

WIRELESS TELEGRAPHY APPENDIX, 1910.

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GENERAL SUMMARY OF WIRELESS TELEGRAPHY PROGRESS DURING THE YEAR 1910.

All the ships to which Mark I* and Mark II sets were appropriated have now had the sets installed, and new ships, as they are completed, are fitted out with these installations.

The sets being in a final form, except in so far as the progress of Wireless Telegraphy may necessitate minor improvements being added, it has become necessary to devote a good deal of time and labour to standardising the Wireless Apparatus at sea, and putting the W.T. Stores generally on a more satisfactory footing.

This has been a considerable part of the work of the year, and, though much remains to be done, very satisfactory progress has been made as regards standardising the apparatus, arranging

for the purchase of replacements in the cheapest and most efficient manner, and forming reserves of stores.

There is comparatively little to record in the way of new apparatus.

The Mark I*. Operating Switch has been superseded, for new ships, by a simpler form of apparatus known as the "Hand Operating Key," which performs all the functions of the old Sending Key and of the Operating Switch. The Hand Operating Key is also supplied to all new destroyers.

An improved form of Revolving Spark Gap has been introduced for the Mark I*. set.

Experiments have been carried out with an improved form of aerial feeder for Mark II. installations. The new feeder, which is found to effect a considerable saving in power by cutting down the loss of energy due to brushing, will be brought into general use shortly.

Exhaustive experiments have been carried out in "Vernon" to ascertain the best method of improving the ventilation of Silent Cabinets and Wireless Telegraphy offices. Proposals for a revised system of ventilation in new ships and for alterations to existing ships have been forwarded, and it is considered that the method now recommended will meet all requirements.

The results of trials with the Crystalite Detector in the "B" Type Receiving Sets at sea proved very satisfactory, and this form of detector will be issued to all ships together with an improved form of Receiving Circuit, the whole to be known as the "C" Type Receiving Set.

Various other forms of detector have been tried during the year, and a Zincite-Tellurium Detector has given very promising results. If further trials prove equally satisfactory, this detector may supersede the Crystalite Detector in the "C" Type Sets.

There are now 61 destroyers fitted with W.T., not including the two Australian destroyers "Paramatta" and "Yarra," which have been fitted by the Marconi Company.

Nine Portable and 11 Harbour Defence Sets have been delivered, except for the alternator, which the makers have had much difficulty with, and the power generator, which has been delayed by the difficulty in getting a suitable engine to work off paraffin or methylated spirit. It is under consideration now to use a petrol engine, and, if this is approved, it is anticipated that the sets will be completed very shortly. The sets have been used to some extent with torpedo-boat dynamos and induction coils, and have proved completely satisfactory so far as can be judged under these conditions.

Nine Short Distance Sets have been installed and tried at sea. Although only installed just before the 1910 Manœuvres, they proved generally satisfactory, and were most useful.

As a result of this experience it was proposed to fit all battleships from the "King Edward VII." class onwards, and all armoured cruisers from the "Duke of Edinburgh" class onwards, with these sets; but this would entail a considerable increase in personnel, and has not been approved.

The Wireless Telegraphy installation for the naval airship has been completed, a Quenched Spark Set being used. Preliminary trials have been carried out at Barrow, where the airship is building.

Considerable progress has been made with the Quenched Spark experiments, important improvements have been effected and very promising results have been obtained. There is little doubt that this system will allow of a smaller, lighter, and far more efficient set than Spark Telegraphy, but much remains to be done before final designs can be got out.

Work is proceeding on the three new Low Power Stations, at Wick, Bunbeg, and Scarborough, and they will probably be completed about July 1911.

Work on the High Power Station at Malta is now well advanced; but it proved necessary to arrange for an increase of power in order to provide a higher note for overcoming the very severe atmospheric conditions prevalent in the Mediterranean. This somewhat delayed the designs, and it is not anticipated that the station will be working much before the end of 1911.

A large number of experiments have been carried out at Horsea with a view to effecting improvements in the other High Power Stations, and much useful information has been obtained. It is hoped that these experiments, when completed, will result in the introduction of a large number of improvements which will add materially to the efficiency of the High Power Station.

A new field of research in the science of Wireless Telegraphy has been opened up by some very interesting experiments in spark photography carried out at Cleethorpes.

As a result of experience up to date, and in accordance with the recommendations of a conference of W.T. experts held after the manœuvres, it is under consideration to introduce certain modifications and additions to the organisation of wave lengths and the Wireless and Long Distance Signal Code.

The first five Warrant Telegraphists have qualified and have taken up their appointments in Torpedo Schools and Flagships, &c.

The training of Telegraphists continues to prove satisfactory, and the Telegraphist Ratings acquitted themselves well in manœuvres, though very short-handed. The number of ratings is now steadily increasing towards that required.

A course of Wireless Telegraphy for Officers qualifying for Lieutenant (S.) has been approved, and the first class is now undergoing this course in the Torpedo School.

INSTRUCTIONAL REPORT.

The following numbers of Officers and other ratings have been instructed in "Vernon" during the year :—

Qualifying Lieutenants (T.)	-	-	-	-	9
Marine Officers (special)	-	-	-	-	10
" " (short course)	-	-	-	-	6
Other Officers (specially arranged courses)	-	-	-	-	5
Gunners (T.) (Scout course)	-	-	-	-	7
Qualifying Gunners (T.)	-	-	-	-	5
" Warrant Telegraphists	-	-	-	-	6
" P.O. Telegraphist (N.S.)	-	-	-	-	30
Requalifying P.O. Telegraphists	-	-	-	-	10
Armourers and Electricians	-	-	-	-	43
Coast Guard ratings	-	-	-	-	4
Total	-	-	-	-	135

In addition to the above a class of Officers qualifying for Lieutenant (S.) is now undergoing the course in "Vernon."

The following apparatus has been fitted in "Vernon" since last year :—

- One Short Distance Set.
- One Portable Set.
- One Harbour Defence Set.
- Modifications to Mark II., Mark I*, and Destroyer's sets.

INSTRUCTIONAL REPORT OF "DEFIANCE."

The following ratings have received Wireless Telegraphy instruction in "Defiance" during the year :—

Gunners (T.)	-	-	-	-	-	1
Higher Telegraphist ratings qualifying	-	-	-	-	-	5
Higher telegraphists ratings requalifying	-	-	-	-	-	7
Armourers and Electricians	-	-	-	-	-	20
Coast Guard ratings	-	-	-	-	-	31
						64

TELEGRAPHIST BRANCH.

The numbers of Telegraphist ratings in the Service on the 20th November 1910 were as follows :—

C.P.O. Telegraphists	-	-	-	-	18
P.O. Telegraphists	-	-	-	-	168
Leading Telegraphists	-	-	-	-	121
Telegraphists	-	-	-	-	268
Ordinary Telegraphists	-	-	-	-	183
Boy Telegraphists	-	-	-	-	93
Total	-	-	-	-	851

The first class of candidates for the rank of Warrant Telegraphist completed their course on the 13th May 1910. Five out of the six candidates passed the final examination and have since been appointed to various ships for duty as Warrant Telegraphists.

The next class for the rank of Warrant Telegraphist will commence on the 9th January 1911.

The system of training of Telegraphists ratings continues to produce satisfactory results. (*Vide* report of W.T. Conference, page 9.)

In order to relieve the congestion in the "Vernon," all Devonport ratings qualifying or requalifying for Petty Officer Telegraphist (N.S.), and all the Coastguard Telegraphist ratings, now undergo their courses in the "Defiance" instead of in "Vernon" as formerly. (A.L. N. 14015/09 of 20th January 1910.)

REPORT BY CAPTAIN OF "IMPREGNABLE" ON TRAINING OF BOY TELEGRAPHISTS, DATED 29TH OCTOBER 1910.

Since the last report rendered to "Vernon," dated 2nd December 1909 (when 90 boys were under instruction), up to the present date, 249 boys have been classed up in Wireless Telegraphy classes.

Of these—

50 have been discharged from their classes under headings of failures, invalided, D.D., discharge by purchase.

89 have been drafted to sea as Boy Telegraphists after passing satisfactory examinations here.

11 are now awaiting draft, and

189 are under instruction.

The progress during the last 12 months has been very satisfactory. The boys appear to get a good working knowledge of the Mark 1* installation, and so should not have much difficulty in picking up the practical work with other installations at sea.

A portion of 10 working days is now allotted to coding and decoding at the end of the course.

Since 20th December 1909, an average of 17 boys per class has been maintained. From the larger classes, the rejections for failure in Morse have been slightly greater than previously, when smaller classes were joining.

REPORT ON WIRELESS TELEGRAPHY CONFERENCE.

Held at Torbay on 28th July, in accordance with A.L. M. 0976 of 26th July 1910.

PREFACE.

1. A short general discussion on the subject of results obtained during manœuvres was first held, and it was agreed that the Wireless Apparatus at present supplied was generally satisfactory; that the organisation had worked well, but required modification in certain respects, and that the personnel had done extremely well during the operations; but that, owing to being so short-handed, the work had been very heavy, and the high standard of efficiency shown could not have been maintained for many days longer.

2. It was then decided to divide up the questions referred to in A.L. M. 0976 into three sections, and to discuss various points under the different headings as follows:—

Section I.—Signal Book and Organisation.

Section II.—Material.

Section III.—Personnel.

3. In the discussion of the various matters referred to it soon became evident that the question of Short Distance Wireless is one of very great importance. This question necessarily appeared during the discussions of each section, and from every point of view the Conference are forced to the conclusion that Short Distance Wireless is a necessity for the efficient conduct of extensive operations with a large fleet. The introduction of Short Distance Wireless on a large scale is recommended, but it is recognised that no decision on this point can be arrived at without considering the question of a large increase in the personnel, since opinion was unanimous that these sets, if supplied, must be worked by Telegraphist ratings.

After careful consideration, the Conference are of opinion that it is most desirable that Short Distance Sets be supplied to all battleships and to all cruisers attendant on a Battle Fleet, but that it is useless to provide these sets unless it is approved to supply additional Telegraphist ratings to work them.

They therefore recommend that these two questions be considered together, and that the provision of the Short Distance Sets depend on the approval to supply extra ratings.

If it is not considered possible to provide the additional ratings asked for, then it is considered that it would be a waste of money to purchase the sets.

It is, of course, recognised that it would be impossible to provide the ratings immediately, and it is considered that, if the provision of ratings is approved in principle, then it is desirable to purchase the Short Distant Sets forthwith, in order that the present operators may obtain experience with the apparatus and make such gradually extended use of it as the increasing number of Telegraphist ratings may permit.

The various considerations which lead to these conclusions are set out fully in the following report:—

SECTION I.

SIGNAL BOOK AND ORGANISATION OF WAVE LENGTHS.

In the recommendations included under this heading, no attempt has been made to deal in detail with the actual letterpress alterations to the Wireless and Long Distance Signal Code which will be entailed if the proposed alterations are adopted. It is considered that the necessary corrections to that book can be arranged without much difficulty if, and when, the following proposals are approved:—

1. Proposed Modifications in the Arrangements for sending Admiralty Messages from High Power Stations.

It is considered desirable to arrange for messages to be sent to Fleets and to detached Ships and Squadrons at more frequent intervals; to provide for the Admiralty being informed at the

earliest possible moment that a message has been read by the ship detailed to receive it; and to modify the arrangements for passing the addressee's final acknowledgment of receipt of the message to the Admiralty.

For the purpose of this report, signals *via* Cleethorpes only have been considered; but, if the following proposals are approved for that station, similar principles can be applied to other High Power Shore Stations as soon as they are available for regular work.

The Conference unanimously recommend that—

- (a) Detached ships and squadrons look out for Admiralty messages from Cleethorpes every two hours, counting from noon G.M.T. (instead of every four hours as at present).
- (b) That the messages from Cleethorpes to fleets be made every half hour, viz., 12.0, 12.30, 1.0, &c., and that Cleethorpes be instructed to send exactly at the half hours G.M.T. only.

This procedure cannot be adopted in full at present, since at certain times Cleethorpes is occupied with signals to Gibraltar, and also the existing plant at the generating station could not be used so continuously as is proposed; but, if the principle is approved, the necessary modifications in the procedure recommended can be arranged for until such times as the plant at the generating station is duplicated and Horsea relieves Cleethorpes of the work with Gibraltar.

The above procedure, if adopted, will necessitate modifications to the instructions contained in Article II., para. 27, clause (a) of "Instructions for Conduct of Wireless Telegraphy Signalling," and is considered necessary in order to allow of the procedure laid down in clauses (e) and (f) below.

- (c) That High Power Stations invariably make a signal at the times laid down, to say whether they have any messages to send or not. This rule to apply both to times laid down for sending to fleets and times laid down for sending to detached ships.

It is considered necessary to introduce this procedure in order to prevent ships having to wait on "X" wave length for an unnecessarily long time on the chance of a message coming. This commonly happens with detached ships now, since the signal "ZUZA" is rarely used by the shore stations.

To carry out the above procedure, it is recommended that the signal "ZUZA" be used in the way now laid down, and that the group "ZUYU" be given the signification "Am not going to send till the next half hour."

- (d) That at the end of every half-hourly series from Cleethorpes the signal "Z" be made, denoting "Nothing more coming," and that after the "Z" is made no further signal will be made by the High Power Station till the next half hour. This is necessary in order to carry out the procedure recommended in (e) and (f) below.
- (e) That when a Fleet is within range of a Medium Power Station, the ship having the guard on "X" wave-length, and receiving an Admiralty message from Cleethorpes for any ship in her Fleet, shall, immediately on receipt of the "Z" (denoting "Nothing more coming"), revert to "W" wave-length, and make "D" followed by the "Time of Origin" of the message referred to (*see* para. 4, clause (a) below), in order to inform the Admiralty that the message has been read by her.
- (f) That messages to a Fleet, whether received direct from Admiralty or *via* Cleethorpes, be "acknowledged" *via* the ship having the guard on "X" wave length. Such acknowledgment to be passed on by the "X" guardship during the interval between the making of "Z" by the High Power Station and the commencement of the next half hour. The "X" tune guardship to revert to "X" wave length in good time, ready to receive the next half-hourly message.
- (g) That at 6 a.m. daily, the High Power Station at Cleethorpes send "V's" for five minutes before making the signal "ZUZA" or "ZUYU."

This is considered necessary in order to allow ships to tune their receiving circuits.

2. Modification of Organisation to meet requirements when the Fleet is spread.

The present organisation does not meet requirements when the whole fleet is spread outside of easy visual signal distance, and it was decided that the problem of dealing with this case must be divided into two parts, viz. :—

- (a) With a Fleet spread to a distance of 5 miles between ship and ship.

Under these conditions, were all ships fitted with Short Distance Sets, the usual organisation could be used quite efficiently; all messages received, or to be transmitted, on the different wave lengths, being passed to and from the Flagship by Short Distance Wireless.

The Conference therefore strongly recommends the supply of Short Distance Sets to all battleships and cruisers working with the Battle Fleet.

- (b) With the Fleet spread to a distance exceeding 5 miles between ship and ship.

To deal with this case, it is recommended that Commanders-in-Chief be permitted to use the wave-lengths "R" and "T" in addition to the wave-lengths now recognised, and that what is known as the "Group System" be employed.

This system can perhaps be best explained by an example.

Suppose 16 vessels spread at a distance of 20 miles apart, and that the following information is required to be passed to the senior Flagship :—

- (a) Routine messages, *e.g.*, Position, course, and speed of each ship every hour.
Name or description of all merchant ships sighted, with position, course, and speed.
Consumption of coal, oil, &c.
Weather reports.
- (b) Immediate messages, *e.g.*, Reports of sighting the enemy.

(1) The Senior Flagship remains on "S" wave, the remaining ships being divided into two groups, working on "R" and "T" waves respectively.

(2) All "Routine messages" are passed to the "Group Repeating Ship" (generally the Senior Officer of the group), the two groups working simultaneously without mutual interference.

(3) The "Group Repeating Ships" pass all information collected from their respective groups to the Senior Flagship on "S" tune at prearranged times.

Thus, at 5 and 35 minutes past each hour the "R" Group Repeating Ship passes all information collected from "R" group during the previous half hour; at 20 and 50 minutes past each hour the "T" Group Repeating Ship passes all information collected from "T" group during the previous half hour.

(4) The Senior Flagship, or such other ships as may be detailed, will look out on "X" tune for Cleethorpes at the proper times.

(5) At all other times the Senior Flagship is free to receive "Immediate Messages."

Note.—These can be sent at any time by the use of the "Urgent Call" except when Cleethorpes is sending.

It is not considered desirable to lay down the organisation to be adopted too strictly, as circumstances may alter cases; and it is considered that the best method is to allow the use of the waves "R" and "T" in any one Fleet at the discretion of the Commander-in-Chief.

A suggestion was put forward by the Home Fleet Officers that the different divisions of the Home Fleet should have different "normal" wave-lengths. Thus, that each 1st Division ship should, as now, normally be on "S," unless specially detailed as guardship on another wave-length, similarly each ship of the 2nd Division to be normally on "R" wave, and each ship of the 3rd and 4th Divisions to be normally on "T" wave-length.

The Conference were not prepared to recommend this procedure without further consideration, but it is suggested that the question be raised separately by the Home Fleet.

3. Shore Stations not to use the Silence Sign.

With reference to Article III., clause 3, of "Instructions for the Conduct of Wireless Telegraphy Signalling," it is considered that the control exercised by Shore Stations should be confined to the control of ships actually communicating with that station, and that the Shore Station should not be permitted to silence all signalling in the Fleet by the use of the Silence Sign.

It is considered that the Silence Sign should be used by Senior Officers only, and that, in the case of two or more ships trying to communicate with the same Shore Station at the same time, the Shore Station should not make the Silence Sign (which will stop all signalling in the vicinity on all wave-lengths, or such wave-lengths as are denoted), but should make the signal "Q" (wait) to such ships as she wishes to wait, and make "G" to the ship whose signal she proposes to take next.

4. Modifications in Procedure.

(a) The Conference recommend that the use of the single letter signals B, D, and N, be extended to permit of these signals being used with a time of origin to denote the signal referred to.

Thus, B II 0815 would denote, "Have you received my signal timed 8.15 a.m.?"

N II 1245 would denote, "Nothing received though answer was expected to my signal made at 12.45 p.m."

(b) It is also recommended that the use of an "Operator's Table" be introduced to shorten procedure. This table to include such signs as WA for word after, ALL for all, &c. It is proposed that a special sign, to be known as the "Operator's Sign," be introduced for use before and after every signal taken from the Operator's Table.

It is recommended that the Home Fleet be directed to get out detailed proposals on this point, if the principle is approved.

5. Additional Signals required.

The Conference are of opinion that a certain number of additional signals are required to be inserted in the "Wireless and Long Distance Signal Code"; but, time not permitting of the discussion of all the signals proposed to be added, it is recommended that each Fleet be asked to forward proposals on this point.

6. Index to Wireless and Long Distance Signal Code.

It is considered very desirable that the Wireless and Long Distance Signal Code should have as complete an Index as possible, and it is suggested that this Index be compiled by Signal School and "Vernon."

SECTION II.

MATERIAL.

1. *Short Distance Sets.*

The existing Short Distance Sets have worked satisfactorily. Experience points to the desirability of introducing a few minor alterations in certain parts of the apparatus, and proposals on these points will be put forward separately, in order that the necessary modifications may be introduced into any new sets purchased.

In the opinion of the W.T. experts of the Red Fleet the success of the W.T. communications in the Irish Sea depended on the Short Distance Sets, and had these sets not been available it is considered that the operations would have been very seriously hampered, possibly to the extent of a failure to bring the Blue Fleet to action.

Further, as a result of experience in the manœuvres, the necessity for the supply of Short Distance W.T. for ships other than Battleships appears to be established. As an instance in support of this conclusion the case of two armoured cruisers working in conjunction with a Destroyer Flotilla may be quoted.

One of the cruisers was looking out on "D" wave for the Destroyers, the other on "S" wave for communication with Flagship.

Reports from the Destroyers came in very well indeed, but during the night the only means of communication between the ship on "D" wave and the ship on "S" wave was by megaphone, which made it extremely difficult and tedious to pass the information on to the Flagship. This is but one instance of several showing the necessity of Short Distance Wireless in ships other than Battleships.

One other example showing the great utility of these sets, and the necessity for having them, may be quoted.

On July 27th, while the combined Fleets at Torbay were enveloped in fog, the greatest difficulty was experienced in getting the simplest signals through by ordinary methods, but the "Dreadnought" and "King Edward VII." were communicating with ease and certainty, at 5 miles distance, by Short Distance W.T., while at the same time using the main installations for other purposes.

In the opinion of the Conference, Short Distance W.T. has become a necessity for all ships down to attached cruisers for the following purposes:—

- (a) To enable proper use to be made of the Long Distance Sets, as originally intended in the organisation, and as experience has shown to be necessary.
- (b) For use in fog or thick weather, and at night when cruising without lights.
- (c) To meet requirements in the case of ships spread to a distance of 5 miles, as mentioned in section I., para. 2, clause (a).

It is not considered necessary at present to supply Short Distance Sets to Minelayers, parent ships of Submarines, parent ships of Destroyers, or vessels on special detached duty on foreign stations.

2. *Mark II. Transmitting Sets.*

These sets have been generally satisfactory, but the following points were raised:—

- (a) It is recommended that a second Motor Alternator Starter be supplied to each ship. The article is so important that it is considered necessary to have a spare one immediately available for replacements.*
- (b) The method of sending the short wave-lengths "D" and "P" from these sets is not altogether satisfactory, and it is proposed that "Vernon" endeavour to bring out a more suitable arrangement, using the main aerial. This may involve a slight addition to the existing apparatus.†

3. *Mark I*. Sets are considered satisfactory.*4. *Destroyer Sets. Proposal to fit all Destroyers of Sea-going Flotillas.*

The Destroyer sets worked very well indeed.

The Destroyers not fitted with W.T. were very much handicapped during manœuvres, and in many cases were entirely without information, and practically lost.

The Conference is therefore of opinion that all Destroyers belonging to sea-going flotillas should be fitted with W.T.

Vessels used for Harbour Defence only will not require these sets, but can be provided with Harbour Defence Sets in the usual way.

5. *Improvements required in Receiving Circuits.*

Improvements in the receiving circuits of all ships and stations are required as follows:—

- (a) *More sensitive detectors.*—This can be met by the introduction of contact detectors, crystallite or carborundum, and the "C" type receiving set, designs for which are practically complete in "Vernon."‡

* Approved, N.S. G. 15507/14576, 14.10.10.

† "Vernon" has been directed to carry out experiments.

‡ Approved, N.S. 10272/10.

(b) *A small tuned testing set*, by means of which the receiving circuit can be tested at any moment, to see that it is correctly joined up and properly in tune for the wave length which it is desired to receive, is required.*

It is proposed that "Vernon" get out designs for such a set.

(c) *A more selective receiving circuit is necessary*, especially in view of the proposed re-introduction of "R" and "T" wave-lengths. "Vernon" is now experimenting with a view to obtaining the circuit required, and it is hoped that a material improvement in this respect will shortly be effected.

6. *Stores, &c.*

It is strongly recommended that in all future ships, suitable arrangements be made for all W.T. stores to be stowed together.† At present these stores, being stowed promiscuously with other Torpedo and Electrical stores, are not so immediately available, and do not get such special supervision as is considered necessary.

7. *Offices.‡*

Better ventilation of offices and of Silent Cabinets is very urgently required. The Conference are unanimously of opinion that the present ventilating arrangements for Silent Cabinets are most unsatisfactory.

The best method of improvement is now the subject of experiment in "Vernon," but, generally speaking, the requirements are to get air from outside the office altogether to ventilate the Silent Cabinets; and to alter the construction of the cabinet so as to ensure the free passage of fresh air right through, and to provide means of cleaning the air passages.

8. *Telephone between Short Distance Office and Main W.T. Office.*

Experience in ships where Short Distance Sets are fitted has shown it to be essential that telephonic communication be provided between the Short Distance Office and the Main Office.

SECTION III.

PERSONNEL.

1. *Training of Telegraphist Ratings.*

It is considered that the training of telegraphist ratings is generally satisfactory, and that during the recent manœuvres the great advantage of having a special branch specially trained in this subject was again exemplified.

The Boy Telegraphists come to sea with a very good education, and rapidly pick up the details of signalling, &c.; but it is recommended that every opportunity be taken, while the boys are still in the Training Ship, to render them familiar with the latest apparatus. It might perhaps be arranged for them to see the sets in the "Defiance" more often, but it is also desirable to provide as much as practicable in the way of new gear in the "Impregnable" for instructional purposes.

In view of the decision that boys are to be considered as part complement, it is recommended that the provisions of A.L. N. 4689 of 13.6.10 be extended to the Mediterranean Station also, as, if no boys are drafted to this station, the Mediterranean Ships will be at a great disadvantage as compared with other ships, observing that while boys and ordinary telegraphists cannot be considered as competent to take charge of a watch, it is undoubtedly of great assistance, when the numbers of trained operators are so far short of requirements, to have someone who can wear the telephones for a time and look out for calls.

In order to ensure that boys get adequate training at sea, it is further recommended that no boy be drafted to a ship which does not carry a Petty Officer Telegraphist.

2. *Increase in Complements of Telegraphist Ratings necessary.*

It proved impossible to discuss the working of the W.T. apparatus at sea without reference to the great difficulties of carrying out the work with the approved numbers of ratings.

The Conference are very strongly of opinion—

(a) That it is absolutely necessary to materially increase the complements of Telegraphist Ratings if proper use is to be made of the existing apparatus.

(b) That if Short Distance Sets are introduced as recommended a still further increase of complements will be necessary.

The Conference consider that Short Distance Sets, if supplied, must be manned by Telegraphist Ratings, as the operator working this set is left alone to work apparatus of a highly technical nature, and, in order to use it efficiently, he must have a good knowledge of electricity generally, and of the special features of it which are met with in W.T.

This conclusion is not a theoretical one, but is the result of actual experience with the present Short Distance Sets.

Not only as regards Short Distance W.T., but as regards the Ship's Main Installations, and the proposed increase in number of Destroyer Sets, the Conference is of opinion that the

* "Vernon" has been directed to get out design.

† Approved, G. 15499/10/23521 of 11.10.10.

‡ See page 37.

question of material cannot be considered without also considering this question of ratings, and they are unanimously of the opinion that, however urgent the requirements for additional apparatus, it would be a waste of money to purchase it unless the additional ratings necessary to work it will eventually be provided.

Experience has shown that the requirements for efficient working are as follows :—

Ships.	Supervision.	Watchkeepers.		Boys or Ordinary Telegraphists as Second Hands.
		Main Installation.	Short Distance (if fitted).	
Flagships of C.-in-C. - - - -	1 W.O. 2 C.P.O.	4 L. Tel. or above	3 Tels.	4
Flagships of divisions - - - -	1 W.O. 1 C.P.O.	4 L. Tel. or above	3 Tels.	4
Other Flagships - - - -	1 W.O. 1 C.P.O.	4 Tels. or above	3 Tels.	4
*Commodore (T.) and Captains (D.) of Second Flotilla.	1 C.P.O.	4 Tels. or above	—	4
†All other ships - - - -	1 P.O.	4 Tels. or above	3 Tels.	†—
Destroyers - - - -	—	1 L. Tel. 1 Tel.	—	—

* It is considered that the very large amount of wireless signalling necessarily carried out by Commodore (T.) and Captain (D.) renders it necessary to have the complement shown.

† Except small ships on distant stations, for which special complements would be arranged.

‡ It would be a great advantage if, so soon as sufficient ratings became available, Boys and Ordinary Telegraphists were drafted to fully-manned sea-going ships in addition to, but not in lieu of, the higher ratings shown, preference being given to ships fitted with Service Mark II. Installation. These extra ratings would be most useful as second hands in each watch, but are only shown as necessary in flagships.

It is strongly recommended that provision be made to meet the above requirements at the earliest possible moment.

(Signed) *R. S. Phipps Hornby,*
Captain H.M.S. "Vernon."
C. R. Payne,
Commander H.M.S. "Crusader."
T. H. M. Maurice,
Commander for W.T. duties,
H.M.S. "Vernon."
E. J. Prendergast,
Lieutenant, R.N., representing
Admiral Commanding Reserves.
R. M. Groves,
Lieutenant, H.M.S. "King Edward VII."
J. K. in Thurn,
Lieutenant, H.M.S. "Dreadnought."

Concur in above report.

(Signed) *Duncan W. Roe,*
Lieutenant, H.M.S. "Exmouth."

Concur except as regards proposed modification in training Boy Telegraphists. In my opinion, as W.T. Instructor, great care should be taken not to employ time which would otherwise be devoted to acquiring knowledge of Morse and Electricity in the Training Ship, to learning details of W.T. apparatus which are still being frequently modified. The latter is best taught at sea.

(Signed) *Arthur F. Salkeld,*
Captain, R.M.A., H.M.S. "Prince of Wales."

ORGANISATION OF WAVE LENGTHS AND WIRELESS SIGNAL CODE.

(See also ADDENDUM, page 59.)

A method of passing signals from one ship to another through Shore Stations has been approved, and has been inserted in errata to the Wireless and Long Distance Code. (A.L. M. 0801/1909 of 3.1.10.)

The use of the Silence Sign in conjunction with hoists indicating the tunes which it is desired to silence has also been approved. (A.L. M. 0801/1909 of 3.1.10.)

Temporary instructions for the organisation of wave-lengths in the Mediterranean and Atlantic have been added to the Wireless Code. Messages from the Admiralty to ships north of 43° N. are transmitted *via* Cleethorpes, whilst those for ships south of this latitude are sent *via* Horsea and Gibraltar. Detached ships receive signals from Gibraltar at 2, 6, and 10 o'clock. (A.L. M. 026 of 11.2.10.)

Proposals put forward at the Wireless Telegraphy Conference for further modifications to the Organisation of Wave Lengths will be found on pages 5 *et seq.*