INTRODUCTORY REMARKS ON THE WIRELESS TELEGRAPHY APPENDIX.

The Wireless Telegraphy Appendix has this year been printed as an appendix in order to be able to insert in it confidential reports of great interest to the Service which would otherwise have had to be excluded.

The agreement recently concluded with the Marconi Company has enlarged our acquaintance with the subject, and perhaps the most interesting outcome has been the introduction of Marconi's "A" and "B" tunes.

These tunes principally differ from the Service method in the sending arrangements.

Instead of causing the spark to take place between the aerial and earth, which is our ordinary arrangement, and is technically called "plain" working, the spark is here made in a circuit containing the primary of a transformer and a condenser, whilst the ends of the secondary of transformer are connected to aerial and earth respectively, and the two tunes are made by varying the turns of the transformer and the capacity of the condenser.

The receiving arrangements are practically identical with our own, except that the turns on the jigger are modified to suit the two senders.

Results.

As far as our experience goes at present it appears that—

(1.) "A" and "B" do not interfere with each other at all except at close ranges (say, five miles).

(2.) "A" and "B" both interfere with "plain."

(3.) "Plain" interferes with "B" but not with "A."

(4.) "A" is much affected by land or any screening, but will signal about 80 to 100 miles at sea.

(5.) "B" is very similar in all ways to "plain," but can be made to signal slightly greater distances than "plain" can.

(6.) "A" and "B" are superior to "plain" in accuracy and speed of signalling.

It will be seen from above that if an enemy chose to signal on either **"A" or "B" tune, we could use the other tune with** comfort; but if he does

not choose to use either, or, in fact, tries to interfere, it is considered that our present "A" and "B" tunes would not prevent him doing so in the very great majority of cases.

In other words, "A" and "B" tunes have not greatly increased the war usefulness of wireless telegraphy. They do, however, increase the output, each is superior to "plain" and they do not interfere with each other, and that means that more practice can be carried out.

The question whether a signal can or cannot be passed through will often be settled merely by the speed and experience of the operators.

"A" tune will probably be introduced throughout the Service, and "B" tune be supplied to shore stations, and to a few ships per station.

WIRELESS TELEGRAPHY APPENDIX.

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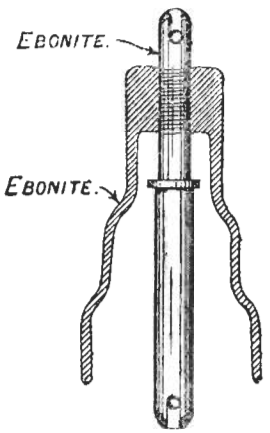
FIG. 1.



Alterations, &c.—Long Insulator—Type shown in Fig. 1 is now approved.

Oil Insulator to Screen—Type shown Plate XXIX. A.R./02 approved.

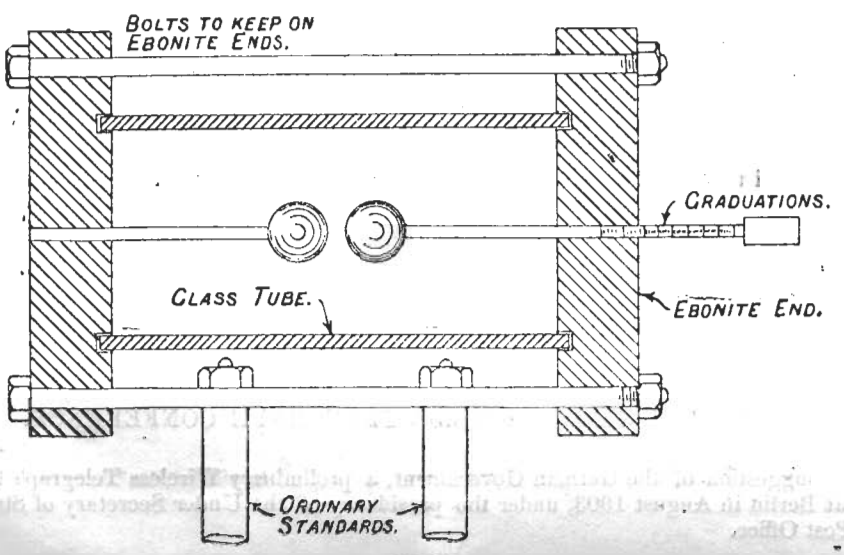
Flexible leads for internal wiring of receivers and for the aerial lead from box to switch, are approved, and replace solid pattern on refitment. (Patt. No.'s 1871, 1872, 1873.)

Submarine Set (*see* Plate I.).—A new receiver box, made as compact as possible, has been designed for the above; for this purpose the inker has been built into at the back, so as to form a closed box; size 13″ × 12½″ × 10″, containing tapper, jigger, relay, and coherer cell.

Pressure to work the tapper is taken off the main accumulators.

Spark-gap Silencer.—It is proposed to introduce a form, as in Fig. 2, which it is found very greatly reduces the noise, indeed, when using a hammer make-and-break, the spark noise is swamped by the noise of the make-and-break.

FIG. 2.



Coils.—There have been several break-downs reported from sea-going ships—in all cases the aerial end of the primary tube perforating under long sparks. The most successful method of overcoming this has been found to be in building up the primary tube of ebonite sleeves so as to make the aerial end the thicker, and compensating for the loss of power thus caused by decreasing the thickness at the earth end.

A very satisfactory form of coil on this principle has been tested in "Vernon."

If, however, an oscillator system is adopted, this method will not do, as both ends would have to be equally strong.

No alteration in coils is therefore going to be made in this respect until the oscillator question is settled.

Should the latter, however, be introduced, they will probably have to alter in other respects, the requirement being the longest spark possible (provided it does not exceed about 1 inch) on a large condenser ($20 \cdot 10^3$ cm.).

FIG. 3.

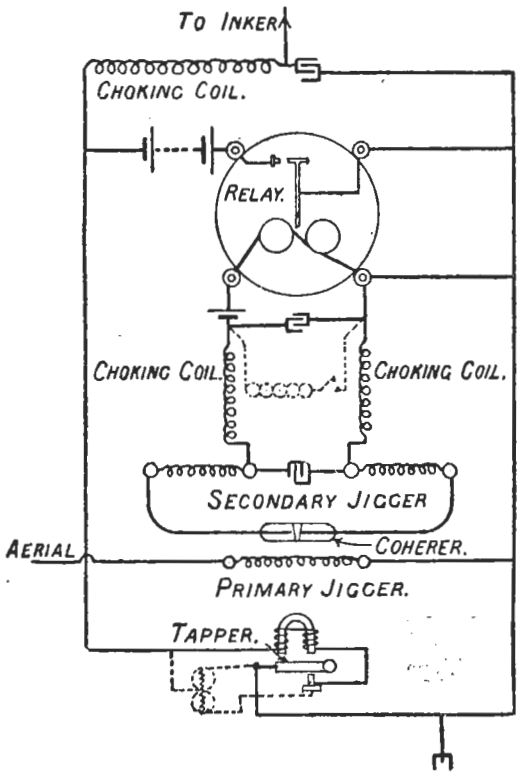


Plate II. and Fig. 3 above, respectively, show the form and diagrammatic connections of the latest Marconi Receiver Box.

MARCONI AGREEMENT.

A new agreement has been entered into with the Company, by which we are entitled to use their inventions and have limited access to Poldhu.

We are restricted to their instruments only in all cases of commercial work; whilst for our own war purposes we may use what we like.

It is believed that the agreement is practically identical with that between the Company and the Italian Government.

It is considered too confidential to further particularise.

RESULT OF THE WIRELESS TELEGRAPH CONFERENCE.

At the suggestion of the German Government, a preliminary Wireless Telegraph Conference was held at Berlin in August 1903, under the presidency of the Under Secretary of State for the German Post Office.

Delegates attended from Germany, Austria, Spain, United States of America, France, Great Britain, Hungary, Italy, and Russia.

The British delegates were :—

J. C. Lamb, Esq., C.B., C.M.G.
J. Gavey, Esq., C.B.
R. J. Mackay, Esq.
Colonel R. L. Hippisley, C.B.
Captain H. L. Heath, R.N.
Lieutenant C. R. Payne, R.N.

The object of the Conference was to propose some general regulations for the conduct of Wireless Telegraphy signalling, especially between ships and shore stations, with a view to forming a basis for an International Conference.

A protocol agreeing with the following resolutions was signed by the delegates from Germany, Austria, Spain, U.S.A., France, Hungary, and Russia :—

"The coast stations shall be obliged to receive and transmit all telegrams from and to ships at sea without respect to the system.

"In order to facilitate communication between the ships and stations as far as possible, all necessary technical information shall be published.

"It shall be the duty of these stations to give precedence to telegrams relating to shipwrecks and appeals for help from ships.

"Tariffs shall be fixed for forwarding communications, which shall be based on the tariff now in force for ordinary telegrams, plus a special charge for the Wireless Telegraphy apparatus, the latter charge being fixed at such a figure that due remuneration is paid for the services of Wireless Telegraphy. Tariffs, in all cases, shall be based on the number of words. The rates are to be fixed with the consent of the country whose flag is carried by the ships, or of the country on which the land stations are."

The protocol was not signed by either the British or Italian delegates.

The British delegation stated that, "while undertaking to submit the foregoing resolutions "for the examination of its Government, it found it necessary to declare that, in view of the "position of Wireless Telegraphy in the United Kingdom, it must maintain a general reserve."

The Italian delegation stated that its Government had signed an agreement binding its stations to the Marconi system for 14 years, and preventing them from exchanging telegrams with stations on other systems.

WIRELESS TELEGRAPHY IN SOMALILAND.

In February 1903 two Wireless Telegraphy parties were landed in Somaliland, one under Lieut. Silvertop, R.N., at Obbia, and the other under Lieut. Crawford, R.N., at Berbera.

Each party consisted of :—

1 lieutenant (T.).
1 W.O. (T.).
1 T.I.
1 man from Telegraph Battalion, R.E.
1 „ „ Balloon Section, R.E.

It was intended that Lieut. Crawford should erect stations at Bohotle and Damot to communicate with similar stations erected by Lieut. Silvertop at Badwein and Galkagu. Each party was divided into two sections, which were fitted out as follows :—

Contents.	Weight.	No. of Cases.
	Lbs.	
8 Obachs (M type)	96	8
Coil, complete	125	1
Receiver box, complete	85	1
Box coherers, inker, tape, ink, signalling key, buzzer, jigger, 3 Obachs (Q), 8 insulators, 50* of Pattern 733.	102	1
Tinfoil, 100* of Pattern 600, 20* Pattern 779 A, Menotti, hammer, spunyarn	110	1
½ lb. of 42-gauge wire, ¼ lb. of 25-gauge, screwdrivers, pliers, tape and solution, india-rubber, screws, condenser, signal log, stationery, &c.	112	1
Accumulators	112 (each).	2
2 balloons and gear	98	1
1 kite case	70	1
Earth plate (300 square feet)	65 (each).	2

Also :—1 tent with pole, &c., jar of sulphuric acid, picks and shovels, Willesden Paper, 8 gas cylinders.

At the base were :—

56 M-type Obachs, sulphuric acid, gas cylinders, 1 case of spare gear.

The aerial wires used were :—

(1.) Bare steel piano wire.
(2.) 7 strands of 22 gauge, insulated.

Transport for each Section.—The minimum number of camels was 11, each carrying 2 cases. This gave a load of about 200 lbs. per camel, but in the very hot weather the loads had to be reduced to about 160 lbs. each. For kits, rations, &c., 3 more camels were required.

Result of the Expedition.—On the Bohotle side, good signals were received at Damot from Bohotle, 45 miles, though at Bohotle difficulty arose in obtaining signals from Damot.

On the Obbia side, good signals were exchanged between Dibit and Lodobal, 35 miles, using a kite and 270 feet aerial at the former, and an aerial of 400 feet (200 feet thick wire and 200 feet thin wire) at the latter.

It was never possible to attempt to carry out the object of the expedition, as the Obbia column had not sufficient transport to get within signalling range of the Bohotle column.

Remarks.

Transport.—It was exceedingly difficult to obtain adequate transport for the apparatus.

Balloons.—Balloons proved of little use except in a flat calm. The material of the balloons was rapidly perished by the great heat of the sun. The gas for filling balloons was another drawback, as it required considerable transport.

Kites.—The wooden kites used were very easily broken. Flying an aerial by a kite proved to be extremely difficult, and entirely dependent on a favourable wind.

Aerial Wires.—The piano wire was excellently light, but apt to kink and break.

The insulated wire used was good with a balloon in a flat calm, but was too heavy in a wind.

Coil.—The coils, being apt to get broken, proved a constant source of anxiety.

In transport, the coil and condenser should be separated, as when together the load is too heavy for a camel.

The accumulators, dry cells, and receiver boxes proved efficient and gave no trouble.

Earth Plates.—The earth plates consisted of sheets of tin 2 feet 5 inches by 1 foot 7 inches. 300 square feet of these plates made a satisfactory earth.

The best arrangement was to place one or two plates in a well not more than 20 yards from the instruments, and to bury the rest not more than 3 feet deep, keeping them wet, and using layers of charcoal if possible. The earth wire was joined to the centre and the four corners.

Camels.—A Somali camel, at its best, will carry 320 lbs. arranged in a suitable and not too compact form, and is capable of doing 20 to 25 miles a day for about a month, after which time its condition falls off and a rest is needed. If not properly treated, its carrying power falls off to as low as 160 lbs., shortly after which it collapses altogether. The average pace of a camel is 2½ miles per hour, including halts. If when on the march a camel sits down, it means that he can go no further, and if after being loaded he refuses to get up, it is almost certain that he is overloaded, as a well trained camel will hardly ever refuse from laziness. The Somali camel lives entirely on the country, eating grass, leaves, branches, &c.

Whilst on the march 7 hours a day for grazing should be allowed.

Camels should be watered if possible every day, but can continue for about five days without water without impairing his strength.

The loading up of the camels is extremely important. It takes about an hour (one man to three camels) and should on no account be unduly hurried, or sore backs, necessitating complete rest, will develop.