OVER THE SOLDERING IRON

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PREPARED FOR THE INFORMATION AND USE OF RCA VICTOR DISTRIBUTORS' SERVICE MANAGERS

ANTENNA TERMINAL LINK

Six and Seven Tube Sets

Instruments in the class of models 86T, 86K, 87K, etc. have a three-terminal antenna-ground connection board. Terminal "A" is for attachment of the antenna, and terminal "G" for connection of the ground in the regular manner. The extra terminal, to which is attached a link, is to be used only in localities where interference is produced by strong local stations. In the event of such interference in the form of heterodyne beats, image response, or other disturbances due to abnormal signal strengths the link should be closed so as to connect with the "A" terminal. Always leave the link open where interference does not exist.

OSCILLATOR CONDENSERS - 813K and 816K

The 100 mmfd. molded Luscite capacitors which connect in parallel with the band-spread oscillator tuning condenser for short wave operation, are specially designed to have a negative thermal coefficient of capacity to compensate for variations in other parts of the oscillator circuit with temperature changes. These capacitors are therefore, not inter-changeable with ordinary types and replacements should always be of the particular RCA stock number specified in the Replacement Parts Lists. Care must be exercised in replacing these parts, to avoid twisting the leads excessively and allowing too much heat to be applied when soldering.

TOPTENNA MOLDED COUPLINGS

The molded bakelite screw cap which secures the Stock #9792 Toptenna forward section to the cowl coupling, is carried in stock as #14673. This part may be ordered for replacement use in repairing any breakages that might occur in service.

RECTIFIER 5Z4 REPLACEMENTS

The new RCA-5T4 metal type rectifier may be used for replacement on RCA Victor receivers employing the 5Z4. The arrangement of pin connections is such that the 5T4 can be plugged directly into the 5Z4 socket without requiring circuit changes. In using the 5T4, somewhat better service will be obtained due to its increased power handling capacity.

The 5T4 tube will be secured in its socket by special packing or shipped in a separate container on future instruments of the new line. This same packing should be incorporated when re-packing and shipping is necessary in the field.

ELECTRIC TUNING MECHANISMS
Assembly and Adjustments

The electric tuning mechanisms of Models 811-K, 812-K, 813-K, 816-K and U-109 are designed to be as simple in construction and as foolproof in operation as is possible. In order to maintain the accurate results possible with these devices, servicemen should use intelligent precaution in effecting any repairs or adjustments that may be necessary in the field. Principle adjustments and various assembly details which may be of use in service are given as follows:-

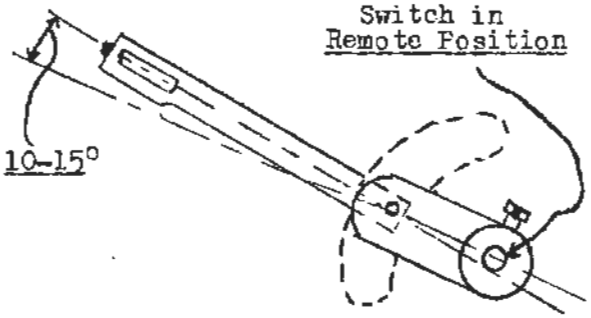
Audio Shorting Switch - This switch is located on the motor bracket and closes due to solenoid action of the motor armature. The tension of the long contact finger is important in bringing about quick dis-engagement of the motor and in permitting the motor to pull into mesh with the drive mechanism. Normal adjustment is attained when the short fingers are aligned exactly straight with contact points separated approximately .030 inches, and the long finger spaced 3/16 inches from the adjacent short finger at the contact point. With the switch installed on the bracket, the lateral adjustment should be made so that the short finger contacts definitely close when the motor armature is pushed completely forward. The clamping screws should be tightened securely. If necessary in order to obtain positive pull-in and quick dis-engagement of the motor, the tension of the long finger should be decreased or increased by bending. Contacts of the switch must be kept clean. Crocus cloth or a relay burnisher may be used for this purpose.

Motor Reversing Switch - It is necessary to automatically stop and reverse the drive motor before the tuning condenser reaches the ends of its travel. Approximately 175 degrees of sweep is required, and the reversal must take place above 1700 Kc and below 540 Kc but not too near the limits of scale. The coupling between the selector drum and condenser shaft should be attached so that when the condenser is in full mesh, the reversing switch trip lever is exactly vertical. The bracket holding the reversing switch, has elongated mounting holes, allowing for fine adjustment of the reversing point. There should be definite clearance (1/32") between the end of the condenser shaft and the selector drum shaft. If the tripping lever becomes loose on the shaft, securely re-solder it into position using 50/50 solder and acid flux.

Main Pinion Gear - Clearance between the small high-speed pinion gear at top of front bracket and the intermediate gear determines the amount of mechanical noise produced. Correct adjustment gives approximately 1/64 inches of "gear slop" or movement at the teeth of the intermediate gear. The elongated hole in the front bracket allows for moving the pinion shaft to get the proper gear clearance. The pinion must also be adjusted for correct mesh with the motor shaft clutch pin. With motor completely forward and the pinion tight against its front bearing, the pinion shaft should be adjusted so that square pin of the shaft meshes its full thickness with the rotating pawl. The tip of the pawl should not over-lap the rear edge of the pin, as this will tend to give poor dis-engagement and possible carry-over on tuning.

Selector Contact Springs - The eight contact springs which interrupt the push button circuits when the selector discs revolve, are adjustable. Each spring should be aligned so as to ride in line with its corresponding disc, and adjusted so that it is exactly over the center of the insulating segment of the disc when the station adjustment key is engaged with the groove at the top of the disc. The tension of the fingers against the discs should not be increased. It is important that the discs be kept clean. A very small amount of Vaseline or Petrolatum should be applied to the discs with a cloth after cleaning.

Manual-Electric-Remote Changeover - To properly line up the mechanical link assembly between the switch shaft and throw-out gear bracket; the set screws holding the lever on the switch shaft must be loosened, the switch turned to the remote position (extreme left), and the link lever revolved so that its center line makes an angle about 10-15 degrees with the center line of the link to which it is attached and which in turn couples through a spring to the throw-out gear bracket. The sketch to the right gives the approximate relation of the parts for proper alignment. This adjustment affects detent action of the changeover and may prevent correct operation of electric or remote tuning if not properly made.



Motor Alignment - The motor shaft must be exactly aligned with the axis of the pinion gear with which it engages. This may be adjusted by loosening the mounting screws of the motor and aligning the shaft by sight. Correct alignment may be tested by slowly rotating the motor and observing the mesh between the pin of the motor shaft and the pawl on the pinion. The relation of the two should remain the same throughout the revolution.

Chassis Position - The position of the chassis in the cabinet must be adjusted in relation to the push buttons. The push buttons will tend to stick if the chassis is too far forward, and will not latch properly when the chassis is too far to the rear of the cabinet. Where necessary, the four chassis mounting screws should be loosened and the chassis shifted to give the correct latching and releasing of the buttons. This adjustment may be affected by shipment unless ths rear packing cleat is kept intact.

Vernier Tuning - Binding or excessive friction at any part of the tuning mechanism may cause the vernier shaft to slip at some part of the range. The slider of the dial pointer may be hitting a burr on its guide channel, too much tension may be present at the selector drum wiper springs, condenser rotor contact springs may be too tight, or there may be binding at the vernier tuning shaft gear. If correction of these items does not effect a cure, replace the vernier tuning shaft assembly. Remove by loosening the set screws of the gear on the large tuning shaft which meshes with the throw-out gear, removing screws holding support bearing of shaft and pulling shaft forward through opening in large pulley. The lip of metal at the center hub of the pulley must be bent forward to allow drive to pass through. Install the new drive in the reverse manner. Slide anti-backlash scissors gear on the condenser shaft apart so that compression amounting to two teeth on the gear, is obtained in the springs. Adjust mesh of the gear on the vernier shaft before tightening screws so that smooth tuning is obtained throughout the range.

Lubrication - The dial pointer slide should be greased with Vaseline or Petrolatum. This same lubricant should be applied lightly to all gear faces of the drive mechanism and sparingly with a cloth to the station selector discs. Three-in-One oil is suitable for the motor shaft bearings. A light grade of engine oil should be used for all gear bearings. Medium viscosity engine oil, similar to Pyroil "B", should be applied between the thrust washers on the motor shaft. Castordag, a mixture of grahite and Castor oil, is recommended for use at the selector drum end-bearing slots and at the bearings of cable pulleys.

MAGIC WAVE ANTENNA

The length of the grounding lead of the antenna transformer is very important and it should be maintained as short as possible on all installations. Approximately five feet of ground lead (yellow) is supplied in the antenna kit. This should be cut down to the minimum length required for making a solid ground. Extension of this lead should be avoided. It will generally be found better to lower the elevation of one end of the antenna to obtain a short ground connection rather than increasing the length of the ground lead to gain elevation. Antenna locations should, therefore, be chosen with consideration of remoteness from noise sources, and facility of obtaining a short transformer ground.

In using less than four receivers on the stock #9814 branch transformer, the unused output terminals should be left open circuited and should not be loaded nor connected to a line.

Lightning arrestors are not supplied with the new RCA Magic Wave Antenna kit. Where they are required by local ordinance, or if installation is desired for other reason, the doublet type, or two arrestors should be used. An arrestor arrangement should be connected between each side of the transmission line and ground at the point where the line enters the building.

AUTOMATIC FREQUENCY CONTROL

The AFC of the new line "Electric Tuning" receivers is operative only when the set is being used in the electric or remote positions of the changeover switch. The use of AFC with manual tuning makes for sluggish operation and causes unfavorable reaction due to apparent broadness. It is much preferred that hand or manual tuning be accomplished, as on the new RCA receivers, through use of the Magic Eye as an indicator.

Ordinarily, stations separated by 10 Kc may be set up and tuned electrically. It is not very wise however, to attempt to set up a weak station for electric tuning on a channel adjacent to a strong station, unless the station is of sufficient strength to actuate the AFC.

SHORT WAVE INSTABILITY - MODEL 85T1

Unstable performance at the high frequency end of "C" band may be due to super-regenerative action in the oscillator-detector circuits. Careful re-alignment of the "C" band circuits will correct most cases of this trouble, however, it may be necessary to replace the oscillator resistor R-2. This resistor should have 33,000 ohms resistance. The "C" band circuits must be aligned at 15,000 Kc, with the heterodyne oscillator stage tracking 460 Kc below the signal frequency.

BLOCKING OF MODEL 84BT

Should any blocking tendencies be noted on this receiver, the 1F4 tube should be exchanged. Blocking which is produced by the 1F4 tube is particularly noticeable when the battery switch is turned off and immediately turned on again. Wear on the contact of the battery switch may bring this action about when the receiver is first turned on. In such cases, it is advisable to replace the switch, and at the same time, investigate the condition of the 1F4 tube as well as the "B" batteries.

CLEANING SPEAKER AIR GAPS

Blowing or wiping of metal particles from the air gaps of electrodynamic loudspeakers may be facilitated by applying 110 volts A-C to the field coil. The A-C will eliminate any residual magnetic force that may be present and permit easy removal of the particles. It is very important to carefully inspect and clean the air gap when installing a replacement cone, or when making repairs to the speaker.

POINTS OF SUPERIORITY
RCA Electric Tuning

(1) Instantaneous push-button control simplest type possible---one single operation required to tune any of predetermined choice of stations.

(2) Any station or combination of stations may be set up for electric tuning, provided they are sufficiently strong to be of listening value. Other tuning mechanisms are limited in respect to choice of stations over relatively large sections of the tuning range.

(3) Electric Tuning adapts itself readily to armchair or remote control.

(4) Same station can be tuned on more than one push button.

(5) Calibration is simple and may be set up or changed by customer.

(6) Tuning is accurate.

SERVICE NOTE CORRECTIONS

Model 5T1 - Page 3, Figure 3; Resistance of high voltage winding should be 760 ohms, total.

Model R-99 - Input transformer resistances are shown incorrectly in schematics and wiring diagrams. Primary resistance should be 10 ohms and the secondary resistance 6750 ohms.

Magic Wave Antenna Instruction Sheet - The correct identification of the Receiver Transformer is Stock #9813.