

*W. F. Geo. Jackson*  
**WIRELESS TELEGRAPHY**

*28/11/13*  
**INSTALLATIONS SPECIALLY DESIGNED FOR RECEIVING THE  
TIME SIGNALS**

from the Eiffel Tower (Paris Observatory) and Norddeich (Wilhelmshaven Observatory).

According to the new arrangements of the International Time Service, inaugurated 1st July, 1913.

---

**THE  
HOROPHONE**

consists of a complete set of instruments necessary for receiving wireless messages. The apparatus is mounted on a handsome polished hardwood board in a very small compass, and all that is required is an aerial wire and a connection to earth. If the user is accustomed to the Morse Code, wherever he may be in the British Isles, he can also with this simple equipment listen to the Weather Reports and other news despatched from Paris, Norddeich, and similar high power Stations within a radius of 800 miles. A license from the Postmaster-General should be applied for. We will give advice as to erection of the aerial and all necessary assistance in filling up the application form.

---

The word "HOROPHONE" is registered as a Trade Mark by  
**THE SYNCHRONOME COMPANY LIMITED,**

32 & 34, CLERKENWELL ROAD, LONDON, E.C.

F. HOPE-JONES, M.I.E.E. (Managing Director)

Specialists in all Applications of Electricity to Horology.

## Programme of Wireless Signals Despatched from the Eiffel Tower, Paris.

(Corrected to October, 1913.)

Ordinary Time Signals, 10 a.m. and midnight. Time Signals according to the old code are still being despatched from 10.44 to 10.49 a.m.

Scientific or Rythmic Time Signals, preceding the midnight Time Signals.

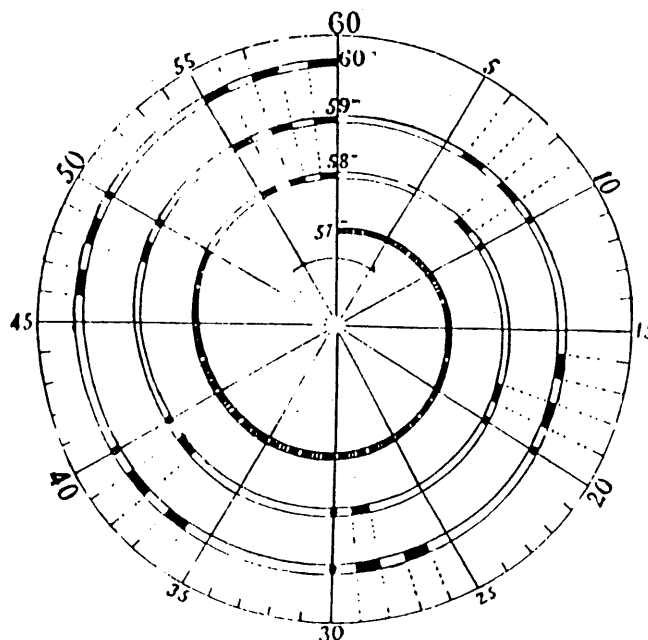
Two Weather Reports, one immediately after the morning Time Signals, and one at 5 p.m.

Experimental Signals, for the benefit of those studying the variation in strength of signals received, sent twice a day immediately preceding the ordinary Time Signals.

---

### International Service of Time Signals.

The International Service of Time Signals is shown in the following spiral diagram. From the end of the 57th minute of the hour, warning signals are sent out consisting of the letter X (---) repeated for fifty seconds, followed by silence for five seconds, after which the first time signal is given.



consisting of three dashes each lasting for one second, separated by intervals of one second. Thus the end of the third dash coincides precisely with the end of the 58th minute. Afterwards the letter N ( · · ) is sent every ten seconds, followed by the second time signal, and finally a series of G's ( — ) followed by the third time signal, the last dash ending precisely at the hour. These signals will be sent out from the Eiffel Tower daily at 10 a.m. and midnight, with a wave length of about 2,500 metres, and from Norddeich at mid-day and 10 p.m. Greenwich Mean Time is of course referred to in both cases, France having adopted our meridian in March, 1911, by dropping 9 minutes, 21 seconds.

---

## RYTHMIC SIGNALS.

If greater accuracy in the determination of time is required than can be obtained by the ordinary time signals, the rhythmic signals or "clock beats" transmitted from the Eiffel Tower at 11.45 to 11.50 p.m. will enable the time of any clock to be compared to within one-hundredth part of a second. The signals consists of 300 short dots (the 60th, 120th, 180th and 240th being suppressed to facilitate counting) regularly spaced at intervals of .98 seconds apart. By listening to these beats and at the same time to the beats of the clock or chronometer to be compared, it is easy to note the exact times at which coincidences occur and at which beats. The precise times of the first and last rhythmic signals are given shortly after midnight in the form of two groups of 6 figures, as for example: 450815, 500117, repeated thrice, indicating that the first and last signals were sent out at 45 min. 8.15 secs. and 50 min. 1.17 secs. respectively. By this means also a ship can ascertain its longitude with a precision hitherto unattempted, and although such a high degree of accuracy is not often required on land, except for surveying purposes, it is highly appreciated by anyone who is keen on the accurate measurement of time.

## THE HOROPHONE.

Comprising double slider Inductance, Crystal Detector, Variable Condenser, Battery, Buzzer, 2,000 ohm single head-gear Telephone, Hook for chronograph watch, aerial and earth terminals.

Price £6:16:6.

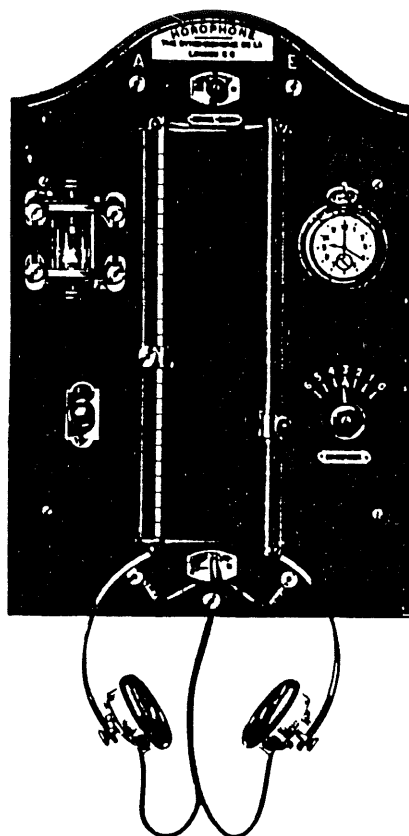
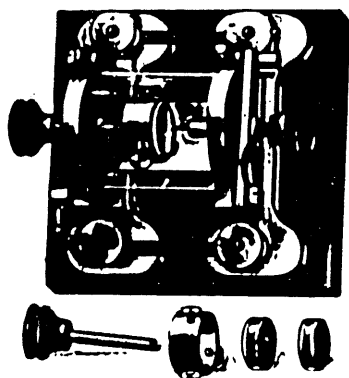
Price with double head-gear  
Telephones - £7:10:0.

Price with Chronograph  
Watch - £9:0:0.

Neatly mounted and joined up ready for use on a polished walnut board suitable for hanging on the wall, 18 in. high x 12 in. wide.

### CRYSTAL DETECTOR,

as supplied on the above, is fitted with two substantial aluminium castings, mounted on the base by four screws. A cup with three screws is provided for holding the Crystal, and a brass point selector, perfect selection being obtained by means of the locked ball and socket adjustments. A glass cylinder encloses the crystal and point, and the whole detector can be taken to pieces in a few seconds by simply loosening the fixing screws. The crystal supplied is prepared by a special process and will be found very sensitive and easy of adjustment. No local battery is required, in fact applied E.M.F. renders it less sensitive. Other crystals can of course be used if desired.



Price complete with Crystal 18/6.

## WEATHER REPORTS.

The Morning Weather Report from the Paris Bureau Central Meteorologique (B.C.M.) is sent immediately after the Time Signals according to the following code :

R. Reykiavik (Iceland).	C. La Corogne (Spain).
V. Valentia (Ireland).	H. Horta (Azores).
O. Ouessant (Ushant, Brittany).	S. St. Pierre & Miquelon (Newfoundland).

Each letter is followed by a group of 7 or 8 figures, of which :

1.2.3. Represent height of Barometer in m.m. after adding 700.

*It is rarely that the tens will be less than 3 or more than 7.*

4.5. Represent Direction of Wind (See Table A).

*The first of these figures can only be 0, 1, 2, or 3.*

6. Represents Force of the Wind (See Table B).

*Double these figures and you will get the speed of the wind  
in metres per second.*

7. Represents State of the Sky (See Table C).

8. Represents State of the Sea (See Table D).

*These figures are usually the same as those indicating the  
Force of the Wind.*

Omissions are represented by the letter X (-...).

TABLE A.

DIRECTION OF THE WIND.

0 2 ... N-N-E	1 8 ... S-S-W
0 4 ... N-E	2 0 ... S-W
0 6 ... E-N-E	2 2 ... W-S-W
0 8 ... E	2 4 ... W
1 0 ... E-S-E	2 6 ... W-N-W
1 2 ... S-E	2 8 ... N-W
1 4 ... S-S-E	3 0 ... N-N-W
1 6 ... S	3 2 ... N

TABLE B.

FORCE OF THE WIND.

		Speed Corresponding
0. Calm	...	0 to 1
		Metres per Second
1. Light air	...	1 to 2
2. Light breeze	...	2 to 4
3. Gentle breeze	...	4 to 6
4. Moderate	...	6 to 8
5. Fairly strong	...	8 to 10
6. Strong	...	10 to 12
7. Very strong	...	12 to 14
8. Gale	...	14 to 16
9. Hurricane	...	above 16

TABLE C.  
STATE OF THE SKY.

0. Fine
1. Slightly cloudy
2. Cloudy
3. Very cloudy
4. Overcast
5. Rain
6. Snow
7. Misty
8. Fog.
9. Storm

TABLE D.  
STATE OF THE SEA.

0. Calm
1. Very smooth
2. Smooth
3. Slight
4. Moderate
5. Rough
6. Very rough
7. High
8. Very high
9. Phenomenal

In addition to weather reports of the six meteorological stations mentioned above (which are transmitted slowly to facilitate de-coding) there follows in ordinary language, first, some indication of the general atmospheric conditions in Europe; secondly, groups of 7 or 8 figures according to the same code for Western Europe, from Paris, Clermont-Ferrand (C) Biarritz (B), Marseilles (M), Nice (N), Algiers (A), Stornoway (SY), Shields (SH), le Helder (HE), Skudesness (SK), Stockholm (ST), Prague (P), Trieste (T), Rome (R); thirdly, general forecast of sky and wind for France, and fourthly, force of the wind at the Eiffel Tower at 7 a.m. and forecast of its force in the evening.

The Evening Weather Report, sent at 5 p.m. is supplementary to that sent out in the morning and gives a more precise forecast for the following day. It consists, first, of 8 groups of figures according to the same code as the Morning Weather Report, from Paris (B.C.M.), Brest (BR), Biarritz (BI), Nice (N), Valencia (V), Skudesness (S), Rome (R), La Corogne (C); secondly, forecast of barometer and weather; thirdly, the force of the wind at the Eiffel Tower at 4 p.m. and probable force on the following morning, and fourthly, an indication as to whether the conditions are settled.

## EXPERIMENTAL SIGNALS.

A very wide field is open for experimental work in Wireless Telegraphy, and a Committee of the British Association has been formed to organize such work, and in particular to investigate such phenomena as the influence of sunrise and sunset, of daylight and darkness, and of meteorological conditions on the propagation of electric waves over long distances, and the relative intensity with which they are received.

The experimental signals are intended to assist in these investigations, and are invariably transmitted with the same power and wave length, which is also the same as that used for the Time Signals. They are sent at 9.52 a.m. and 11.52 p.m., and consist of six dashes each lasting 5 seconds, separated by intervals of 5 seconds, and preceded by three call signals ( )

## How to Adjust and Use the Horophone.

---



FOR the benefit of those unacquainted with wireless apparatus we give the following hints as to its adjustment and operation: The instrument should be erected on a wall free from vibration and preferably in a room where one is not likely to be disturbed by noise. Having joined up the aerial and earth wires to the terminals at top of board marked A and E respectively and withdrawn the plug in the centre, place the telephones over the ears and proceed to adjust the detector as follows:

Loosen the two small clamps on the top and bottom of the crystal detector (on the left of the instrument) about half a turn and manipulate the little vulcanite knobs until the pointed end of the spiral brass wire is resting on the crystal in the cup. Now press the button on the case underneath the detector and operate the buzzer which acts as a very weak transmitter of electrical waves, and if the detector is in adjustment, a loud buzzing will be heard in the telephone. Failing this, move the point of the brass wire over the surface of the crystal until a sensitive spot is found, then regulate the pressure of the point until the sound is loudest, clamping it up again when the best result has been achieved. Some parts of the crystal are more sensitive than others and can only be found by trial.

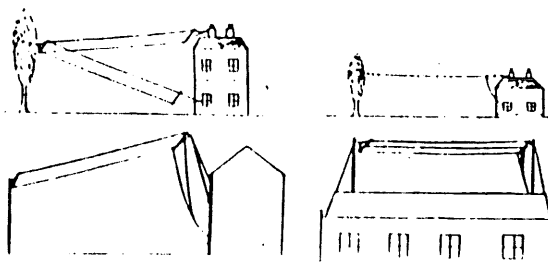
Those unaccustomed to wireless apparatus will do well to commence with the Eiffel Tower signals. With a fairly long aerial the position of the sliders on the coil will be approximately as shown in the illustration, the shorter the aerial, the lower down will be the sliders, but the correct position must be found by moving them up and down until the signals are sharpest. They can then be still further strengthened by adjusting the variable condenser.

When the apparatus is finished with, never forget to replace the plug at the top of the board. This connects the aerial direct to earth and protects the instruments from lightning.

## AERIALS.

An elaborate or lofty aerial is not essential for receiving the Paris and Norddeich Time Signals. Paris can be heard quite well on a single wire, 20 or 30 ft. long at a height of 20 ft. or so above the ground, but the loftier and longer the aerial the louder will the signals be and it is preferable to use two or three wires in parallel instead of one. It is often possible to dispense with a mast altogether by making use of a neighbouring building or a tree or a couple of short poles can be attached to chimney stacks if far enough apart.

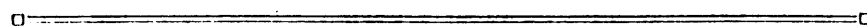
Effective insulation of the aerial is desirable, and care should be taken that the leading-in wire is kept clear of any buildings, iron gutter pipes or stay wires. The following sketches will serve to suggest some simple forms easy of erection.



**MATERIALS FOR AERIALS** will be quoted for on application, and

we will advise intending purchasers of the Horophone as to the design of a suitable aerial if dimensioned sketches of the premises and surroundings are submitted with questions.

**CONNECTION TO EARTH.** A really good earth connection is essential and can usually be obtained by soldering a wire on to a water pipe, preferably where the main enters the premises instead of higher up where taps may intervene. The gas pipes should not be used for earthing purposes, but they are often successful as a substitute for an aerial, at any rate in the Southern and Midland Counties.



**THE SYNCHRONOME COMPANY LIMITED**

32 & 34, CLERKENWELL ROAD, LONDON, E.C.

Telephone No Holborn 4643.