

EXTRACT FROM LIEUT. PAYNE'S REPORT ON THE WIRELESS TELEGRAPH MESSAGES
FROM POLDHU DURING THE BALTIC CRUISE OF THE CHANNEL FLEET.

Wireless tele-
graphy messages
in Baltic cruise.

Advantage was taken while the Fleet was at Ymuiden (distance from Poldhu, 400 miles), where signals from Poldhu could be received both by day and night, to carry out the following experiments:—

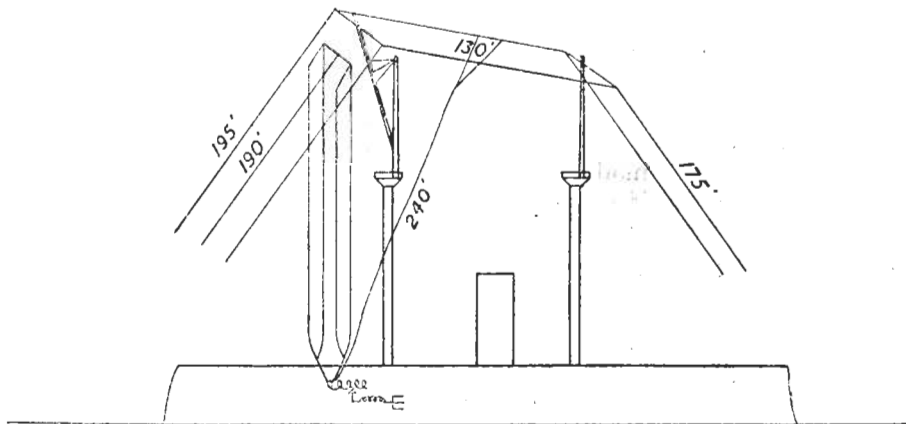
- (1) To ascertain the best form of aerial wire for loudest signals.
- (2) To ascertain the effect of the triatic and fore-topmast stays on the reception of messages.
- (3) To find the best arrangements of receiving circuit for cutting out atmospherics.

(1) Six aerials were tried, and their respective values ascertained by the range of the number of turns of the tuner through which signals could be heard.

The different aerials were:—

- (i.) A fourfold.
- (ii.) A double roof with the ends separate.
- (iii.) A double roof with the ends joined.
- (iv.) A fourfold and the roof combined.
- (v.) A fourfold with an additional tail to the stern.
- (vi.) The same with ends connected.

FIG 3.



The result of these experiments were that aerial (v.) was found to be the best, and that there was no advantage to be gained by joining the ends.

(2) "With the triatic stay down, signals were stronger than with it up," but "no difference could be detected in the strength of signals with the fore-topmast stays set up, or cased in up and down the mast. This was confirmed on several occasions. . . ."

(3) "The $\frac{1}{2} \lambda$ method was used on most occasions."

General Remarks.

Distances at which messages were received.

By day, 600 miles was the greatest distance at which a message was read, and at this distance signals were very weak indeed.

At night signals were greatly interfered with by atmospherics, which, as a rule, commenced about sunset and got stronger up to midnight, then gradually cleared off, so that by sunrise they had disappeared. Off the north coast of Denmark atmospherics seemed to be particularly strong; this was noticed both going and returning.

When there were no atmospherics, signals were so loud that they could be read with the listener a couple of inches from the ear, so that the limit of distance by night under favourable conditions was not nearly reached.

Signals were weaker on a bright moonlight night than on a dark cloudy night. The effect of the Aurora Borealis was to entirely fog signals.

"VERNON'S" REMARKS.

This report is most interesting, and the details have been carefully noted. With regard to the best aerial, it is noticed that the aerial with the greatest amount of wire proved the best. It is possible that this aerial lent itself to interference from atmospherics more than others, but no data is to hand to show this. The fact that the topmast stay had no effect is very important. It tends to show that the screening effect of stays is due to inductive and not to electrostatic effects. With regard to the cutting out of atmospherics, the $\frac{1}{2} \lambda$ method, as applied to the Service in general, does not appear to have met with the best success. In this case, with an expert, it is successful. The tuned shunts will, it is hoped, overcome to a great extent the atmospheric difficulty.

Long-distance Reception.

From reports received from the Battle Fleet and 2nd Cruiser Squadron of the Atlantic Fleet, it appears that, during the hours of darkness, messages may be received from Poldhu up to 1,000 miles, with land intervening. From reports received, it is impossible to tabulate the results, as the information is not sufficiently uniform in character. This difficulty will probably be overcome by the introduction of a special form requiring the necessary details to be entered on it. The failures to receive were mainly due to two causes:—

- (1) Daylight effect.
- (2) Atmospherics.

With regard to (2), failure was apparently due to lack of experience on the part of the operators, as the "Majestic" found that, with increased practice, atmospherics hardly ever interfered sufficiently to prevent signals being received.

EXTRACT FROM REPORT ON WIRELESS CYPHER TELEGRAMS RECEIVED DURING BALTIC CRUISE OF CHANNEL FLEET.

On August 22nd the "Exmouth," "Duncan," and "Russell" were ordered to fit roof acrials under the direction of Lieutenant Payne, of "Duncan." The ships already fitted with roof acrials being "Prince George," "Albemarle," "Cornwallis," "Montagu" and "Dido." Orders were given to all ships so fitted to look out for cypher messages from Poldhu every night about midnight. Owing to very strong atmospherics nothing intelligible was received until the morning of the 24th, when both the "Exmouth" and "Duncan" received the ordinary press message, but no cypher. On the morning of the 25th, broken signals were received by "Duncan," and on the 27th the "Prince George" received the cypher message which commenced at 1.15 a.m., the telegram not being intelligible.

On the morning of the 28th, at Swinemunde, 780 miles, "Exmouth," "Prince George" and "Duncan," all received both the press and cypher messages.

On receipt of the telegram from the Admiralty, ships were ordered to look out for the cypher from 1 a.m. till 3 a.m., instead of as previously.

On August 29th (?) the cypher was received by "Exmouth," "Prince George," "Duncan," "Cornwallis" and "Dido," a message to the Commander-in-Chief, Atlantic Fleet, was also received.

On August 30th the cypher was received by two ships only.

On August 31st and September 1st both press and cypher messages were received by most ships; but on September 2nd, at Neufahrwasser, the atmospherics prevented any ships from receiving. On the 3rd the "Duncan" only received part of the cypher, atmospherics blocking the remainder. On the 4th three ships got the cypher correctly, distance 940 miles.

From this date until the 13th both press and cypher messages were received by nearly all ships.

On the 13th atmospherics intervened, but signals were again read on the 14th.

"VERNON'S" REMARKS.

This experiment cannot be said to have started fairly until one message had been received, viz., on the 28th. Including that date, 18 messages were sent; of these 15 were received by one or more ships in the Fleet. This report shows:—

1. The need of tuned shunts, which will lessen considerably atmospheric effect.
2. That while there is no certainty, the probability of an Admiral within 1,000 miles of Poldhu receiving a cypher message intended for him is distinctly good.

It is suggested that the practice of sending cypher messages should be continued.

The following information was extracted from a report by the Commander-in-Chief of the Atlantic Squadron, dated 2nd October 1905:—

The Admiralty sent five cypher telegrams to the Atlantic Fleet on the nights of the 26th, 27th, 28th, 29th, and 30th August. On the 26th and 27th the Fleet was at sea, on the other days in harbour at Porto Santo.

On the 26th the telegram was missed, though nearly all of it was received by the "Majestic."

On the 27th the "Magnificent" and "Commonwealth" received the whole telegram.

On the 28th the "Majestic" and "Commonwealth" received the whole telegram.

On the 29th and 30th the "Majestic" received the whole telegram.

Extract from Remarks by "Vernon" on above.

"There is no certainty that a cypher message sent by the Admiralty to the Commander-in-Chief of the Atlantic will reach its destination, but the chance of its going astray is not more than 1 in 5."

EXTRACT FROM REPORT ON INSTALLATION AT PORT BLAIR.

Port Blair.

The Commander-in-Chief, in a covering letter to the Report, calls attention to the fact that this wireless telegraphy installation between Port Blair, Slipper Island, 170 miles, and Port Blair, Diamond Island, 300 miles, might be of considerable importance in war time and ought, therefore, to be placed under Government control.

Sub-Lieutenant M. K. H. Kennedy, of "H.M.S. "Proserpine" was ordered to inspect the station at Port Blair and forward a report.

System used, Lodge-Muirhead. Installed 1903, and working uninterruptedly ever since.

ABSTRACT OF REPORT ON PORTABLE STATIONS (MARCONI COMPANY) BY LIEUT. CRAWLEY, R.M.A., H.M.S. "VERNON," DATED 16TH DECEMBER 1904.

The Company has at present no standard portable station. Experiments have just been started with a horizontal aerial 120 feet long, 25 feet from the ground.

The following particulars refer to the latest portable station designed by the Company.

Transmitting Circuit.

A roof aerial consisting of wires in the form of the diagonals of a square is used with a feeder from the centre. Bamboo poles about 20 feet high are used to support the roof. The poles weigh about 1 lb. per foot, and can be disconnected in the centre for convenience in transit.

An oscillator using 9 Leyden jars is used. The wave length is about 1,000 feet. The power consists of 8 one-cell accumulators on two coils in series, or 1½ h.p. oil engine driving a small alternator. The "earth" consists of wire nettings or 12 iron sheets 5 feet by 3 feet. One man can carry six sheets.

Receiving Circuit.

The usual pattern receiver with a specially designed jigger, but "B" jigger can be used; 30 miles is the greatest working distance. A covered four-wheeled cart is used for transporting the gear and forms the wireless telegraphy office.

EXTRACTS FROM REPORT ON THE POST OFFICE WORK CARRIED OUT BETWEEN
ALDERNEY AND PORTLAND BILL.

1. Work was commenced at 5 p.m. on the 5th September and ceased at 4 p.m. on the 14th.
2. 139 messages were transmitted from Portland to Alderney and 230 from Alderney to Portland.
3. It was found that the accumulator batteries ran down.
4. No other work was done, and the visual watch had to be entirely separated from the wireless watch.
5. All the work was done on "B" tune, "A" proving unsatisfactory for some unknown cause.

EXTRACT FROM REPORT OF WIRELESS TELEGRAPHY OPERATIONS CARRIED OUT BY
"DONEGAL" WITH 3RD CAVALRY BRIGADE AT RUSH CAMP.

The object of the experiments was to ascertain how far wireless might be usefully employed by cavalry brigades.

First station was erected at Rush Camp, 4 miles from Donegal. Usual instruments with "B" jigger and box being placed in a bell tent. Aerial consisted of Pattern 600 doubled, 180 feet in length, attached to spar lashed on a tree 40 feet above ground. Earth consisted of two plates, combined area 17 square feet, buried 6 feet deep and kept moistened.

Two sets of accumulators were used throughout, one set being sent to "Donegal" each night for recharging. Results at first station were very good, and station working within eight hours of leaving "Donegal."

Second station at Barry bog-hill, 12 miles from Donegal. Aerial 120 feet double (Pattern 600), 60 feet from ground. Earth as before, buried in mud 12 inches deep, at bottom of small running stream. Good results.

Third station, a little further in. Failed to communicate. Earths resting under 4 inches of water on stony bottom. Position entirely enclosed.

Fourth station, still further in. Again failed. Earth in pond in a slate quarry. After that earth was shifted to a horse pond, but with no result.

Fifth station at Ashbourne, 18 miles distant and in view of ship. Earth 4 feet deep in running water. Results were a failure. This was afterwards found to be probably due to "Donegal's" failure to obtain a spark that day.

The results obtained apparently held a direct connection to the type of earth available, running water giving the best results.

A two-wheeled squadron cart was found amply suited to carry 10-inch coil, "B" tune, accumulators, and "M" type Obach for recharging.

"VERNON'S" REMARKS.

It is not clearly stated, but it appears that plain aerial was used ashore. The aerial being 180 feet long, the wave length must have been about 720 feet; this is rather short for work overland, and it is expected that better results would accrue if an inductance were placed in the foot of the aerial, and "B" jigger and magnetic detector used.

The remarks on earths are valuable. It is a pity that there is not more practice in wireless telegraphy between the two Services.

At present the Army have a totally different system to the Navy, and our agreement with the Marconi Company prevents us from giving them any information. Doubtless they have a similar agreement with Lodge-Muirhead Company.

If wireless telegraphy communication were now required between land and sea forces, it is not available for any great distance.

It is suggested that the matter might be brought before the Imperial Defence Committee and some arrangement come to whereby the two Services would have the benefit of both systems, and the efficiency of the country's armed forces would not suffer due to patent rights of private individuals.