

## SUBSCRIBER SETS MAINTENANCE

### 1. GENERAL

1.01 This section covers maintenance information for subscriber sets of types 531, 584, 592, 634, 684, 685, 686, 687, 688, 689, 690, 691, 693, and 694.

1.02 This section is reissued to add information on the 584-, 688-, 689-, 690-, 691-, 693-, and 694-type subscriber sets.

### 2. MAINTENANCE

2.01 Maintenance of these subscriber sets consists of:

- Replacing broken, cracked, or defective components.
- Inspecting for loose connections.
- Checking for presence of foreign matter that could interfere with proper operation.
- Adjusting ringers, relays, and buzzers.

2.02 The B-, C-, or D-type ringers are used in these subscriber sets. For ringer test procedures and adjustments, refer to the section that covers maintenance of ringers.

2.03 Tables A and B list the components for subscriber sets covered in this section.

### 3. 531C AND 687B SUBSCRIBER SETS

3.01 These sets have similar components. They both contain a UA-112 relay, a 20A varistor, and a 426A electron tube (Fig. 1 and 2).

#### Relay

3.02 When relay fails to perform properly:

- (a) Check for dirty or pitted contacts, spring tension, and contact follow.
- (b) Clean contacts with a 265C tool (contact burnisher holder) having a clean 266E tool (contact burnisher blade). Use a KS-6320 orange stick to hold contacts closed while cleaning. (See Fig. 3.)
- (c) Test electron tube and varistor (See 3.08 and 3.09).

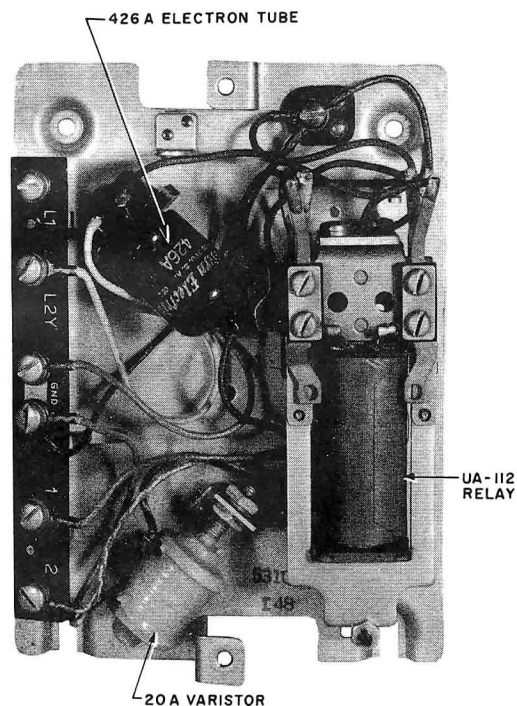


Fig. 1 - 531C Subscriber Set

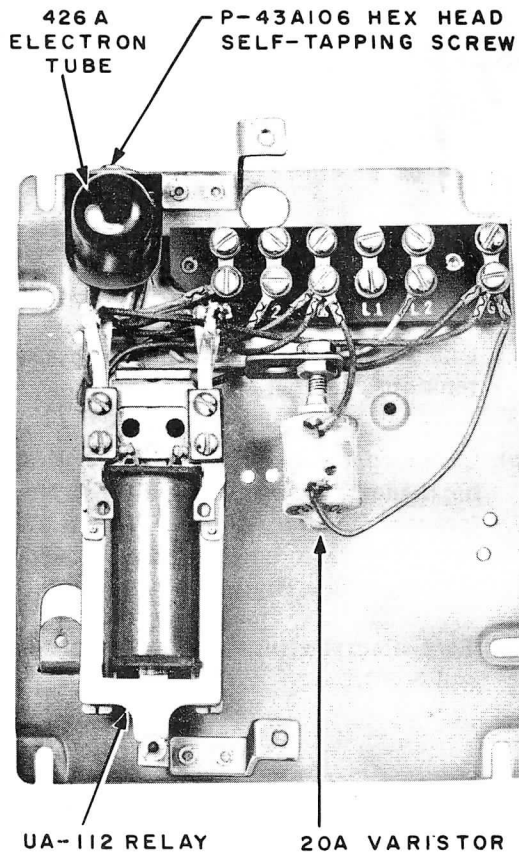
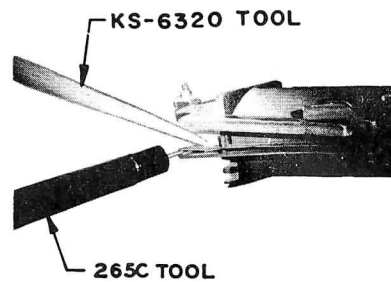


Fig. 2 - 687B Subscriber Set

Fig. 3 - Cleaning Contacts,  
UA-112 Relay**Spring Tension**

**3.03** Adjust each spring of the UA-112 relay toward the armature to increase tension, and away from the armature to decrease tension.

**3.04** To adjust spring tension, place the spring adjusting tool on each spring just back of the operating stud, and slide back to the base of the spring (Fig. 4).

**Spring and Contact Separation**

**3.05** The separation between normally open contacts of UA-112 relay should be a minimum of 0.005 inch. The separation between adjacent springs should be a minimum of 0.008 inch. Gauge separations by eye. (See Fig. 5.) All contacts should have a perceptible follow when made.

**TABLE A**  
**COMPONENTS FOR SUBSCRIBER SETS**

Type Set	Ringer	Electron Tube	Relay	Capacitor	Varistor	Amplifier	Inductor	Network	Dial	Resistor	Buzzer
531A	B1AL			198B							
531C	B1AL	426A	UA-112		20A						
584DG	B4A									449G	
592A	B1A										
592B	B1A										
592C	B1A	359A		198A							
634BA	41 type		S36	194A			101A				
684	B1AL			195A			101A				
685A	C4A							425B			
685B	C4A		S36					425B			
685C	C4A		KS-19132, L1					425D			
686A	C4A							425B			
687A	C4A			198C							
687B		426A	UA-112		20A						
687D				KS-14337		151D	266A			KS-13490, L1	
688A	C4A				100A	151D	266A	425D			KS-8109
689	D1B			548B					8C		
690	C4A				100A	151D	266A	425D	8C-58		KS-8109
691	C4A							425F	7L-3		

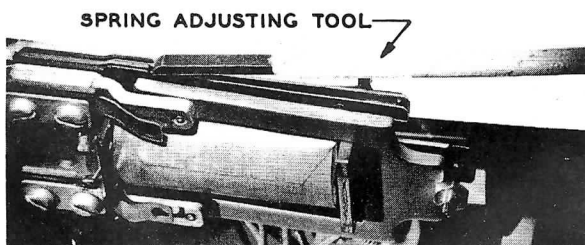
**TABLE B**  
**COMPONENTS FOR 693- AND 694-TYPE SUBSCRIBER SETS**

Type Set	Transmitter	Loudspeaker	Housing	Transistor Amplifier	Volume Control	OFF-ON Volume Control	Grid
693A	AC1	KS-16881	P-83B400*	12G	P-44E057		P-24E884
693B						P-44E058	P-24E885
694A					P-44E057		P-24E884
694B						P-44E058	P-24E885

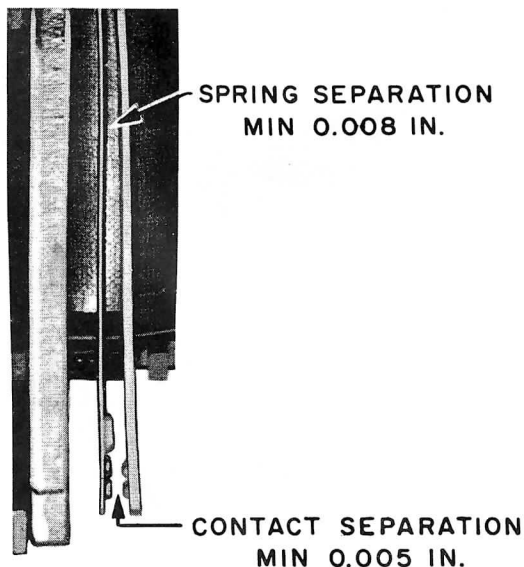
\* Replace the 00 digits of this part number with the code number of the color desired.

### Alignment

**3.06** On a UA-112 relay the width of the contact surface on each contact bar should fall wholly within the length of its mating bar (Fig. 5).



**Fig. 4 - Adjusting Springs,  
UA-112 Relay**



**Fig. 5 - Spring and Contact Separation,  
UA-112 Relay**

**3.07** If UA-112 relay fails to operate satisfactorily, it should be readjusted or the set should be replaced. To test operation of the UA-112 relay, proceed as follows:

- (1) Place a 5600 ohm  $\pm 10$  per cent resistor in series with 90-volt 20-cycle ac biased with 22 1/2-volt dc power supply.
- (2) Connect lead with positive side of bias voltage to terminal G in 687B subscriber set or terminal GRD in 531C subscriber set. Connect lead with negative side of bias voltage to terminal L2 in 687B subscriber set or L2Y in 531C subscriber set.

Note: The UA-112 relay operates with test leads attached to the terminals as stated in (2).

- (3) Apply continuity check across terminals 1 and 2 in either subscriber set.

### Varistor

**3.08** Test varistor by putting one clip of hand test set on L2 and other clip on punching No. 1 of varistor. If no audible ring is heard when ringing is applied to line, the varistor is defective and should be replaced. Test set must be in monitor position during test.

### Electron Tube

**3.09** Test tube by shorting the yellow and black tube leads and note if relay operates when ringing of correct polarity is applied to the line. If relay operates, tube is defective and should be replaced. (This test is applicable to all tubes except the 313 type.)

**3.10** The 425A or 426A electron tube should be used to replace defective 313-, 333-, 372-, 405-, and 411-type tubes. See section covering electron tubes.

**3.11** To mount a 425A or 426A tube in a 634-type subscriber set, use a P-248535 bracket; a P-43A106 Hex Head self-tapping screw in the 686 and 687B types; and a P-210810 RHM screw in the 531C subscriber set.

#### 4. 592-TYPE SUBSCRIBER SET

**4.01** This subscriber set has a loud ringing bell. If a louder signal is desired, larger gongs (42A) may be ordered and installed. Refer to section covering maintenance for B-type ringers.

#### 5. 634 AND 685B SUBSCRIBER SETS

**5.01** The S36 relay is used in the 634 and 685B subscriber sets. The relay operates to connect the tip and ring of the line together at the station whenever coin-collect or refund current is applied to the line.

**5.02** When relay fails to perform properly:

- (a) Check for dirty or pitted contacts.
- (b) Clean contacts with a 265C tool (contact burnisher holder) having a clean 266E tool (contact burnisher blade). Use a KS-6320 orange stick to hold contacts closed while cleaning. (See Fig. 6.)

**5.03** If relay fails to operate satisfactorily, it should be readjusted or the set should be replaced. A 35F test set, or equivalent, may be used to readjust the relay in accordance with the following data:

##### Test Set Preparation

Battery and Ground

##### Test Clip Data

Connect Battery to M; connect ground to E

##### DC Flow Requirements

Operate—Test 47.0 ma, readjust 44.5 ma  
Nonoperate—Test 37.5 ma, readjust 39.5 ma

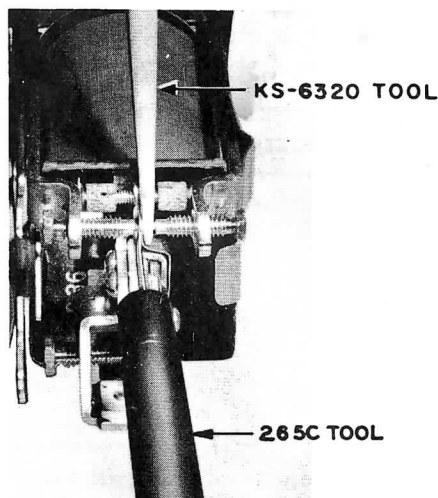


Fig. 6 - Cleaning Contacts, S36 Relay

**5.04** For operate requirements, slowly increase current to the test or readjust values using a battery supply of no less than 3 volts.

**5.05** If trouble cannot be corrected by these procedures, replace the subscriber set.

#### 6. 685C SUBSCRIBER SET (FIG. 7)

**6.01** This set uses a KS-19132,L1 relay or equivalent. Adjustments cannot be made on this relay. Replace the relay if it is defective.

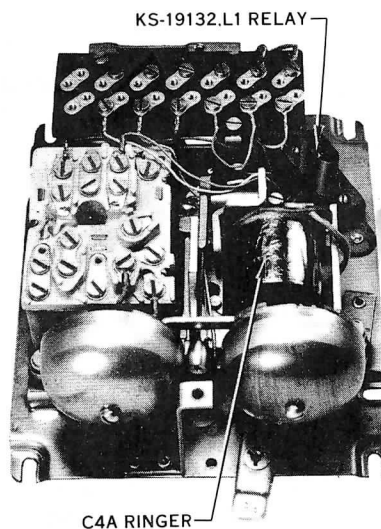


Fig. 7 - 685C Subscriber Set

**7. 689-TYPE SUBSCRIBER SET (FIG. 8)**

**7.01** The 689-type subscriber set is equipped with an 8C dial. For maintenance procedures, refer to the section that covers maintenance for this type dial.

**7.02** This set uses a 731A receiver equipped with an HC3 receiver unit. Replace defective parts.

**8. 690-TYPE SUBSCRIBER SET (FIG. 9)**

**8.01** This set is equipped with the 8C-58 dial. For maintenance procedures, refer to the section that covers maintenance for this type dial.

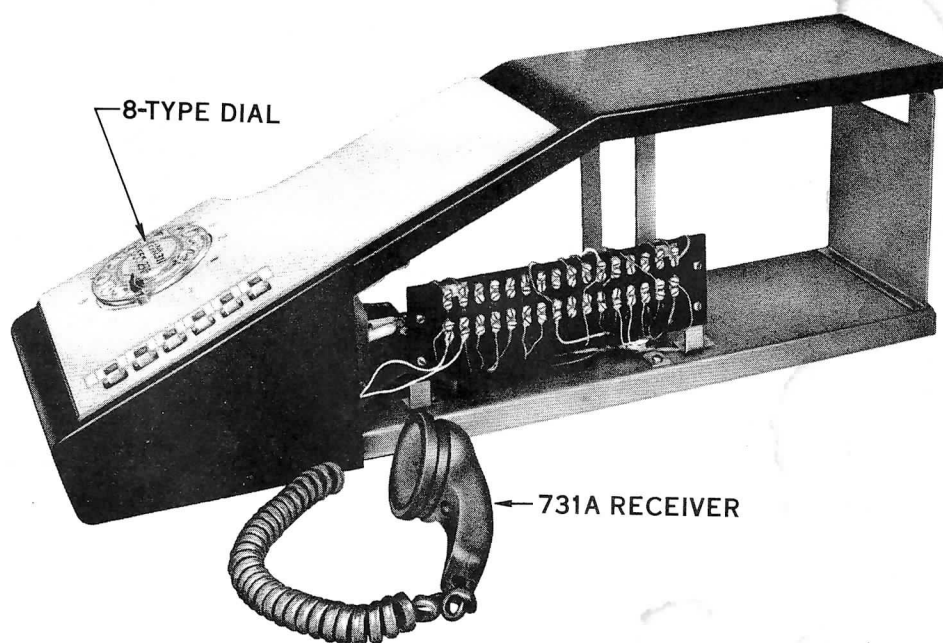
**9. 691-TYPE SUBSCRIBER SET (FIG. 10)**

**9.01** This is a desk type key subscriber set. For maintenance procedures, refer to the section covering maintenance for 540- and 560-type telephone sets.

**10. 693- AND 694-TYPE SUBSCRIBER SETS**

**10.01** Fig. 11 shows the 693A and 694A subscriber sets. Table B shows components for the 693- and 694-type subscriber sets.

**10.02** If replacement of the AC1 transmitter is necessary, reterminate transmitter leads to the transmitter unit exactly as removed. Use the orientation dot as a guide.



**Fig. 8 - 689-Type Subscriber Set**

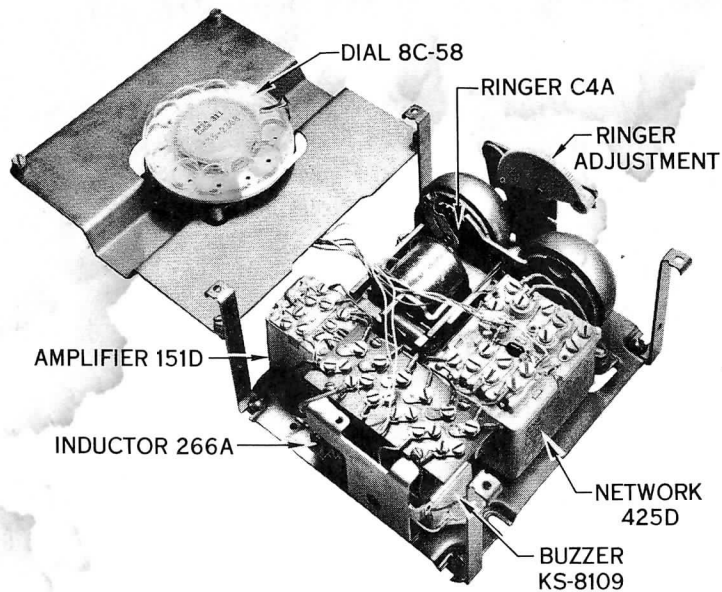


Fig. 9 - 690-Type Subscriber Set



Fig. 10 - 691-Type Subscriber Set

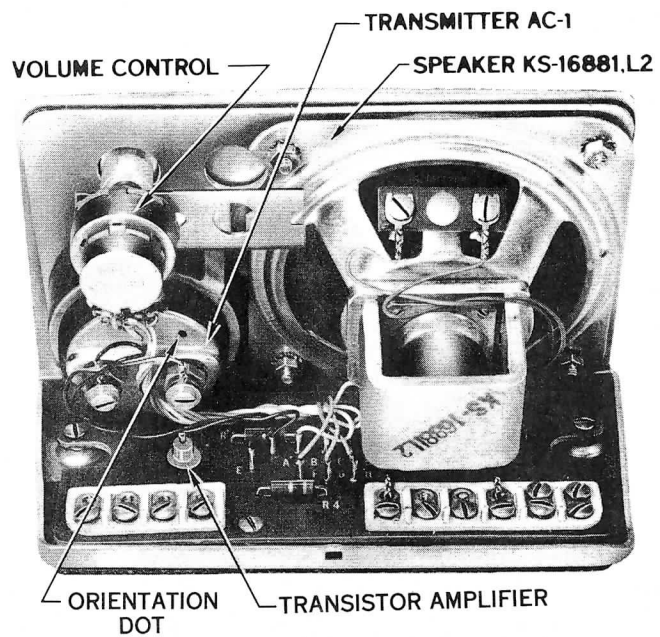


Fig. 11 - 693A and 694A Subscriber Sets