BELL SYSTEM PRACTICES
Teletypewriter and Data Stations

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28 PERFORATOR-TRANSMITTER-BASE DISASSEMBLY AND REASSEMBLY ROUTINES

CONTENTS **PAR. NO.**

1. GENERAL

1.01 This section contains specific instructions for disassembling the 28 perforator-transmitter-base and its various subassemblies, 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 perforator-transmitter-base.

1.02 To reassemble, reverse the disassembly procedures. Where additional information is required, a **Note** is added.

2. DISASSEMBLY AND REASSEMBLY

2.01 **General:** Disconnect any electrical connections (connectors, leads, etc), that would interfere with the removal of the particular subassembly and proceed in accordance with the appropriate disassembly routine.

2.02 **Character Counter Assembly:**

(1) Remove the two screws that hold the character counter bracket to the keyboard base.

(2) Raise the character counter and remove the two screws that hold the contact switch to the switch bracket. Remove the character counter assembly.

2.03 **Tape Container Assembly:**

(1) Where a tape-out switch assembly is present, remove the switch wiring from the cable clamp that holds it in position before disconnecting the plug connector from the electrical service unit.

(2) Remove the four screws that hold the tape-container-panel mounting bracket to the base. Remove the tape container assembly.

2.04 **Typing Reperforator Mechanism (If So Equipped):** Refer to the section giving the disassembly routines for the 28 typing reperforator, base, and cover.

2.05 **Nontyping Reperforator Mechanism (If So Equipped):** Refer to the section giving the disassembly routines for the 28 nontyping reperforator.

2.06 **Typing Perforator or Nontyping Perforator (If So Equipped):**

(1) Loosen the two setscrews on the coupling located on the rear shaft, and slide the coupling to the rear to disengage it.

(2) Remove the three screws, lockwashers, and flat washers that hold the perforator or reperforator frame to the base and remove the screw, lockwasher, and flat washer that secure the mounting (anchor) bracket to the base.

(3) Raise the perforator or reperforator slightly from the base, being careful not to damage the codebar extension or associated springs.

(4) If the power backspace mechanism is present, unscrew the leads from under the associated magnet assembly before entirely removing the perforator or reperforator.

2.07 **Punch and Magnet Assemblies and Backspace Mechanism:** To remove the punch and magnet assemblies and the backspace mechanism as one unit:

(1) Unhook the perforator or reperforator drivelink spring and disengage the drivelink.

(2) Remove the three screws that hold the perforator or reperforator main plate to its associated frame and the one that anchors the unit to the base.

(3) Disengage the eccentric arm, and remove the assemblies and the backspace mechanism as one unit.

Note: If further disassembly of the backspace mechanism is necessary, see 2.24 and 2.25.

2.08 **Ribbon-feed Mechanism (Typing Perforator):** Remove the ribbon and then remove the two mounting screws and lockwashers that hold the ribbon-feed mechanism.

2.09 **Transfer Mechanism (Typing Perforator):** Remove the main triplever spring and then remove the mounting screws, lockwashers, and flat washers that hold the transfer mechanism.

2.10 **Typing Mechanism (Typing Perforator):**

(1) Remove the operating blade from the rocker bail assembly by removing the mounting screws, lockwashers, washers, and shims that hold the mechanism. Disconnect the printing trip link by removing the retaining ring that secures it to the hammer accelerator. Remove the nut, lockwasher, and flat washer from the eccentric on the rocker bail assembly, and disconnect the oscillating drive link. Remove the springs from the hammer accelerator and the function blade lifter.

(2) Remove the screw and washer that fastens the lifter mounting plate to the mounting bar on the frame. Remove the screw and lockwasher that secure the axial mounting bracket to the mounting post on the frame. Remove

the screw, lockwasher, and flat washer that fasten the function box front plate to the main plate. Remove the retaining ring from the eccentric shaft; and remove the lug nut, idler gear, eccentric shaft, and lockwasher, by removing the mounting screw. Remove the three screws, lockwashers, and flat washers, that secure the front plate to the frame. Remove the typing mechanism from the frame assembly.

2.11 **Function Box Mechanism:**

(1) Remove the typing mechanism (see 2.10).

(2) Remove the mounting screw, lockwasher, and flat washer from the front plate. Remove the function box from the typing mechanism.

2.12 **Axial Plate Assembly:**

(1) Remove the correcting drive link spring. Remove the correcting drive link by removing the retaining ring. Remove the retaining ring and disconnect the ribbon guide from the ribbon oscillating lever.

(2) Remove the three mounting screws and lockwashers from the axial plate. Remove the axial plate assembly. After the function box mechanism and axial plate assembly have been removed, the remainder of the typing mechanism is the front plate assembly.

Note: When remounting the axial plate assembly, the rearmost tooth of the rack on the typewheel shaft must mesh with the rearmost tooth space in the axial sector, and the forward tooth on the sector must mesh with the second tooth space on the shaft. There is an extra tooth space on the forward portion of the shaft's rack.

2.13 **Margin Indicator Assembly:** Remove the two screws which hold the switch mounting bracket to the reset camfollower lever assembly bracket.

2.14 **Reset Camfollower Assembly:** Remove the two screws which hold the reset camfollower lever assembly bracket to the frame. Remove the five screws which hold the bracket to the base. Disengage the follower lever assembly from the selector lever assembly.

2.15 **Auxiliary Electrical Switch Assembly:**

(1) Disconnect the switch cable leads from the terminal board located to the right of the perforator drive shafting.

(2) Remove the three screws which hold the auxiliary switch housing to the base.

(3) Slide the housing to the rear to disengage the auxiliary switch gear and lift the assembly off the base.

2.16 **Codebar Extension Mechanism:**

(1) Remove the auxiliary electrical switch assembly (see 2.15).

(2) Disengage the switch shaft from the control cam.

Note: For reassembly purposes, observe how the link guide pin and the trip bar link latch spring which encase it are engaged between the clutch trip bar link and the trip bar link latch.

(3) Remove the screw which holds the left end of the frame to the base.

(4) Slide the frame to the left and disengage the reset lever from the keyboard control selection lever assembly.

Note: When reassembling, be sure that the selection lever assembly straddles the clutch trip bar extension lever, and that the selection lever fork engages its mating pin.

2.17 **Signal Generator Assembly:**

(1) Remove the typing unit if it is present.

(2) Remove the contact box cover, and disconnect the signal line leads from the contact terminals.

(3) Remove the two screws at the front of the signal generator frame, and the screw at the right rear of the signal generator frame, that fasten the frame to the base.

(4) Lift the signal generator carefully, while holding the universal bail back, so that the nonrepeat lever clears and its spring will not be excessively stretched.

Caution: If the nonrepeat lever is pulled down approximately 90 degrees from the normal position, its spring may be stretched beyond limits, which will cause malfunction of the assembly.

2.18 **Keyboard Hood Assembly:** To remove the plastic windows and labels, hood, seal, and seal plates, proceed as follows:

(1) Remove the screws which secure the label windows and instruction labels.

(2) Remove the screws underneath the hood which hold the hood to the hood mounting bracket; and remove the four screws on the top of the hood which hold it to the left and right frame mounting brackets.

(3) Pull the hood forward to remove.

(4) Stretch the rubber keyboard seal off its plates.

(5) Remove the four screws that secure 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 screws at its front.

2.19 **Keyboard Assembly:**

(1) Remove the typing unit, signal generator assembly, and keyboard hood assembly.

Note: It is easier to disassemble and reassemble the keyboard assembly with the base standing on its rear.

(2) Remove the four screws which hold the frame mounting brackets to the front of the base.

(3) Remove the two screws which hold the right and left code lever guide brackets on the top of the base, and the two screws at the extreme right and left of the front bracket which hold it on the base.

(4) When these four screws in front and four screws on the top of the base have been removed, tip up the front of the keyboard assembly and pull it forward, disengaging the function levers.

(5) Note that all function levers are under their corresponding function bails — except the keyboard lock function lever — which fits on top of its function bail.

(6) When reassembling, depress the keyboard lock keylever so that the lock function lever will go in over its bail instead of under as the other function levers should.

2.20 **Contact Box Assembly:**

(1) Remove the contact box cover and disconnect the signal line leads.

(2) Unhook the drive link spring.

(3) Remove the two screws at the front of the front plate which hold the contact box assembly.

(4) Disengage the drive link from the transfer bail and lift off the assembly. It is more economical to replace the entire contact assembly if the contacts need replacement.

2.21 **Transfer Lever Locking Bail:**

(1) Remove the signal generator assembly from the keyboard (see 2.17).

(2) Remove the contact box assembly (see 2.20).

(3) Remove the transfer lever locking bail spring.

(4) To remove the locking bail, trip the clutch and rotate the shaft until the cam is positioned so that the bail can be unhooked and dropped from its guide post. Turn the locking bail clockwise until it is at right angles to the guide, and extract it from the bottom of the frame.

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

2.22 **Signal Generator Shaft Assembly:**

(1) Remove the transfer lever locking bail (see 2.21).

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

(3) Hold the clutch latch lever and the clutch stop lever away and pull back on the 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 code bar bail eccentric follower, the felt washer, and the cam spacer will fall free. These must be repositioned before reassembly.

(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.

2.23 **Keylever Guide Plate:**

(1) Remove the keyboard hood assembly (see 2.18).

(2) Remove the space bar by unscrewing the two shoulder screws that fasten it to the space bar bail.

(3) Remove the screw on the keylever guide plate under the space bar and the two screws in the upper corners of the plate which hold the plate to the frame.

(4) Work the guide plate off the keytops and let them fall free.

(5) To replace the guide plate over the keylevers, flop all the levers to the rear. Place the front end of the guide plate down on the frame; and push the keylevers into their respective holes, starting with the bottom row and proceeding upward.

2.24 **Power Drive Backspace Mechanism:**

(1) Unhook the spring from the latch.

(2) Loosen the screw on the eccentric and pull the eccentric arm off the hub.

(3) Disengage the eccentric arm from its guide between the latch and drive link.

(4) Unscrew the post from between the adjusting link and the front punch frame, and remove the link and latch assembly.

(5) Remove the two screws on the front punch frame and extract the magnet assembly.

2.25 **Manual Backspace Mechanism:**

(1) Unscrew the two screws which hold the plate to the rear punch frame and remove the rake shaft.

(2) Remove the screws and eccentric from the guide bracket on the left side of the punch front plate. Remove the bellcrank assembly.

3. ASSOCIATED BELL SYSTEM PRACTICES

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

Subject	Section
Teletypewriter Apparatus, General Requirements and Procedures	P30.012
Teletypewriter Apparatus, Lubrication, General Information and Routines	P30.011
Teletypewriter Apparatus, Disassembly and Reassembly, General Information and Routines	P30.013
Teletypewriter Apparatus, Preparation of Apparatus for Installation	P33.014
Teletypewriter Tools and Maintenance Supplies	P30.301
Alphabetical Index of 28-type Equipment, Bell System Practices, and Associated 28 ASR Station Drawings	P34.001