

INSTRUCTIONS
for
CARE AND OPERATION
of
MAJESTIC
ELECTRIC
RADIO RECEIVERS
and
ELECTRIC PHONOGRAPHS

Models 90, 91, 92, 93, 102 and 103

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MAJESTIC RADIO receivers are licensed only for Radio Amateur, experimental and broadcast reception. They are manufactured under patent applications of the Grigsby-Grunow Company, and are licensed under patent applications and patents of the Radio Corp. of America, and under patents and patent applications of the Radio Frequency Laboratories, Inc., also by Lektiphone and Lowell & Dunmore.

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JANUARY, 1930

PREFACE



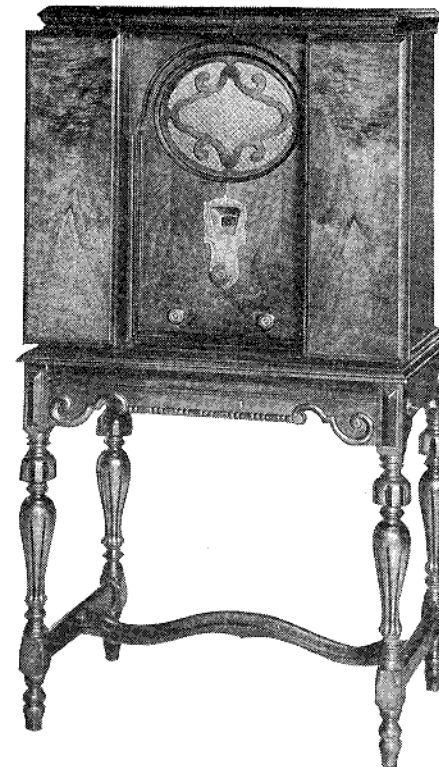
The MAJESTIC Electric Radio Receivers herein described have been developed in the laboratories of the Grigsby-Grunow Company, Chicago, by some of the foremost engineers and designers in the entire field of radio.

All previous attempts to secure excellence of performance, selectivity, sensitivity and fidelity of reproduction, together with beauty of cabinet design, and general sturdiness of construction have been surpassed in these new model MAJESTIC Receivers.

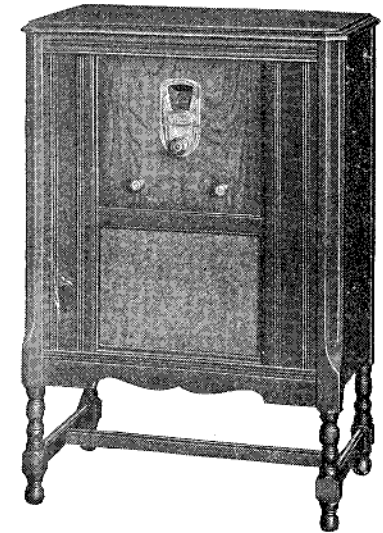
The new MAJESTIC Combined Electric Radio Receiver and Electric Phonograph herein described is the latest and most notable achievement of the Grigsby-Grunow Company.

Every effort has been made to produce a combination which not only incorporated a radio receiver of the most advanced type but also a phonograph reproducer of the highest order.

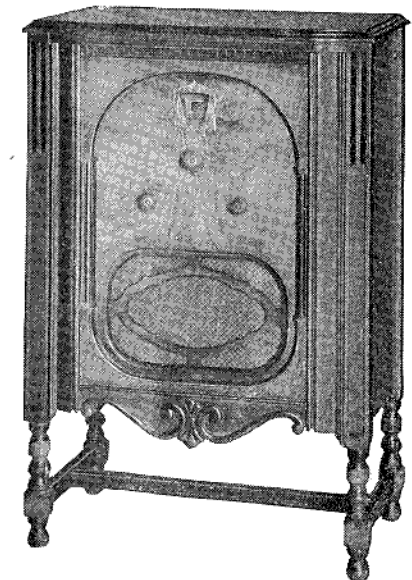
The power amplifying system in the MAJESTIC Receiver and the improved MAJESTIC Super-Dynamic Speaker are utilized to make the reproduction of the records an important part of this new combination.



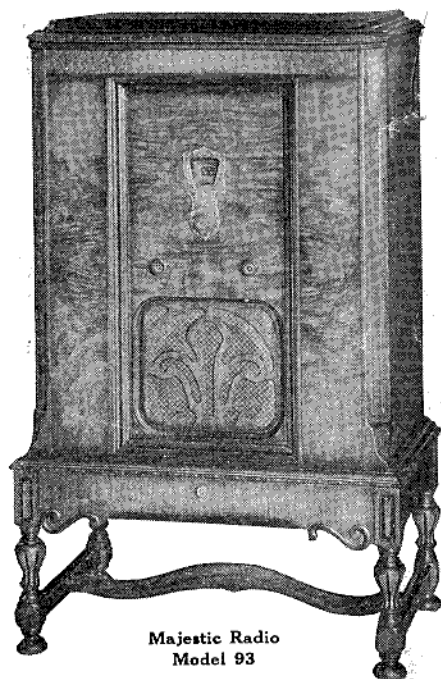
Majestic Radio
Model 92



Majestic Radio
Model 90



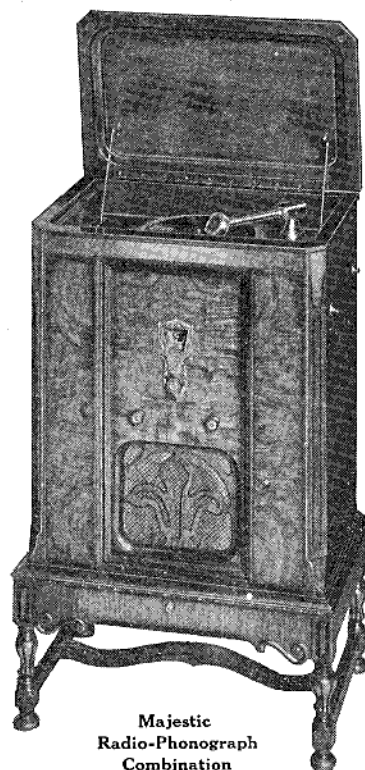
Majestic Radio
Model 91



Majestic Radio
Model 93



Majestic Radio-Phonograph
Combination
Model 103



Majestic
Radio-Phonograph
Combination
Model 102

Specifications

Circuit. The radio frequency amplifier consists of four tuned stages and tuned antenna input, using the R. F. L. balanced circuit. Power Detection is employed and the output of the Detector is fed directly into one stage of push-pull audio amplification which employs two type G-45 Power Tubes.

Control. A single dial control is employed which tunes the four radio frequency stages and the Detector. This single dial control is supplemented by a secondary selectivity control, which enables the operator to secure sharper tuning. The dial on the main tuning control is illuminated, thereby giving a definite indication as to when the set is "ON."

Shielding. The receiver is thoroughly shielded to obtain maximum selectivity under the most severe receiving conditions. This carefully designed shielding also helps to make possible a sensitive Receiver without the use of regeneration.

Volume Control. The volume control varies the grid bias of the 1st, 2nd, and 3rd radio frequency tubes, and is instantaneous in its action. When a long antenna is used, and a powerful local station is being received, it is advisable to assist the volume control by regulating the selectivity control.

Audio Transformers. Especially designed high quality push-pull audio transformers, give uniform amplification over the entire musical scale. The power supply, which is an integral part of the Receiver Chassis, is of generous design, insuring long life and freedom from trouble.

Tubes. Models 90, 91, 92, 93, 102 and 103 use the following tubes:

- 5 Type G-27 Detector and R. F. Amplifiers
- 2 Type G-45 (Power Amplifiers)
- 1 Type G-80 (Rectifier)

Variable Tuning Condensers. The five-gang condenser, together with its dial and control knob, is a complete unit in itself. The condenser plates are of aluminum, held rigidly in place by special die casting. The entire condenser gang is completely shielded.

Power Speaker. The MAJESTIC Super-Dynamic Speaker employed in these new models is of the electrodynamic type. Various improvements have been instituted in this construction and it has been designed especially for use in connection with the MAJESTIC Receivers, and to operate in the particular

compartment in which it is housed. The Speaker compartment of these new models is designed with acoustical properties in mind, and to secure the proper baffle for the MAJESTIC Super-Dynamic Speaker. Better tone quality is obtained in this improved type MAJESTIC Super-Dynamic Speaker and far more volume is handled without distortion.

Terminals. Terminals are provided on the 90B and 100B Chassis for Antenna and Ground connections. Additional terminals are provided on the 100B Chassis, for electric pick-up connections.

Note. Models 90, 91, 92, and 93 employ the Model 90B Receiver Chassis and Models 102 and 103 employ the Model 100B Receiver Chassis. The Model G-3 MAJESTIC Super-Dynamic Speaker is employed in all receivers.

Additional Equipment Required

Antenna Outdoor. Forty to seventy-five feet of solid or stranded No. 14 copper wire, including lead-in.

- 1 window lead-in.
- 1 lightning arrestor having Underwriters' Laboratories' approval.
- 2 antenna insulators.
- 1 ground clamp.

Antenna Indoor. Twenty to forty feet of No. 22 or larger solid or stranded copper wire, either bare or insulated.

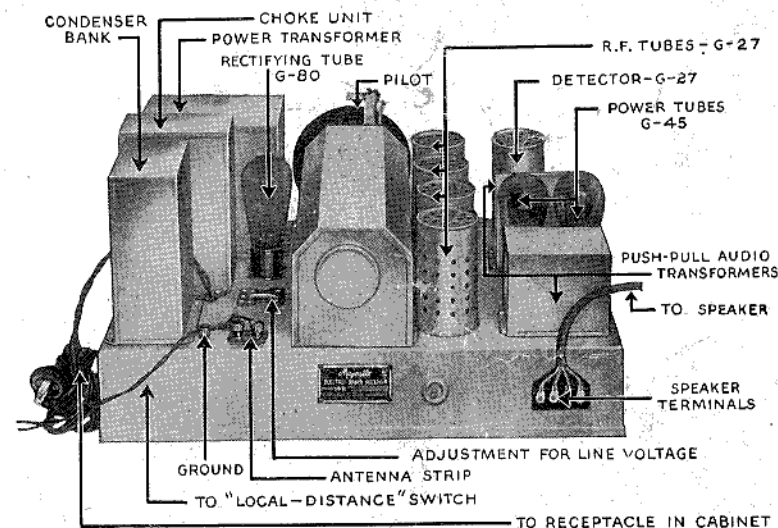
- 1 ground clamp.

Installation of Receiver

Location. Inasmuch as this Receiver requires an antenna, it is well to locate it with this in mind, especially if one desires to install an outdoor antenna. A convenient location for securing a good ground connection is also important. The location of the Receiver is also important, in that no large pieces of furniture should be located on either side of it so that sound reproductions from the speaker will be partially shielded from the room. After placing the receiver in the most suitable location, considering the above suggestions, the antenna and ground installation should then be made. If a broadcast station is located nearby (within 100 miles) an inside antenna may be first installed and the set thoroughly tested out before attempting to install an outside antenna.

Antenna and Ground. Two factors of prime importance are the antenna and ground installations, for no radio Receiver, however efficient can be better

than the antenna and ground system. The Antenna system consists of the entire length of the antenna wire from the far end to the Antenna Post on the Receiver. The wire used may be either a solid or stranded copper wire. Seven strands of No. 22 gauge enameled copper wire twisted into a cable is a highly satisfactory wire to use. If possible, it is advisable to make the antenna wire continuous from the far end to the Antenna Post on the Receiver, but if this is impossible solder all joints and then tape or paint to prevent corrosion. It will be impossible to prescribe any definite form of antenna construction that will be most desirable, but it will be well to bear in mind that the higher the antenna (if outside antenna is used) the sharper and clearer will be the recep-



View of Model 90B Chassis

tion. If receiver is installed in a building of steel construction be certain that an outside antenna is used. Also, we wish to impress upon the purchaser, the absolute necessity of installing a lightning arrestor of the approved type in the antenna circuit, when an outside antenna is used. Serious injury can result to the Receiver and associated equipment if a lightning arrestor is not provided to take off the discharge of current caused by lightning striking the antenna or within close proximity of it. In some installations it may be advisable to use two antennae, one an outside antenna, and the other a short inside antenna, which may be run in a moulding or under a rug, changing from one antenna

to the other to suit receiving conditions. A long antenna will be superior for distance reception but a shorter inside or outside antenna will prove better for selectivity and for freedom from atmospheric disturbances. Reference to atmospheric disturbances, in this instance applies to disturbances of the nature of "static," and does not apply to power line disturbances, etc. The ground wire is of no less importance and equal care must be taken in its installation. A very satisfactory ground may be made by running a wire to a cold water pipe. Clean the pipe thoroughly with a file or sandpaper and connect wire with a ground clamp. Remove insulation and enamel from end of ground wire before connecting to clamp.

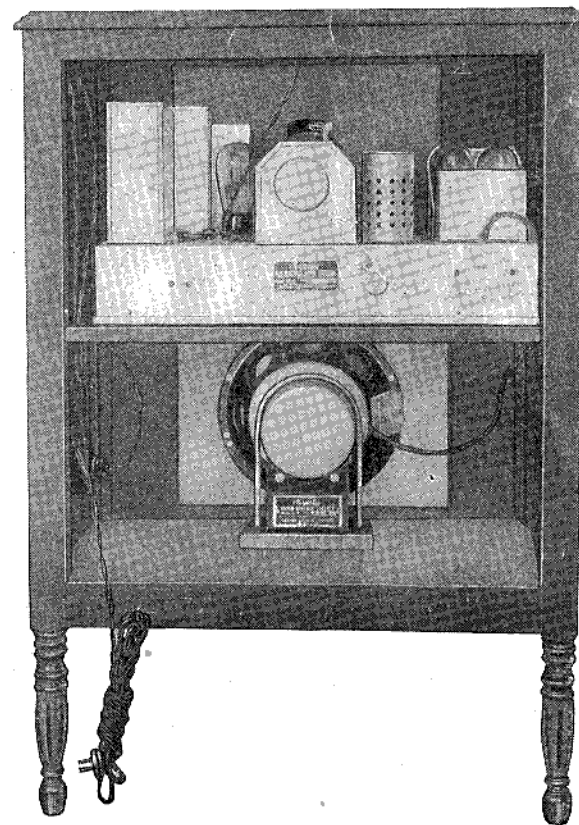
Warning. Under no circumstances should the ground wire be connected to the antenna binding posts. Connect antenna and ground wire to their respective binding posts at the left side of the receiver. Be sure and scrape off the insulation from the ends of wire thoroughly before connecting under binding posts. A switch is provided on all models known as the "LOCAL-DISTANCE" switch. When receiving a powerful local station, the "LOCAL-DISTANCE" switch should be set on the "LOCAL" position. When receiving distant stations, set switch on "DISTANCE" position.

Position of Tubes. As you face the cabinet from the rear, you will note one socket on the left hand side of the Receiver. Into this socket, must be placed the tube which bears the number G-80. On the right hand side of the Receiver, as you face it from the rear, you will note four sockets which are in line. These are the radio frequency sockets, and into these must be placed tubes which bear the numbers G-27. Towards the front of the Chassis and to the right of these four sockets, which are in line, is the Detector socket, and into it must be placed a tube which bears the number G-27. At the extreme right hand side of the Chassis, you will notice two sockets which are in line and at right angles to the radio frequency tubes. Into these sockets must be placed the two power tubes which bear the numbers G-45.

Power Supply

Warning. Be sure you have alternating current 110-115 volts, 50 or 60 cycle, as the standard power supply is designed to operate under these conditions. Should your power service be of a different voltage or frequency, be sure your dealer has supplied you with a special Chassis which is marked for the proper voltage and frequency. You will find the voltage and frequency marked on the name plate on the rear of the Receiver Chassis.

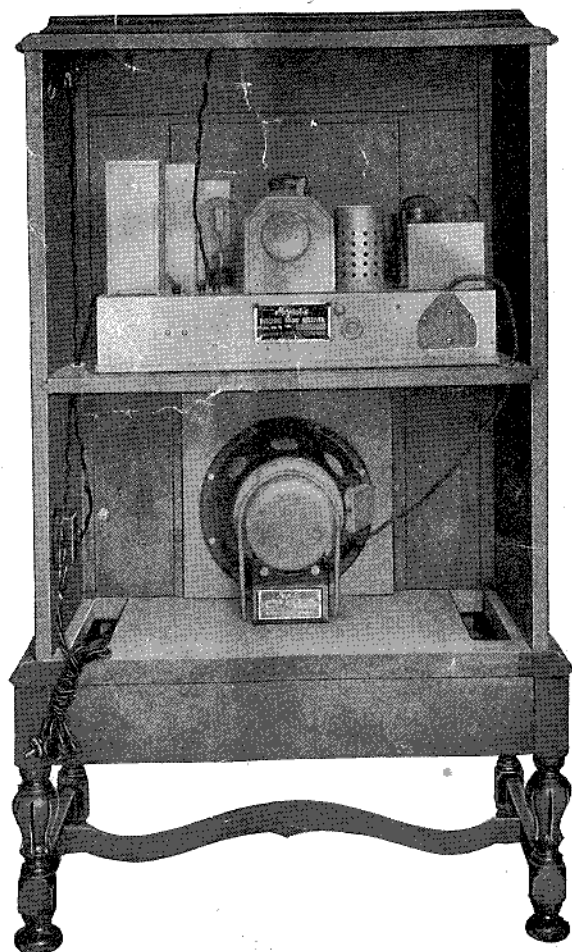
Adjustment for Line Voltage. On the left hand side of the Receiver directly in front of the G-80 Tube, you will note a small plate. Be certain, when your Receiver is installed, that you determine the average line voltage that is supplied in your territory. All Receivers shipped from the factory are adjusted to a line voltage of 115 volts. If you know your line voltage to be above or below this figure, be certain upon installing the Receiver that the plate mentioned is removed and the voltage adjustment which is under it, is adjusted. Upon removing the adjustment plate, you will find three taps. One of them is marked 105 volts, another 115 volts, and another 125 volts. If the A. C. line voltage supplied in your territory is constantly between 100 and 108 volts, the wire jumper should be placed in the tap marked 105. If the line voltage in your territory is constantly between 108 and 118, the wire



Rear View of Model 90

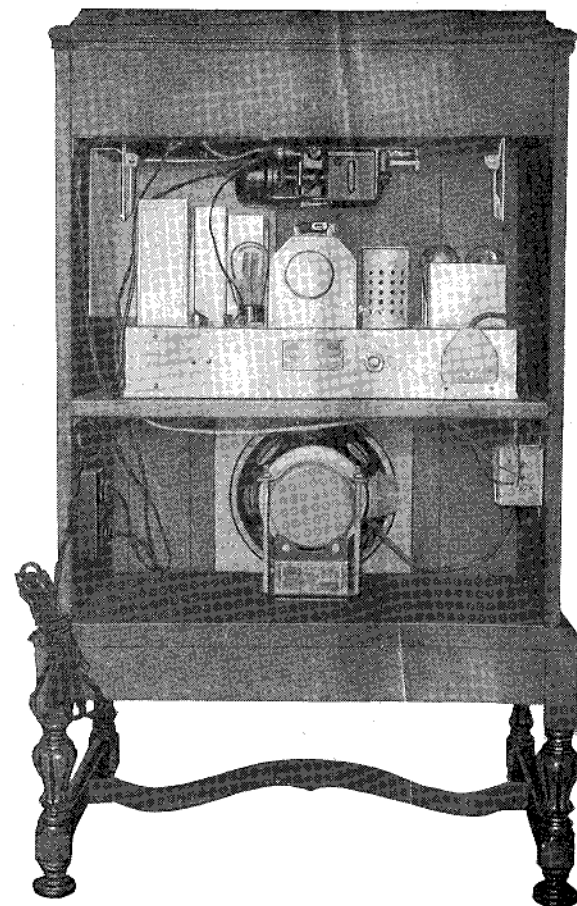
jumper should be placed in the tap marked 115. If the voltage is excessively high and constantly runs between 120 and 135 volts, the wire jumper should be placed in the tap marked 125. After determining what line voltage is prevalent in your territory, and after being certain that the adjustment is set for that particular voltage, your Receiver is then ready to connect to the A. C. circuit.

Caution. Do not remove adjustment plate or speaker terminal plates without disconnecting A. C. plug at wall receptacle.



Rear View of Model 93

Connections. On the Receiver Chassis, there is a short cord which should be connected to the receptacle which is located on the lower left hand side of the cabinet. A long cord leads from this receptacle in the cabinet, and the plug on the end of this cord should be inserted into the wall receptacle or lamp socket. After these two plugs have been inserted, the Receiver is now ready for operation. On the right hand side of the cabinet towards the front is the A. C. line switch. This switch is mounted with an escutcheon plate which indicates whether it is "OFF" or "ON." Snap switch to the "ON" position.



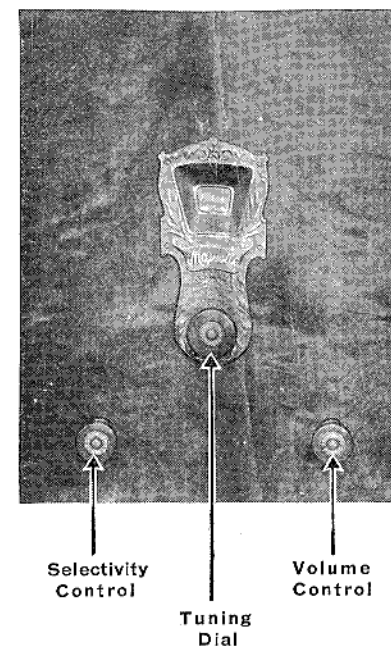
Rear View of Model 102

Operation of Receiver. All the tubes and the dial light should now light up after the switch has been turned to the proper position. Try the switch both ways to be sure that it turns the current both "OFF" and "ON" properly. The A. C. tubes light up very dimly in a brightly lighted room, consequently it may be difficult to tell whether you have current there or not. As you face the Receiver there are three knobs on the front panel. The one at the left is the antenna trimmer which is used to obtain additional selectivity on distant stations. The center knob operates the main illuminated dial, which is used to locate the stations and the knob at the right is the volume control. Turn the trimmer knob to the left and then to the right to determine its range of motion and set about midway for normal operation. Turn the volume control well around in a clock-wise direction. Locate a station by turning the central tuning control. After locating a broadcasting station tune exactly on maximum volume, then control that volume with the knob at the right of the panel to secure the desired intensity. It is always necessary to set the tuning control at the point at which the station comes in at the greatest volume to secure best quality. Poor reception will result if the set is slightly detuned. Should the volume be insufficient it will be necessary to assist the tuning with the selectivity control, which greatly increases the selectivity and sensitivity of the Receiver.

Distant Stations. If it is desired to tune in a distant station, tune in a nearby station at approximately the same frequency in kilocycles and make an accurate adjustment of the selectivity control. Then search for the desired station with the volume control turned as far to the right as necessary. A still finer adjustment of the trimmer may be made after the station is heard.

Should the Receiver Fail to Perform Satisfactorily

Make sure the antenna and ground wires are continuous and are properly connected to their respective binding posts. Make certain that the enamel has been carefully removed from antenna and ground wires at binding posts. Make sure that the socket current is turned on and the various plugs employed are firmly screwed tight in their sockets. Make sure the fuses are not blown out. (Insert a common lamp into socket to indicate a supply of current.) The panel lamp should light when the supply of current is obtained. Make sure the vacuum tubes are placed in their proper sockets as indicated. If necessary, have your dealer test your tubes and vouch for their condition. It will be necessary to look closely in the Receiver and to see that the filaments are burn-



Control Panel View

ing, as they merely glow at a dull red color. If the above procedure does not remedy the trouble, request your dealer to send a competent service man who will promptly place the Receiver in service.

Maintenance

In order to secure maximum volume without distortion it is necessary to be certain that both type G-45 power tubes in the push-pull amplifier be nearly alike in efficiency. In order to test for this balance between the two tubes, a station should be tuned in with medium volume. Next remove one of the power tubes from its socket and note the drop in volume. Replace this tube and remove the other power tube from its socket, again noting the drop in volume. If the tubes are balanced the drop in volume will be about the same in each case. If there is a large difference in volume between the two conditions, the tube giving the least volume is the weaker of the two and should be replaced by a new tube. When making this test do not leave either tube out of its socket longer than necessary. Never operate the Receiver for more

than a few seconds without both tubes in their sockets. If one does not seem to get the customary volume on distant stations, he may make the following test to determine whether the radio frequency tubes are up to par. Tune in a weak station and note the maximum volume obtainable. Now take a new G-27 amplifier tube and replace each tube, one at a time, with this good tube and note whether the volume becomes decidedly greater. If one or more of the four radio frequency tubes when replaced by the good tube increases the volume to a large extent, it means that those particular tubes are not up to par. The detector tube can be tested in the same manner. If the radio receiver operates, but the dial light does not, it means that it is either burned out or has become loose in its socket. In order to replace this lamp it is only necessary to reach into the receiver from the rear and unscrew it. The antenna and ground installations should be inspected three or four times a year to see that everything is in first-class condition for best results from your Receiver. Be sure that there is no possibility of the wires coming in contact with limbs or foliage of trees. At no place should the antenna system touch anything except the insulators by which it is supported. Insulators have a tendency to become coated with dirt and soot, so they should be cleaned occasionally. If a window lead-in strip is used the connection to same may become corroded and should be kept clean and bright. This may be done with a piece of sandpaper. The point at which the ground wire is connected with a clamp to the cold water pipe should be inspected occasionally to see that a good clean contact is being made.

Majestic Electric Radio Receiver and Phonograph Models 102 and 103

The preceding information relative to antenna installation, position of tubes, method of control, etc., applies to the Models 102 and 103 as well as the Models 90-91-92 and 93.

Radio-Phonograph Lever. A small lever, located directly underneath the selectivity control knob on the panel, is provided to switch from radio to phonograph reproduction. When operating phonograph, this lever should be thrown to the left. When receiving stations throw lever to the right.

Operation of Automatic Stopping Device. Place record on turn table. Bring electric pick-up to point on record at which you wish it to stop, rest pick-up on record at this point, then pull stop adjustment lever lightly (toward the operator) until it stops. After stop adjustment lever has been set, bring

pick-up to the right as far as possible. This procedure automatically starts the phonograph motor. Now place electric pick-up at starting point of record. When pick-up reaches stopping position it throws adjustment lever which automatically opens the line switch to the phonograph motor, thereby stopping it. This Automatic Stopping Device must be set for different makes of records as the stopping positions vary. Volume of reproduction is varied by the same volume control that is used to regulate the volume of the radio Receiver, namely the right hand knob. Turn this knob in a clock-wise direction until the proper volume is attained.

Speed Lever. A lever is provided to regulate the speed of the record turn-table. This should be set at 80 for proper reproduction.

Care of Phonograph Motor. The only care necessary for the phonograph motor is oiling. This should be done about twice a year. To oil motor remove turn-table by lifting it up and place oil in holes provided for that purpose. Be sure to use a high grade light machine oil, such as sewing machine or type-writer oil.

General Remarks

Do not remove speaker leads or any tubes without first placing the power switch in the "OFF" position, to relieve the power supply apparatus from undue strain. Do not allow the power switch to remain on the "ON" position



View of Phonograph Compartment

over long periods of time when not receiving programs. This shortens the life of the tubes. Remember that equal quality of reception from all stations is not possible, as some broadcasting stations are superior to others. The MAJESTIC Receiver will faithfully reproduce the broadcast programs, whether good or poor in quality. When tuning in a local station or even when tuning in a moderately distant station do not turn the volume control any farther to the right than necessary to give the required volume. In other words, due to the great sensitivity of the Receiver there is a danger of overloading the power tubes. This results in distortion which is unwarranted because ample volume is attained far below the point where distortion occurs.

The MAJESTIC Receiver does not exaggerate either the high or low notes of the music. The high notes are received sweet and pure, and the low notes are received full and rich and without the characteristic "rumble" and echo of some former types of Receivers. Every note is reproduced in relative strength to the original programs. No sound is added to or subtracted from the musical spectrum, but all notes are reproduced in strict fidelity, which is in notable evidence by the Receiver's perfect reproduction of the human voice—the true test of all receivers. It has been the aim of the engineers and designers of the MAJESTIC Receiver to completely avoid the so-called "oscillating point." It is the belief of the MAJESTIC engineers that the owner of a MAJESTIC Receiver will demand perfect reproduction, and so they have accomplished selectivity and sensitiveness in the Receiver, by scientific methods rather than resorting to regeneration.

Operation Refinements. To obtain maximum results one additional tube of each type should be available to check up to insure all tubes are up to standard. Great improvements can sometimes be obtained by experimenting with various lengths of antennae and by trying antenna pointing in different directions.

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