FM 24-14

WAR DEPARTMENT FIELD MANUAL

TELETYPEWRITER SWITCHING AND RELAY PROCEDURE

WAR DEPARTMENT · 19 SEPTEMBER 1944

FM 24-14
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[AG 300.7 (11 Dec 44)]
BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:
J. A. ULIO
Major General
The Adjutant General

G. C. MARSHALL
Chief of Staff

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For explanation of symbols, see FM 21-6.

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CHANGES No. 1

WAR DEPARTMENT,
Washington 25, D. C., 22 December 1944.

FM 24-14, 19 September 1944, is changed as follows:

In the interests of eliminating unnecessary operations by a teletypewriter operator, it was decided to omit the transmission of superfluous characters when handling traffic. When a group count is used, the operator, at the appropriate place in the transmission, follows the last character transmitted with LINE FEED *without* CARRIAGE RETURN and then transmits the group count. This is not clearly indicated in the examples in paragraph 5a to g inclusive, and paragraph 8a to c, inclusive. Make the necessary changes in each of these paragraphs to correctly position the group count under the column headed *Line of typed copy*. Corrected examples should comply with the sample below:

Action of station and switchboard operators	Line of typed copy
* * *	* * *
	11. TO CRXD
12. Operator sends line feed without carriage return …	**12. GR5 BT**
	13.
	14.
* * *	* * *

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WAR DEPARTMENT,
WASHINGTON 25, D. C., *19 SEPTEMBER 1944.*

FM 24-14, Teletypewriter Switching and Relay Procedures, is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:
J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION:

As prescribed in paragraph 9a, FM 21-6.

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IC 11: T/O & E 11-7; 11-16; 11-18; 11-57; 11-77; 11-96; 11-97; 11-217; 11-237; 11-247; 11-257; 11-287; 11-460-1S; 11-510; 11-400, Sig AW Org, Sig Wire Opn Co.

IC 44: T/O & E 44-1-3S; 44-316.

For explanation of symbols, see FM 21-6.

CONTENTS

	Paragraph	Page
SECTION I. General.		
Purpose and scope	1	1
Definitions	2	1
II. Manual Switching Procedure.		
Station procedure in switched systems	3	3
Switching central procedure	4	4
Examples of complete transmission in a switched network	5	7
III. Manual Tape Relay Procedure.		
General	6	21
Relay through teletypewriter reperforator centrals	7	21
Example of a message relayed through a reperforator central	8	21

SECTION I

GENERAL

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1. PURPOSE AND SCOPE. a. The procedure contained in this manual is prescribed for—

(1) Establishment, control, and termination of teletypewriter connections involving one or more teletypewriter manual switching centrals such as Telegraph Central Office Sets TC-3.

(2) Relaying of teletypewriter messages through teletypewriter reperforator centrals, except those centrals using semiautomatic relay equipment.

b. This procedure is based on and is for use in connection with FM 24-8. This procedure is not approved for joint U. S. Army-Navy or combined communications, however, since it is intended only for use within the United States Army.

c. This manual does not deal with the relay of messages through teletypewriter manual relay centrals, which is covered in FM 24-8.

2. DEFINITIONS. a. Teletypewriter directory. A list of teletypewriter stations which can be reached by all stations on the teletypewriter network. The directory is used by teletypewriter station and switchboard operators, message center clerks, and others desiring to send messages via the teletypewriter system. The directory also may include a section listing the stations in order of call signs.

b. Teletypewriter traffic diagram. A diagram of tele-

typewriter trunks between centrals and locals terminating at centrals. The diagram is used by teletypewriter central operators in making connections and routing messages for relay. Routing sheets or traffic routing charts may be used instead of traffic diagrams. All trunks and locals terminating in the various centrals will be listed on the routing sheets or traffic routing charts.

c. Teletypewriter manual relay central. A teletypewriter installation set up especially for the relay of messages by retyping from received messages.

d. Teletypewriter manual switching central. An installation for manually connecting teletypewriter trunks and locals.

e. Teletypewriter reperforator central. A teletypewriter installation of one or more reperforators and transmitter-distributors set up especially for the relay of messages by perforated tape. Installations using *manual tape-relay* normally terminate each incoming channel in a teletypewriter. When required for the relay messages, a reperforator may be connected readily to any channel for the reception of signals on a perforated tape. A transmitter-distributor may be similarly connected for transmission of signals from a perforated tape. Installations using *semiautomatic relay* normally terminate each incoming and each outgoing channel with a reperforator and a transmitter-distributor, respectively.

SECTION II

MANUAL SWITCHING PROCEDURE

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3. STATION PROCEDURE IN SWITCHED SYSTEMS. a. Placing calls. (1) Station operator signals the switchboard operator with a 2-second break signal.

(2) When an answer is received from the switchboard operator (par. 4b), the station operator sends a preliminary call, known as *calling instructions*, to indicate the station(s) to which he desires to be connected. The calling instructions consist of the call signs of desired station(s) (selected from the teletypewriter directory), the prosign V, the call sign of the station placing the call, the precedence (if P or higher), and the prosign K.

(3) After the switchboard operator has completed the connection(s), repeated the calling instructions to the desired station(s), and received answers from the desired station(s), transmission of traffic is started.

b. Answering calls. A station operator, who has been called by a preliminary call (calling instructions) containing the station call sign, answers with the called station's call sign followed by the prosign K. Station operators answer in turn if other stations are called by the same preliminary call (art. 82b, FM 24-8).

c. Transmission of traffic. When a connection is complete, traffic is transmitted in the same manner as in equivalent unswitched nets. The procedure for transmission is given in chapters I through IX, FM 24-8. Transmission should be interrupted only by sending repeated space-bar signals, however, since the use of a

break signal would recall the switchboard operator(s).

d. Recalling switchboard operator. During a connection, the switchboard operator(s) can be recalled with a 2-second break signal. When an answer is received from the switchboard operator(s) the recalling station operator sends instructions in regard to the connection.

e. Disconnection. When transmission is completed (art. 89c (ii), FM 24-8), the station placing the call recalls the switchboard operator(s) with a 2-second break signal. After the switchboard operator answers, the recalling station sends the prosign AR as a clearing signal to the first switchboard operator to answer. The switchboard operator(s) then terminates the connection by disconnecting the patch cords.

f. Party line. The procedure outlined in a to d above is equally applicable to all stations connected to a switchboard by the same circuit (party line station).

g. Incomplete connection. When the switchboard operator informs the station operator placing the call that a connection cannot be completed because station(s) are already engaged, or for other reasons, the station operator placing the call sends the switchboard operator appropriate instructions.

4. SWITCHING CENTRAL PROCEDURE. a. General Connecting procedure. The switchboard operator—

(1) Receives signal (lighted lamp) from station placing call.

(2) Answers with switchboard call sign and prosign K (b below).

(3) Receives calling instructions from station placing call (par. 3a (2)).

(4) Makes necessary connections to trunk or local station (c to e, incl., below).

(5) Repeats complete calling instructions.

(6) Notes answers from all desired stations in starting of traffic.

(7) Disconnects his teletypewriter.

b. Answering. (1) The switchboard operator answers a signal appearing on his switchboard by connecting his teletypewriter to the signaling line, checking for traffic in progress if necessary, answering with his call sign followed by the prosign K, and awaiting instructions from the signaling station. All switchboard signals are answered in the same manner whether the signal indicates a call being placed, a recall, or an accidental break signal. If the switchboard operator finds traffic in progress when he connects his teletypewriter in response to a signal, he checks the traffic to see that his services are not desired and then disconnects his teletypewriter.

(2) If a call is being placed or a recall has been sent, the switchboard operator receives calling or other instructions in response to his answer to the switchboard signal.

(3) If a disconnection is desired by a recalling station, the switchboard operator receives the prosign AR in response to his answer. He then terminates the connection by removing all associated patch cords.

c. Making local connection. The switchboard operator connects all desired local stations, repeats the complete calling instructions, receives answers from all desired stations, and then disconnects his teletypewriter when traffic starts (par. 5a and b).

d. Making trunk connections between two stations. The switchboard operator connects the necessary trunk to the local station. When the distant switchboard operator's answer is received, he repeats the calling instructions and awaits final completion of the connection.

When the answer from the desired station is received and traffic started, the switchboard operator disconnects his teletypewriter from the connection. The distant switchboard operator handles the call in the same manner as any other incoming call. He connects it to a local station where another trunk is required and disconnects his teletypewriter when his portion of the connection is completed (par. 5c and d).

e. Making connections involving both trunks and local stations. The most complicated trunk portion of a connection will normally be made first, followed by the connection of the local station desired. Only that portion of a complete calling instructions necessary for the station or stations to be connected over a trunk will be sent upon receipt of the distant switchboard operator's answer. If other trunk connections are required after completion of a portion of a connection, the switchboard operator tells the stations already connected to wait by sending the prosign AS. After completion of all connections, including any local stations, the switchboard operator repeats the complete calling instruction and disconnects his teletypewriter when traffic starts (par. 5a, e, f, and g)

f. Connection establishment not possible (engaged or busy stations and trunks). When one or more of the desired stations or a necessary trunk is engaged, the switchboard operator informs the station placing the call that the call cannot be completed. However, the switchboard operator may interrupt traffic according to the rules in article 90, FM 24-8. If the connection cannot be established, the switchboard operator will send the prosign ENGD and K and await further instructions from the station placing the call. If the call involves three or more stations he will send the call sign(s) of

the engaged station(s) followed by the prosign ENGD and K.

5. EXAMPLES OF COMPLETE TRANSMISSION IN A SWITCHED NETWORK. The following seven examples of switched connections show the step-by-step action of the station and switchboard operators and the corresponding line of typed copy as it would appear at the station placing the call. Action and line of copy are numbered to correspond. It is assumed that lines of copy are single spaced. If an action causes no corresponding typed line, it is not numbered but is listed in proper sequence. All traffic takes place over the network shown in figure 1. The use of the prosign TR is not obligatory; when used, it is used as indicated.

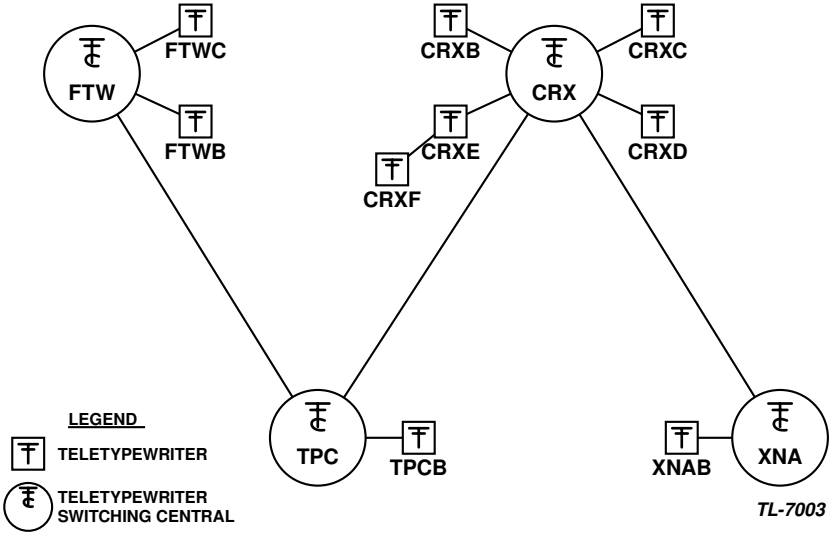


Figure 1. Switched teletypewriter network.

8 **a. Connection between two local stations.** Station CRXB sends a priority message to station CRXD (par. 4c).

Action of station and switchboard operators	Line of typed copy
CRXB sends 2-second break signal to light lamp at **CRX**.	
1. **CRX** answers lamp signal	1. **CRX K**
2. **CRXB** sends calling instructions	2. **CRXD V CRXB P P K**
CRX patches **CRXD** to **CRXB**.	
3. **CRX** repeats calling instructions to **CRXD**	3. **CRXD V CRXB P P K**
4. **CRXD** answers calling instructions	4. **CRXD K**
5. **CRXB** starts message by "tear here" prosign, **TR**	5. **TR**
CRX, noting the start of traffic, disconnects his machine.	
6–7. **CRXB** sends two extra line feeds for top of message page	6.
	7.
8–17. **CRXB** sends message	8. **CRXD V CRXB NR2 P P**
	9.
	10. **FROM CRXB 031445Z**
	11. **TO CRXD**
	12. **GR5 BT**
	13.
	14. **(TEXT OF MESSAGE)**
	15. **BT 031445Z**
	16.
	17. **K**
18. **CRXD** receipts for the message	18. **R 1455Z AR**
19–20. **CRXB** sends two extra line feeds and enough more to bring top **TR** to tearing edge	19.
	20.
21. **CRXB** sends **TR** for bottom of message page	21. **TR**
CRXB sends 2-second break signal to light lamp at **CRX**.	

22. **CRX** answers lamp signal	**22. CRX K**
23. **CRXB** sends clearing signal. **CRX** disconnects patch cord. **CRXB** and **CRXD** shut off their machines.	**23. AR**

b. Connection between four local stations. Station CRXB sends a message to stations CRXC, CRXD, and CRXE. Note that CRXE is on a party line (pars. 3f and 4c).

Action of station and switchboard operators	Line of typed copy
CRXB sends a 2-second break signal to light lamp at **CRX**.	
1. **CRX** answers	**1. CRX K**
2. **CRXB** sends calling instructions. **CRX** patches **CRXC** to **CRXB**, **CRXD** to **CRXC**, and **CRXE** to **CRXD**.	**2. CRXC CRXD CRXE V CRXB K**
3. **CRX** repeats calling instructions to **CRXC**, **CRXD**, and **CRXE**.	**3. CRXC CRXD CRXE V CRXB K**
4–6. **CRXC**, **CRXD**, and **CRXE** answer	**4. CRXC K** **5. CRXD K** **6. CRXE K**
7. **CRXB** starts message by "tear here" prosign, **TR**. **CRX** noting the start of traffic, disconnects his machine.	**7. TR**
8–9. **CRXB** sends two extra line feeds for top of message page	**8.** **9.**

Action of station and switchboard operators	Line of typed copy
10–21. **CRXB** sends message	**10. CRXC CRXD CRXE V** **CRXB NR1 NR5 NR3** **11.** **12. FROM CRXB 031527Z** **13. TO CRXC** **14. CRXD** **15. INFO CRXE** **16. GR4 BT** **17.** **18. (TEXT OF MESSAGE)** **19. BT 031527Z** **20.** **21. K**
22–24. **CRXC**, **CRXD**, **CRXE** receipt in order for message	**22. CRXC R 1533Z AR** **23. CRXD R 1533Z AR** **24. CRXE R 1533Z AR**
25–26. **CRXB** sends two extra line feeds and enough more to bring top **TR** to tearing edge .	**25.** **26.**
27. **CRXB** sends **TR** for bottom of message page **CRXB** sends 2-second break signal to light lamp at **CRX**.	**27. TR**
28. **CRX** answers lamp signal	**28. CRX K**
29. **CRXB** sends clearing signal **CRX** disconnects patch cords. All stations shut off their machines.	**29. AR**

c. Connections between two local stations connected over a trunk. Station CRXB sends an urgent message to station XNAB (par. 4d).

Action of station and switchboard operators	Line of typed copy
CRXB sends 2-second break signal to light lamp at **CRX**.	
1. **CRX** answers lamp signal	**1. CRX K**
2. **CRXB** sends calling instructions	**2. XNAB V CRXB O O K**
CRX patches **XNA** to **CRXB**.	
3. **XNA** answers lamp signal	**3. XNA K**
4. **CRX** repeats calling instruction to **XNA**	**4. XNAB V CRXB O O K**
XNA patches **XNAB** to trunk from **CRX**.	
5. **XNA** repeats calling instructions to **XNAB**	**5. XNAB V CRXB O O K**
6. **XNAB** answers calling instructions	**6. XNAB K**
7. **CRXB** starts message with "tear here" prosign, **TR**	**7. TR**
CRX and **XNA** disconnect their machines.	
8–9. **CRXB** sends two extra line feeds for top of message page	**8.** **9.**
10–19. **CRXB** sends message	**10. XNAB V CRXB NR9 O O** **11.** **12. FROM CRXB 031709Z** **13. TO XNAB** **14. GR5 BT** **15.** **16. (TEXT OF MESSAGE)** **17. BT 031709Z** **18.** **19. K**
20. **XNAB** receipts for message	**20. R 1716Z AR**

Action of station and switchboard operators	Line of typed copy
21–22. **CRXB** sends two extra line feeds and enough more to bring top **TR** to tearing edge .	**21.** **22.**
23. **CRXB** sends **TR** for bottom of message page..... **CRXB** sends 2-second break signal to light lamps at **CRX** and **XNA**.	**23. TR**
24–25. **CRX** and **XNA** answer lamp signal	**24. CRX K** **25. XNA K**
26. **CRXB** sends clearing signal..... **CRX** and **XNA** disconnect patch cords. **CRXB** and **XNAB** shut off their machines.	**26. AR**

d. Connections between two local stations connected over two trunks. Station CRXB sends a message to station FTWB (par. 4d).

Action of station and switchboard operators	Line of typed copy
CRXB sends 2-second break signal to light lamp at **CRX**.	
1. **CRX** answers lamp signal.....	**1. CRX K**
2. **CRXB** sends calling instructions..... **CRX** patches **TPC** to **CRXB**.	**2. FTWB V CRXB K**
3. **TPC** answers lamp signal	**3. TPC K**
4. **CRX** repeats calling instructions to **TPC** ..... **TPC** patches trunk from **FTW** to trunk from **CRX**.	**4. FTWB V CRXB K**
5. **FTW** answers lamp signal.....	**5. FTW K**
6. **TPC** repeats calling instructions to **FTW** ..... **TPC** finishing his portion of the connection disconnects his machine. **FTW** patches **FTWB** to trunk from **TPC**.	**6. FTWB V CRXB K**
7. **FTW** repeats calling instructions to **FTWB**.....	**7. FTWB V CRXB K**

8.	**FTWB** answers	**8. FTWB K**
9.	**CRXB** starts message with "tear here" prosign, **TR** **CRX** and **FTW** disconnect their machines.	**9. TR**
10–11.	**CRXB** sends two extra line feeds for top of message page	**10.** **11.**
12–21.	**CRXB** sends message	**12. FTWB V CRXB NR3** **13.** **14. FROM CRXB 031833Z** **15. TO FTWB** **16. GR6 BT** **17.** **18. (TEXT OF MESSAGE)** **19. BT 031833Z** **20.** **21. K**
22.	**FTWB** receipts for message	**22. R 1841Z AR**
23–24.	**CRXB** sends two extra line feeds and enough more to bring top **TR** to tearing edge .	**23.** **24.**
25.	**CRXB** sends **TR** for bottom of message page **CRXB** sends 2-second break signal to light lamps.	**25. TR**
26–28.	**CRX**, **TPC**, and **FTW** answer lamp signals	**26. CRX K** **27. TPC K** **28. FTW K**
29.	**CRXB** sends clearing signal **CRX**, **TPC**, and **FTW** disconnect patch cords. **CRXB** and **FTWB** shut off their machines.	**29. AR**

e. Connection between three stations over different trunks. Station TPCB sends a message to stations FTWB and XNAB (par. 4e).

Action of station and switchboard operators	Line of typed copy
TPCB sends 2-second break signal to light lamp at **TPC**.	
1. **TPC** answers lamp signal	**1. TPC K**
2. **TPCB** sends calling instructions	**2. FTWB XNAB V TPCB K**
TPC patches trunk from **CRX** to **TPCB**.	
3. **CRX** answers lamp signal	**3. CRX K**
4. **TPC** repeats portion of calling instructions	**4. XNAB V TPCB K**
CRX patches trunk from **XNA** to trunk from **TPC**.	
5. **XNA** answers lamp signal	**5. XNA K**
6. **CRX** repeats portion of calling instructions	**6. XNAB V TPCB K**
XNA patches **XNAB** to trunk from **CRX**.	
7. **XNA** repeats portion of calling instructions	**7. XNAB V TPCB K**
CRX disconnects his machine.	
8. **XNAB** answers	**8. XNAB K**
9. **TPC** tells **XNAB** to wait	**9. TPC AS**
XNA disconnects his machine.	
TPC patches trunk from **FTW** to trunk from **CRX**.	
10. **FTW** answers lamp signal	**10. FTW K**
11. **TPC** repeats portion of calling instructions	**11. FTWB V TPCB K.**
FTW patches **FTWB** to trunk from **TPC**.	
12. **FTW** repeats portion of calling instructions	**12. FTWB V TPCB K**
13. **FTWB** answers	**13. FTWB K**
14. **TPC** repeats complete calling instructions	**14. FTWB XNAB V TPCB K**
FTW disconnects his machine.	
15–16. **FTWB** and **XNAB** answer	**15. FTWB K** **16. XNAB K**

17.	**TPCB** starts message with "tear here" prosign, **TR** **TPC** disconnects his machine.	**17. TR**
18–19.	**TPCB** sends two extra line feeds for top of message page	**18.** **19.**
20–30.	**TPCB** sends message	**20. FTWB XNAB V TPCB NR4 NR2** **21.** **22. FROM TPCB 031902Z** **23. TO XNAB** **24. INFO FTWB** **25. GR5 BT** **26.** **27. (TEXT OF MESSAGE)** **28. BT 031902Z** **29.** **30. K**
31–32.	**FTWB** and **XNAB** receipt for message	**31. FTWB R 1909Z AR** **32. XNAB R 1909Z AR**
33–34.	**TPCB** sends two extra line feeds and enough more to bring top **TR** to tearing edge	**33.** **34.**
35.	**TPCB** sends **TR** for bottom of message page **TPCB** sends 2-second break signal to light lamps.	**35. TR**
36–39.	**TPC**, **CRX**, **XNA**, and **FTW** answer lamp signals	**36. TPC K** **37. CRX K** **38. XNA K** **39. FTW K**
40.	**TPCB** sends prosign **AR** as a clearing signal **TPC**, **CRX**, **XNA**, and **FTW** disconnect. **TPCB**, **FTWB**, and **XNAB** shut off their machines.	**40. AR**

f. Connection between three local stations and a distant station over a trunk. Station CRXB sends a message to stations CRXC, CRXD, and TPCB (par. 4e).

Action of station and switchboard operators	Line of typed copy
CRXB sends 2-second break signal to light lamp at **CRX**.	
1. **CRX** answers lamp signal	**1. CRX K**
2. **CRXB** sends calling instructions	**2. CRXC CRXD TPCB V CRXB K**
CRX patches trunk from **TPC** to **CRXB**.	
3. **TPC** answers lamp signal	**3. TPC K**
4. **CRX** repeats portion of calling instructions to **TPC**	**4. TPCB V CRXB K**
TPC patches **TPCB** to trunk from **CRX**.	
5. **TPC** repeats portion of calling instructions	**5. TPCB V CRXB K**
6. **TPCB** answers	**6. TPCB K**
CRX patches **CRXC** to trunk from **TPC**, and **CRXD** to **CRXC**.	
7. **CRX** repeats complete calling instructions	**7. CRXC CRXD TPCB V CRXB K**
TPC disconnects his machine.	
8–10. **CRXC**, **CRXD**, and **TPCB** answer	**8. CRXC K** **9. CRXD K** **10. TPCB K**
11. **CRXB** starts message by "tear here" prosign, **TR**.	**11. TR**
CRX disconnects his machine.	
12–13. **CRXB** sends two extra line feeds for top of message page	**12.** **13.**

14–25. **CRXB** sends message	**14. CRXC CRXD TPCD V** **CRXB NR3 NR8 NR12** **15.** **16. FROM CRXB 031925Z** **17. TO TPCB** **18. INFO CRXC** **19. CRXD** **20. GR4 BT** **21.** **22. (TEXT OF MESSAGE)** **23. BT 031925Z** **24.** **25. K**
26–28. **CRXC**, **CRXD**, and **TPCB** receipt for message	**26. CRXC R 1941Z AR** **27. CRXD R 1942Z AR** **28. TPCB R 1942Z AR**
29–30. **CRXB** sends two extra line feeds and enough more to bring top **TR** to tearing edge .	**29.** **30.**
31. **CRXB** sends **TR** for bottom of message page..... **CRXB** sends 2-second break signal to light lamps at **CRX** and **TPC**.	**31. TR**
32–33. **CRX** and **TPC** answer lamp signal.....	**32. CRX K** **33. TPC K**
34. **CRXB** sends prosign **AR** as a clearing signal ..... **CRX** and **TPC** disconnect. All stations shut off their machines.	**34. AR**

g. Complicated connection involving trunks and local stations. Station CRXB sends a message to stations CRXC, FTWB, FTWC, TPCB, and XNAB (par. 4e).

Action of station and switchboard operators	Line of typed copy
CRXB sends 2-second break signal to light lamp at **CRX**.	
1. **CRX** answers lamp signal	1. **CRX K**
2. **CRXB** sends calling instructions	2. **CRXC FTWB FTWC TPCB XNAB V CRXB K**
CRX patches trunk from **TPC** to **CRXB**.	
3. **TPC** answers lamp signal	3. **TPC K**
4. **CRX** repeats portion of calling instructions	4. **FTWB FTWC TPCB V CRXB K**
TPC patches trunk from **FTW** to trunk from **CRX**.	
5. **FTW** answers lamp signal	5. **FTW K**
6. **TPC** repeats portion of calling instructions	6. **FTWB FTWC V CRXB K**
FTW patches **FTWB** to trunk from **TPC**, and **FTWC** to **FTWB**.	
7. **FTW** repeats portion of calling instructions	7. **FTWB FTWC V CRXB K**
8–9. **FTWB** and **FTWC** answer	8. **FTWB K** 9. **FTWC K**
10. **TPC** tells **FTWB** and **FTWC** to wait	10. **TPC AS**
FTW disconnects his machine.	
TPC patches **TPCB** to trunk from **FTW**.	
11. **TPC** repeats portion of calling instructions	11. **TPCB V CRXB K**
12. **TPCB** answers	12. **TPCB K**
13. **CRX** tells **FTWB**, **FTWC**, and **TPCB** to wait	13. **CRX AS**
TPC disconnects his machine.	
CRX patches trunk from **XNA** to trunk from **TPC**.	
14. **XNA** answers	14. **XNA K**

15.	**CRX** repeats portion of calling instructions	**15. XNAB V CRXB K**
	XNA patches **XNAB** to trunk from **CRX**.	
16.	**XNA** repeats portion of calling instructions	**16. XNAB V CRXB K**
17.	**XNAB** answers	**17. XNAB K**
	CRX patches **CRXC** to trunk from **XNA**.	
18.	**CRX** repeats complete calling instructions	**18. CRXC FTWB FTWC TPCB XNAB V CRXB K**
	XNA disconnects his machine.	
19–23.	ALL STATIONS answer in turn	**19. CRXC K** **20. FTWB K** **21. FTWC K** **22. TPCB K** **23. XNAB. K**
24.	**CRXB** starts message with "tear here" prosign, **TR**	**24. TR**
	CRX disconnects his machine.	
25–26.	**CRXB** sends two extra line feeds for top of message page	**25.** **26.**
27–40.	**CRXB** sends message	**27. CRXC FTWB FTWC TPCB XNAB V CRXB NR6 NR4 NR2 NR14 NR13** **28.** **29. FROM CRXB 032047Z** **30. TO FTWB** **31. TPCB** **32. XNAB** **33. INFO CRXC** **34. FTWC** **35. GR5 BT** **36.** **37. (TEXT OF MESSAGE)**

Action of station and switchboard operators	Line of typed copy
	38. BT 032047Z
	39.
	40. K
41–45. All stations receipt for message	**41. CRXC R 0307Z AR**
	42. FTWB R 0307Z AR
	43. FTWC R 0308Z AR
	44. TPCB R 0308Z AR
	45. XNAB R 0308Z AR
46–47. **CRXB** sends two extra line feeds and enough more to bring top **TR** to tearing edge .	**46.**
	47.
48. **CRXB** sends **TR** for bottom of message page	**48. TR**
CRXB sends 2-second break signal to light lamps at **CRX**, **TPC**, **FTW**, and **XNA**.	
49–52. All switchboards answer	**49. CRX K**
	50. TPC K
	51. FTW K
	52. XNA K
53. **CRXB** sends prosign **AR** as a clearing signal	**53. AR**
All switchboards disconnect.	
All stations shut off their machines.	

SECTION III

MANUAL TAPE RELAY PROCEDURE

6. GENERAL. Messages to be relayed will contain transmission instructions as described in articles 12a (ii) and 46, FM 24-8.

7. RELAY THROUGH TELETYPEWRITER REPERFORATOR CENTRALS. a. Use combined procedure as amplified in this paragraph. The transmitting operator follows the transmission instructions with BELL signals and waits for the receiving operator to respond with BELL signals. The receiving operator, on hearing the BELL signals sent by the transmitting operator, looks at his copy, notices that the message is to be relayed as evidenced by the prosign T, connects his reperforator, and answers the transmitting operator with BELL signals.

b. The transmitting operator precedes the message address by five operations of the LTRS key when resuming transmission to indicate on the tape the start of the message address.

c. When relaying a message from a tape the operator sends a new call and preamble retaining the unchanged components as described in article 12b, FM 24-8.

8. EXAMPLE OF A MESSAGE RELAYED THROUGH A REPERFORATOR CENTRAL. The following example of a relayed message shows the step-by-step actions of the operators and the corresponding lines of typed copy as they would appear at the stations. Actions and lines of copy are numbered to correspond. If an action causes no corresponding typed line, it is not numbered but is listed in proper sequence. It is assumed that the lines of typed copy are single spaced.

a. Priority message from CNWA is sent to BARA for relay to KLPA.

Action at reperforator central	Line of typed copy
CNWA sends 2-second break signal to start machines.	
1. **CNWA** sends preliminary call	1. **BARA V CNWA P P K**
2. **BARA** answers	2. **BARA K**
3. **CNWA** sends "tear here" prosign, **TR**, for top of message page	3. **TR**
4–5. **CNWA** sends two extra line feeds for top of message page	4. 5.
6. **CNWA** sends first line of message heading	6. **BARA V CNWA NR7 P P**
7. **CNWA** sends transmission instructions	7. **T**
CNWA sends **BELL** signals and waits. **BARA**, hearing **BELL** signals and seeing T, connects in his reperforator and sends **BELL** signals.	
8. **CNWA** sends extra line feed after preamble. **CNWA** operates **LTRS** key five times	8.
9–10. **CNWA** continues with message	9. **FROM CNWA 131457Z** 10. **TO KLPA**
11. **CNWA** sends one line feed without carriage return	11. **GR7 BT**
12. **CNWA** sends one line feed	12.
13. **CNWA** sends text of message	13. **(TEXT OF MESSAGE)**
14. **CNWA** sends BT and date-time group	14. **BT 131457Z**
15. **CNWA** sends one line feed and **BELL** signals	15.
BARA disconnects reperforator.	
16. **CNWA** sends **K**	16. **K**
17. **BARA** receipts for message	17. **R 1515Z AR**
18. **CNWA** indicates end of traffic for **BARA**	18. **AR**
19–20. **CNWA** sends two extra line feeds and enough more to bring top **TR** to tearing edge	19. 20.

21. **CNWA** sends bottom **TR** **CNWA** and **BARA** stop their machines.	**21. TR**

Actions 1 and 2 will be used only when preliminary call-up is deemed necessary.
Actions 8 to 15 are recorded on perforated tape by the reperforator.

b. The message is relayed by BARA to KLPA.

Action at reperforator central	Line of typed copy
BARA sends 2-second break signal to start machines.	
1. **BARA** sends preliminary call	**1. KLPA V BARA P P K**
2. **KLPA** answers	**2. KLPA K**
3. **BARA** sends "tear here" prosign, **TR**, for top of message page	**3. TR**
4–5. **BARA** sends two extra line feeds for top of message page	**4.** **5.**
6. **BARA** sends a new preamble	**6. KLPA V BARA NR5 P P**
7. **BARA** sends extra line feed after preamble	**7.**
BARA starts tape in transmitter distributor at five **LTRS** perforations.	
8–14. **BARA** sends message from perforated tape	**8. FROM CNWA 131457Z** **9. TO KLPA** **10. GR7 BT** **11.** **12. (TEXT OF MESSAGE)** **13. BT 131457Z** **14.**
15. **BARA** sends prosign **K**	**15. K**
16. **KLPA** receipts for message	**16. R 1523Z AR**
17. **BARA** indicates end of traffic for **KLPA**	**17. AR**

Action at reperforator central	Line of typed copy
18–19. **BARA** sends two extra line feeds and enough more to bring top **TR** to tearing edge .	**18.** **19.**
20. **BARA** sends bottom **TR**	**20. TR**
BARA and **KLPA** stop their machines	

Actions 1 and 2 will be used only when preliminary call-up is deemed necessary.

c. Priority message from CNWA is sent to BARA for relay to KLPA and hard copy to BARA.

Action at reperforator central	Line of typed copy
CNWA sends 2-second break signal to start machines.	
1. **CNWA** sends preliminary call.....	**1. BARA V CNWA P P K**
2. **BARA** answers.....	**2. BARA K**
3. **CNWA** sends "tear here" prosign, **TR**, for top of message page and includes proper "Q" signal to indicate copy is to be made at **BARA**.....	**3. TR Q—**
4–5. **CNWA** sends two extra line feeds for top of message page	**4.** **5.**
6. **CNWA** sends first line of message heading.....	**6. BARA V CNWA NR7 P P**

7.	**CNWA** sends transmission instructions..... **CNWA** sends **BELL** signals and waits. **BARA**, hearing **BELL** signals and seeing T and preceding "Q" signal, connects in his reperforator and sends **BELL** signals.	**7. T**
8.	**CNWA** sends extra line feed after preamble. **CNWA** operates **LTRS** key five times..	**8.**
9–10.	**CNWA** continues with message.....	**9. FROM CNWA 131457Z** **10. TO BARA KLPA**
11.	**CNWA** sends one line feed without carriage return.....	**11. GR7 BT**
12.	**CNWA** sends one line feed.....	**12.**
13.	**CNWA** sends text of message.....	**13. (TEXT OF MESSAGE)**
14.	**CNWA** sends BT and date-time group.....	**14. BT 131457Z**
15.	**CNWA** sends one line feed and **BELL** signals..... **BARA** disconnects reperforator.	**15.**
16.	**CNWA** sends **K**.....	**16. K**
17.	**BARA** receipts for message.....	**17. R 1515Z AR**
18.	**CNWA** indicates end of traffic for **BARA**.....	**18. AR**
19–20.	**CNWA** sends two extra line feeds and enough more to bring top **TR** to tearing edge.	**19.** **20.**
21.	**CNWA** sends bottom **TR**..... **CNWA** and **BARA** stop their machines.	**21. TR**

Actions 1 and 2 will be used only when preliminary call-up is deemed necessary.
Actions 8 to 15 are recorded on perforated tape by the reperforator.

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