

## THE RADIO SETS SCR-77-A AND SCR-77-B.

### THE SCR-77-A SET.

1. *Carrying Units of set—Weight and bulk.*—The whole set is assembled in five carrying units, each provided with a carrying strap. The loop antenna folds up and is carried in a bag, which is  $28\frac{1}{2}$  inches long,  $4\frac{1}{2}$  inches in diameter, and weighs 6 pounds with the loop in it. The transmitting and receiving apparatus is in an operating chest measuring  $14\frac{5}{8}$  inches by  $9\frac{1}{2}$  inches by  $12\frac{5}{8}$  inches high and weighs  $20\frac{1}{2}$  pounds complete. The four-volt storage batteries are carried in a case measuring  $5\frac{5}{8}$  by  $10\frac{5}{16}$  inches by  $8\frac{1}{4}$  inches high and weighing 27 pounds with the batteries in it. The equipment box has two distinct compartments, one of which carries the dry batteries and the other the spare vacuum tubes and the telephone head set. Its dimensions are 13 by  $4\frac{5}{8}$  inches by  $15\frac{5}{16}$  inches high, and when filled it weighs  $17\frac{1}{2}$  pounds. The spare transmitting dry batteries, which like those in use are contained in a wooden case, are carried in a carrying bag which measures 10 by  $3\frac{1}{2}$  inches by 8 inches, and weighs  $7\frac{1}{2}$  pounds with the case in it. The case containing the transmitting dry batteries in use is contained in the equipment box. There is room for two extra BA-2 dry batteries in the carrying bag in addition to the case. It is a wise precaution to carry these two extra batteries, though they are not provided in the parts list. They weigh only 15 ounces each.

2. *Troubles and remedies.*—*a.* If the set is inoperative after being installed, go over carefully all connections made in installing the set. Especially examine the loop joints to see that they are clear and bright and make electrical contact. If the set is still inoperative, pull forward the operating chest panel and see if all their filaments are lighted. If not, trace out the circuit for poor or broken connections. The tube socket contact springs sometimes make poor contact with the contact pins of the tube, due to dirty contacts or weak-spring tension. Of course, a run-down storage battery may be the cause of the failure of the tubes to light up.

*b.* If the instrument still fails to operate properly, as indicated by failure of meter to read as much as 5 milliamperes and by failure to obtain a marked drop in plate current when the left-hand side of the loop is touched with the bare hand, note whether the telephone click produced in this manner is louder while operating the key when the meter is shunted. If so, the meter is burned out. If the clicking is the same and quite weak, the trouble probably lies in

faulty or run-down BA-2 batteries or faulty connections between the batteries or elsewhere in this circuit.

*c.* If the milliammeter is burned out or otherwise becomes open-circuited, it can be shunted until replaced or repaired. To shunt the meter, connect its two terminal posts together by a piece of wire. To test whether or not the set is oscillating when there is no meter, touch the left-hand side of the loop with the bare hand. A distinctive click in the telephone receiver is heard if the set is oscillating.

*d.* If it is impossible to cause the meter to read as low as 5 milliamperes by adjustment of the plate-control current knob, it is due either to reverse polarity of storage-battery connections or a run-down or wrongly-connected grid potentiometer battery. It may happen, however, that an exceptionally good oscillator tube will cause a plate current that can not be reduced to the proper value.

3. *General care of the set.*—The sets are made as rugged as possible with this type of apparatus. However, they should not be subject to any heavy jars or severe shaking, as this will break connection or injure the apparatus. The set should not be unnecessarily exposed to rain or dampness. If it becomes wet it should be thoroughly dried out but not exposed to intense direct heat. Care should be taken to keep all terminals bright and clean, including the joints of the loop. If the sets are stored they must be kept in a dry place.

#### PARTS LISTS OF SET FOR FIELD OPERATION.

4. *Equipments in the SCR-77-A set.*—There are two equipments in the set, as follows:

Power equipment, type PE-37.

Radio equipment, type RE-23.

5. *Parts lists of equipments.*—These equipments are made up of parts as noted below:

**Power Equipment, Type PE-37:**

3 batteries, type BB-41: 1 in use, 2 spare.

1 case, type CS-19.

**Radio equipment, type RE-23, comprises:**

1 bag, type BG-13; for carrying battery case, type CS-17.

1 bag, type BG-18; for carrying loop.

15 batteries, type BA-2; 9 in use, 6 spare.

2 battery cases, type CS-17; 1 in use, 1 spare.

1 equipment box, type BE-48.

2 head sets, type P-11.

RADIO OPERATOR.

- 1 loop, type LP-2.
- 1 radio transmitter and receiver, type BC-9.
- 6 tubes, type VT-1; 3 in use, 3 spare.

**THE SCR-77-B SET.**

TROUBLES AND REMEDIES.

1. If the set is inoperative after being installed, go over carefully all connections made in installing the set. Especially examine the loop joints to see that they are clean and bright and make good electrical contact. If the set is still inoperative, pull forward the operating chest panel and see if all their filaments are lighted. If not, trace out the circuit for poor or broken connections. The tube socket contact springs sometimes make poor contact with the contact pins of the tube, due to dirty contacts or weak-spring tension. Of course, a run-down storage battery may be the cause of the failure of the tubes to light up.

2. If no reading of the milliammeter can be obtained with the key up by adjusting the potentiometer, the milliammeter or the C-21-A transformer primary may be open. Or the trouble may be due to faulty connection with the 120-volt "B" battery, or the battery may be run down. If the milliammeter is burned out or otherwise becomes open-circuited, it can be shunted until replaced or repaired. To shunt the meter, connect its two terminal posts together by a piece of wire.

3. If it is impossible to cause the meter to read as low as 0.5 milli-ampere by adjustment of the plate control knob, it is due either to reverse polarity of storage battery connections or a run-down or wrongly connected grid potentiometer battery.

4. When the amplifier stages are operating, a ringing sound will be heard when the oscillator tube or the panel is tapped. When the storage battery runs down, the set will usually continue oscillating even after the amplifier has ceased functioning as evidenced by the tapping test.

5. A small percentage of tubes will not oscillate with key up for any position of the potentiometer. Another tube should then be tried. Tubes which have a gas leak will ionize when the key is pressed. This is evidenced by a blue glow in the tube when the key is pressed.

6. If the set becomes noisy the following procedure is suggested as useful in locating the trouble. When the key is pressed the noise practically always stops since this shorts the primary of the first C-21 transformer. If it is still heard the noise is in the two-stage

amplifier, the 40-volt amplifier plate battery, or the storage battery circuit. If the noise largely disappears when the key is closed, it is due to irregularity of the oscillator plate current passing through the C-21 primary when receiving. One side of the grid BA-2 battery should be disconnected. If the noise is still heard, the grid potentiometer circuit is probably working normally. If the noise disappears when the oscillator tube socket plate terminal is connected to filament, the noise is then either in the tube or in the plate 1,000 mmf. R. F. by-pass condenser or the 20,000 mmf. stopping condenser. Then, removing the special connection to filament, if the noise continues when the tube is removed from the socket the noise is located in one of the two condensers mentioned. Several of the plate 1,000 mmf. condensers have been found to cause noise because of low insulation resistance due to corrosion. When the sets are working normally the most frequent source of noise is the oscillator tube. Often pressing the key momentarily will reduce the noise. Some tubes are very noisy when jarred. All tubes developing unusual noise should of course be replaced. The discarded tube will probably work satisfactorily in one of the audio amplifier sockets. The new set is found to be considerably more quiet than the BC-9, due to careful test of condensers before installation, and because the D. C. voltage impressed on the oscillator tube and condenser while receiving is much reduced.

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