INFORMATION *re* FOREIGN SHIPS AND STATIONS.

Extracted from the Returns of intercepted Signals sent in by the Naval Shore Stations.

French fleet.

Until recently the French Fleet did not appear to have any regular procedure, and usually signalled "en clair."

In March 1909, two ships were working together at night from Brest to Toulon on a 1,000-foot wave and also much more feebly on a 1,200 foot wave. They seemed very pleased and surprised with the results.

Eiffel tower.

The Eiffel Tower and French ships now use more code in their signalling. A code consisting of five-figure groups is most common. This is referred to as "Chiffre Z." A very long preamble is used.

In July 1909 the Eiffel Tower commenced experiments with a musical note, a revolving gap being apparently employed. The station now uses the musical note regularly.

French shore stations.

In April 1909 a large number of French shore stations were opened.

German fleet.

The German Fleet has been heard constantly, and they apparently work a great deal on "V" and "W" waves. They use about 30 cycles and no note. Numeral call signs are used. The sign KK is used as we use G, and a signal is generally acknowledged by making their own call signs. The "III" sign is used between groups, and each group is generally repeated two or three times instead of repeating the whole of the message. A 3 or 4 letter code is usually employed, the 4-letter codes all beginning with the N (— . —) sign. P, U, and R are used singly in the text, P being most common; it appears to be the full stop sign . Messages usually finish with DD, DDD, or HHH.

In September 1909, a ship (call sign DEW) was heard working in German with high musical note, also another station (call sign DLW) usually on "W" wave. Both DEW and DLW use waves of 2,000 and 5,000 feet. DLW is apparently the South African steamer "Lucie Woermann."

In October 1908, a ship or station was heard working in German, with a high musical note on "U," "V," or "W" wave; she sent odd groups of letters and never used the same call sign twice. This station has since been ascertained to be Nauen; the station appears to have just started regular work again.

Heligoland.

In November 1908, a station was first heard working in German with a musical note. This is believed to be Heligoland experimenting with a similar system to the Lepel system.

American fleet.

The American Fleet usually use a wave length of about 1,600 feet. Only one ship DC (Connecticut) had a note. Their operators appear to be very undisciplined and they appear to have suffered severely from atmospherics, to have interfered a great deal with, and to have experienced considerable interference from, commercial traffic.

Pola, Austria.

A power station, apparently similar to Nordeich, has opened at Pola, at the top of the Adriatic, and uses a wave length of about 5,000 feet, about 30 cycles, no note, 30 mm. spark.

For some time this station was only heard at night in England; recently it has been heard in the daytime also.

List of French Letters, Words, and Abbreviations used in Wireless Telegraphy.

PFT	Atmospherics very strong.
RTB	Reception very good.
BSR	Bon soir.
BJR	Bon joir.
TSF	Wireless telegraphy.
OFF	Official message.
SVP	Please.
PZ	Reception good.
RM	Reception bad.
RN	Nothing received.
RJ, **RV**	Reception weak, usually followed by IMI.
TG	Telegram.

DE - - - - - -	From (sometimes made as B).
SB - - - - - -	Signals jammed (not by atmospherics).
Parasite - - - - -	Atmospherics.
Brouillage - - - - -	Interference.
Compartment emission - - -	Spark gap.
Etincelle - - - - -	Spark.
Etincelle chantante - - - -	Musical spark.
Chiffre (Chif) - - - -	Code.
Attacquer - - - - -	Call.
Appeller - - - - -	Call.
Cloture - - - - -	Finished working.

REPORT ON W.T. IN U.S. NAVY.

The following is an extract from a report by the Naval Attache at Washington :—

Wireless telegraphy is making considerable strides in the U.S. Navy. A contract has lately been given to the National Electric Signalling Company for a distance of 3,000 miles between shore and ship, and 1,000 miles between ship and ship. The power to be used between ship and ship will probably be about 10 to 12 Kw., using high frequency motor generators, with a wave length of 4,500 feet. The above distances, although guaranteed by the Company, have not been actually accomplished, but from what has been done, viz., constant communication maintained between Washington and the Brant Rock, a distance of 600 miles, the Navy Department are confident of its feasibility.

The power at present used between ship and ship is 5 Kw. Aerial the same as ours with six parts coming together at end of one tail. Radius of action is 250 miles, night and day. Wave length standard 425 metres. Lightning conductors are not fitted, but in a few ships they have "lightning arresters." These are not considered absolutely necessary, they prefer to disconnect when required. All ships are fitted and destroyers are to be fitted with a short distance installation with a radius of action of 50 miles. The Wireless office is on deck, and on going into action it is proposed to put the instruments below, the usefulness of Wireless then being over. They have, however, a vague idea of putting a short aerial over the side to use for distances of 10 miles or so. There is no separate system of short Wireless, they use the main. The officer in charge is the Navigating Officer, who, as a rule, has no special training. Up to the present it has not been used for manœuvring purposes.

There is no Wireless communication direct from the Navy Department, but the new shore 3,000-mile station about to be established will be at Washington. There is no proper Wireless department at the Navy Department, the officer in charge being a Lieutenant-Commander of the Bureau of Equipment, assisted by a Lieutenant. The Department carry out a good many experiments themselves, but very little money is available, the National Electric Signalling Company doing most of it, and I gather that the latter are almost entirely responsible for the new long distance stations about to be installed. . . . The Poulsen (arc) system is thought little of except for Wireless Telephony, which has been tried in the Atlantic Fleet just returned from their "round the world" cruise; it is badly reported on, but the Department experts still have some hopes of it, and it will probably be further tried, but not with any idea of its supplanting Wireless Telegraphy. The Minelayers being under Military authorities are not fitted at present. Some portable sets are kept in store for use at advanced bases, ships to boats, &c.

ADDENDUM.

Additional Fittings required in connection with Operating Switches.

Condenser for Morse key.

An additional condenser will be provided for connecting across the Morse key in the cabinet. This is required to take the additional inductive kick of the operating switch windings. The capacity will be about 1 m.f.

Breakdown fuze.

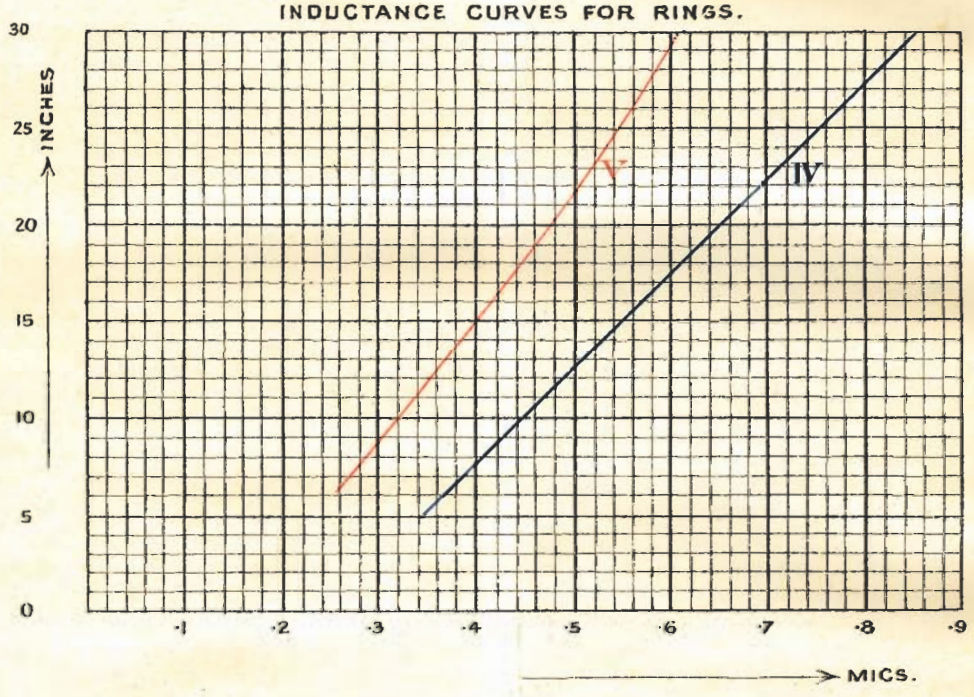
It has been found that there is always a possibility of an arc at the magnetic key contacts, or some other accident, causing a spark from the sending gear to pass into the receiving gear. A breakdown fuse will be supplied to prevent damage to the tuner and the No. 2 condenser from this cause. It consists of a strip of thin paper between two metal electrodes, the electrodes being joined across the leads into the cabinet, leading to the receiving gear. If a spark through the operating switch causes excess of pressure across the receiving gear, the paper punctures and provides a path for the aerial current. The paper punctures at a voltage between 500 and 1,000. When the paper is punctured the insulation resistance across the receiving gear is slightly reduced, and if a wave much longer than the one transmitted is being received, *i.e.*, if much of the receiving tuner is in circuit, the reduction in strength of signals may be very noticeable. The paper is therefore supplied on a reel and arranged so that it can be pulled through and a fresh piece exposed to the electrodes if a puncture takes place.

The operating switch should on no account be used without this instrument, or the No. 2 condenser is very likely to be punctured.

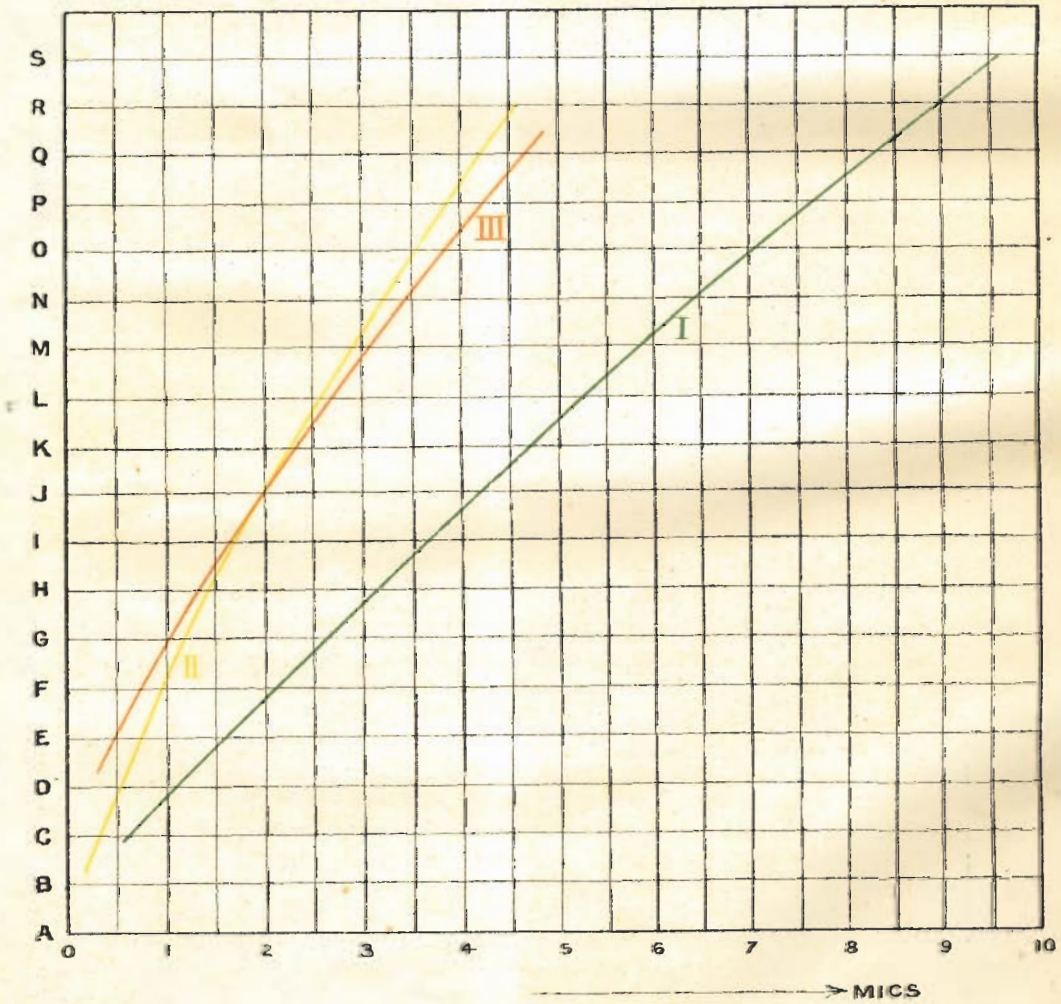
REJECTOR CURVES

I	MARK I REJECTOR INDUCTANCE	IV	MARK I REJECTOR (CURVE FOR RING)
II	MARK II REJECTOR INDUCTANCE (1ST ORDER WITH PHOSPHOR BRONZE RING)	V	MARK II REJECTOR (CURVE FOR RING)
III	MARK II REJECTOR INDUCTANCE (2ND ORDER WITH COPPER RING)		

INDUCTANCE CURVES FOR RINGS.



INDUCTANCE CURVES FOR BOXES.



NOTE. *The true values of the Rejector Capacities are only about 93% of those engraved on the boxes.*

Further Report of Trials between Horsea and Mediterranean Fleet. 25th October—21st November.

The following report is in continuation of that given on page 8.

Towards the end of these trials, a much improved note was obtained by shortening up the spark gap sufficiently to get a spark frequency of about 500.

During the last week, using this note and with certain slight alterations in the transmitting circuit, very much better results were obtained by ships at Malta, the test message being received, except on two occasions, either correctly or with two or three mistakes only, although, when using the short spark gap, less power is radiated than under normal conditions.

Experimental Cruise by "Furious," December 1909.

H.M.S. "Furious" sailed from Portsmouth on 6th December and visited Leith, Cromarty and Kirkwall. The object of the experiments was to obtain information on the following points:—

(1) The relative values of various receiving detectors.
(2) Methods by which interference with the reception of weak signals could be minimised.
(3) Comparative trials of the three principal methods of preventing arcing at the spark gap of large power high frequency sets, *e.g.*, air blast, rotary spark gap, and multiple water-cooled gap.
(4) A trial of the Lepel set, recently installed in "Vernon."

Points on which information was obtained.

The interference trials were somewhat inconclusive due to the burning out of a section of the "Furious" transformer at Leith, and failure to hear "Furious" signals after her arrival at Cromarty. The Lepel set was found to require very extensive modification to enable more than from two to three K.W. to be used. Failures for insulation with this set were frequent during the trials.

Results.

The results obtained may be summarised as follows:—

I. The detectors used were the crystalite, graphite-galena, audion, and Brown relay in combination with the magnetic detector. Detectors.

The Audion proved to be the most sensitive and the note was much clearer than with the other detectors. The deterioration of the audion filament was, however, very rapid, its effective life being probably less than a week.

The electrical and mechanical stability of this detector, with the exception of the filament, is very marked, and there is little doubt that, if this defect can be overcome, the audion approximates very closely to the ideal detector.

The Crystalite gave satisfactory results and is, at the present time, the contact detector best suited to Service requirements. Its want of stability is, however, a very serious disadvantage.

The Graphite-Galena is not quite so sensitive as the crystalite, but is rather more stable.

The Brown Relay requires considerable skill and attention in adjustment. It is also, when used with the magnetic detector, not as sensitive as the other detectors tried.

II. As previously stated the interference trials were not very conclusive. Some information, however, was obtained as to the more promising lines for experiment. Interference.

III. Generally speaking the *air blast* seems to be the most satisfactory means of obtaining a fairly pure spark. Musical notes and prevention of arcing.

Further experiments with the *Rotary Spark Gap* may, however, show that this system gives greater range, and it is of course possible to use a much higher note than with the ordinary Mark II. Further trials of a rotary spark gap will be made. This form of gap is not very well suited to a high frequency alternating supply, because the spark frequency with a rotary spark gap must be at least four or five times greater than the supply frequency to produce a good note. The note with the rotary spark gap was at times described as "very musical." Trials with this gap were not conclusive, as it was only ready for use during the last few days of the cruise.

The Multiple Gap is not suited to the Mark II. installation as the tightest coupling available is quite insufficient. By making special arrangements to couple tighter better results would probably be obtained, but the arrangement then becomes practically the Lepel system.

IV. The results with the *Lepel Set* were occasionally promising, signals being once or twice nearly as strong as those of the Mark II. The failures for insulation of the oscillator and transmitting condensers, due to an attempt to increase the power used, beyond that for which the set was designed, and the difficulty of obtaining receiving adjustments for a single wave system, considerably interfered with the trials. The oscillator has now been placed in oil and the number of sections of the transmitting condensers in series will be increased. Lepel installation.

Value of Rejectors.

The curves shown on Plate XI. give the value of inductances of the different stops of the variable inductances.

The values of the stops of the No. 2 condensers may be taken as 93 per cent. of the value marked on them.