

# TRAFFIC HANDLING

Reference Text 53RCX

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# STUDY SCHEDULE

For each study step, read the assigned pages first at your usual speed, then reread slowly one or more times. Finish with one quick reading to fix the important facts firmly in your mind. Study each other step in this same way.

- 1. Ship Services . . . . . Pages 1-3  
This introductory section gives the definition of traffic handling as well as important data on ship classes, operators' positions, authority of the master and details on Greenwich Mean Time (G.M.T.). A list of the documents required before sailing is also given.
- 2. General Operating Procedures . . . . . Pages 3-9  
Although other messages have priority over the ordinary types, you will use the general procedures more than any other. Here you learn how to call a station, how to answer to a call, and the general rules for sending messages. Calling and working frequencies, together with typical procedures for the 365-515-kc. and 100-160 kc. radiotelegraph bands are explained.
- 3. Distress, Urgent and Safety Signals . . . . . Pages 10-13  
You may never need these procedures, but when you do, your own and other lives depend on your following the proper steps. You are certain to hear distress messages and must know how to avoid interference and still render the maximum assistance. Urgent and safety messages are not quite as important as distress messages, but improper handling may lead to distress. Urgent signals are sent when danger is real and threatening. Medical messages are also classed as urgent. Safety signals have to do with hazards which are sighted and which may cause others damage, such as icebergs, wrecks, and other floating objects. This causes others in the neighborhood to be on guard until the hazard can be destroyed by Coast Guard vessels. Storm warnings also come under this class.
- 4. Obtaining Radio Direction-Finding Bearings . . . . . Pages 13-15  
Radio bearings are very important as they determine the ship position almost exactly. This permits navigation around shoals and other obstructions and also serves as a check on the ship observations. Ships report when they expect to dock so everything will be in readiness for loading and unloading, obtaining tugs, etc. The position and speed are needed to figure just when the arrival will occur.
- 5. Handling of Radiotelegrams . . . . . Pages 15-23  
A preamble is sent just ahead of each telegram, serving as an identification of the message and giving much information about it. You may have to compose such preambles, count the words in the message and figure the charges on the message. The basic procedures are given here, so you can quickly pick up the procedure followed by each company.
- 6. Radio Logs and Records . . . . . Pages 23-26  
The radio log is a complete record of the operation of a radio station. The time, message number, and other information about all messages sent and received, as well as the results of tests, all distress traffic heard, hours of duty, etc. must be written in the log. The operator may have to keep other records also, such as a message abstract, which lists details about the money collected.
- 7. Appendix . . . . . Pages 26-28

## TRAFFIC HANDLING

### Ship Services

THERE are four major radio operating fields—aviation, ship, broadcast, and commercial or land station services. We have already covered much of the details of operation in the aviation and broadcast fields, so we will now turn to the operation of commercial ship and land stations, where the operator not only has technical responsibility for the equipment—he must also do the actual traffic handling.

In this lesson, we shall use the term "traffic handling" to cover *all the duties of a radio operator at a radio station which is providing radio communication service.*

Traffic handling, therefore, includes the sending and receiving of radiotelegrams and messages of all kinds, including distress messages, service messages, all types of private messages, navigational information, time signals, radio beacon signals, direction-finding signals, meteorological (weather) bulletins, standard-frequency signals, etc., along with the preparation of reports (logs, abstracts, etc.) and the testing of radio equipment as required by governmental and international regulations.

Traffic handling is thus closely related to radio laws and regulations; in fact, you will find that many laws and regulations are given in simplified form in this lesson for emphasis even though they may be covered in detail elsewhere in the Course.

This lesson gives the general procedures as they apply to ship radio operators, and points out the more important exceptions applying to certain other services. We will take up the general operating procedure, distress, urgent and safety communications, getting bearings, handling radiotelegrams, keeping logs, and other operating procedures fully.

Since most mobile stations use radiotelegraphy for communications purposes, the general *radiotelegraph* procedure used in the mobile service will be stressed.

Although radiotelephone service is available on some ocean-going ships of American registry (chiefly large passenger liners), radiotelegraph equipment is universally used. The radiotelephone is primarily used to provide telephone service for passengers, and the ordinary traffic of the ship is handled by radiotelegraph equipment. A regular operator landing a berth on one of these ships would have no difficulty in mastering the minor variations in procedure required for radiotelephone work.

At land stations, radiotelephone traffic is chiefly handled by regular long-distance telephone operators. Special services do use licensed operators, but here again a thorough knowledge of radiotelegraph procedure is the chief requirement.

**Ship Classes.** Ship stations are arranged in three classes, according to the hours of radio communication service, which in turn is determined primarily by the size and type of ship, whether cargo or passenger, and number of passengers. First-class ship stations carry on a continuous, 24-hour service when at sea. Second-class stations carry on limited services during certain fixed hours, while third-class stations have no fixed hours except those set by the master of the ship. Ships of the third class usually have only one operator; second-class ships may have only one but usually have two or more, and first-class ships may have a number of operators.

**Getting a Job.** Now suppose you have obtained the required second-class radiotelegraph operator's license. This makes you eligible for the position of second (assistant) operator on any class of ship. Also, you can be the only operator on board a ship of the third category (class) without previous experience. Before you can become chief operator on ships of the second class, you must serve as second opera-

tor for six months, or have six months of service on a ship of the third class. By first getting a second operator's berth (position), the operating procedures can be easily learned.

After having served a year as second-class operator, you are then eligible (after an examination) for a first-class license, which makes you eligible to become chief operator on a first-class ship.

► As a radio operator on board a ship, you are classed as an officer of the ship, as the radio room is in your charge. However, you are definitely and absolutely under the master of the ship, who has absolute control over you and your apparatus. You must obey any order he may make. This must always be remembered. The following is quoted from Section 358 of the Communications Act of 1934, as amended, and must be fully understood:

#### AUTHORITY OF MASTER

*"Sec. 358. The radio installation, the operators, the regulation of their watches, the transmission and receipt of messages, and the radio service of the ship except as they may be regulated by law or international agreement, or by rules and regulations made in pursuance thereof, shall in the case of a ship of the United States be under the supreme control of the master."*

#### GETTING STARTED

When you go aboard ship, you will be assigned quarters by the master of the ship or chief operator. As soon as these formalities have been completed, you should become familiar with the equipment and duties of the position. Each company employing radio operators has its own rules and routine duties, but specific instructions regarding these rules are always given to newly employed operators, and are easily picked up by an operator once he is on the job. Careful study of this lesson will give you the basic knowledge for speedy mastery of specific traffic-handling rules at any station to which you may be assigned.

#### DOCUMENTS REQUIRED

Start by checking the documents and equipment, to see that the legal requirements are fulfilled. Before sailing, ship

stations which are required by law to have radiotelegraph equipment must have available:

**1. A radio license for the transmitter**, specifying the call letters, operating frequencies and particulars of the equipment.

**2. The operator's license or certificate** for each operator.

**3. A register (radio service log)** in which a complete record of operations shall be kept. It will be necessary to place in this register, at the time they occur, service incidents of all kinds, tests and results of tests, record of operators and their hours of duty, records of messages sent and received, as well as the communications exchanged with land or mobile stations relating to reports of disaster. If the regulations on board permit, the position of the vehicle shall be indicated once a day in said register. (Log keeping is covered later in this lesson.)

**4. Alphabetical lists of the call signals** used by each country.

**5. The Nomenclature (lists) of coast and ship stations**, giving call signals, frequencies used, power, working hours and other data.

**6. Nomenclature (lists) of stations carrying on special services**, such as radio direction-finding stations, radio beacon stations and stations sending time signals, weather reports, etc.

**7. The General Radio Regulations and the Additional Radio Regulations**, as well as the provisions of the Convention necessary for the operation of radio communication services on board ship.

**8. The telegraph rates of the countries** from which the station most frequently accepts radiotelegrams.

► In addition, it is required by law that there be on board complete diagrams and operating instructions for the radio equipment. Furthermore, you should be provided with data on operational procedures in the particular service for which the ship is classed.

Should any of these be missing, this fact should be reported to the master of the ship so that the documents can be procured immediately.

► There are two documents which you should provide for yourself before getting

a job, even though they may be on board ship. The General Radio Regulations are given in the Report of the International Telecommunications Conferences, Cairo, 1938. This is known as the Department of State Publication 1286, Conference Series 39, and is available from the Superintendent of Documents, Government Printing Office, Washington, D. C. The price is forty-five cents.

In addition, you should have a copy of Part 8 of the Rules and Regulations of the Federal Communications Commission. This part refers to "Rules Governing Stations on Shipboard in the Maritime Services," and is also available from the Superintendent of Documents, Government Printing Office, Washington, D. C. The price for this document is 25 cents.

► In addition to these documents, there must be a number of spare radio parts on board ship. Before leaving port, certain tests of radio equipment are necessary. Complete information on these tests and the parts which should be available will be found in the Radio Rules and Regulations, Part 8, previously mentioned. You should be thoroughly familiar with these requirements.

#### GREENWICH MEAN TIME

Radio communication is frequently carried out between locations which differ in local time, especially in the maritime mobile service. To avoid confusion, ship radio operators use in their work the international standard of time known as Greenwich Mean Time (G.M.T.). This system is based on the time at the zero meridian of longitude, passing through Greenwich, England.

Greenwich Mean Time is in hours rang-

ing from 0 to 24, starting at *midnight*, and is always given in four figures. The first two figures indicate the number of hours past midnight at Greenwich, and the second two figures indicate the number of minutes past the hour. This means that at Greenwich, 0001 to 1159 are a.m. times; 1200 is noon; 1201 to 2359 are p.m. times; 2400 is the same as 0000, and is midnight. Thus, 0115 G.M.T. is 1:15 a.m. at Greenwich; 1100 is 11 a.m. at Greenwich; 1330 is 1:30 p.m. at Greenwich; 2359 is 11:59 p.m. at Greenwich.

A colon is sometimes used after the first two figures of G.M.T. to separate hours from minutes, just as is done with ordinary time. Thus, you may find 2359 G.M.T. written as 23:59 G.M.T.

When a definite time in every hour is to be specified, the letter x is used in place of the two hour figures. Thus, x:35 G.M.T. means "at 35 minutes after every hour G.M.T."

To change G.M.T. to local time at a particular location, the difference between the time at Greenwich and the local time must be known. The difference is *subtracted* from G.M.T. for locations up to 180 degrees *west* of Greenwich, and is *added* for locations up to 180 degrees *east* of Greenwich. Thus, Washington, D. C. is about 77 degrees of longitude *west* of Greenwich, and is 5 hours different in time when using Eastern Standard Time. Therefore, 0645 G.M.T. at Washington would be 1:45 a.m. E.S.T.; 1705 G.M.T. at Washington would be 12:05 p.m. E.S.T.; 2015 G.M.T. would be 3:15 p.m. E.S.T.

Don't worry about conversion to local time, however; the clock in the radio room will be set to G.M.T. and all entries in the log book will be made directly from the clock.

## General Operating Procedures

After sailing, the operator is expected to pick up and report time signals, news broadcasts, navigational information, weather data and communications addressed to the ship. By law, distress messages must be listened for. On authority of the master, messages must be sent re-

lating to the ship, private telegrams, requests for direction-finding, etc. Some of this merely requires listening to the right stations at the proper time. When you have to use the transmitter, however, you must follow certain rules.

Although there are many different ser-

vices, definite operating procedures for each have been agreed on by international conferences, so the same procedures are used throughout the world. This is necessary so as to get the greatest use out of the limited frequency bands available, with a minimum of interference. This means the time taken to send messages must be kept as short as possible, so special abbreviations and methods are used.

The general operating procedure, now to be given, is the basic method of getting in contact with another station and delivering your message. We will learn how to call a station and arrange for an operating frequency, how to answer a call, and the rules for sending radiotelegrams.

## HOW TO CALL A STATION

**Listen First.** Before you, as operator of a mobile station, apply power to the transmitting antenna, you must listen sufficiently long at or near your transmitting frequency to make sure you will not cause interference with transmissions being made within the range of your station. If such interference is likely, you must await the first stop in the transmission which would be disturbed, unless your message has priority over the transmission in progress.

**Order of Transmission.** Radio communications in the mobile service have the following order of priority:

1. Distress calls, messages and traffic, relating to the safety of life in maritime or aerial navigation. (SOS) This has absolute priority over all other types of messages.

2. Communications preceded by an urgent signal. (XXX)

3. Communications preceded by a safety signal. (TTT)

4. Communications pertaining to radio direction-finding bearings.

5. Government telegrams for which priority right has not been waived.

6. All other communications (ordinary traffic), bearing the following order of priority among themselves:

(a) Meteorological (weather) telegrams.

(b) Telegrams relating to interruptions or trouble on communication channels.

(c) Urgent service telegrams. (This is

not preceded by the urgent signal XXX, as it is not the same kind of message.)

(d) Urgent private telegrams and urgent press telegrams. (See c also.)

(e) Non-urgent or ordinary service telegrams, and telegraphic acknowledgments of receipt.

(f) Government telegrams for which the sender waives priority of transmission, ordinary private telegrams and ordinary press telegrams.

(g) Deferred telegrams and other classifications of telegrams at reduced rates.

(h) Radioletters and greeting telegrams.

These are all described in detail later in this lesson.

► If, despite preliminary listening precautions, you cause interference with a radio transmission already in progress and you do not have priority, you must cease transmitting at the first request of either of the stations.

It should be clearly understood that no provision in this lesson or in any rules or regulations shall prevent a mobile station in distress from using any means whatsoever available to it for drawing attention, signalling its position and obtaining help.

**Calling Frequency.** When calling a station and when sending preparatory signals, use the frequency on which the station called is listening. You should look up the station in the nomenclature to find its listening and working frequencies, hours of service, etc.; this is necessary so you won't call the station when it is off the air or call one you cannot work with, and so you will know just how to make the contact.

The general calling frequency for all ship and coast radiotelegraph stations, and for aircraft stations desiring to communicate with ship or coast stations, is 500 kc. This is also the international distress frequency, so messages are not sent on this wave except distress messages. Only calls to attract the attention of the desired station are sent here.

No calls (EXCEPT DISTRESS CALLS and safety signals) can be made during the three-minute INTERNATIONAL SILENT periods beginning at 15 and 45 minutes respectively after each hour G.M.T. These 3-minute periods are provided so that very

weak distress messages can be heard. You are required to listen on 500 kc. during these periods and mark your log accordingly.

► When you intend to work in the 100 to 160-kc. band, 143 kc. is the international calling frequency for long-distance communication in the mobile service. Coast stations capable of working in the 100 to 160-kc band are required to listen on 143 kc. as well as on 500 kc., during the silent period and whenever no traffic is being handled.

**General Calling Procedure.** A call may or may not be followed by signals preparatory to traffic. The call itself consists of the following:

*The call signal of the station called, sent not more than three times.*

*The word DE, sent once.*

*Your own call signal, sent not more than three times.*

Here is an example of a call: *KPK KPK KPK DE KFIM KFIM KFIM*, which means that ship station KFIM wants to communicate with coast station KPK. (Four-letter calls in the mobile service are ship stations, and three-letter calls are coast stations, as explained in the Appendix at the end of this lesson.)

When this call is sent by itself from a ship station, it means that the station called can choose the frequency to be used for the traffic. As a general rule, however, the call is followed by a preparatory signal to indicate the proposed working frequency and/or proposed type of emission, the number of radiotelegrams to be sent or a request for permission to send radiotelegrams in series. The preparatory signals are sent from an international code known as the "Q" code. (A portion of this code is given at the end of this lesson.) An example follows:

*QSW . . . . .* (Give frequency in kc. on which you propose to transmit, or the type of emission—A1, A2 or B\* — which you propose to use, or both frequency and emission.)

*QTC . . . . .* (Give the number of telegrams you have for the called station.)

\* Type B waves are not permitted on American ships. Only certain foreign ships still use this type wave.

*QSG? . . . . .* (Give the number of telegrams you want to transmit at a time.)

*AR . . . . .* This signal, consisting of the code character *. — . — .*, comprises the letters *AR* run together and signifies the end of the transmission. It is used to indicate that you will now listen for a reply.

Example of complete call and preparatory signals: *WAB WAB WAB DE KXYZ KXYZ KXYZ QSW 155 QTC 3 QSG? 1 AR*. This says that ship station KXYZ is calling coast station WAB, and would like to send 3 messages, one at a time, on 155 kc.

**Repeating a Call.** If the called station does not reply immediately, the call for that station may be repeated two additional times, at intervals of at least 2 minutes. If the third call is not answered, that station cannot be called again during the next 15 minutes, unless you are absolutely certain that additional calls will not interfere with communications already in progress. When one station is on an aircraft, however, the waiting period after three calls is 5 minutes.

**Special Calls.** Sometimes more than one station is to be called. Also, you may wish to call a certain station, but do not know its call signals. For these occasions, a "general call to all" or a code call will be used, as follows:

1. *A regular call with the letters CQ in place of the call signal of the station called, and the letter K transmitted after the call.* The letter *K* is a request for a reply. This call is used when you wish to enter into communication with stations of the mobile service but do not know the names of the mobile stations within your range. This *CQ* call is forbidden in regions where traffic is heavy.

Example: *CQ CQ CQ DE WCCB WCCB WCCB WHAT SHIP IS THAT WITH RED FUNNEL OFF OUR PORT BOW? K.*

2. *The above CQ call without the letter K at the end.* This is a general call to all stations without request for reply, and is used before transmitting information intended to be read or used by any one who can receive it, such as weather data.

3. *A special call designating all stations belonging to one navigation line or company, followed by the word DE and the signal of the calling station.* This is

a limited general call without request for reply: Example: *KSOC KSOC KSOC DE WSC WSC WSC*. (This is a call to all Standard Oil Co. stations.) This may also be sent as CP, followed by a list of calls or a code word indicating the stations which should listen.

**Calling Rules.** To minimize interference due to calling, a mobile station may call a land station only after having arrived within working range of the latter. A land station having traffic for a mobile station may call that station only if it has reason to assume that the mobile station is within its range and is listening.

**Lists of Calls.** Coast stations must, to the extent possible, transmit their calls in the form of "lists of calls" sent at prearranged times at least two hours apart, on a working frequency and according to the schedule given in the nomenclature of coast stations. Call signals of all stations for which traffic is at hand are transmitted first, usually in alphabetical order, followed by the coast station's call and abbreviations to indicate the working frequency it wishes to use. Example: *DAEK DAEK DAEK DDNY DDNY DDNY NILF NILF NILF WFCR WFCR WFCR DE WSC WSC WSC QSU 475 AR*. Mobile stations hearing this call must answer, insofar as possible, in the order in which their calls were transmitted.

## HOW TO REPLY TO A CALL

**Replying Frequency.** The station called transmits its reply on the frequency at which the calling station listens (usually 500 kc. in the case of ship stations), unless the calling station specified a frequency for the reply. However, an exception occurs when a mobile station calls a coast station on 143 kc.; the coast station then replies on its normal working frequency in the 100-160-kc. band, as indicated in the nomenclature.

Changes in frequency are made when traffic is not allowed on the calling frequency, when reception may be better on another frequency (or with another type of emission), or when traffic is too heavy on the frequency initially used. The Q abbreviations QSU, QSX, QSY and QSW facilitate frequency changing during han-

dling of traffic.

**General Replying Procedure.** The first portion of the reply to a call is standardized as follows:

*The call signal of the calling station (the one which first transmitted) sent not more than three times.*

*The word DE once.*

*The call signal of the station called, sent not more than three times.* (Common practice is to send only once.)

Example: *WIMP WIMP WIMP DE WFCR*.

This indicates that ship station WFCR is replying to a call sent out by ship station WIMP.

The second portion of the reply may be an acknowledgment of the preparatory signals which followed the first call, or a series of preparatory signals for the purpose of arriving at an agreement regarding working frequency and other details.

The stations may have a prearranged understanding with each other as to working frequency, so the called station answers with the reply to the call and some or all of the following data, as required in the particular case:

*The standard reply to the call.*

*The abbreviation QSU followed by the frequency, indicating that from that time on it is listening on the frequency and/or type of wave announced by the calling station.*

*The abbreviation QSG followed by a figure, if the calling station asked how many telegrams could be sent at one time.*

*In certain cases, if it is useful, the abbreviation QSA and a figure indicating the strength of the signals received. (The International Scale for Strength and Legibility of Signals is given with the QSA abbreviation in the Appendix.)*

*The letter K, if the station called is now ready to receive the traffic of the calling station.*

Example of complete reply to call: *WIMP WIMP WIMP DE WFCR QSU 155 QSG 3 QSA 2 K*.

If there is no preliminary understanding as to frequency, the answer to a call would consist of the following:

*The standard reply to the call.*

*The abbreviation QSU followed by fig-*

*ures indicating the frequency and/or type of wave requested.*

*In some cases, the regulatory abbreviation QSG, indicating whether it refuses or accepts the request to transmit radiotelegrams in series and, if need be, the number of telegrams it is ready to receive in one series.*

In any event, the station called shall transmit the letter K after its reply when an agreement is reached as to the working frequency for the traffic to be handled.

If the station called is unable to handle traffic at the time, it sends the standard reply but uses the signal AS (wait) . . . instead of K, followed by a number indicating in minutes the probable duration of the wait. If this exceeds 10 minutes (5 in aeronautical mobile service), a reason for the wait must be given.

If you hear a call but are not sure it is for you, do not reply; listen until the call is repeated and you understand it.

If you hear a call for you but are doubtful about the call signal of the calling station, reply immediately, using the abbreviation *QRZ?* (By whom am I being called?)

The reply can include special requests made necessary by poor receiving conditions. A sample reply of this nature would be: *KXYZ KXYZ KXYZ DE WAB QSU 425 QRK 3 QRN QRM QRO QSG 1 K*. This means that coast station WAB is ready to receive messages (K) one at a time (QSG 1) on 425 kc. (QSU 425) from ship station KXYZ, but the ship station should increase its power if possible (QRO) because the signal is readable but with difficulty (QRK 3) due to static interference (QRN) and interference from another station (QRM).

Once the letter K (go ahead) is sent, the traffic at hand can be handled.

## SENDING RADIOTELEGRAMS

**Working Frequency.** In general, both stations change to the working frequency as soon as agreement is reached on this frequency. An absolute minimum of communication is carried out on 500 kc., in order to reserve this frequency for DISTRESS calls, replies and emergency traffic. **365-515-Kc. Band.** All coast and ship

stations working within this band must be able to use at least one frequency in this band besides that of 500 kc. Additional working frequencies of each station are indicated in the nomenclature.

This means ship station frequencies are changeable, there being two or more available calling and working frequencies. These frequencies are pre-set, according to the license of the ship station. The operator must keep these frequencies accurate by monitoring (listening) tests and by checks with other stations when changes are suspected. On American ships, the frequency change is accomplished by a switch, placing pre-tuned circuits in operation.

**100-160-Kc. Band.** In this band, 143 kc. is reserved for calls and replies. The other frequencies between 140 and 146 kc. are forbidden to all traffic in order to protect the 143-kc. calling frequency, but any other working frequency in this band may be used for traffic as long as it does not interfere with the work in progress of another station.

As a general rule, any mobile station equipped for type A1 emission in this band must listen once each hour for 5 minutes on 143 kc. beginning at x:35 o'clock G.M.T., if not then communicating on some other frequency, in order to permit interchange of traffic with other stations of the mobile service.

Land stations may not transmit calling lists on 143 kc., but when the flow of traffic is facilitated thereby, they may transmit a brief preamble on 143 kc. before changing to their regular working frequency for transmission of the calling list. This preamble can be sent only once, and consists of: *CQ CQ CQ DE . . . .* (land station call signal) *TFC* (traffic) *QSW . . . .* (working frequency on which calling list will be immediately afterward transmitted). Example: *CQ CQ CQ DE WSO TFC, QSW 135*. Individual stations may be called at any time by any station on 143 kc., however.

**Starting.** When the calling station changes to its working frequency for transmission of a radiotelegram, a call signal should be transmitted before the message. It can consist of the call signal of the

called station three times, the word DE, and the call signal of the calling station once, as *WAB WAB WAB DE KXYZ*.

**Long Radiotelegrams.** Any radiotelegram containing more than 100 words shall be considered as a series of messages. As a general rule, long radiotelegrams are transmitted in sections, each containing 50 words of plain language or 20 words or groups of code or cipher. At the end or each section, transmit the question mark (?) signal . . . — — . . . which in this case means "Have you received the radiotelegram correctly up to this point?" If received correctly, the receiving station will reply by the letter K, after which transmission of the series radiotelegram can be continued.

**Repetition.** To request the repetition of a part or all of a message, use the proper abbreviation: AA, AB, AL, BN or RPT (see list of abbreviations in Appendix), preceded by the interrogation signal (?). For example: Suppose you were receiving this paragraph as the text of a message and you missed all the words between *request* and *abbreviation*. You would request a repetition as follows: *?RPT BN REQUEST AND ABBREVIATION*. The transmitting operator would then repeat as requested.

**End of Transmission.** After completing the transmission of a radiotelegram, send the signal . — . — . (end of transmission, consisting of the letters AR run together), followed by your call signal as transmitting station and the letter K. In the case of transmission of a number of messages by series (without stopping between messages for acknowledgments of receipt), indicate the end of each radiotelegram by the signal AR, and indicate the end of the series by your call signal and the letter K. The other station now has a chance to acknowledge receipt of the messages, to ask for repeats or corrections and to send to you any traffic it may have.

**Acknowledgment of Receipt.** To acknowledge receipt of a radiotelegram, the receiving station sends, on its own working frequency, the call signal of the station which has transmitted, the word DE, the call signal of the station which has received, the letter R and the number (explained

later) of the radiotelegram. Example: *KUDP DE WSL R 3*, which means that coast station WSL acknowledges receipt of radiotelegram No. 3 from ship station KUDP.

In acknowledging receipt of a series of radiotelegrams, the number of the last radiotelegram is transmitted.

**Duration of Work.** On the working frequencies, the duration of the period of work between two ship stations shall be determined by the receiving station. In communication between a land station and a ship station, the land station shall determine the duration of work.

**End of Work.** When through transmitting, the ending of work between two stations is indicated by each of them by the signal . . . — . — (end of work, consisting of the letters SK run together), followed by the call signal. The receiving operator should not send this signal until he receives clearly and understands everything sent to him, because this "SK" signal is a sign for any other waiting station to break in and start transmitting. The end-of-work signal SK is also used after transmissions of general information, meteorological information and general safety warnings, where no acknowledgments of receipt are required.

**Routing of Traffic.** In general, a ship station shall send its traffic to the nearest land station. Due to company rules, it may have to wait until it comes within the range of a particular land station owned or controlled by the same company.

A ship station may send traffic to another mobile station when that will facilitate or accelerate the transmission to its land destination. When a ship station can choose among several land stations, it must give preference to the station located in the country of destination or along the normal transit route of the radiotelegram, unless the master of the ship directs otherwise or the sender of the radiotelegram specifies a land station. If the chosen station is not the nearest, the ship station must cease working or change the frequency or type of emission upon the first request of the land station which is actually the nearest, if interference is caused.

When a land station cannot handle immediately all traffic on hand, it will notify each mobile station as to the probable time at which the work can begin.

On all occasions except distress, mobile stations shall comply with instructions given by the land station as to the order and time of transmission, choice of frequency, type of emission and suspension of work. In communications between mobile stations, the station called shall control the work except in cases of distress.

**Closing of Station.** If you are an operator at a land station which does not have continuous working hours, you may not legally close until you have finished all operations called for by a distress call, and have exchanged all radiotelegrams with mobile stations which are within your range and have signaled their presence to you.

Second and third-class ship stations may not close before having completed all traffic at hand. A ship or other mobile station which has no fixed working hours must advise the land station with which it is in communication of the closing and reopening hours of its service. However, if in a foreign port, the reopening announcement must not be made until reopening is permitted by the regulations of that country.

## INTERFERENCE

**During Tests.** Although the transmitting of unnecessary or unidentified signals or correspondence is forbidden to all stations at all times, it is permissible for mobile stations to carry out tests and make adjustments if they do not interfere with the service of other stations. Stations other than mobile stations can make tests only as permitted by the administration of the country in which they are located.

When it is necessary for a mobile station to make test signals, either for the adjustment of a transmitter before transmitting a call or for the adjustment of a receiver, these signals must not last more than 10 seconds, and must consist of a series of V's, followed at low speed by the call signal of the station transmitting the tests,

or the name of the station if need be.

When there is a possibility that test or adjustment signals may interfere with the service of a neighboring land station, permission must be obtained from that land station before such transmissions are made.

**During Traffic.** All stations of the mobile service are required to exchange traffic with the *minimum* of radiated power which is necessary to insure good communication.

In some ship transmitters, power is adjusted by varying the field rheostat of the plate supply generator. In other types, a switch is provided to insert a resistance in series with the primary of the plate transformer when power is to be reduced.

Except in cases of distress, communications between on-board (ship and aircraft) stations must not interfere with the work of land stations. When such interference occurs, the on-board station causing it must stop transmitting or change frequency upon the first request of the land station concerned.

Land stations usually have more sensitive receivers than mobile stations, and hence a communication in progress between a land station and a distant mobile station may not be audible to a nearby ship operator when the distant station is transmitting. Remember this when a land station asks you to wait for no apparent reason.

When a choice of the type of emission is possible at both stations handling traffic, the emission which creates the least interference should be used. Thus, type A1 emission (pure continuous waves, keyed according to the telegraph code) should be used in preference to type A2 emission (tone modulated carrier, keyed according to the telegraph code).

Good operating procedure calls for judgment in sending and handling traffic. Do not send faster than you can receive, because the other operator usually matches his sending speed with yours, and you may cause unnecessary interference by asking for repeats too often. Keep your code characters well separated to avoid errors. Be alert, and watch how experienced operators handle their jobs.

# Distress, Urgent and Safety Signals

**Definition.** *Distress signals are used only to announce that the ship, aircraft or other vehicle which sends the distress signal is threatened by serious and imminent danger and requests immediate assistance.* A distress signal can be sent only by order of the master of the ship.

The call has absolute priority over all other transmissions. All stations hearing it must immediately cease all transmissions capable of interfering with the distress traffic, and must listen on the frequency being used for the distress call.

## DISTRESS CALL

The distress call shall include the following:

*The automatic alarm signal, if time permits and radiotelegraphy is being used.*

*The distress signal, transmitted three times.*

*The word DE.*

*The call signal of the mobile station in distress, transmitted three times.*

A distress call is a general call to all stations, and hence must not be sent to any particular station. It does not require an acknowledgment of receipt. An example: (Send auto alarm signal) *SOS SOS SOS DE KXXX KXXX KXXX.*

**Auto Alarm.** The automatic alarm signal consists of a series of 12 dashes, each four seconds long, with an interval of one second between dashes, so that the entire signal is sent in one minute. The only purpose of this special signal is to set into operation the automatic apparatus which is used on many ships to give the alarm to operators who are not on watch at the time. The auto alarm signal can be used for only two purposes, to summon operators for a distress call or message, or for an urgent cyclone warning by an authorized coast station. There should be a wait of about two minutes after sending this alarm, to allow operators to come on duty.

► All ship stations must have a clock with a sweep second hand and a face clearly marked for guidance in timing the different elements of the one-minute alarm sig-

nal. Many ships have automatic devices to send this signal accurately.

► Auto alarm equipment must be tested at least once every 24 hours while a ship is being navigated outside a harbor or port, and a record of this test must be made in the log of the station. Testing instructions are posted near the equipment at each station. In addition, a monthly report of auto alarm operation must be mailed to the Federal Communications Commission, Washington, D. C., on prescribed forms.

**Distress Signal.** In addition to the auto alarm, a distress signal is sent as follows:

**Radiotelegraphy.** In radiotelegraphy the distress signal is keyed . . . — — — . . . and is transmitted as one signal, with the dashes emphasized so that they are clearly distinguishable from the dots. As you can see, this radiotelegraph distress signal consists of the letters SOS run together.

**Radiotelephony.** In radiotelephony, the distress signal shall consist of the spoken expression *MAYDAY*. This corresponds to the French pronunciation of the expression "m'aider," which means "help me."

**Distress Frequencies.** Whenever possible, the frequency to be used in case of distress shall be the international distress frequency of 500 kc., preferably using type A2 or type B emission. Ship radiotelegraph stations which cannot for any reason transmit on this frequency shall use their normal calling wave for the distress signal. As previously pointed out, all stations of the maritime mobile service normally listen on this frequency when not handling traffic, and all of these stations listen regularly twice each hour for 3-minute periods, beginning at x:15 and x:45 o'clock G.M.T.

Any aircraft in distress must transmit its distress call on the watching frequency of whatever land or mobile station is capable of helping it. This means that aircraft in distress over water should use 500 kc.

Although the regulations given in this section of the lesson are generally fol-

lowed throughout the world, none of these regulations or provisions prevent a mobile station in distress from using any means whatsoever for drawing attention, signaling its position, and obtaining help.

## THE DISTRESS MESSAGE

The distress message includes the complete distress call, the name of the ship or aircraft in distress, the position, the nature of the help needed, and any other information which might facilitate this assistance.

When radiotelegraphy is used for a distress message, the transmitting speed must not exceed 16 words per minute.

**Position.** As a general rule, a ship or aircraft at sea shall signal its position in latitude and longitude or by giving the true bearings and the distance in nautical miles from some known geographical point. Figures shall be used for transmitting the degrees and minutes, with a period separating degrees from minutes and with the direction words spelled out. Example: *21.35 NORTH 39.20 WEST.*

After having sent the distress message, a ship equipped with radiotelegraph apparatus shall transmit, when practicable, the ship's call signal for a period long enough to enable land and ship stations equipped with radio direction-finders to determine or check its position.

**Repetition.** The distress message must be repeated at intervals until an answer has been received, and should particularly be repeated during the intervals of silence specified by international regulations on the distress frequency being used. The alarm signal may also be repeated, if considered necessary because of poor receiving conditions in the vicinity of the ship in distress. Enough time should be allowed between repetitions of the distress message, however, so that stations preparing to reply will have time to put their transmitters in operation.

A mobile station which has been listening to a distress message and has not heard an acknowledgment of receipt from other stations must, if not itself in a position to render assistance, take all possible steps to attract the attention of stations which are in a position to furnish help.

For this purpose, with the permission of the master of the ship, it may repeat the distress message, preceded by the auto alarm signal. This repetition shall be made at full power, either on the distress frequency or on one of the other frequencies which may be used in case of distress. A station so repeating a distress message shall transmit after the message the word DE, followed by its own call signal sent three times.

**Replying to Distress Message.** Mobile stations which receive a distress message from a mobile station which is unquestionably in their vicinity must acknowledge receipt of the message at once, as follows:

*The call signal of the mobile station in distress, transmitted three times.*

*DE*

*The call signal of the station acknowledging receipt transmitted three times.*

*The group RRR.*

*The distress signal.*

Example: *WUAG WUAG WUAG DE WPBT WPBT WPBT RRR SOS.*

A mobile station acknowledging receipt of a distress message must, on the order of the master of the ship, transmit the following information as soon as possible after the acknowledgment, in the order indicated:

*The name of the acknowledging mobile station.*

*The position of the station.*

*The maximum speed at which it is proceeding toward the ship or aircraft in distress.*

**Important:** Before transmitting the foregoing message of acknowledgment, the station must make sure that it is not interfering with any other stations which are in a better position to render immediate assistance to the station in distress.

If the distress call was not preceded by an auto alarm signal, these nearby stations may transmit the auto alarm signal themselves with the authorization of the master of the ship or other authority responsible for the station. Care must be taken not to interfere with other stations acknowledging receipt of the distress message.

Stations not in the vicinity of a mobile station in distress must wait a short period

of time before acknowledging receipt of the distress message, so that stations nearer to the site of distress can answer without interference.

A mobile station which becomes aware that another mobile station is in distress may transmit the distress message under the following two conditions: 1. If the station in distress is not able to transmit the distress message: 2. If the master having authority over the rescuing mobile station believes that further help is necessary.

## DISTRESS TRAFFIC

This includes all messages relative to immediate assistance needed by the mobile station in distress.

Every distress-traffic radiotelegram must include the distress signal *SOS* preceding the call, repeated at the beginning of the preamble of the message.

Distress traffic is controlled by the mobile station in distress or by the station which has been designated by the station in distress. These stations may, however, delegate the control of the distress traffic to another station.

Any station of the mobile service which becomes aware of distress traffic must listen to this traffic even though not taking part in it. For the entire duration of distress traffic, the stations are definitely prohibited from using the frequency on which the distress traffic is taking place. A mobile station which has sufficient equipment on hand to listen and operate simultaneously may, while following distress traffic of which it is aware, continue normal service after the distress traffic is well established, provided *no interference* is caused.

**Request for Silence.** Any station which is in the vicinity of a ship or aircraft in distress may impose silence on all mobile stations in the zone or on any one station which may be causing interference with distress traffic. Silence is requested by means of the abbreviation *QRT*, followed by the word *DISTRESS* and a call addressed either to all stations (*CQ*) or to the one interfering station. When silence is requested by the station in distress, however, it shall substitute the distress signal (*SOS*) for the word *DISTRESS*. The use of the abbreviation *QRT* must be

reserved, so far as possible, for the ship in distress and for the station which is controlling distress traffic.

**Ending Distress Traffic.** When distress traffic is ended or when it is no longer necessary to observe silence, the station which is controlling distress traffic shall send a general message "to all," indicating that distress traffic is ended. This message shall be sent on the regular distress frequency and also, where necessary, on the frequency being used for the distress traffic. The form of the message is as follows:

*The distress signal (SOS).*

*CQ CQ CQ DE*

*The call signal of the station transmitting the "all clear" message, transmitted once.*

*The time of filing of this message.*

*The name and call signal of the mobile station which was in distress.*

*QUM* (the regulatory abbreviation indicating that the distress traffic is ended). Example: *SOS CQ CQ CQ DE WPBT 1745 ROSE WUAG QUM.*

## URGENT COMMUNICATIONS

Next to distress messages in priority are urgent, then safety messages. Refer back to the definition of a distress message and compare with the following, so as to be absolutely sure of the meaning of these terms.

**Definitions.** These signals are defined as follows:

1. *Urgent signals are used to indicate that the calling station has a very urgent message to transmit concerning the safety of a ship, aircraft or other vehicle, or concerning the safety of some person on board or sighted from on board. In the aeronautical service, the urgent signal indicates that the aircraft transmitting it is in trouble and is forced to land, but is not in need of immediate help.*

2. *Safety signals announce that the station is about to transmit a message concerning the safety of navigation or giving important meteorological (weather) warnings.*

**Urgent Signal.** In radiotelegraphy, the urgent signal consists of the group *XXX*

transmitted three times, with the letters in each group and the three consecutive groups well separated. This urgent signal is sent immediately before the regular call.

In radiotelephony, the urgent signal consists of three transmissions of the expression *PAN* (corresponding to the French pronunciation of the word "panne"), transmitted before the call.

The urgent signal, which is used to indicate a very urgent message regarding the safety of a ship, aircraft or person, has priority over all other communications except distress communications. All mobile and land stations hearing the urgent signal must take care not to interfere with the transmission of the message which follows it.

The urgent signal may be transmitted only with the authorization of the master or other person responsible for the ship or aircraft or, in the case of a land station, with the approval of a responsible authority.

As a general rule, a mobile station addresses an urgent signal to a definite other station, whereas a land station addresses it "to all."

Mobile stations hearing the urgent signal must listen for at least 3 minutes; if no urgent message is heard during this time, they may resume normal service. Land and on-board stations which are carrying on communication on frequencies other than those used for the urgent call may continue their normal work unless the message is addressed to them or "to all."

A station which transmits an urgent message "to all" and which includes measures to be taken by stations receiving the message must cancel the urgent message

as soon as there is no longer necessity for acting upon it.

## SAFETY COMMUNICATIONS

**Safety Signal.** In radiotelegraphy the safety signal consists of the group *TTT* transmitted three times, with the letters in each group and the three consecutive groups well separated. This signal is followed by the word *DE* and three transmissions of the call signal of the station sending it, and indicates that the station is about to transmit a message concerning the safety of navigation or an important meteorological warning.

In radiotelephony the safety signal consists of three transmissions of the word *SECURITY* (corresponding to the French pronunciation of the word "sécurité"). This is followed by *DE* and three transmissions of the station's call signal.

The safety signal and the message which follows it can be transmitted either on a distress frequency or on one of the other frequencies which may, in some cases, be used for distress traffic.

Normally, the *safety signal* is transmitted toward the end of a period of silence, and the *safety message* is transmitted immediately after the period of silence (after x:18 and x:48 G.M.T. on 500 kc.). The message must be transmitted with as little delay as possible, and the entire safety signal and message must be repeated in this same manner at the next period of silence.

All stations hearing the safety signal must continue listening until the message has been received completely, and must keep silence on all frequencies likely to interfere with the message.

## Obtaining Radio Direction-Finding Bearings

When a ship, aircraft or other mobile station is not equipped with a radiocompass (or its own is out of order) and wishes to obtain its bearing from radio stations providing that service, the following information must first be obtained from the

nomenclature:

1. The call signals of the stations providing radio direction-finding bearings in the location.

2. The frequencies on which these stations keep watch, their hours of service,



the frequencies on which they take bearings, and the type and duration of signal required for direction-finding purposes.

3. The stations which may be connected by wire with the radio direction-finding station to be called.

► The frequency of 375 kc. is reserved for transmissions relating to direction-finder bearings. All Navy direction-finding stations should be called on 375 kc.

In general, if the stations which provide bearings do not listen on the same frequency, the bearings must be requested separately from each station.

If all the radio direction-finding stations concerned listen on the same frequency, and all are able to take bearings on a common frequency, all must be called at the same time so that simultaneous bearings can be taken on one and the same transmission. When stations are grouped by land wires, only one of the group must be called.

**General Procedure.** The mobile station desiring to obtain a bearing calls the radio direction-finding station on its watching frequency. After the call, the abbreviation QTE? is transmitted, followed by the abbreviation QTH? if the direction-finding station is a mobile station. If necessary, the calling station also indicates the frequency it is going to use to have a bearing determined. The calling station then awaits instructions.

The radio direction-finding station which is called shall direct the calling station to transmit. The calling station then sends out the required signal.

The radio direction-finding station determines the direction and, if possible, the sense of the bearing, and transmits this information to the station as follows:

The abbreviation QTE.

The true bearing in degrees from the radio direction-finding station.

The time of observation.

If the radio direction-finding station is a mobile station, it then sends its own position in latitude and longitude, preceded by the abbreviation QTH.

If the radio direction-finding station is unable to secure an accurate bearing from the first transmission, it may request the calling station to repeat the transmission.

As soon as the calling station has received the result of the observation, it must repeat the message to the radio direction-finding station in order to confirm the accuracy. If the radio direction-finding station is certain that the mobile station has received the message correctly, it transmits the signal "end of work." The calling station then repeats this signal to indicate that the operation is completed.

The abbreviation QTF? is used when calling the control station of a group of two or more direction-finding stations to request a position. (Notice that the *position* is given exactly in latitude and longitude while a *bearing* just indicates the angle with respect to north.) The control station replies to the call and, when its associated direction-finding stations are all ready, directs the calling station to transmit. The control station likewise transmits the results, using the abbreviation QTF.

When simultaneous bearings are desired from two or more radio direction-finding stations organized as a group, the control station handles all communications with the calling station, and transmits in turn the bearings observed by each station of the group. Each bearing is preceded by the call signal of the station which took it.

**Example:** Suppose ship WTCW wishes to obtain its bearing upon approaching New York Bay. It calls NJY, which is the master station of the New York Bay radiocompass group, located on Fire Island. WTCW calls as follows:

NJY NJY NJY DE WTCW WTCW WTCW QTE?

NJY answers:

WTCW DE NJY K.

WTCW then sends:

NJY DE WTCW MO\* WTCW MO WTCW MO WTCW (etc. for about 45 seconds). (Then he finishes the transmission by sending) AR K.

NJY then replies, giving the bearing:

WTCW DE NJY QTE F I GONIO\* 140

\*The letters MO are formed of dashes, and if sent slowly, give the station an opportunity to take the bearing of the ship.

\*GONIO refers to the bearing taken from the goniometer. The abbreviations FI, M and SH refer to the stations under the control of the master station.

M GONIO 080 S H GONIO 040 AT 0245 AR K.

WTCW then repeats the numbers as follows:

NJY DE WTCW F I 140 M 080 S H 040 AT 0245? AR K.

NJY then acknowledges them correct:

WTCW DE NJY R SK (end of work).

If the ship has received them incorrectly, the compass station would repeat them again in their correct form and the entire

acknowledgment would have to be repeated.

**Radiobeacon Service.** If the ship is fitted with its own radiocompass, it may take its own bearings. U. S. beacon stations operate within the 285-315-kc. band. These stations have exactly known positions, so the radiocompass bearing from shipboard can be used to find the position. The procedure has been described elsewhere in the Course.

## Handling of Radiotelegrams

When you begin work at a station which handles radiotelegrams, your employer will give you detailed information on the preparation, handling and delivery of traffic in accordance with the rules established by that company. Therefore, it is sufficient now for you to master the general procedures which are given here and which are followed by practically all stations. This information will enable you to master quickly the rules of a particular station, and will also serve as a guide for you in any circumstances where a regular traffic manual is not available.

When a telegram is handed to you, it should contain an address, the actual message, and the signature of the sender. You must then count the words, figure the charges and fill in the preamble, unless the ship is a large one employing some one for this duty.

As each part is treated separately, let's divide the radiotelegram into four parts: 1. *The preamble*; 2. *The address*; 3. *The text*; 4. *The signature*. The composition of each part will now be taken up in turn.

### THE PREAMBLE

The preamble is a series of characters sent just before a radiotelegram to indicate the kind of message, the message number, office of origin, the date and time, number of words in the message, routing instructions and service indicator. Thus, the preamble gives information necessary to identify the telegram, trace it, figure charges and otherwise handle the message.

The exact order of these items is subject to change, but the essential data is sent as follows:

(a) **A PREFIX** (abbreviation) designating the nature of the telegram. The following abbreviations are specified for this purpose in the International Telegraph Regulations, Cairo Revision, 1938:

- SOS.....Distress signal.
- XXX.....Urgent signal.
- TTT.....Safety signal.
- SVH.....Telegram relating to safety of life in maritime or aerial navigation.
- S.....Government telegram.
- SCDE.....Government code telegram.
- F.....Government telegram for which priority has been waived.
- FCDE....Government code telegram for which priority is waived.
- A.....Ordinary official or service telegram.
- AD.....Urgent official or service telegram.
- ADG.....Official or service telegram relating to trouble on communication channels.
- ST.....Paid-service notice, requesting information or issuing instructions relating to telegrams previously transmitted.
- RST.....Reply to paid-service notice.
- OBS.....Meteorological telegram.
- D.....Urgent private telegram.
- CR.....Acknowledgment of receipt.
- CDE.....Telegram in code or secret language.

No prefix—All other types of telegrams, such as full-rate day messages, press messages, etc.

Some variations exist in American services. The following prefixes are frequently used by American operators. Note the use of GOVT instead of S to indicate a Government telegram.

- P (or no prefix) ..Full-rate day message.  
DL.....Day letter.  
NL.....Night letter.  
GOVT.....Government day message. (Also used ahead of above prefixes; thus, GOVT NL indicates a government night letter.)  
PRESSE ..Press message.  
DPR.....Day press message, filed for transmission between 6 a.m. and 6 p.m., zone time, at one-third the rate of a full-rate day message.  
NPR.....Night press message, filed during the day for transmission after 6 p.m., at one-sixth the rate of a full-rate day message.  
MEDICO ..Medical service message.  
SVC.....Service message relating only to traffic.  
MSG.....Master's service message.  
PDH.....Dead head message (no charge).

(b) **A MESSAGE NUMBER.** Beginning at midnight on whatever time is used by a station for its traffic-handling records, radiotelegrams transmitted to each station each day are numbered in sequence, starting with 1. In other words, a new series of numbers is used for each station worked during each 24-hour period beginning at midnight. Example: Four messages sent by a ship in one day to WNY (New York) would be numbered 1 to 4 inclusive; six messages to WBF (Boston) on that same day would be numbered 1 to 6 inclusive.

(c) **The OFFICE OF ORIGIN,** which is the name of the telegraph or radio office or station which accepts the message from its sender. Thus, if a radio message for a passenger on the S.S. Republic is filed at

the telegraph office in Rockville, Md., the office of origin is Rockville, Md., regardless of which coast station actually transmits the message to the ship.

The office of origin is sometimes followed by the call signal of the station of origin, in which case the name of the office is separated from the call signal by a fraction bar. Example: BOSTON/WBF. In the case of a ship station of origin, the letters S.S. ahead of the name serve to distinguish it from any land telegraph office which may have the same name. When a radiotelegram is relayed, the name of the forwarding station should be transmitted after the name of the station of origin.

(d) **The DATE and TIME of filing of the telegram.** (This is the time the telegram is accepted for transmission.) The date is indicated by a two-figure group (01 to 31) representing the day of the month. The time is indicated by a four-figure group (0001 to 2400) indicating the hour and the minute, either in G.M.T. or local zone time, with the type of time being clearly indicated. Thus, a message filed at 6:30 p.m. Eastern Standard Time on July 17 would carry the notation 17 1830 EST or 17 2330 (G.M.T. is always assumed when no other indications are given.)

The actual time of transmission is written on the original blank by the sending operator, but this is not a part of the transmitted preamble.

(e) **The NUMBER OF WORDS** in the message, including those in the address and signature. Instructions for counting words are given later in this lesson.

(f) **ROUTING INSTRUCTIONS,** if necessary. Thus, when a message for a ship is filed inland, the coast station which is to handle the message would be specified by its call signal and/or name.

(g) **PAID-SERVICE INDICATORS** if the sender requests some kind of special handling. Equal signs (= sent as — . . . —) are transmitted to separate the paid-service indicators from the rest of the preamble and to separate the indicators from each other and from the address which follows. The paid service indicator is sent just before the address, and is sometimes counted (and may be charged for) as

a word of the message. It is thus different from the rest of the preamble which is sent free and not word-counted.

The following paid-service indicators are taken from the International Telegraph Regulations. Some variations will be found in American practice.

- = D = ..... Urgent. Gives priority over other private telegrams. Charges are double the ordinary rate.  
= RP ... = ... Prepaid reply, followed by amount paid for reply. Example: = RP 6.75 = means the sender has paid \$6.75 in advance for the reply.  
= TC = ..... Collation. This involves repetition of the entire telegram (including the preamble) and careful checking by each radio and telegraph office through which the message passes. The extra charge is one-half the ordinary rate for that message. Government and service telegrams written wholly or partly in secret language are given routine collation free of charge.  
= RM = ..... Request for retransmission of radiotelegram en route by one or at the most two on-board stations when direct transmission is not possible.  
= PC = ..... Acknowledgment of receipt by radio.  
= PCP = ..... Acknowledgment of receipt by mail.  
= FS = ..... Please forward.

Delivery from office of destination to addressee may be requested by sender in any of the following ways, with extra postage or delivery charges either being paid in advance or collected from addressee.  
= EXPRESS = . Special delivery service (this means any method quicker than mail, used outside the

free delivery area for telegrams).

- = XP = ..... Special delivery prepaid.  
= POSTE = ... Ordinary mail (no extra charge).  
= PR = ..... Registered mail.  
= GP = ..... General postal delivery.  
= GPR = ..... Registered general postal delivery.  
= PAV = ..... Airmail.  
= MP = ..... Personal delivery only to addressee by a messenger.  
= LX = ..... Telegram to be delivered on de luxe blank at festive event.  
= LXDEUIL = . Telegram to be delivered on de luxe blank on occasion of mourning.  
= DAY = ..... Not to be delivered at night.  
= NIGHT = ... To be delivered promptly even if it arrives at night.  
= TF = ..... (followed by telephone number).

The following paid-service indicators are used for reduced-rate telegrams:

- = PRESSE = .. Radiotelegram containing only news or information intended for publication or radio broadcasting. They must be addressed to newspapers, periodicals, news services or broadcasting stations, not to individuals. Charges are half of full rate.  
= LC = ..... Deferred telegram, not to be transmitted until after ordinary private telegrams and ordinary press telegrams. Charges are half of regular rates. Only clear-language telegrams accepted.  
= NLT = ..... Radioletter, which is not to be delivered before the morning after the day of filing.  
= DLT = ..... Radioletter which is not to be delivered before

the morning of the second day after the day of filing.

== XLT == ..... Congratulatory telegram where the message is made up by the sender.

## THE ADDRESS

The address must contain all particulars necessary to insure delivery of the message to the addressee by the receiving office without research or inquiry. Usually, the full name and complete address are given. However, where there is no possibility of a misunderstanding or where a code address has been registered beforehand, shorter addresses may be used. In any case, an address must contain at least two words, the first designating the addressee and the second the name of the office of destination.

If the radiotelegram is destined for a mobile station, it must contain the name or designation of the addressee, the name or call signal of the mobile station, and the name of the land station which is to transmit the message.

The particulars of the address must be written in the language of the country of destination, or in French. Names of territorial subdivisions or of countries, however, may be written in accordance with the data shown in the Official List of Offices. Family or given names, business names, and residence data shall be accepted as written by the sender.

When the addressee is in a large city, the address must include the name or number of the street and the number of the house or, in the absence of these particulars, it must state the occupation of the addressee and give any other useful information. Even in small localities, the designation of the addressee must be supplemented, as far as possible, by further particulars for the guidance of the office where the delivery is to be made.

In telegrams for China, however, groups of four letters taken from the official telegraph dictionary of the Chinese administration may be used to designate the name and residence of the addressee.

The address may be composed of the name of the addressee followed by the word

TELEPHONE, the telephone number, and the city of destination, as follows: *JONES TELEPHONE PASSY 5074 PARIS*. This indicates that delivery by telephone is optional.

The address may consist of the name of addressee, the number of his post office box, and the city, as follows: *JONES POST OFFICE BOX 275 PARIS*.

The name of the telegraph office of destination is written after the words in the address which designate the addressee and his residence. When a city has more than one telegraph office, further identification should follow the name of the city when possible. The country of destination is not transmitted unless necessary to distinguish the intended office from other offices bearing the same name or when the locality of destination is not mentioned in the appropriate official nomenclature.

In cases of insufficient address, telegrams shall be accepted at the sender's risk only.

► The equal sign (=) is transmitted after the address to separate it from the text.

## THE TEXT

The text of a message may be expressed in *clear language*, in *secret code language*, or in *secret cipher language*. Each of these languages may be used alone or together with the others in the same message; in this latter case, the message is referred to as a *mixed telegram*.

All administrations accept telegrams in clear language. They need not accept outgoing or incoming private telegrams written wholly or partly in secret language, but under normal conditions must allow these telegrams to pass through in transit.

**Clear Language.** This means ordinary, proper language which has an intelligible meaning. Each word, each expression and each group of figures or letters must have the meaning normally attached to it in the language to which it belongs. Trade marks, merchandise numbers, etc., are acceptable as clear language. In the case of telegrams from or to China, however, the text may be written entirely by means of four-figure groups taken from the official telegraph dictionary of the Chinese administration.

**Code Language.** This type of message is

composed of real or artificial words which are made up exclusively of five letters or less, which have secret meanings and do not form intelligible sentences. A code-language telegram is one whose text contains one or more words in code language.

**Cipher Language.** Groups of Arabic figures, groups of letters, words, names or expressions which do not meet the requirements of clear language or of code language (usually because figures are used or there are more than five characters per group) are called cipher messages. Figures and letters may not be mixed within the same group.

► The equal sign (=) is transmitted after the text in any kind of telegram, to separate it from the signature.

## SIGNATURE

A signature is not obligatory. If used, it may be written by the sender in any transmissible form.

An equal sign is transmitted after the signature for separation purposes, if a certification of the signature is also to be transmitted. This certification may be in the form "*SIGNATURE CERTIFIED BY* ....." or in any other legal form.

## FIGURING CHARGES

The charge for a radiotelegram originating in or intended for a mobile station is commonly referred to as a *tax*, and includes one or more of the following items:

1. The ship tax or on-board charge of the mobile station of origin or destination, or both.
2. The coast station tax of the coast station or stations participating in a transmission.
3. The land line tax for transmission over the general system of telecommunication channels.
4. Charges for supplementary services requested by the sender.
5. Any government tax applying to radiotelegrams. (This is a true tax; the other "taxes" are really charges.)

With minor exceptions, all of these charges are based upon the number of words in the message. The rate per word for each charge is always given in schedules made available to operators at stations, so there is no need to learn actual

values now. Furthermore, if a mobile station does not have sufficient data at hand to determine charges for radiotelegrams, it is permissible to obtain such information from a land station by means of a service message. The following information is presented only to give you a general idea of what the charges are.

The ship tax on most ocean steamers under the American flag is eight cents a word; on ships on the Great Lakes, it is four cents a word.

Most American coast stations have a tax of ten cents a word.

The charges on land lines depend on work and distance. Tables of rates for land lines are available at coast stations.

As an example, let us compute the cost of a ten-word message to Alabama through coast station WBF (Boston) from a ship whose ship tax is eight cents. Ship tax \$.08, coast station tax \$.10, land tax \$.05 to Alabama, total \$.23 per word. For ten words the cost would be \$2.30, plus the governmental tax.

Most radiotelegraph companies operating stations in the mobile service have reciprocal relay arrangements, which means that they relay one another's messages free of charge. This refers to relaying on the part of ship stations. For example, suppose Ship A has a message for coast station X, with which he is not yet in touch. Ship A then hears B communicate with the shore station X. Ship A could request ship B, if he is in communication with it, to relay a message to the coast station X. Ship B would make no charge for this service, provided there was a reciprocal relaying arrangement between the ships. This example assumes that both ships are controlled by different radio companies. If they are both controlled by the same company there is, of course, never a relay charge.

**United States Internal Revenue Tax.** In accordance with the United States Revenue acts, a tax of 10% of the total message cost is collected from the sender on all radiograms originating in the U. S., or on messages on American ships within the three-mile limit of the U. S. coast or its possessions, except where specifically exempted by the Act itself or by specific rul-

ing of the United States Treasury Department.

**Free Messages.** No charges are to be made for the following types of radiotelegrams which are of immediate general interest:

1. Distress messages and replies.
2. Notices originating in mobile stations regarding the presence of icebergs, derelicts and mines, or reports of cyclones and storms.
3. Notices reporting sudden weather changes threatening aerial navigation or the sudden appearance of obstacles at air-dromes.
4. Notices originating in mobile stations advising of the sudden changes in location of buoys, the functioning of light-houses, dredging equipment, etc. (Known as HYDRO messages.)
5. Service notices relating to mobile services.
9. MEDICO or medical messages to or from mobile stations.

### WORD COUNTING

Rules for counting words in radiotelegrams vary so greatly with different companies and different countries that even general rules are difficult to give. The procedure for counting words will always be available to a new operator at a station, however, so this phase of traffic-handling is one best left alone until you are actually on the job.

The following rules which are taken from International Telegraph Regulations merely indicate the general nature of the procedure for counting words. Many exceptions and variations will undoubtedly be encountered at American stations, and some of these are pointed out here.

- All parts of the preamble of a telegram are transmitted free, and the paid-service indicators following the preamble are in some cases also sent free; otherwise, count as one word.
- All parts of the address, text and signature are counted and charged for, except such reply instructions as "answer by RCA."
- Each word in the signature is counted at the rate of fifteen characters to a word. An arbitrary word, other than a registered

code address, is counted as five characters to the word, however.

- Punctuation marks, as well as dashes serving only to separate words or groups, are neither charged for nor transmitted unless the sender requests their transmission. When so requested, each isolated sign, letter or figure counts as one word.
- A pair of parenthesis signs counts as one word. Underscoring, regardless of length, counts as one word. The fraction bar counts as one word except when used to separate letters or figures added to a house number in an address, in which case it is free.
- Words separated or tied together by a hyphen, fraction bar or apostrophe shall be counted as isolated words. Compounds or alterations of clear-language words contrary to general usage are not to be accepted. Thus, WILLARRIVE cannot be accepted as a clear-language word; it must be changed to WILL ARRIVE, and counted as two words.
- Groups of figures, groups of letters, or combinations thereof (such as trade marks and abbreviations) are counted for as many words as they contain five characters, plus one word for the excess. Punctuation marks in these groups shall each count for one letter or figure. Thus, the 17-character group FM15C, 742-62CHNRI would be counted as four words. Street and house designations which are made up of figures and letters shall be counted for as many words as they contain five characters, plus one word for the excess.
- The following may be grouped into and counted a single word: family names pertaining to one and the same person; complete designations of places, squares, boulevards, streets and other public thoroughfares; names of vessels; designations of aircraft, railway trains, etc.; composite words in common usage and hence justifiable for acceptance; whole numbers, fractions, decimal or fractional numbers which are spelled out in letters.
- The name of the office or station of origin or destination in the address is counted as one word no matter how many words it takes to identify it definitely. Thus, 42ND STREET STATION, NEW YORK CITY is counted as one word. If

the name appears in the official nomenclature, it should be written exactly as shown there. If not in the nomenclature, the country name, territorial subdivision and/or descriptive data may be included with the name as one word.

- Each word in the address, text and signature which is written entirely in clear language (has no secret or prearranged meaning) shall be counted for as many words as it contains fifteen characters, plus one word for the excess.
- In code language, where each word is limited to five letters, count one for each word. In cipher language, each group shall be counted for as many words as it contains five characters, plus one word for the excess. In mixed telegrams (containing some code words or cipher groups), each word or group shall be counted for as many words as it contains five characters, plus one word for the excess. This applies to plain language words when mixed in with other groups.

**Word Check in Preamble.** When the number of words counted according to the foregoing charging rules differs from the actual number of real words and groups, both counts are to be given in the preamble of a paid message, with a fraction bar separating the two numbers. The numerator of the fraction shall indicate the number of words according to the charging rules, and the denominator (transmitted last) shall indicate the number of real words and groups. Thus, 11/9 means there are 9 actual words, but due to length or special combinations, 11 words are charged for. These two counts will differ when a clear-language telegram contains words having more than fifteen characters, when a mixed telegram contains words or groups exceeding the unit length, when groups of figures or letters in cipher and in other telegrams contain more than five letters each, or when a prearranged word appears in the signature, without constituting a registered address. Of course, in service telegrams and free-service notices only the actual number of real words need be counted or need be given in the preamble.

- The word-count of the office of station or origin shall be decisive, if agreement between stations cannot be secured. This

is true except when the originating station is aboard ship and the message is designated as going via a shore station; in this case the shore station check is to be taken. A service message may be made a part of the transaction as a clarifier by either party or station.

**Examples of Word Counts.** The following are typical examples of word counts. Similar lists are available from the operating company:

Expression	Word Count
New York	2
Newyork	1
New South Wales	3
Newsouthwales	1
Belgrave Square	2
Belgravesquare	1
Hyde Park	2
Hydepark	1
Saint James Street	3
Saintjames Street	2
Stjamesstreet	1
5th Avenue	2
332nd Street	2
East 36th Street	3
East thirtysixthstreet	2
5 bis (foreign house number, sent 5/bis)	1
15/3 h 1 (foreign house number, sent 15/3/h/1)	1

**Note:** In the address, each of the above expressions is grouped together by the operator or counter clerk, for counting and transmitting as one word.

Expression	Word Count
54-48 (five characters)	1
11 h. 30	3
11,30	1
May/August	3
15 x 6 (sent 15 x 6)	3
15x6 (without spaces)	1
E	1
G H F 15	4
G.H.F. 15	4
21070A1 (7 characters)	2
D1003 (aircraft designation)	2

**Collection of Charges.** Charges are collected from the sender at the time of filing of a radiotelegram. A receipt for the charges paid is given free upon request. When a charge is due on delivery, the telegram is delivered to the addressee only on payment of the amount due, un-

less the addressee has an authorized charge account and guarantees payment.

Where and when circumstances warrant, charge account facilities may be extended for reasonable periods of time to individuals and concerns whose credit standing is satisfactory. A radio operator must, of course, refer all requests for charge account privileges to his employer.

Radio operators must also honor *franks*, which are cards given to certain individuals or firms in the communication field, permitting the sending of a limited or unlimited number of words per year.

**Errors in Collection.** Accounts undercharged in error will be collected from the sender, and accounts overcharged in error will be refunded to the sender.

**Cancellation of a Radiogram.** The sender of a radiogram or his authorized representative may, on establishing his identity, stop its transmission and delivery, if there is still time to do so. If the cancellation is requested before transmission has begun, the charges are to be refunded. If, on the other hand, the radiogram is canceled by an intermediate office or station before reaching its final destination, the difference between the rate to the intermediate point and the final destination is refunded to the sender.

### MESSAGE EXAMPLES

The following examples show how the rules for counting words and figuring charges are applied to different types of messages:

P 4 SS ROMA 16 1030 14 VIA BOSTON==  
JOHN SMITH  
14 SEYMOUR AVE  
CRANSTON R I  
ARRIVING ROMA TOMORROW MORN-  
ING MEET ME==

WILLIAM

This is an example of a plain or clear language message. The preamble indicates this is a paid message, number 4, from SS Roma, on the 16th of the month, filing time was 10:30 (G.M.T.). The number of words (check) is 14 and the message is to

go by way of Boston. (The underscoring shows the way the words are counted). There is no paid-service indicator, as no special service was requested. Notice that punctuation is not used in the message; it would be charged for as a word per punctuation sign if used. The equal signs (=) separate the preamble, address, text and signature. The charges, assuming ship tax of 8 cents, coast station tax of 10 cents, and land line tax of 3 cents, would total 21 cents per word. For 14 words this gives a total of \$2.94, to which must be added a 10% Federal tax, making the charge \$2.94 plus .29, or \$3.23.

CDE 5 SS SURF 24 1050 8 VIA MIAMI ==  
BUXTON

NEWYORK==

BUXOM HELM HATS COWS BTRYE==  
JONES

This is a code message, made up of words of 5 letters or less. This is message number 5, from SS Surf, filed on the 24th at 10:50. Notice that a code address is used. When the message arrives in New York, the receiving station will look up the correct address in a code list. These addresses must be registered beforehand. The signature can be a code signature also, if desired. Code messages are sent at 6/10 the regular rate, so if the cost per word is 30 cents at the regular rates, the code rate will be 18 cents per word. For 8 words, this totals \$1.44 plus 14 cents tax, or \$1.58.

P 6 SS WICHITA 4 0930 9/8 ==  
BASCO  
PHILADELPHIA ==  
PMBTU LBTKNPD GNAWS WINS  
79653 ==

JONES

This is a cipher message. Mixed numbers and letters, as A76B4, are not permitted. The count is one word for each 5 characters or fractions, so the second word in the text would count as two words. Hence 9 words are charged for, with 8 words visible. The actual word count is

important, as it helps the receiving operator determine whether any improper groupings have been made, or if a word is missing. Cipher messages are charged for at the full rate. (Operators frequently repeat each word to make sure of the transmission, as a single wrong letter may destroy the entire message).

► Examples of several service messages follow. In general, they are handled like regular messages but no charge is made, so the word count is just the actual words.

MEDICO 1 SS ABERCOS 16 1000 14 ==  
MEDICO  
SS MEXICAN ==  
REQUEST PRESCRIPTION PTOMAINÉ

POISON CASE ADULT SEVERE ABDOMINAL CRAMPS ==

CAPTAIN SMITH

SVC 2 SS REPUBLIC 17 0800 15 ==  
WSC ==  
YOURS SIXTEENTH TO JOHN SMITH  
SS REPUBLIC UNDELIVERED  
PARTY NOT ON BOARD  
CAPTAIN JONES

MSG 2 SS REPUBLIC 19 1100 8 ==  
SHIPBOARD  
NEW YORK ==  
ARRIVE QUARANTINE FOUR PM  
EST ==  
SCOTT.

## Radio Logs and Records

The permanent record of the operation of the radio station is called the log. In the log the operator notes the time and other pertinent data of every message transmitted and received by the station. When no messages are being transmitted or received by the station, the operator on watch makes a record, every 15 minutes, in the log of other traffic overheard as proof that he is on the job.

Each sheet of the log shall be numbered in sequence, for each voyage, and shall include official call letters of the ship station and the name of the operator on watch.

The entry "on watch" shall be made by the operator beginning a watch, followed by his signature. The entry "off watch" shall be made by the operator being relieved or terminating a watch, followed by his signature. All log entries shall be completed, up to the minute, at the end of each watch by the operator responsible for the entries. The use of initials or signs is not authorized in lieu of the operator's signature.

During the period a watch is maintained by an operator, all calls transmitted to or from the ship station and all replies transmitted or received shall be entered, stating the time and frequencies, and the call let-

ters of the station communicated with or heard. In addition, a notation of any messages exchanged shall be entered stating the time, the frequency in kilocycles and the call letters of the station or stations heard or communicated with. Insofar as possible, a positive entry with respect to reception on 500 kc. shall be made at least once in each 15 minutes.

The time of making an entry shall be shown opposite the entry and shall be expressed in Greenwich Mean Time (G.M.T.), except that in the Great Lakes region the time shall be expressed in Eastern Standard Time (E.S.T.) (counted from 0000 to 2400 o'clock, beginning at midnight). The first entry in each hour shall consist of four figures; additional entries in the same hour may be expressed in two figures by omitting the hour designation. The abbreviation "G.M.T." (E.S.T. in the Great Lakes region) shall be marked at the head of the column in which the time is entered. On inland waters, local standard time expressed in four figures may be used.

During the period a watch is maintained by an operator, an entry shall be made twice per hour stating whether or not the international silent period was observed. In addition, entries shall be made indicat-

# Radio Log

S. S. CALAMARES Call Signal WPXL

Sheet No. 9 Bound From NEW YORK to SAN JUAN P.R.

Chief Operator JOHN JONES Assistant Operator \_\_\_\_\_

NOTICE: Entries must be made every 15 minutes while on watch

TIME	CALL LETTERS		DATE AND PARTICULARS OF COMMUNICATIONS	KC.	SIGNAL STRENGTH
	TO	FROM			
G.M.T.			----- JAN 25, 1944 -----		
0335	WEF		SENT MESSAGE NO.1,2,3	500/434	
0339		WSC	RECD MESSAGES NO. 10,11	500/476	5
0345-48			SILENT PERIOD OBSERVED - NIL	500	
0400	WSC	WJJJ	CALLING	500	5
0415-18			SILENT PERIOD OBSERVED - NIL	500	
0418-29		WSL	COPIED PRESS	109	3
0430			<i>John Jones</i> OFF WATCH. AUTO ALARM ON. BELLS RANG SENSITIVITY 45		
1545			<i>John Jones</i> ON WATCH. AUTO ALARM OFF		
1545-48			SILENT PERIOD OBSERVED - NIL	500	
1550			TESTED AUTO ALARM. WARNING LIGHTS AND BELLS WORKING OK IN RADIO ROOM AND WHEELHOUSE. BELLS RANG AT END OF 4TH FOUR SECOND DASH. SENSITIVITY 50 LINE VOLTAGE 120		
1555-1600		NSS	TIME SIGNALS. CLOCK 3 SECONDS SLOW NO CORRECTIONS MADE.	113	4

A portion of a typical radio log.

ing any signals or communications heard on 500 kilocycles during this period. If no signals are heard on 500 kilocycles, an entry to that effect shall be made. The use of rubber stamps for making entries is not authorized.

All distress calls, automatic alarm signals, urgent and safety signals made or intercepted, the complete text, if possible, of distress messages and distress communications, and any incidents or occurrences which may appear to be of importance to safety of life or property at sea, shall be entered, together with the time of such observation or occurrence, and the position of the ship or other mobile unit in need of assistance, if it can be determined.

Whenever harmful interference is experienced, an entry shall be made to that effect, stating the source of the interference, if known.

The approximate geographical location of the ship, preferably the noon position, shall be entered each day of each voyage, either in terms of latitude and longitude, or as the distance in nautical miles

and the direction from a known fixed point. For this purpose, the master of the ship shall furnish this information to the radio operator.\*

An entry shall be made of the time of departure and arrival of the vessel at each port, including in each entry the name of the port.

On a cargo vessel equipped with an auto alarm, the entry "auto alarm on," "sensitivity set at ..." and the entry "auto alarm off," respectively, shall be made whenever the operator places the auto alarm in or out of operation. Results of the required auto alarm tests shall be entered daily, including the sensitivity control setting and the minimum number of 4-second dashes from the testing device which were necessary to operate the alarm properly. The time of each failure, repair,

\* Should the master refuse to give this data, as may occur in wartime, the operator should put a statement to this effect in the log, indicating that the master refused to give the position.

adjustment or other work on the auto alarm equipment shall also be entered.

Entries shall be made of the results of tests of the emergency installation, including antenna current, hydrometer readings of lead-acid storage batteries, voltage readings of other types of batteries, and quantity of fuel available for engine-driven generators.

An entry shall be made each time the emergency power supply is used (when the vessel is in the open sea) to carry on routine communication (other than a watch for safety purposes), stating the approximate period of time of such use.

Results of inspections and tests of lifeboat radio equipment, when installed in compliance with requirements of law, prior to departure of the vessel from a harbor or port and the results of weekly inspections of such lifeboat equipment shall be entered.

A daily entry shall be made regarding comparison of the radio station clock with standard time, including an indication of any errors observed and corrections made. For this purpose, authentic radio time signals received from land or fixed stations shall be acceptable as standard time.

Any failure of equipment to operate as required, any failure of power supply, any inability to obtain sufficient power to charge storage batteries or to operate the radio installation properly and any incidents tending to unduly delay communication shall be entered.

All test transmissions shall be entered, together with the time of such transmissions and the approximate geographical location of the vessel, without regard to whether two-way communication with any other station is established.

All of the foregoing log entries must be made at ship stations which are operating on frequencies within the 100-515-kc. band. At other types of ship stations, such as those using ultra-high-frequency equipment, some of these entries are obviously not required. A new operator can quickly learn the procedure for his station by glancing over a few old log pages or by checking F.C.C. Rules and Regulations, Part 8, Rules Governing Ship Service.

► Ship station logs shall be fully completed

at the end of each voyage before the responsible operator leaves the ship. After a period of 24 hours following arrival in port, the log may be filed at the shore office of the ship owner. It must be retained for one year ordinarily, but when some entries pertain to disaster the log must be kept until written permission for its destruction is given by the F.C.C. When the log relates to complaints, claims or lawsuits, it should be kept until all such matters have been cleared up.

Log entries can be corrected only by the person who originally made them. The correction must be initialed and dated by the operator.

Rough notes may be written into a neat and condensed form, but the original rough log must be preserved and made a part of the complete log.

## ABSTRACTS

Abstracting is the bookkeeping end of the radio operator's job. Abstracts record all messages sent and received by the station, together with full information about charges collected and charges to be collected from other services. These records are necessary, as the ship operator collects fees for coast and land line charges when he sends a message, so money is owed to these services. When a message is received on board, this means some other ship or a land station has collected a fee due the ship company, which must be collected.

On smaller ships, very few private messages will be handled so this record-keeping may not be much of a job. On large liners, a clerk may be hired to keep records as well as make up telegrams, leaving operators entirely free to do the actual operating.

Different radio companies have different abstract forms, which may vary slightly in the way the information is recorded. The actual abstract sheet is usually about 20 by 12 inches in size and is ruled like a ledger, approximately 35 lines down and 21 columns across. The column headings are self-explanatory.

**Preservation of Radiotelegrams.** The originals of radiotelegrams and the documents relating to them shall be kept until

the accounts covering them are settled and, in any case, shall be kept for at least ten months, counting from the month following the month of filing the radiotelegram.

They are turned over to the company office when the ship arrives in the home port. All necessary precautions must be taken to maintain the secrecy of communications.

## Appendix

The General Radio Regulations contain complete lists of call signal assignments and the complete Q code, both described below. You should refer to these regulations for the complete tables when you need them.

### CALL SIGNAL ASSIGNMENTS

Call signals are assigned each country from an international series in which the first letter or the first two letters of the call signals show the nationality of the station. Thus, all stations starting with W, K or N are in the United States (N calls are government stations, chiefly Navy and Coast Guard). The assignment of CAACEZ to Chile means that the call signals of all stations controlled by the Chilean government start with CA, CB, CC, CD or CE, with all twenty-six letters of the alphabet being available for the remaining letters of each call signal.

You can identify the type of station by the number of letters in its call signal, as follows:

*Land stations:* Three letters.

*Fixed stations:* Three letters, or three letters followed by a single figure other than 0 or 1.

*Ship stations:* Four letters.

*Aircraft stations:* Five letters.

*Other mobile stations:* Four letters followed by a single figure other than 0 or 1.

*Amateur, experimental and private stations:* One or two letters and a single figure other than 0 or 1, followed by a group of not more than three letters (amateur stations may use 0 or 1, however).

*Broadcast stations:* Not specified, but short-wave broadcast stations usually use three letters, or combinations of figures and letters. Italian stations like 2R03, 2R018, etc., are exceptions, as also are U. S. frequency modulation stations like W71NY, K45LA and W9XYH.

U. S. standard broadcast stations on the 550 to 1500-kc. band use three or four-letter calls beginning with K or W.

### GENERAL CALLS TO SHIPS OR STATIONS

When sending a message to all stations owned by a single company, or to certain groups of U. S. stations, the following general calls are used. All stations in such groups will listen to your message.

<i>Firm</i>	<i>Call</i>
ALASKA STEAMSHIP CO. ....	WALS
ALCOA STEAMSHIP CO. ....	WALC
AMERICAN EXPORT STEAMSHIP LINE .....	KAEL
ANY OR ALL U. S. MERCHANT SHIPS .....	WGBC
AMERICAN PRESIDENT LINE. . . . .	WAMP
A. H. BULL STEAMSHIP LINES. . . . .	WABS
CLYDE MALLORY STEAMSHIP CO. ....	WCMM
ANY MACKAY RADIO SHIP. . . . .	KGMM
ANY STANDARD OIL CO. SHIP. . . . .	KSOC
TEXAS OIL CO. SHIPS .....	KETX
U. S. LINES .....	KUSL
WATERMAN STEAMSHIP CO. . . . .	WMOL
ANY U. S. MARITIME COMMISSION SHIP .....	KSBV
ANY U. S. COAST GUARD (Ship or Shore Stations) .....	NCU
ANY RADIOMARINE CORP. STATION (Short Wave Station) . . . . .	KSRW
ANY RADIOMARINE CORP. SHIP STATIONS .....	WWAA
ANY TROPICAL RADIO OR UNITED FRUIT CO. STATIONS OR SHIPS .....	KUFC
ANY OR ALL U. S. NAVAL SHIPS .....	NERK
ANY OR ALL U. S. NAVAL SHORE RADIO STATIONS .....	NQO
ANY OR ALL U. S. COMMERCIAL COAST RADIO STATIONS. . . . .	WAUS

## ABBREVIATIONS USED IN RADIO COMMUNICATION

Here are examples of the two groups of abbreviations used by radio services all over the world. The first group consists of three-letter abbreviations starting with Q, known as Q signals. A "Q" signal transmitted alone has the meaning set forth in the *Answer or statement* column. A "Q" signal followed by a question mark takes the form of a question on the same subject, as set forth in the *Question* column. The second group consists of miscellaneous one, two and three-letter abbreviations, each having only a single meaning.

Abbreviation	Question	Answer or statement
QRA ....	What is the name of your station?	The name of my station is .....
QRG ....	Will you tell me what my exact frequency (wavelength) is in kilocycles (or meters)?	Your exact frequency (wavelength) is ..... kilocycles (or ..... meters).
QRH ....	Does my frequency (wavelength) vary?	Your frequency (wavelength) varies.
QRI ....	Is the tone of my transmission regular?	The tone of your transmission varies.
QRJ ....	Are you receiving me badly? Are my signals weak?	I cannot receive you. Your signals are too weak.
QRL ....	Are you busy?	I am busy (or I am busy with .....). Please do not interfere.
QRM ....	Are you being interfered with?	I am being interfered with.
QRN ....	Are you troubled by static?	I am troubled by static.
QRO ...	Must I increase the power?	Increase the power.
QRS ...	Must I transmit more slowly?	Transmit more slowly (..... words per minute).
QRT ...	Must I stop transmission?	Stop transmission.
QRU ...	Have you anything for me?	I have nothing for you.
QRV ...	Are you ready?	I am ready.
QRW ...	Must I advise.....that you are calling him on.....kilocycles (or.....meters)?	Please advise ..... that I am calling him on ..... kilocycles (or ..... meters).
QRX ...	Must I wait? When will you call me again?	Wait (or Wait until I have finished communicating with .....). I shall call you again at ..... o'clock (or immediately).
QRZ ...	By whom am I being called?	You are being called by .....
QSG ...	Must I transmit.....telegrams (or one telegram) at a time?	Transmit ..... telegrams (or one telegram) at a time.
QSU ...	Must I transmit (or answer) on ..... kilocycles (or meters) and/or on waves of type A1, A2, A3, or B?	Transmit (or answer) on ..... kilocycles (or ..... meters) and/or on waves of type A1, A2, A3, or B.
QSV ....	Must I transmit a series of V's?	Transmit a series of V's.
QSW ....	Do you wish to transmit on ..... kilocycles (or .....meters), and/or on waves of type A1, A2, A3, or B?	I am going to transmit (or I shall transmit) on ..... kilocycles (or ..... meters), and/or on waves of type A1, A2, A3, or B.
QSX ....	Will you listen to ..... (call signal) on ..... kilocycles (or ..... meters)?	I am listening to ..... (call signal) on ..... kilocycles (or ..... meters).
QSY ....	Must I shift to transmission on ..... kilocycles (or ..... meters), without changing the type of wave? or Must I shift to transmission on another wave?	Shift to transmission on ..... kilocycles (or ..... meters) without changing the type of wave. or Shift to transmission on another wave.
QSZ .....	Must I transmit each word or group twice?	Transmit each word or group twice.
QTA ....	Must I cancel telegram no ..... as if it had not been transmitted?	Cancel telegram no..... as if it had not been transmitted.
QTB ....	Do you agree with my word count?	I do not agree with your word count; I shall repeat the first letter of each word and the first figure of each number.
QTC ....	How many telegrams have you to transmit?	I have ..... telegrams for you (or for .....).
QTE ....	What is my true bearing in relation to you? or What is my true bearing in relation to ..... (call signal)? or What is the true bearing of ..... (call signal) in relation to ..... (call signal)?	Your true bearing in relation to me is ..... degrees or Your true bearing in relation to ..... (call signal) is ..... degrees at ..... (time) or The true bearing of ..... (call signal) in relation to ..... (call signal) is ..... degrees at ..... (time).
QTF ....	Will you give me the position of my station on the basis of bearings taken by the radio direction-finding stations which you control?	The position of your station on the basis of bearings taken by the radio direction-finding stations which I control is ..... latitude, ..... longitude.
QTH ...	What is your position in latitude and in longitude (or according to any other indication)?	My position is ..... latitude, ..... longitude (or according to any other indication).
QTR ....	What is the exact time?	The exact time is .....
QUM ....	Is the distress traffic ended?	The distress traffic is ended.

Abbreviation	Meaning
C .....	Yes.
N .....	No.
W .....	Word or words.
AA .....	All after ..... (to be used after a question mark to request a repetition).
AB .....	All before ..... (to be used after a question mark to request a repetition).
AL .....	All that has just been transmitted (to be used after a question mark to request a repetition).
AS .....	Waiting period.
BN .....	All between ... (to be used after a question mark to request a repetition).
BQ .....	Answer to RQ.
CL .....	I am closing my station.
CS .....	Call signal (to be used in requesting that call signal be given or repeated).
DB .....	I cannot give you a bearing, you are not in the calibrated sector of this station.
DC .....	The minimum of your signal is suitable for the bearing.
DE .....	From.
DF .....	Your bearing at ..... (time) was ..... degrees, in the doubtful sector of this station, with a possible error of 2 degrees.
DG .....	Please advise me if you find an error in the bearing given.
DI .....	Doubtful bearing due to the bad quality of your signal.
DJ .....	Doubtful bearing due to interference.
DL .....	Your bearing at ..... (time) was ..... degrees, in the uncertain sector of this station.
DO .....	Doubtful bearing. Request another bearing later, or at ..... (time).
DP .....	Beyond 50 miles, possible error of bearing can attain 2 degrees.
DS .....	Adjust your transmitter, your minimum signal is too broad.
DT .....	I cannot give you a bearing, your minimum signal is too broad.
DY .....	This is a two-way station, what is your approximate direction in degrees, in relation to this station?
DZ .....	Your bearing is reciprocal (to be used only by the control station of a group of radio direction-finding stations when addressing other stations of the same group).
ER .....	Here ..... (to be used before the name of the mobile station in the transmission of routing indications).
GA .....	Resume transmission (to be used more especially in the fixed service).
GQ .....	Character indicating a new paragraph.
JM .....	If I may transmit, make a series of dashes. To stop my transmission, make a series of dots (not to be used on 500 kc. (600 m)).
MN .....	Minute or minutes (to be used to indicate the duration of the waiting period).
NW .....	I am resuming transmission (to be used more especially in the fixed service).
OK .....	We agree.
RQ .....	Announcing a request.
SA .....	Announcing the name of an aircraft station (to be used in transmitting transit data).
SF .....	Announcing the name of an aeronautical station.
SN .....	Announcing the name of a coast station.
SS .....	Announcing the name of a ship station (to be used in transmitting transit data).
TR .....	To announce sending of indications concerning a mobile station.
TU .....	Thank you for the cooperation given.
UA .....	Do we agree?
WA .....	Word after ... (to be used after a question mark to request a repetition).
WB .....	Word before ... (to be used after a question mark to request a repetition).
XS .....	Static.
YS .....	See your service notice.
ABV .....	Repeat (or I repeat) the figures in abbreviated form.
ADR .....	Address (to be used after a question mark to request a repetition).
CFM .....	Confirm (or I confirm).
COL .....	Collate (or I collate).
ITP .....	The punctuation counts.
NIL .....	I have nothing to transmit to you (to be used after an abbreviation of code Q to show that the answer to the question asked is in the negative).
PBL .....	Preamble (to be used after a question mark to request a repetition).
PTR .....	Request by land station to mobile station to give position (approximate distance in nautical miles and bearing with reference to the land station, or latitude and longitude) and next place of call. Can be answered by ship station only with approval of master of ship.
REF .....	Reference to ..... (or Refer to .....).
RPT .....	Repeat (or I repeat) (to be used in requesting or giving repetition of all or part of the traffic, the abbreviation to be followed by the corresponding indications).
SIG .....	Signature (to be used after a question mark to request a repetition).
TFC .....	Traffic.
TXT .....	Text (to be used after a question mark to request a repetition).



## WHEN YOU WORK FOR A MAN

Here are some words of advice written by Elbert Hubbard. Whether you are an employer or employee, I believe you'll want to read this over several times:

"If you work for a man, in heaven's name work for him. If he pays wages that supply you your bread and butter, work for him, speak well of him, think well of him, stand by him, and stand by the institution he represents. I think if I worked for a man, I would work for him, I would not work for him a part of his time, but all of his time. I would give an undivided service or none. If put to a pinch, an ounce of loyalty is worth a pound of cleverness. If you must vilify, condemn, and eternally disparage, why, resign your position, and when you are outside, damn to your heart's content. But, I pray you, so long as you are a part of an institution, do not condemn it. Not that you will injure the institution—not that—but when you disparage the concern of which you are a part, you disparage yourself."

J. E. SMITH