

## CHAPTER 8 INSTALLATION

8-1. INTRODUCTION. This chapter provides instructions for installation and checkout of Model 28 Compact Page Printer (CPP) KSR and RO teletypewriter sets. Tools required for installation, other than standard shop tools, are provided in Teletype Repair Kit TK-188/U.

8-2. UNPACKING. Each teletypewriter set is shipped completely assembled in a single container. As shown in figure 8-1, the keyboard (KSR) or base (RO) is attached to a wooden pallet, with shipping studs and nuts, in such a manner as to disable the vibration mounts during shipment. Exercise care when unpacking. To remove set from container, proceed as follows:

- a. Cut tape sealing upper flaps of outer carton.
- b. Remove styrofoam blocks from upper corners.
- c. Remove inner lining from top of set.
- d. Remove set by lifting wooden pallet out of carton.
- e. Remove all packing tape from cover.

8-3. SPACE REQUIREMENTS. The overall dimensions of the KSR set are approximately: Depth, 16 inches; Width, 16-1/2 inches; Height, 10 inches. The overall dimensions of the RO set are approximately: Depth, 12 inches; Width, 16-1/2 inches; Height, 10 inches. Detailed dimensions and location of shipping stud holes are shown in figure 8-2 for the KSR set and

in figure 8-3 for the RO set. Shipping studs must be removed for normal installation and use. If special vibration isolation is desired, the studs may be left in place and special shock mounts fastened to the 1/4-20 threads.

8-4. INSTALLATION PROCEDURES. Installation procedures for the high-level CPP equipment are provided in paragraph 8-4.1. Information pertinent to low-level CPP equipment installation is covered in paragraph 8-4.2.

8-4.1 INSTALLATION PROCEDURES (HIGH-LEVEL). The following paragraphs provide information for mounting, connecting power and signal lines, and generally preparing the teletypewriter set for use.

### NOTE

There are four sets of nuts, lockwashers, and flat washers to remove from the RO set, and five sets from the KSR set.

a. Normal Mounting. The teletypewriter set is normally mounted as follows: (See figure 8-1.)

(1) Remove cover to gain access to upper ends of shipping studs.

(2) Remove nuts and lockwashers from upper ends of shipping studs.

(3) With wooden pallet raised, remove nuts, lockwashers, and flat washers

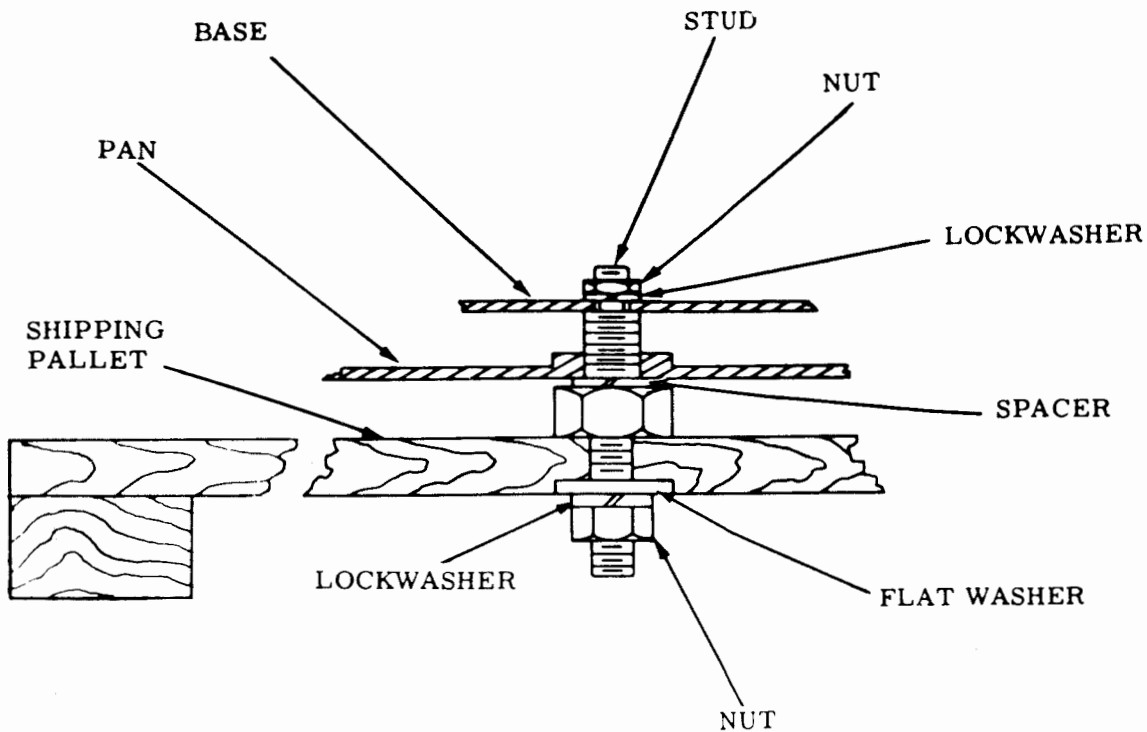


Figure 8-1. Shipping Stud Details

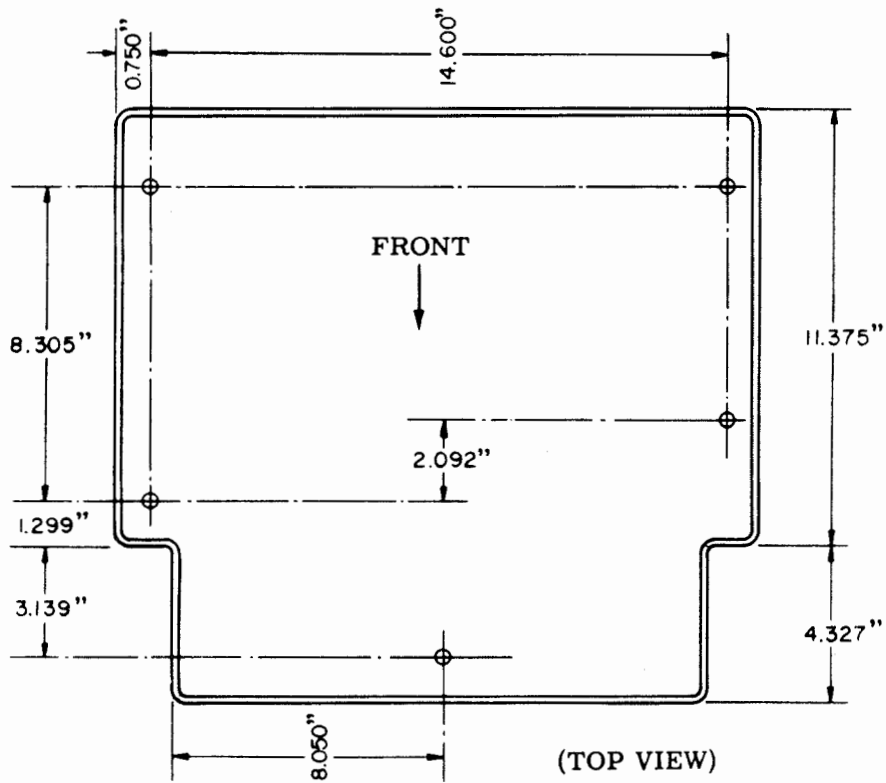


Figure 8-2. CPP (KSR) Dimensions and Shipping Stud Locations

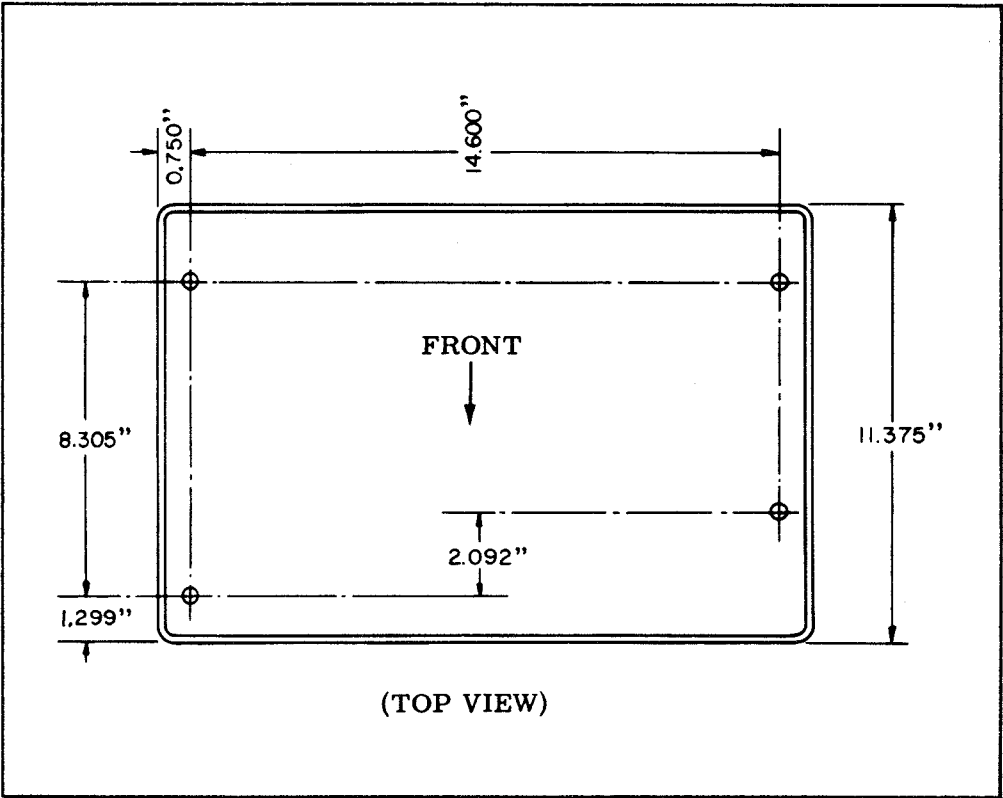


Figure 8-3. CPP (RO) Dimensions and Shipping Stud Locations

from bottom ends of shipping studs.

(4) With pallet flat, lift each end of set and unscrew shipping studs from pan.

NOTE

The teletypewriter set can now be mounted on a table or any other flat surface. Shock mount action is provided by rubber bumpers inserted between the base and the pan.

b. Special Shock Mounting. The teletypewriter set can be mounted using special shock mounts. The wooden pallet can serve as a temporary fixture for supporting the set and protecting the studs until the special shock mounts are attached. Proceed as follows: (See figure 8-1.)

(1) With pallet raised, remove nuts, lockwasher, and flat washer from bottom ends of shipping studs.

NOTE

Shipping studs will accept a 1/4-20 thread.

(2) With pallet flat, lift each end of set and fasten special shock mounts to exposed studs.

c. Attaching Speed Indicator Plate. In certain cases, the speed indicator plate has not been installed on the cover. If not installed, the speed indicator plate will be enclosed in a bag attached to the base or keyboard and should

be installed as shown in figure 8-4.

d. Enabling Time Delay Mechanism. If the set is equipped with a time delay mechanism, the upstop bracket (figure 8-5) must be raised before the mechanism will function properly. Instructions for disabling and enabling time delay mechanism are as follows:

(1) Remove cover and typing unit.

(2) To disable: loosen two mounting screws on upstop bracket; lower upstop bracket to its bottom position; tighten mounting screws.

(3) To enable: loosen two mounting screws on upstop bracket; raise upstop bracket to its upper position; tighten mounting screws.

(4) Replace typing unit and cover.

e. Electrical Connections. AC electrical power and signal line connections are made to terminals on terminal blocks located at the rear of the set. Connections are indicated in high-level CPP schematic and wiring diagrams included in Chapter 5.

8-4.2 INSTALLATION PROCEDURES (LOW-LEVEL). Procedures in paragraph 8-4.1 are also applicable to low-level CPP equipment. The following paragraphs provide additional information applicable only to low-level sets.

a. Electrical Service Assembly (KSR) Installation. A table-mounted electrical service assembly is used with low-level

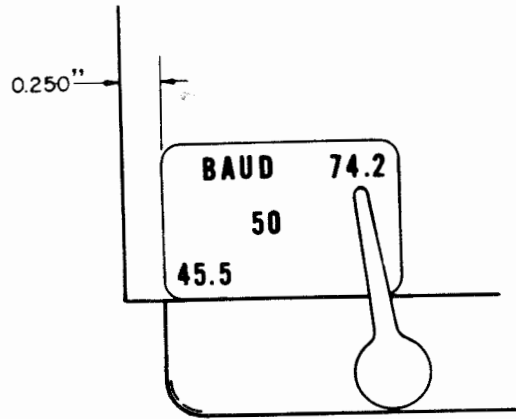


Figure 8-4. Speed Indicator Plate

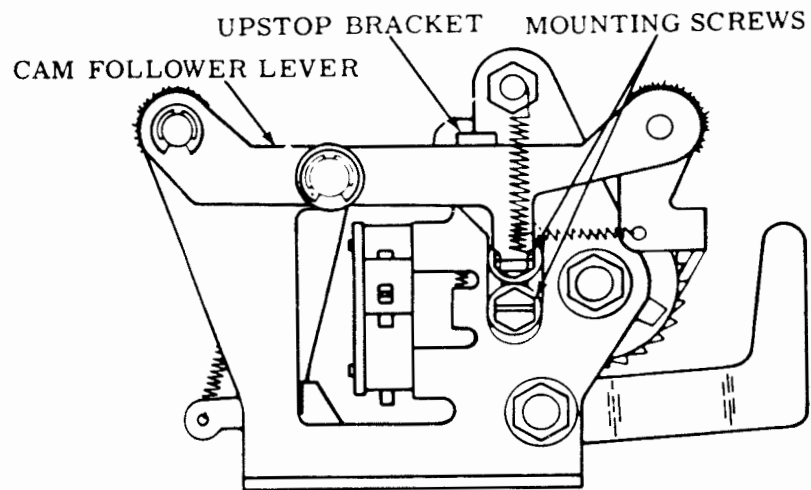


Figure 8-5. Time Delay Mechanism

CPP KSR equipment. Install the ESA as follows:

(1) Mount the electrical service assemblies (ESA) in space available anywhere near the set within the limit of the signal cables. Mounting brackets for the ESA are supplied; however, the user must supply the hardware to fasten these brackets to a table.

(2) Route the signal line conduit or cabling to the keyer selector magnet driver of the ESA. Route the signal line to the opposite side of the fuse and attach by means of a conduit fitting. The ESA container has two 7/8-inch diameter knockouts for 1/2-inch conduit fittings.

(3) Route the synchronous pulse control conduit or cable to the ESA opposite the side of the fuse and attach by means of conduit fittings.

(4) Route the power line conduit or cable to both ESA containers. Connect the power line to the side on which the fuse and power switch are located. Attach by means of a conduit fitting.

(5) Route the clutch magnet driver output cable and signal cables through the notch in the rear of the cover. Route the cables through the nylon clamp on the base and connect to the appropriate terminal block and connector.

b. Electrical Service Assembly (RO) Installation. A table-mounted ESA is also used with low-level CPP RO equipment. Figure 8-6 shows an ESA connected to a RO set. The ESA is connected to a KSR set in the

same manner. Install the ESA as follows:

(1) Mount the ESA in space available anywhere near the set within the limit of the signal cable. Mounting brackets for the ESA are supplied, however, the user must supply the hardware to fasten these brackets to a table.

(2) Route the signal line conduit or cable to the ESA container (the side opposite the fuse) and attach by means of a conduit fitting. The container has two 7/8-inch diameter knockouts for 1/2-inch conduit fittings.

(3) Route the power line conduit or cable to the ESA container (the side with the fuse and power switch) and attach by means of a conduit fitting. The container has a 7/8-inch diameter knockout for 1/2-inch conduit fitting. A separate power cable should be brought into the base for the motor.

(4) Route the signal cable from the ESA to the apparatus through the notch in the rear of the cover, through the nylon cable clamp at the rear of the base, and along the left side of the set to the selector magnet assembly connector. Tie the cable to the motor mounting post at the base to keep it clear of the fan.

c. ESA Circuit Card Hold-Down Installation. The circuit card hold-down installation provides the means to secure circuit cards into connectors of CPP low-level ESAs. This provides protection against shock, vibration, and loosening of circuit cards. The installation material consists of strips of Neoprene rubber

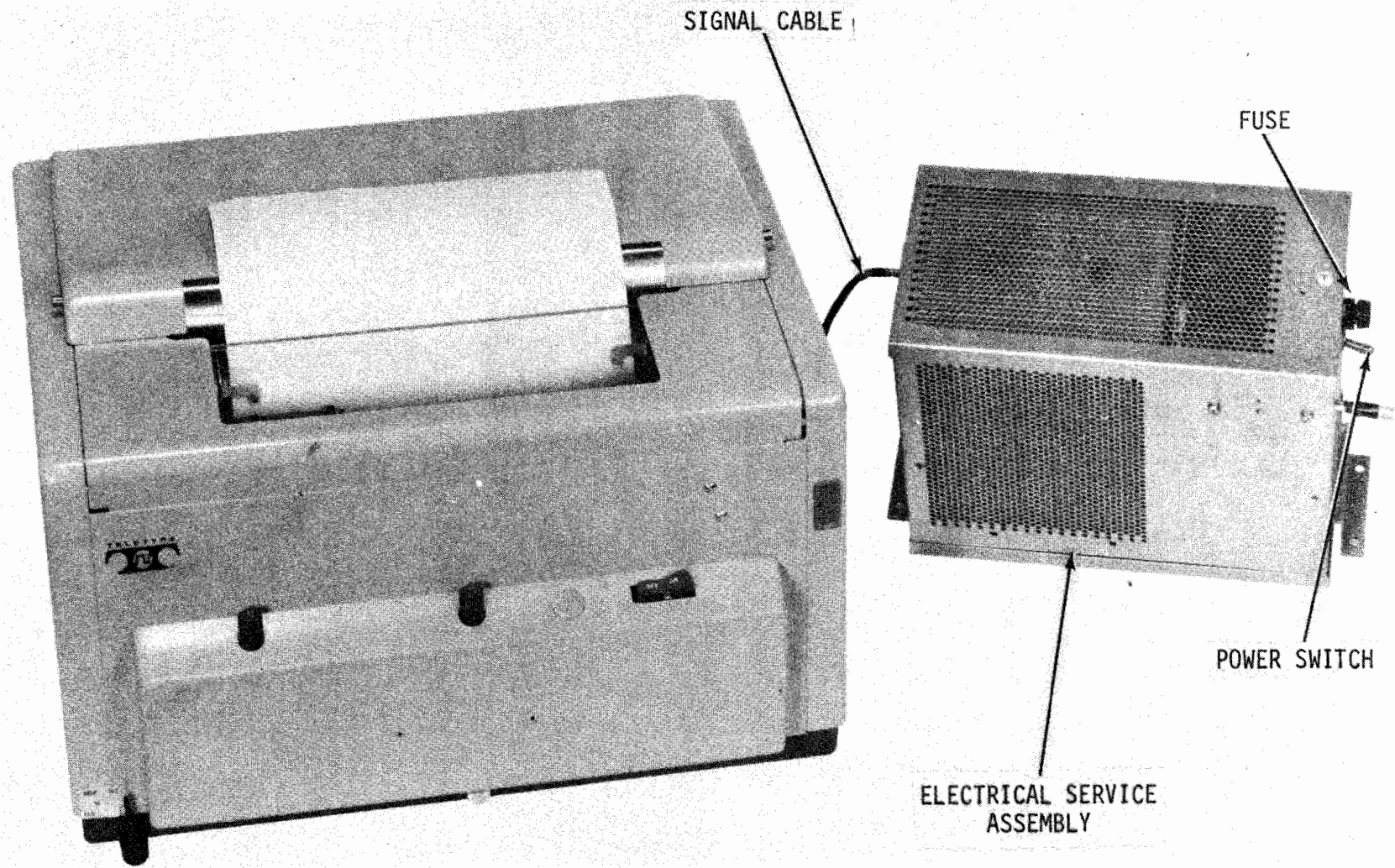


Figure 8-6. Typical ESA Installation

foam. Installation procedures vary for different ESAs. The following information covers ESAs used with low-level CPP equipment.

(1) ESA 323120.

Install Neoprene rubber foam circuit card hold-downs as follows: (See figure 8-7)

(a) Turn locking screw to remove and retain TP321996 cover w/stud.

(b) Measure and mark location for TP343731 foam card holder.

(c) Peel paper from foam and place adhesive side to inside of TP321996 cover in area shown in figure 8-7.

(d) Press foam down to obtain maximum adhesion.

(e) Replace TP321996 cover w/stud and lock into position.

(2) ESA 321231 and 323121. Install Neoprene rubber foam circuit card hold-downs as follows: (See figure 8-8)

(a) Turn the locking screw to remove and retain the TP321996 cover w/stud.

(b) Remove and retain the TP320057 inner cover.

(c) Measure and mark the central locations for the placement of the two TP343732 foam card holders, at the inside edge of the perforations, inside the TP320057 cover.

(d) Peel the paper backing from each TP343732 foam card holder and place adhesive sides to the inside of

the TP320057 inner cover in area shown on figure 8-8. Press foams to obtain maximum adhesion.

(e) Replace the modified TP320057 inner cover.

(f) Replace the TP321996 cover w/stud and lock into position.

d. Electrical Connections (Low-Level). AC power and signal line connections are made to low-level CPP equipment through the ESA. Connections are indicated in low-level CPP schematic and wiring diagrams included in Chapter 5.

8-5. INSTALLATION CHECKOUT. Installation checkout consists of performing reference standards tests and performance tests.

a. Reference Standards Test. After installation is satisfactorily completed, perform the following procedures to determine that the teletypewriter set is properly assembled to meet specified reference standards.

(1) Check printing carriage position as follows:

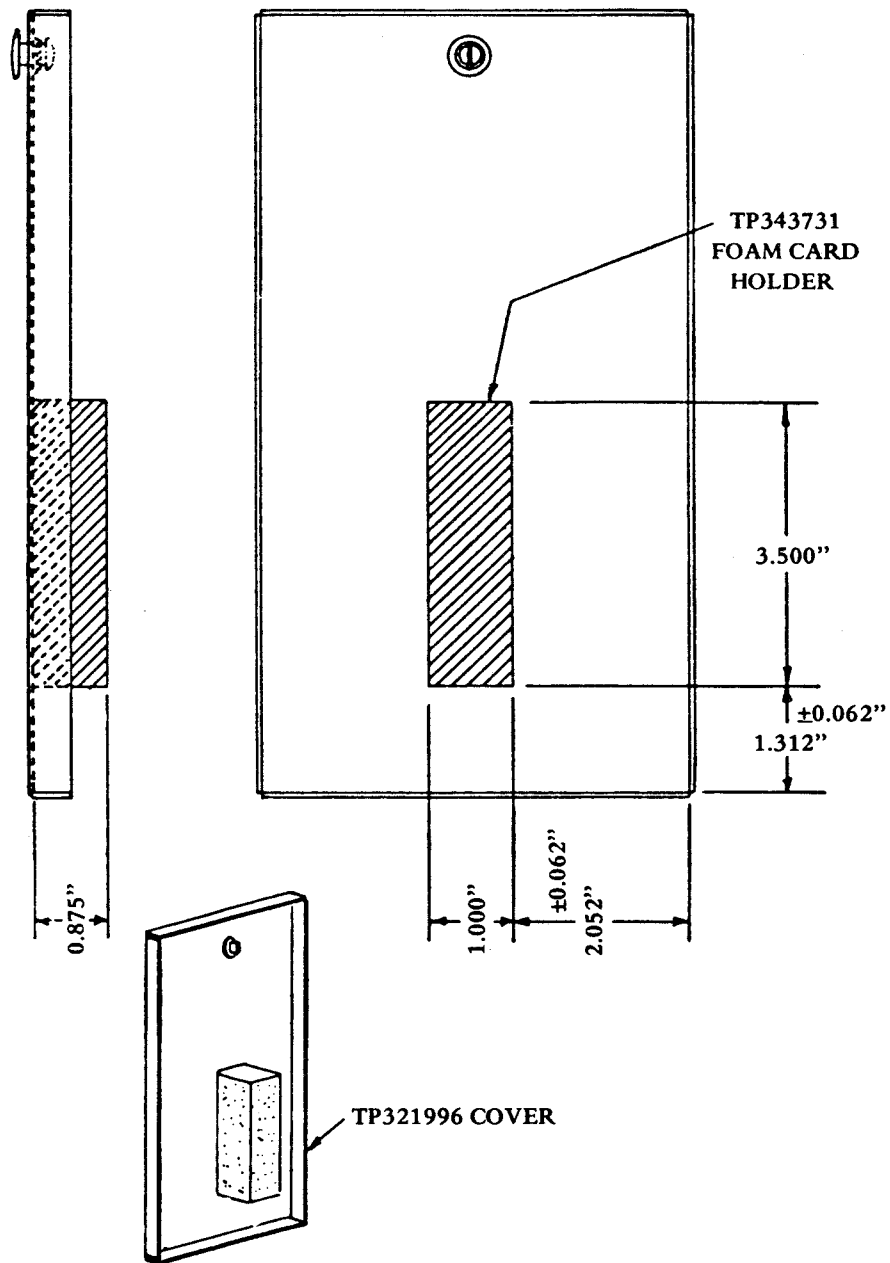
(a) With type box in printing position, select "M" type pallet.

(b) Observe to make sure that "M" type pallet is in center of printing hammer when touching.

(2) Check printing hammer stud as follows:

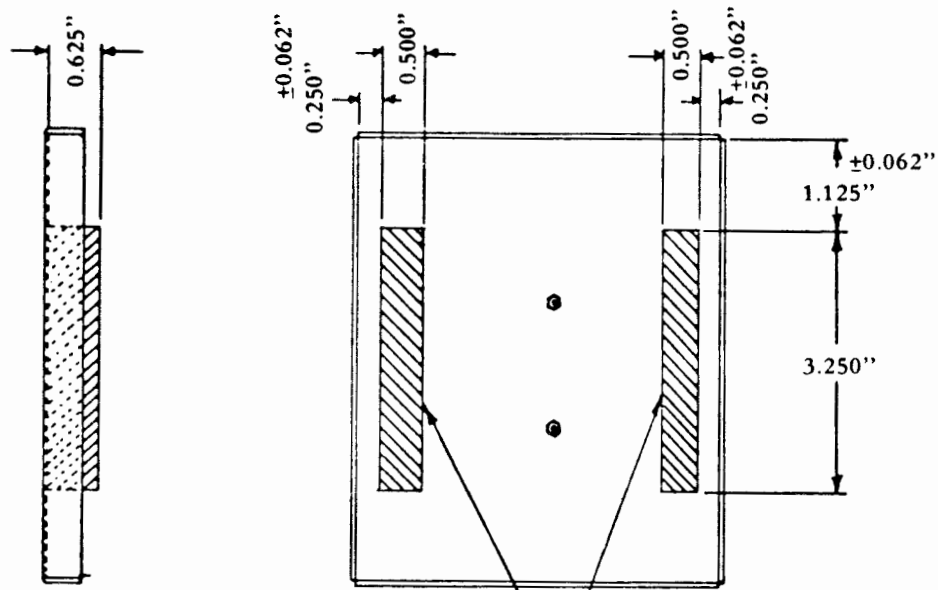
(a) Move box to midpoint of platen in position to print period.





**Note:** Figure is not to scale, use dimensions.

**Figure 8-7. Circuit Card Hold-Down Installation for ESA 323120**



Note: Figure is not to scale, use dimensions.

TP343732 FOAM  
CARD HOLDER

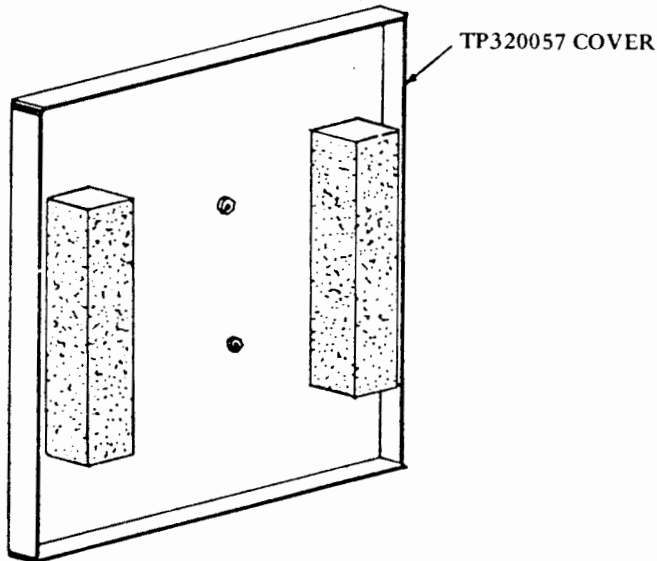


Figure 8-8. Circuit Card Hold-Down Installation for ESAs 321231 and 323121

(b) Place printing hammer in contact with type pallet and pressed down to bearing post.

(c) Observe hammer face to make sure it is positioned on end of type pallet.

(3) Record draw-wire rope clearances as follows: (Use feeler gauge.)

(a) Measure clearance between carriage return latch bail post and lower wire rope. Record clearance. Standard: 0.006 inch minimum.

(b) With horizontal positioning mechanism in lowest position, measure clearance between lower wire rope and left horizontal positioning drive linkage. Record clearance. Standard: 0.30 inch minimum.

(4) Record printing arm clearance as follows: (Use feeler gauge.)

(a) Place printing hammer track at maximum downward; printing hammer operating bail against its stop.

(b) Measure clearance between secondary printing arm and forward extension of hammer operating bail. Standard: some clearance; not to exceed 0.15 inch.

(c) With printing track in uppermost position, latching extensions of printing hammer operating bail should over-travel surface of operating bail latch. Check and record clearance, both sides. Standard: 0.006 inch minimum.

(5) Record printing hammer stop bracket clearance as follows: (Use feeler gauge).

(a) Move type box to "M" position; position printing track to maximum downward.

(b) Press (8 ounces) printing hammer stop bracket toward platen.

(c) At end of pallet with least clearance, measure clearance between printing hammer and "M" pallet.

(6) Record rocker shaft eccentric stud clearance as follows: (Use feeler gauge.)

(a) Disengage type box clutch.

(b) Move locking arm toward front.

(c) Measure clearance between lower side lock lever roller and top edge of horizontal positioning lock lever shoulder. Standard: 0.55 inch minimum to 0.90 inch maximum.

NOTE

If adjustments are required and made, re-check adjustments (see Chapter 4) to following items:

Horizontal positioning drive linkage.

Right vertical positioning lever eccentric stud.

Left vertical positioning lever eccentric stud.

Vertical positioning lock lever.

Ribbon feed lever bracket.  
Function stripper blade arms.  
Spacing trip lever bail cam plate.  
Reversing slide brackets.  
Ribbon reverse space gear.  
Printing track.  
Printing arm.

(7) Measure clutch shoe lever clearance as follows: (Use feeler gauge).

(a) Trip clutch. Rotate until clutch shoe lever is toward bottom of unit.

(b) Align clutch drum mounting screw head with stop lug.

(c) Compress shoe lever against stop lug, allowing to snap apart.

(d) Measure and record gap with clutch thus engaged.

(e) Measure and record gap with clutch disengaged.

NOTE

Step f reading (differential between engaged and disengaged clutch) must be 0.75 inch for 100 WPM operation.

(f) Compare two readings in steps (d) and (e). The difference between the two must fall within 0.055 and 0.085 inches.

(8) Check dash-pot vent screw as follows:

(a) Set POWER switch to ON.

(b) With letter "M" depressed, operate printer on local loop.

(c) First character should print in same location as in slow manual operation.

(d) Type box carriage should return without bouncing.

(9) Record keyboard contact wire clearances as follows:

(a) Place keyboard in reset condition.

(b) Set T-levers in marking positions.

(c) Using feeler gauge, check clearance between contact wires and terminal is from 0.010 inch (minimum) to 0.025 inch (maximum).

(d) Set T-levers in spacing condition.

(e) Check clearance between contact wires and terminal is from 0.020 inch (minimum) to 0.040 inch (maximum).

(10) Check distributor code level contacts as follows:

(a) Place cam follower lever on high part of cam by tripping clutch manually and rotating distributor shaft.

(b) Using feeler gauge, check first six

contact gaps from clutch end of shaft. Gaps should be from 0.020 inch (minimum) to 0.030 inch (maximum).

(11) Check distributor solenoid contact gap as follows: (Use feeler gauge).

(a) With distributor clutch in latched or stop position, check and record solenoid contact gap. Standard: 0.025 inch minimum to 0.030 inch maximum.

(12) Record DC line current as follows:

(a) Attach meter to appropriate patch panel.

(b) Turn patch panel selector switch to desired position and record reading.

b. Performance Tests.  
After reference standards tests have been satisfactorily accomplished, conduct performance tests described in Chapter 4, paragraph 4-8.

