great. As a remedy the brilliancy of the Amplifier Tubes can be reduced by means of the control marked "AMPLIFIERS." This will result in decreased volume. However, the most desirable method is to plug the Loud Speaker in on either Detector or First Stage, by means of a Telephone Plug attached to its terminals.

The other type of Loud Speaker recommended, is the Western Electric No. 10-A with Power Amplifier. While this instrument is rather high priced it will be found the only satisfactory one to use where a large volume is required. The "Input" of this speaker should be plugged in on either Detector or First Stage only. Otherwise the volume obtained will be too great.

GENERAL SUGGESTIONS FOR IMPROVING RECEPTION

If the set howls and distorts signals, turn "REGENERATION" back toward zero. If this fails to clarify reception, turn "DETECTOR" back slowly.

Excessive crackling noises, which continue even if the Aerial wire is disconnected, indicates that either the "B" or "C" Batteries are nearly exhausted.

If this crackling noise stops when Antenna wire is disconnected it is probably caused by electric or atmospheric disturbances in your vicinity.

When using "Peanut" Tubes it will often be found that reception falls off although the tube filaments are still up to brilliancy. This means that the filament coating has been burned off due to excessive brilliancy. This usually can be remedied by disconnecting the negative (—) "B" Battery lead and leaving the tubes burn for about 30 minutes. If this fails to remedy the difficulty, new tubes must be substituted.

All controls should be rotated slowly, if one is to get the maximum out of his receiver.

In most cases failure to secure satisfactory results, at first, is due to lack of experience of the operator, and not to the instrument. It must be borne in mind that a Radio Receiver is a delicate piece of Scientific Apparatus, and as such must be manipulated in a careful manner. It must also be remembered that good quality of telephonic signals will not result unless the correct Loud Speaking device is employed. The best Radio Receiver is no better than its Loud Speaker, therefore avoid using home-made Loud Speakers converted from Telephone Receivers and other make-shift arrangements.

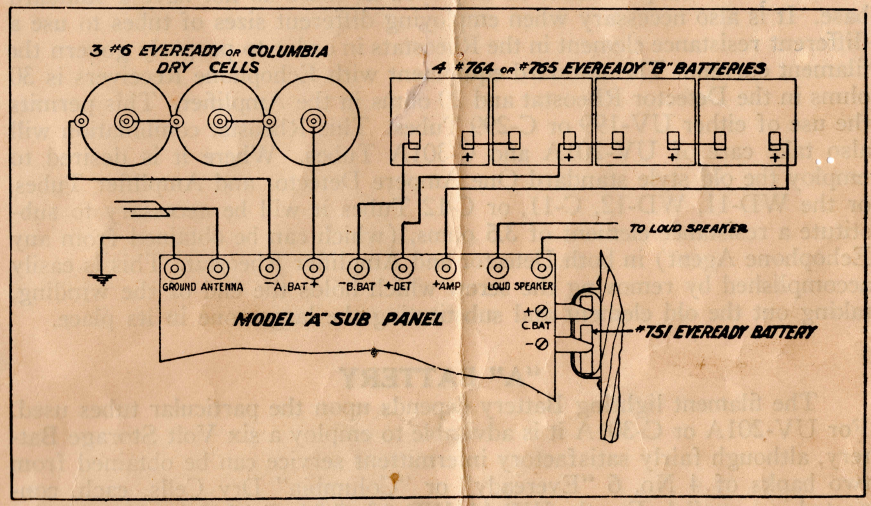
THE RADIO SHOP

Manufacturers

SUNNYVALE CALIFORNIA

INSTRUCTIONS

FOR INSTALLATION AND OPERATION OF ECHOPHONE MODEL "A" RECEIVER



The importance of a good Antenna system and the proper installation of the various accessories comprising a complete receiver cannot be emphasized too greatly. It is always advisable to have this first work done by someone versed in radio installation such as the local agent from whom you purchase the receiver. Usually this service will be given gratis, or at a very nominal charge. However, there are occasions where it is impossible to obtain such a service, therefore a brief outline of the installation and operation is given.

ANTENNA OR AERIAL

A single wire from 50 to 75 feet long, and 30 or more feet high is recommended to produce the best results. The Aerial should be carefully insulated at both ends and the lead-in wire should be as short and direct as practical. Excessive wire in the Antenna results in broadness of tuning and should be avoided wherever possible.

GROUND OR EARTH CONNECTION

The ground connection may be secured by attaching a wire to a water main, or, in the absence of this, by driving a pipe or stake sufficiently far into the ground to reach moist earth. A soldered connection is advisable, or

if this is not possible, use a Ground Clamp. The ground wire should not be attached to a Gas pipe although connection to a Steam or Water Radiator System is generally satisfactory.

TUBES

Any of the standard 1½, 3, 5, or 6 Volt Tubes on the market can be used satisfactorily. When the UV-199, C-299, WD-11, or C-11 tubes are used, a special adaptor must be employed as these do not have a standard base. It is also necessary when employing different sizes of tubes to use a different resistance element in the Rheostats in order to properly govern the filament current. The standard equipment with Echophone Receivers is 30 ohms in the Detector Rheostat and 20 ohms in the Amplifier. This permits the use of either UV-199 or C-299 Tubes. This Rheostat combination will also take care of UV-201A and C-301A Tubes. Where it is desired to employ the old style standard One Ampere Detector and Amplifier Tubes, or the WD-11, WD-12, C-11, or C-12 Tubes it will be necessary to substitute a resistance element of 3.5 ohms, (which can be obtained from any Echophone Agent) in both Detector and Amplifier Rheostat. This is easily accomplished by removing the screw which holds the end of the winding, taking out the old element and substituting the larger one in its place.

"A" BATTERY

The filament lighting Battery depends upon the particular tubes used. For UV-201A or C-301A it is advisable to employ a six Volt Storage Battery, although fairly satisfactory intermittent service can be obtained from two banks of 4 No. 6 "Eveready" or "Columbia" Dry Cells, each, connected in parrallel. For the WD-11, WD-12, C-11, C-12 Tubes three No. 6 Dry Cells should be connected in parallel.

"B" BATTERY

It is advisable to use 4 Blocks of 22½ Volt "B" Batteries on Echophone Model "A" Receivers. Either "Eveready" No. 765 or "Eveready" No. 764 Blocks are recommended, preferably the latter on account of the increased life obtained. The method of connection is shown on the diagram furnished with these instructions. A potential of 45 Volts is generally satisfactory on the Detector alone, but this sometimes must be reduced to 22½ Volts when a "soft" Detector Tube is used.

"C" BATTERY

An "Eveready" No. 751, 4.5 Volt Flash Light Battery, is recommended for this purpose. This should be placed in the metal band on the right-hand side of the cabinet *before* the panel is inserted. The "C" Battery springs provided for making contact should be bent down so that they will rest firmly on the terminals of the Battery. Care should be taken that the polarity is not reversed; the long prong is negative (—) and should point away from the control panel.

CONNECTIONS

Connect all Batteries as indicated in the diagram and make sure that everything is tight and firm. Loose battery connections cause undesirable noises in the receiver and will seriously handicap reception.

GRID LEAK

A mounting for a standard Grid Leak is installed on the sub-panel back of the Detector Tube Socket. It will be found that a resistance of from one to two Megohms is satisfactory. When using the standard one ampere Tube, a Grid Leak will not always be necessary.

OPERATION

After all connections are made as per diagram, the Vacuum Tubes should be inserted in their sockets. Care should be taken to insert the pin, on the side of the base, in the slot, then by pressing down and turning the tube to the right, contact is made with the springs and the tube locked in place.

Turn the Controls marked "DETECTOR" and "AMPLIFIERS" about half way. If "A" Battery connections are correctly made the tubes should now light.

Set "WAVELENGTH VERNIER" at a midway position. Set "REGENERATION" at about 50 degrees.

Gradually rotate "WAVELENGTH" back and forth over the scale until station is heard with maximum audibility.

Increase "REGENERATION" for still louder signal strength.

Turn "VERNIER" to right or left to secure absolute resonance.

A small switch mounted on sub-panel marked "ANTENNA CONDENSER" is used to compensate for different size Aerials and for long and short waves.

If a very large Aerial is used, i. e., over 100 feet long, it will be found that the best reception is obtained when this switch is set on contact No. 1. When a smaller Aerial is employed the correct setting is No. 2. This adjustment will have to be manipulated from time to time in order to receive the entire band of wavelengths covered by this set. It should be used in the position that gives the best audibility and selectivity.

LOUD SPEAKER OPERATION

On account of the various types of Loud Speakers, no definite plan of connection can be laid down. There are two general types which will be found to give the best results with Echophone Receivers. Where a great volume is not required we recommend the "Atlas" Amplitone Loud Speaker. When this instrument is employed the terminals should be connected to binding posts marked "LOUD SPEAKER." This will result in the full output of three tubes being employed. However, in many cases where reception is coming from a local station, the volume will be too