

GENERAL INSTRUCTIONS FOR INSTALLING TELETYPE MODEL 28
AUTOMATIC SEND-RECEIVE SET (ASR)

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1. GENERAL

a. The Model 28 Automatic Send-Receive Set is self-contained, and may be used as a complete message originating center, as well as receiving page printer set. A manual control permits any one of the following operations:

(1) Manual Control in Keyboard (K) Position. - Operation of the keyboard will cause transmission directly to the line at a maximum line speed dependent upon the motor gears used. The page printer will produce a monitor copy of what is being transmitted.

(2) Manual Control in Keyboard - Tape (K-T) Position. - Operation will be similar to that achieved when the manual control is in keyboard position. In addition, a tape will be produced.

(3) Manual Control in Tape (T) Position. - Operation of the keyboard will produce tape only, and at a rate higher than when the manual control is in the K-T position. While tape is being perforated, the typing unit can be receiving messages from another station. Or, tape produced locally can be used to transmit at maximum line speed.

b. Essentially, a complete set consists of the following basic Model 28 Units, some of which may be provided with various accessories for different service requirements:

- (1) Automatic Send-Receive Cabinet - LAAC See Paragraph 1.e. below.
- (2) Electrical Service Unit - LESU
- (3) Keyboard Perforator Transmitter - LAK/LPE, LTPE, LRPE or LPR
- (4) Typing Unit - LP
- (5) Motor Unit - LMU
- (6) Transmitter Distributor Unit - LAXD, LBXD, LCXD, LXD or LX
- (7) Base for Transmitter Distributor Unit - LCXB
- (8) Two (or three) sets of gears (depending on the apparatus to be installed in the cabinet) must be ordered as separate items for desired speed of operation. Refer to appropriate Teletype Parts Bulletins for part numbers.

c. Instructions for installing an Auxiliary Typing Reperforator Unit (LPR), Base (LRB) and Motor Unit (LMU) in ASR Cabinet (LAAC) are also included in this specification.

d. Instructions for installing a Multiple Wire Distributor LD8 in an ASR Set equipped with an LXD Transmitter Distributor Unit are covered in Teletype Specification 50019S.

NOTE

The "Transmitter Distributor Unit" and "Base" are referred to frequently in the following paragraphs of this specification. For simplicity, the terms "TD Unit" and "TD Base" are being used instead in all but the main paragraphs.

e. This specification contains instructions for removing and installing the housing for the TD Unit when the housing is part of the cabinet as furnished. For applications where the housing for the TD Unit is ordered separately as a modification kit, refer to Teletype Specification 5885S (furnished with each kit) for installation information.

f. The double asterisks (**) denote a suffix which indicates the color of the paint finish.

g. For part numbers referred to in this specification, refer to appropriate Teletype Parts Bulletin.

2. INSTALLATION (FIGURES 1 THROUGH 11)

NOTE

Unpack all components with care. Observe all caution labels and instructions. All bags and loose parts should be kept with their associated components until used in the installation. Unless otherwise specified, all references to direction are made from the operator's position in front of the set. If necessary, cut relief notches in the silencing pads in the cabinet in order to eliminate any pad interferences. Do not pull the pads from their mounted surface - score the area with a sharp knife or razor blade and pull out the interfering area only.

a. CABINET (FIGURES 1 AND 2)

(1) Installation

(a) Unpack cabinet being careful not to mar the finish.

(b) Four 151555 Feet are provided for leveling and adjusting the height of the cabinet. Use a 3/4" open-end wrench applied to the feet to make adjustments. A maximum of one inch increase in cabinet height may be obtained.

(c) If it is desired to secure the cabinet directly to a mounting surface, remove and discard the four 151555 Feet. In selecting the mounting bolts to be used, make certain that they are of such length as to engage all the threads in the holes from which the feet have been removed. See Figure 1.

(2) Electrical Connections

(a) Two holes (remove filler plugs if present) are provided in the rear corners of the shelf of the apparatus compartments. Two additional holes, with cover plates

containing knockouts, are provided in the rear of the shelf and the floor of the lower compartment of the cabinet. Electrical connections are made by opening these holes and feeding cords up from the bottom through the holes. Telegraph and power circuits may enter through either left or right hole.

(b) Cable clamps are provided where necessary (in bag tied inside of lower compartment) for securing the cords at the input point to the cabinet. Friction or electrical tape may be wound around the wires, at the clamping point, if additional thickness is required.

(c) A horizontal wiring channel with terminal blocks extends across the upper rear position of the printer compartment of the cabinet. These terminals are protected with insulating covers which are secured to posts in the channel by means of screws.

(d) Make power and telegraph circuit connections to the cabinet, and attach the various units comprising the printer set, in accordance with the appropriate apparatus set specifications and wiring diagrams.

(e) A cabinet ground screw is provided at the right mounting screw for the right cable clamp mounting plate. A wire connecting to the common station ground should be attached at this point in each cabinet at the time of installation.

(3) Separately Ordered Accessories. - Installation instructions for the separately ordered accessories are included with each accessory and may be found as follows:

- (a) Offset Coypholder - Specification 5736S.
- (b) Directory Holder (Furnished with LAAC235** and LAAC236** Cabinets) - Specification 5729S.
- (c) Apparatus Mounting Rack - Specification 5730S.
- (d) Relay Rack - Specification 5915S.
- (e) Mounting of Electrical Service Unit on Relay Rack - Specification 5928S.
- (f) Sub Base to Permit Stand-Up Operation of ASR Set - Specification 5846S.

b. ELECTRICAL SERVICE UNIT (FIGURE 3)

NOTE

The electrical service unit should be installed in the cabinet before the keyboard perforator transmitter is installed.

(1) Locate the 162629 Power Switch Shaft under the right side of the cradle, so that the handle end protrudes through the hole provided in the right front of the cabinet, the shaft rests in the spring provided (mounted on the rear channel of the cradle), and the bracket is to the rear of, but just touching the rear channel of the cradle. The shaft handle should point to the right.

- (2) Repeat Paragraph (1) for the 162630 Line-Test Key Shaft, except that the shaft handle should point to the left.
 - (3) Place the electrical service unit in the rear of the cabinet with the legs extending upward and the name plates toward the front. Fasten with two 151437 Studs, furnished with the unit. See Figure 3.
 - (4) Route and connect the cabinet terminal block cables. Refer to appropriate wiring diagram.
 - (5) Route the page printer, keyboard perforator transmitter and TD Unit cables to the approximate location of the connectors on their respective units.
 - (6) Make the necessary strap connections at the cabinet terminal blocks as shown in the applicable actual wiring diagram of the electrical service unit.
 - (7) Fasten the 154444 Fork to the bracket on the power switch shaft (the prongs of the fork should be away from the shaft) with the two 151152 Screws, 110743 Lock Washers and 104807 Washers provided with the cabinet. (The screws should be installed from the front). Place the fork end over the power switch on the electrical service unit and locate the shaft in the hole on the right side of the container. Be certain that the groove in the end of the shaft engages the side of the hole in the container. Position the fork so that it securely engages the upper part of the handle of the switch so that the switch may be operated easily. Tighten the screws.
 - (8) Repeat Paragraph (7) for the line-test key shaft (if used) on the left side of the electrical service unit.
 - (9) For applications where a 160420 Auxiliary Line Shunt Relay Assembly is used, two 115594 Nuts and 55219 Screws are supplied with the electrical service unit. The relay assembly should be installed in the cabinet as follows:
 - (a) Slip the two 115594 Nuts on the cabinet back panel mounting brackets in the lower portion of the cabinet. Insert the two 55219 Screws.
 - (b) Connect the 160419 Cable of the 160420 Auxiliary Line Shunt Relay Assembly to the cabinet terminals (see wiring diagram furnished with the electrical service unit), route the cable through the left rear shelf hole.
 - (c) Mount the relay assembly (using the slotted holes in the 160421 Bracket) on the 55219 Screws. Tighten the screws.
- c. KEYBOARD PERFORATOR TRANSMITTER, MOTOR UNIT AND TYPING UNIT
(FIGURES 2 AND 3)

(1) Initial Assembly and Adjustment before Installation in Cabinet.

(a) Remove the gear guard tied to the keyboard perforator transmitter, then remove four 151678 Screws (with captive lock washers) from the bag also tied to the unit. Secure the motor unit to the keyboard base with three of the four screws with lock washers. At this time, omit the left rear motor mounting screw.

(b) Install the tape container assembly on the keyboard base using four 151632 Screws, 2191 Lock Washers and 7002 Washers found in the bag tied to the unit.

(c) Remove the insulator cover from the terminal block on the keyboard perforator transmitter base, just to the left of the motor. Connect the motor leads to terminals 1 and 2 of this terminal block for units not equipped with paper feed-out switch. Reinstall the insulator cover. Remove and discard the screw and lock washer in the left end of the motor shaft. The motor pinion and intermediate driven gear (set) for the desired speed of operation must be ordered as a separate item. Install the 159287 Isolator (furnished with the gear set) in position over the hub of the nylon pinion. Press the extensions of the isolator down into the holes in the gear hub. With the teeth of the gear toward the motor, slide the assembled gear and isolator onto the motor shaft (apply a light film of grease on the shaft to facilitate installation of the pinion assembly). Insert the two 161301 Posts (furnished with the gear set) into the holes in the isolator, align them with the tapped hole in the motor shaft, and screw them down tight (see Figure 4). Remove the two screws and lock washers from the hub on the right end of the intermediate gear shaft. Mount the intermediate driven gear on the shaft with the flat side of the gear to the right (see Figure 4). Secure the gear with the two screws and lock washers removed and make certain that the motor pinion, intermediate driven gear, and page typing unit gear are properly meshed.

(d) Connect the motor shaft with the perforator power take-off bracket shaft using the 158079 Shaft and two 173645 Flexible Couplings w/Set Screws furnished (the external hub of each coupling should point outward). Position the couplings (maintain some to .020" clearance between the coupling and the motor pinion to decrease transmission of sound) and tighten the set screws. See Figure 4. A straightedge rule applied to the center of the rear bearing bracket cross-shaft should also extend through the center of the intermediate and motor shafts. If necessary, refine the Rear Bearing Bracket Alignment of the Perforator Alignment Adjustment (Bulletin 250B) to meet this requirement. Assemble the remaining motor screw and the gear guard to the base.

(e) Typing Unit to Keyboard Unit. - Place the typing unit on the keyboard base and make certain that the front feet of the typing unit are placed over the locating studs provided on the base. Rotate the motor shaft by hand to get the gear teeth to mesh. Secure the typing unit to the base using four 151678 Screws (with captive lock washers) found in the bag tied to the keyboard unit.

(f) Typing Unit to Signal Generator. - There should be a perceptible amount of backlash between the signal generator gear and the typing unit main shaft gear at the closest point. To adjust, remove the signal generator and add or remove shims at the rear

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generator mount. (For instructions covering removal of signal generator refer to Bulletin 250B). Replace the signal generator and tighten the screws.

(g) Intermediate Gear to Typing Unit Gear. - There should be a barely perceptible amount of backlash between the typing unit main shaft gear and the intermediate gear at the highest point of the intermediate gear. To adjust, loosen the three hexagon head mounting screws so that the bracket is held friction tight and position the complete intermediate gear assembly by utilizing the adjusting slot to the rear of the bracket. Align the gears at this time. Tighten the screws.

(h) Motor Pinion to Intermediate Gear. - There should be a barely perceptible amount of backlash between the motor pinion and the intermediate gear at the highest point of the intermediate gear. To adjust, raise or lower the front end of the intermediate gear bracket by means of the adjusting and clamping screws located at the front end of the bracket. Refine this adjustment and the typing unit gear adjustment, if necessary, in order to obtain quiet operation. Tighten the screws.

(2) Installation into a Cabinet (Figures 2 and 3)

(a) Remove the typing unit from the keyboard base.

(b) Remove the 154496** Front Panel from the cabinet by removing two 111017 Screws, lock washers and washers at the left end of the panel and loosening a thumb screw (inside of cabinet) at the right end of the panel. Slide panel out to the left.

(c) For cabinets equipped with 158685** Housing and 158645** Cross Bar. - Remove the 158685** Housing by removing two 111017 Screws, lock washers and washers. Remove the 158645** Cross Bar by removing the 151723 Screw, lock washer and washer (inside of cabinet) at the lower right-hand corner of the cross bar (Do not loosen or remove the 151723 Screw which secures the 154416 Adjusting Plate so as to avoid the necessity of repositioning the plate during reassembly) and two 1253 Screws at the left end of the cross bar. Slide the cross bar out toward the left.

(d) For cabinets equipped with the 154485**, 160293** or 170302** Housing and 154490** or 160286** Cross Bar. - Remove the 154485**, 160293** or 170302** Housing by sliding the housing forward (two detent springs on the side hold the housing in place). Remove the 154490** or 160286** Cross Bar by removing the 151723 Screw, lock washer and washer (inside of cabinet) at the lower right-hand corner of the cross bar (Do not loosen or remove the 151723 Screw which secures the 154416 Adjusting Plate so as to avoid the necessity of repositioning the plate during reassembly) and loosen the two 151631 Screws at the left end of the cross bar. Slide the left end toward the rear to clear the slotted holes in the cabinet. Slide the cross bar out toward the left.

(e) For cabinets equipped with 158693** Cross Bar. - Remove the 158693**

Cross Bar by removing the 151723 Screw, lock washer and washer (inside of cabinet) at the lower right-hand corner of the cross bar (Do not loosen or remove the 151723 Screw which secures the 154416 Adjusting Plate so as to avoid the necessity of repositioning the plate during reassembly) and two 1253 Screws at the left end of the cross bar. Slide the cross bar out toward the left.

CAUTION

If the TD Base has been modified (equipped with rubber isolation bushings - Figure 6) for reduction of noise level, the keyboard must be raised by use of four 105029 Washers (used as 3/32" spacers and are furnished with the modified TD Bases) to maintain proper alignment between the keyboard and the TD Base shafting.

(f) Using the four 151549 Special Screws provided (in bag), fasten the keyboard perforator transmitter to the cradle assembly in the cabinet. See Figures 2 and 3.

NOTE 1

For keyboard perforator transmitter units arranged for polar operation. - The ground strap from the signal generator should be terminated on top of the keyboard lower base plate and secured using the left front 151549 Special Mounting Screw for the keyboard base. Route the ground strap down between the 154055 Front Bracket and the 158113 underneath the base and through the circular opening in the base frame. See that the ground strap clears any moving parts.

NOTE 2

Before reinstalling the typing unit, insert a piece of bond paper between the selector magnet pole faces and the armature to soak up any lubricant which may have accumulated. When removing the paper, make sure no lint or bits of paper remain.

(g) Reinstall the typing unit on the keyboard base in accordance with Paragraph 2. c. (1) (e).

(3) Electrical Connection. - The electrical service to the keyboard perforator transmitter comes through the cable from the left end of the electrical service unit. Insert the plug that terminates this cable into the connector at the middle rear of the keyboard perforator transmitter. Push down until the plug is latched into position in the receptacle.

d. TRANSMITTER DISTRIBUTOR UNIT LCXD AND BASE LCXB (SEE FIGURES 2, 3 AND 5)

(1) Mount the 158648 Tape Chute friction tight on the TD Unit base using two 151630 Screws, 2191 Lock Washers and 7002 Washers. All these parts are provided with the appropriate cabinet.

(2) Loosen the 158673 Base Locating Bracket on the cradle assembly in the cabinet. Install and tighten the two 160425 Adjusting Studs (for the base and furnished with the base) in the front rail of the cradle assembly.

(3) Assemble the speed change gear set to the TD Base. The gear set to provide the desired speed of operation must be ordered as a separate item.

(4) Install the base on the cradle assembly and fasten (friction tight) using one 76279 Screw, three 2449 Lock Washers, three 71858 Washers and two 160975 Nuts furnished with the base.

(5) Install the coupling shaft and two flexible couplings between the driving shaft of the TD base and the power shaft of the keyboard perforator transmitter. Move the base backward or forward until the driving shaft and power shaft line up; check with straightedge rule. The parts are in a bag attached to the base.

(6) Mount the 158686 Plate to the front of the TD Unit using two 151693 Screws, 2191 Lock Washers and 7002 Washers. The plate should fit tightly against the cover, tape guide and tape lid plates. All parts are provided with the appropriate cabinet.

(7) Adjust the three feet of the TD Unit so that they protrude approximately $7/32$ " from beneath the main casting. Place TD Unit on the base. Route cabling under cradle rails. Mount the connectors to the side mounting bracket on the base using the four screws and lock washers furnished with the base. The female connector should be closest to the casting.

(8) Make certain the TD Unit is against the two locating studs on the left. Adjust the three feet of the TD Unit so that there is a minimum amount of backlash between the gears at the closest point, and the cover and top plates of the fixed tape sensing unit are parallel, within $1/32$ ", to the top of the tape winder access door on the cabinet. Tighten lock nuts.

(9) Secure the TD Unit (friction tight) to the base with the three 86850 Screws, 2669 Lock Washers and 3438 Washers furnished with the base.

(10) Make certain the TD Unit is against the two locating studs at the left. Turn the base adjusting studs counterclockwise with a screwdriver, turning both studs an equal amount at a time until the top plate of the pivoted tape sensing head (tape lid open) is flush to $.010$ " below the tape lower line of the punch when the pivoted sensing head is against the punch. Loosen the base mounting screw and nuts as required, and make sure the base is resting on its three mounting surfaces. Cover and top plates should remain parallel, within $1/32$ ", to the top of the tape winder access door on the cabinet.

(11) Utilizing the play in the mounting holes, move the TD Unit backward or forward until the sensing pins line up with the punch pins as gauged by eye.

(12) Tighten the TD Unit mounting screws and base mounting screw and nuts. Position the eccentric so that it rests against the rear plate of the TD Unit. Tighten screw.

(13) Position the TD Base locating bracket so that both locating surfaces rest against the base. Tighten screws. Tighten the set screws on the flexible couplings.

(14) The top plate of the pivoted sensing head should meet the punch squarely. If necessary, remake the top plate adjustment. Refer to Bulletin 254B. There should be 3/16" clearance between the tape depressor and punch. Adjust the tape depressor bracket and utilize the play in the base mounting holes, if necessary. Recheck squareness and shaft line-up. Tighten the base mounting screws.

(15) Position the tape chute so that it clears all moving parts on the TD Unit and perforator at their closest point to the chute during an operating cycle. Tighten the chute mounting screws.

(16) Reinstall the 158645** Cross Bar, 158685** Housing and 154496** Front Panel (in that order and be careful not to damage counter) removed in Paragraphs 2.c. (2) (c) and (b).

(17) Mount the 158684** Plate to the rear of the fixed tape sensing unit using a 111017 Screw, 2191 Lock Washer and 7002 Washer. All these parts are furnished with the appropriate cabinet.

(18) Install the 158697 Designation Plate (to left of keyboard) using two 6344 Screws and 2191 Lock Washers. All these parts are furnished with the appropriate cabinet.

(19) Attach the 154445 Knob to the 154442 Shaft using the screw in the knob (these parts are furnished with the appropriate cabinet). Insert the shaft in the hole to the left of the keyboard.

(20) Install the tape storage bin by means of two studs and thumb screw provided on the cabinet. Plug cord into receptacle provided in the cabinet (to left of tape storage bin).

(21) Tape Depressor Extension Adjustment

(a) Requirement:

1. The tape depressor extension should be .040" to .080" from the punch block and flush to .060" below the top of the punch block.

2. The small tip of the depressor extension should be centered on the respective area between the #2 and #3 Punch Pin Slots of the punch block.

(b) To Adjust:

1. Loosen lock nut and position the depressor extension to meet requirement #1 by moving it angularly and/or horizontally.

NOTE

If requirement #1 cannot be met, loosen the four mounting screws of the rectangular bar on the TD Unit and rotate the bar until the requirement is met. Tighten the four mounting screws. Readjust the oil reservoir assembly adjustment and check tape depressor adjustment (Bulletin 254B).

2. Loosen the two horizontal adjusting screws on the depressor extension and position to meet requirement #2.

3. Check #1: With the tape following its normal path, and the pivoted tape sensing head approximately 15 characters from the punch block, the edge of the tape must not touch the depressor. Refine the tape depressor adjustment, if necessary (Bulletin 254B).

4. Check #2: With the pivoted transmitter unit in idle line condition, and with tape following its normal path and flowing from the punch, it is important that the depressor guides the tape to the "tape wedger" to assure positive stuffing of the tape into the tape storage bin. Readjust depressor extension, if necessary.

(22) Last Character Contact Switch Assembly Adjustment

(a) Requirement:

1. With motor running and tape extending from the punch to the pivoted sensing head, and with the sensing head one character away from the punch block, there should be .010" to .015" clearance between the tape deflector ear and the last character switch insulating button.

2. With the pivoted sensing head against the punch block there should be at least .005" clearance between the contacts.

(b) To adjust: Loosen the contact bracket mounting screws and position the bracket to meet the requirements. Tighten the screws.

e. TRANSMITTER DISTRIBUTOR UNIT LAXD AND BASE LCXB (FIGURES 2, 3, AND 5)

(1) Mount the 158648 Tape Chute (friction tight) on the TD Base using two 151630 Screws, 2191 Lock Washers and 7002 Washers. All these parts are provided with the appropriate cabinet.

(2) Assemble the speed change gear set to the TD Base. The gear set to provide the desired speed of operation must be ordered as separate item.

(3) Adjust the three feet of the TD Unit so that they protrude approximately $7/32$ " from beneath the main casting. Place the unit on the base and readjust the feet until there is a minimum amount of backlash between the gears at the closest point. Do not tighten the lock nuts.

(4) Make certain that the 158673 Base Locating Bracket on the cradle assembly is loose. Place the base (with TD Unit) on the cradle assembly. Mount the connector to the side mounting bracket on the base using the two screws and lock washers furnished with the base.

(5) Fasten the base (friction tight) using the three 76279 Screws, 2449 Lock Washers and 71858 Washers furnished with the base.

(6) Install the coupling shaft and two flexible couplings between the driving shaft of the base and the power shaft of the keyboard perforator transmitter. Move the base backward or forward until the driving shaft and power shaft line up; check with straightedge rule. The parts are in a bag attached to the base.

(7) Utilize the play in the base mounting holes to adjust pivoted sensing head to meet punch squarely. If necessary, remake the pivoted head top plate adjustment (Bulletin 252B). Make certain that TD Unit is against the two locating studs near the feet on the left side. There should be $3/16$ " clearance between the tape depressor and punch. Adjust the tape depressor bracket and utilize the play in the base mounting holes, if necessary. Re-check squareness and shaft line-up. Tighten the base mounting screws.

(8) Hold the base locating bracket against the base and tighten the locating bracket mounting screws. Tighten the set screws on the flexible couplings.

(9) Using gear mesh point as a pivot point, adjust the mounting feet so that pivoted sensing head tape gate is flush to $.010$ " below the punch. Recheck gear backlash.

(10) Move the TD Unit backward or forward until the sensing pins line up with the punch pins as gauged by eye. Secure the TD Unit to the base with the three mounting screws, lock washers and washers furnished with the base.

(11) Position the eccentric so that it rests against the rear plate of the TD Unit. Tighten screw.

(12) Position the tape chute so that it clears all moving parts on the TD Unit and perforator at their closest point to the chute during an operating cycle. Tighten the chute mounting screws.

(13) Reinstall the 158693** Cross Bar and 154496** Front Panel (in that order and be careful not to damage counter) removed in Paragraphs 2.c. (2) (a) and (b).

(14) Install the 158697 Designation Plate (to left of keyboard) using two 6344 Screws and 2191 Lock Washers. All these parts are furnished with the appropriate cabinet.

(15) Install parts and make adjustments as specified in Paragraphs 2.d. (19), (21) and (22). Refer to Bulletin 252B for oil reservoir assembly adjustment and tape depressor adjustment.

f. TRANSMITTER DISTRIBUTOR UNIT LBXD AND BASE LCXB (FIGURES 2, 3, 6 AND 7)

(1) Remove the 158622 Deflector from the top of the rear plate by removing its two mounting screws, two lock washers and one washer. Replace the right mounting screw and lock washer. The deflector and remaining screw, lock washer and washer may be retained in the event the TD Unit is mounted as self-contained unit at some future time.

(2) Make certain that the mounting feet of the TD Unit are screwed in as far as they will go and tightened. No vertical adjustment of the TD Unit is needed.

(3) Assemble the speed change gear set to the TD Base. The gear set to provide the desired speed of operation must be ordered as separate item.

(4) Three 49056 Screws, 2669 Lock Washers and 3438 Washers are provided (in bag tied to base) for mounting the TD Unit on the base. Mount the TD Unit and tighten the mounting screws to friction tightness.

(5) Insert and tighten the three 163515 Shoulder Studs (furnished with TD Base) into the TD Base mounting holes in the front and rear cradle rails. Place a 163517 Rubber Bushing (furnished with TD Base) over each stud (smaller diameter of bushings upward). Position the TD Base (with TD Unit) over the three studs so that the smaller diameter of the bushings extends into the mounting holes of the base, and the base rests on the shoulders of the bushings (see Figure 6).

(6) Route the 117366 Ground Strap forward and under the base, then to the rear under the rear cradle rail (see Figure 7). Route cabling under the cradle rails and plug into the TD Unit. Mount the connectors (also resistors if applicable) using the hardware furnished.

(7) Place a 163517 Rubber Bushing (with smaller diameter downward) on the three studs that now extend up through the mounting holes of the base. The smaller diameter of the bushings should extend into the base mounting holes. Place a 103305 Washer, 2669 Lock Washer and 74807 Nut (furnished with TD Base) on each stud (the terminal of the 117366 Ground Strap should be placed on top of the 103305 Washer on the right rear stud followed by the 2669 Lock Washer and 74807 Nut); do not tighten the nuts (see Figures 6 and 7). Couple to keyboard shafting. Utilize the play in the TD Base mounting holes to line up the driving shaft, coupling shaft and keyboard perforator power shafting; check with straightedge rule. Tighten the TD Base mounting nuts and the coupling screws. In order to prevent transmission of vibration, neither the terminal nor the wire of the ground

strap should touch the TD Base, and the wire should be slack. If necessary, bend the terminal upward for clearance (see Figure 7).

(8) Adjust the lateral position of the TD Unit on the base so that the gears are in alignment and there is a minimum amount of backlash between the gear teeth at the closest point. Tighten the screws.

(9) Install the 160290** Plate w/Studs on the front of the TD Unit using two 151693 Screws, 2191 Lock Washers and 7002 Washers. All these parts are furnished with the appropriate cabinet.

(10) Reinstall the 160286** Cross Bar, 160293** Housing and 154496** Front Panel (in that order and be careful not to damage counter) removed in Paragraphs 2.c. (2) (d) and (b). There should be a minimum of 1/32" clearance between the TD Unit and the cabinet. A minimum clearance of 1/32" is also required between the TD Unit side and top plates and the housing. To obtain these clearance (required for reducing noise level), adjust the housing detent springs and/or reposition the cradle. See Paragraphs 2.j. (1) (a), (b) and (c).

CAUTION

To aid in the reduction of the noise level, the units must not touch the cabinet at any point thereby preventing transmission of vibrations to the cabinet.

(11) Install the 158695 Designation Plate (to left of keyboard) using two 6344 Screws and 2191 Lock Washers. All these parts are furnished with the appropriate cabinet.

(12) Attach the 154445 Knob to the 154442 Shaft using the screw in the knob (these parts are furnished with the appropriate cabinet). Insert the shaft in the hole to the left of the keyboard.

g. TRANSMITTER DISTRIBUTOR UNIT LXD (SEE PARAGRAPH h. FOR LXD PLUS LX ARRANGEMENT) AND BASE LCXB (FIGURES 2, 3, 6 AND 7)

(1) No vertical adjustment of the TD Unit is needed.

(2) Assemble the speed change gear set to the TD Base. The gear set to provide the desired speed of operation must be ordered as separate item.

(3) Three 151632 Screws, 2191 Lock Washers and 125015 Washers are provided (in bag tied to base) for mounting the TD Unit on the base. Mount the TD Unit and tighten the mounting screws to friction tightness.

NOTE

For TD Units arranged for polar operation. - The ground strap from the signal generator should be attached to the left front mounting screw (under the flat washer) of the TD Unit. See that the ground strap clears any moving parts.

(4) Insert and tighten the three 164101 Shoulder Studs (furnished with TD Base) into the TD Base mounting holes in the front and rear cradle rails. Place a 163517 Rubber Bushing (furnished with TD Base) over each stud (smaller diameter of bushings upward). Position the TD Base (with TD Unit) over the studs so that the smaller diameter of the bushings extends into the mounting holes of the base, and the base rests on the shoulders of the bushings (see Figure 6).

(5) Route the 117366 Ground Strap forward and under the base, then to the rear under the rear cradle rail (see Figure 7). Route cabling along right side of base. Mount the connectors using the hardware furnished.

(6) Place a 163517 Rubber Bushing (with smaller diameter downward) on the three studs that now extend up through the mounting holes of the base. The smaller diameter of the bushings should extend into the base mounting holes. Place a 103305 Washer, 2669 Lock Washer and 74807 Nut (furnished with TD Base) on each stud (the terminal of the 117366 Ground Strap should be placed on top of the 103305 Washer on the right rear stud followed by the 2669 Lock Washer and 74807 Nut); do not tighten the nuts (see Figures 6 and 7). Couple to keyboard shafting. The 173645 Flexible Couplings should be installed with the external hub on the shafts with the ball bearings. Utilize the play in the TD Base mounting holes to line up the driving shaft, coupling shaft and keyboard perforator power shafting; check with straightedge rule. Tighten the TD Base mounting nuts and the coupling screws. In order to prevent transmission of vibration, neither the terminal nor the wire of the ground strap should touch the TD Base and the wire should be slack, If necessary, bend the terminal upward for clearance (see Figure 7).

(7) Adjust the lateral position of the TD Unit on the base so that the gears are in alignment and there is no backlash between the gear teeth at any point. Tighten the screws.

(8) Install the 154487** Plate w/Studs on the front of the TD Unit using two 151693 Screws, 2191 Lock Washers and 7002 Washers. All these parts are furnished with the appropriate cabinet.

(9) Reinstall the 154490** Cross Bar, 154485** Housing and 154496** Front Panel (in that order and be careful not to damage counter) removed in Paragraphs 2. c. (2) (d) and (b). There should be a minimum of 1/32" clearance between the TD Unit and the cabinet. A minimum clearance of 1/32" is also required between the TD Unit side and top plates and the housing. To obtain these clearances (required for reducing noise level), adjust the housing detent springs and/or reposition the cradle. See Paragraphs 2. j. (1) (a), (b) and (c).

CAUTION

To aid in the reduction of the noise level, the units must not touch the cabinet at any point thereby preventing transmission of vibrations to the cabinet.

(10) Install the 158695 Designation Plate (to left of keyboard) using two 6344 Screws and 2191 Lock Washers. All these parts are furnished with the appropriate cabinet.

(11) Attach the 154445 Knob to the 154442 Shaft using the screw in the knob (these parts are furnished with the appropriate cabinet). Insert the shaft in the hole to the left of the keyboard.

h. TRANSMITTER DISTRIBUTOR UNIT COMBINATION LXD PLUS LX (SEE PARAGRAPH g. FOR LXD ALONE) AND BASE LCXB (FIGURES 2, 3, 6 AND 7)

(1) No vertical adjustment of the TD Units is needed.

(2) Assemble the speed change gear set to the TD Base. The gear set to provide the desired speed of operation must be ordered as separate item.

NOTE

The LX Unit operates twice as fast as the LXD Unit since the LX Unit is equipped with a two-stop clutch.

(3) Insert and tighten the three 163515 Shoulder Studs (furnished with TD Base) into the TD Base mounting holes in the front and rear cradle rails. Place a 163517 Rubber Bushing (furnished with TD Base) over each stud (smaller diameter of bushings upward). Position the TD Base over the studs so that the smaller diameter of the bushings extends into the mounting holes of the base, and the base rests on the shoulders of the bushings (see Figure 6).

(4) Route the 117366 Ground Strap forward and under the base, then to the rear under the rear cradle rail (see Figure 7). Place a 163517 Rubber Bushing (with smaller diameter downward) on the three studs that now extend up through the mounting holes of the base. The smaller diameter of the bushings should extend into the base mounting holes. Place a 103305 Washer, 2669 Lock Washer and 74807 Nut (furnished with TD Base) on each stud (the terminal of the 117366 Ground Strap should be placed on top of the 103305 Washer on the right rear stud followed by the 2669 Lock Washer and 74807 Nut); do not tighten the nuts (see Figures 6 and 7). Couple to keyboard shafting. The 173645 Flexible Couplings should be installed with the external hub on the shafts with the ball bearings. Utilize the play in the TD Base mounting holes to line up the driving shaft, coupling shaft and keyboard perforator power shafting; check with straightedge rule. Tighten the TD Base mounting nuts and the coupling screws. In order to prevent transmission of vibration, neither the terminal nor the wire of the ground strap should touch the TD Base, and the wire should be slack. If necessary, bend the terminal upward for clearance (see Figure 7).

(5) Six 151632 Screws, 2191 Lock Washers and 125015 Washers are provided (in bag tied to base) for mounting the TD Units on the base. Mount the TD Units and tighten the mounting screws to friction tightness.

(6) Adjust the lateral position of the TD Units on the base so that the gears are in alignment and there is a minimum amount of backlash between the gear teeth at the closest point. Tighten the screws. The TD Units should be parallel; reposition if necessary.

(7) Install the 154487** Plate w/Studs on the front of the LXD Unit using two 151693 Screws, 2191 Lock Washers and 7002 Washers. All these parts are furnished with the appropriate cabinet.

(8) Reinstall the 154490** Cross Bar, 170302** Housing and 154496** Front Panel (in that order and be careful not to damage counter) removed in Paragraphs 2.c. (2) (d) and (b). There should be a minimum of 1/32" clearance between the LX Unit and the cabinet. A minimum clearance of 1/32" is also required between the side and top plates of the TD Units and the housing. To obtain these clearances (required for reducing noise level), adjust the housing detent springs and/or reposition the cradle. See Paragraphs 2.j. (1) (a), (b) and (c).

CAUTION

To aid in the reduction of the noise level, the units must not touch the cabinet at any point thereby preventing transmission of vibrations to the cabinet.

(9) Install the 158695 Designation Plate (to left of keyboard) using two 6344 Screws and 2191 Lock Washers. All these parts are furnished with the appropriate cabinet.

(10) Attach the 154445 Knob to the 154442 Shaft using the screw in the knob (these parts are furnished with the appropriate cabinet). Insert the shaft in the hole to the left of the keyboard.

i. TAPE WINDER TW (FIGURE 2)

(1) The backlash and alignment between the motor pinion and driven gear should be checked before installing or operating the tape winder. Refer to applicable adjustment information.

(2) For cabinets with provisions for tape winder (at lower left side). - With the motor toward the rear, place the tape winder between the two flanges and slide it back until the front part of the tape winder base plate drops into place behind the front retaining flange. See Figure 2. Plug cord into receptacle provided in the cabinet after the tape winder is fully in place (or just before the tape winder is fully in place depending on applicable cabinet and tape winder). Reverse the procedure when removing the tape winder.

j. AUXILIARY TYPING REPERFORATOR UNIT LPR, BASE LRB AND MOTOR UNIT (LMU FIGURES 3, 8, 9 AND 10)

(1) Install the parts contained in 161814 or 161815 Modification Kit (which must be ordered separately) to adapt a TD Base (LCXB) to mount an Auxiliary Typing Reperforator Base (LRB) and to provide a tape guide. Installation instructions are covered in Specification 50055S (for 161814 Kit) or 5929S (for 161815 Kit) furnished with the kit.

NOTE

A tape (exit) guide is not used on ASR Sets where the tape from the auxiliary typing reperforator is wound on a tape winder in the cabinet.

(2) Remove and discard the 158271 Gear Guard on the TD Base.

(3) On units not equipped with variable speed drive, install the gears (set of gears must be ordered as separate item) for the desired speed of operation on the shafts of the gear bracket assembly as shown in Figure 5. Mounting hardware is in a bag tied to the base.

(4) Remove the gear bracket assembly and the 161805 Gear Guard.

NOTE

Before installing the motor unit. - If the leads on the motor unit, as received, are threaded through the hole in the motor mount bracket, pull them out as they should not be routed through the hole when the unit is installed.

(5) Install the motor unit on the auxiliary reperforator base using the following parts found in a bag tied to the base: Four 162730 Screws, three 2449 Lock Washers, four 3226 Washers, four 92146 Nuts and two 82332 Star Lock Washers. Place one star lock washer against the anodized aluminum surface of the motor bracket and one against the painted surface on the bottom of the base so as to ground the motor bracket to the base. Connect the motor leads to the lower terminal block as indicated in the appropriate wiring diagram furnished with the base. It is necessary to remove the tape container to reach these terminals with a screwdriver. Replace the tape container leaving the screws friction tight for later adjustment. Replace the gear bracket assembly and the 161805 Gear Guard.

(6) Mount the 161804 Tape Guide on the typing reperforator as follows:

(a) On units not equipped with letters-figures contact assembly, remove and discard the screw in the location shown in Figure 9 and mount the tape guide using the 151442 Screw and 7002 Washer furnished (in bag tied to base) and the existing mounting parts as shown in Figure 9.

(b) On units equipped with letters-figures contact assembly, remove and discard the screw in the location shown in Figure 10 and mount the tape guide using the 151631 Screw and 7002 Washer furnished (in bag tied to base) as shown in Figure 10.

(7) Mount the 156400 Sprocket (found in bag tied to base) on the typing reperforator using the mounting hardware on the hub. The screw heads and lock washers should be on the side of the deeper inset of the sprocket.

(8) Mount the 161783 Gear (found in bag tied to base) on the motor shaft using the 159287 Isolator and two 161301 Posts also found in the bag tied to the base. Screw the posts down tight.

(9) Loosen the three gear bracket assembly mounting screws to friction tightness and position the assembly up or down until there is a barely perceptible amount of backlash between the motor pinion and the driven gear at the closest point. The gears should be parallel to each other. Tighten the screws.

(10) Mount the auxiliary typing reperforator onto the base as follows:

(a) Remove the following parts from the bag tied to the base: Three 151632 Screws, three 76461 Washers, four 2191 Lock Washers, one 151631 Screw and one 125015 Washer.

(b) Position the reperforator over its mounting studs in the base.

(c) Loosen the screw holding the small "L" shaped anchor bracket to the right front of the punch.

(d) Start the 151631 Screw with 2191 Lock Washer and 125015 Washer through the "L" shaped anchor bracket into the proper tapped hole in the base plate. Do not tighten the screw.

(e) To allow for maximum accessibility for a screwdriver to the rear 151632 Mounting Screw, position the push bar bail of the reperforator to its foremost position. Start the three 151632 Screws with 2191 Lock Washers and 76461 Washers through the holes in the casting and into the proper tapped studs in the "T" shaped plate. Do not tighten the screws.

(f) Remove the timing belt from the bag tied to the base and place it over the sprockets. Take up the slack in the belt by moving the reperforator away from the motor. The belt should have just enough slack so that a light pressure (8 ozs.) applied midway between the sprockets will cause the belt to deflect approximately 1/8". Tighten the three 151632 Mounting Screws. Check timing belt deflection.

(g) Hold the anchor bracket so that it rests squarely against the reperforator and base plate and tighten the screw that secures the anchor bracket to the base plate. Tighten the screw that secures the anchor bracket to the reperforator.

(11) Route and connect the 161886 Cable (found in the bag tied to the LRB Base) as follows: Place the 161818 Receptacle Connector over the 161817 Plug Connector and tighten the associated knurled lock nut. Route the cable forward and down, past the right side of the TD Unit drive shaft, to the right, under the right side of the TD Base casting, left and right, keyboard cradle rails and up to the cabinet terminal block. Connect the black lead to terminal 39, white lead to terminal 40 and the green lead to the cabinet ground screw as indicated in the appropriate wiring diagram furnished with the LRB Base.

(12) Install the 176302 and 176303 Cables (if applicable) as indicated in the appropriate wiring diagram furnished with the LRB Base.

(13) Place the base (with reperfurator) on its mounting posts and secure with the following parts found in bag attached to the base: Three 162730 Screws, two 2449 Lock Washers, three 3226 Washers and one 82832 Star Lock Washer. Place the star lock washer next to the upper painted surface of the base under the left front mounting screw.

NOTE

When an old style LRB Base is used (this base has the old style 161770 Mounting Bracket and 172966 "T" Plate) a 13/16" diameter flexible coupling must be used on the TD Base under the LRB Base. Use of larger diameter couplings results in interference when mounting the LRB Base. If no 13/16" diameter coupling is on hand, it may be ordered under part number 178425 (formerly 158020). New style LRB Bases have a modified 161770 Mounting Bracket and 178426 and 178427 Nut Plates, in place of the old style mounting bracket and "T" plate, and provide clearance for 1-1/16" diameter couplings (173645).

(14) Install the desired control panel in place of the blank panel in the cabinet dome using existing mounting hardware. The control panel must be ordered as a separate item.

(a) When a 162477 Modification Kit (This kit must be ordered as a separate item, and consists of a 162898 TAPE FEED OUT Control Panel and a 162899 Cable w/Switch) is used, proceed with installation of this kit as follows: Install the control panel in place of the blank panel in the cabinet dome using existing mounting hardware. Secure the switch (on the cable) to the control panel using the mounting nuts on the switch. Route the cable along the left side of the cabinet (through the hole at the rear of the dome). Connect the cable in accordance with applicable wiring diagram furnished with the LRB Base. Secure the cable as necessary to clear any moving parts.

(b) When a 161830 Control Panel (has a hole for a tape guide) is used to replace a 160381 Control Panel (does not have a hole for a tape guide), two 161206 Insulating Bushings and two 161210 Nuts will be required (and must be ordered as separate items) to mount the LPG1 and LPG2 Jacks if the LPG1 and LPG2 holes in the 161830 Control Panel are larger than those in the 160381 Control Panel.

(15) Adjust the tape guide included in the 161814 or 161815 Modification Kit in accordance with instructions contained in Specification 50055S (for 161814 Kit) or 5929S (for 161815 Kit) furnished with the kit.

(16) Install the 161829 Modification Kit (which must be ordered separately) to mount an electrical service unit to a 160387 or 160388 Relay Rack Bracket Assembly used with the ASR Cabinet. Installation instructions are covered in Specification 5928S furnished with the kit.

(17) Position the tape container so that a full roll of tape may be inserted through the access door in the dome of the cabinet. Tighten the screws.

k. MISCELLANEOUS INSTRUCTIONS

(1) Cradle (Figure 2)

(a) The cradle in the cabinet is factory adjusted (no load) for nominal squareness and parallelism with respect to the cabinet. Two locating eccentrics are positioned against the rear rail. The cradle may have to be repositioned after the units are installed in order to level the equipment and obtain a flush fit with respect to the cabinet. Be careful so as not to damage the counter.

CAUTION

To aid in the reduction of the noise level, the units must not touch the cabinet at any point thereby preventing transmission of vibrations to the cabinet.

(b) Should it be necessary to raise or lower the cradle after the units are installed, loosen the lock nuts on the right front and the two rear vibration mounts, and the lock nut on the lower end of the stud in the left front vibration mount. Raise or lower the cradle by turning the studs. Tighten the lock nuts while holding the studs in position.

(c) Should it be necessary to move the cradle forward or backward after the units are installed, loosen the four screws holding the front and rear rails and the two screws securing the eccentrics. Move the cradle as necessary; tighten the four rail mounting screws; position the eccentrics against the rear rail and tighten their mounting screws.

(2) Secure all cords and cables where necessary to keep them away from any moving parts.

(3) Apply a thin film of grease to all newly installed gears. Use standardized lubricant.

(4) Make a visual check of all fuses, plugs, screw terminal connections and lamps for loosening or breakage.

CAUTION

Any TD Base which is equipped with rubber isolation bushings must be grounded to the cradle using the 117366 Strap as specified in the foregoing text and Figure 7. Also, check to see that the cabinet is connected to the common station ground as specified in the foregoing text.

(5) Make certain that the power switch is in its "OFF" position before closing the main power to the equipment.

(6) Refer to standardized instructions for installing paper and ribbon in the page printer.

(7) A thumb wheel or screwdriver slot is provided on the tape feed wheel shaft for starting or advancing the tape manually. On units with backspace mechanism, a hole is provided in the 160666 Guard for a screwdriver. Turn the thumb wheel or screwdriver to the left.

(8) For keyboard tape perforating unit. - Thread the tape from the top of the roll of tape, over the roller of the tape guide on the tape container and into the tape entry chute. Position and/or reform the tape guide, as necessary, so that the tape flows freely and makes full contact with the roller on the tape guide. Tighten the screws.

(9) For auxiliary typing reperforator unit. - Thread the tape from the bottom of the roll of tape, over the roller of the tape guide on the tape container, over the roller of the tape guide on the selector bracket and into the tape entry chute. Position and/or reform the tape guides, as necessary, so that the tape flows freely and makes full contact with the rollers on the tape guides. Tighten the screws.

(10) Routing of tape from the auxiliary typing reperforator unit to the tape winder reel. - Thread the tape through the access hole provided, twist the tape 180 degrees, thread the tape through the tape arm, around the drag pins and onto the tape winder reel. See Figure 11.

l. LIGHTING FACILITIES - The incoming power is controlled by a three-position switch located inside of the cover and tucked away just to the left of the lid opening for the printer.

(1) "OFF" - Lights off.

(2) "NORMAL ON" - Lights on, excluding end-of-line lamp when printer set is operating.

(3) "MAINTENANCE ON" - Lights continuously on, except end-of-line lamp.

m. OPERATING TESTS

NOTE

Tapes to be run through TD Unit LCXD should have at least two blanks at the end so as to clear the unit.

(1) Keyboard Position (K)

(a) Manually depress each key and determine that the proper character is printed or the proper function is performed.

(b) The "LOC LF" (local line feed) key, when depressed, should cause paper to be fed out of the machine at approximately three times the speed obtained when the "LINE FEED" and "REPT" (repeat) keys are continuously depressed.

(c) The "REC" (keyboard lock) key, when depressed, should cause the signal generator to be shunted, preventing signal generation (check this action on the page printer). It should remain depressed until released by the "SEND" (keyboard unlock) key.

(d) The "SEND" (keyboard unlock) key, when depressed, should remove the shunt from the signal generator.

(e) The "BREAK" key, when depressed, should hold the transmitting line open. If the duration of the open line interval is greater than two character cycles, the electrical keyboard lock should be operated as in Paragraph (c) above.

(f) The "REPT" (repeat) key, when depressed together with any other key except the local function keys, should cause repeat transmission of the associated code combination.

(g) The "LOC CR" (local carriage return) key, when depressed, should cause the carriage to be returned.

(h) The bell should ring clearly on single or repeated operation of the "BELL" key.

(i) The "Blank" key, when alternately depressed with any other key except the local function keys, should not lock the keyboard. Depression of the "Blank" key twice in succession should operate the keyboard lock making it necessary to depress the "SEND" key to resume keyboard transmission.

(j) When the "Line-Test" handle is turned to the "TEST" position, the keyboard should operate the page printer as above. No break in the signal line should occur as the "Line-Test" handle is switched.

(2) Keyboard-Tape Position (K-T)

(a) Manually depress each key and determine that the correct character is printed on the page printer and perforated in the tape.

(b) When the "Blank" and "REPT" (repeat) keys are depressed simultaneously, the tape should feed out without interruption.

(c) When the "E" and "REPT" (repeat) keys are depressed simultaneously, the character counter should count without missing. The end-of-line indicator should light at its preset count. When the "CAR RET" (carriage return) key is depressed, the counter should return to zero. When the "E" key is again depressed, the counter should count one character.

(d) The electrical keyboard lock should be operative.

(e) The TD Unit should be operative. Accuracy of transmission should be tested using a prepared tape and monitoring the transmission on the page printer.

(f) Turning the "Line-Test" handle to the "TEST" position should result in operation similar to the above except that operation is on a local loop.

(3) Tape Position (T)

(a) Depress the "Blank" and "REPT" (repeat) keys simultaneously; the tape should feed out of the punch at high speed without interruption.

(b) Depress the "E" and "REPT" (repeat) keys simultaneously; the character counter should count without missing, and the end-of-line indicator should light at its preset count. Depressing the "CAR RET" (carriage return) key should cause the counter to return to zero and the end-of-line indicator to shut off. When the "E" key is again depressed, the counter should count one character.

*

*

*

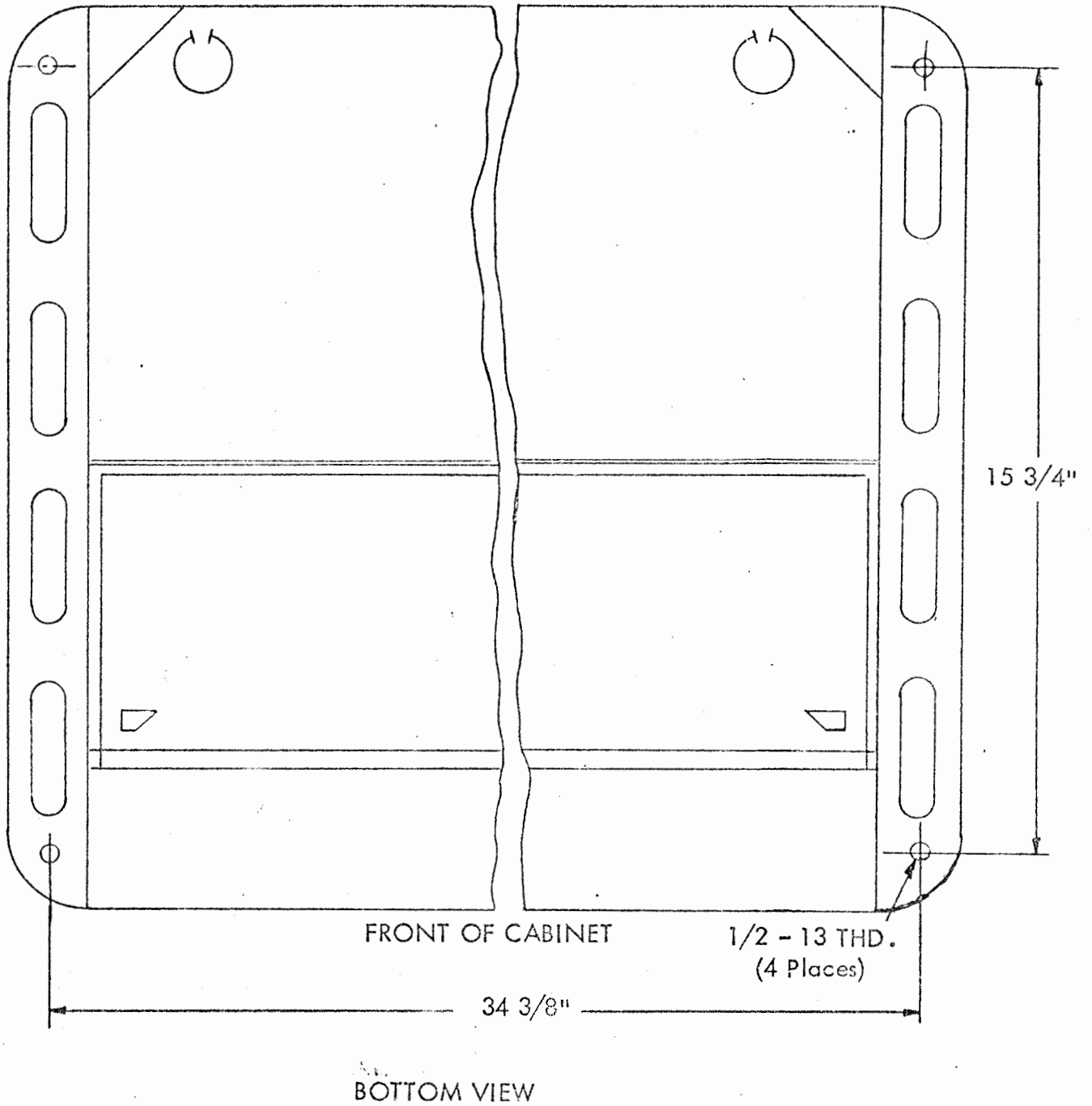


FIGURE 1. SECURING AUTOMATIC SEND-RECEIVE CABINET TO MOUNTING SURFACE

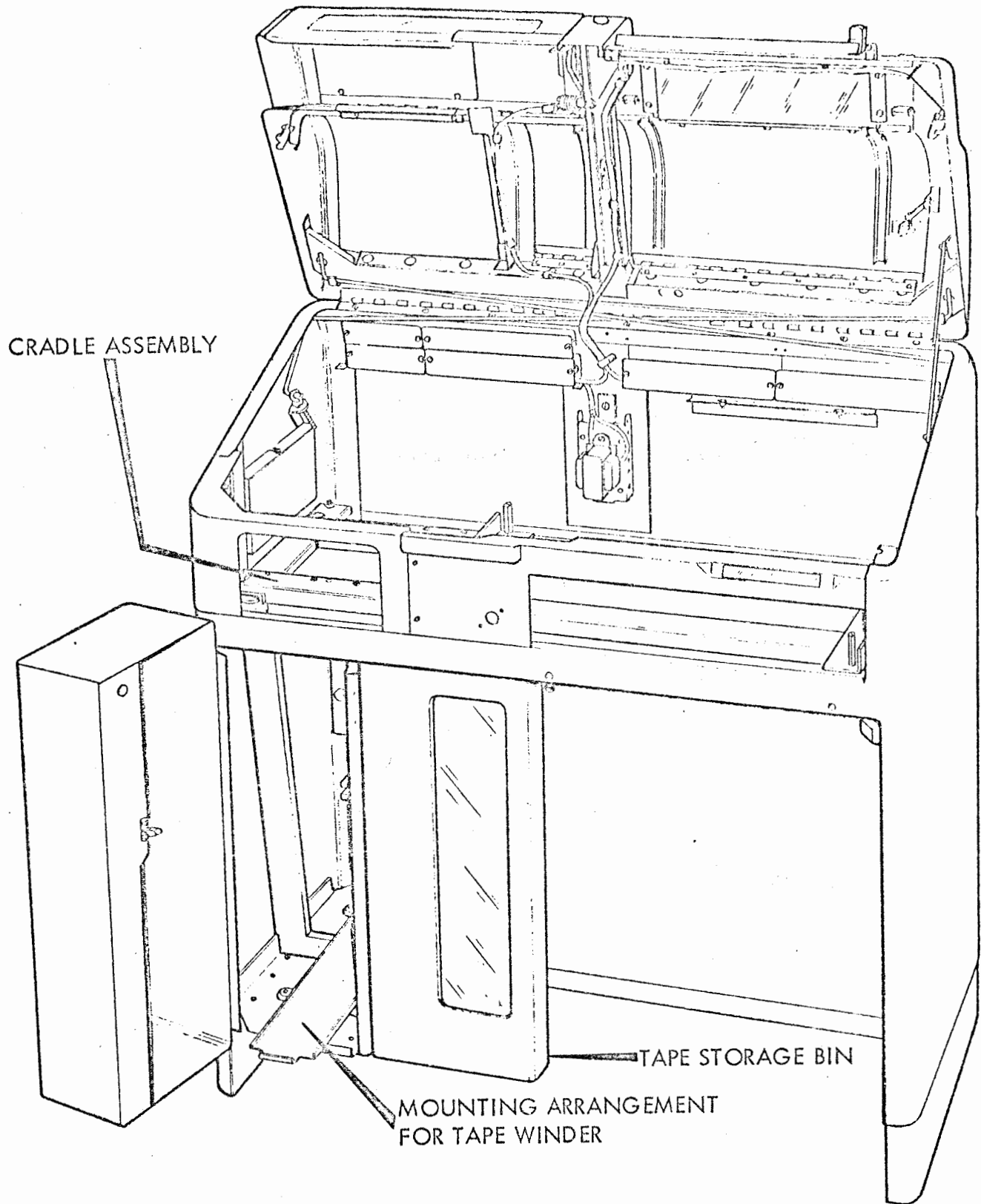
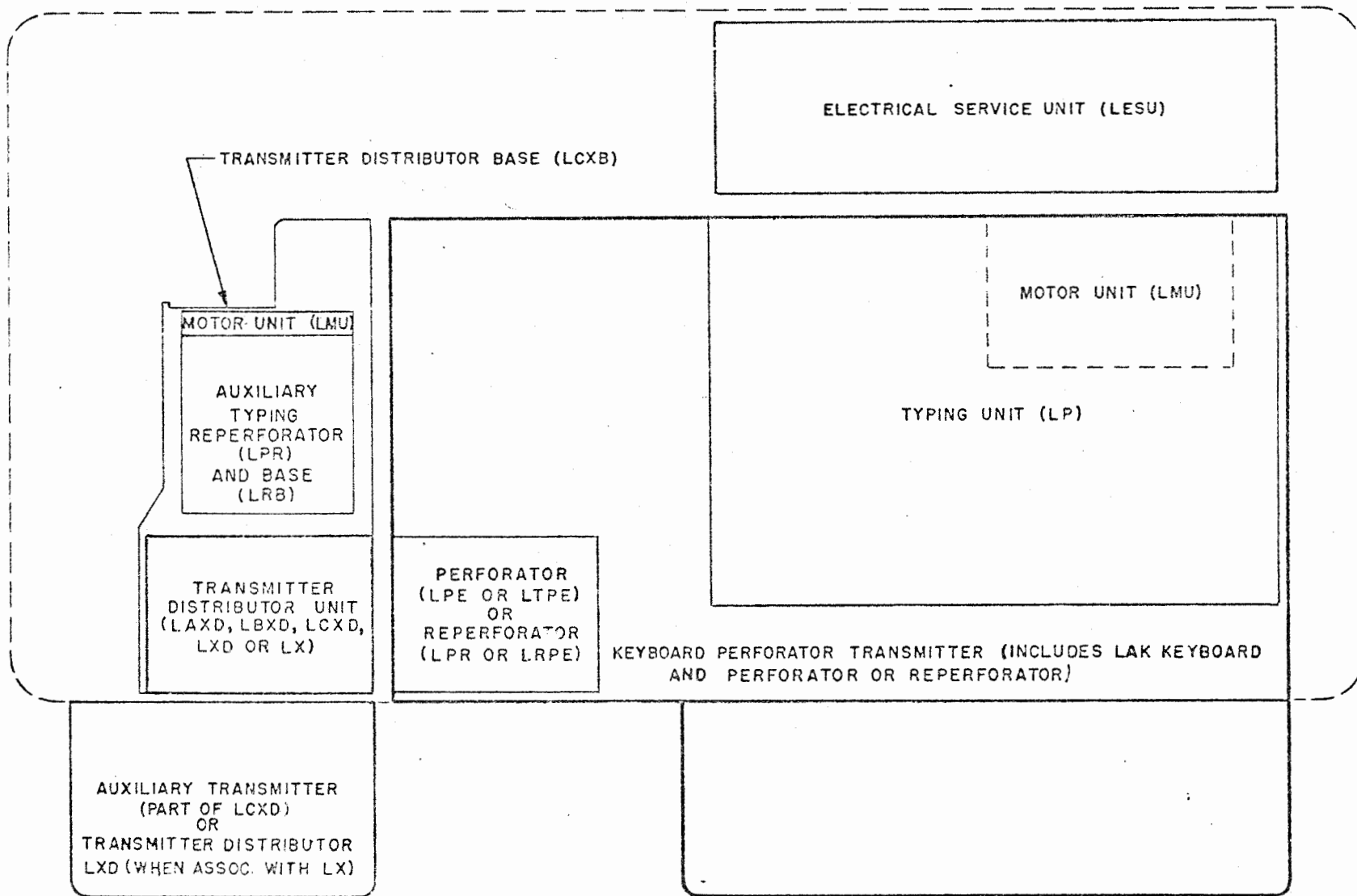


FIGURE 2. TYPICAL AUTOMATIC SEND-RECEIVE CABINET (LAAC) SHOWN OPEN

FIGURE 3. LOCATION OF UNITS IN AUTOMATIC SEND-RECEIVE CABINET



TOP VIEW

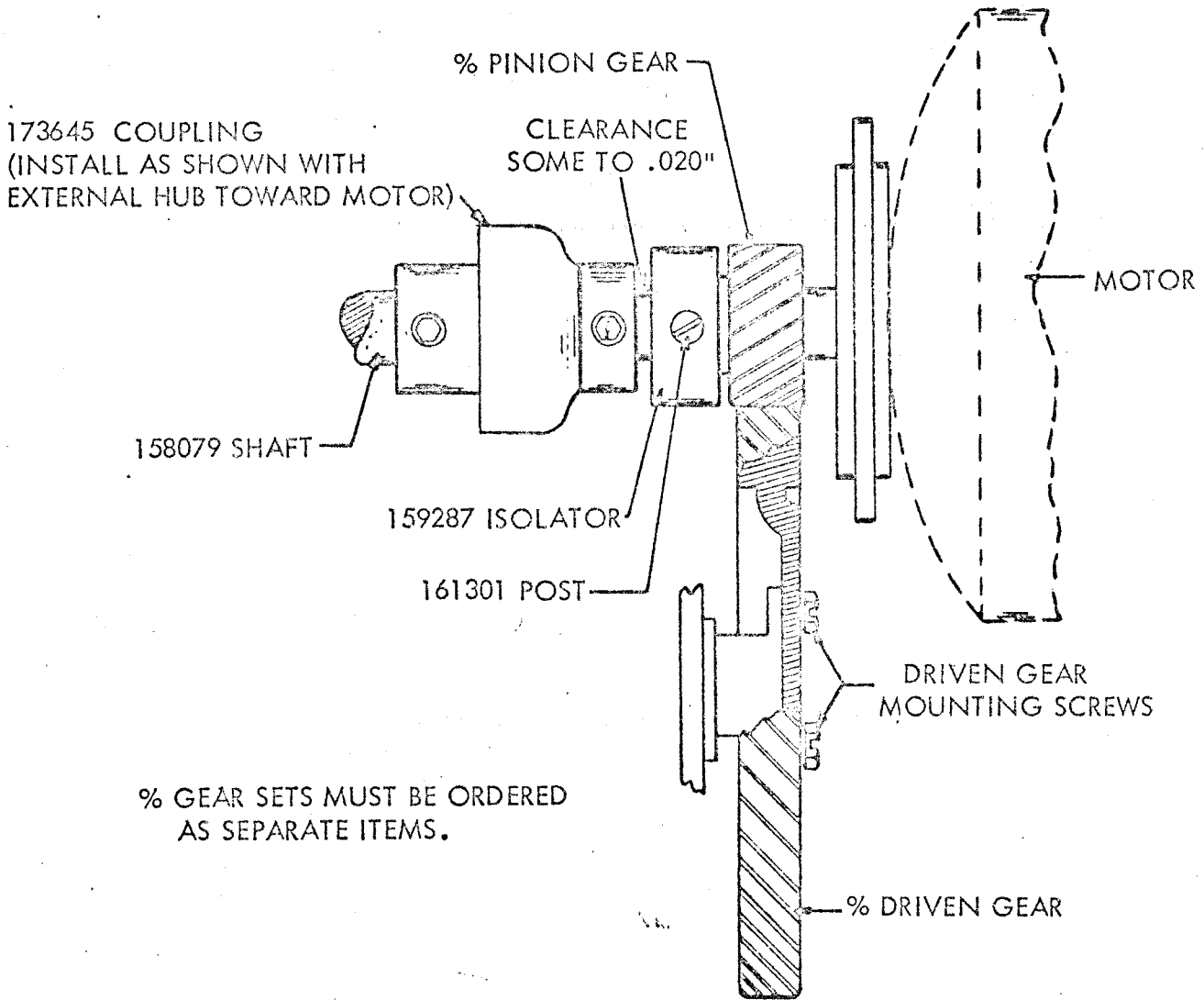


FIGURE 4. INSTALLATION OF MOTOR PINION, GEAR AND FLEXIBLE COUPLING

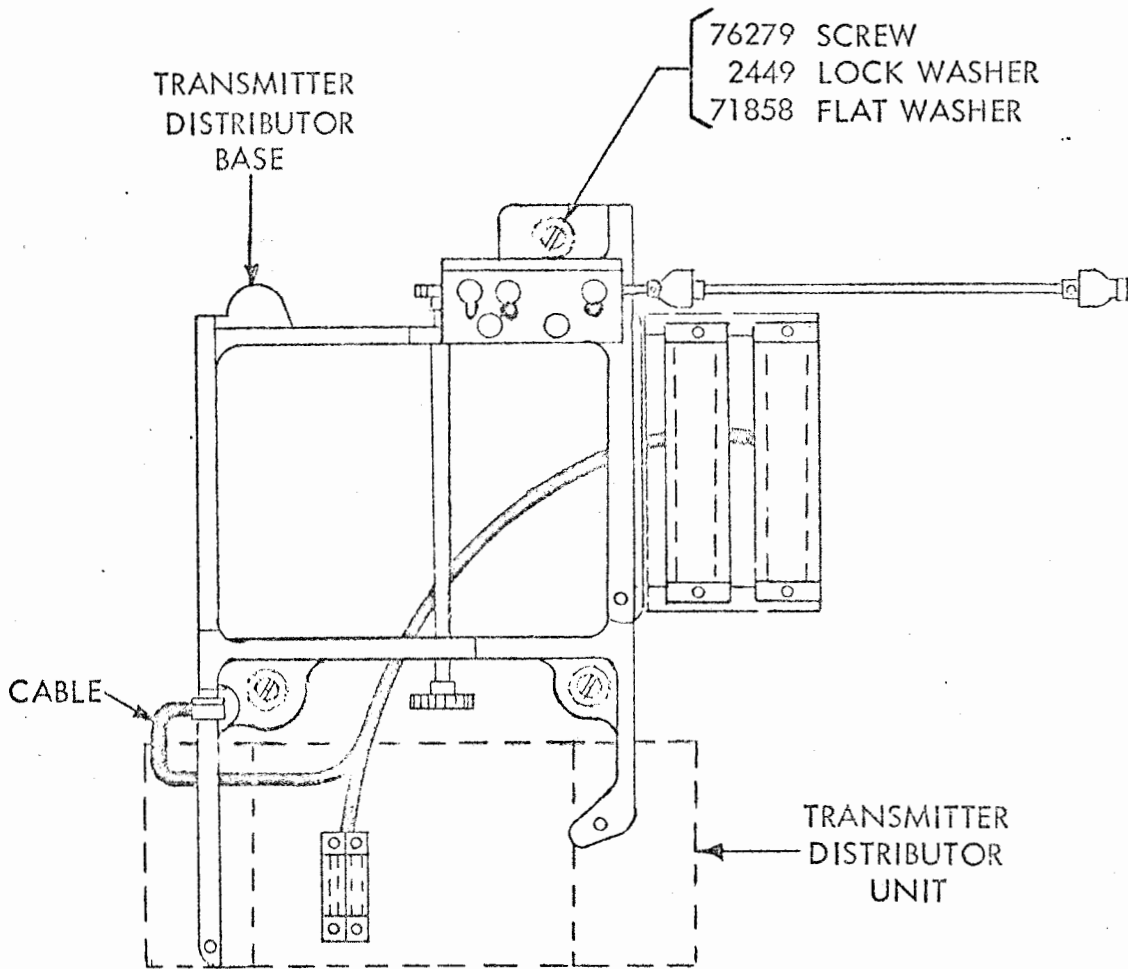


FIGURE 5. TYPICAL TRANSMITTER DISTRIBUTOR UNIT AND BASE ARRANGEMENT

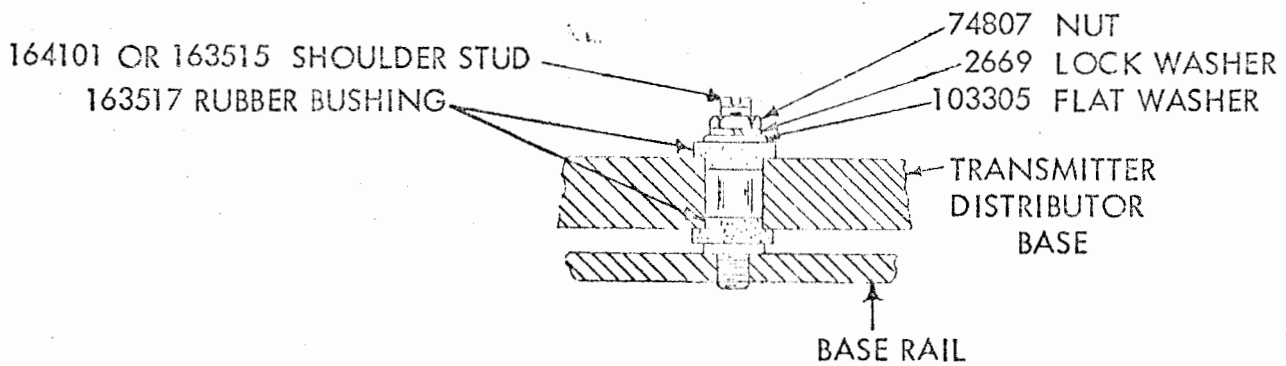


FIGURE 6. ISOLATION MOUNTING OF TRANSMITTER DISTRIBUTOR BASE

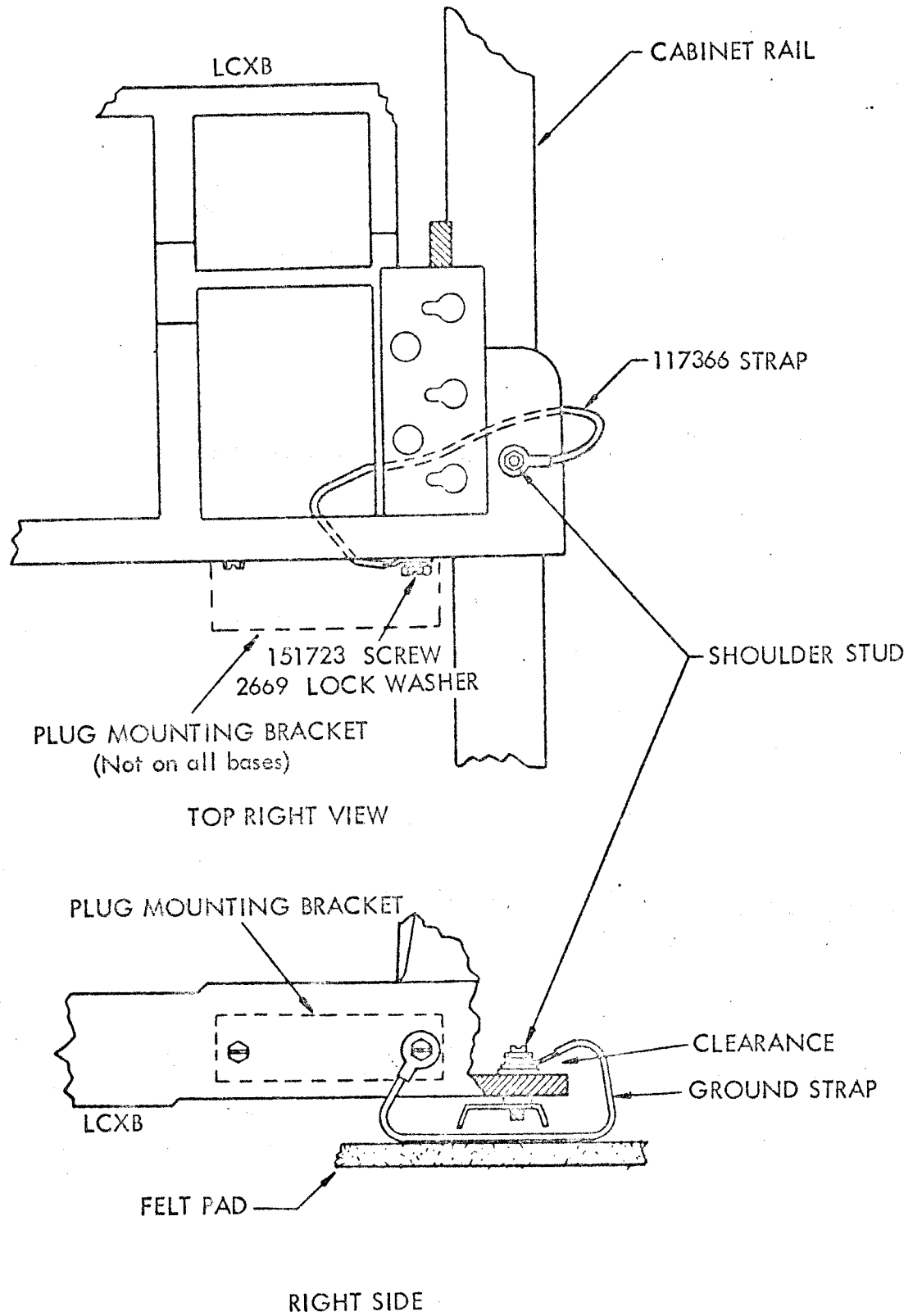
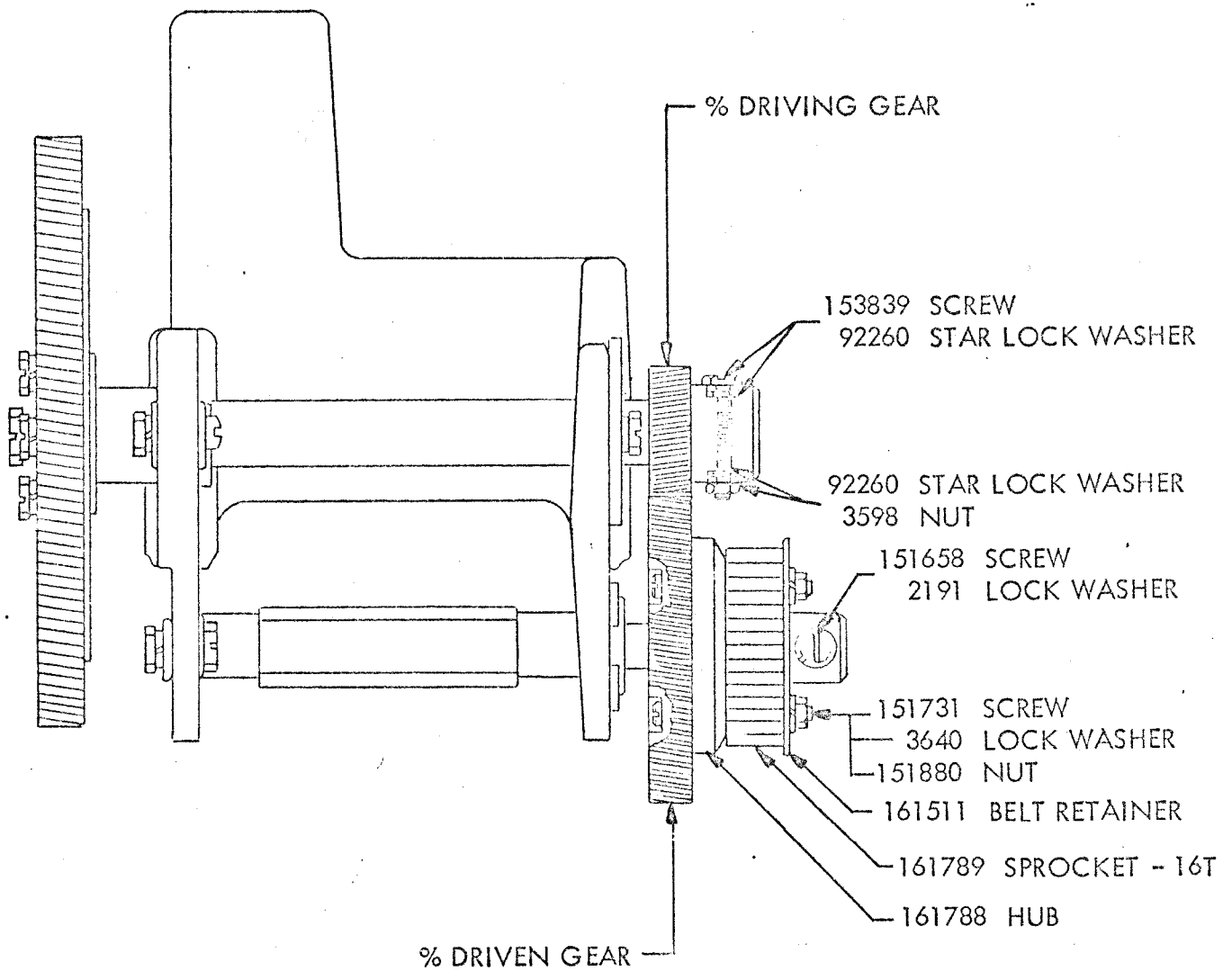


FIGURE 7. INSTALLATION OF TRANSMITTER DISTRIBUTOR BASE GROUND STRAP



% GEAR SETS MUST BE
 ORDERED AS SEPARATE ITEMS

FIGURE 8. INSTALLATION OF GEAR SET ON GEAR BRACKET
 ASSEMBLY (AUXILIARY REPERFORATOR BASE)

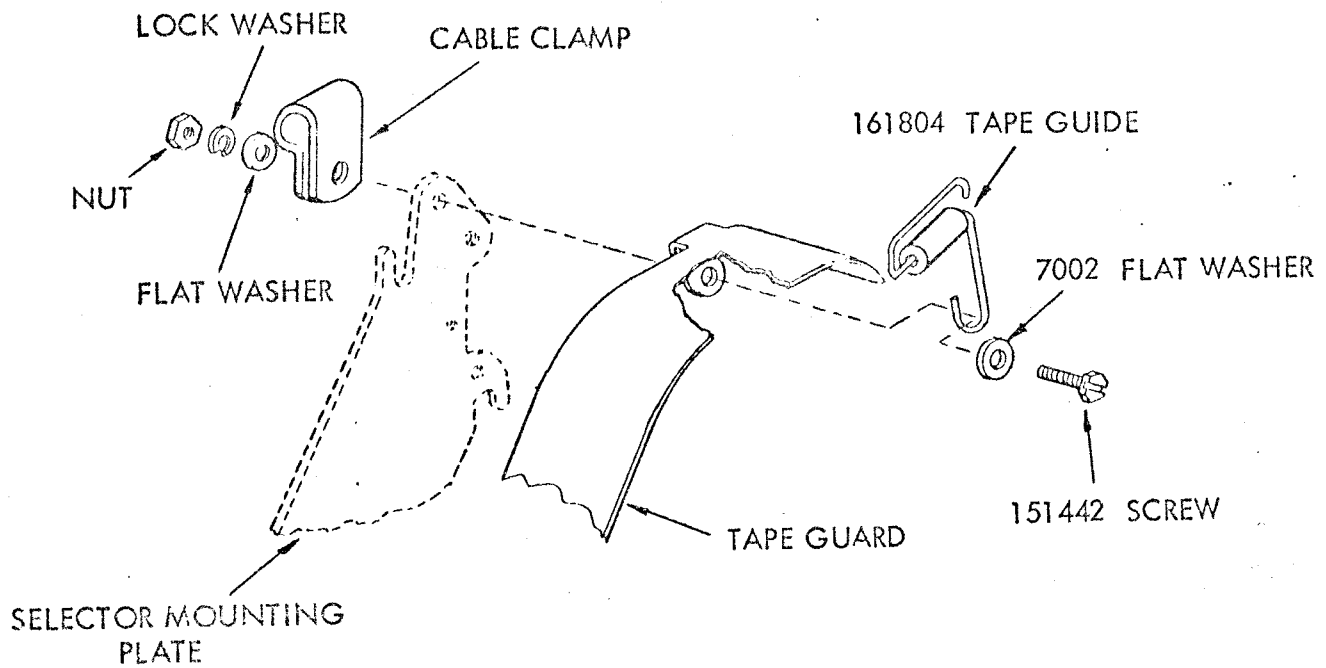


FIGURE 9. INSTALLATION OF 161804 TAPE GUIDE
(AUXILIARY REPERFORATOR WITHOUT
LETTERS—FIGURES CONTACT ASSEMBLY)

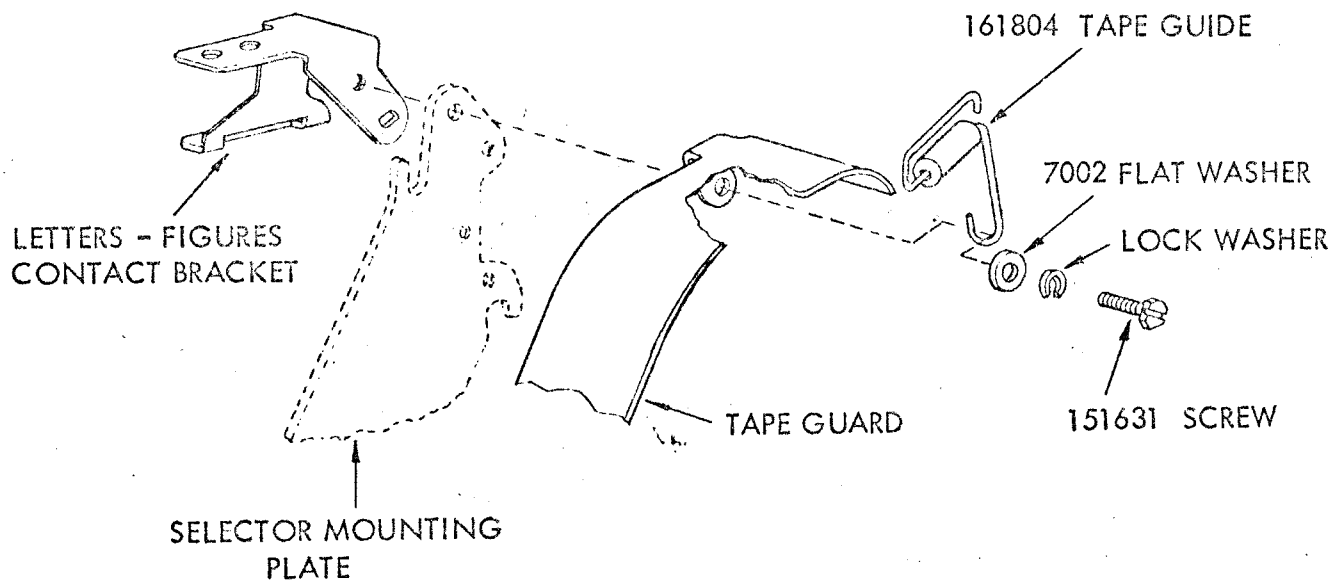


FIGURE 10. INSTALLATION OF 161804 TAPE GUIDE
(AUXILIARY REPERFORATOR WITH LETTERS—
FIGURES CONTACT ASSEMBLY)

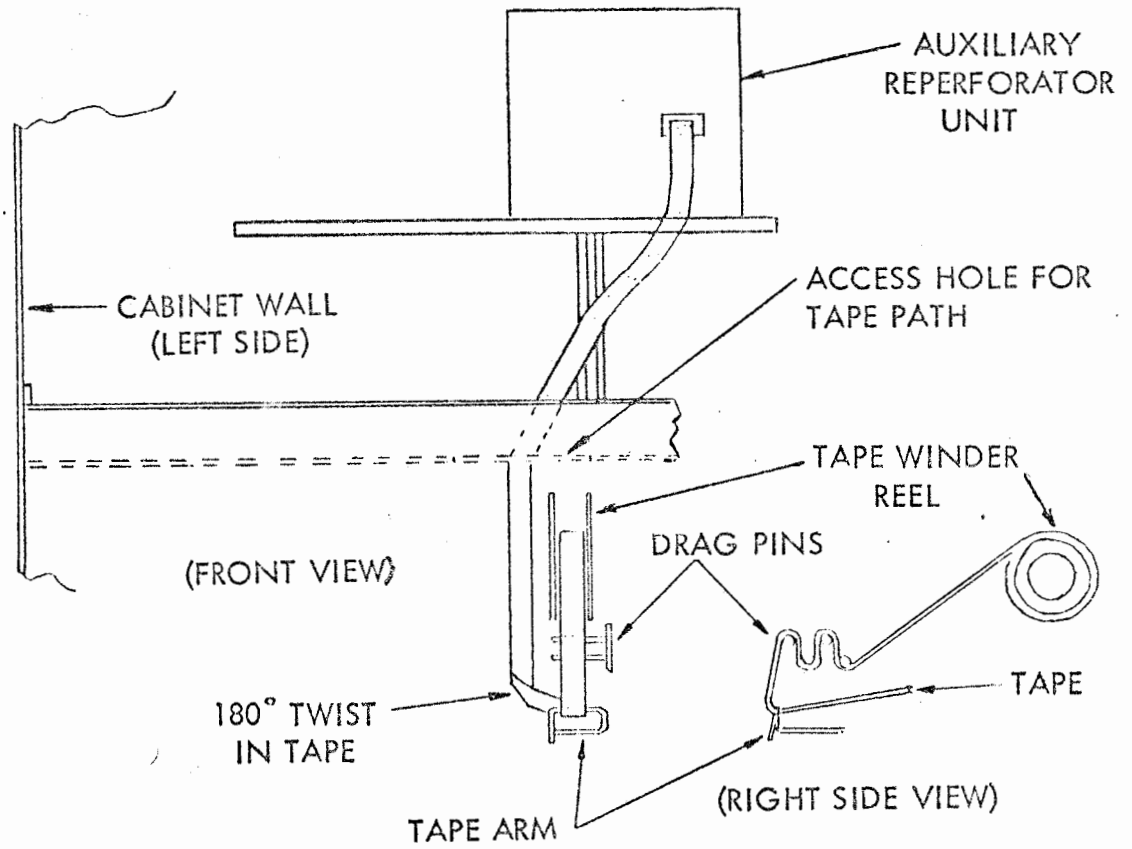


FIGURE 11. TAPE PATH FROM AUXILIARY REPERFORATOR UNIT TO TAPE WINDER REEL

