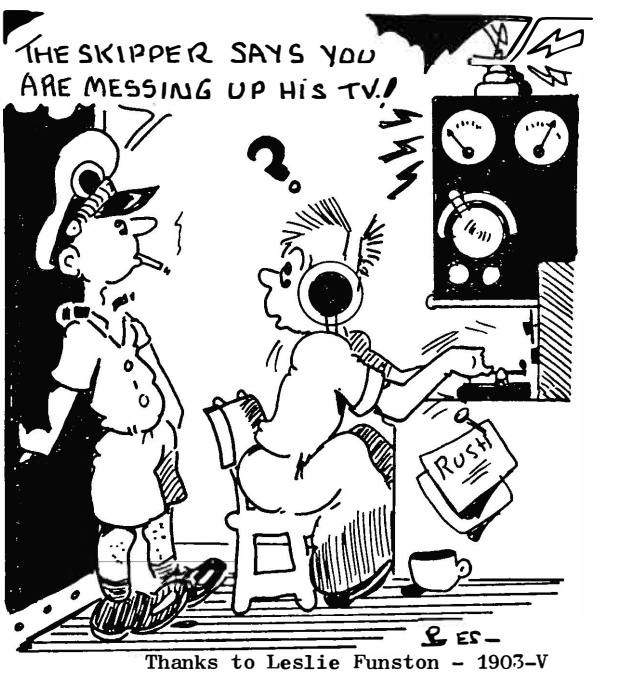
Telecommunications is always fascinating--especially the matter of the use of codes. Of course, we all use a variety of codes to communicate our thoughts to others. For instance, a writing instrument comprised of a stick of graphite we know in English as a "pencil" is known as a "lapiz" by the Spanish speaking, a "bleistift" in German, a "crayon" in French, an "empitsu" in Japanese, a "karandash" in Russian, and to the Italians a "matita," etc. Exactly the same item and thought is expressed but a different "code signal" is employed for each languate. Then there are all sorts of variations orally - a Brooklynite will usually pronouce Long Island as "lon-guyland." A South Carolinian may refer to a "poke" - known to the northerners as a "bag" or "sack." Some oral "codes" utilize various inflections in a single word to convey different meanings, such as that used in the Chinese languate. Of course, even in English we do this - every mother knows that a child addressing her as "mother" may use half a dozen inflections - conveying thoughts or feelings of anger, humor, impatience, fear, sadness, etc. In the written word many languages use additional "codes" to indicate a change in pronounciation, such as the "umlaut" over the letter "o" in German which flattens the sound, and the "tilda" over a Spanish "n" to indicate it has a "nyeh" sound.

Well, from a telecommunications standpoint, in 1837 Morse and Vail collaborated on a telegraphic code made up of dots and dashes. But, it really was not very well thought out . . . seven years later they revised it giving the most commonly used letters the shortest signals. Then reception was carried out by visually reading an inked strip of paper on which appeared the dots and dashes. Interestingly enough, some years passed before operators discovered they could decipher the signals much faster by ear by listening to the solenoid operating the pen. Thus the "sounder" was born. But in Europe telegraph systems developed with the use of the English "needle telegraph" invented by Cooke and Wheatstone. The existing Morse code with some of its letters (C, O, R. Y. Z) having spacing within the letters themselves was not suitable as a code for this device. Just who in Europe developed the "International Code" (still used today) seems lost in history but all telegraphic communications outside America employed it*, including "wireless" when it came into being. The American Morse code was as distinctly American as apple pie and baseball and it continued to be used on all telegraph lines (WU, Postal, Railroads, Press, etc.) until the gradual replacement of Morse by the teleprinter. Some non-European countries developed special codes for their telegraph systems to accommodate their own alphabets--notably Russian, Japanese, Arabic, Greek and Turkish. With the old American Morse code and its spacing within letters, sloppy senders and/or receivers sometimes produced weird messages for the addresses. One famous text was received by the addressee as "COG HOG TO ROG JAGS IS NOT 100" instead of "COME HOME TO ROME JOE IS NOT WELL." (Credit to Dick Hilferty.)

*Perhaps American Morse Code should really be termed "North American" since it was also used on lines in Canada and Mexico growing as extensions circuits from the U.S.

Then there was the old Morse "Number Code" to conserve time and space. Each represented not just a word but a complete standardized sentence. Not all remained popular but the following were in general use some 40 years ago:

4 - Where was I? (Used after an interruption or when the sender lost his place.)
9 - Wire Chief Calling. Drop everything and do what I tell you.
13 - Do you understand?
17 - The following is for all stations on the line.
25 - I'm busy now; call me later.
30 - That's all for today (or tonight). *
73 - My best regards to you. *
95 - The following is very urgent.



Thanks to Leslie Funston - 1903-V

*Contrary to views in the past as to how 30 and 73 originated some old timers claim that the old number code gave birth to them.

Old Morse operators, when the receivers wrote in a fast scrawl, ran at about 22 words per minute. Speed increased considerably when the receiving operators began using typewriters, known only as "mills" in those days. The telegraphers' handwriting was very distinctive - young men imitated the old. It was called "telegrapher's script." Thomas A. Edison's famous signature was a classical example.

ODE TO CODE—Don de Neuf

After the introduction of the typewriter in telegraphy●Walter P. Phillips, who headed the Associated Press Washington Bureau from 1879 to 1882 devised a set of abbreviations for speeding up telegraphy - especially press messages - which immediately became known as "The Phillips Code." APC stood for appreciate. PLS for Please. XNL was constitutional, XXN cross-examination, etc. etc. POX stood for police. There some comical blunders were committed when operators allowed their minds to wander. One AP operator in Florida turned out a bulletin which read "Small police had broken out in one part of the state."●●

International telecommunications introduced a number of different operating codes. There were five letter codes using pronouncable words such as WAJIV for "Give better attention;" SIZIZ for "second request;" SOCUR for "third request," etc. GUHOR meant "You are fading badly." Then there were a whole set of "Z" signals for operating purposes - "ZHC" for "How are receiving conditions," "ZOK" for "Receiving OK," "ZLS" for "Lightning storm here." ZSF meant "send faster" of course, and ZSS "send slower." Although almost all transmission was by means of punched paper tape, reception was either by ear or visually by undulator tape, depending upon the quality of received signals. Contrary to the much earlier development where operators found they could copy by ear faster than by deciphering the inked tape, such was not the case on undulator tape as against aural reception. Highly skilled operators could copy visually, on a typewriter of course, undulator tape at speeds of 70 wpm when the language was plain text (not five or ten letter "code"). *

Here again was another set of codes used by businessmen to reduce the number of words in an international telegram, because there was a special rate per word for recognized commercial business five letter codes, which was less than plain English. For example one code book carries the 5 letters EPUSD which meant "We can not deliver the exact material you request at the present time but offer to you the following substitution."

*Undulator tape employed a continuous inked line which moved upward with the presence of a signal forming visible dots and dashes on the top. This was quite different from "cable tape" recorders used on underseas cable circuits . . . here the "no signal" condition kept the pen in the center of the tape. + DC current was used for dots which caused the pen to rise above the center line, whereas for dashes a negative DC current pulled the pen below the line. Visually it was quite a different "language."

The Citizens Band reveals all kinds of weird distortions of established signal codes. A standard police code "10-4" means "message received OK." You'll hear a CB operator saying, "That's a big 10-4" when he presumably means "I agree with you." The funniest to me are the ones who sign off with "threes and eights to you" - presumably derived from 73 and 88, in some fashion but I'll bet few of them know what 88 used to stand for!!!

--D. K. deNeuf

Add the following(insert per legend as marked):

● but it was adopted at the Austro-German Telegraph Conference held in Berlin in 1851.

● in 1884.

● An important increase in telegraphy speed came along in 1904 ● when the semi-automatic sending machine or "bug" became an important tool to the telegrapher. The combination of the typewriter, the Phillips Code, and the bug increased manual telegraphic speeds to 50 or more words per minute.

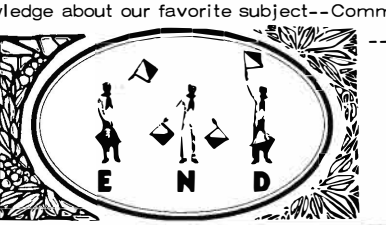
(Corrections by Author Don deNeuf)

Author and contributor DONALD K. de NEUF, SOWP Charter Member 117-P has had a very distinguished career in Tele-communications since taking his first assignment on the Matson Liner SS LURLINE/WML back in 1925. Following a career at sea on some of our larger ships, he held many important assignments shoreside, becoming President of PRESS WIRELESS, INC. He has been decorated by foreign governments for his humanitarian efforts. He has also received many awards and citations for his outstanding ability and knowledge of the communications field and ability to 'get things done'.

He was one of the early holders of the coveted "Pink" Ticket (Number Four) and one of the few (if any) Americans who were ever issued an operators license by the Cuban Government.

The above photograph shows Don, circa 1925 on duty handling a 'hot' job on the SS MATSONIA/WMP on the run from S.F. to Honolulu. Traffic was always heavy on WMP and WMR (SS Maui - Sister Ship). We served as primary relay stations - collecting traffic for RCA (KPH and KSE in those days when competition was very keen. 'Ye Ed' should know as he preceded Don by five years at the key of WMP. We are sure our members will enjoy these fine contributions by "Don" from his store of knowledge about our favorite subject--Communications.

--W.A.B.



POUNDING BRASS

Out of pounding brass, there comes a spark.
For many a soul, it was a lark.
This shuffle of life we call a game,
Some make for themselves a name.

Some brave souls stay at the keys,
On tossing ships on high seas.
Coaxing their spark to survive,
Because on it depends many lives.

Under adversities they do their work,
Never for a moment, known to shirk.
So, out of the shuffle of life, we call a game.
Some do make themselves a name.

Now they reap, where they have sown.
They go down in history not unknown.
Known, for many a worth while deed,
For they have sown precious seed.

Laura E. Bartlett

Box 33 - A