# CHAPTER 11

# TELETYPEWRITER PROCEDURE

Before discussing teletypewriter and tape relay procedures, a brief description of the network in which these procedures are employed is necessary.

As you learned in chapter 2, the Naval Communication System is the Navy operated portion of the DCS, and includes all shore-based communication activities and the fixed circuits (landline and radio) that bind them into a worldwide network. The majority of these fixed circuits are teletypewriter circuits. Collectively they are called the Naval Teletypewriter Tape Relay Network (NTX). Figure 11-1 is a schematic drawing of the NTX portion of the Defense Communication System Teletypewriter Network. Normally, ship-to-ship and ship-to-shore teletypewriter circuits are not a part of the NTX.

The communication activities of the NTX are primary, major, and minor communication centers, and tributary stations (independent message centers). These activities and their functions are described in chapter 2.

Each communication center maintains a tape relay station that receives and forwards messages in tape form by means of semiautomatic and automatic relay equipment. The relay station does not originate messages, except those relating to traffic handling (such as service messages and supervisor wirenotes), nor receive them as addressees. The message center belonging to the same communication center as the relay station originates and receives all messages for the communication center.

Tributary stations are activities connected electrically to the tape relay network through some relay station. Tributaries have no relay responsibilities. They are the points from which a large part of the NTX traffic originates, and to which it eventually goes for final delivery to addressees. Tributaries are located where there are Navy activities that need the services of the NTX. Typical places are depots, receiving stations, training centers, and so on. Even a flagship may temporarily become a tributary.

The network presently has both classified (on-line) and unclassified (off-line) relay stations. As cryptographic equipment becomes available, though, the entire network is being converted to on-line operation.

## AUTOMATIC RELAY

In chapter 2 you learned that there are five automatic relay stations in the Navy's tape relay network. They are located at Trenton, N. J., Cheltenham, Md., Norfolk, Va., San Diego, Calif., and Stockton, Calif.

The automatic switching equipment installed in these relay stations is designed to relay only those message tapes that meet certain requirements. In certain critical portions of an incoming tape, the equipment senses each character (letter and function) to determine the message routes and to guard against nondelivery resulting from garbles or improper character sequence. Any deviation from prescribed procedure, including omission or insertion of machine functions, results in a rejected message.

Messages rejected by the equipment are shunted to a miscellaneous intercept position for service action. When rejections occur, delay is inevitable and, depending upon the traffic load and number of rejects, the delay may amount to hours.

You must bear in mind that automatic relay stations are manned by very few operators. If your message is not punched correctly and the precedence is lower than IMMEDIATE, the relay station does not reprocess and correct it for you. Your station is notified by service message to transmit a correctly prepared tape, and you will have to repunch the message. It is most important, therefore, that you learn and always use the correct teletypewriter procedure.

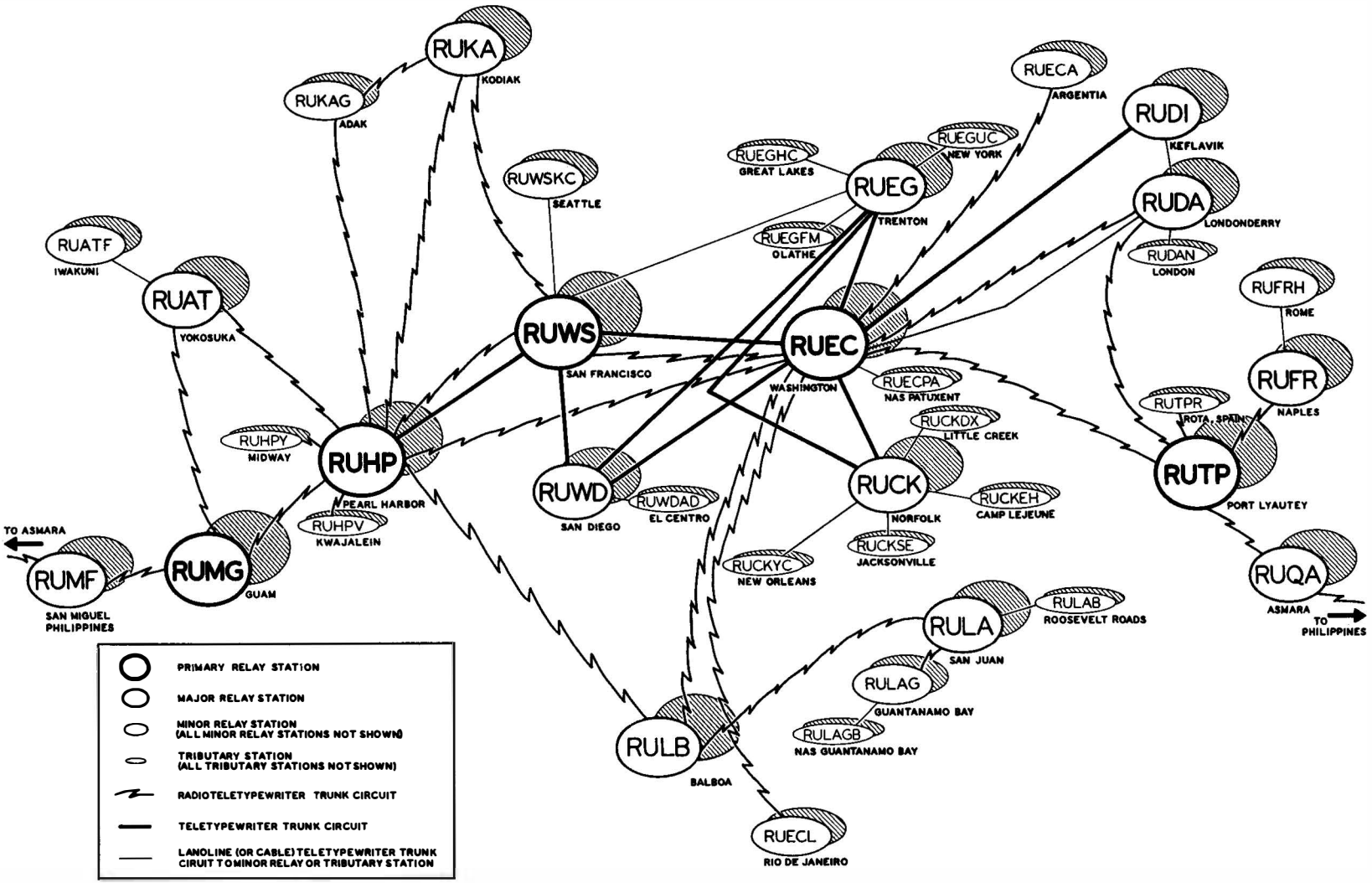


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Figure 11-1. —U.S. naval teletypewriter tape relay system.

Even if your tributary station does not work directly into an automatic relay station, your messages enter the automatic system if there are addressees in the continental United States.

The sequences of letter, numeral, and machine function characters required for automatic system operation are shown in message examples later in this chapter.

## TORN TAPE RELAY

Torn tape relay is a term derived from the manner in which message tapes are processed at a semiautomatic relay station. At such stations, incoming message tapes are received on a reperforator, torn from the reperforator by the operator, and hand-carried to the outgoing circuit. Hence, torn tape relay means that the tape actually is torn at the receiving machine, and is transferred to the outgoing machine by hand.

An operator at a torn tape relay station usually is assigned to operate several circuits in the immediate vicinity of one another. He is responsible for all traffic passed over these circuits; maintains a separate message log for each circuit; screens all messages for obvious errors or garbles; makes certain that messages given him for transmission are transmitted on the circuit indicated; and disposes of incoming messages in accordance with the practices of his particular station.

Except for a slight difference in format line 1, the message format for torn tape relay is identical to the format for automatic relay. We will discuss this difference when we take up the message format.

## ROUTING INDICATORS

In order to move tape relay traffic efficiently from one point to another, each station in a teletypewriter network is designated by a routing indicator. An indicator is made up of a group from four to seven letters, following a specific pattern, to indicate the nation to which the station belongs, its geographic area and whether it is a major, minor, or tributary station.

### CONSTRUCTION

Routing indicators are distinguished easily from call signs and address groups because the first letter of a routing indicator is always either the letter R or U. These letters, in that order, show whether the message will be handled by the worldwide communication network or will travel over a net serving some local area. Messages with routing indicators beginning with the letter U do not enter the worldwide system. Routing indicators are not encrypted for transmission security purposes.

The second letter identifies the communication system of each country. Those of the United States and its Allied Nations are as follows:

A--Australia;
B--British Commonwealth (less Canada);
C--Canada;
U--United States;
X--NATO.

The third letter indicates the geographical location in which a station is located or from which it is served. There are 15 such areas. Following is a list of the letters used to designate each.

A--Eastern Asiatic area, including Japan and Korea;
C--Central United States;
M--Southwest Pacific area, including the Philippines and Marianas;
Y--Australian-New Zealand area;
K--Alaskan-Aleutian area;
H--Central Pacific area, centered on the Hawaiian Islands;
W--Western United States and Canada; Mexico;
E--Eastern United States and Canada; Greenland;
L--South American and Caribbean areas;
D--British Isles and Iceland;
F--European area;
T--Northwest African area;
Q--East African, Arabian, Turkish, and Iranian areas;
V--South African area below equator;
S--Western Asian area, including India.

Zone boundaries are laid out according to latitude and longitude; but, despite area boundaries, a tributary must carry the same area designator as the parent relay station, regardless of location. For example, although in a different zone area, the Naval Air Station in Olathe, Kansas (C zone) is assigned a routing indicator from major relay Trenton, N.J. (E zone).

Fourth and subsequent letters (except for and special suffixes) designate relay and tributary stations. Four-letter indicators designate

either primary or major relay stations. The fourth letter does not distinguish between the two, however. (Although A is assigned as the fourth letter to the major relay station at Asmara, and some alphabetical connection can be seen in some of the other assignments, they are not assigned alphabetically.)

Following are breakdowns of the routing indicators for (1) a primary station, RUMG, and (2) a major station, RUAT.

R--Worldwide network;
U--U. S. facility;
M--Southwest Pacific;
G--Primary relay station (Guam, Mariana Islands).

R--Worldwide network;
U--U. S. facility;
A--Eastern Asia;
T--Major relay station (Yokosuka, Japan).

Routing indicators containing four letters always mean a primary or major relay station. These four-letter indicators form the basis for every routing indicator in the tape relay network. If you learn the geographical location of the relay stations and their routing indicators, you will have no trouble routing or relaying NTX messages.

Fifth and subsequent letters of a routing indicator designate a minor relay station or a tributary of some primary or major relay station. You will have to look it up to know which one it is. A minor relay station always has a five- or six-letter routing indicator, the first four letters of which are identical to the indicator of the primary or major station into which it feeds. The minor relay station RUKAG at Adak, Alaska, for example, feeds into the major relay station RUKA, Kodiak.

Routing indicators simplify message handling in semiautomatic relay systems because operating personnel do not need to look up locations of distant addressees to relay the message properly. Assume that NAS Patuxent River originates a message addressed to NAS Guantanamo Bay--served by the tributary station RULAGB. (Refer to fig. 11-1 to follow this example.)

The first relay point is Washington (relay station is located at Cheltenham, Md.), where the message is received in the automatic relay center but must be transferred to the semiautomatic relay section that handles overseas traffic. An operator in the semiautomatic relay station, seeing that the routing indicator begins with the letters RULA, knows that the message goes to the major relay station at San Juan, P.R., and forwards it to RULA through the facilities of RULB. At San Juan, RULA, the operator knows that the next letter, G, designates the minor relay center at Guantanamo Bay. At Guantanamo, RULAG, the operator knows that the last letter, B, designates the Naval Air Station, and forwards the message to that tributary.

## SPECIAL SUFFIXES

The letter C, and all two-letter combinations CA through CZ, are reserved for suffixes to routing indicators. Additionally, the two-letter combinations SO, SU, and SX are used as routing indicator suffixes by the U. S. Air Force only. There is a prescribed meaning for each suffix. Suffixes aid routing of tapes for processing purposes or localized action by the relay station or any of its supplementary sections or facilities. A list of suffixes and their meanings follows. Those authorized for Navy use are so indicated in ACP 117 CAN-U. S. SUPP-1.

C--Local delivery or refile in page form is required.
CF--Section accomplishing delivery by broadcast methods.
CI--Section coordinating routing information.
CM--Section preparing tape copies for retransmission.
CN--Electrical conference facility or section.
CR--Cryptocenter.
CS--Section dealing with service messages.
CT--Section effecting delivery by telephone.
CU--Section using tape relay for delivery to commercial carriers.
CW--Section relaying by radiotelegraph.
CX--Section using tape relay for refile to activities served by teletypewriter exchange systems.

Following are two examples of suffixes as used with the routing indicator of the primary COMMCEN Washington, D. C. (RUEC).

RUECC--Primary message center, COMMCEN Washington,
RUECCR--Cryptocenter, COMMCEN Washington.

## PUBLICATIONS

Publications of principal importance to NTX operators are the effective editions of ACP 127 (with United States supplement), ACP 117 (with Canadian and United States supplements), and DNC 5. Tape relay procedure is dealt with in ACP 127 and DNC 5. Routing indicators are listed in ACP 117.

Supplements actually are separate publications, issued by the individual Allied countries, that amplify (or expand) the basic publications. For example, ACP 127 U. S. SUPP-1 prescribes operating procedures that are peculiar to the United States tape relay networks. In ACP 117 CAN-U. S. SUPP-1 (a Joint supplement) are listed the routing indicators of the teletypewriter stations belonging to the United States and to Canada. The ACP 117 U. S. SUPP-1 contains instructions for routing U. S.-originated messages to military and nonmilitary activities that are not assigned a routing indicator in the CAN-U. S. SUPP-1.

At the larger shore COMMCENs, the routing indicator book would literally be "worn out" in a short time through constant usage. For that reason, most of the busier message centers ashore transfer the routing information from ACP 117 to cardboard strips, which are held in metal frames supported by revolving stands called spindles. Routing spindles are practically indestructible and provide speedier access to the current routing information. They also provide more space for entering the frequent routing indicator changes than is available on a fixed, printed page.

## MACHINE FUNCTIONS

Machine functions are of the utmost importance in teletypewriter operation. Because some functions do not show up on the printed page copy of the message, you may wonder why it is necessary to use them at all. Remember that NTX messages are relayed in tape form; machine functions play an important part in efficient operation of the tape relay system.

An explanation of the machine functions and the rules for their use are given in the ensuing six topics.

### SHIFT (FIGS) AND UNSHIFT (LTRS)

Teletypewriter machines, owned or leased for use in naval communications, shift from uppercase characters (figures) to lowercase characters (letters) only when the LTRS key is pressed. Many naval messages, however, are delivered to some addressees by the commercial Teletypewriter Exchange Service (TWX). The TWX machines shift automatically from uppercase to lowercase characters whenever the SPACE BAR is pressed, in addition to shifting when the LTRS key is pressed. To ensure that this unshift-on-space feature does not result in errors, the following rules must be complied with when transmitting by direct keyboard or punching tape on either a TWX or Navy–owned or - leased teletypewriter.

1. Always press the LTRS key to shift from uppercase to lowercase (disregarding the unshift-on-space feature of TWX machines). Example:

35784 (SPACE) (LTRS) TRY MAKE

This procedure has no adverse effect on either a TWX or Navy machine. Failure to follow this procedure would result in the following error:

a. Transmitted on TWX machine:
35784 TRY MAKE

b. As received on Navy machine:
35784 546 . -(3

2. Always press the FIGS key to shift from lowercase to uppercase, and also after the space before each group of figures or uppercase characters in a series. Example:

35784 (SPACE) (FIGS) 27896 . . .

The procedure in step 2 has no adverse effect on either a TWX machine or on a Navy machine. This rule applies whether direct keyboard transmission or tape perforation is used. Failure to follow this practice would result in the following error:

a. Transmitted on Navy machine:
35784 (SPACE) 27896

b. As received on TWX machine:
35784 (SPACE) WUIOY

### CARRIAGE RETURN (CR)

The carriage return function resets the machine to the left margin of the paper. As a special precaution to make sure that the carriages return on all machines properly, the operator presses the CR key twice at the end of each line. Regardless of your own typing speed when punching a message tape, the message is transmitted on circuits running at 60, 75, or 100 words per minute. At these high speeds, the carriage does not have enough time

to return to the left margin on a single CR function. As a result, the next character prints while the carriage still is moving toward the left. Always remember to press the CR key twice at the end of each line in the message examples in this chapter.

LINE FEED (LF)

The line feed function advances the paper on the page. You will note that the normal end-of-line functions include only one LF. At the end of the message, however, eight LF functions are used to provide more space between messages on the printed page.

BELL SIGNAL

The bell signal attracts the attention of the receiving operator. It precedes the precedence prosign in the routing line (format line 2) in FLASH messages.

On most teletypewriters the bell signal rings when the uppercase S key is pressed. Some equipments, though, particularly those used in the Canadian tape relay network, have the bell on the uppercase J key. Consequently, correct procedure requires the bell signal to be transmitted as follows:

(FIGS) JJJJJSSSSS (LTRS)

SPACE (SP)

The space function advances the carriage without printing any character on the page. It is used throughout the message for spacing between prosigns, routing indicators, words or groups, and the like.

BLANK (BL)

Pressing the blank key has no effect on the page copy of a message, but it advances blank tape through the punch block of the teletypewriter perforator. The blank function is required in the operation of certain cryptosystems, but has no application in NTX procedure. Do not substitute BLs for LTRS functions.

## MESSAGE ALIGNMENT

Message alignment is essential so that the receiving teletypewriter can print a legible page copy of the message. The alignment procedure given here is for your guidance when preparing message tapes for transmission. Functions that usually are inserted by the automatic channel numbering unit are not included here, but are discussed in the next topic.

Machine functions that are a part of the message alignment must appear in the specified sequence. Otherwise, the message is rejected at the first automatic relay station along its route.

All messages must be preceded by five spaces, two carriage returns, and one line feed. The transmission must begin with the five spaces. Any tape feedout functions preceding the five spaces are not transmitted.

The functions at the end of each line of a message are two carriage returns and one line feed. An exception is when the end of the line is also the end of a page of a long message. Then, the end-of-line functions are two carriage returns and four line feeds.

End-of-message functions are two carriage returns, eight line feeds, the letter N repeated four times, and 12 letters (functions). (The BL key is not used in lieu of LTRS, and any tape feedout in excess of 12 LTRS is removed before the message is transmitted.)

Separation between groups within any given line of a message is one space, except in the text of tabulated messages (presented later in the message examples). Spacing between routing indicators in the routing line is particularly important because the routing indicators are sensed by the automatic switching equipment when it is determining message routes.

The lines of a teletypewriter message are limited to 69 characters, including spaces.

## MESSAGE NUMBERING

Aside from the DTG and any message identifying numbers (called cite numbers) in the text, the numbers assigned a message for identification purposes are of two types. They are station serial numbers and channel numbers.

STATION SERIAL NUMBERS

Teletypewriter messages are assigned station serial numbers by the station originating

(punching) the messages. Messages are numbered consecutively for a 24-hour period, beginning at ØØØ1Z each day.

The station serial number is a permanent means of message identification, and it remains the same regardless of whether the message is destined for one or many addressees. Communication activities that have occasion to refer to the message (to obtain repetitions, for example) cite the station serial number of the message as part of their identifying data. The station serial number is also referenced for in-station accountability of the message.

When a station has more than one outgoing position or transmitting channel, a separate set of serial numbers is used for each channel. In such instances, a channel letter designator is added to the station serial number to identify the channel over which the message is transmitted. The letter appears following the station serial number. Letter A usually is assigned the first channel. The next channel is designated B, the next C, and so on. For example, the station serial number 1Ø7B indicates a message transmitted over channel B of a teletypewriter station.

## CHANNEL NUMBERS

Another name for channel numbers is transmission identification (TI). You will see and hear both terms used interchangeably.

To provide a means of keeping a constant check on traffic between stations, a channel number is required in the heading of every message. The channel number ensures that no message is lost or unaccounted for. Each station relaying a message adds its channel number to the head of the message. The station receiving the message checks this channel number against its record of transmissions received from that station. The number of transmissions received and the number in the message heading must agree. Such a check on traffic is known as "protecting the continuity of service." Understand: A message carries the same station serial number all the way, but receives a new channel number at each relaying station.

Equipment that automatically sends transmission identification ahead of each message is the most satisfactory means of performing the identification function. When automatic number equipment is unavailable, transmission identification is prepared in tape form in such a way that a tab containing identification for one transmission can be detached from a roll and be transmitted ahead of each message. As a last resort, transmission identification is incorporated directly into each message as it is being prepared for transmission.

Transmission identification for messages transmitted directly into fully automatic relay stations consists of the following: (1) the letter V; (2) the start of message indicator ZCZC; (3) the three-letter station and channel designators; (4) one figures shift; (5) a channel serial number; and (6) one letters shift. Example: VZCZCABC(FIGS)Ø31(LTRS).

The preceding example is explained in this manner: Letter V is required to ensure that the first character of intelligence is not lost or garbled. The start of message indicator (abbreviated SOM) activates the automatic switching equipment at the relay station. (The SOM must appear once (and only once) in each transmission introduced directly into an automatic relay station.) Letters ABC are the station (AB) and the channel (C) designators of the station making the transmission. The figures shift is operated once to shift the equipment from lowercase to receive the channel serial (Ø31). Then, the letters shift is operated once to bring the equipment back to the lowercase position.

A slightly different form of transmission identification applies in messages transmitted directly into torn tape relay stations. It consists of (1) letters VV; (2) three space functions; (3) the three-letter station and channel designators; (4) a figures shift; (5) a channel serial number; and (6) a letters shift. Example: VV(3 SPACES)ABC(FIGS)Ø31(LTRS).

The explanation of the foregoing example is the same as that for the automatic system, except that the characters VV(3 SPACES) replace the start of message indicator. This substitution is made because the ZCZC serves no purpose unless automatic switching equipment is used.

## NTX MESSAGE FORMAT

Messages transmitted over tape relay circuits must be prepared in the NTX message format shown in table 11-1. The 15 format lines are explained briefly in the table, and are amplified in the following paragraphs.

Table 11-1. — NTX Message Format

| Parts | Components | Format line | Elements | Contents | Explanation */ |
|---|---|---|---|---|---|
| HEADING | PROCEDURE | 1 | Handling instructions. | Transmission identification.<br>Security warning prosign (when used).<br>Pilot - Pilots contain:<br>Repeated precedence prosign**/.<br>Routing indicator(s).<br>Prosigns, operating signals and address designations***/as required. | Always contains transmission identification (which includes the "start of message indicator" when necessary); also contains pilot(s) as required to convey specific message-handling instructions. |
| | | 2 | Called station(s). | Repeated precedence prosign**/.<br>Routing indicator(s) of station(s) responsible for delivery or refile. | Basic routing line.<br>If message is dual-precedence, only the higher precedence is shown in this line. |
| | | 3 | Calling station and filing time. | Prosign DE.<br>Routing indicator of station preparing message for transmission.<br>Station serial number.<br>Filing time: Date separated by slant from hour and minutes expressed in digits followed by zone suffix. | Filing time is the date and time the message was filed with the communication center. |
| | | 4 | Transmission instructions. | Security warning operating signal (when used).<br>Prosign T.<br>Other operating signals.<br>Special operating group(s) (SOGs).<br>Address designator(s).<br>Routing indicator(s). | Indicates specific transmission responsibility not apparent in other components of the message heading. Not to be used unless necessary. Plain language address designators are not permitted in codress messages. |

Table 11-1. — NTX Message Format—Continued

| Parts | Components | Format line | Elements | Contents | Explanation */ |
|---|---|---|---|---|---|
| | PREAMBLE | 5 | Precedence; date-time group; message instructions. | Precedence prosign(s).<br>Date-time group and zone suffix (Z indicating Greenwich mean time).<br>Operating signal(s). | In dual precedence, both prosigns are shown separated by a space. Operating signals are used only when required to convey message-handling instructions. |
| | ADDRESS | 6 | Originator. | Prosign FM.<br>Originator's designation. | Message originator is indicated by plain language, routing indicator, address group, or call sign. |
| | | 7 | Action addressee(s). | Prosign TO.<br>Routing indicator(s).<br>Operating signal.<br>Address designation(s). | Action addressees are indicated by plain language, routing indicator(s), address group(s), or call sign(s). In multiple-address messages, when addressees are listed individually, each address designation must be on a separate line and may be preceded either by the operating signal ZEN (meaning delivered by other means) or by the routing indicator of the station responsible for delivery. Such use is mandatory on all joint and combined messages. |
| | | 8 | Information addressee(s). | Prosign INFO.<br>Routing indicator(s).<br>Operating signal(s).<br>Address designator(s). | Same as for line 7, except that line 8 pertains to information addressee(s). |

Table 11-1. — NTX Message Format—Continued

| Parts | Components | Format line | Elements | Contents | Explanation */ |
|---|---|---|---|---|---|
| | | 9 | Exempted addressee(s). | Prosign XMT, Address designator(s). | Used only when a collective address designation is used in line 7 or 8 and an indication of the addressee(s) exempted from the collective address is required. |
| | PREFIX | 10 | Accounting information: group count. | Accounting symbol (when required).<br>Group count prosign GR.<br>Group count. | The group count prosign and group count must be used only when the text consists of countable encrypted groups. |
| SEPARATION | | 11 | . . . . . | Prosign BT. | |
| TEXT | . . . . . | 12 | Classification; internal instructions; thought or idea expressed by originator (in that order). | . . . . . | See ACP 121 series. |
| SEPARATION | | 13 | . . . . . | Prosign BT. | |
| ENDING | PROCEDURE | 14 | Confirmation. | . . . . . | Not used in tape relay operation. |
| | . . . . . | 15 | Correction. | Prosign C.<br>Other prosigns, operating signals, and plain language as required. | |
| | | | End-of-message functions. | 2CR, 8LF, 4Ns, 12LTRS | The 4Ns in this sequence are the end-of-message indicator. |

*/ Included only when required for clarity.

**/ If message is dual-precedence, only the higher precedence is shown in this line.

***/ Plain language designators are not permitted in codress messages.

LINE 1: Because format line 1 contains the message transmission identification, its construction varies with the type of relay station into which you are transmitting. If you are transmitting into an automatic station, this line must include the start of message indicator (ZCZC).

The security prosigns referred to in the Contents column of table 11-1 are not used by the United States. Hence, they are not discussed in this text. (Consult ACP 127 U. S. SUPP-1.)

Pilots are explained under a separate topic later in this chapter.

LINE 2: Tape preparation usually begins with line 2, the routing line. It consists of the precedence prosign (repeated) and the routing indicators of stations called, that is, stations to which the message is routed for final delivery. To avoid misroutes, the routing line must be prepared with special care.

In multiple-call messages, all routing indicators associated with a single relay station are grouped together in the routing line. They are not intermingled indiscriminately. If a called station serves more than one addressee in the message, the station's routing indicator need appear only once in line 2.

When dual precedence is used, only the higher precedence appears in the routing line. If a dual precedence of FLASH and a lower precedence are assigned to multiple-address message, and the message requires using more than nine routing indicators in line 2, the originating station makes two separate transmissions. One transmission goes to the action addressees, and the other is sent to the information addressees. You must remember: When the FLASH precedence prosign is transmitted in the routing line, it is preceded by the bell signal.

LINE 3: Line 3 consists of the prosign DE, the routing indicator of the station preparing the message for transmission, the station serial number, and the date and time the message was filed with the communication center for transmission.

It is essential that the prosign DE follow immediately the two CRs and one LF at the end of the routing line (line 2). The automatic relay equipment is designed to stop seeking outgoing channels upon receipt of the letter D at the beginning of line 3.

LINE 4: The operating signal ZNR is transmitted as the first component in format line 4 of all unclassified messages (including off-line encrypted messages and service messages), except unclassified EFTO messages. When used in this manner, ZNR means "This message may be forwarded without change by radio or nonapproved circuit." The absence of ZNR indicates that the message is classified and must be transmitted over secure circuits.

When necessary, transmission instructions denoting transmission responsibility are included in line 4. Such instructions are employed only when essential to ensure delivery of the message. They are not used when stations called are automatic guard for the addressees, nor when delivery responsibility is indicated in the address portion of the message.

LINES 5 AND 6: See table 11-1 for explanation of format lines 5 and 6.

LINE 7: Line 7 is the action addressee line. It commences with the prosign TO and contains the address designations of commands or activities that are to take action on the message. Addressees normally are designated by plain language. But, as you will see in the message examples that follow this section, there are certain instances when the addressees are designated by both plain language and call signs or address groups.

Delivery responsibility is indicated by preceding each address designation with the routing indicator of the station responsible for delivery to that addressee. An exception to this is when the addressees are designated by a collective address designator or an address indicating group. Then, it is not necessary to precede the designator with routing indicators. When a single station is responsible for delivery to all addressees represented by a collective address designator, however, that station's routing indicator precedes the designator.

When delivery to an addressee is accomplished by other means than a particular transmission, the operating signal ZEN is used in place of a routing indicator. A slant sign separates the routing indicator (or ZEN) from the address designation.

LINE 8: The explanation of line 8 is the same as line 7, except that line 8 pertains to information addressees.

LINE 9: When necessary to exempt one or more addressees from a collective address designation appearing in lines 7 or 8, line 9 is utilized. Line 9 consists of the prosign XMT and the designator(s) of commands or activities exempted from the collective address designation.

LINE 10: In tape relay procedure, line 10 (group count) is included only when the text of the message consists of encrypted groups. An accounting symbol is used to indicate financial responsibility only when the message requires commercial refile. (Complete instructions concerning accounting symbols are contained in ACP 127 U.S. SUPP-1.)

LINE 11: The prosign BT appears in line 11. It separates the text from the message heading.

LINE 12: Line 12 is the text of the message. The first word of all plain language text messages must be either the abbreviation UNCLAS, the word CLEAR, or the security classification of the message. The abbreviation UNCLAS indicates that the message is unclassified. CLEAR indicates that the message is classified, but that the originator has authorized its transmission over nonapproved circuits. The abbreviation UNCLAS and the word CLEAR are sent as one word, but a space is transmitted between each letter of the security classification of a classified message. For example, SECRET is sent as S E C R E T.

LINE 13: The prosign BT appears in line 13. It separates the text from the message ending.

LINE 14: Line 14 is not used in tape relay procedure.

LINE 15: Occasionally, an error in the text of a message is undetected until the message is nearly completed. Instead of canceling the transmission (or destroying the tape) and starting the message again, the error is corrected in line 15. The correction consists of the prosign C, followed by the correct version of the error.

The end-of-message functions are a part of line 15. They follow any necessary corrections, and consist of two carriage returns, eight line feeds, the letter N repeated four times, and 12 letters functions. The end-of-message functions must be in the exact order indicated.

## NTX MESSAGE EXAMPLES

The message examples shown in the remainder of this chapter are for illustrative purposes only; they do not necessarily reflect actual routing indicator, call sign, or address group assignments. The format of the examples, however, gives the proper sequence of the message elements and of line functions used. End-of-line and end-of-message functions are in parentheses. The messages are prepared as they would appear when reproduced on a page printer set for single line feed.

### PLAINDRESS MESSAGE

A plaindress message carries the originator and addressee designations in the message heading. The message text may be plain language or encrypted. A group count is not required for plain language, but an encrypted message always carries a numerical group count.

As explained earlier, in line 7 the addressees of NTX messages normally are designated in plain language. Intra-Navy messages, however—those originated by and addressed to commands and activities served entirely by Navy-operated stations—destined for mobile units, such as ships and commands afloat, must indicate the mobile units by their call signs or address groups and by their plain language designations. You must remember that the foregoing method of addressing messages applies only to messages handled within the tape relay system. It does not affect the addressing of messages sent via CW (which are addressed by call signs/address groups), nor those sent via manual RATT (discussed later in this chapter). In addition, the only call signs/address groups authorized for use with their plain language equivalents are those assigned to U. S. Navy, Marine Corps, and Coast Guard units.

#### Single-Address

Following is a plaindress version of a single-address message destined for a mobile unit (ship).

| Format line | | |
|---|---|---|
| | (5 SPACES 2CR LF) | |
| 2 | PP RUHPC | (2CR LF) |
| 3 | DE RUHPB 85 Ø1/Ø841Z | (2CR LF) |
| 4 | ZNR | (2CR LF) |
| 5 | P Ø1Ø837Z | (2CR LF) |
| 6 | FM CINCPACFLT | (2CR LF) |
| 7 | TO RUHPC/NWBJ/USS | (2CR LF) |
| | RENSHAW | (2CR LF) |
| 11 | BT | (2CR LF) |
| 12 | UNCLAS | (2CR LF) |
| | 1. THIS PLAINDRESS | (2CR LF) |
| | SINGLE-ADDRESS MSG IS | (2CR LF) |
| | PREPARED IN FORMAT | (2CR LF) |

| Format line | | |
|---|---|---|
| 12 | UNCLAS (continued) | (2CR LF) |
| | PRESCRIBED FOR INTRA- | (2CR LF) |
| | NAVY MSGS ADDRESSED | (2CR LF) |
| | TO MOBILE UNITS. | (2CR LF) |
| | 2. TRANSMISSION IN- | (2CR LF) |
| | STRUCTIONS ARE UN- | (2CR LF) |
| | NECESSARY BECAUSE | (2CR LF) |
| | DELIVERY RESPONSIBLE | (2CR LF) |
| | IS INDICATED IN ADDRESS | (2CR LF) |
| | OF MSG. | (2CR LF) |
| | 3. NOTE UTILIZATION OF | (2CR LF) |
| | LINE 15 TO CORRECT AN | (2CR LF) |
| | ASSUMED ERROR | (2CR LF) |
| 13 | BT | (2CR LF) |
| 15 | C WA PLAINDRESS | (2CR 8LF) |
| | SINGLE-ADDRESS | (2CR 8LF) |
| | NNNN | (12LTRS) |

Multiple-Address

A multiple-address message intra-Navy form appears in the next example. Plain language address designators are employed because all the addressees are stationary commands, and are a part of the tape relay network.

| Format line | | |
|---|---|---|
| | (5 SPACES 2CR LF) | |
| 2 | RR RUHPB RUHPC RUATA | (2CR LF) |
| | RUWSPG | (2CR LF) |
| 3 | DE RUECW 115A 3Ø15Ø5Z | (2CR LF) |
| 4 | ZNR | (2CR LF) |
| 5 | R 3Ø1455Z | (2CR LF) |
| 6 | FM CNO | (2CR LF) |
| 7 | TO RUHPB/CINCPACFLT | (2CR LF) |
| 8 | INFO RUHPC/ | (2CR LF) |
| | COMHAWSEAFRON | (2CR LF) |
| | RUATA/COMFAIRWESTPAC | (2CR LF) |
| | RUWSPG/ | (2CR LF) |
| | COMWESTSEAFRON | (2CR LF) |
| 11 | BT | (2CR LF) |
| 12 | UNCLAS | (2CR LF) |
| | 1. INCLUSION OF CALL | (2CR LF) |
| | SIGNS/ADDRESS GROUPS | (2CR LF) |
| | IN ADDRESS UNNECES- | (2CR LF) |
| | SARY. ADDEES NOT | (2CR LF) |
| | MOBILE UNITS | (2CR LF) |
| 13 | BT | (2CR 8LF) |
| 15 | NNNN | (12LTRS) |

A message received via CW, R/T, or manual RATT must be prepared in tape relay format before it can be introduced into the tape relay network. This preparation is made by the station introducing the message into the network. (It is called the refile station.)

Assume that a refile station receives an unclassified message via radiotelegraph. Prior to tape preparation, the station must (1) insert routing indicators in format lines 7 and 8, (2) convert the heading to authorized plain language address designators, and (3) retain the call signs/address groups for mobile addressees. These follow the routing indicators and precede the plain language designators.

The following exemplifies a message prepared in tape relay format after it is received by radiotelegraph.

| Format line | | |
|---|---|---|
| | (5 SPACES 2CR LF) | |
| 2 | PP RUCKCF RUCKHC | (2CR LF) |
| | RUEGNE | (2CR LF) |
| 3 | DE RUECC Ø55 Ø9/1542Z | (2CR LF) |
| 4 | ZNR | (2CR LF) |
| 5 | P R Ø91428Z | (2CR LF) |
| 6 | FM USS TUCKER | (2CR LF) |
| 7 | TO RUCKCF/SQBC/ | (2CR LF) |
| | COMDESRON 12 | (2CR LF) |
| 8 | INFO ZEN/COMDESDIV 121 | (2CR LF) |
| | RUCKHC/CINCLANTFLT | (2CR LF) |
| | RUEGNE/COMCRUDESLANT | (2CR LF) |
| | RUCKCF/E5TT/CTF 14Ø | (2CR LF) |
| 11 | BT | (2CR LF) |
| 12 | UNCLAS | (2CR LF) |
| | 1. PLAIN LANGUAGE TEXT. | (2CR LF) |
| | 2. NOTE USE OF ZEN TO | (2CR LF) |
| | INDICATE MSG DLVD BY | (2CR LF) |
| | OTHER MEANS TO COM- | (2CR LF) |
| | DESDIV 121. | (2CR LF) |
| | 3. NOTE USE OF DUAL | (2CR LF) |
| | PRECEDENCE. | (2CR LF) |
| | A. ONLY HIGHER PRE- | (2CR LF) |
| | CEDENCE APPEARS IN | (2CR LF) |
| | ROUTING LINE. BOTH AP- | (2CR LF) |
| | PEAR IN LINE 5 | (2CR LF) |
| 13 | BT | (2CR 8LF) |
| 15 | NNNN | (12LTRS) |

As indicated in the preceding example, RUCKCF has delivery responsibility for two

addressees via fleet broadcast. If the message is transmitted on the RATT broadcast, routing indicators and call signs normally are not removed. But if the message is sent on the CW broadcast, routing indicators and call signs must be removed by RUCKCF. In other words, only the plain language address designators appear in the heading, and these are separated from each other by the separative sign.

## JOINT AND COMBINED FORM

Messages originated by or addressed to activities served by Army or Air Force tape relay networks must be in joint form. If addressees are served by teletypewriter systems belonging to other countries, the message format is called the combined form. The formats of joint and combined forms are exactly alike. These forms differ slightly from the intra-Navy form, however.

In the intra-Navy message form, routing indicators are used in the address of both single- and multiple-address messages to denote delivery responsibility. In the joint and combined forms, routing indicators are used for this purpose only in multiple-address messages. Similarly, call signs and address groups are mixed with plain language to designate addressees of joint and intra-Navy messages. but such mixtures are never permissible in combined form messages. The address must consist of either all plain language designators or all call signs and address groups.

## ABBREVIATED PLAINDRESS

Operational requirements for speed of message handling may sometimes require abbreviations of plaindress message headings. In such instances, any or all of the following elements may be omitted from the message heading: precedence, date, date-time group, and group count.

Most plaindress messages originated within the NTX system omit the group count (format line 10). In this instance, absence of the group count does not, in itself, place the messages in abbreviated plaindress form. (This is an exception to the definition of the abbreviated plaindress form.) Only in encrypted messages are numerical group counts required for messages originated within the NTX system.

Abbreviated plaindress form is employed widely in radiotelephone, radiotelegraph, and manual teletypewriter procedures. It is used rarely, if ever, in tape relay procedure. An abbreviated plaindress message is included in the explanation of manual teletypewriter procedures later in this chapter.

## CODRESS MESSAGES

A codress message is an encrypted message that has the designations of the originator and addressees (and any internal passing instructions) in the encrypted text. Accordingly, the address components (format lines 6, 7, 8, and 9) are omitted. Codress is a valuable security device, because it conceals the identity of units and prevents an enemy from making inferences from originator-addressee patterns.

Transmission instructions are required in the heading of codress messages when the station (or stations) called in line 2 is to deliver or refile the message without decrypting it. If the station is to decrypt the message, as well as refile it, the station's routing indicator must appear following the prosign T in line 4. An example of a codress message follows.

| Format line | | |
|---|---|---|
| | (5 SPACES 2CR LF) | |
| 2 | OO RUCKHCR RUECK | (2CR LF) |
| 3 | DE RUTPC 42C 12/1Ø4ØZ | (2CR LF) |
| 4 | ZNR | (2CR LF) |
| | RUECK T RUECK XYPT | (2CR LF) |
| 5 | O 121Ø37Z | (2CR LF) |
| 10 | GR97 | (2CR LF) |
| 11 | BT | (2CR LF) |
| 12 | (Ninety-seven encrypted | (2CR LF) |
| | groups typed five characters | (2CR LF) |
| | per group and ten groups to | (2CR LF) |
| | a line.) | (2CR LF) |
| 13 | BT | (2CR 8LF) |
| 15 | NNNN | (12LTRS) |

## ROUTING LINE SEGREGATION

The automatic relay system uses a method of routing multiple-call tapes (messages having

two or more routing indicators in the routing line) known as routing line segregation. This means that routing indicators in the routing line are segregated or distributed in accordance with the desired transmission channel in the switching process. Under this method, only the routing indicators applicable to a particular transmission appear in the routing line. Messages received at a station that has further relay responsibility contain only the routing indicators for which that station has relay responsibility.

Routing line segregation does not affect the tape preparation at the originating station; it is accomplished at the relay stations. At the automatic relay stations, the relay equipment segregates the routing indicators automatically according to the required transmission path.

In order to make the semiautomatic relay system compatible with the fully automatic system, relay stations that are not connected directly to the automatic system must also perform routing line segregation on all relayed messages. Semiautomatic relay stations require an operator using special routing segregation equipment to perform the routing line segregation.

Refer again to figure 11-1 to follow the routing line segregation process in the following message example.

Format lines 2 and 3 of a message as prepared by originating station RUQAC and forwarded to RUQA relay Asmara:

PP RUFRC RUCKC RUWSC RUMFC
DE RUQAC 27 21/1234Z
(Etc.)

Station RUQA relay must make two transmissions of this message, one to RUTP, Port Lyautey, and another to RUMF, Philippines.

As relayed to RUTP:

VZCZCQAB137
PP RUFRC RUCKC RUWSC
DE RUQAC 27 21/1234Z
(Etc.)

As relayed to RUMF:

VZCZCQAA1Ø3
PP RUMFC
DE RUQAC 27 21/1234Z
(Etc.)

The next example is how the message is processed by RUTP. Two transmissions are required, one to RUFR, Naples, and the other to RUEC, Washington, for relay to RUCKC and RUWSC. The routing line is altered for the two transmissions as follows:

Transmission to RUFR:

VZCZTPA296QAB137
PP RUFRC
DE RUQAC 27 21/1234Z
(Etc.)

Transmission to RUEC:

VZCZCTPC678QAB137
PP RUCKC RUWSC
DE RUQAC 27 21/1234Z
(Etc.)

Station RUEC is responsible for two transmissions, one to RUCK, Norfolk, the other to RUWS, San Francisco. Each transmission is reduced to a single call in the basic routing line.

As relayed to RUCK:

VZCZCECB311TPC678
PP RUCKC
DE RUQAC 27 21/1234Z
(Etc.)

As relayed to RUWS:

VZCZCECD935TPC678
PP RUWSC
DE RUQAC 27 21/1234Z
(Etc.)

As can be seen from the preceding examples, routing indicators are dropped from the routing line when they have served their purpose. This procedure results in decreased transmission time for onward relay of the message, and the message arrives at each terminal station with only that station's routing indicator in the routing line.

## PUNCTUATION

Message drafters try to word their messages clearly without using punctuation. Occasionally, though, punctuation is essential for clarity. In such instances, punctuation marks (or symbols) are used in preference to spelling out the desired punctuation.

All of the punctuation marks and symbols on U. S. military teletypewriter keyboards are authorized for use in U. S. networks. Only those marks and symbols listed in table 11-2, however, may be used in messages that have other routing indicators besides the United States in format line 2.

Table 11-2.— Punctuation Used in Allied Messages

| Punctuation | Abbreviation | Symbol |
|---|---|---|
| Period | PD | . |
| Hyphen | --- | - |
| Parentheses | PAREN | ( ) |
| Slant sign | SLANT | / |
| Colon | CLN | : |
| Comma | CMM | , |
| Question mark | QUES | ? |
| Quotation marks | QUOTE UNQUOTE | " " |
| Apostrophe | --- | ' |

## TABULATED MESSAGES

The ability to handle information in tabulated form is one of the many advantages of teletypewriter equipment. If a message is received for transmission in tabulated form, it normally should be transmitted in that form. In some instances the headings of the columns require more space than the data in the column. When this happens, use more than one line for the headings. (Compare the form of the headings in the examples of incorrect and correct methods.) Another point: Keep your columns as close as possible to the left margin, to reduce the total transmission time.

In the first example, each dot represents the transmission of a space, which requires as much circuit time as transmitting a character. In the second example (the correct way), the same information is transmitted at a considerable saving of circuit time.

1. Example of incorrect method:

STOCK REPORT AND REQUIREMENTS

ITEM NO CAT QUANTITY ON HAND ARTICLE REQUIRED

1 . . 268423 . . . 1ØØ . . CYL RINGS . . . . . .3ØØ
2 . . 93846 . . . 39 . . MUFFLERS. . . . . 5Ø
3 . . 624364 . . . 28 . . MAGNETOS. . . . . 2Ø
4 . . 34256 . . . 3ØØ . . WRIST PINS . . . . . .3ØØ
5 . . 19432 . . . 14Ø . . VALVES . . . . . .5ØØ
6 . . 43264 . . . 42 . . CARBURETORS. . . . . 5Ø

2. Example of correct method:

STOCK REPORT AND REQUIREMENTS

| ITEM NO | CAT NO | QNTY ON HAND | ARTICLE | REQUIRED |
|---|---|---|---|---|
| 1 | 268423 | 1ØØ | CYL RINGS | 3ØØ |
| 2 | 93846 | 39 | MUFFLERS | 5Ø |
| 3 | 624364 | 28 | MAGNETOS | 2Ø |
| 4 | 34256 | 3ØØ | WRIST PINS | 3ØØ |
| 5 | 19432 | 14Ø | VALVES | 5ØØ |
| 6 | 43264 | 42 | CARBURETORS | 5Ø |

## MULTIPLE-PAGE MESSAGES

Most message centers ashore serve several addressees. To provide the addressees with sufficient copies of each message, the messages are run off on a duplicating machine. Usually, the paper used in duplicating the messages is standard letter-size paper on which approximately 20 lines can be typewritten. To facilitate the duplication process, messages containing more than 12 lines of text are divided into pages by the operator preparing them for transmission.

The first page of a multiple-page message contains the heading and the first 10 lines of text. Each succeeding page contains 20 lines of text, with the exception of the last page, which may have fewer. No more than five pages may be sent in any one transmission.

The second and succeeding pages carry a page identification line above the first line of text. This page identification line gives the page number, the originating station's routing indicator, the station serial number of the message, and, if the text is plain language, the security classification or the abbreviation UNCLAS. Page identification is not included in the group count of those messages for which a group count is required.

In the following example of the proper way to page a message, note that necessary corrections are made at the end of each page, and that the pages are separated from each other by 4LF functions.

(5 SPACES 2CR LF)
RR RUWSPG RUHPB (2CR LF)
DE RUECW 43B Ø81123Z (2CR LF)
ZNR (2CR LF)
R Ø8Ø951Z (2CR LF)

| | |
|---|---|
| FM CNO | (2CR LF) |
| TO RUWSPG/COMWESTSEAFRON | (2CR LF) |
| RUHPB/CINCPACFLT | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS | (2CR LF) |
| (Ten lines of plain language text | (2CR LF) |
| on page.) | (2CR LF) |
| C LINE 6 WA LANDING POINT | (2CR 4LF) |
| | |
| PAGE 2 RUECW 43B UNCLAS | (2CR LF) |
| (Twenty lines of plain language text.) | (2CR 4LF) |
| (Note: Pages 3 and 4 appear as shown for page 2.) | |
| | |
| PAGE 5 RUECW 43B UNCLAS | (2CR LF) |
| (Remaining lines of text.) | (2CR LF) |
| BT | (2CR LF) |
| C PAGE 3 LINE 2 WA BEACH ALL | (2CR 8LF) |
| NNNN | (12LTRS) |

Paging rules do not apply to statistical and meteorological (weather) messages that are intended for processing by computers. Messages of this type that exceed 100 lines, however, are divided into transmission sections, which are discussed in the next topic.

## LONG MESSAGES

Messages that exceed five teletypewriter pages are transmitted in sections. This procedure prevents prolonged circuit tieups that could result in delaying more important traffic. By breaking the longer messages into sections, higher precedence messages can be sent between sections without appreciable delay.

At a convenient point within the limits of five pages, the text of a long message is separated into sections. Normally, the separation is at the end of a sentence or a cryptopart. (Long encrypted messages have cryptoparts.) Each section then is numbered, and the section number is inserted on a separate line at the beginning of the text. If the text is plain language, the section number follows the security classification or the abbreviation UNCLAS. For example, when a message is divided into two sections, the first section is identified as SECTION 1 of 2, and the second as FINAL SECTION OF 2.

In long encrypted messages, when a transmission section commences with a new cryptopart, the designation of the cryptopart follows the designation of the transmission section.

Transmission sections of a long message have exactly the same heading, except that station serial numbers change with section. Each section bears the same date-time group and filing time. A group count, if used, applies only to the section it accompanies. Transmission section and page identifications are not included in the group count. The cryptopart identification is included.

Here is a message handled in two transmission sections:

| | |
|---|---|
| (5 SPACES 2CR LF) | |
| RR RUHPB RUWSPG RUMGB | (2CR LF) |
| DE RUECW 1Ø5A 18/2Ø15Z | (2CR LF) |
| ZNR | (2CR LF) |
| R 181912Z | (2CR LF) |
| FM CNO | (2CR LF) |
| TO RUHPB/CINCPACFLT | (2CR LF) |
| INFO RUWSPG/COMWESTSEAFRON | (2CR LF) |
| RUMGB/COMARIANAS | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS | (2CR LF) |
| SECTION 1 OF 2 | (2CR LF) |
| (Plain language text in- | (2CR LF) |
| cludes 90 teletypewriter lines | (2CR LF) |
| in this section, paged as | (2CR LF) |
| required.) | (2CR LF) |
| BT | (2CR 8LF) |
| NNNN | (12LTRS) |
| | |
| (5 SPACES 2CR LF) | |
| RR RUHPB RUWSPG RUMGB | (2CR LF) |
| DE RUECH 1Ø6A 18/2Ø15Z | (2CR LF) |
| ZNR | (2CR LF) |
| R 181912Z | (2CR LF) |
| FM CNO | (2CR LF) |
| TO RUHPB/CINCPAFLT | (2CR LF) |
| INFO RUWSPG/ | (2CR LF) |
| COMWESTSEAFRON | (2CR LF) |
| RUMGB/COMARIANAS | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS | (2CR LF) |
| FINAL SECTION OF 2 | (2CR LF) |
| (This transmission section con- | (2CR LF) |
| tains the remainder of the text, | (2CR LF) |
| paged as required.) | (2CR LF) |
| BT | (2CR 8LF) |
| NNNN | (12LTRS) |

## CORRECTING ERRORS

Even the best operators sometimes make mistakes. There are definite procedures for correcting mistakes, depending on whether they occur in tape preparation or while you are sending direct from a keyboard.

You learned in chapter 10 how to erase or letter out errors in tape by backspacing and striking the LTRS key as many times as necessary to obliterate the error. This is the method used to correct errors in tape preparation, except when they occur in format lines 1, 2, 3, and 4. Errors in the first four format lines cannot be corrected; you must discard the tape with the error in it and prepare a new one. The main reason for this rule is that even one extra LTRS function in any of the first four format lines results in rejection of the tape at the first automatic relay station.

Another special rule applies to correcting errors in the security classification of a plain language message. When such errors occur, you must backspace and obliterate the entire classification. Then, start anew with the first letter of the classification.

When transmitting from the keyboard, you cannot correct mistakes that occur in the message heading, nor in the security classification when it is the first word of the text. You must cancel the transmission and again send the message from its beginning. To cancel the transmission, send 2CR, 1LF, 1LTRS, and prosigns E E E E E E E E AR, followed by your station's routing indicator and the usual end-of-message functions. In NTX procedure the error prosign is exactly 8 Es—no more, no less—with a space between each E.

To correct a mistake in the text of the message (other than one in the security classification), send 1 LTRS, 8 Es, repeat the last word sent correctly, and continue with the correct version of the text. For example, assume you are transmitting the words IN ACCORDANCE WITH PREVIOUS INSTRUCTIONS and make a mistake in the word "previous." Correct it as follows: IN ACCORDANCE WITH PREVX E E E E E E E E WITH PREVIOUS INSTRUCTIONS. The error prosign is transmitted immediately after the error occurs. Transmission resumes with the last word or group sent correctly.

If the text is transmitted before you discover an error in it, make the correction on the line following the prosign BT. Use of the prosign C for this purpose was shown in earlier message examples. Errors in a multiple-page message, which were not corrected by 8 Es or the lettering-out method, are corrected at the bottom of each page by means of the prosign C. If the error is not noticed before starting another page, the error is corrected at the end of the last page.

## HIGH-PRECEDENCE TAPES

Messages of FLASH precedence are given special handling over NTX circuits. When the tape is prepared at the originating station, the repeated precedence prosign in line 2 is preceded by the bell signal so that succeeding stations have audible warning that a high-precedence message is coming in. Example:

(FIGS)JJJJJSSSSS(LTRS)ZZ RUHPB RUWSC
DE RUATC 58A Ø1/231ØZ
Z Ø12312Z
(Etc.)

Notice that the precedence prosign appears in lines 2 and 4, just as in any other message, but the bell signal is used only in line 2.

In semiautomatic relay stations, high-precedence tapes receive hand-to-hand processing. The receiving operator immediately notifies the supervisor when a high-precedence tape is being received. The supervisor sees that the tape is taken immediately to the proper outgoing circuits and sent out. A receipt must be transmitted to the station from which the message was received, and a receipt obtained from every station to which the message is relayed.

The equipment in automatic relay stations is designed to "recognize" IMMEDIATE as well as FLASH messages. Upon receipt of the repeated prosigns ZZ or OO at the beginning of the routing line, the director component of the switching equipment seeks an immediate connection with the proper outgoing circuits instead of waiting for the four Ns at the end of the message. As a further aid to high-speed relay of high-precedence messages, the busiest circuits usually are provided with an additional receiving unit for use exclusively with high-precedence messages.

The system of station-to-station receipts used by semiautomatic relay stations for FLASH messages is not practical in the fully automatic system because messages enter and leave the relay station unseen and untouched by human operators. For this reason, receipts for FLASH messages are handled as follows:

1. Messages originated and addressed entirely within the automatic relay network require a receipt from the addressee to the originator.

2. Messages originated by a station within the automatic network and addressed to stations outside the automatic network require a receipt from the station transferring the message from the automatic network (called gateway refile station) to the originator. All messages transmitted outside the automatic network must be receipted for, station-to-station.

3. Messages originated outside the automatic network and destined for addresses within the automatic network are receipted for station-to-station from originator to the gateway refile station. No receipt is required of such messages after entry into the automatic relay network, unless an acknowledgment was requested.

## MISSENT AND MISROUTED

Occasionally you will receive a message that was delivered to your office through error. Whenever this happens, remember that every NTX office is responsible for delivering EVERY message received, even though it was transmitted through error.

Messages transmitted through error are classed in two groups: MISSENT and MISROUTED. A missent message has the correct routing indicator, but the relay station transmitted it over the wrong circuit. The message may have carried Asmara's indicator RUQA, for example, but was transmitted over the RUFR circuit to Naples.

Misrouted messages bear the wrong indicators, either through error when assigned by the punching station, from mechanical trouble in the system, or from the tape-cutter's typing mistake.

If you should receive two copies of a multiple-address message, and the second is not marked SUSPECTED DUPLICATE, you must assume that one of the other addresses did not receive his copy. You must notify the relay station from which you received the duplicate message, explaining the situation. The relay station then checks its monitor rolls to make sure that all addressees received a copy of the message in question.

The procedure for forwarding a misrouted message is treated in detail in the discussion of reroute pilot tapes.

## PILOT TAPES

A pilot indicates that, for some reason, a particular message requires special handling over relay circuits. The pilot is considered to be format line 1 of the message. Here are four important types of NTX pilots.

| Pilot | Abbreviation | Associated operating signal |
|---|---|---|
| 1. Subject to correction. | SUBCOR | ZDG |
| 2. Corrected copy. | CORCY | ZEL |
| 3. Suspected duplicate transmission. | SUSDUPE | ZFD |
| 4. Rerouted message. | - - - - | ZOV |

### SUBCOR PILOT

When a relay operator finds a garbled or mutilated tape of PRIORITY or lower precedence, the tape usually is not relayed until a good copy is available. If waiting for a good copy would delay the message unreasonably, or if the message is of higher precedence than PRIORITY, it is forwarded immediately, subject to correction. The station releasing a message subject to correction is responsible for seeing that a good tape is transmitted as soon as possible as a corrected copy.

In the following example, a message from the Far East, addressed to Washington, is received garbled at the primary relay station in Honolulu, and is forwarded SUBCOR.

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| OO RUECN | (2CR LF) |
| ZNR ZDG RUHP | (2CR LF) |
| VV (3 SPACES)MGA19ØVV | (2CR LF) |
| (3 SPACES)ATA1Ø5 | (2CR LF) |
| OO RUECN | (2CR LF) |
| DE RUATH 93 18/19Ø1Z | (2CR LF) |
| ZNR | (2CR LF) |
| O 18191ØZ | (2CR LF) |
| FM COMNAVFORJAPAN | (2CR LF) |
| TO RUECN/DIRNAVSECGRU | (2CR LF) |
| BT | (2CR LF) |
| (Text garbled but still useful.) (Etc.) | (Etc.) |

### CORCY PILOT

When a relay station forwards a SUBCOR message, as in the foregoing example, it is that station's responsibility to obtain a good tape and forward it to the station to which the SUBCOR

was sent. The next example shows the pilot used by RUHP in forwarding the corrected copy of the preceding message.

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| OO RUECN | (2CR LF) |
| ZNR ZEL RUHP | (2CR LF) |
| VV (3 SPACES)MGA19ØVV | (2CR LF) |
| (3 SPACES)ATA1Ø5 | (2CR LF) |
| OO RUECN | (2CR LF) |
| DE RUATH 93 18/19Ø1Z | (2CR LF) |
| ....Etc.... | (Etc.) |

SUSDUPE PILOT

When a station has no conclusive evidence that a tape was transmitted, but suspects that it was, the message is forwarded as a suspected duplicate. In such instances, the station called is responsible for preventing duplicate deliveries to the addressee. Example:

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| PP RULAGB | (2CR LF) |
| ZFD RULA | (2CR LF) |
| PP RULAT RULAC RULAGB | (2CR LF) |
| DE RUECH 48A 11/1158Z | (2CR LF) |
| P 111213Z | (2CR LF) |
| (Etc.) | (Etc.) |

REROUTE PILOT

As you learned in the previous section, a misrouted message bears an incorrect routing indicator. Because a misroute is handled differently, do not confuse this type of message with the missent message, which bears the correct routing indicator but inadvertently is sent to the wrong station. The misrouted message must be forwarded with a pilot, whereas the missent message is forwarded without alteration.

The station detecting a misroute is responsible for taking corrective routing action. (In some instances the station detecting a misroute is a relay station; in others, the tributary station to which the message was misrouted.) Corrective routing action consists of preparing a pilot containing the message precedence (repeated), the correct routing indicator of the station to effect delivery, the operating signals ZNR (when appearing in the original heading) and ZOV (the routing indicator of the station preparing the pilot), and, if required, transmission instructions. Transmission instructions are used only in multiple-addressed messages, and then only when absolutely necessary to effect delivery of the message.

In the following example, assume that relay station RUHP receives a message for further relay, and discovers a misroute in it. An operator at RUHP prepares a reroute pilot tape, prefixes it to the original tape (as received), and relays the message to the correct station.

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| RR RUHPF | (2CR LF) |
| ZNR ZOV RUHP | (2CR LF) |
| VV (3 SPACES)UATØ98 | (2CR LF) |
| RR RUHPB RUHPE | (2CR LF) |
| DE RUATA 43 Ø8/Ø759Z | (2CR LF) |
| ZNR | (2CR LF) |
| R Ø8Ø923Z | (2CR LF) |
| FM NAS ATSUGI | (2CR LF) |
| TO RUHPB/CINCPACFLT | (2CR LF) |
| INFO RUHPE/COMBARPAC | (2CR LF) |
| BT | (2CR LF) |
| (Etc.) | (Etc.) |

After rerouting the message, RUHP transmits a service message to RUATA (station originating the misrouted message), pointing out the incorrect routing and indicating the corrective action taken. This procedure is an important part of the reroute process. It brings the routing error to the attention of the station at fault, and helps prevent future misroutes.

## TWX SYSTEM

The TWX is a commercial teletypewriter system owned and operated by the various telephone companies. Its services are available to anyone on much the same basis as the telephone. Any businessman may have TWX installed in his office. Charges are made as for phone service --so much for the use of the equipment and so much for each call, based on time and distance.

The Navy uses TWX as an extension of the NTX system. The TWX serves outlying stations that do not send or receive enough traffic to warrant the cost of circuits and equipment that would make them a part of NTX.

A message to an activity served by TWX is forwarded over NTX to the station nearest its destination and there is refiled into the TWX network This method results in considerable savings because the long-haul portion of such traffic is then handled over Navy-leased lines and the only extra cost is for the short-distance

transmission from the NTX station. The routing indicator given in ACP 117 for an activity served by TWX is the basic indicator of the relay station or tributary station that will effect transfer of traffic, with the suffix CX added. For instance, the routing indicator for the Naval Propellant Plant at Indian Head, Md. is listed as RUECCX, which indicates that the message would be sent to the TWX section of RUECC COMMCEN in Washington, and there refiled by TWX for delivery to Indian Head. Keep in mind that any time you have a message to an activity whose routing indicator ends in CX, there are commercial charges for final delivery.

When a message is received for TWX refile, the operator finds the TWX number in the directory. When he has the number, he calls the local TWX operator, states the number he wants, and then stands by until he receives a GA (go ahead) from the distant station.

Assume that RUECCX receives a message for refile to the Naval Propellant Plant at Indian Head. This is the way it came in:

| | |
|---|---|
| VZCZCCCB395CDAØ78 | (5 SPACES 2CR LF) |
| RR RUECCX | (2CR LF) |
| DE RUECD 21B 11/1412Z | (2CR LF) |
| ZNR | (2CR LF) |
| R 111533Z | (2CR LF) |
| FM BUWEPS | (2CR LF) |
| TO RUECCX/NPP INDIAN HEAD | (2CR LF) |
| NAVY | (2CR LF) |
| BT | (2CR LF) |
| (Etc.) | (Etc.) |

In the following procedure for delivery by TWX, the TWX operator answers as soon as the RUECC operator turns on his machine. Example:

| Transmission | Explanation |
|---|---|
| GA PLS | TWX operator answers "Go ahead, please." |
| INDIAN HEAD MD 241 | RUECC operator gives number he wants. |
| MIN PLS | TWX operator says "Stand by a minute please," then makes the circuit connection. |
| INDIAN HEAD | TWX operator calls Naval Propellant Plant, Indian Head, Md. |
| GA PLS | Naval Propellant Plant, Indian Head, answers. (At this point, the TWX switchboard operator drops off line.) |
| RUECC 3, etc. | RUECC transmits message. |
| END (bell signal) | Sent by RUECC operator at end of message or end of last message, if more than one is transmitted. |
| R NR3 | Operator at Indian Head receipts for message. Both the RUECC and Indian Head operators turn off machines, and the TWX operator disconnects circuit. |

## COMMERCIAL MESSAGES VIA NTX

Official messages to commercial activities are sent over NTX circuits to the message center nearest the addressee. If the message center is near enough, delivery may be made by telephone or by other appropriate means. Otherwise, it must be given to a commercial communication company for final delivery.

Here are two messages addressed to commercial activities. The first message has two commercial addressees; the second has one naval addressee and one commercial addressee. Note that the form is the same for both messages. An accounting symbol is always required in format line 10. Example 1:

| | |
|---|---|
| VZCACCDA198 | (5 SPACES 2CR LF) |
| RR RUEGCU | (2CR LF) |
| DE RUECD 43A 26/1Ø15Z | (2CR LF) |
| ZNR | (2CR LF) |
| R 261235Z | (2CR LF) |
| FM BUSHIPS | (2CR LF) |
| TO RUEGCU/TELETYPE CORP | (2CR LF) |
| 41ØØ FULLERTON | (2CR LF) |
| AVE CHGO | (2CR LF) |
| RUEGCU/COLLINS RADIO CO | (2CR LF) |
| CEDAR RAPIDS IOWA | (2CR LF) |
| NAVY | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS | (2CR LF) |
| THIS IS AN EXAMPLE OF A | (2CR LF) |
| MULTIPLE ADDRESS MSG | (2CR LF) |
| FOR COMMERCIAL ADDEES | (2CR LF) |
| ONLY CMM ROUTED TO | (2CR LF) |
| AUTHORIZED REFILE POINT | (2CR LF) |
| NEAREST ADDEES | (2CR LF) |
| BT | (2CR 8LF) |
| NNNN | (12 LTRS) |

Example 2:

VZCZCCDB312 (5 SPACES 2CR LF)
RR RUCKDY RUWPLC (2CR LF)
DE RUECD 296B 27/1759Z (2CR LF)
ZNR (2CR LF)
R 272331Z (2CR LF)
FM BUWEPS (2CR LF)
TO RUCKDY/NAVSHIPYD NORVA (2CR LF)
RUWPLC/CONSOLIDATED (2CR LF)
VULTEE ACFT (2CR LF)
CORP POMONA (2CR LF)
NAVY (2CR LF)
BT (2CR LF)
UNCLAS (2CR LF)
THIS IS AN EXAMPLE OF A (2CR LF)
MULTIPLE ADDRESS MSG (2CR LF)
FOR A NAVAL AND A (2CR LF)
COMMERCIAL ADDEE, ROUTED (2CR LF)
BY NTX FOR DELIVERY TO (2CR LF)
NAVAL ADDEE AND TO NEAREST (2CR LF)
POINT OF COMMERCIAL (2CR LF)
REFILE FOR DELIVERY TO (2CR LF)
COMMERCIAL ADDEE (2CR LF)
BT (2CR 8LF)
NNNN (12 LTRS)

## CLASS E NTX MESSAGES

Class E messages originated by ships were discussed in chapter 6. The class E privilege also is extended to personnel at all overseas naval stations served by naval communications. Such messages are handled as plaindress, single-address messages to points of refile in the continental United States. Although many shore stations on both coasts are authorized to refile class E messages from ships at sea, those originating at overseas shore stations are refiled at the circuit entry points at Washington and San Francisco. Following is an example of a class E message in NTX form.

(TI) (5 SPACES 2CR LF)
RR RUECC (2CR LF)
DE RULAC 125A 14/Ø913Z (2CR LF)
ZNR (2CR LF)
R 141227Z (2CR LF)
FM NAVCOMMSTA SAN JUAN (2CR LF)
TO RUECC/NAVCOMMSTA WASHDC (2CR LF)
BT (2CR LF)
MSG CK18 COMLE JOHN D (2CR LF)
NICHOLAS 33Ø8 (2CR LF)
SENATOR AVE SE DISTRICT (2CR LF)
HEIGHTS MD (2CR LF)
JOYCE AND KIDS ARRIVING (2CR LF)
IDLEWILD 123Ø AM (2CR LF)
OCT 15 PAA FLT 2Ø6 MEET IF (2CR LF)
POSSIBLE (2CR LF)
MARK VECELLIO NAVCOMMSTA (2CR LF)
SAN JUAN (2CR LF)
BT (2CR 8LF)
NNNN (12 LTRS)

## READDRESSING

The procedure for readdressing NTX messages is the same as for readdressing radiotelegraph messages. That is, all procedure lines preceding line 5 (preamble) of the original heading and deleted, and a supplementary heading is inserted in front of the original preamble. The supplementary heading is separated from the remaining portion of the original heading by a line feed function.

Assume that on receipt of this message, COMFIVE wishes to readdress it for INFO to NTC Bainbridge, Md.

(TI) (5 SPACES 2CR LF)
PP RUECW RUCKC RUWSPG (2CR LF)
DE RUHPB 123C 15/Ø821Z (2CR LF)
ZNR (2CR LF)
P 15Ø911Z (2CR LF)
FM CINCPACFLT (2CR LF)
TO RUECW/CNO (2CR LF)
RUCKC/COMFIVE (2CR LF)
RUWSPG/COMWESTSEAFRON (2CR LF)
BT (2CR LF)
UNCLAS (2CR LF)
(Plain language text.) (2CR LF)
BT (2CR 8LF)
NNNN (12 LTRS)

The next example is the message as readdressed. Notice that COMFIVE has changed the precedence in the supplementary heading. Selection of the precedence and the decision whether the message is to be readdressed for action or information are responsibilities of the readdressing activity. The original message is unchanged past line 4.

(TI) (5 SPACES 2CR LF)
RR RUECTAJ (2CR LF)
DE RUCKC 34 15/1334Z (2CR LF)
ZNR (2CR LF)
R 151452Z (2CR LF)
FM COMFIVE (2CR LF)

| | |
|---|---|
| INFO RUECTAJ/NTC BAIN | (2CR LF) |
| P 15Ø911Z | (2CR LF) |
| FM CINCPACFLT | (2CR LF) |
| TO RUECW/CNO | (2CR LF) |
| RUCKC/COMFIVE | (2CR LF) |
| RUWSPG/COMWESTSEAFRON | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS | (2CR LF) |
| (Plain language text.) | (2CR LF) |
| BT | (2CR 8LF) |
| NNNN | (12 LTRS) |

## SERVICE MESSAGES

Service messages are short, concise messages between communication personnel used to expedite the handling of messages. Usually, service messages concern transmissions originated at, addressed to, or refiled by a station, although they may pertain to any phase of traffic handling, communication facilities, or circuit condition.

Plain language service messages are prepared in abbreviated plaindress format. The degree of abbreviation depends upon whether the service messages must be relayed. If two stations are directly connected, service messages consist of only format lines 1, 2, 3 (less station serial number), 4 (when required), and 12. Service messages requiring relay contain all format lines except lines 5, 6, and 10. Lines 7 and 8 are used only when it is necessary to show action and information addressees, at which time addressees are designated by routing indicators. Service messages requiring commercial refile must show the complete address, including accounting data in format line 10.

The text of all service messages begins with the security classification or the abbreviation UNCLAS. Then follows the abbreviation SVC, which, in turn, may be followed by a reference number. When reference numbers are used, they are assigned consecutively on a monthly basis, commencing with the first and ending on the last calendar day of each month. This numbering method provides an additional means of referring to a particular service message.

Following is an example of an abbreviated service message between directly connected relay stations, requesting retransmission of a garbled tape.

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| RR RUEP | (2CR LF) |
| DE RUCA Ø2/1421Z | (2CR LF) |
| ZNR | (2CR LF) |
| UNCLAS SVC EUC128 RPT | (2CR 8LF) |
| EUC 128 ZES2 | (2CR 8LF) |
| NNNN | (12 LTRS) |

A normal, single-address service message between tributary stations in the continental United States (CONUS) is shown in the next example. (In the CONUS, a tributary station receiving a garbled message requests retransmission (rerun) from the station originating the message. Outside the CONUS, a tributary station receiving a garbled message from a relay station requests retransmission from the relay station.)

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| RR RUEPDA | (2CR LF) |
| DE RUEPPD 29 Ø7/Ø643Z | (2CR LF) |
| ZNR | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS SVC RUEPDA 15A | (2CR LF) |
| Ø7/Ø5Ø5Z Ø7Ø445Z | (2CR LF) |
| ZES2 | (2CR LF) |
| BT | (2CR 8LF) |
| NNNN | (12 LTRS) |

## TEST TAPES

Standard test tapes are utilized for testing circuit operation. The test tapes themselves must be letter perfect to prevent misleading the receiving operator at the distant station. You should prepare test tapes ahead of time and keep them available near the operating position for use when needed. Accurate reception of the tests indicates that the circuit and the equipment at both terminals are operating satisfactorily.

Test tapes are transmitted on a circuit or channel that has just been opened, but before transmission of traffic. In the following examples, a channel is opened between RUEPW and RUEPWN.

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| RR RUEPW | (2CR LF) |
| DE RUEPWN | (2CR LF) |
| ZNR | (2CR LF) |
| TEST THE QUICK BROWN FOX | (2CR LF) |
| JUMPS OVER THE LAZY DOG | (2CR LF) |

1234567890 RYRYRYRYRYRYRYRY (2CR LF)
RYRYRYRYRYRYRYRYRYRYR (2CR LF)
INT ZBZ K (2CR 8LF)
NNNN (12 LTRS)

When the operator at RUEPW determines that the test message is satisfactory, he transmits:

(TI) (5 SPACES 2CR LF)
RR RUEPWN (2CR LF)
DE RUEPW Ø8/1245Z (2CR LF)
ZNR (2CR LF)
ZBZ5 K (2CR 8LF)
NNNN (12 LTRS)

After a circuit or channel is opened for traffic, it becomes necessary, sometimes, to interrupt traffic and send a test because of poor readability. In such instances, the test tape is constructed as follows:

(Sufficient LTRS to permit splicing tape into a continuous loop.)
(5 SPACES 2CR LF)
THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG
1234567890 TEST DE RUHPC (2CR)
THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG
1234567890 TEST DE RUHPC (2CR LF)
RYRYRYRYRYRYRYRYRYRYRYRY
RYRYRYRYRYRYRYRYRYR
RYRYRYRYRYRYRYRYRYRYRYRY (2CR LF)
(Sufficient LTRS to permit splicing tape into a continuous loop.)

## ENSURING CONTINUITY OF TRAFFIC

Except for FLASH messages, station-to-station receipts are not employed in the tape relay system. The responsibility for continuity of received messages rests with the station receiving the traffic. The receiving station ensures that a tape is received under each channel number and that numbers are not duplicated or omitted.

When no transmission is received over a circuit or channel for a period of 30 minutes (this interval may be increased to 60 minutes at the discretion of the relay station on channels to its tributaries), the receiving station originates a service message (called a channel check) to the transmitting station. The channel check is assigned a precedence of IMMEDIATE, and is in the following form:

(TI) (5 SPACES 2CR LF)
OO RUHPB (2CR LF)
DE RUHPC Ø3/16Ø5Z (2CR LF)
ZNR (2CR LF)
UNCLAS SVC ZID PBA113 (2CR 8LF)
NNNN (12 LTRS)

(The channel number following the operating signal ZID indicates the channel number of the last message received from RUHPB on that channel.)

Station RUHPB checks the channel number of the last message transmitted to RUHPC on the channel indicated, and, if it agrees with the number in the channel check, RUHPB transmits:

(TI) (5 SPACES 2CR LF)
OO RUHPC (2CR LF)
DE RUHPB Ø3/16Ø7Z (2CR LF)
ZNR (2CR LF)
UNCLAS SVC SIC PBA113 (2CR 8LF)
NNNN (12 LTRS)

If the message reported as last received does not correspond to that sent last, RUHPB takes whatever action is necessary to establish contact with RUHPC, and retransmits the missing message(s).

At tributary stations, if no traffic is received for a period of 30 minutes (or 60 minutes if so directed), the tributary originates and transmits a channel check addressed to its own station. The following example is such a channel check.

(TI) (5 SPACES 2CR LF)
OO RUHPB (2CR LF)
DE RUHPB (2CR LF)
ZNR (2CR LF)
UNCLAS SVC CHANNEL CHECK (2CR LF)
RYRYRYRY (2CR LF)
ABCDEFGHIJKLMNOPQRSTUV (2CR 8LF)
WXYZ 1234567890 (2CR 8LF)
NNNN (12 LTRS)

The preceding message, routed in its own station, indicates to the tributary a satisfactory circuit condition if it is received promptly from the relay station and the channel number agrees with the received message log. If it is not returned over the receive channel within a

reasonable length of time, then circuit trouble should be suspected, and the condition of the circuit should be investigated by maintenance personnel.

## CHANGING CHANNEL NUMBER SEQUENCE

Channel number sequences are changed as near to 0001Z daily as practicable. Because of having many circuits on which the numbers must be changed, relay stations usually commence resetting their outgoing channel numbers to 001 at approximately 2330Z daily.

Upon receipt of channel number 001 from the relay station, tributary stations reset their numbers to 001. Then they originate a service message to the relay station, stating the last number received for that day and listing any messages awaiting rerun. This service message is sent under channel number 001 for the new day.

In the following example, station RUECD sends the final number comparison for the old day and informs RUEC that retransmission of a message still is pending.

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| RR RUEC | (2CR LF) |
| DE RUECD 12/ØØØ2Z | (2CR LF) |
| ZNR | (2CR LF) |
| UNCLAS SVC ZID ECA164 | (2CR LF) |
| AWAITING ZDK ECA137 | (2CR 8LF) |
| NNNN | (12 LTRS) |

The same procedure is observed on circuits between relay stations, except that on multichannel circuits one service message usually suffices for reporting all circuits. Example:

| | |
|---|---|
| (TI) (5 SPACES 2CR LF) | |
| RR RUEC | (2CR LF) |
| DE RUWS 12/ØØØ2Z | (2CR LF) |
| ZNR | (2CR LF) |
| UNCLAS SVC ZID ECA558 | (2CR LF) |
| ECB62Ø ECC459 ECD7ØØ | (2CR 8LF) |
| NNNN | (12 LTRS) |

## TRACER PROCEEDINGS

Naval communications prides itself on reliability, but no communication system is absolutely perfect. For this reason there must be some provision for tracing messages that are lost or meet unreasonable delay. Tracers answer three questions: Was the message actually lost? Who lost it? Why was it lost?

Tracers are sent to protect the dependability of communications—not to serve as a basis for disciplinary action. They warn the station at fault that its internal message-handling procedures may need reexamination.

Tracing a message is nothing more than checking from station to station to find where the failure occurred. The proceedings leading to transmission of a service message tracer differ, however, depending upon whether the message in question is a nondelivery, a suspected nondelivery, or an excessively delayed delivery. Detailed procedures for each of these circumstances are prescribed in the effective edition of ACP 127.

For purposes of our discussion of tracer proceedings, assume that a known (not suspected) nondelivery occurs. In such instances, tracer proceedings start with the originator of the message, either on his own initiative or at the request of the addressee who did not receive the message.

The first step the originator takes is either to cancel or retransmit the original message to the addressee not receiving it. If the message is retransmitted, the operating signal ZFG is transmitted immediately following the DTG in the original message heading. (Operating signal ZFG means "This message is an exact duplicate of a message previously transmitted.")

After retransmitting the message, a service message tracer is drafted and sent to the first relay station concerned with the original message. The relay station, after assuring that the message was not mishandled at that station, forwards the tracer to the next relay station for action, and to the originating station for information. This procedure continues on a station-to-station basis until the cause for the lost message is determined and reported to the originating station.

To illustrate a message being traced from originator to addressee, assume a message originated by RUEAHQ was lost en route to the addressee at RUFPBW. After retransmitting the original message to RUFPBW as an exact duplicate, RUEAHQ originates and transmits the following tracer to the service desk of the first relay station handling the original message.

(TI) (5 SPACES 2CR LF)
RR RUEASU (2CR LF)
DE RUEAHZ 25A 25/15ØØZ (2CR LF)
ZNR (2CR LF)
UNCLAS SVC RUEAHQ 1Ø4C (2CR LF)
24/Ø8ØØZ 24Ø75ØZ (2CR LF)
ZDE2 RUFPBW/HQ USAFE (2CR LF)
ZDQ RUEA HQB115 (2CR LF)
24Ø9ØØZ (2CR 8LF)
NNNN (12 LTRS)

(The meaning of the operating signals used in the text of the tracer are: ZDE2—Message___ undelivered. Advise disposition. ZDQ—Message___was relayed to___by___at___.)

On receipt of the tracer, RUEASU checks its handling of the original message and finds that the message was forwarded to RUFP. Tracer action continues with RUEASU sending the following to RUFPSU (service desk of relay station RUFP) and RUEAHQ.

(TI) (5 SPACES 2CR LF)
RR RUFPSU RUEAHQ (2CR LF)
DE RUEASU 75A 25/1625Z (2CR LF)
ZNR (2CR LF)
TO RUFPSU (2CR LF)
INFO RUEAHQ (2CR LF)
BT (2CR LF)
UNCLAS SVC RUEAHQ 104C (2CR LF)
24/Ø8ØØZ 24Ø75ØZ (2CR LF)
ZDE2 RUFPBW/HQ USAFE ZDQ (2CR LF)
RUFP JNB185 (2CR LF)
24Ø955Z (2CR LF)
BT (2CR 8LF)
NNNN (12 LTRS)

On receipt of the foregoing tracer, RUFPSU checks its station monitors and finds that the questioned message was sent to RUFPBW for delivery to the addressee. Accordingly, RUFPSU sends this tracer:

(TI) (5 SPACES 2CR LF)
RR RUFPBW RUEAHQ (2CR LF)
DE RUFPSU 1Ø9 25/17Ø5Z (2CR LF)
ZNR (2CR LF)
TO RUFPBW (2CR LF)
INFO RUEAHQ (2CR LF)
BT (2CR LF)
UNCLAS SVC RUEAHQ 1Ø4C (2CR LF)
24/Ø8ØØZ 24Ø75ØZ (2CR LF)
ZDE2 RUFPBW/HQ USAFE ZDQ (2CR LF)
RUFPBW BWA234 (2CR LF)
241ØØØZ (2CR LF)
BT (2CR 8LF)
NNNN (12 LTRS)

As seen in the preceding examples, the original message was traced from the originating station to the station serving the addressee. After a thorough search of its files and records, RUFPBW discovers that the original transmission of the questioned message was received garbled and was filed without a good copy being obtained. That station must accept responsibility for the nondelivery. It does so in the following report to the originator of the message.

(TI) (5 SPACES 2CR LF)
RR RUEAHQ RUFPSU (2CR LF)
DE RUFPBW 223B 25/1915Z (2CR LF)
ZNR (2CR LF)
TO RUEAHQ (2CR LF)
INFO RUFPSU (2CR LF)
BT (2CR LF)
UNCLAS SVC ZUI RUEAHQ (2CR LF)
1Ø4C 24/Ø8ØØZ (2CR LF)
24Ø75ØZ ZDE2 RUFPBW/HQ (2CR LF)
USAFE RECEIVED (2CR LF)
ABK2. THISTA FAILED TO (2CR LF)
INITIATE ZDK (2CR LF)
REQUEST. CORRECTIVE ACTION (2CR LF)
TAKEN (2CR LF)
BT (2CR 8LF)
NNNN (12 LTRS)

## MANUAL TELETYPEWRITER PROCEDURE

Manual teletypewriter procedure is used on teletypewriter circuits that are not part of the tape relay network--on ship-ship and ship-shore RATT circuits, for example. The procedure, contained in the effective edition of ACP 126, presents little difficulty for the operator versed in radiotelegraph procedure. The two are closely related, and the message formats are essentially the same. Because of this similarity, the message format for manual teletypewriter messages is not given here.

The rules concerning calling and answering, repetitions, corrections, use of ending prosigns, and the like, in manual teletypewriter procedure are the same as in radiotelegraph procedure.

## MANUAL TELETYPEWRITER MESSAGES

In the ensuing message examples, you will see the similarities of the manual teletypewriter procedure in both radiotelegraph and tape relay procedures. As in all message examples throughout this text, format lines not needed for the message are omitted. End-of-line and end-of-message machine functions are indicated in parentheses. (As necessary, refer to the format in table 5-5, chapter 5, to follow the examples.)

Here is a plaindress, single-address message originated by USS Epperson and addressed to USS Renshaw. The originator and the addressee are in direct communication, and the call serves as the address. A preliminary call is made before transmitting the message.

| | |
|---|---|
| (5 SPACES 2CR LF) | |
| NWBJ DE NTGT K | (2CR LF) |
| (5 SPACES 2CR LF) | |
| NTGT DE NWBJ K | (2CR 8LF) |
| (5 SPACES 2CR LF) | |
| NWBJ DE NTGT | (2CR LF) |
| R 272113Z | (2CR LF) |
| GR3Ø | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS | (2CR LF) |
| 1. EXCEPT FOR ABSENCE | (2CR LF) |
| OF SEPARATIVE SIGNS | (2CR LF) |
| IN HEADING, FORMAT OF | (2CR LF) |
| MSG IS IDENTICAL TO | (2CR LF) |
| RADIOTELEGRAPH | (2CR LF) |
| 2. NOTICE THAT END-OF- | (2CR LF) |
| MESSAGE FUNCTIONS ARE | (2CR LF) |
| THE SAME AS IN TAPE | (2CR LF) |
| RELAY PROCEDURE | (2CR LF) |
| BT | (2CR LF) |
| K | (2CR 8LF) |
| NNNN | (12 LTRS) |

Our next example is of a plaindress, multiple-address message. The originator is not in direct communication with the addressees, and sends the message to NAVCOMMSTA Guam for relay. Assume that communications are established by an exchange of calls (as in the preceding example).

| | |
|---|---|
| (5 SPACES 2CR LF) | |
| NPN DE NWBJ | (2CR LF) |
| T | (2CR LF) |
| P Ø51921Z | (2CR LF) |
| FM USS RENSHAW | (2CR LF) |
| TO COMDESDIV 252 | (2CR LF) |
| INFO COMDESRON 25 | (2CR LF) |
| COMDESFLOT 5 | (2CR LF) |
| GR29 | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS | (2CR LF) |
| 1. IF NOT MEMBERS OF TAPE | (2CR LF) |
| RELAY SYSTEM, MOBILE UNITS | (2CR LF) |
| TRANSMITTING UNCLAS MSGS TO | (2CR LF) |
| SHORE STATIONS VIA RATT MUST | (2CR LF) |
| USE PLAIN LANGUAGE DESIGNAT- | (2CR LF) |
| TORS IN ADDRESS OF SUCH MSGS | (2CR LF) |
| BT | (2CR LF) |
| K | (2CR 8LF) |
| NNNN | (12 LTRS) |

The following exemplifies an abbreviated plaindress message, with the call serving as the address.

| | |
|---|---|
| (5 SPACES 2CR LF) | |
| NLNB DE NREB | (2CR LF) |
| P | (2CR LF) |
| BT | (2CR LF) |
| UNCLAS | (2CR LF) |
| 1. THE DATE AND GROUP COUNT | (2CR LF) |
| ARE OMITTED FROM THIS MSG. | (2CR LF) |
| OTHER ELEMENTS THAT COULD | (2CR LF) |
| BE OMITTED AT THE DISCRETION | (2CR LF) |
| OF THE ORIG ARE PRECEDENCE | (2CR LF) |
| AND TIME GROUP IN MSG ENDING | (2CR LF) |
| BT | (2CR LF) |
| 1421Z | (2CR LF) |
| K | (2CR 8LF) |
| NNNN | (12 LTRS) |

A radioteletypewriter message prepared in codress form is shown in the next example. The called station, NAVCOMMSTA Honolulu, must decrypt and deliver the message to certain local activities named in the encrypted text. The originator uses an indefinite call.

| | |
|---|---|
| (5 SPACES 2CR LF) | |
| NPM DE NA | (2CR LF) |
| R 2718Ø5Z | (2CR LF) |
| GR46 | (2CR LF) |
| BT | (2CR LF) |
| ENCRYPTED GROUPS | (2CR LF) |
| BT | (2CR LF) |
| C 12 XYTOP | (2CR LF) |
| K | (2CR 8LF) |
| NNNN | (12 LTRS) |

## TOUCH TELETYPEWRITING TEST

Before you can be recommended to take the fleet servicewide examination for advancement ot either RM3 or RM2, you must demonstrate your ability as a teletypist by satisfactorily passing a performance test in touch teletypewriting. This performance test is not a part of the competitive examination. It is administered by your local examining board at least once each quarter, or four times a year. You cannot compete in the servicewide examinations without first passing the performance test and meeting all the other requirements listed in the front of this Navy Training Course.

The teletypewriting test for advancement to RM3 consists of three messages, totaling approximately 600 characters, which must be transmitted in 9 minutes. For RM2, four messages, totaling 750 characters, must be sent in 9 minutes. Some of the message texts are plain language, others are composed of five-character groups of random mixed letters, or random mixed numerals. The headings contain about 30 percent and the texts about 70 percent of the total number of characters. Only in the event a teletypewriter is unavailable will the examining board let you use a telegraphic typewriter for the typing test.

The time limits for the test include servicing each message by endorsing the time of transmission, the circuit used, and your personal sign. Servicing should not require much time, but be sure to include time for servicing in your practice runs.

Transmission of the touch teletypewriting test must be by direct keyboard method; you are not permitted to cut a tape. A total of five errors (uncorrected or omitted characters) is permitted in the official test. If an error is corrected properly and according to the correct procedure, it does not count as an error. Thus, there is no limit to the number of corrected errors you may have. But correcting errors takes time and, on examination, if you must stop to correct too many errors, you may disqualify yourself by failing to finish within the time limits.

Immediately before the official test you will be given a practice test consisting of messages that are different from the official test, though similar in number, length, and general content. The results of the practice test do not affect the score of the official test, but if you try your best on the practice test, it will help you overcome nervousness, and you will be better able to adjust your typing speed within the time limits on the official test.

Be sure to practice your teletypewriting in preparation for the performance test. Strive to improve both your accuracy and your speed. Remember that you may not be able to do your normal best typing on the day of the test. The examining board may hold the test in surroundings unfamiliar to you; besides, most persons are victims of nervousness on examination day. It is well, therefore, to have sufficient speed and accuracy to provide a little "margin" for overcoming your nervousness in unfamiliar surroundings.