

## 197- AND 198-TYPE SWITCHES

### METHODS OF MOUNTING CAPACITORS AND NETWORKS ON SHELF ANGLES

#### 1. GENERAL

**1.01** This section describes methods of mounting 147-, 149-, 447-, and 449-type capacitors and 178- and 179-type networks on lower shelf angles in step-by-step offices.

**1.02** This section is reissued to replace the KS-8441 200-ohm resistor with the KS-19253 L1 200-ohm resistor, and to revise the List of Tools.

**1.03** In order to compensate for differences in dimensions of various capacitors and networks, adapters are used to obtain satisfactory mounting of the parts. The adapters required for individual capacitors and networks are given in Part 2, and the methods of mounting the apparatus on the adapters are given in Part 4 of the section.

#### 2. LIST OF CAPACITORS AND NETWORKS BY CODES

**TABLE A — CAPACITORS**

CAPACITOR	ADAPTER REQUIRED	REPLACES CAPACITOR
147A	P-409555	21E
*147B	P-409555	122C
**149A	P-409556	21K
149B	P-409556	21AK
447A	P-431343	147A
449A	P-431344	149A
449B	P-431344	149B

\* Equipped with 81B resistor, replaces the 122C capacitor which includes resistor.

\*\* When equipped with 81B resistor, replaces the 122A capacitor which includes resistor.

**TABLE B — NETWORKS**

NETWORK	ADAPTER REQUIRED	REPLACES CAP.—RES COMBINATION (See note)	
		CAP.	RES
178A	P-431343	147B	81B
179A	P-431344	149A	81B

**Note:** If the 81B resistor only is defective, the resistor should be replaced with the KS-19253 L1, 200-ohm resistor, as covered in 4.09. If the capacitor only or the capacitor and resistor are defective, the combination should be replaced with the corresponding network shown in the table.

#### 3. LIST OF TOOLS AND MATERIALS

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
R-1542	6-Inch Adjustable Wrench
—	3-Inch C Screwdriver (or the re- placed 3-inch cabinet screwdriver) ←
—	5-Inch Diagonal Pliers
—	P-Long-Nose Pliers
<b>MATERIALS</b>	
—	22 Gauge Bare Tinned Wire Per P-146468

#### 4. PROCEDURES

##### MOUNTING CAPACITORS AND NETWORKS ON ADAPTERS

##### 447- and 449-Type Capacitors and 178- and 179-Type Networks

**4.01** Cut two pieces of the 22 gauge wire approximately 1-1/2 inches longer than twice the length required to go around the ca-

capacitor or network and the adapter. Double the lengths of wire at the middle.

**4.02** Pass the cut ends of one of the doubled wires through the two holes at the top of the adapter so that the doubled wire lies in the groove of the adapter. Similarly pass the other doubled wire through the other two holes in the adapter.

**4.03** Position the capacitor or network on the ungrooved side of the adapter as shown in Fig. 1 so that the groove near the top of the capacitor or network is in line with the wire extending from the holes near the top of the adapter. Wrap the doubled wire around this groove so that the loop end of the wire is at one side of the capacitor or network. Then pass the cut ends of the wire through the loop, pull the wire tight with the P-long-nose pliers and bend the ends back from the loop. Cut off the ends of the wire leaving a length of approximately 1/4 inch behind the loop as shown in the figure. Press the ends of the wire against the wire in the groove and solder them in place. Similarly wrap and solder the wires extending through the other holes in the adapter.

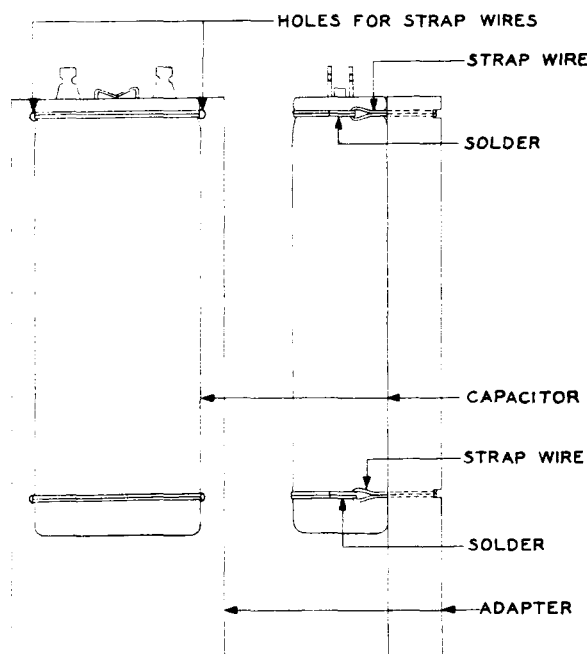


Fig. 1 - 447A Capacitor Mounted on P-431343 Adapter

#### 147- and 149-Type Capacitors

**4.04** Using the 3-inch C screwdriver, remove the capacitor mounting screw from the adapter. Position the capacitor in the recess of the adapter so that the mounting screw hole in the capacitor is in line with the screw hole in the adapter. Securely tighten the mounting screw.

**4.05** Cut a piece of the 22 gauge wire approximately 1-1/2 inches longer than twice the length required to go around the capacitor and adapter. Double the length of wire at the middle.

**4.06** Place the doubled wire in the groove in the adapter and wrap it around the capacitor so that the loop of the wire is at one side of the capacitor. Then pass the cut ends of the wire through the loop, pull the wire tight with the P-long-nose pliers, and bend the ends back from the loop. Cut off the ends of the wire leaving a length of approximately 1/4 inch behind the loop. Press the ends of the wire against the wire on the capacitor and solder them securely in place.

#### MOUNTING CAPACITORS AND NETWORKS ON SHELF ANGLE

**4.07** First remove the apparatus to be replaced by unsoldering the leads and loosening the nuts on the bolts holding the clamping bar with the 6-inch adjustable wrench.

**4.08** Place the new capacitor or network with the adapter on the shelf angle so that it will be held securely between the vertical portion of the angle and the clamping bar. If practicable, mount the apparatus so that the adapter only will be clamped between the angle and the bar. If other capacitors or networks are mounted on the shelf angle, position the new apparatus close to those on the angle, if practicable, to obtain a firm mounting. Press the clamping bar against the apparatus on the angle and securely tighten the nuts using the 6-inch adjustable wrench. Check that all apparatus on the shelf angle is held securely and, if necessary, bend the bar slightly to obtain firm mounting of all the apparatus.

**MOUNTING RESISTOR ON CAPACITOR**

**4.09** To mount the KS-19253 L1, 200-ohm resistor, in place of the 81B resistor on a capacitor, proceed as follows. Unsolder the connection to the 81B resistor and remove it from

the capacitor. Wrap one pigtail lead of the KS-19253 L1 resistor at least 1-1/4 turns around the terminal of the capacitor to which the 81B resistor was connected and solder the connection. Connect and solder the other pigtail lead of the resistor to the circuit lead.