

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 telephones in the W.T. office (already supplied for this purpose) which can be switched on, in parallel with the pair in use inside the cabinet, to allow of both people reading the message.

Necessity for an increased number of telegraphists.

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 Signal Code, it is unanimously agreed that their general principles are sound, and that these books should be issued forthwith in their present form to all ships and 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.

Issue of instructions to all ships.

As regards the revision of these books, it is recommended that this should be carried out by the "Vernon" in conjunction with the Superintendent of Signal 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.

Revision of instructions.

With reference to the practice which prevailed during the recent manœuvres of ciphering all coded messages, it is pointed out that several messages were not 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:—

Delay caused by ciphering.

- (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 of too confidential a nature to be supplied to destroyers, and the limited amount of signalling 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.

Transposed alphabet for destroyers.

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

Arrangements for coding, ciphering, &c.

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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 misunderstandings 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.

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.

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