REPORT OF W.T. CONFERENCE HELD ON BOARD H.M.S. "VERNON," 31st OCTOBER 1907.

The value of W.T. as a strategical factor of the highest importance has more than ever been clearly demonstrated by the results obtained during the recent manœuvres, and the advance that has been made since the previous manœuvres last year is considered to be highly satisfactory.

Necessity for an increased number of telegraphists.

The factor on which the success of W.T. communication in a large Fleet depends is the personal. No mechanical device for recording messages can equal the reasoning powers of an intelligent man, and the rapidity and the reliability of W.T. during the manœuvres was the result of the co-operation of all the operators in the Fleet, working together under a common procedure, and adhering to rules by which alone interference between friendly ships can be avoided.

There is no doubt that at the present moment the weak point is the lack of operators, who require to be rapidly increased in numbers, as the strain on them, especially in Flag Ships, is so great that, unless the present staff is considerably increased, the men will be incapable of bearing the mental and physical strain for more than a few days after the outbreak of war.

It is considered that, for reliable working, there should, during war time with the Fleet at sea, always be two operators on watch in the W.T. office. It is quite impossible, when a continuous succession of messages is pouring in, for the operator in the silent cabinet to do more than write down the coded groups as they come in and make the necessary replies at the precise moments. Even if not receiving a message actually addressed to himself, his attention cannot be diverted for a moment from the general signalling going on, otherwise he may miss a call or urgent message, which latter has sometimes to be made by the Flag Ship without waiting for the reply to the call-up. Accordingly, the other necessary duties of coding and decoding, keeping the log, and rendering such assistance from time to time as may be necessary with the transmitting instruments (e.g., the spark balls require to be renewed periodically, the magnetic key occasionally requires re-adjustment, &c.) requires a second hand in the W.T. office.

This second hand should be a telegraphist rating, in order that he may periodically exchange duties with the man in the silent cabinet, who benefits greatly from a change of occupation. Also this second hand can at times act as a very

useful check on coded messages if the signals are strong, by putting on a pair of Necessity for an telephones in the W.T. office (already supplied for this purpose) which can be increased number switched on, in parallel with the pair in use inside the cabinet, to allow of both

people reading the message.

As a suggestion for increasing the present number of telegraphist ratings allowed by C.L. 100, it is recommended that a further 100 non-signal volunteers be allowed to turn over to the new branch. It is estimated that there are fully this number of desirable men available amongst those who have already volunteered, have actually been doing duty, and who are now under instruction in the Channel, Atlantic, Home and Mediterranean Fleets. These men would be a valuable asset if war were to break out in the near future, and it is therefore strongly recommended that their services may be utilised in a branch for which they have shown considerable aptitude.

Instructions for the Conduct of W.T. Signalling.

With reference to the Instructions for W.T. Signalling and to the Supplementary Issue of in-Signal Code, it is unanimously agreed that their general principles are sound, and structions to all that these books should be issued forthwith in their present form to all ships and ships. stations, because at present the ships to which these books have not been supplied are unable to understand the procedure in vogue amongst the majority of the Fleet.

of telegraphists.

As regards the revision of these books, it is recommended that this should Revision of be carried out by the "Vernon" in conjunction with the Superintendent of Signal instructions. Schools, to whom should be forwarded all suggested modifications for the revised version. The most important modification which was agreed to by all the Fleet representatives, is that the compass table should be removed from the 4-letter code and inserted in the 6-letter code, to provide an additional check upon the accuracy of alter course signals, and to give further space in the 4-letter code for operators' signals.

With reference to the practice which prevailed during the recent manœuvres Delay caused by of ciphering all coded messages, it is pointed out that several messages were not ciphering. delivered until it was too late to act upon them, on account of the delay caused by the ciphering and deciphering, in addition to coding and decoding. As some method for decreasing this delay is absolutely essential in war time, the following three methods were discussed:-

(a) That the use of cipher should be limited to those messages which it is imperative to keep secret, and which should on no account be discovered by the enemy—all other signals being made by Service code.

(b) That signal books, on the same lines as those used in peace, should be prepared for use in war only, the significations opposite the various signals being interchanged.

(c) That some method be introduced of ciphering and deciphering mechanically on the typewriter principle.

As regards method (a), it is observed that when signals are being received in Service code that they can be interpreted very quickly by a person accustomed to using the book, whilst the experience of the manœuvres showed that when ciphered, a message which is useless if delayed may not be attended to until previous messages, which could well have waited, have been deciphered.

As regards method (b), any copy of the war signal books falling into the enemy's hand either before or during war would render this precaution of little

value.

As regards method (c), it is suggested that some such apparatus should, if

available, be obtained for trial.

The general consensus of opinion is that method (a) is the best, because it is desirable that the least possible change should take place on the outbreak of war, although any apparatus which tends to increase the speed of ciphering and deciphering is of great value for saving time in dealing with those messages of which the secrecy is of paramount importance.

It is also the opinion of this Conference that the Supplementary Signal Code is Transposed of too confidential a nature to be supplied to destroyers, and the limited amount of alphabet for dessignalling necessary with and between destroyers should be carried out by means of ciphering a message, written out en clair, with a single transposed alphabet. This would also tend to simplify the duties of the single operator allowed to a destroyer.

As negards the arrangements for carrying out coding, ciphering, decoding, and Arrangements for deciphering, the present practice in all fleets is for this to be done in the W.T. coding, ciphering, office, or if there is no nown, as mean to it as possible. It is considered essential &c.

Arrangements for coding, ciphering, &c.

that this should always be done as near to the operator as possible, in order that a

message which decodes unintelligibly may be checked immediately.

The operator on watch must devote the whole of his attention to looking out for, or transmitting signals; and an additional staff is required to do the decoding, deciphering, logging, &c. In all the flagships two operators were on watch at once throughout the manœuvres, in addition to the W.T. officers. In the "King Edward VII." it was found necessary to employ six clerks, working in three watches, to decipher and decode the numerous messages received. If no operator is available junior officers should be employed, who should be regularly practised at the work.

Books required in W.T. office.

It has been found necessary to have a copy of the "Flotilla Signal Book" and the Supplementary Signal Code available at all times for coding and decoding, and it is recommended that a copy of each be supplied for the W.T. offices of all ships except destroyers.

Local modifications of instructions.

It is considered most desirable that additional signals or modifications of procedure should, as far as practicable, be avoided in the various fleets, and that the Service Signal Books be rigidly adhered to, in order to prevent misunder-standings in inter-Fleet communication.

It is therefore recommended that all suggested alterations or additions should be collected, and addenda issued from time to time.

Signalling positions.

With reference to the signalling positions the War College method has proved itself the best. It is recommended that this method be generally adopted.

ORGANISATION.

Organisation of wave-lengths.

With reference to the organisation of wave-lengths given in Article XV. of the Instructions for the Conduct of W.T. signalling, which has been under trial, it is unanimously agreed that no general alteration in principle is desirable.

It is therefore considered that the rules for the organisation of wave-lengths

should now be definitely laid down and no longer considered as under trial.

Interference.

The method of dealing with interference, however, given in Article XV., para. 10, pp. 32 and 33, in which it is suggested that under certain circumstances ships transmit upon a different wave-length to the one being received, has not been found in practice to be as simple and reliable as that of every ship transmitting upon the same wave-length that she is receiving on.

In the present state of the operators it is therefore advisable to rigidly adhere to the general organisation indicated in Article XV., paras. 6 to 9 of the instructions. It is also advisable to insert the following paragraph in place of para. 10 to enable an outlying ship which is being interfered with to get an important message

through to the Flagship.

"Should a cruiser find that, owing to interference, her direct communication either to or from the Flagship is interrupted, she can call up another ship of the Battle Squadron on any of the Service wave-lengths except 'T,' and ask her to pass the message to the Flagship. As soon as the cruiser has sent the message she should revert to her normal wave-length, and it should be particularly emphasized that this method of sending a message to the Flagship should only be used as a last resource, as not only is it likely to tend to confuse the communication on other lines, but the cruiser during this time is liable to miss a general signal from the Flagship.

"A battleship thus called up on her own wave-length, will, of course, reply

upon that wave-length.'

Communication between ships in company.

For passing on messages received by ships of the Battle Squadron to the Flagship, the following methods should be employed:—

By Day.—Visual.

By Night or in Fog.—The ship nearest to the Flagship should be excused other W.T. duties, and ordered to look out on a special long wave-length (for the present "U" to be employed) to receive reports and pass them on visually (using screened light), by short-distance W.T., or other method as considered desirable. The Flagship is thus enabled to continue to look out on "S."

Interference with enemy.

As regards wilful interference with an enemy, it is considered that, except in very exceptional cases, the risk of interfering with one's own communication makes such a practice of very doubtful value, especially as the results of trials show that no reliance can be placed in this method of preventing a short signal getting through. For the present it is only necessary to consider this in the design of instruments.

To facilitate the passing of signals by day to the Flagship, it is desirable that Visual signalling if the Fleet is in more than one column, there should be one ship on each wave-length by day. in the column next the Flagship.

When a Battle Squadron gets into touch with a shore station, the shore Getting in touch station should be informed which ship she is to call up on "T," should she require with shore stations. to communicate with the Battle Squadron.

It is considered essential that a reliable method should be available for inter- Short distance. communicating between the ships of the Battle Squadron at night, without showing W.T. a light, quite independent of the main W.T. installation. Failing other means, an independent short distance W.T. set is suggested, and it is recommended that experiments in this direction should be started in "Vernon," as the appliances for such experiments in seagoing ships are naturally very limited.

The available methods of W.T. signalling during and after an action have been Signalling during discussed. It is considered desirable that such ships of the Battle Squadron as can and after an action. be dispensed with in the W.T. organisation of the Fleet should be ordered to unrig their W.T. offices, and transport the gear to a place of safety below before going into action. Two hours will be required for a Service Mark I. installation, and one day for a large set.

All ships, before going into action, should have an extempore aerial in place, with a lead from it led down to a protected position, which is fitted as an extempore station for receiving purposes. The main W.T. office should be kept intact up to the moment of engagement, when the operators would, unless special orders to the contrary were given, retire to the extempore station below.

After the action, if the W.T. office is wrecked, an extempore transmitting and receiving station should be fitted in the most convenient position on deck (e.g., a casemate), utilising the spare coil, the spare magnetic detector, &c., which till then

have been kept below in a place of safety.

It is considered desirable that inter-Fleet W.T. exercises should be started. Inter-Fleet After a few trials, reports should be rendered with the object of ultimately institut- exercises. ing a general combined W.T. exercise, between all Fleets and shore stations within signalling range.

As regards shore stations taking part in Fleet W.T. exercises and in the Utilisation of proposed inter-Fleet W.T. exercises, it is suggested that the Fleet requiring the use shore stations. of a station or stations should ask the permission of the A.C.R. in one of the following ways:-

(a) For W.T. exercises between certain hours. This will involve the selected shore station sending and receiving on various wave-lengths, necessitating it being put out of routine as regards ordinary work, and another station answering calls made to her.

(b) For strategical exercises between certain dates. In this case the shore station or stations notified would remain under the conditions laid down

in the general organisation.

It is considered advisable to modify the Service wave-lengths "Q" and "R" Modification of to 2,000 feet and 2,600 feet respectively, in view of the rules laid down in the "Q" and "R" International Convention coming into force next July. In order that practice may wave-lengths. be obtained before that date, it is suggested that the alteration in the above wavelengths should come into force on January 1st, 1908.

As regards the use of commercial shore stations in war time, it is necessary that Practice with ships should occasionally communicate with commercial shore stations, to familiarise commercial shore with their call signs and procedure. It is not proposed that this should be instituted until after the rules of the Convention come into force next July.

GENERAL IMPROVEMENTS.

In order to prevent unnecessarily strong signals being sent out from ships in Buzzer signalling. harbour, which is found, especially in the Channel, to interfere with long-distance W.T. communication, it is strongly recommended that orders be issued to the effect that the buzzer system explained on pages 17 and 18 of Appendix of A.R. of Torpedo Schools, 1906, be invariably used for communication and W.T. exercises between ships in the same harbour. This of course does not include the W.T. guard ship.

On account of the inconvenience caused by ships tuning at various hours, it is Limited hours for suggested that orders be issued to the effect that tuning up (with aerial connected) tuning. is to be limited to the hours of 11 a.m. to noon and 2 to 4 p.m.

With reference to the high power Service Mark II. gear being introduced into Reducing signal the Service, it is considered essential that effective arrangements should be made to range.

reduce the signalling range, at will, to 50 miles. This has been noted by "Vernon," and it is proposed to include the means of doing so in the designs.

Improvements in existing apparatus.

As regards existing W.T. apparatus in sea-going ships, two important points were brought forward with respect to the Service Mark I. installation: --

- (a) That a considerable loss in range takes place in damp weather due to the moisture collecting on the glass of the Leyden jars supplied.
- (b) That the oscillators at present in use which have been made on board with ship's stores, are the cause of a considerable loss of power.

It is therefore suggested that a more efficient type of condenser and oscillator is required, and that "Vernon" should experiment with a view to introducing these improvements.

(Signed)

C. R. PAYNE,

Commander R.N.,

H.M.S. "Vernon."

F. LORING.

Lieutenant R.N.,

A.C.R. Department,

Admiralty.

ALLDIN U. MOORE,

Lieutenant R.N., H.M.S. "Dreadnought"

(Home Fleet).

ARTHUR SILVERTOP.

Lieutenant R.N.,

D.N.O. Department,

Admiralty.

RAYMOND FITZMAURICE,

Lieutenant R.N.,

H.M.S. "Exmouth"

(Atlantic Fleet).

R. A. R. Plunkett.

Lieutenant R.N.,

H.M.S. "King Edward VII."

(Channel Fleet).