

agreement; and the particulars of the D.F. stations will eventually appear in the International list of radio-telegraph stations. Meanwhile, each country is publishing regulations governing the use of its own D.F. stations as set out below.

7. It should be noted that there are two principal systems of D.F. stations at present in use, viz. :—

- (a.) Where each D.F. station is fitted with transmitting and receiving gear and works independently of others :
- (b.) Where several D.F. stations (all of them usually near a harbour entrance or difficult passage) are linked together by special land telegraph lines, being thus controlled by one station which alone is fitted with transmitting apparatus. The controlling-station in such cases is not necessarily a D.F. station, but may be an ordinary coast station.

REGULATIONS FOR CANADIAN AND NEWFOUNDLAND D.F. STATIONS.

8. The following independent D.F. stations are established :—

| Station.         | Call Signal. | Range (Miles) | Lat. N.  | Long. W. |
|------------------|--------------|---------------|----------|----------|
| Chebucto Head .. | VAV          | 250           | 44 30 1  | 63 31 20 |
| Canso ..         | VAX          | 100           | 45 19 24 | 60 58 25 |
| Cape Race ..     | VAZ          | 250           | 46 39 10 | 53 5 5   |

9. These stations keep watch and take bearings on the 600-metre wave.

10. A ship requiring a bearing should call the D.F. station required, and transmit a *government* message requesting the bearing.

*Example.*—A ship s.s. "Nonsuch," call sign XYZ, calls up Chebucto Head in the ordinary way and, on receiving "K" (go on), makes the message as follows :—

"Call" S Radio Nonsuch 1, 5, 10 (day of month) 10.50 M (time) = Officer in Charge Chebucto Head = Request bearing = Master + XYZ.

11. The D.F. station will then acknowledge receipt of the message, and, if not ready to take the bearing at once, will direct the ship to wait.

12. When ready to take the bearing, the D.F. station will make "K" (go on), whereupon the ship will make the figure "2" thirty times, commencing with the "Call" and ending with the "Cross" and her own call signal.

13. If the D.F. station is not satisfied with the bearing, it will make the "repeat" sign (?) and the ship will again make the figure "2" as above, but only twenty times.

14. In default of such request for a repetition, the D.F. station does not transmit until it is ready to give the bearing. To do so, the station calls the ship and sends (as a government message) the TRUE bearing of the ship from the station in degrees from 0° to 359°, the angles being measured from true north (0°) clockwise through true east (90°), true south (180°), and true west (270°).

REGULATIONS FOR D.F. STATIONS IN THE UNITED STATES.

15. The following independent D.F. stations are established :—

| Station.    | Call Signal. | Lat. N.  | Long. W. |
|-------------|--------------|----------|----------|
| Cape Cod .. | NAE          | 42 2 58  | 70 4 32  |
| Cape May .. | NSD          | 38 56 41 | 74 53 10 |

16. The above independent stations are available for use at ranges within 100 miles; and they keep watch and take bearings on 600-metre wave.

17. The controlled D.F. stations established are as follow :—

| Controlling Station. |              | D.F. Stations controlled. |           |          |
|----------------------|--------------|---------------------------|-----------|----------|
| Name.                | Call Signal. | Name.                     | Position. |          |
|                      |              |                           | Lat. N.   | Long. W. |
| New York             | NAH          | Fire Island ..            | 40 38 7   | 73 12 32 |
|                      |              | Rockaway Beach ..         | 40 33 52  | 73 52 40 |
|                      |              | Sandy Hook ..             | 40 28 12  | 74 1 6   |
|                      |              | Montoloking ..            | 40 1 30   | 74 3 10  |
|                      |              | Gloucester ..             | 42 35 19  | 70 41 8  |
| Boston ..            | NAD          | Deer Island ..            | 42 21 15  | 70 57 30 |
|                      |              | Fourth Cliff ..           | 42 9 40   | 70 42 22 |

18. These stations are available for use at about thirty miles range from the harbour entrance. They keep watch and take bearings on the 600-metre wave.

19. The ship calls up the station or stations required and requests her bearing or position by means of the abbreviations shown below :—

| Signal. | Meaning.  |
|---------|---|
| QTE ?   | What is my true bearing ?                           |
| QTE     | Your true bearing is — degrees from — D.F. station. |
| QTF ?   | What is my position ?                               |
| QTF     | Your position is latitude —, longitude —.           |

20. The station will, if necessary, direct the ship to wait, and, when ready for taking the bearing, will make "K" (go on).

- 21. The ship will then transmit—
  - (i.) Her own call signal repeated for 30 seconds.
  - (ii.) A "dash" 5 seconds long.
  - (iii.) Her own call signal thrice.
  - (iv.) A "dash" 5 seconds long.
  - (v.) Her own call signal thrice, then a "dash," and so on for one complete minute (i.e., for 1½ minutes in all), finishing with "K" (go on).

22. The station then calls the ship, and makes "QTE" followed by the true bearing in degrees (0° to 359°) as in para. 14, and the name of the D.F. station which obtained the bearing, or else "QTF" and the position in latitude and longitude. All numbers will be spelt out in words.

23. The ship acknowledges receipt by repeating back, in figures, the bearing or bearings or the position, as the case may be.

24. When working with independent stations ships should always ask for bearings. Controlling-stations may be requested to give bearings or positions as the master may elect.

REGULATIONS FOR D.F. STATIONS IN THE UNITED KINGDOM.

25. The following D.F. stations will be opened for use by merchant vessels on 1st June, 1919 :—

| Station.           | Call Signal. | Lat. N.  | Long. W. |
|--------------------|--------------|----------|----------|
| Peterhead (1) ..   | BVL          | 57 33 30 | 1 49 5   |
| Berwick (1) ..     | BVG          | 55 41 48 | 1 53 40  |
| Flamborough (1) .. | BVN          | 54 7 5   | 0 4 58   |
| Amlwch (2) ..      | BXV          | 53 24 28 | 4 18 20  |
| Rhyl (2) ..        | BZW          | 53 18 20 | 3 28 50  |
| Lizard ..          | BVY          | 49 59 7  | 5 12 18  |
| Carnsore ..        | BVZ          | 52 11 50 | 6 21 0   |
| Larne ..           | BXJ          | 54 51 15 | 5 48 15  |
| Seaview (3) ..     | BXK          | 55 22 0  | 7 19 25  |

NOTES.—(1.) Peterhead, Berwick, and Flamborough are linked by a special land line enabling any one to control the other two if required.

(2.) Rhyl is not fitted with transmitting apparatus, and is controlled by Amlwch.

(3.) Seaview is not fitted with transmitting apparatus, and is controlled by Malin Head (GMH), which keeps watch on 600 metres.

26. All the above D.F. stations keep watch and take bearings on the 450-metre wave (see note). Except as shown in the notes they all work as independent stations, and can transmit as well as receive on 450 metres.

*Note.*—Ships with Marconi apparatus can adjust their transmitting gear very nearly to this wave (using reduced power) by cutting out half the primary transmitting condenser and adjusting the A.T.I. till the earth lamp shows maximum current in the aerial. The primary slider should be "all in."

27. The actual procedure to be adopted by ships requiring bearings will depend upon what stations are concerned. It should be observed that if the stations to be called do not all keep watch on the same wave (e.g., Malin Head and Larne), bearings should be asked for separately. If, on the other hand, the stations to be called all keep watch on the same wave (e.g., Lizard and Carnsore), they should be called up together and the bearings taken in one operation. If, however, two or more stations are linked by special land lines (e.g., Peterhead and Berwick), only one of them should be called up (i.e., the nearest of them which is fitted with transmitting apparatus). In such cases, however, the ship must specify in the preliminary signal the D.F. stations which are required to supply bearings.

28. The following abbreviations are to be used :—

| Signal. | Meaning.   |
|---------|--|
| QTE ?   | "What is my true bearing from you (or from —) ?"       |
| QTE     | "Your true bearing from me (or from —) was — degrees." |

29. The ship calls the station or stations on the appropriate wave, making "QTE?" in conjunction, if necessary, with the