33 TELETYPEWRITER SET

INSTALLATION

CONTENTS PAGE

1. GENERAL

1.01 This section provides installation instructions for the 33 teletypewriter set. It is reissued to include 3300 Series Coded Sets and Computer Input/Output Sets. Some minor changes have been made throughout the section, as well as some additions and rearrangement of text. Marginal arrows have not been used to indicate the changes or additions.

1.02 References to left, right, front, or rear, etc, consider the teletypewriter set to be viewed from a position where the typing unit carriage faces up and the typing unit selector mechanism is located to the viewer's left.

1.03 Tools and materials used for teletypewriter set installation are shown in Section 570-005-800TC.

Note: To avoid injury, take special care when working with a teletypewriter set connected to its power supply.

1.04 Leads for the signal line must be furnished by the customer.

UNPACKING

1.05 The teletypewriter set is packed in one carton. Observe all caution and instruction labels on the carton before breaking the seals.

1.06 Cut tape at center and end seams. Open carton and remove the upper filler pads. Remove typing unit carefully to avoid damaging the plastic cover. Take out the remaining carton fillers and the stand (if used).

1.07 The typing unit and subbase are mounted on a shipping pallet by six screws. Remove the six screws, being careful that the typing unit does not fall off the pallet. Once the shipping screws are removed, the typing unit is retained only by the cover.

Note: Retain the forward mounting screw and associated flat washer. This screw is used to secure the typing unit when shipped to another location without its cover fastened in place. The screw and washer may be stored in the TP181104 cable clip (included in bag of hardware with pedestal mounted units) to be mounted on the typing unit frame between the two dashpot mounting screws (Figure 1).

1.08 Remove typing unit from the shipping pallet.

CAUTION: DO NOT TILT THE TYPING UNIT AFTER IT HAS BEEN REMOVED FROM THE PALLET. THE TYPING UNIT FLOATS ON RUBBER ISOLATORS AND MAY PULL LOOSE IF IT IS TILTED.

PREPARATION FOR INSTALLATION

1.09 Remove the tape from across the top of the cover and take out the cables, platen knob, and paper spindle from the paper recess. Unwrap the parts.

1.10 Remove the call control bezel, if used, after removing its two mounting screws. Remove volume control knob or power switch rotary knob, if used, by pulling knob forward. Detach the nameplate (Figure 2) by pulling it down and out. Remove the four front and three rear cover mounting screws.

Note: On Automatic Send-Receive (ASR) Sets, remove the screw from the left rear corner of the tape reader cover.

Gently lift the cover from the subbase.

1.11 Remove the twist tie holding the carriage to the left side frame of the typing unit.

1.12 If a stand is used, remove its two rear panel mounting screws and take panel off. Remove the copyholder, if used, from inside the stand. Remove the bag tied to the stand and place its hardware contents on the bench.

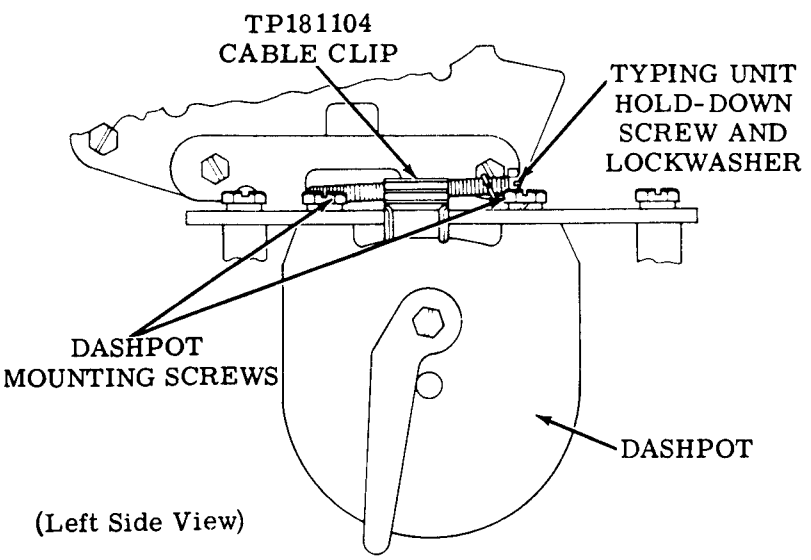


Figure 1 - Typing Unit Hold-Down Screw Storage

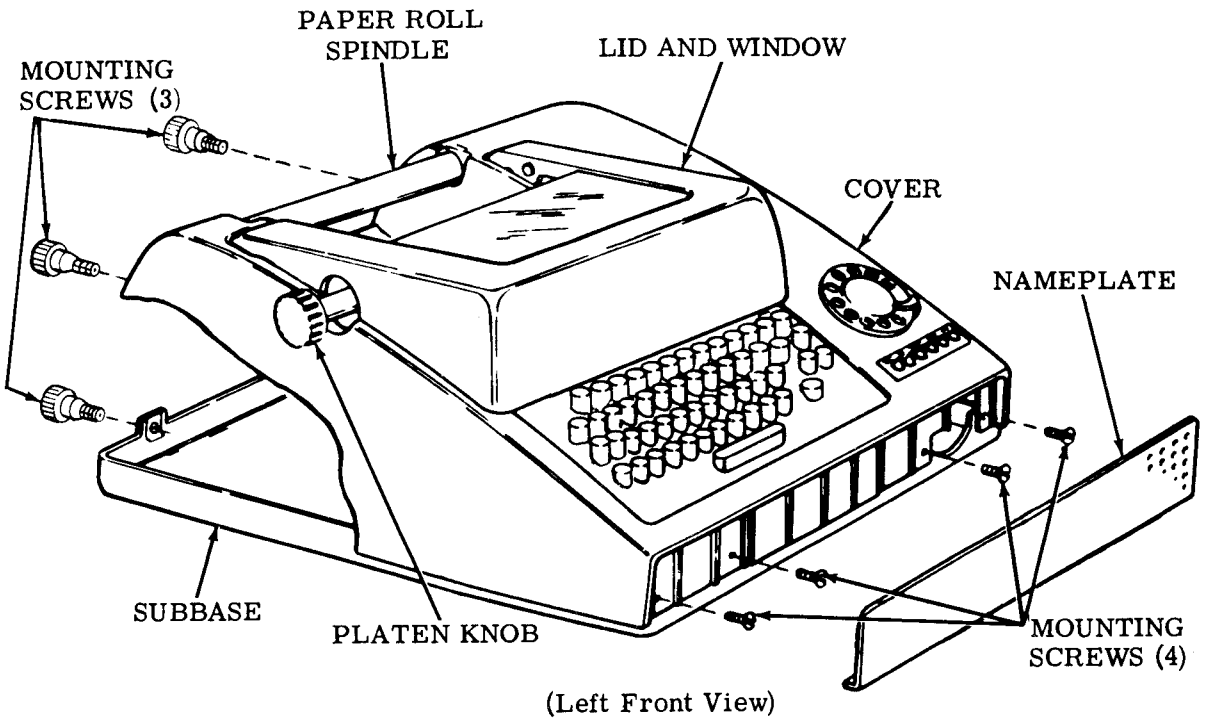


Figure 2 - Cover Mounting

1.13 Use the supplied screws to fasten the data set, if used, to the relay rack.

1.14 The teletypewriter set should be thoroughly lubricated before placing it into service and relubricated after a short period of service. Thereafter, maintain the regular lubrication intervals as required in the appropriate lubrication sections.

2. INSTALLATION

MOUNTING TYPING UNIT ON STAND

2.01 If the teletypewriter set is to be bolted to the floor, remove the front screw in each leg of the stand (Figure 3).

2.02 Install the plug button, included in the bag of hardware, in the forward hole in the bottom of the subbase.

2.03 Place the subbase and typing unit on top of the stand so that its back edges and sides line up with the back edges and sides of the stand. Install the two retaining clips, included in the hardware bag, on the base at the rear (one each end) and snap them in place on the stand. Refer to Figure 4.

2.04 Mount the base to the stand from the bottom with four no. 14Z screws and associated flat washers.

CODING THE ANSWER-BACK DRUM

2.05 To remove answer-back drum for coding, press back and down on the tab portion of the TP180854 brace until it becomes detented in its open position. Lift feed pawl slightly (do not overextend its spring) and remove drum.

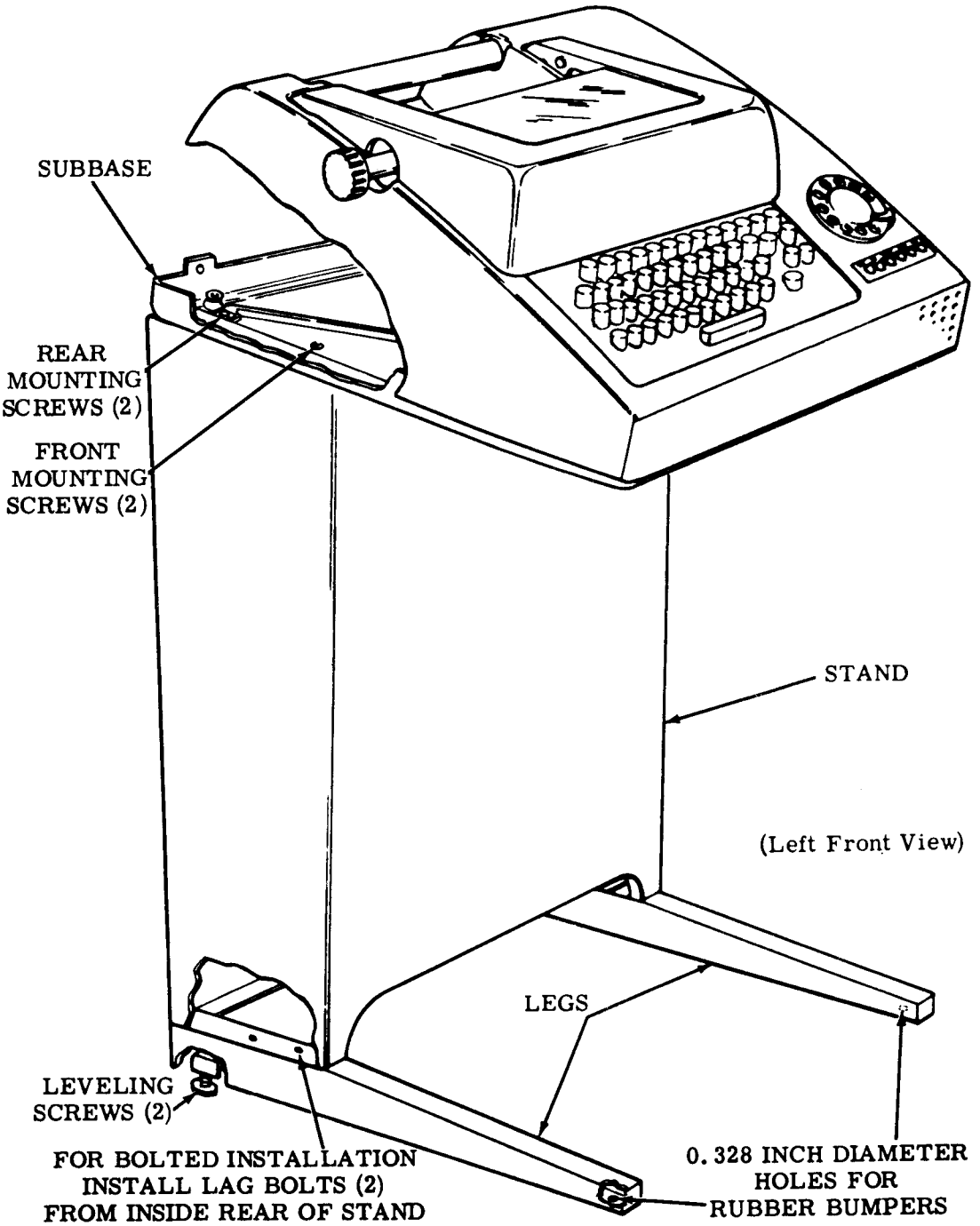


Figure 3 - Stand Leveling and Anchoring and Assembly of Subbase with Typing Unit to Stand

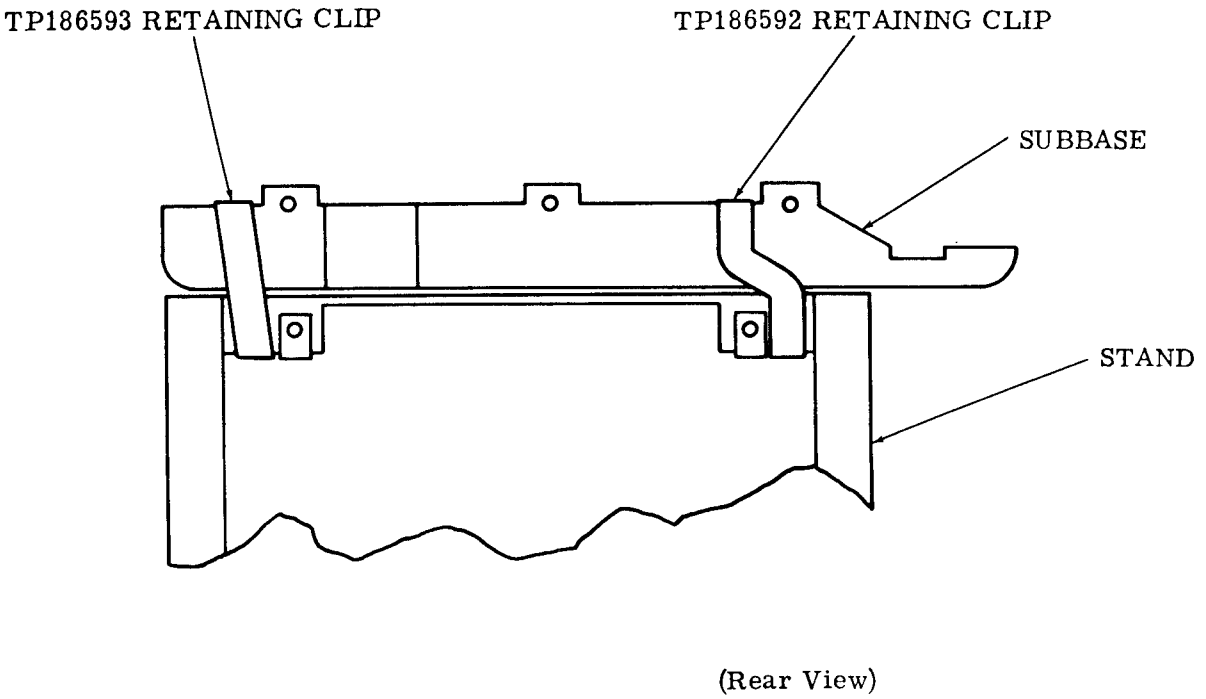


Figure 4 - Installation of Retaining Clips to Subbase and Stand

2.06 Code the answer-back drum in a counter-clockwise direction (Figures 5 and 6), starting with row no. 1.

Note: The ST row is the first row sensed at the beginning of an answer-back cycle. It is coded at the factory for character suppression and must not be recoded.

2.07 A particular character is coded by either retaining or removing tines within a row, as illustrated in Figure 5. A tine may be removed by either of the two following methods:

(a) Method 1: Place the end of a screwdriver blade at the base of a tine in the row previously coded. Press the side of the blade against the top of the unwanted tine until the tine breaks off. Figure 5 illustrates this method — pressure applied to base of row no. 18 and against top of adjacent tine being removed from row no. 19.

(b) Method 2: Place the unwanted tine in the slot of a TP161686 tine tool, or grasp the tine firmly with long-nose pliers. With the tool or pliers held stationary, rotate the answer-back drum back and forth until the unwanted tine breaks off near its base. Do not damage adjacent tines.

Note: If a coding error is made, or for some other reason it is necessary to suppress (erase) characters from the answer-back drum, remove the character suppression tine from the row(s) affected.

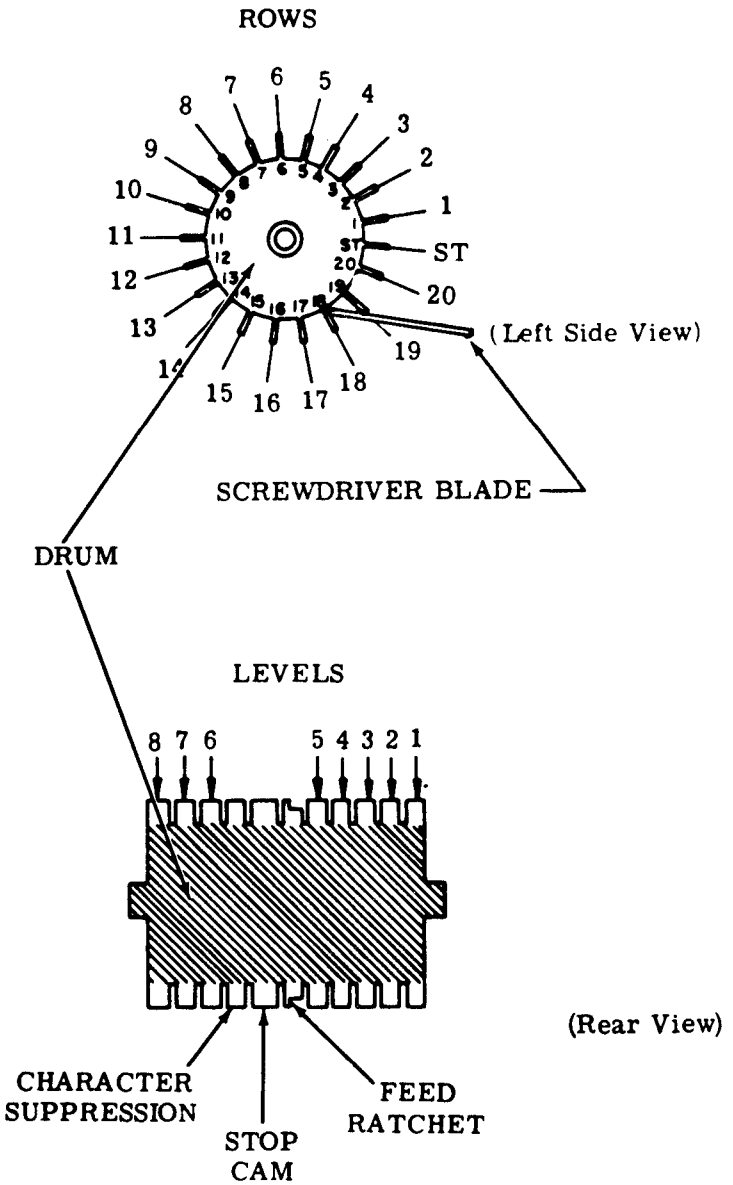
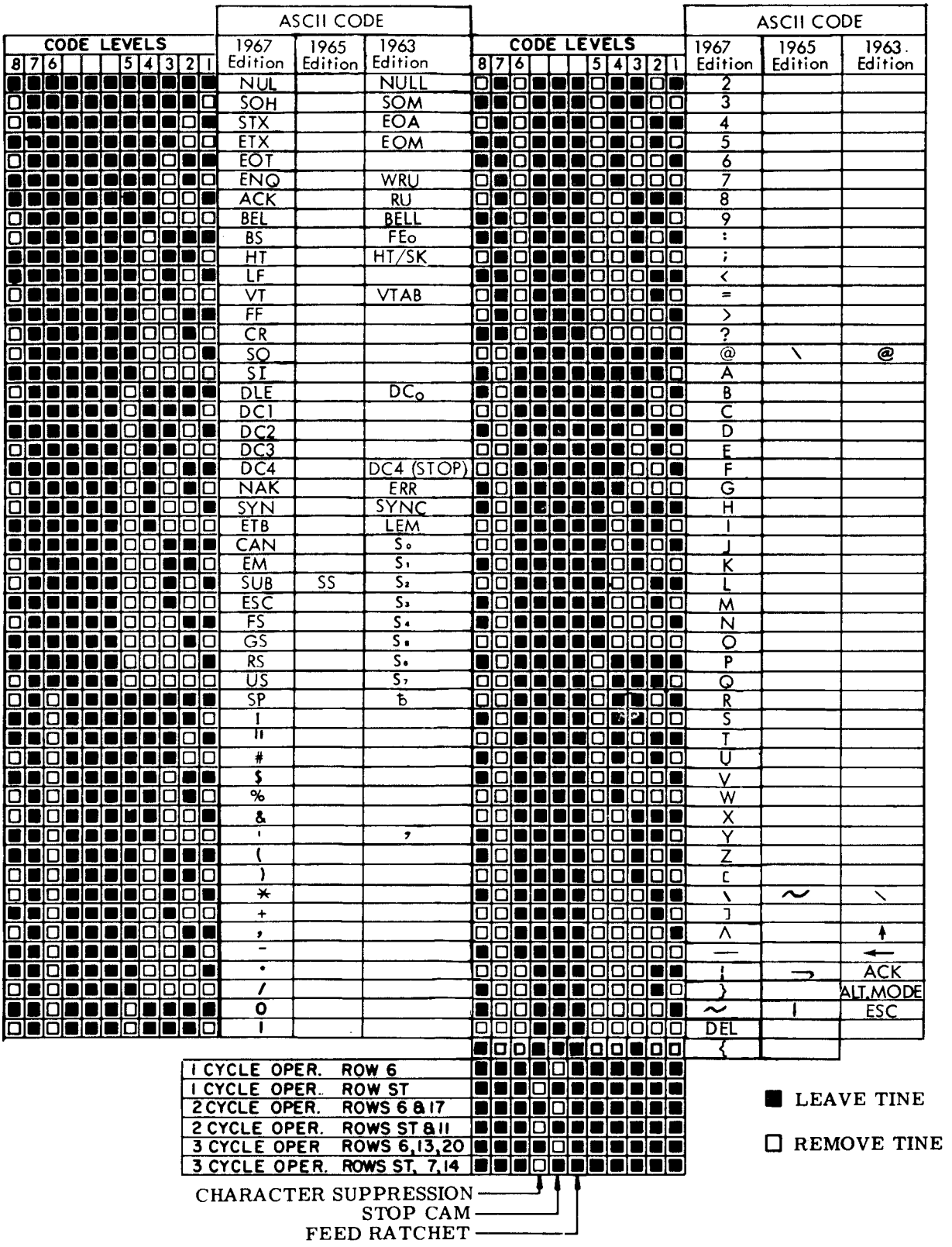


Figure 5 - Answer-Back Drum



Note 1: Blank space indicates no change from latest edition.

Note 2: Codes shown are for even parity operation --- for nonparity, remove eighth level tine.

Figure 6 - Answer-Back Drum Coding

2.08 The length of an answer-back sequence can be varied either by removing the stop cam tine(s) and/or the character suppression tine(s).

(a) For short sequences, code the drum for either 2- or 3-cycle operation by removing the appropriate tine(s) as indicated in Figure 6.

(b) Removal of the character suppression tine from any row prevents transmission from the answer-back mechanism. To shorten the answer-back sequence, remove the suppression tine from any unused row(s) after the end of a message.

Note: Do not remove the character suppression tine from the last row of each segment of the answer-back drum — row no. 20 for answer-back drums coded for 1-cycle operation — on sets used in systems where a response to each answer-back activation signal must be obtained. The last row can be coded with any other character that is compatible with the particular system.

2.09 The number of rows available for message coding is shown below for 1-, 2-, or 3-cycle operation.

CYCLE OPERATION	TOTAL ROWS	AVAILABLE ROWS
1	21	20
2	10 (11)*	9 (10)*
3	7	6

*Alternately one, then the other.

2.10 The number of rows available for actual station identification is less than shown above, because each coded message should begin and end with CARRIAGE RETURN and LINE FEED (this may be altered in specific applications). This assures that the transmitted message will appear at the beginning of a line of the receiving teletypewriter set and eliminates overprinting.

2.11 In switched network service, the station identification for 1-cycle operation may not exceed 14 characters, including spaces. The answer-back drum should be coded as follows.

ABBREVIATION	KEY TO ABBREVIATION
ACK	Acknowledge
CR	Carriage Return
LF	Line Feed
RO	Rub Out
SP	Space
SUP	Character Suppression

(a) Example 1:

SUP CR LF RO
TELETYPE SP NILES CR LF ACK

Company City

Station Identification
(Maximum-14 characters)

Note: In this system, the ACK character code combination must be the final significant character code combination in the coded answer-back message.

(b) Example 2:

SUP CR LF RO

ERIE SP BOST CR LF ACK SUP
SUP SUP SUP SUP

Company City

Station Identification
(Less than maximum
number of characters)

Note: If the station identification is less than the maximum of 14 characters in length, then the remaining rows on the answer-back drum must be coded with the character suppression code according to Example 2 above.

2.12 To replace the answer-back drum, place the TP180854 brace in its detented open position, and lift feed pawl (do not overextend its spring). Replace drum with its shaft firmly seated in the contact block slots. Release feed pawl and TP180854 brace. Rotate answer-back drum to assure proper seating of its associated parts. Check that the contact wires are located in their proper slots.

ELECTRICAL CONNECTIONS AND PRE-SERVICE PROCEDURES

CAUTION: MAKE SURE POWER CORD IS NOT CONNECTED.

33 Sets

2.13 Refer to the appropriate wiring diagrams packed with the teletypewriter set.

2.14 Connect the signal line leads (supplied by customer) to the terminals on the terminal board at the rear of the call control unit as indicated in the wiring diagram.

2.15 Connect power cord to an ac source, 115 volt 60 Hz.

2.16 Check DASHPOT ORIFICE (Spacing Area) adjustment, since altitude may have some effect on dashpot operation. See Section 574-122-700TC.

2.17 Sets equipped with an answer-back mechanism must be tested for proper response to a predetermined call character such as WRU. The following procedure is recommended for performing this test.

(a) Use a predetermined call character such as WRU, to call in the newly installed set.

(b) The set should establish the connection and automatically transmit the answer-back message.

Note: Set will not respond if the suppression tine has been removed from the last row. See 2.07 (b).

(c) If proper response is not obtained, check and correct the answer-back area adjustments (Section 574-122-700TC), beginning with those of the following list.

DRUM POSITION
TRIP LEVER CLEARANCE
FEED PAWL POSITION
FEED LEVER POSITION
"HERE-IS" BELLCRANK POSITIONING
TRIP BAIL POSITIONING
CHARACTER SUPPRESSION CONTACT
WIRE GAP

3300 Series Coded Sets

2.18 The 3300 Series Coded Sets are shipped from the factory with the automatic carriage return-line feed feature in the typing unit disabled by means of clips. The clips mount over slots in the TP180950 front tie bar. To enable this feature on friction feed sets remove the clip over slot A. To enable this feature on sprocket feed sets remove the two clips, in slot A and slot L.

Note: Slot A is not stamped on the function casting. Refer to 574-122-700TC for orientation.

2.19 Connect the signal line leads (supplied by customer) to the terminals on the terminal board at the rear of the call control unit as indicated in the wiring diagram.

2.20 The 3300 Series Coded Sets are shipped from the factory with the even parity option installed in the keyboard. The customer may:

(a) Retain even parity, or

(b) Wire the keyboard for the 8th bit always marking, or

(c) Wire the keyboard for the 8th bit always spacing.

The wiring options are installed by connecting wires to terminals at the right front of the keyboard and at the left contact block (see Figure 7). The options are shown in the Keyboard Wiring Options Table.

2.21 Check the DASHPOT ORIFICE (Spacing Area) adjustment, since altitude may have some effect on dashpot operation. See Section 574-122-700TC.

2.22 Test the answer-back operation as described in 2.17.

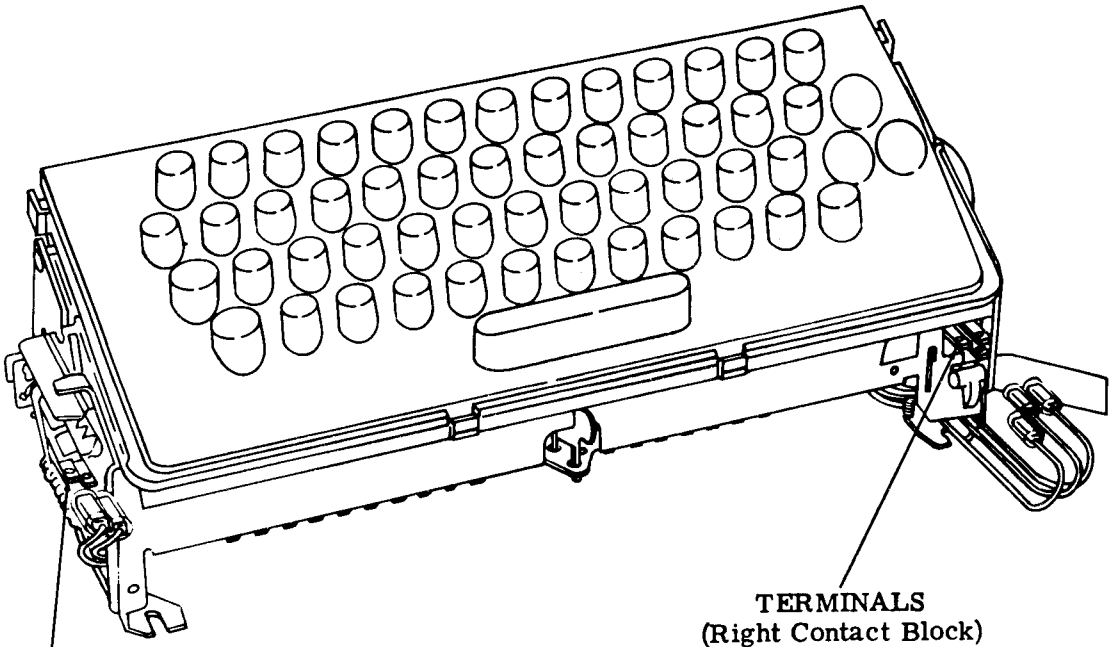
Computer Input/Output Sets

2.23 Check DASHPOT ORIFICE (Spacing Area) adjustment, since altitude may have some effect on dashpot operation. See Section 574-122-700TC.

2.24 Low Tape Contact Adjustments:

(a) Operating Arm Adjustment (Figure 8): Replace cover. With tape spindle in place, there should be 5/16 inch to 7/16 inch clearance between operating arm and tape spindle. To adjust, bend operating arm.

(b) Operating Arm Clearance (Figure 9): Remove cover. The operating arm should have a minimum of 1/8 inch clearance



Note: Push the terminals on the contacts with long nose pliers. It should be possible to install the parity options without removing the keyboard.

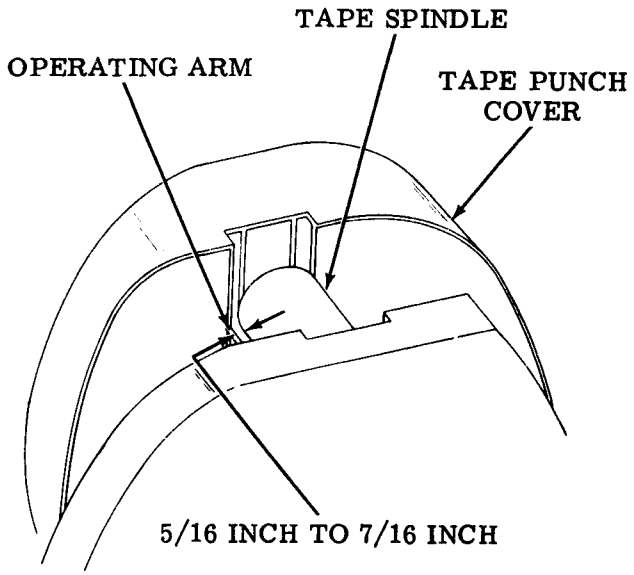
Figure 7 - Location of Terminals on Keyboard for Parity Options

KEYBOARD WIRING OPTIONS TABLE

OPTION	LEAD 1 Left Contact Block Color: Red-Green	LEAD 2 Left Contact Block Color: Green	LEAD 3 Right Contact Block Color: Green	LEAD 4 Right Contact Block Color: White-Slate
Even parity	ON	OFF	OFF	ON
8th bit Always mark	OFF	ON	ON	ON
8th bit Always space	Either Lead 1 or Lead 2 ON or both OFF		ON or OFF	OFF

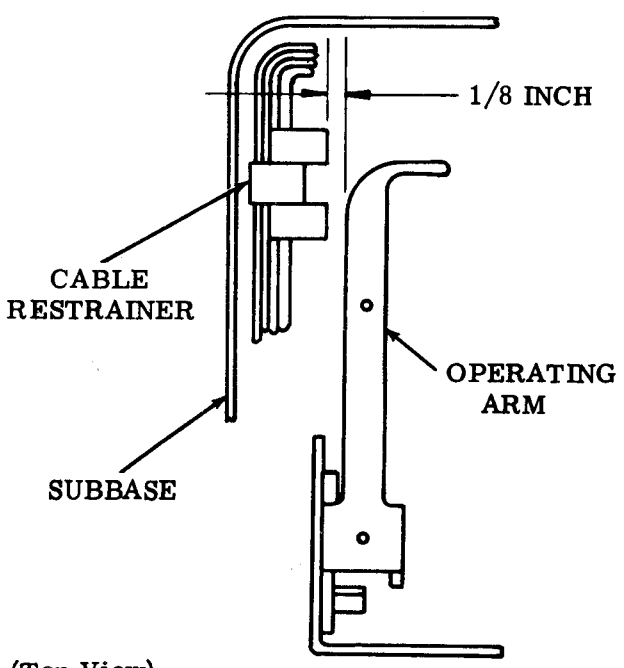
Note 1: Tape and store unused leads.

Note 2: Reference: 9334WD



(Left Rear View)

Figure 8 - Operating Arm Adjustment

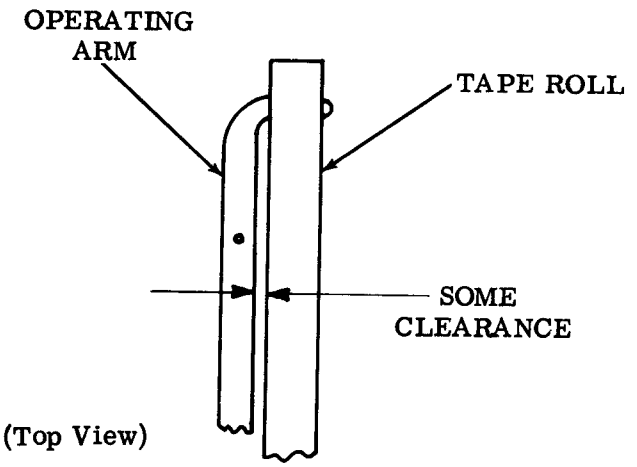


(Top View)

Figure 9 - Operating Arm Clearance

between the left edge of the operating arm at the closest point and the cables and cable restrainer at the left rear corner of the set. Gauge by eye. To adjust, bend switch bracket and/or reposition cables and reform cable restrainer.

(c) Operating Arm Clearance (Figure 10): Install cover. The tape roll should not touch the operating arm at any point other than the activating portion of the arm. To adjust, bend switch bracket and/or reposition cables and reform cable restrainer.



(Top View)

Figure 10 - Operating Arm Clearance

2.25 Air Deflector (Motor Area) Adjustment:

Note: This adjustment applies to 50 Hz I/O sets only.

(a) There should be at least 1/8 inch clearance at closest point between air deflector and motor fan. To adjust, position and/or bend air deflector.

(b) There should be some clearance between air deflector and the low paper alarm sensing rod so that the air deflector does not interfere or restrict the total travel of the sensing rod. To adjust, position and/or bend air deflector.

2.26 Test the answer-back operation as described in 2.17.

2.27 Connect power cord to ac source, 115 volt, 60 Hz or 50 Hz.

PLACEMENT

A. Without Stand

2.28 If a stand is not included, place the teletypewriter set on the surface where it is to be used.

B. With Stand

2.29 Figure 3 illustrates the facilities for leveling and anchoring the stand.

2.30 Place the partially assembled set where it is to be used. If the set rocks to one side or another, tip it slightly and reposition the leveling screws.

Note: Reaction to the carriage returning to its left position may cause early design teletypewriter sets to move across the floor toward the left. To correct this, either add weight to the stand, arrange to have it bolted to the floor, or drill one 0.328 inch diameter hole into each leg and install TP182285 rubber bumper in each leg.

2.31 If the teletypewriter set is to be bolted to the floor, place stand at the desired location and drive lag bolts into the floor through the front holes in the legs.

2.32 Place the relay rack inside the stand.

3. FINAL ASSEMBLY

GENERAL

3.01 Replace the back panel onto the stand, if used, using the removed screws.

Note: Before replacing an ASR cover, remove the retaining clip (early design units only) from the tape reader upstop screw (Figure 15). Also, prepare the punch on 3300 Series Coded Sets for manual or automatic operation as described in 6.01.

3.02 Replace the cover over the typing unit and onto the subbase (Figure 2). Take care that all seams are tight and that keyboard pushbuttons, dial, etc, are properly aligned. Insert and tighten the cover mounting screws removed during PREPARATION FOR INSTALLATION.

Note: On an ASR Set, insert and tighten screw at left rear corner of tape reader cover.

3.03 Replace the nameplate making sure that the formed lip fits around the bottom of the flange on the cover, that the top edge is behind the small lip on the cover, and that the bottom of the nameplate rests on top of the two small projections on the subbase.

3.04 Replace the volume control knob or the power switch rotary knob, if either is used, by positioning and pushing it rearward.

3.05 Position the bezel, if used, on the cover over the call control unit. Insert and tighten its two mounting screws.

3.06 On friction feed typing units, align the platen knob with the flat on the left side of the platen. Push knob in place. On sprocket feed typing units, install platen knob on left side of platen. Fully seat knob to the right and secure it with the screw provided.

RIBBON INSTALLATION

3.07 Figure 11 illustrates ribbon threading.

3.08 Raise the cover lid. Pull both spools off the friction spindles.

3.09 Engage the hook at the end of the ribbon in the hub of the empty spool; if there is no hook, pierce the end of the ribbon over the point of the arrow in the hub of the empty spool. Wind a few turns of ribbon onto the empty spool in the direction indicated by the arrow, and make sure that the reversing eyelet has been wound upon the spool.

3.10 Place the spools on the shafts in such a manner that the ribbon feeds to the rear from the right side of the right spool and from the left side of the left spool. Turn each spool slightly until the spool driving pin engages the hole in the spool. Guide the ribbon around the right vertical post and through the slot in the reverse arm. Place the ribbon in the ribbon guide behind the typewheel. Guide the ribbon through the left side of the reverse arm and around the vertical post. Rotate the spool to take up any slack.

PAPER OR FORM INSTALLATION

A. Friction Feed

3.11 A friction feed teletypewriter set accommodates a standard roll of paper 8-1/2 inches wide and 5 inches in diameter. Figure 12 illustrates paper threading for a friction feed typing unit.

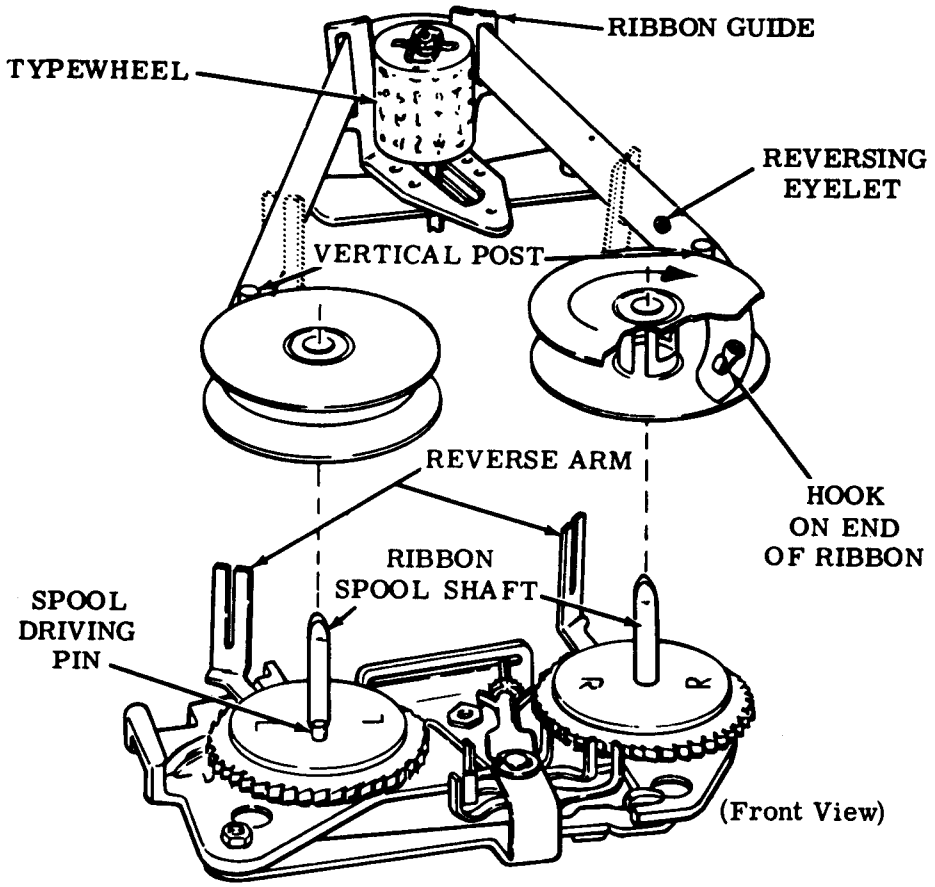


Figure 11 - Ribbon Threading

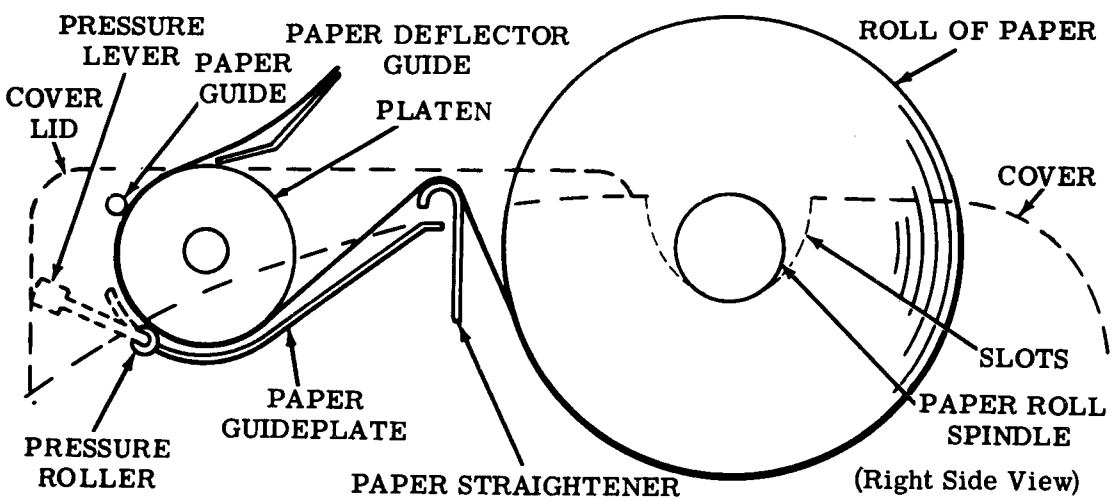


Figure 12 - Paper Threading — Friction Feed

3.12 Insert the paper roll spindle into the roll of paper so that an equal length of spindle is exposed at either end of the roll. Place roll into the cover recess with the ends of the spindle resting in the slots so that the paper will unroll from the bottom.

3.13 Raise the cover lid. Release pressure roller tension by moving the pressure lever forward. Prepare a smooth leading edge of paper. Pass paper over paper straightener, under platen, and under paper guide. Straighten paper and reapply the pressure roller tension. Close the cover lid.

Note: When typing units are stored or out of service for an extended period of time, release the pressure roller tension.

B. Sprocket Feed

3.14 A sprocket feed teletypewriter set accommodates forms 8-1/2 inches wide and of various lengths. The forms are normally passed to the typing unit from a conveniently located supply at the rear of the set.

3.15 Place the paper roll spindle into the paper recess of the cover so that it rests in the slots provided.

3.16 Figure 13 illustrates form threading for a sprocket feed typing unit.

3.17 Form Threading: Raise the cover lid. Pass the leading edge of the first form under the paper roll spindle. Thread the form under the low-paper and paper-out arms, if used, and between the platen and paper guideplate. Guide the form squarely into the platen and rotate the platen until the form is advanced by the sprocket pins. Lift up the wire guide and continue to rotate the platen until the form is under the wire guide and positioned for the first typing line. Lower wire guide and cover lid. After the first form is fed out, lift the form over the paper roll spindle to separate the incoming forms from the outgoing forms.

3.18 Figure 14 illustrates the zeroizing position of the platen drive mechanism for one cam lobe operation. For platen drive mechanisms using more than one cam lobe, see the CAM ZERO POSITION (Platen Drive Area, Sprocket Feed Mechanism) adjustment in Section 574-122-700TC.

3.19 Zeroized Position: Position a form at its first printing line in the typing unit. Depress the zeroizing button and rotate the pulley until the index plate is lined up with the pointer. Release the zeroizing button.

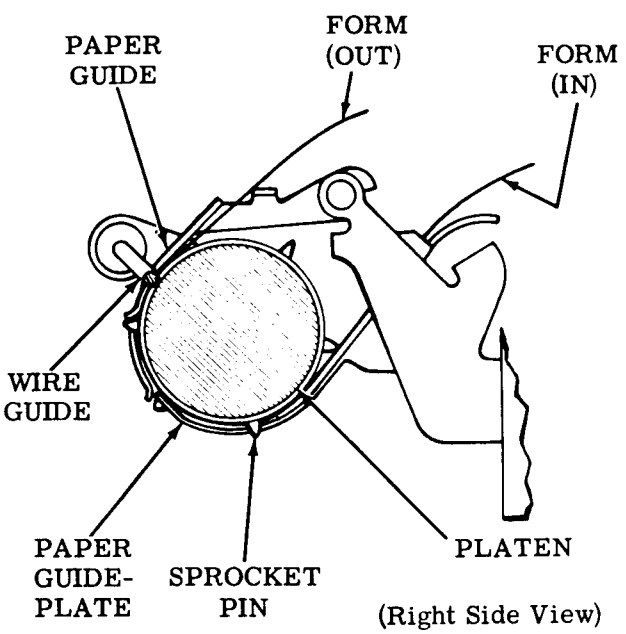


Figure 13 - Form Threading — Sprocket Feed

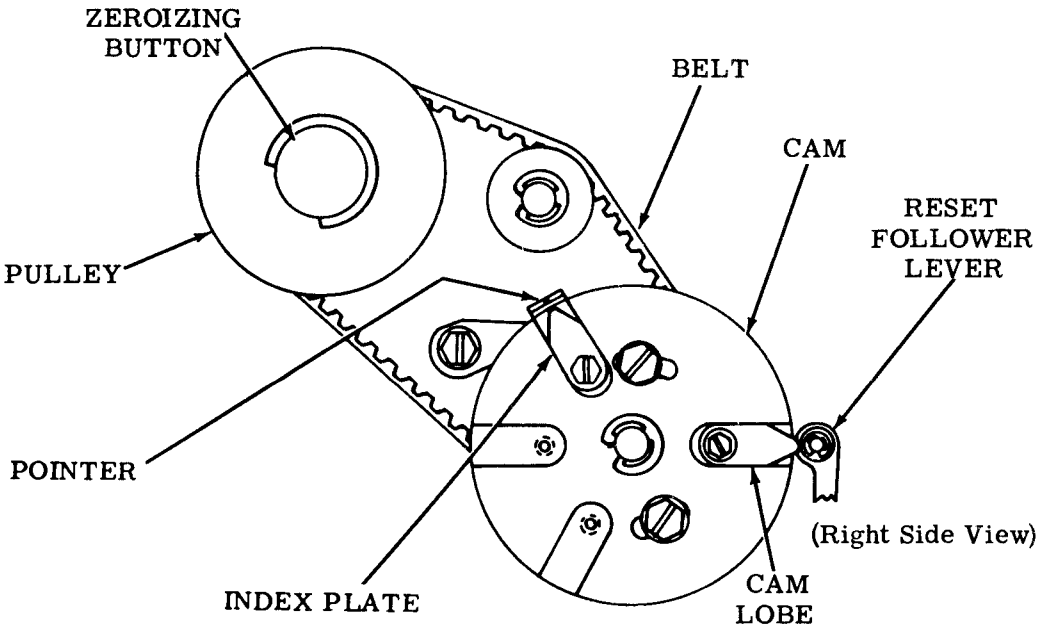


Figure 14 - Zeroizing Position of Platen Drive Mechanism — One Cam Lobe Operation

Note 1: To initiate the action to feed out a form, depress the CTRL and FORM keytops. The form-out mechanism will not respond to successive commands to feed out a form. At the end of a form feed-out, advance the form at least one line before issuing a second form-out command.

Note 2: The typing unit, in an ASR Set, operates one cycle behind the tape reader. Thus, a nonprint fill in code selection is required immediately after each form-out selection for proper set operation.

4. TAPE READER

4.01 A retaining ring or clip (Figure 15) is assembled (on early design units) to the upstop screw to prevent the sensing pins from being dislodged during shipment. This retaining clip must be removed before placing the tape reader in operation.

4.02 When inserting tape into the tape reader prior to operation, allow enough slack in the tape between the tape punch and the reader so that the reader lid can be easily closed.

CAUTION: THE TAPE READER OPERATES UNDER HIGH VOLTAGE. PRECAUTIONARY MEASURES SHOULD BE TAKEN WHENEVER POWER TO THE TAPE READER IS TURNED ON. HIGH VOLTAGE FROM THE POWER PACK WILL CONTINUE UNTIL APPROXIMATELY 10 SECONDS AFTER THE TAPE READER HAS BEEN DISCONNECTED.

4.03 Do not place the control lever beyond the STOP position while the tape reader is operating under power. The reader must come to a complete stop before placing the control lever in the FREE position.

5. POWER PACK ASSEMBLY

5.01 The 3300 Series Coded Sets and Computer I/O Sets have the power pack for the tape reader mounted in the call control unit. Therefore no installation is required. For 33 sets, the reader power pack mounts inside the stand, underneath the base. Two clips attach the power pack to the stand at the left front corner when the set is viewed from the rear. See Figure 16.

5.02 The auxiliary ASR power supply is mounted in the enclosure of the stand. It is used in the off-line mode to provide 115 volts

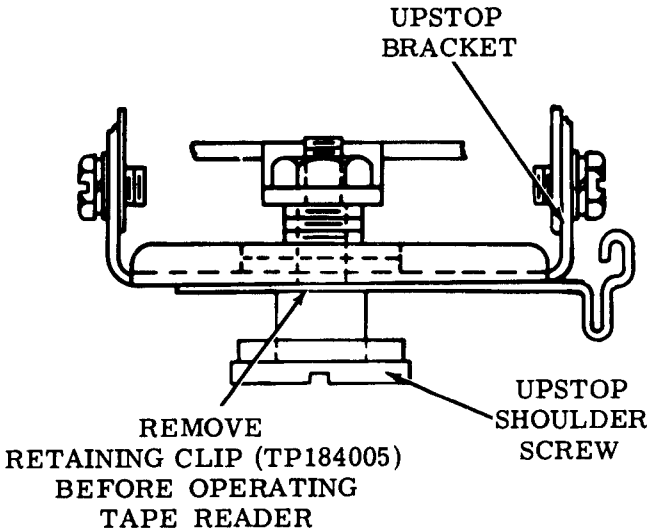


Figure 15 - Tape Reader Upstop Bracket Retaining Clip

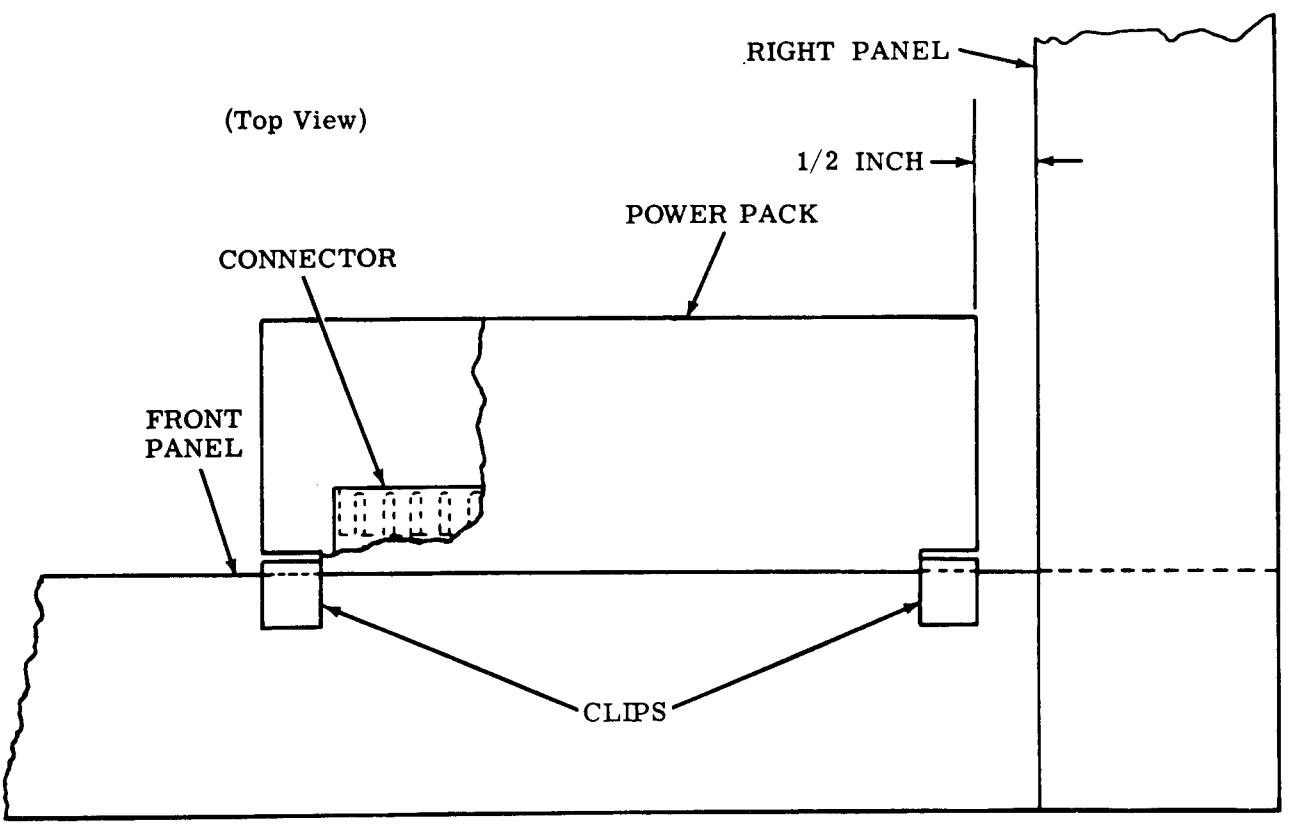


Figure 16 - Power Pack Assembly

on the tape reader, answer-back, and distributor contacts when a tape reader is used. When the tape reader is not used, a plug with a jumper wire is inserted in position R2 at the rear of the call control unit.

6. TAPE PUNCH

6.01 The 3300 Series Coded Sets are shipped with the tape punch having two disabling clips installed in slots A-O and A-8. If manual operation of the tape punch is desired, retain the two clips; if automatic operation is desired, remove the two clips. See Figure 17. The 33 I/O sets do not have clips, but have either a manual or an automatic tape punch.

6.02 Figure 18 illustrates the installation of a tape spool in a tape roll.

(a) For 2-inch inside diameter tape rolls, use the tube-type spool.

(b) For 1-inch inside diameter tape rolls, use the 2-piece spool.

(c) Place the tape and spool into the tape punch cover so that the leading edge of the tape is at the top of the roll.

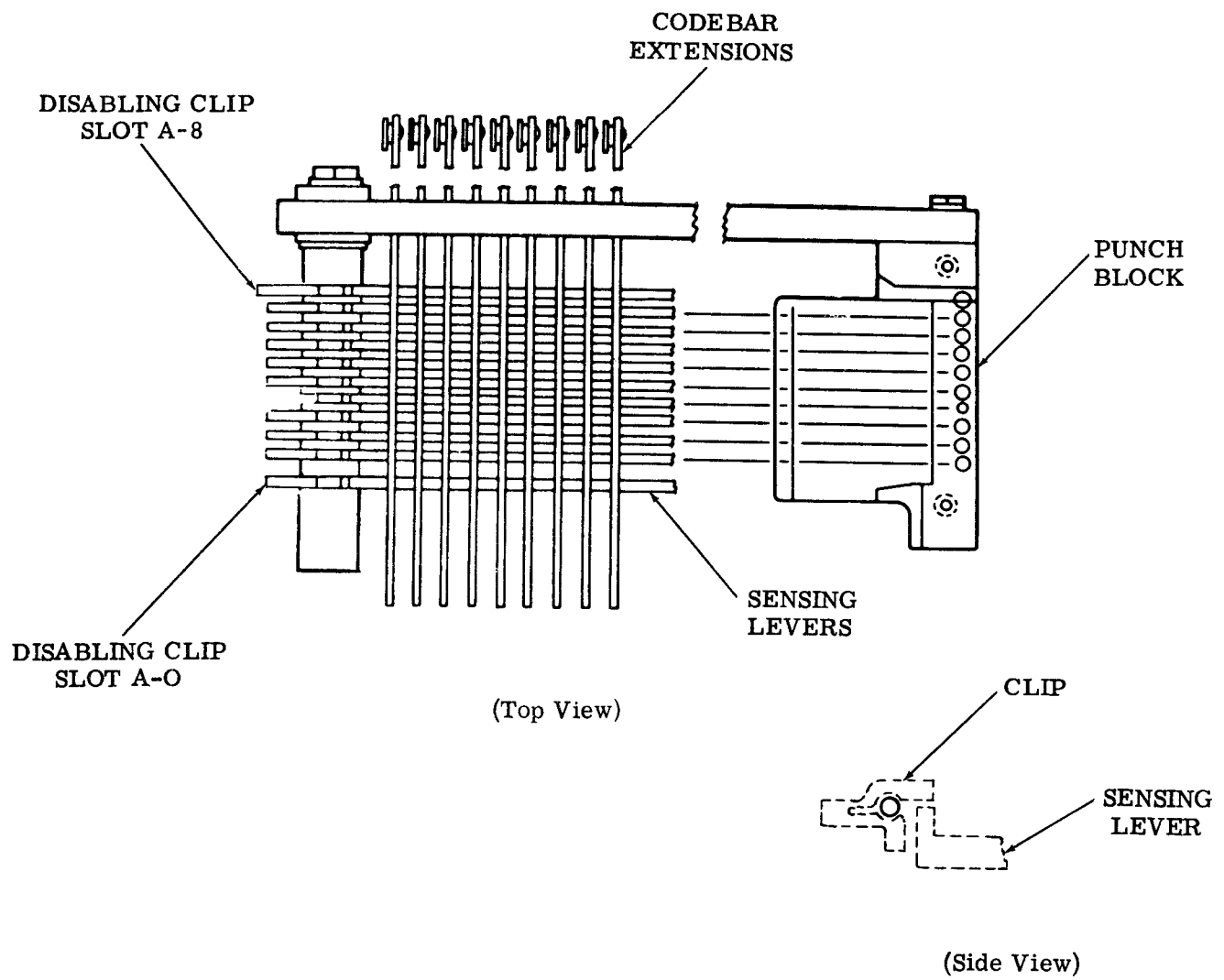


Figure 17 - Tape Punch Disabling Clips

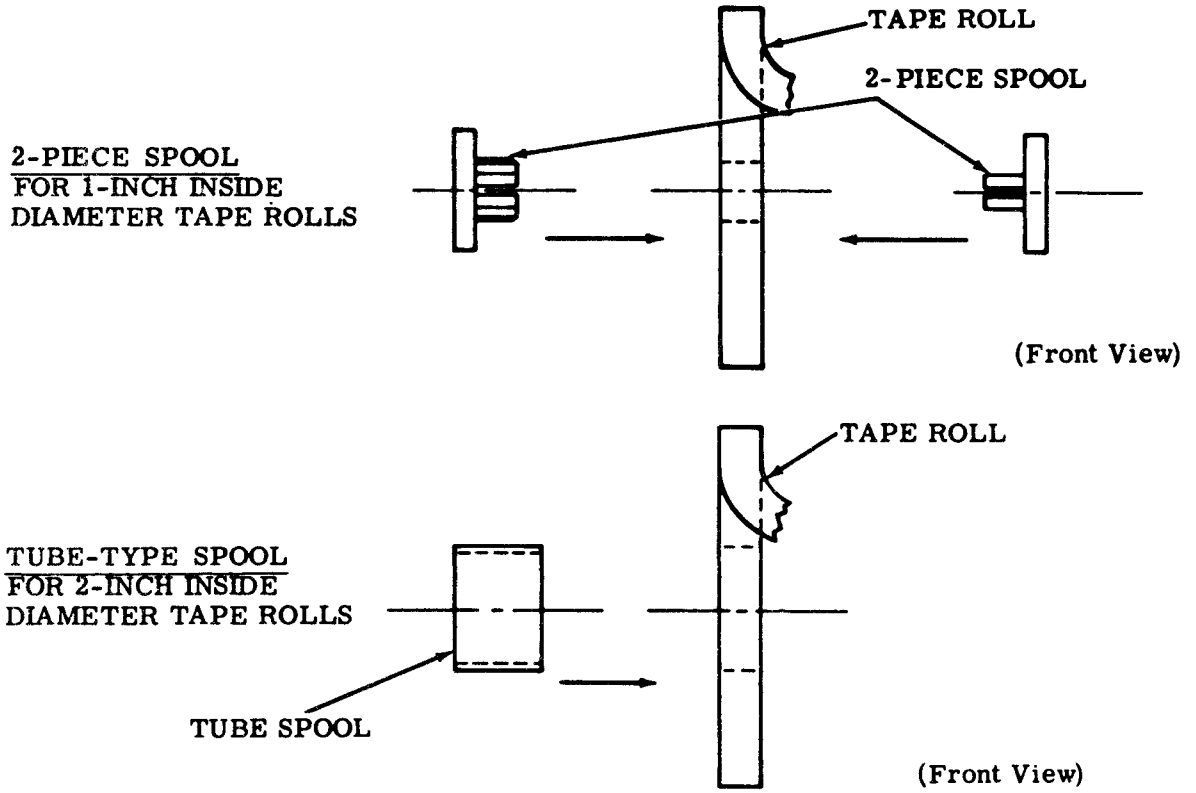


Figure 18 - Tape Roll and Tape Spool Assembly

6.03 Figure 19 illustrates the chad box installation.

(a) Assemble the chad box under the tape punch pan by inserting the back of the flanged surface between the stand and the typing unit subbase.

(b) Push the chad box toward the rear until the bent surface located at the front of the chad box engages the stand. An embossing located on the front bottom surface of the flanged surface engages an oblong hole in the stand and holds the chad box in place.

(c) To empty the chad box, lift the front slightly and pull the chad box toward the front until it becomes disengaged.

7. RESHIPMENT

7.01 If the teletypewriter set is to be shipped to another location without its cover, the following must be done to avoid damage to the typing unit.

(a) Remove subbase and typing unit from the stand.

(b) Remove the plug button from the forward mounting hole in the bottom of the subbase.

(c) Secure typing unit to the base by inserting and tightening the screw and washer previously stored in the TP181104 cable clip (1.09). Do not damage the typing unit by overtightening the screw.

(d) Store the removed plug button in the TP181104 cable clip.

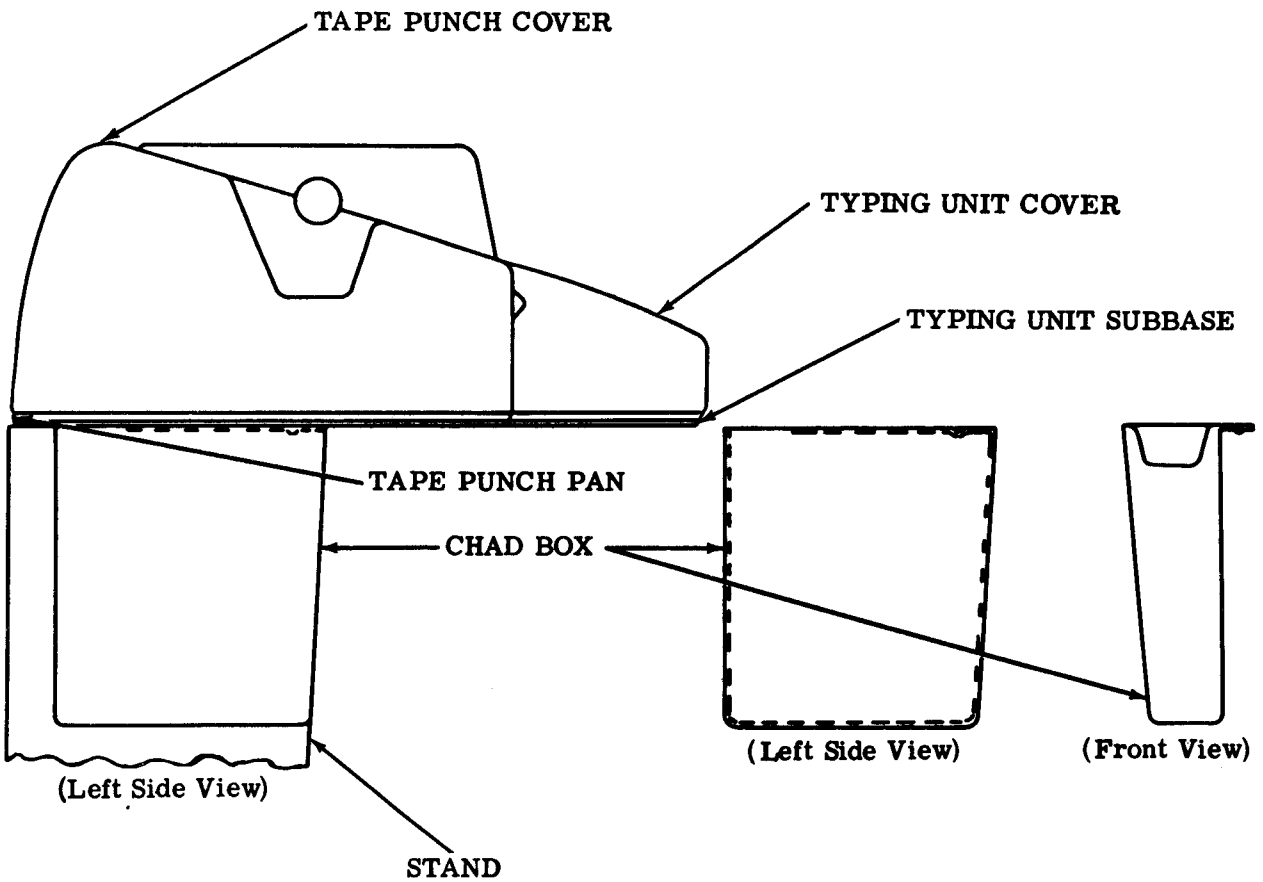


Figure 19 - Tape Punch Chad Chute Assembly

8. OPTIONAL FEATURES

A. Copyholder

8.01 With the line guide facing forward (Figure 20), insert the rear mounting tabs in the lower mounting slots. Pivot the copyholder to align the front mounting tabs above their mounting slots. Push copyholder downward until the tabs are fully seated.

B. Busy Circuit

8.02 The teletypewriter set is normally wired in a "don't answer" mode of operation for low-paper alarms and out-of-service. In this mode, the set will not answer an incoming call. To wire the teletypewriter set to indicate "busy" instead of not answering, move the black-slate wire from terminal no. 2 to terminal no. 4 on the ringer terminal strip.

C. Hand Receiver

8.03 To install the hand receiver, connect the two white wires to terminals no. 5 and no. 6 on the 9-point terminal board.

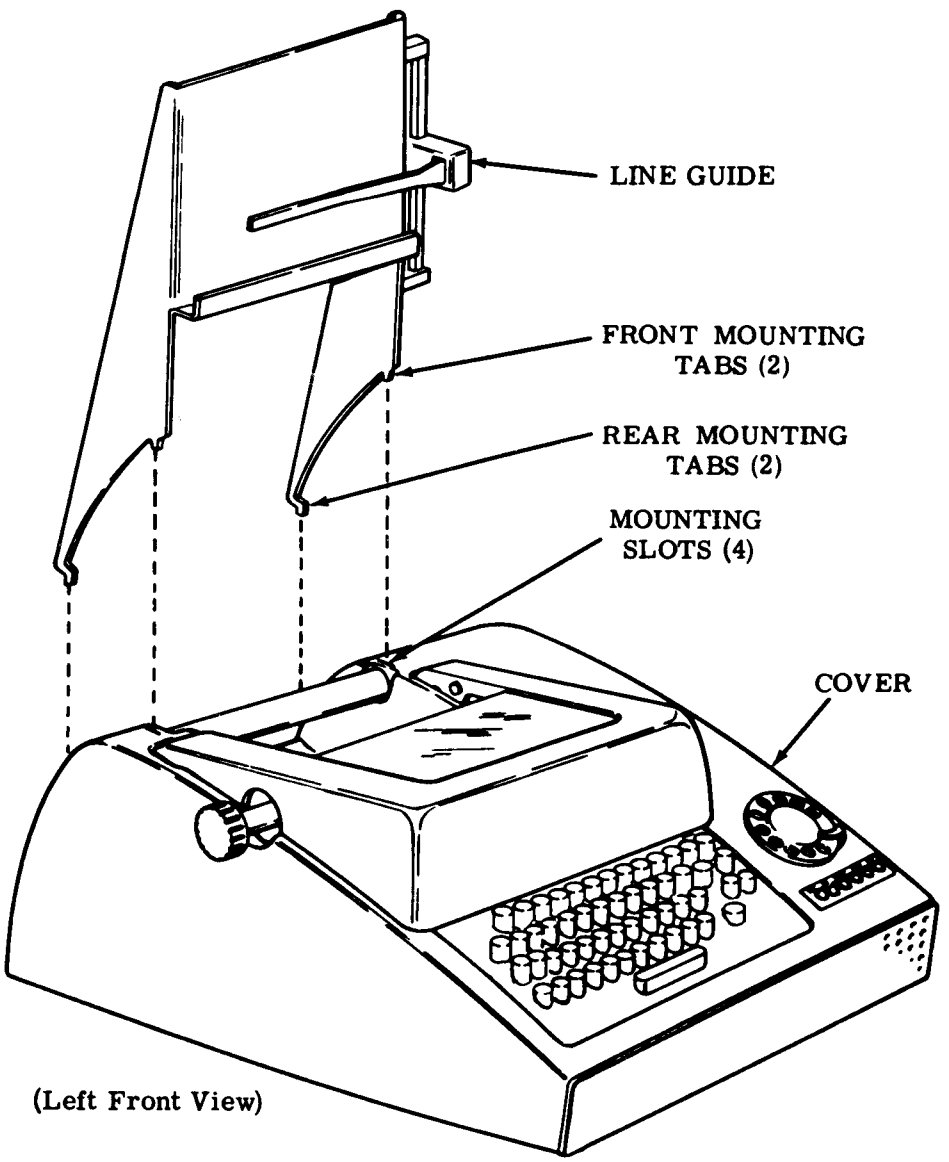


Figure 20 - Copyholder