W1.33:24-14

Document
Reserve

FM 24-14

WAR DEPARTMENT FIELD MANUAL

NON-CIRCULATING

TELETYPEWRITER SWITCHING AND RELAY PROCEDURE

WAR DEPARTMENT · 19 SEPTEMBER 1944

NTSU LIBRARY

FM 24-14
C 1

[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

DISTRIBUTION:

AAF (10); AGF (10); ASF (2); T of Opns (2); Depts (10); Arm & Sv Bd (2): Def C (2); Tech Sv (2); Sv C (10); PC&S (1); Gen & Sp Sv Sch (10); USMA (2); ROTC (Hq) (1); ROTC (Lib) (1); WDGS (Lib) (5); A (10); CHQ (10); D (5); Bn 11 (5): AF (2); W (5); G (5); S (5)

T/O & E: 11-7 (10); 11-16 (10); 11-18 (10); 11-57 (10); 11-77 (10); 11-96 (10); 11-97 (10); 11-217 (10); 11-237 (10); 11-247 (10); 11-257 (10); 11-287 (10); 11-460-1S (10); 44-1-3S (10)

For explanation of symbols, see FM 21-6.

U. S. GOVERNMENT PRINTING OFFICE: 1944

WAR DEPARTMENT FIELD MANUAL

TELETYPEWRITER SWITCHING AND RELAY PROCEDURE

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
* * *	* * *
12. Operator sends line feed without carriage return . . .	11. TO CRXD 12. GR5 BT 13. 14.
* * *	* * *

WAR DEPARTMENT FIELD MANUAL

FM 24-14

TELETYPEWRITER SWITCHING AND RELAY PROCEDURE

WAR DEPARTMENT • 19 SEPTEMBER 1944

United States Government Printing Office, Washington: 1944

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

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.

[A. G. 300.7 (26 Apr 44).]

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.

Armies (10); Corps (10); SvC (10); Depts (10); Def C (2); D (5); B 1 (5); R 1 (5); Bn 1, 11 (5); IC 11, 44 (10); C, Tech Sv (2); Arm & Sv Boards (2); Posts, Camps & Sta (1); ROTC (1); ROTC (Library) (1); Gen & Sp Sv Schs (10).

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

---

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

---

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. 82*b,* 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. 89*c* (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. 3**a** (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.

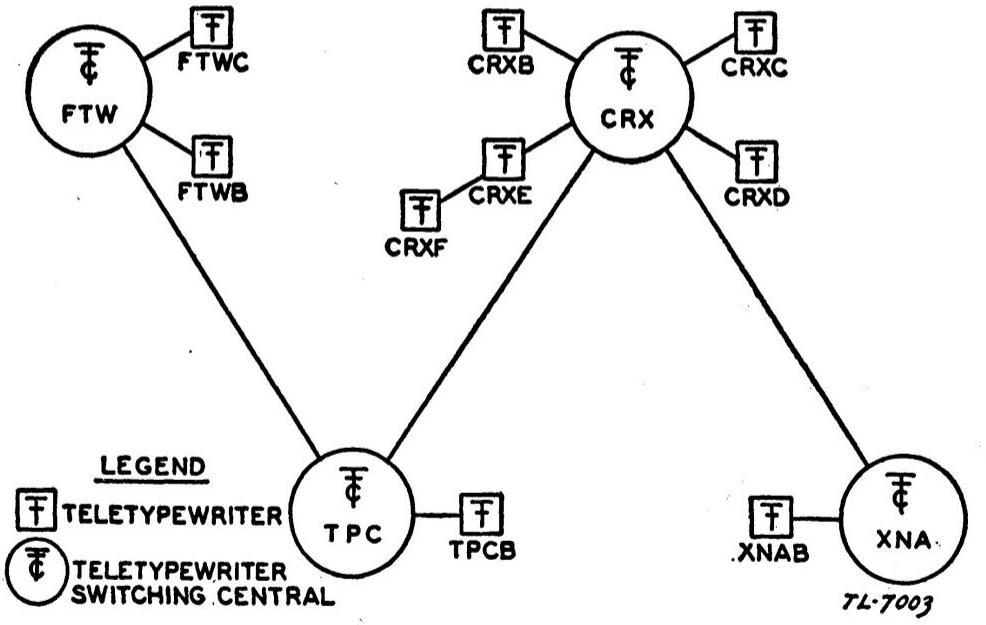


Figure 1. Switched teletypewriter network.

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	23. AR
CRX disconnects patch cord.	
CRXB and CRXD shut off their machines.	

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	2. CRXC CRXD CRXE V
CRX patches CRXC to CRXB, CRXD to CRXC, and CRXE to CRXD.	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	7. TR
CRX noting the start of traffic, disconnects his machine.	
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. GR_4 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	27. TR
CRXB sends 2-second break signal to light lamp at CRX.	
28. CRX answers lamp signal	28. CRX K
29. CRXB sends clearing signal	29. AR
CRX disconnects patch cords.	
All stations shut off their machines.	

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	23. TR
CRXB sends 2-second break signal to light lamps at CRX and XNA.	
24–25. CRX and XNA answer lamp signal	24. CRX K 25. XNA K
26. CRXB sends clearing signal	26. AR
CRX and XNA disconnect patch cords.	
CRXB and XNAB shut off their machines.	

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	2. FTWB V CRXB K
CRX patches TPC to CRXB.	
3. TPC answers lamp signal	3. TPC K
4. CRX repeats calling instructions to TPC	4. FTWB V CRXB K
TPC patches trunk from FTW to trunk from CRX.	
5. FTW answers lamp signal	5. FTW K
6. TPC repeats calling instructions to FTW	6. FTWB V CRXB K
TPC finishing his portion of the connection disconnects his machine.	
FTW patches FTWB to trunk from TPC.	
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
CRX patches trunk from TPC to CRXB.	CRXB K
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
TPC disconnects his machine.	CRXB K
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 ..... XNA patches XNAB to trunk from CRX.	15. XNAB V CRXB K
16. XNA repeats portion of calling instructions	16. XNAB V CRXB K
17. XNAB answers ..... CRX patches CRXC to trunk from XNA.	17. XNAB K
18. CRX repeats complete calling instructions ..... XNA disconnects his machine.	18. CRXC FTWB FTWC TPCB XNAB V CRXB K
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 ..... CRX disconnects his machine.	24. TR
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 12*a* (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 12*b*, 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.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1944—606471

WITHDRAWN

cr 1945 mocat p 296

UNT LIBRARIES DENTON TX 76203
1001893860
NTSU LIBRARY