

THE SCR-121 AMPLIFIER.

Equipment.

- 1 SCR-121 amplifier (BC-44-A set box only).
- 1 SCR-61 wave meter.
- 1 SCR-54-A receiver (BC-44-A set box only).
- 1 SCR-55 (DT-3-A) detector.
- 1 head set, type P-11.
- 1 plug with cord.
- 3 VT-1 vacuum tubes.
- 1 4-volt storage battery, type BB-14.
- 3 22½-volt "B" batteries, type BA-2.
- 1 rule.

GENERAL CONSTRUCTION OF THE AMPLIFIER.

Information.

The SCR-121 is a two-stage audio frequency amplifier similar to the SCR-72 amplifier. (See Fig. 64.) It has a filament rheo-

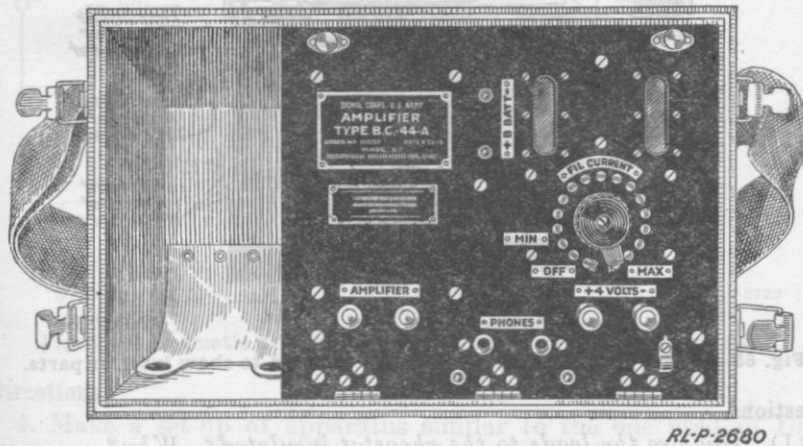


Fig. 64.—Set box, BC-44-A, of the SCR-121 amplifier.

stat for regulating the filament current and uses 45 volts on the plates of the tubes. Means are provided for plugging in phones on the second stage only.

Directions.

1. Examine the exterior of the set. Note the name plates, marking each separate set of binding posts. Also note the rheostat arrangement.

2. Unscrew the two thumbscrews at the top of the panel and pull the panel outward. (See Fig. 65.) Note the position of the various parts inside the set. Notice how the rheostat resistances are constructed and fastened to the panel. Examine the small resistance between the tube sockets and the panel.

3. Examine the wiring of the set and compare it with the wiring diagram shown in Fig. 66. Note that the same "B" battery is used for both plate circuits.

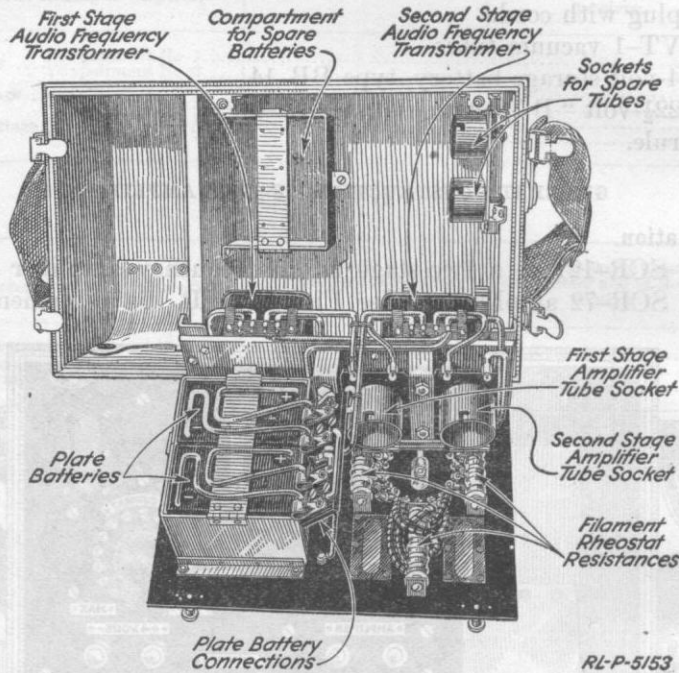


Fig. 65.—Panel of set box BC-44-A pulled forward to show interior parts.

Questions.

- (1) *How are the leads to the rheostat insulated? Why?*
- (2) *How are the rheostat resistances constructed?*
- (3) *Why are the tube sockets mounted on sponge rubber cushions?*
- (4) *How many transformers are used in this set?*
- (5) *Is this set easier to repair than the SCR-72?*
- (6) *How are the "B" batteries fastened in the case?*

- (7) *Can extra "B" batteries be carried in the box? How?*
- (8) *Can extra tubes be carried? How?*
- (9) *For what is the compartment at the left end of the set box used?*
- (10) *How is it ascertained that both tubes are burning when the panel is in its proper position?*
- (11) *If one of the tubes was removed from its socket would the other still burn? Explain.*
- (12) *If BA-8 batteries were provided instead of BA-2 batteries could the set be used? Where would connections be made?*

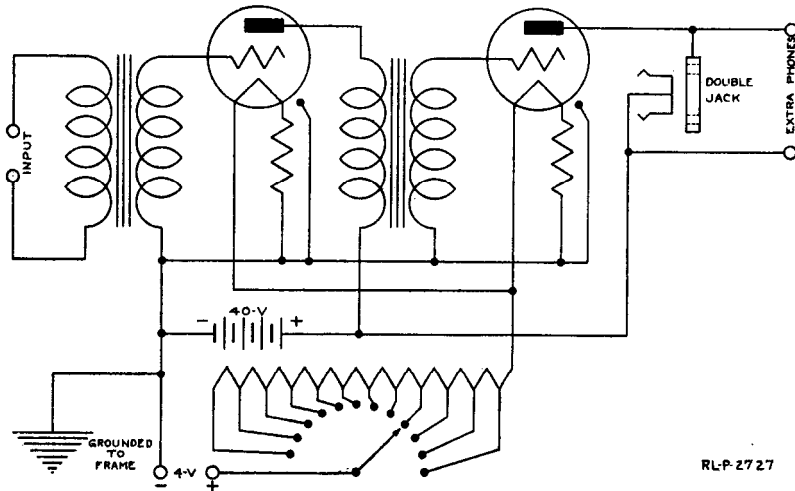


Fig. 66.—Schematic diagram of connections in the BC-44-A amplifier.

Directions.

4. Make a set-up of apparatus similar to the one used in Unit Operation No. 12, using the SCR-121 amplifier in place of the SCR-72 amplifier. (See Fig. 67.) To do this connect the leads from the jack of the DT-3-A detector to the binding posts marked "Amplifier" on the SCR-121. Connect the 4-volt terminals on the SCR-121 panel to the terminals of the storage battery with due regard to polarity. Turn the filament current rheostat to the "OFF" position. See that the two 22½ volt "B" batteries are properly connected in the set box. Insert a VT-1 tube in each socket (including the socket of the DT-3-A detector).

5. Start the wave meter transmitting on a wave length of 200 meters. Remove the plug from the DT-3-A detector jack and insert the head set plug in the jack. Tune the SCR-54-A receiver to the wave meter signal. Reduce the coupling between the wave meter and the SCR-54-A receiver until the wave meter signal is just faintly heard in the head set. Measure the distance between the wave meter and the SCR-54-A with the rule provided.

6. Remove the head set plug and insert it in the SCR-121 amplifier jack. Insert the plug connected to the "Amplifier" terminals in the detector jack. Turn the rheostat control knob in the direc-

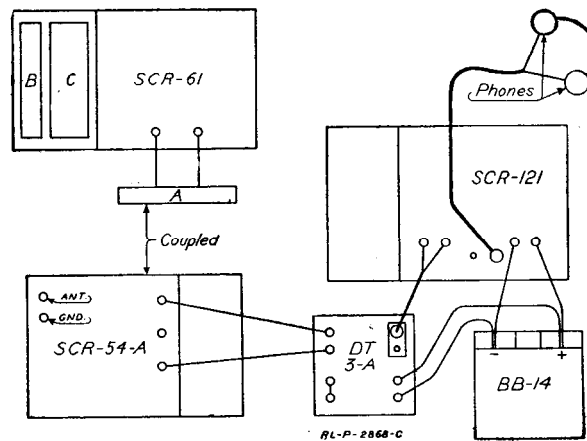


Fig. 67.—Cording diagram of connections when operating the SCR-54-A, the DT-3-A, and the SCR-121 sets together.

tion toward "Max," until the amplifier tube filaments burn at a bright red. Reduce the coupling between the wave meter and the SCR-54-A set until the wave meter signal is just faintly heard in the head set. Measure the distance between the wave meter and the SCR-54-A with the rule.

7. Reduce the filament current in the amplifier tubes until the faint signal from the wave meter just disappears. Note the brightness of the filament at this point; also the adjustment of the rheostat control knob.

8. Increase the filament current in the amplifier tubes until the signal is heard with maximum intensity. Note the brightness of the filament and the position of the rheostat control knob.

Questions.

(13) *How does the SCR-121 amplifier compare with the SCR-72 amplifier? (Compare the measurements taken in the above experiment with those taken in the experiment using both stages in Unit Operation No. 13.)*

(14) *How bright do the filaments of the amplifier tubes burn when the amplifier ceases to operate?*

(15) *How bright do the filaments burn when maximum amplification is obtained?*

(16) *How many pairs of phones can be plugged in the SCR-121 amplifier?*

(17) *If a choice of amplifiers were left to the radio operator, which type would he most likely use, the SCR-72 or the SCR-121?*