

BELL SYSTEM PRACTICES
Teletypewriter and Data Stations

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28 TELETYPEWRITER BASE
(KEYBOARD SEND-RECEIVE BASE
AND RECEIVE-ONLY BASE)
DISASSEMBLY AND REASSEMBLY ROUTINES

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1. GENERAL

1.01 This section contains specific routines for disassembling the 28 teletypewriter base, and where necessary, provides detailed reassembly information. The material herein, together with that in the section entitled Teletypewriter Apparatus, Disassembly and Reassembly, General Information and Routines, gives the complete disassembly and reassembly procedures necessary for the maintenance of the 28 teletypewriter base.

1.02 This section includes information on 28 teletypewriter bases of the following designs:

- (a) **Receive-only (RO) Base:** Teletypewriter bases of this design are referred to herein as **Base**.
- (b) **Keyboard Send-Receive (KSR) Base:** Teletypewriter bases of this design are referred to herein as **Keyboard**.

They may be either of the following types:

- (1) **With Transfer-lever Locking Bail That Is Pivoted in the Middle:** Keyboards of this type are currently being manufactured instead of those described in (2). They can be identified by the transfer-lever locking

bail (signal generator mechanism) which is pivoted in the middle and by the presence of the transfer bail with the leather wick.

(2) **With Transfer-lever Locking Bail That Is Pivoted on One End:** Keyboards of this type are no longer being furnished; however, the individual parts are available for maintenance. Existing keyboards can be identified by the transfer-lever locking bail (signal generator mechanism which is pivoted on one end.

2. DISASSEMBLY AND REASSEMBLY

A. Keyboard (KSR) With Transfer-lever Locking Bail That Is Pivoted in the Middle

2.01 Removal of Signal Generator Assembly

- (1) Remove the typing unit in accordance with the section entitled 28 Typing Unit, Disassembly and Reassembly Routines.
- (2) Remove the contact box cover and disconnect the signal-line leads from the contact terminals.
- (3) Remove the two mounting screws at the front of the signal-generator frame and the mounting screw at the right rear of the frame.
- (4) Carefully lift the signal generator assembly while holding back the universal bail so that the nonrepeat lever will clear the bail and so that the nonrepeat-lever spring will not be stretched excessively.

Note: If the nonrepeat lever is pulled down approximately 90 degrees from its normal position, the nonrepeat-lever spring may be stretched beyond its elastic limits, resulting in improper operation of the assembly.

2.02 Removal of Label-set Windows and Label Sets, Keyboard Hood, Keyboard Front Seal, and Keyboard Seal Plates

- (1) Remove the four special screws that secure the label-set windows and label sets.
- (2) Remove the two screws under the keyboard hood that hold the keyboard hood to the hood-mounting bracket; and remove the four screws on top of the keyboard hood which hold it to the left and right frame-mounting brackets.
- (3) Pull the keyboard hood forward and remove it.
- (4) Stretch the keyboard front seal (rubber) off the keyboard upper and lower seal plates.

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- (5) Remove the four screws that retain the two hood-mounting brackets and remove the brackets.
- (6) Remove the keyboard upper seal plate by unscrewing the three screws at its rear.
- (7) Remove the keyboard lower seal plate by unscrewing the two screws at its front.

2.03 Removal of Keyboard Assembly

Note: It is easier to disassemble and reassemble the keyboard assembly when it is resting on its rear.

- (1) Remove the typing unit in accordance with the section entitled 28 Typing Unit, Disassembly and Reassembly Routines.
- (2) Remove the signal generator assembly in accordance with 2.01.
- (3) Remove the label-set windows and label sets, the keyboard hood, keyboard front seal, and the keyboard seal plates in accordance with 2.02.
- (4) Remove the four screws that hold the left and right frame-mounting brackets to the front of the keyboard base.
- (5) Remove the screws that hold the right and left code-lever-guide brackets on the top of the keyboard base, and the two screws, at the extreme right and left of the front bracket, which hold the front bracket to the keyboard base.
- (6) Remove the four screws in the front of the keyboard base and the four screws on top of the keyboard base.
- (7) Tip the front of the keyboard assembly upward and pull it forward, disengaging the function levers.

Reassembly Notes

1. Make sure that all of the function levers except the keyboard-lock function lever are under their corresponding function bails.
2. Depress the keyboard-lock keylever so that the keyboard-lock function lever will go into its position over its bail, instead of under as the other function levers should.

2.04 Removal of Signal-generator Contact-box Assembly

- (1) Remove the signal-generator contact-box cover and disconnect the signal line leads.
- (2) Unhook the toggle-drive link spring.

(3) Unscrew the two screws, at the front of the signal-generator front plate, that hold the signal-generator contact-box assembly.

(4) Disengage the drive link from the transfer bail and lift off the signal-generator contact-box assembly.

Note: If it is necessary to provide new contacts, install an entire contact assembly instead of individual contacts.

2.05 Removal of Transfer-lever Locking Bail

(1) Remove the signal generator assembly in accordance with 2.01.

(2) Remove the signal-generator contact-box assembly in accordance with 2.04.

(3) Remove the transfer-lever locking-bail spring.

(4) Take out the transfer-lever locking bail by unlatching the clutch and rotating the shaft to position the cam in such a way that the transfer-lever locking bail can be unhooked and dropped down from its guide post. Turn the transfer-lever locking bail clockwise until it forms a right angle with its guide, and then remove it through the bottom of the frame.

Reassembly Note: It may be necessary to move the shaft back and forth to position the cam for maximum clearance.

2.06 Removal of Signal-generator Shaft and Cam Assembly

(1) Remove the transfer-lever locking bail in accordance with 2.05.

(2) Remove the two screws that mount the clutch-shaft rear mounting plate to the signal-generator frame, and remove the nut that locks the shaft to the front of the frame.

(3) Hold the clutch latchlever and the clutch stoplever away and pull back on the clutch-shaft rear mounting plate to disengage the shaft from the front plate.

(4) Remove the entire cam, clutch, and shaft assembly by rotating it to clear the various transfer levers. The codebar-bail eccentric follower, the felt washer, and the cam spacer will fall free.

(5) To take the cam (with clutch assembly) off the shaft, disengage the clutch by holding the clutch shoe-lever against the stop lug, and slide the cam and clutch off.

Reassembly Note: Reposition the codebar-bail eccentric follower, felt washer, and cam spacer before reassembling the signal-generator cam and shaft assembly.

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2.07 Removal of Keytop Guide Plate

- (1) Remove the label-set windows, label sets, and keyboard hood in accordance with 2.02.
- (2) Remove the spacebar by unscrewing the two shoulder screws that fasten it to the spacebar bail.
- (3) Remove the screw from under the spacebar on the keytop guide plate and remove the two screws, in the upper corners of the keytop guide plate, which hold the keytop guide plate to the frame.
- (4) Remove the keytop guide plate by working it off the keytops. (Let the keylevers fall freely.)

Reassembly Note: Position all of the keylevers to the rear. Place the front end of the keytop guide plate down on the frame; and push the keylevers into their respective holes, starting with the bottom row and proceeding upward toward the top row.

B. Keyboard (KSR) With Transfer-lever Locking Bail That Is Pivoted on One End and Base (RO)

Note: Unless otherwise indicated, the following procedures apply to any teletypewriter keyboard (KSR) of the design which has the transfer-lever locking bail that is pivoted on one end and also apply to any receive-only teletypewriter base (RO).

2.08 Removal of Keyboard or Base Assembly

- (1) Remove the typing unit, if present, in accordance with the section entitled 28 Typing Unit, Disassembly and Reassembly Routines.
- (2) Remove the four screws (one at each corner of the keyboard or base) that secure the keyboard or base to the cradle assembly.
- (3) Remove the keyboard plug connector from its keyboard receptacle connector on the left rear corner of the keyboard or base.
- (4) Lift the keyboard or base from the cradle assembly.

2.09 Removal of Signal Generator Assembly (Keyboard)

- (1) Remove the typing unit in accordance with the section entitled 28 Typing Unit, Disassembly and Reassembly Routines.
- (2) Remove the signal-generator guard bracket, if present.

(3) Remove the two screws located to the right and left of the contact box and raise the contact box. (Do not unsolder the connections if the contact box is connected to metal tubing.) If the wire connections to the contact box are flexible, unsolder the wires inside the box and do not remove the contact box.

(4) Remove the four screws that mount the signal-generator casting (two at the front of the casting and two at the rear). If the keyboard is equipped with an electrical-signal line-break mechanism, remove the mechanism by removing its two mounting screws.

(5) Lift the signal generator upward from the keyboard.

Reassembly Notes

1. Position the codebar-bail latch under the codelever-bail latchlever, in the notches of all the codebars, and in the notches of the tripbar and upstop bar.
2. Put the breakrod in its guide hole.
3. Place the clutch-tripbail extension in the clutch-tripbar notch.
4. Recheck the nonrepeat lever adjustments, the generator contact adjustment, the contact-box spring tension, and the codelever guide adjustment as specified for keyboards of this design in the section giving the requirements for the 28 teletypewriter base (KSR or RO).

2.10 Removal of Signal-generator Shaft and Cam Assembly (Keyboard)

- (1) Remove the signal generator in accordance with 2.09.
- (2) Disconnect the clutch-latchlever spring.
- (3) Disconnect the clutch-stoplever spring.
- (4) Disconnect the flutter-lever spring.
- (5) Remove the front nut of the signal-generator shaft.
- (6) Remove the two screws that hold the signal-generator rear plate to the casting.
- (7) Remove the signal-generator shaft assembly by lifting it upward and pulling it to the rear simultaneously.
- (8) Remove the signal-generator cam assembly.

Reassembly Note: Check that the clutch is fully seated and engages the drum.

2.11 Removal of Label Cover and Keyboard Label Set (Keyboard or Base)

- (1) Remove the label mounting screw (or screws).
- (2) Picking up the label cover at the top edge first, remove the cover and the keyboard label set.

2.12 Removal of Keylever Assembly Cover (Keyboard or Base)

(a) Keyboard

- (1) Remove the label cover and the keyboard label set in accordance with 2.11.
- (2) Remove the four screws located under the keyboard label set (two at the extreme right side and two at the extreme left).

Note: Support the keylever assembly cover while removing the screws.

- (3) Pull the keylever assembly cover forward to remove it.

(b) Base

- (1) Remove the two screws located inside the sealing plate (one at the right side and one at the left).
- (2) Remove the keylever assembly cover by pulling it forward and downward to disengage it from the two studs near the bottom.

2.13 Removal of Keylever (Keyboard)

- (1) Insert the smaller lug of the TP151383 keylever remover tool in the slot of the keylever and engage the shoulder of the larger lug on the top of the codelever. Pry upward to snap the keylever from the stud on its codelever.
- (2) Remove the keylever. (The plastic keytop should not be removed from any keylever to change a character.)

Reassembly Notes

1. Support the codelever so that it will not be forced down when the keylever is later re-engaged with the stud on its codelever.
2. Make sure that the keylever is restored to its proper position in the keytop guide plate.

2.14 Removal of Spacebar (Keyboard)

- (1) Remove the keylever assembly cover in accordance with 2.12(a).

- (2) Remove the two shoulder screws on the left and right sides of the spacebar.
- (3) Remove the spacebar.

2.15 Removal of Keytop Guide Plate (Keyboard)

- (1) Remove the keylever assembly cover in accordance with 2.12(a).
- (2) Remove the spacebar in accordance with 2.14.
- (3) Remove the six mounting screws located on the top of the keytop guide plate.
- (4) Remove the keytop guide plate.

2.16 Removal of Lockball Channel (Keyboard)

- (1) Remove the keylever assembly cover in accordance with 2.12(a).
- (2) Remove the two lockball-channel mounting screws at the right and left ends.
- (3) Pull the lockball channel forward, being careful not to drop any of the wedges that are located on the code-levers.

Reassembly Note: Reinstall the wedges individually.

2.17 Removal of Sealing Plate (Keyboard or Base)

- (1) Remove the keylever assembly cover in accordance with 2.12.
- (2) Remove the keylevers (keyboard only) in accordance with 2.13.
- (3) Disconnect the space-codelever extension (keyboard only) at its snap connection.
- (4) Remove all the sealing-plate mounting screws.
- (5) Remove the sealing plate.

2.18 Removal of Keyboard-lock and Local Line-feed Mechanism (Keyboard or Base)

- (1) Remove the signal generator (keyboard only) in accordance with 2.09.
- (2) Unhook the codelever-bail spring from the codelever bail (keyboard only).
- (3) Loosen the two pilot screws and remove the codelever bail (keyboard only).
- (4) Remove the retaining ring from the local line-feed tripbail.

- (5) Remove the two mounting screws and remove the keyboard-lock and local line-feed mechanism through the hole in the bottom of the keyboard or base.

2.19 Removal of Codebar Assembly (Keyboard)

- (1) Remove the keylever assembly cover in accordance with 2.12(a).
- (2) Remove the keylevers in accordance with 2.13.
- (3) Disconnect the space-codelever extension at its snap connection.
- (4) Remove the signal generator in accordance with 2.09.
- (5) Remove the four codebar-assembly mounting screws located on top of the codebar frame.
- (6) Remove the two screws that mount the carriage-return bracket, and remove the carriage-return bracket.
- (7) Remove the keyboard-lock and local line-feed mechanism in accordance with 2.18.
- (8) Remove the nut that secures the codelever-bail latchlever, and then remove the latchlever and its spring.
- (9) Remove the three screws that mount the nonrepeat-bellcrank mounting plate assembly, and remove the assembly.
- (10) Remove the codebar assembly through the opening in the top of the keyboard.

2.20 Removal of Codebar (Keyboard)

- (1) Remove the codebar assembly in accordance with 2.19.
- (2) Disconnect the codebar springs.
- (3) Remove the mounting screw and the lockbar pawl from the codelever guide.
- (4) Loosen the mounting screws for the left and right codebar guides until the screws are friction-tight, and lift each guide to its extreme upward position.
- (5) Slide the codebar to the left or the right so that one end of the codebar moves out of its codebar guide, and remove the codebar.

3. ASSOCIATED BELL SYSTEM PRACTICES

3.01 The following Bell System Practices provide additional information that may be required for use with this section.

Subject	Section
General Information and Routines for Disassembling and Reassembling Teletypewriter Apparatus	P30.013
General Requirements and Adjusting Procedures for Teletypewriter Apparatus	P30.012
Preparation of Teletypewriter Apparatus for Installation	P33.014
Specific Requirements and Adjusting Procedures for Teletypewriter Apparatus	P10.200
Teletypewriter Tools and Maintenance Supplies	P30.301
28 Teletypewriter (KSR and RO), Disassembly and Reassembly Routines	P34.401
28 Teletypewriter Apparatus, Index of Associated Bell System Practices	P34.001 (When Issued)

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