

## CHAPTER 6

# RADIOTELEGRAPH

Radiotelegraph operating procedure explained in this chapter is of great importance to the Radioman. The teletypewriter and radiotelephone procedures described in later chapters really are adaptations of this basic communication procedure and are easily understood by the operator versed in radiotelegraph procedure.

The effective edition of ACP 124 contains the operating instructions for radiotelegraph communications. Chapter 9 of DNC 5 (effective edition) presents an expansion of the material and modifications, where necessary, for Navy usage. Another publication, Supplement 1 to ACP 124, details the procedures followed by the United States, the British Commonwealth nations, and France on their naval broadcast, ship-shore, and intercept circuits.

The previous chapter explained call signs, prosigns, and operating signals. The purpose of this chapter is to show how they are employed in circuit operation.

Radiotelegraph procedure is used also to establish and maintain communications on facsimile circuits. A brief discussion of facsimile procedure is included in this chapter.

### CIRCUIT DISCIPLINE

We learned in chapter 3 that radio is potentially the least secure of all the various means of communication. One way in which the Radioman can improve transmission security is by his observance of strict circuit discipline.

Circuit discipline is the part of transmission security that includes the proper use of radio equipment, net control, monitoring and training, adherence to prescribed frequencies and operating procedure, and remedial action. Lack of circuit discipline and lack of operator training, as well as negligence, inaccuracy, and laxity, are responsible for the violations that endanger radio transmission security.

Although circuit discipline is discussed here in connection with radiotelegraph procedure, you must understand that the requirement for circuit discipline applies as well to teletypewriter and radiotelephone operating.

Every operator must recognize and avoid the following malpractices that endanger communication security:

1. Linkage or compromise of classified call signs and address groups by plain language or association with unclassified call signs.

2. Linkage or compromise of encrypted call signs and address groups by association with other call signs, address groups, or plain language. For example, use of encrypted call signs in the call and unencrypted call signs in the message address.

3. Misuse and confusion of call signs, routing indicators, address groups, and address indicating groups. This may result in the non-delivery of an important message, a compromise, or the linking of classified and unclassified call signs and address groups.

4. Violation of EMCON conditions of radio silence.

5. Unofficial conversation between operators.

6. Transmitting in a directed net without permission.

7. Transmitting the operator's personal sign.

8. Excessive repetition of prosigns or operating signals.

9. Individual mannerisms in transmitting. The peculiar style of an operator's sending will frequently identify a unit or station even when frequency and call signs are changed. This applies to both transmitting and procedural peculiarities.

10. Use of plain language in place of applicable prosigns or operating signals.

11. Use of unauthorized prosigns.

12. Unnecessary transmissions.

13. Incorrect and unauthorized procedure.

14. Identification of unit locations.

15. Identification of individuals belonging to an organization.

16. Excessively long calls. When a station is called and does not answer within a reasonable time, presumably because a condition of radio silence prevails, the message should be transmitted blind or put on the appropriate broadcast schedule. When a unit afloat calls a shore station on a ship-shore circuit and receives no answer within a reasonable time, the ship should deliver the message via any available station, using an indefinite shore station call sign if necessary.

17. Failure to maintain radio watches on designated frequencies and at prescribed times.

18. Transmitting at speeds beyond the capabilities of receiving operators.

19. Use of excessive transmitting power.

20. Tuning transmitters with antenna connected.

21. Excessive time consumed in tuning, testing, changing frequency, or adjusting equipment.

22. Use of profane, indecent, or obscene language.

You may be surprised at such a long list of incorrect ways of performing on circuits. Yet, each one must be avoided if transmission security is to be attained. A recent monitor study of transmission errors revealed that unnecessary transmissions alone accounted for over 17 percent of all errors noted. Transmitting too fast, with resulting improper spacing and character formation, accounted for another 10 percent of the errors. In circuit operating, as in most other work, there is no substitute for commonsense.

The competent operator always observes proper circuit discipline. Here is a guide to the general qualifications of a qualified radio operator:

1. Receives hand sending at prescribed speed and does not receipt (ROGER) for a message until he checks the group count and message indicators, and understands the transmitting instructions.

2. Sends accurately, at moderate speed, both letters and numbers.

3. Knows the executive method.

4. Makes up, pads, and encrypts any call sign.

5. Logs everything he hears on the frequency he is guarding.

6. Knows when and how to authenticate.

7. Uses only prescribed procedure.

8. Is familiar with the communication plan for his own force and for the operating area.

9. Uses accurate operating signals.

10. Tunes any transmitter on board his ship within 3 minutes with calibrated settings or with frequency meter, and with no radiation from the antenna until the last stage and coupling are given final adjustment.

11. Patches any receiver or transmitter to remote positions for single- or multiple-control operation.

## NETS

A net is an organization of two or more stations in direct communication on a common channel. One station in the net—the net control station (NCS)—is in charge. The station serving the senior commander usually is designated as net control, although it may be another station if that station is in better position to control the net.

The duties of the net control station are to speed flow of traffic on the net, to maintain circuit discipline, to limit transmissions to the essential minimum, to settle disputes incident to traffic handling, and to monitor the net so that corrective action can be taken against poor operating practices. When deemed advisable, the NCS prescribes the speed of transmission, or the qualifications of the operators to be employed during specific periods. Net control may authorize the use of speed keys (bugs) if traffic conditions warrant and if operators hold speed key certificates. (The effective edition of DNC 5 lists the qualifications for speed key operators.)

An alternate net control station ordinarily is designated to take charge of the net when the normal NCS is inoperative for any reason. When in control of the net, the alternate NCS assumes all the responsibilities of the NCS.

## DIRECTED AND FREE NETS

Large nets and nets handling many messages usually operate as directed nets, which means that no station may transmit a message without calling and obtaining permission from net control. Nets not requiring strict control may operate as free nets. As such, the controlling station authorizes member stations to send their messages without obtaining prior permission.

## COMMAND; COMMON; FUNCTIONAL NETS

Nets are classified into three types according to mission or purpose: (1) command, (2) common, and (3) functional.

A command net links a commander with his immediate subordinates in the chain of command, and with any other units that may be designated. For example, a task force command net is activated by the taskforce commander and is guarded by the task group commanders.

A common net links all ships (and in amphibious operations, troop units) of the same task organization. For example, a task group common net is activated by the task group commander and is guarded by all ships and troop units in the task group.

A functional net is for direct communication between personnel in charge of the specific task for which the net is provided. An example of a functional net is a picket reporting net guarded by anti-air warfare picket vessels and controlled by a sector AAW ship.

### TYPES OF RADIO WATCHES

Radiomen stand four types of radio watches. The requirements of each type are prescribed in the effective edition of DNC 5 as follows:

1. **GUARD:** A continuous receiver watch is required with a transmitter ready for immediate use. A complete log must be kept.

2. **COVER:** A continuous receiver watch is kept, with transmitter calibrated and available, but not necessarily for immediate use. Requires a complete log.

3. **COPY:** A continuous receiver watch is maintained, and a complete log is kept.

4. **LISTEN:** A continuous receiver watch is maintained. A complete log is optional.

The four types of watches, however, do not provide the Radioman with a choice. The communication plan under which your ship or station is operating directs the type of watch to be stood.

### SPLIT-PHONE WATCH

Owing to a shortage of Radiomen, there may be times when an operator must guard two frequencies at the same time. This method, called a split-phone watch, requires the operator to listen on both frequencies. Obviously, he cannot receive two messages simultaneously. If he is called on both frequencies at the same time, he tells one station to wait until the message is received from the other. This is done by either using the prosign **AS**, meaning "Wait," or the operating signal **ZKF**, meaning "Station leaves

net temporarily." The operating signal may be followed, if desired, by the time in minutes that the operator expects to be off the circuit, the call sign of the station working, and the circuit frequency designator.

When establishing a split-phone watch, the operating signal **ZKV**, meaning "I am standing split-phone watch on     kc (or mc)" may be sent to advise other ships or stations in the net. Circuit designators from JANAP 195 (effective edition) normally are used instead of figures to designate the frequency.

### METHODS OF RADIO TRANSMISSION

Three principal methods of handling traffic by radio are employed. They are the receipt method, the intercept method, and the broadcast method.

#### RECEIPT METHOD

In the receipt method of radio transmission, the receiving station sends a receipt to the transmitting station for each message or sequence of messages. This is the normal method of handling radiotelegraph point-to-point, ship-to-ship, ship-to-shore, and aircraft traffic. The receipt method is the most reliable, because there is no doubt of the addressee's receipt of the message. Repetitions and corrections may be obtained as necessary at the time of transmission.

A disadvantage of the receipt method in wartime is that it requires the use of transmitters by both stations. The presence of both stations is thereby disclosed, and their positions can be determined by direction finding.

#### INTERCEPT METHOD

In the intercept method, the transmitting station sends to a second station. The second station is not the addressee but, under the plan, obtains necessary repetitions to ensure correct reception, then repeats the message. Messages thus transmitted are actually intended for other stations that copy the transmissions but do not receipt for them or use their transmitters in any way. The chief advantage of this method of radio transmission is that the locations of the addressees are not disclosed.

The intercept method is not currently used by the Navy.

## BROADCAST METHOD

In the broadcast method, shore stations transmit serially numbered messages at scheduled times. Receiving stations maintain a complete file of the messages but do not receipt for them. The main advantage of the broadcast method is that the stations addressed do not answer, thus avoiding disclosure of their positions.

The broadcast method has attained such a high degree of reliability that it is the primary means of delivering traffic to the fleet. Reliability is increased by using tremendously high-powered transmitters, simultaneous keying of several different frequencies, and serially numbered messages so that the ships can tell if any messages are missed.

Automatic keying for CW broadcasts is at speeds between 17 and 29 words per minute. When the traffic load is light, the speed of transmission is dropped to 14 wpm between the hours of 0000 and 0600. The slower speed affords an excellent opportunity for strikers to improve their code speed.

The fleet broadcast areas and their identifying designator letters were illustrated in chapter 2. All large naval ships and most of the smaller ones are now equipped to copy the radioteletypewriter broadcasts. A ship copying the RATT broadcast is not required to copy the CW broadcast. This does not mean, however, that the CW broadcast is unimportant, because RATT broadcasts are closed down periodically for equipment maintenance. During these periods it is necessary for the RATT-equipped ships to shift to the CW broadcast. A prompt shift to the CW broadcast is also necessary if the RATT broadcast cannot be copied because of equipment failure or poor receiving conditions.

For many years the broadcast method was commonly called the "fox broadcast" owing to the former phonetic meaning of the prosign F, which means "Do not answer." Since the latest revision of the phonetic alphabet, which changed Fox to Foxtrot, the single title BROADCAST is officially preferred. Oldtimers, however, have been copying the "Fox Skeds" for so many years that you seldom hear them called otherwise.

### Broadcast Operator Periods

Because of a shortage of Radiomen, it has become necessary to establish one- and two-operator periods for guarding the CW broadcasts. Ships having only one Radioman are

required to copy only the one-operator periods. This consists of 5 hourly schedules each day, beginning at 0000, 0600, 1200, 1600, and 2200 GMT.

Ships carrying two Radiomen copy the two-operator periods. This includes all the schedules of the one-operator period, plus those beginning at 0200, 0800, 1000, 1400, 1800, and 2000 GMT.

Ships having three or more Radiomen maintain full coverage of all hourly schedules.

The one- and two-operator periods apply only to the CW broadcasts. The RATT broadcasts run continuously and are not broken up into hourly schedules or operator periods.

## SIGNAL STRENGTH AND READABILITY

Signal strength and readability of a transmission are questioned and answered by means of operating signals. You may assume that your station has good strength and readability unless notified otherwise. You do not exchange strength of signals and readability with another station unless you cannot hear him clearly or he cannot hear you.

The operating signal QSA preceded by the prosign INT means "What is the strength of my signals (1 to 5)?" The reply calls for the same signal (QSA) with the appropriate number affixed. The meaning of signal strength numerals is as follows:

1. Scarcely perceptible;
2. Weak;
3. Fairly good;
4. Good;
5. Very good.

The use of the signal strength report generally is limited to occasions in which the actual signal strength instead of readability is the important consideration. It is particularly applicable when changes are made in equipment, power, location, or other conditions making a test report on signal strength desirable.

Readability is indicated by means of the operating signal QRK followed by a numeral. The meaning of the numeral is:

1. Unreadable;
2. Readable now and then;
3. Readable but with difficulty;
4. Readable;
5. Perfectly readable.

For example, NAU informs NHDY as follows that NHDY's readability is poor:

NHDY DE NAU QRK2 K

After adjusting his equipment, NHDY transmits:

NAU DE NHDY  $\overline{\text{INT}}$  QRK K

Assuming now that NHDYs readability is good, NAU transmits:

NHDY DE NAU QRK4  $\overline{\text{AR}}$

Recent circuit monitor studies show too many unnecessary or excessive requests for signal strength and readability. A few operators add to the list of transmission errors by using the figure  $\emptyset$  in signal strength and readability reports. With the range of signal strength and readability figures limited 1 to 5, reports of QSA $\emptyset$  or QRK $\emptyset$  are therefore incorrect and unauthorized.

### SEPARATIVE SIGN

You will notice a short dash between certain letters in the message examples in this chapter. This is known as the separative sign. It is one of the prosigns and is transmitted as the Morse code characters  $\Pi$  (letter I repeated). Although the operator sends the separative sign as di-DIT di-DIT, it is recorded by typewriter as a hyphen (-). Its main purpose is to separate portions of the heading to prevent mistakes in reception that might occur if characters of adjacent groups are run together.

The separative sign is used in radiotelegraph but not in teletypewriter or radiotelephone procedures. Here are the rules governing the use of the separative sign:

1. Before and after all prosigns in the procedure and preamble components of the message heading, except DE,  $\overline{\text{AA}}$ , NR, and  $\overline{\text{IX}}$ .
2. To separate each element of the address; that is, between the preamble and the prosign FM, between the originator's call sign and the prosign TO, between the call sign of the last action addressee and the prosign INFO, and between the call sign of the last information addressee and the prosign XMT.
3. Between the call and the beginning of the repetition of a message to be repeated back.
4. To separate the address from the prefix (GR count line) when an accounting symbol is used.
5. To separate call signs belonging to adjacent message components or adjacent multiple transmission instructions.
6. In procedure messages to separate portions of the text.

Even though the separative sign is written as a hyphen (-), it must not be used to represent a

hyphen or dash in a message text. Instead, the Morse code equivalent for a hyphen or dash (DAH-di-di-di-di-DAH) must be used to represent this punctuation mark.

### COUNTING GROUPS

The group count of a message is the number of groups in the text, and is found in the message prefix, just before the first break prosign ( $\overline{\text{BT}}$ ). In a message, GR followed by numeral(s), means "This message contains the number of groups indicated." In a message containing a text of six words, the group count is written GR6. If the message is encrypted, the group count indicates the number of code groups in the text. Rules to follow when counting groups are—

1. Count groups between  $\overline{\text{BT}}$  and  $\overline{\text{BT}}$ .
2. Each sequence of characters uninterrupted by a space is counted as one group.
3. Punctuation is not counted unless abbreviated or spelled out.
4. Count every word and every group of letters, figures, and symbols as one group.
5. Hyphenated words and hyphenated names, when transmitted as one word, count as one group.

A numerical group count always must be used in encrypted messages. Sometimes the group count is omitted in messages having plain language texts, although this omission is more common in teletypewriter procedure than in radiotelegraph messages.

A message having an accounting symbol in the prefix (format line 10) must always have either a numerical group count or the prosign GRNC. The prosign GRNC means "The groups in the text of this message have not been counted." This prosign can be used only with plain language texts. Remember that messages with encrypted texts must always indicate a numerical count of the text groups.

The break prosign  $\overline{\text{BT}}$  is placed before and after the text of a message, but is not a part of the text. It is the prosign separating the heading from the text and the text from the ending. The text of a message is always between the two break prosigns.

### RELAY

If all stations could communicate directly with all other stations (called direct communications), there would be no need for relay instructions. Often, though, a station originating

a message cannot communicate directly with the addressees. This is called indirect communication, and one or more relays are required to get the message to its destination. This is accomplished by either a specific or a general relay. In many instances both a specific and a general relay are needed to effect delivery of the message to all addressees.

When the originator and the addressee are in direct communication, the originator may use the call as the address; then, the address component is unnecessary. To do this, however, remember that the originator must be in direct communication with all addressees. A message requiring relay must have a complete address and must contain appropriate transmission instructions.

The specific relay requires the prosign T in the transmission instructions (format line 4). When a message is received with the prosign T alone, it means "Station called transmit this message to all addressees." Suppose NTSY sends a message to NUYO with instructions for NUYO to relay to all addressees—in this example, NUYO and SQFK.

NUYO DE NTSY -  
T -  
R - 311615Z -  
FM NTSY -  
TO NUYO  
SQFK  
GR6  
BT (Etc.)

The prosign T, followed by one or more address designations, means "Station called transmit this message to addressee(s) whose address designation(s) follows." To illustrate, NTSY transmits a message to NUYO with instructions for NUYO to relay to one of the addressees (SQFK):

NUYO DE NTSY -  
T - SQFK -  
R - 161813Z -  
FM NTSY -  
TO SQFK -  
INFO NUJC  
GR18  
BT (Etc.)

Station NTSY made other arrangements to get the message to NUJC (perhaps by mail, messenger, or separate transmission on another circuit), so this station is not included in the relay.

The prosign T, preceded by a call sign, and followed by one or more address designations, means "Station whose call sign precedes T, transmit this message to addressee(s) whose

address designation(s) follow(s) T." Station NWFD, requesting NUBJ to relay the message to NTFJ:

NUBJ NUYO DE NWFD -  
NUBJ - T - NTFJ -  
R - 181927Z -  
FM NWFD -  
TO NTFJ  
NUBJ  
NUYO  
GR29  
BT (Etc.)

When this relay is accomplished, all addressees will have received the message. Station NWFD is in direct communication with NUBJ and NUYO; NUBJ can communicate with NTFJ.

The prosign XMT (exempt) is not used in conjunction with the prosign T. Relay instructions may be modified by the operating signal ZWL, meaning "No forwarding action to the designation(s) immediately following is required." Signal ZWL is used whenever it shortens the number of call signs in the transmission instructions. For example, in the following message, NTSY tells NUYO to relay to all addressees except NTFJ. He could have said the same thing, in effect, by using T - NFFN NHDY NUBJ SQFK but, as you can see, T - ZWL NTFJ is a much shorter way of doing it.

NUYO DE NTSY -  
T - ZWL NTFJ -  
R - 171315Z -  
FM NTSY -  
TO NFFN  
NHDY  
NTFJ  
NUBJ  
SQFK  
GR98  
BT (Etc.)

The general relay requires an operating signal such as ZOC, which means "Station(s) called relay this message to addressees for whom you are responsible." By using ZOC, the guardship for a number of ships and activities can be instructed to relay messages to all such stations without the necessity of individual call signs in the transmission instructions. Operating signal ZOC is used most frequently in general messages. Here is the way it appears in the transmission instructions of a typical general message:

NERK DE NSS W NR156 -  
ZOC -  
R - 061216Z/17 -

FM SECNAV -  
TO ALNAV  
GR85  
BT (Etc.)

### CORRECTING AN ERROR

When an error is made in transmitting, the operator sends a series of eight or more Es, the error prosign. The phrase "eight or more Es" is intended to facilitate operations. It does not mean you should transmit an excessive number of Es. The error prosign is sent immediately after the error. The manner in which transmission is resumed varies somewhat, depending on whether the error was made in the message heading or text.

In correcting errors in the message heading, the operator makes the error prosign, then goes back to the last prosign or operating signal that was transmitted correctly, repeats it, and continues with the correct version. Example: NFFN, transmitting a message, makes and corrects an error in the heading.

NHDY DE NFFN -  
P - 13 0930Z -  
FM NAU -  
TO NENB  
NHTG EEEEEEEE  
TO NENB  
NHTZ -  
INFO NHDY  
GR15  
BT (Etc.)

To correct an error in the text, the error sign is made, and transmission commences with the last word or group correctly sent. Example: YZZF, transmitting a message to NMVH, makes and corrects an error in the text.

NMVH DE YZZF -  
O - 211827Z  
GR21  
BT  
UNCLAS  
CONDUCT NO SUBMERGED OPS SOUTH  
OF LAT 38 EEEEEEEE  
LAT 3730N (Etc.)

The preceding example can be used to illustrate another point. The question sometimes arises regarding the proper procedure to use if the operator, in attempting to correct his original error, makes a mistake in the previous word, LAT, which he transmitted correctly once. Should he make the error sign and go back to the word OF before continuing his transmission? If this type of error continued, he

conceivably could find himself back at the beginning of the message. Here is the answer: The last word transmitted correctly was LAT, hence the operator should continue his transmission with that word. Just because an error was made in retransmitting LAT, in the attempt to correct the original error, does not change the fact that LAT previously was transmitted correctly. Accordingly, there is no need to revert to the word OF in continuing the transmission.

The error prosign is used also to cancel a transmission while in progress. A series of eight or more Es, followed by the prosign AR, means "This transmission is in error; disregard it." Example: NALJ, while transmitting a message to OLRX, discovers that the message should not be sent and cancels the transmission.

OLRX DE NALJ -  
P - 100256Z -  
FM NALJ -  
TO STRK  
EEEEEEEE AR

After a transmission is received for, the error prosign method of canceling the transmission cannot be used. A procedure message or a service message—properly released—is used for this purpose.

### REPETITIONS; CORRECTIONS; VERIFICATIONS

Occasionally, messages or parts of messages must be repeated, corrected, or verified. To accomplish this, the prosigns AA (all after), AB (all before), WA (word after), and WB (word before) are used in procedure messages in conjunction with prosigns IMI, INT, C, J, and certain operating signals.

When a message must be repeated, corrected, or verified, it is necessary to identify the message in question. This may be done by using the date-time group and/or the station serial number. When necessary, the message may be further identified by adding the call sign of the originating station, the group count, or both. If additional identification is needed, the complete preamble, or address, or the complete (or partial) text may be included. The identification data should always be as brief as possible, consistent with positive identification.

When it is necessary to use a code group of an encrypted message text as a reference point, it is referred to by number; that is, according to the numerical order in which it appears in the text. Use of numbers as reference to encrypted

text groups is illustrated in the next topic (Use of  $\overline{\text{IMI}}$ ).

For a plain language message, the reference point in the text is a plain language word and prosign WA or WB, as necessary. If a word or group used to identify a part of a message appears more than once in that message, the first occurrence of the word or group is meant. If otherwise intended, amplifying data such as adjacent words or groups must be included. The following message is transmitted:

NIQC DE NHAP -  
 R - 041227Z -  
 FM NHAP -  
 TO NIQC -  
 INFO NOKB  
 GR9  
 $\overline{\text{BT}}$   
 UNCLAS  
 TWO ARTIC SURVIVAL KITS  
 REQUIRED BY 6 AUG  
 $\overline{\text{BT}}$   
 K

The prosign  $\overline{\text{BT}}$  appears in the message twice. Therefore, a request using (1) AB  $\overline{\text{BT}}$  denotes all before the text (the first  $\overline{\text{BT}}$ ); (2) AA  $\overline{\text{BT}}$  denotes all after the heading (the first  $\overline{\text{BT}}$ ); (3) WA ARCTIC denotes the text word SURVIVAL; (4) AA AUG  $\overline{\text{BT}}$  denotes the message ending (after the second  $\overline{\text{BT}}$ ).

It is important that you learn the correct usage of these prosigns. Make sure you understand the rules and examples that follow. Here is the encrypted message used throughout the examples:

YOBV DE NTSY -  
 R - 271545Z -  
 FM NTSY -  
 TO NUYO -  
 INFO NCFX  
 NTFJ  
 GR 11  
 $\overline{\text{BT}}$   
 BPHTJ ODZNM WEBJL OPNGB DPBIR  
 FLMBJ RRWZA WUJQE DPJAF OHRUC  
 BPHTJ  
 $\overline{\text{BT}}$   
 K

#### USE OF $\overline{\text{IMI}}$

The prosign  $\overline{\text{IMI}}$  means REPEAT. It may be used by the receiving operator to mean "Repeat all of your last transmission," or, with identifying data, to mean "Repeat portion indicated."

It may be used by the sending operator to mean "I will repeat the difficult plain language word I just transmitted," or "I am going to repeat this message." The prosign  $\overline{\text{IMI}}$  cannot be sent to request repetition of a message for which a receipt has been given. Either a procedure message, containing operating signals, or a service message must be used for this purpose.

Suppose that NUYO desires a repetition of the preceding message in its entirety. He sends:

NTSY DE NUYO  $\overline{\text{IMI}}$  K

In response to this request, NTSY replies with the entire message, exactly as he sent it the first time.

If NUYO desires a repetition of the heading, his request would be:

NTSY DE NUYO  $\overline{\text{IMI}}$  AB  $\overline{\text{BT}}$  K

NTSY replies:

NUYO DE NTSY  
 AB  $\overline{\text{BT}}$  -  
 YOBV DE NTSY -  
 M - 271545Z -  
 FM NTSY -  
 TO NUYO -  
 INFO NCFX  
 NTFG  
 GR11  
 $\overline{\text{BT}}$   
 K

The previous example shows how to request and send a repetition of the entire heading. When you need repetition of only a portion of a message heading, you must request it in increments of entire elements (from prosign to prosign) as in the next two examples. Assume that NUYO needs part of the heading between prosigns FM and INFO. He requests:

NTSY DE NUYO  
 $\overline{\text{IMI}}$  FM TO INFO K

NTSY answers:

NUYO DE NTSY  
 FM TO INFO -  
 FM NTSY -  
 TO NUYO -  
 INFO  
 K

Suppose that NUYO needs a repetition of the date-time group, originator, and action addressee of the message. Here is the proper way for him to request it:

NTSY DE NUYO  $\overline{\text{IMI}}$  R TO INFO K

NTSY answers:

NUYO DE NTSY  
 R TO INFO -  
 R - 271545Z -



FM NTSY -  
TO NUYO -  
INFO  
K

The following examples show how to obtain repetitions of parts of the message text. Note how the groups are identified by number. Parts of encrypted texts are always identified this way; prosigns WA and WB are used only with plain language texts.

If NUYO desires all after the eighth group repeated, this is his request:

NTSY DE NUYO  $\overline{\text{IMI}}$  AA 8 K

Reply:

NUYO DE NTSY  
AA 8 - DPJAF OHRUC BPHTJ  $\overline{\text{BT}}$  K

Suppose NUYO asks for the ninth group to be repeated. He sends:

NTSY DE NUYO  $\overline{\text{IMI}}$  9 K

Reply:

NUYO DE NTSY 9 - DPJAF K

NUYO wants a portion of the message from the third to eighth groups repeated. He requests:

NTSY DE NUYO  $\overline{\text{IMI}}$  3 TO 8 K

Answer:

NUYO DE NTSY  
3 TO 8 - WEBJL OPNGB DPBIR FLMBJ  
RRWZA WUJQE K

Here is a worthwhile rule to remember: If you need repetitions of more than one portion of a message, be sure to incorporate all your requests in a single procedure message. For example, if NUYO missed group 3, and also missed groups 6, 7, and 8, he would send the following procedure message:

NTSY DE NUYO  $\overline{\text{IMI}}$  3 - 6 TO 8 K

Here is how NTSY answers:

NUYO DE NTSY  
3 - WEBJL - 6 TO 8 - GLMBJ RRWZA  
WUJQE K

## USE OF C

The prosign C, used alone, means "You are correct." It is applicable in this respect if an operator questions a portion of a message you sent him, and you find that he is correct. When the prosign C is followed by other data, it takes on the meaning "This is a correct version of the message or portion(s) indicated." The uses of C are brought out in the following discussions of  $\overline{\text{INT}}$  and J.

## USE OF $\overline{\text{INT}}$

You already have learned that the prosign  $\overline{\text{INT}}$  means "Interrogative." Its use with operating signals was explained and illustrated in chapter 5 and, in connection with signal strength and readability reports, earlier in this chapter. Other uses of  $\overline{\text{INT}}$  to question transmissions—messages or parts of messages—are presented here.

As with  $\overline{\text{IMI}}$ , the prosign  $\overline{\text{INT}}$  is not used to question any part of a message for which a receipt has been given. Once you "Roger" for a message, any further questions must be resolved by operating signals in service or procedure messages.

The prosign  $\overline{\text{INT}}$ , followed by GR, is transmitted by the receiving operator to question the group count of a message. When the number of groups received does not correspond to the group count transmitted, the receiving station questions the transmitting operator with  $\overline{\text{INT}}$  GR, followed by a numeral indicating what the receiving operator believes to be the correct group count. Example:

NTSY DE NCFX  $\overline{\text{INT}}$  GR8 K

If, after rechecking the message, the transmitting operator finds that the receiving station is correct, he sends the prosign C, meaning "You are correct." An example of this follows:

NCFX DE NTSY C K

Having no further questions, NCFX then receipts for the message in the normal way.

Never hesitate to question the group count when you are not in agreement with the transmitting operator. Remember, he may have counted the groups incorrectly, or he may have omitted a word or an entire line. To prevent useless and unauthorized haggling between operators, there is a correct method for resolving a questioned group count. Rules and transmission examples follow.

For all plain language texts, and for encrypted text messages whose group count does not exceed 50 groups, the following procedure applies: If the receiving station questions the group count and is considered to be incorrect, the transmitting operator repeats the original group count and sends the first character of each word or group of the text in succession. For example, NTSY transmits the following message to NCFX:

NCFX DE NTSY -  
R - 272113Z  
GR1Ø

BT  
 UNCLAS  
 ANCHORED VICINITY CAMP LLOYD.  
 SITE ICE FREE. EFFECTED RDVU  
 BT  
 K

Station NCFX believes he has received the entire message but, perhaps because of adverse receiving conditions, he counts only 9 groups. He questions the group count thus:

NTSY DE NCFX INT GR9 K

Station NTSY checks and finds the group count correct as transmitted. He then repeats the group count and proceeds to send the first character in each group as follows:

NCFX DE NTSY GR10 BT U A V C L S  
 I F E R BT K

Station NCFX now knows which group he lacks, obtains repetition by use of IMI, and receipts for the message.

For encrypted text messages of more than 50 groups, the following procedure is used: If the receiving station is considered to be incorrect, the transmitting operator repeats the original group count and sends the number of the first, eleventh, and each succeeding tenth group, followed by the first letter of that group. The number of the group is separated from the first letter of that group by the separative sign, as shown in the following example.

Station NTSY transmits to NCFX a message having 76 encrypted text groups. NCFX questions the group count:

NTSY DE NCFX INT GR75 K

Station NTSY checks and finds the group count correct as transmitted, then sends:

NCFX DE NTSY GR76 BT 1 - D 11 - L  
 21 - E 31 - P 41 - Q 51 - M 61 - W 71 -  
 F BT K

Now NCFX can find the 10 groups in which he has a miscount. He requests a repetition of those 10 groups:

NTSY DE NCFX IMI 31 TO 40 K

After the repetition, NCFX receipts for the message.

The transmitting station always has the final say after the group count is checked by the foregoing procedure.

The INT prosign is used also to question other portions of messages besides the group count. Preceding a portion of a message, INT means "Is my reception of this correct?" For example, NCFX asks NTSY "Is the date-time group 272113Z?"

NTSY DE NCFX INT 272113Z K

If 272113Z is the correct DTG, NTSY transmits:

NCFX DE NTSY C K

If, however, 272113Z is incorrect (assume correct DTG is 272112Z), NTSY must correct the entire element in which the DTG appears, working from prosign to prosign, as follows:

NCFX DE NTSY C R TO GR11 - R -  
 272112Z GR11 K

The preceding rule is similar to the use of IMI in requesting repetition of part of a message heading. When a part of a message heading is questioned by INT and is found to be incorrect, the response must be in the form of a correction that includes the entire element (from prosign to prosign) in which the correction occurs.

Continuing our discussion of the prosign INT, consider the next message example and the transmissions following it. They show how to use INT with prosigns WA and WB when questioning parts of a plain language text. Here is the message:

NAMR DE NIW -  
 R - 121314Z -  
 FM NIW -  
 TO NAMR  
 NFDR  
 GR10  
 BT  
 UNCLAS  
 MY 121135Z. TRF ONE RM3 TO USS  
 BEARSS IMMED  
 BT  
 K

The ensuing transmissions illustrate three different methods—each of them correct—of questioning a part of the text.

Station NAMR asks "Is the word after USS, BEARS?"

He sends:

NIW DE NAMR INT WA USS - BEARS K

Station NIW answers:

NAMR DE NIW C WA USS - BEARSS K

Here is another way NAMR could question the same word:

NIW DE NAMR INT BEARS K

Station NIW sends his correction in the same form as his first reply:

NAMR DE NIW C WA USS - BEARSS K

In the third method, NAMR uses prosign WB when he asks "Is the word before IMMED, BEARS?" He transmits:

NIW DE NAMR INT WB IMMED - BEARS  
 K

To this query, NIW corrects:

NAMR DE NIW C WB IMMED - BEARSS  
K

In all three methods, if the word is correct as questioned (that is BEARS instead of BEARSS), the response from NIW would be:

NAMR DE NIW C K

USE OF J

Prosign J means "Verify with originator and repeat." This prosign is used when an addressee does not understand the meaning of a message. It is important to understand that the operator does not originate the verification request. A verification request may be initiated only by the addressee, and must be written up and released the same as any other message. In some instances, the addressee may draft a regular message to request a verification, especially codress messages. This procedure may be necessary for security reasons. In this chapter, however, we are concerned with obtaining verifications with the J prosign.

In contrast to your frequent need to use IMI, only infrequently is an addressee likely to require that a message be verified. Whereas IMI never is used to obtain a repetition of a message after it is receipted for, practically all requests for verification are sent after transmission of the receipt. A rare exception may be an abbreviated plaindress message wherein the text is such that its meaning normally is known before receipting for the message. If it is necessary to request a verification in such an instance, the prosign J may be sent instead of a receipt.

The following examples show how prosign J is used in typical situations.

Station NTSY desires NTFJ's message 171623Z verified and repeated. This is his request:

NTFJ DE NTSY J 171623Z K

After NTFJ verifies with the originator, he answers:

NTSY DE NTFJ  
C 171623Z -  
R - 171623Z -  
FM NTFJ -  
TO NUYO -  
INFO NTSY  
GR8  
BT

UNCLAS  
PROCEED ON DUTY ASSIGNED. MAKE  
MOVEMENT REPORTS

BT

K

In the example just given, note how NTFJ uses the prosign C following the callup in his reply. Here is an important rule to remember: The answer to a J is always a C (correction). Prosign C, followed by message identification data, as in this example, means "This is a correct version of the message or portions indicated." Prosign C must be used in reply to a J even though the message was correct as originally transmitted.

Taking the same message example, suppose addressee NUYO wishes NTFJ to verify and repeat the message heading. His request for verification would be:

NTFJ DE NUYO J 171623Z AB BT K

After checking with the originator to ascertain that the message was addressed properly, NTFJ replies:

NUYO DR NTFJ  
C 171623Z AB BT -  
R - 171623Z -  
FM NTFJ -  
TO NUYO -  
INFO NTSY  
GR 8  
BT  
K

Again, note how NTFJ uses prosign C in his reply.

Now, suppose that NUYO requests NTFJ to verify and repeat part of the text, all after the word DUTY. He would send:

NTFJ DE NUYO J 171623Z AA DUTY K

The originator, NTFJ, now discovers he made an error in the original message and needs to correct part of the text to read MAKE OWN MOVEMENT REPORT. Adding another word in the text also changes the group count. The transmitting operator must send the corrections to all addressees. He therefore transmits:

NTSY NUYO DE NTFJ -  
C 171623Z INFO TO BT -  
INFO NTSY  
GR9  
BT -  
AA DUTY -  
ASSIGNED. MAKE OWN MOVEMENT  
REPORTS  
BT  
K

The following example shows the correct usage of prosign J before receipting for the message. As the originator, NTFJ transmits

to collective call YOBV, which includes NABC, NTSY, and NUYO:

YOBV DE NTFJ  
 IX BT  
 TURN NINE  
 BT  
 K

Before receipting, NABC asks for verification:

NTFJ DE NABC J K

After verifying with the originator, NTFJ sends:

NABC DE NTFJ C -  
 IX BT  
 TURN NINE  
 BT  
 K

Prosign IX is encountered for the first time in the preceding example. This prosign, applicable only in executive method messages, is explained later in this chapter.

### BREAK-IN PROCEDURE

Occasionally, you will need to break in on someone's transmission. This is permissible if you observe the proper break-in procedure.

When only two stations are concerned in a transmission, breaking in is permitted if necessary. The station desiring to break in makes a series of dashes. When the transmitting operator hears the dashes between his transmitted characters, he stops—at least momentarily—to discover the reason for the break-in. This pause allows the station breaking in to arrange for a shift of frequency, request repeats, and so forth. When two stations are working directly on a circuit, the most frequent use of the break-in procedure is for on-the-spot "fills" or repeats of portions missed. If receiving conditions are good, a preliminary call is not needed before transmission of the last word or group correctly received. For example, NHDY is transmitting to NFFN:

AND WILL PROCEED IMMEDIATELY

Station NFFN missed the word IMMEDIATELY. The operator breaks in thus: -- -- -- PROCEED

Station NHDY then commences transmission with the last word NFFN indicated he received correctly:

PROCEED IMMEDIATELY (etc.)

If, however, the break-in is for a reason besides requesting immediate repetition of a missed word, a full or abbreviated call must be

given. For example, NHDY is transmitting to NFFN:

AND WILL PROCEED IMMEDIATELY

Station NFFN has trouble with the receiver and asks NHDY to wait:

-- -- --NHDY DE NFFN AS

When ready to receive, NFFN transmits:

DE NFFN IMI AA PROCEED K

Station NHDY then resumes transmission:

DE NHDY AA PROCEED - IMMEDIATELY (etc.)

Remember that break-in procedure cannot be used to obtain repetitions when more than one station is receiving the message. The series of three dashes shown in these examples to attract the attention of the sending station does not represent a hard-and-fast rule. The transmitting operator usually stops the instant you press your key. If, however, three break-in attempts are unsuccessful, the receiving operator must cease further attempts until the transmission is completed.

In certain instances, a station on a circuit having a message of higher precedence than the one being handled has the privilege of breaking in and transmitting his message. A message with the precedence of FLASH or IMMEDIATE must be sent as quickly as possible, and therefore interrupts all messages of lower precedence. A PRIORITY message does not interrupt a ROUTINE message unless the ROUTINE is exceptionally long. Discretion must be practiced on all such occasions.

### RECEIPTS

The prosign R indicates the receipt of a transmission. Example:

NFFN DE NHDY R AR

Both ships and shore stations receipt for transmissions in the form just shown. At times, however, identification of the transmission should be included in the receipt.

To eliminate possible confusion and misunderstanding on ship-shore circuits, where many stations usually are working at the same time, it is standard practice for the shore station to receipt for a message by using the prosign R, followed by the station serial number (if assigned) or the date-time group of the message. (Station serial numbers are not authorized presently for ship-ship or ship-shore use.) Thus the receipt would be:

NHDY DE NPN R NR3 AR

Or, the receipt may take this form:

NHDY DE NPN R 131137Z  $\overline{AR}$

It is advisable to include identification data in receipting for a message that required several transmissions incident to its reception. This would apply if receiving conditions were poor and you obtained several repetitions before receiving the message correctly.

### ACKNOWLEDGMENTS

An acknowledgment is a communication announcing that the message to which it refers has been received and is understood. Do not confuse an acknowledgment with a receipt or a reply. A receipt, as you have learned, is sent by one operator to another to indicate only that the message has been received. An acknowledgment says that the message has been received and is UNDERSTOOD. A reply is an answer to a message. A prompt reply referring to the message also meets the requirement of an acknowledgment.

Acknowledgments usually are obtained by means of a request within the text. The acknowledgment itself consists of the message reference and the word acknowledged. For example, YOUR 102030Z ACKNOWLEDGED.

Naval communications are sufficiently reliable, however, that an originator, filing a message for transmission, can expect delivery to all addressees. For this reason, acknowledgments ordinarily are not requested.

Whereas receipts are exchanged freely between operators, you must remember that acknowledgments must always be authorized by the addressee of the message.

If the request for acknowledgment is not included in the message text, it may be requested after transmitting the message. Perhaps an acknowledgment was unnecessary at the time the message was sent, but was needed later. When this occurs, a separate message is sent requesting the acknowledgment.

For security reasons, an acknowledgment to a codress message must be another codress message.

An operating signal, ZEV, means "Message is acknowledged," but the effective edition of DNC 5 limits its use to acknowledging procedure messages only.

### ENDING PROSIGNS K AND $\overline{AR}$

Every radiotelegraph transmission you make must end with either the prosign K or  $\overline{AR}$ .

Prosign K means "Go ahead" or "This is the end of my transmission to you and a response is necessary." As shown in many message examples in this chapter, prosign K denotes the end of a transmission when the transmitting station requires or expects a response from the receiving station.

Prosign  $\overline{AR}$  means "This is the end of my transmission to you and no response is required or expected." Although you do not receipt for a transmission ending in  $\overline{AR}$ , you still can request repetitions or verifications on radiotelegraph circuits that employ the normal receipt method of operation.

All messages on the fleet broadcasts end in  $\overline{AR}$ . Ships copying fleet broadcasts do not receipt for messages or otherwise use their transmitters in connection with the broadcast transmissions.

Prosigns K and  $\overline{AR}$  are not used together. End every transmission with one or the other--but never both.

### USE OF $\overline{AA}$

Prosign  $\overline{AA}$  (overscore means that the group is sent as one character) is not the same as AA without the overscore. It has an altogether different meaning and use. Use of  $\overline{AA}$  (all after) was explained earlier. Prosign  $\overline{AA}$  means "Unknown station." It is used instead of a call sign in establishing communication with a station whose call sign is not recognized.

Suppose you hear a station calling you by radiotelegraph. You are certain that he is calling your station but, possibly for a variety of reasons, you fail to get his call sign. Perhaps his signal was weak, or there might have been interference from static or other stations. In your prompt response,  $\overline{AA}$  is used as follows:

$\overline{AA}$  DE NHDY K

The "unknown station" sends his call sign again when he answers, and you are alerted sufficiently so that you are unlikely to miss it the second time.

One pitfall should be avoided in using  $\overline{AA}$ . Do not be tempted to respond with AA if you are doubtful that the station called is yours. Unless you are sure that you heard your call sign, sit tight and wait until the distant station calls you a second time.

You may observe your ship's Signalmen using prosign  $\overline{AA}$  frequently in signaling with flashing light. They use it to call ships whose call signs are unknown, such as warships of merchantmen too distant to identify.

## MESSAGES IN STRINGS

When communication is good, traffic handling frequently is speeded when one station sends several messages to another without interruption. Five messages normally should comprise a string (or sequence). The receiving station may, however, indicate by means of an operating signal the number of messages to be sent in a given string. To illustrate, NGTA has 10 messages for NAU, and sends this transmission:

NAU DE NGTA ZB01Ø K

(ZB01Ø means "I have 10 messages for you.")

Station NAU replies:

NGTA DE NAU QSG5 K

(QSG means "Send 5 messages at a time.")

The prosign B is placed in the ending of each message sent as part of a string. This prosign is followed by the precedence of the next message. When the last message of the sequence is transmitted, a receipt is requested before commencing the next string. Accordingly, the last message of each sequence is ended with prosigns B and K, meaning "There is more to follow; receipt for what I have sent." Example: NGTA sends the first of a string of 5 messages.

NAU DE NGTA --

T --

P - 112214Z -

FM NGTA -

TO EZRA

GR 15

BT

TEXT

BT

B P

Station NGTA pauses briefly to allow any station to break in to transmit traffic of higher precedence. If no station interrupts, NGTA proceeds. He may make a full call, as before, or simply make a separative sign and begin with the next message:

- P - 112216Z-

FM NGTA - (Etc.)

On reaching the ending of the first string, NGTA sends:

BT

B R K

If break-in procedure was not employed, NAU requests any needed repetitions. Otherwise, NAU receipts for the sequence in this manner:

NGTA DE NAU R K

Transmission of his second string of messages then is started by NGTA.

## EXECUTIVE METHOD

To speed tactical movements of ships, the executive method is used frequently. It is employed when some action must be executed at a certain instant, especially when two or more ships must take action simultaneously. Although used principally for transmitting tactical signals by radiotelephone and visual communications, the executive method also may be used on radiotelegraph circuits.

Executive method messages are of two types. They are the delayed executive and immediate executive. Only the delayed executive method is authorized for use on radiotelegraph circuits, hence it is the only method discussed here.

In the delayed executive method, the message to be executed is sent and the desired receipts are obtained. At the time for execution, another transmission is made that carries the signal of execution.

The procedure for delayed executive method messages may seem complicated at first. Actually, the steps are simple, and a few drills will do much toward squaring you away on this method. You can start by learning these four rules for handling executive messages:

1. Only abbreviated plaindress messages may be used in the delayed executive method.

2. In executive method messages, a group count and date-time group are never used. A time group may be used, however, to show the time of origin. If a time group is used, it is placed either in the heading or in the ending, but never in both.

3. A message requiring a signal of execution carries the prosign IX immediately before the first BT.

4. The signal of execution consists of the prosign IX followed by a 5-second dash. It always is preceded by a full call. The instant of execution is the termination of the 5-second dash.

Following is an example of the delayed executive method message.

NFFN NHDY DE PKWN

IX BT

FOXTROT CHARLIE JULIETT

BT

1248Q

K

Ships called receipt as follows:

DE NFFN R AR

DE NHDY R AR

Station PKWN executes:

NFFN NHDY DE PKWN  $\overline{IX}$  (5-second dash)  
 $\overline{AR}$

An executive method message must be identified at the time of execution if it is one of several outstanding unexecuted messages. It also is identified if considerable time passes between transmitting the message and executing it. Example:

NFFN NHDY DE PKWN 1248Q  $\overline{IX}$  (5-second dash)  $\overline{AR}$

Ordinarily, the signal of execution does not require a receipt. When a receipt is requested, however, the request is indicated by transmitting the prosign K instead of  $\overline{AR}$  after the 5-second dash.

To execute a portion of an outstanding executive message, the part desired must be retransmitted and followed by the executive signal. For example, PKWN sent the following message to be executed and obtained receipts for it:

NFFN NHDY DE PKWN  
 $\overline{IX BT}$   
FORM QUEBEC 1000 TACK SPEED 16  
 $\overline{BT}$

Note the word TACK in the message text. It always is transmitted and spoken TACK. TACK (for tackline) is a length of signal halyard about 6 feet long. Its purpose is to separate parts of flaghoist signals which, if not separated, could convey a different meaning from that intended. It is used also in tactical signals transmitted by radio. In the preceding message example, TACK separates the text into two individual tactical signals.

Assume that the originator now wants to execute only that portion of the message concerning the speed change. Absence of the prosigns  $\overline{IX BT}$  in the heading indicates that it is part of a message transmitted previously. Example:

NFFN NHDY DE PKWN  
SPEED 16  $\overline{IX}$  (5-second dash)  $\overline{AR}$

Before executing the message, PKWN decides to cancel it. He then transmits:

NFFN NHDY DE PKWN  
 $\overline{BT}$   
NEGAT  
 $\overline{BT}$   
K

Each ship addressed then receipts for the cancellation.

Although the signal NEGAT used alone cancels all messages awaiting execution, NEGAT followed by message identification cancels only the identified message. Here is the way PKWN,

with more than one message awaiting execution, would cancel one of them:

NFFN NHDY DE PKWN  
 $\overline{BT}$   
NEGAT TURN SIX  
 $\overline{BT}$   
K

Each addressee then receipts in the normal manner.

With but one exception, the procedure for obtaining a repetition or a verification of an executive method message is the same as for a regular message. The exception is a message that consists of signals from a naval signal book. For this kind of message, requests for repetition or verification must be made for the entire message or for those portions separated by the word TACK. Example:

$\overline{IX BT}$   
SIERRA HOTEL WHISKEY TACK DELTA  
ZULU ROMEO  
 $\overline{BT}$   
K

Station NCFX receipts for the message, but NWBJ requests verification of the first part of the message with this transmission:

HEFT DE NWBJ  
J  $\overline{BT}$  TO TACK K

After verifying the message with the originating officer and learning that the original version is correct, HEFT transmits:

NWBJ DE HEFT  
C  $\overline{BT}$  TO TACK --  
 $\overline{BT}$  SIERRA HOTEL WHISKEY TACK  
K

To obtain a repetition, the same procedure is followed, except that  $\overline{IMI}$  is substituted for J, and the reply is not in the form of a correction.

If HEFT discovers that the portion of the original message was in error, he must cancel that portion to both addressees. He transmits:

NCFX NWBJ DE HEFT  
 $\overline{BT}$   
NEGAT SIERRA HOTEL WHISKEY  
 $\overline{BT}$   
K

(This transmission leaves the original message with only the signal "Delta Zulu Romeo" awaiting execution.)

To replace the canceled portion of the original message, HEFT then transmits a new message:

NCFX NWBJ DE HEFT  
 $\overline{IX BT}$   
SIERRA FOXTROT WHISKEY  
 $\overline{BT}$   
K

## COMMERCIAL FORM

As a Navy communicator you frequently find that traffic from commercial radio circuits is channeled over Navy systems, Navy traffic, in turn, sometimes relies on commercial facilities. The procedure and message formats used by the Navy and by commercial communication companies are quite different, however. To handle commercial traffic efficiently, you must have a thorough understanding of commercial practices.

The subject itself is too extensive to give more than a general discussion in this chapter. The next few pages serve as an introduction to the commercial form message. Your best source of information on commercial traffic is Commercial Traffic Regulations (effective edition of DNC 26), which explains message traffic involving tolls.

A ship originating a message addressed to an individual at a nonmilitary address in the United States sends the message to a naval shore radio station in the usual plaindress message form. Following is an example of a message transmitted by a ship to a shore station for refile with a commercial company.

NSS DE NIQM --  
 T -  
 M - 291646Z -  
 FM USS ENTERPRISE --  
 TO MARK L VECELLIO 7927 GATEWAY  
 BLVD  
 DISTRICT HEIGHTS MD -  
 NAVY GR13  
 BT  
 UNCLAS  
 YOUR LEAVE EXPIRES ON BOARD AT  
 NORFOLK VA 0745 6 AUG 60  
 BT  
 K

The preceding message differs from those studied earlier in this chapter in that the addressee is an individual instead of a ship or other military activity. It still is a class A message because it is official Navy business. Do not confuse it with class E (personal) messages, which are explained later.

Note the word NAVY just ahead of the group count. It is an accounting symbol, always necessary in messages that are to be refiled with a commercial company for delivery to the addressee. The purpose of an accounting symbol is to indicate the Government agency financially responsible for the message. In addition

to NAVY, there are many other accounting symbols for each of the various Government agencies. All of them are listed in the effective edition of DNC 26.

In the message being examined, the Department of the Navy is billed by Western Union for delivery charges from Washington (the refile point) to the addressee. At Washington the message is refiled as a domestic telegram with Western Union. The transmission is not handled by CW, however. NAVCOMMSTA Washington's teletype transmission takes the following form:

BEA 045  
 CK 12 WASHINGTON DC 29 JUL 60 515P  
 GOVT NAVY  
 MARK L VECELLIO  
 7927 GATEWAY BLVD  
 DISTRICT HEIGHTS MD  
 YOUR LEAVE EXPIRES ON BOARD AT  
 NORFOLK VA  
 0745 6 AUG 60  
 COMMANDING OFFICER USS ENTERPRISE

You will note in the transmission that the order of some of the message parts changed, and some of the parts are altered. The beginning of the message is the circuit designator and channel number for Washington's circuit with Western Union. The check (CK12) is the count of the chargeable words in the text. Western Union does not charge for the words in the address and signature—only for those in the text.

The refile point, WASHINGTON DC, is shown as the place of origin, because the toll charges begin there. The date and local time are given instead of GMT. The P stands for p. m. ; A is for a. m. The month is also included. The indicator GOVT shows that the message concerns Government business. NAVY is the accounting symbol.

The originator, USS Enterprise, and the words COMMANDING OFFICER are placed after the text. The sender's name is called the signature.

## CLASS E MESSAGES

Class E messages, discussed briefly in chapter 5, are personal messages to or from naval personnel, and are handled free of charge over naval communication circuits. Even though they are personal messages, they must meet the requirements for acceptable subject matter and must be released by the commanding officer before transmission, as are all other messages.



Class E messages are of two kinds: those liable to toll charges, and the ones that do not carry tolls. Toll charges are collected from the sender only when the message must be refiled with Western Union for transmission or final delivery. Federal Communications Commission (FCC) regulations prohibit transmission of personal messages by the navy within the continental United States. These regulations limit the free-of-charge transmission of class E messages to the following: between naval ships in the same ocean area; from ship to shore and shore to ship in the same ocean area outside the United States; and from shore station to shore station outside the United States in the same ocean area. For example, a ship in the Atlantic, Mediterranean, Middle East, or Caribbean can send a class E message free of charge to another ship in any of these same areas. Similarly, ships and stations in the Pacific, Far East, and Alaskan areas are considered to be in the same ocean area.

The form for a class E message not subject to toll charges is shown in the following example. The ships are in direct communication, hence the call serves as the address.

NTAA DE NWKY -

R - 281417Z

GR14

BT

MSG LTJG DALY REGRET CANNOT

MEET YOU PHILADELPHIA THIS WEEK  
AS PLANNED LTJG JORDAN

BT

Note the use of the class E message indicator MSG. It always appears as the first word in the text in every class E message.

The next example is of a class E message that is subject to toll charges. The originating station (NFFN) addresses the message to NAVCOMMSTA Washington (address group HAYY) for refile to the addressee named in the text. Station NFFN is not in direct communication with NSS (radio call sign for NAVCOMMSTA Washington), so the operator relays via NHY. Such relays are permitted over naval circuits outside the United States, and the message is handled free of charge as far as Washington. The sender must pay the Western Union charges from Washington (the refile point) to Forestville, Maryland.

NHY DE NFFN --

T -

R - 251430Z -

FM NFFN -

TO HAYY

GR37

BT

MSG CK24 NL COMLE MRS MARCELLA  
CROWLEY 3319 79TH AVE FOREST-  
VILLE MD EXPECT TO BE HOME ABOUT  
TEN NOV NOW ABLE TO WALK WILL  
ADVISE YOU EXACT TIME AFTER ARRIV-  
VAL IN STATES HAROLD USS JOSEPH  
K TAUSSIG

BT

As you can see, the message requiring tolls is slightly more complicated. Following MSG is the check (count) of the chargeable words. Note that the check (CK24) is not the same as the group count (GR37). The group count, of course, must include all words from BT to BT. The chargeable words counted in the check, however, include only the sender's text plus the name of the ship, which must be added to the signature. The address and the sender's name are not chargeable, thus are not included in the check.

After the CK comes the domestic service indicator NL, showing that the sender desires (and paid for) night letter service—to be delivered by Western Union the next morning. (The sender could have paid a small additional amount to send it as a day letter (DL). Or, if he wanted the fastest Western Union handling and delivery, he could have sent it as a full-rate telegram, which carries no class-of-service indicator.)

Following the class-of-service indicator is the commercial indicator COMLE. This must be included in every class E message to be refiled with the Western Union Telegraph Company.

Class E messages addressed to ships are delivered by fleet broadcast. Persons in the continental United States wishing to send a class E message to a ship at sea must send it by mail or by Western Union to NAVCOMMSTA San Francisco, if the ship is in the Pacific, Alaska, or the Far East. If the ship is in the Atlantic, Mediterranean, or Caribbean, the message must be sent to NAVCOMMSTA Washington. Or it is dispatched to Newport or Norfolk, if the ship is in one of those broadcast areas.

If your ship is in port in the continental United States, you still can receive a class E message on the fleet broadcast. However, you cannot send a class E message addressed elsewhere in the States—the sender must use Western Union facilities ashore.

For inbound class E messages from ships at sea, the authorized refile points are at Newport, New York, Washington, Norfolk, Charleston, Key West, New Orleans, San Diego, Long Beach, San Francisco, and Oak Harbor, Wash.

As a general rule, a class E message from a ship in the Atlantic to a ship in the Pacific must be refiled with Western Union at one of the east coast refile points, and toll charges paid for the cross-country transmission to San Francisco. Commercial refile in this instance is required by FCC rules, because the Navy's communication circuits from Washington to San Francisco cannot be used for class E messages. There is, however, one exception to the inter-area refile as outlined. The Navy has radio circuits from Washington direct to Honolulu, Hawaii, so that a ship in the Atlantic, in a position to work Washington directly, can send a class E message to a ship in the Pacific copying the Honolulu broadcast or any other Pacific fleet broadcast except the San Francisco broadcast. The same rule applies if the addressee is at a shore base at Hawaii or beyond.

Persons stationed at overseas bases also are permitted to send class E messages to the United States over NTX teletypewriter circuits. Class E messages sent by NTX are illustrated in chapter 11.

The Radioman needs to know how to place outgoing class E messages in the proper form. He must know whether the message can be sent free of charge or if it must be refiled with Western Union. Usually, he must assist the sender in filling out the message form, explaining the different classes of service and their different minimum charges and charges for additional words. He must know the rules for counting the chargeable words, and also must be able to compute the toll charges from the rate tables in the effective edition of DNC 26.

The Radioman designated by the commanding officer as commercial traffic clerk handles the money, keeps the records, and makes the required reports. Duties and responsibilities of the commercial traffic clerk are explained fully in DNC 26.

**OPERATOR ENDORSEMENTS**

Several minor details in connection with the transmission and reception of a message are important and necessary. For instance, the operator's endorsement, placed on the original of each message he handles, is a written record of exactly how, when, and where he disposed of that message. If a question arises concerning

the handling of a particular message, the operator's endorsement is there to supply the answer. Placing the endorsement on a message is called "servicing the message."

Before discussing the contents of an operator's endorsement, here are some terms you should know.

1. Time of delivery: The TOD is the time the transmitting station completes delivery of the message. (Do not confuse this with the time of file (TOF), which is the time an outgoing message is delivered to the communication center for processing and onward transmission.)

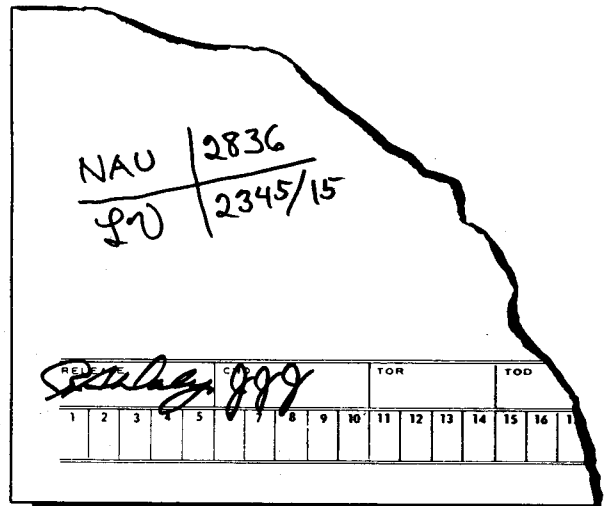
2. Time of receipt: The TOR is the time the receiving station completes the receipt of a message.

3. Personal sign: Each operator and supervisor is assigned a 2-letter personal sign, usually his initials, for use in message endorsements to indicate individual responsibility. Initials cannot be used in all instances, however, because of possible conflict with prosigns or channel designations, and because of the requirement that no two signs can be alike within a particular station. Personal signs are never transmitted.

Operator endorsements are of two types: servicing for outgoing messages and for incoming messages. Now let's take a look at the two types of endorsements.

**OUTGOING ENDORSEMENT**

Servicing for an outgoing message is penciled on the face of the message blank as shown in



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Figure 6-1.— Servicing an outgoing message.

figure 6-1. The supervisor makes the crossed lines and fills in the two upper spaces with the following information:

1. Call sign of the ship or station to be called.
2. The circuit frequency in kilocycles or megacycles.

After transmitting the message, the circuit operator adds the following data in the two lower spaces:

1. Operator's personal sign.
2. The TOD expressed in Greenwich mean time, and the date delivery is completed.

A complete endorsement must appear on the station file copy of each outgoing message.

### INCOMING ENDORSEMENT

For incoming messages, the receiving operator enters the following servicing data below the text on the message blank:

1. TOR in Greenwich mean time.
2. Operator's personal sign.
3. Frequency in kilocycles or megacycles.

Whereas servicing data for an outgoing message is penciled on the message blank, the servicing for an incoming message is typed on the message blank. The information is typed because the receiving operator keeps the message blank in his typewriter until after he receipts for the message. Slant signs separate the portions of the endorsement. Example: 1402/JN/8578KC.

### DISTRESS COMMUNICATIONS

To increase safety at sea and in the air, methods of communication have been developed for use in times of emergency and distress. A list of the emergency and distress frequencies adopted for use at such times follows.

- |          |  |
|----------|--|
| 500 kc   | - International calling and distress.                                    |
| 2182 kc  | - International calling and distress for maritime mobile radiotelephone. |
| 8364 kc  | - International lifeboat, life-raft, and survival craft frequency.       |
| 121.5 mc | - International aeronautical emergency frequency for VHF band.           |
| 243.0 mc | - Aeronautical emergency frequency for UHF band.                         |

You will note that 500 kc is used in times of distress and also is the international calling frequency. In routine radiotelegraph communications, merchant ships contact each other on 500 kc, then shift to a "working" frequency. To make sure that other uses of 500 kc will not interfere with distress traffic, two SILENT periods are designated. These periods are for 3 minutes each, and begin at X:15 and X:45 o'clock. That is, a silent period begins 15 minutes before each hour and 15 minutes after each hour. Ship clocks in radio spaces usually have these 3-minute segments of the clock face painted red to remind the operators of the silent periods. Except for actual distress messages, all traffic ceases at these times on frequencies between 480 and 520 kc.

Guarding the distress frequencies is an important function of Coast Guard shore radio stations. Some naval shore stations stand continuous distress watches. Others maintain only a "loudspeaker" watch.

When a Navy ship is operating singly at sea, a continuous watch is stood on 500 kc and 8364 kc if operators and equipment are available. In all instances a receiver watch is always stood and a log is kept covering at least the silent periods. When ships are operating in a group, the officer in tactical command arranges for the distress guard. Usually, one ship guards for the group. Under certain conditions, the OTC may request a shore radio station to handle the guard for his ships when in the area of the shore station.

### DISTRESS SIGNAL

In radiotelegraph, the distress signal SOS is transmitted as a single character. When sent on 500 kc, the dashes must be emphasized in order to operate an automatic alarm apparatus with which most merchant ships are equipped. The International Telecommunications Union also adopted an alarm signal for use on 500 kc. The ITU system consists of twelve 4-second dashes with a 1-second interval between dashes. Thus, there are two possible methods of actuating the alarm. For this reason the distress call should be preceded by the 12-dash alarm signal, followed immediately by SOS sent 3 times.

The answer to a distress message takes this international form: Call sign of the distress ship (3 times), prosign DE, call sign of own ship (3 times), followed by RRR SOS. Assume

that the SS Blank, whose call sign is WUBN, is in distress. The call sign of your ship is NTAA. Your answer to her distress message would be:

WUBN WUBN WUBN DE NTAA NTAA  
NTAA RRR SOS AR

The answer to a distress message usually is followed by the name of your ship, position, and maximum speed at which you are proceeding toward the vessel in distress. This answer, of course, must be originated by your commanding officer.

If your ship is not in position to give assistance to the SS Blank, your ship may help by relaying the distress message. In the relay, the distress message is repeated word for word on the distress frequency, with full transmitter power, followed by DE and your ship's call sign repeated 3 times. Authority to relay the message must come from your commanding officer. He may include the distress message in the text of a naval message to be transmitted to a shore station for possible action or broadcast to the fleet.

To handle rescue operations successfully, distress traffic must be controlled. The vessel making the distress call is the control station for distress traffic. Control may be exercised by another ship at the scene, however. Any ship can impose silence on any radio stations in the zone, or on a particular station interfering with the distress traffic. To impose silence, the signal QRT is sent, followed by the word DISTRESS. This may be addressed to all stations (CQ) or to a specific station.

When distress traffic is ended, or radio silence no longer is necessary, a message is sent to inform all ships. This message is originated by the control vessel. Assume your ship (NTAA) was control vessel for WUBN. At the end of the distress traffic, your commanding officer would originate the following message:

SOS CQ CQ CQ DE NTAA SS BLANK  
WUBN QUM AR

Note that DE is followed by the call sign of the ship transmitting, and this in turn is followed by the name and call of the ship that originated the distress call. The signal QUM means "Distress traffic is ended."

A naval vessel in distress ordinarily does not use the international distress signal SOS. Instead, Navy communication channels and cryptoids are utilized.

Although SOS is the international distress signal sent by radiotelegraph, the signal in radiotelephone is the spoken word MAYDAY. Pronunciation of this distress signal is the same

as the French word m'aider ("Help me"), from which it derives. MAYDAY also is used by aircraft in distress.

#### URGENCY SIGNAL

In addition to the distress signal SOS, there is an urgency signal for use on distress frequencies. It consists of the group XXX sent 3 times before the call. The urgency signal indicates that the calling ship has an urgent message to transmit concerning the safety of the ship or of a person on board or within sight. It has priority over all other communications except distress.

#### SAFETY SIGNAL

The safety signal, transmitted on any of the distress frequencies, consists of the group TTT sent 3 times before the call. It indicates that the ship is about to transmit a message concerning the safety of navigation or giving important meteorological (weather) warnings.

#### DISTRESS DUE TO ENEMY ACTION

Merchant ships use SOS in distress messages to summon assistance only in instances of distress due to normal marine causes such as fire, collision, storm, and the like, not the result of enemy action.

In wartime the following five signals are used by merchant ships to indicate distress due to enemy action:

Class of distress	Distress signal	When used
Warship raider --	WWWW	On sighting or when attacked by enemy warship.
Armed merchant ship raids -----	QQQQ	On sighting or when attacked by armed merchant ship raider.
Submarine -----	SSSS	On sighting or when attacked by enemy submarine.
Aircraft -----	AAAA	On sighting or when attacked by enemy aircraft.
Mine -----	MMMM	On striking a mine.

Further information concerning international regulations for distress, emergency, and safety traffic can be found in Distress and Rescue Procedure (ACP 135), and in Radio Navigational Aids (H.O. 117A and 117B).

**FACSIMILE BROADCAST**

Facsimile (FAX), as you learned in chapter 2, is a system for sending pictorial matter by radio or landline. It is discussed in this chapter because radiotelegraph procedure is used to establish and maintain communications on facsimile circuits.

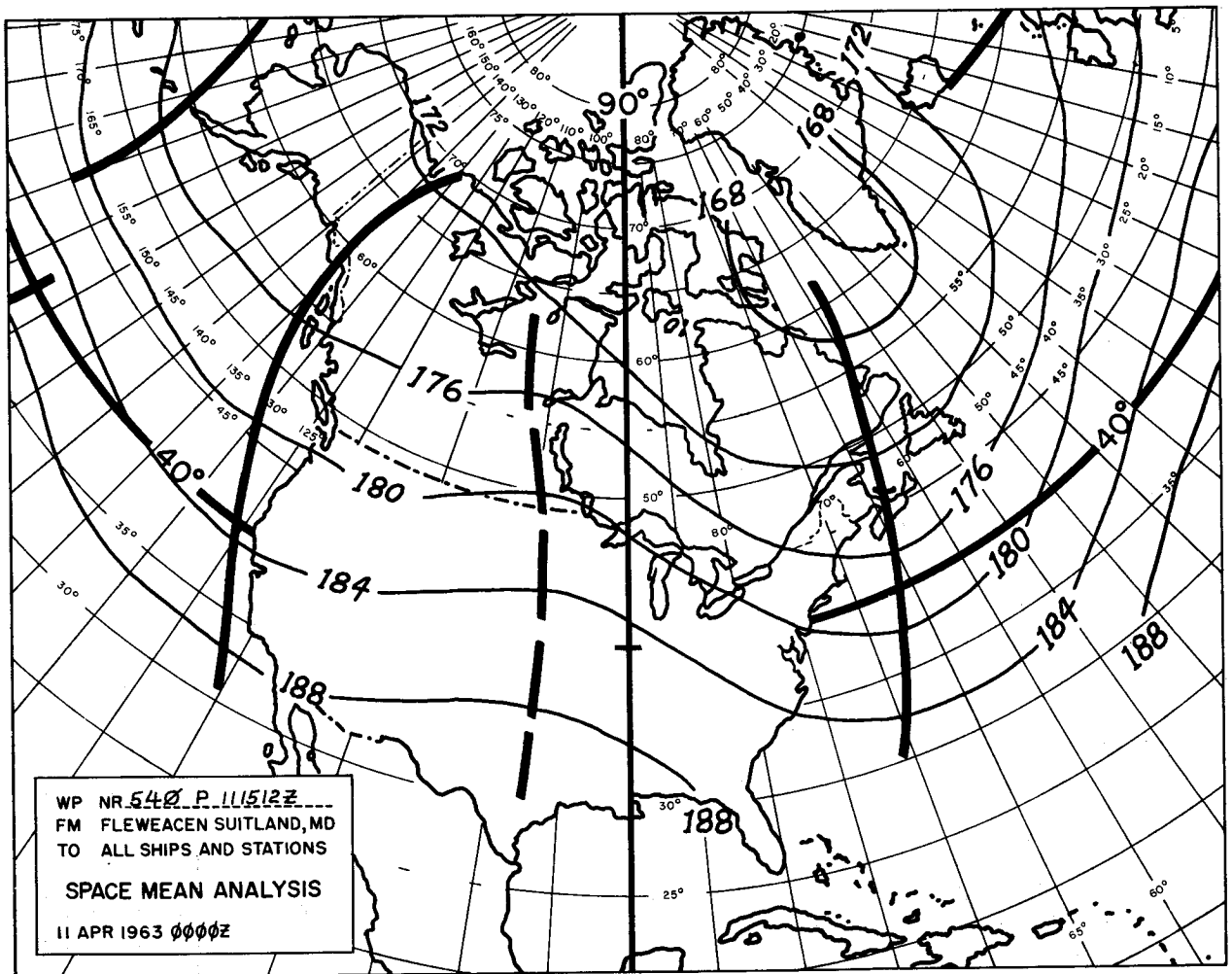
Many ships that are not equipped to transmit FAX have equipment aboard for receiving only. It is used for copying the facsimile component of

the fleet broadcasts. FAX broadcasts are sent by the following stations.

	Call sign	Broadcast designator
NAVCOMMSTA Washington	---NSS	WP
NAVCOMMSTA Balboa	-----NBA	BP
NAVCOMMSTA San Francisco	-NPG	FP
NAVCOMMSTA Honolulu	-----NPM	HP
NAVCOMMSTA Guam	-----NPN	GP
NAVCOMMSTA Port Lyautey	--NHY	KP
NAVCOMMSTA Philippines	---NPO	PP

The areas covered by FAX broadcasts are the same as those covered by the RATT and CW broadcast schedules. The content of the broadcasts is almost exclusively weather charts.

An example of a weather chart transmitted on the facsimile broadcast is shown in figure 6-2.



76.11

Figure 6-2. — Weather chart transmitted on Washington FAX broadcast.

Note the identification block in the lower left corner of the example. This block contains the standard message heading format and other lines as may be necessary for proper identification of the chart.

Facsimile schedules are not continuous, and transmission times vary among stations. A station generally broadcasts for 8 or 9 hours of the 24. All stations transmit simultaneously on either three or four frequencies. At least one schedule is intercepted by one or more stations to satisfy requirements of local weather activities or for purposes of training personnel in operating and maintaining facsimile equipment.

Before commencing a schedule, a station makes a 5-minute series of test calls. The test calls consist of a series of Vs, followed by DE and its call, and the letter designator of the broadcast made 3 times. Example:

VVV VVV VVV DE NSS NSS NSS WP WP WP

After the test calls are transmitted, and at least 2 minutes before scheduled broadcast time a synchronous signal is transmitted. This permits receiving stations to synchronize their equipment with the transmitting station.

The last item of each day's transmissions is the station log of messages sent. The log consists of the station serial numbers, a short description of the contents of each item of traffic, and the TOD. By means of the log, receiving stations are enabled to request repetitions of messages missed that still would be of value to them. Because weather information is timely for only a few hours, charts whose valid times have expired usually are not requested.

Normally, requests for repetitions received by the transmitting station are answered on the first schedule following receipt of the request.

A vessel wishing to transmit facsimile traffic to a shore station or to another ship makes prior arrangement, advising the accepting station of the time of the intended transmission and the frequency to be used.

### DRILL CIRCUITS

Radio drill circuits provide a valuable opportunity for live, "on-the-air" operator training. Each ship participating in the drill transmits both plain language and simulated encrypted drill messages to other ships in the net.

Drill circuits are established at most ports having a concentration of naval ships. Drills are conducted in strict compliance with correct operating procedures. Prompt, on-the-spot corrections of procedural errors by the control

station are a big help to the CW operator in maintaining his proficiency.

For participating in the drill, CW operators are classified into two groups, according to skill. Class 2 is for less experienced operators capable of 10 to 15 wpm. In class 1 are those operating at more than 15 wpm. It is important that you qualify for the class of drill being conducted. Class 2 operators should not participate in a class 1 drill, nor should class 1 operators be assigned to a class 2 circuit.

Most CW drill circuits operate daily except weekends and holidays. The usual schedule provides for 2 hours for class 2 operators in the mornings, and 1½ hours for class 1 operators in the afternoons. The shore station conducting the drill monitors the drill or may designate another station to monitor. Monitoring consists of keeping an accurate intercept log of every transmission heard on the circuit. At the completion of the drill, the monitor log is examined and each ship is sent a copy of the log or a summary indicating the errors noted, with corrections referencing appropriate publications.

As a result of your ship's operations, you often obtain little or no CW transmitting experience. Therefore, do not fail to take advantage of every opportunity to participate in a CW drill.

### PERFORMANCE TEST

Before you can take the fleetwide competitive examination for advancement to RM3 or RM2, you must demonstrate your proficiency in sending and receiving international Morse code by successfully passing the performance test. Your local examining board schedules performance tests at least once each quarter.

Preceding the official test, you are given a rehearsal test consisting of messages that are similar to the official test, but different in content and length. The main purpose of the rehearsal test is to give you a good limbering-up exercise. The results of the rehearsal test do not, of course, affect your score on the official test.

The official transmitting test for RM2 consists of 3 messages, containing a total of 500 characters, to be sent in 8 minutes. Time limits include servicing each message with TOD, circuit used, and operator's sign. You are permitted a total of 5 uncorrected errors or omitted characters, therefore you should correct a

known errors. A standard hand key must be used for the transmitting test.

The official receiving test for RM3 consists of 4 messages (different from the transmitting test), totaling 600 characters, which must be received and recorded on a telegraphic typewriter within 8 minutes, including time for servicing. Five errors are permitted in the receiving test.

The code transmitting test for RM2 consists of 4 messages, totaling 600 characters, to be sent within 8 minutes, including time for servicing. The code receiving test for RM2 has 5 messages, contains 700 characters, and must be received within 8 minutes.

Radiomen must pass an additional performance test in touch teletypewriting. Details of the teletypewriting test are given in chapter 11.