

CARE OF PHONOGRAPH MOTOR

Operation. Efficient operation of the phonograph motor is dependent upon proper lubrication at such points as spindle shaft bearings, governor worm gear, worm on governor shaft and felt friction which bears against the governor disc.

Lubrication. Lack of lubrication of the motor at the points indicated in Figure 7, will result in binding at one or more of the above named bearing points with a resultant drop in motor speed and a variation in the pitch of the music reproduced. The use of the lubricants, as stated in following paragraph, will insure proper lubrication, maintenance of constant motor speed and most efficient operation of the motor.

The felt washer at (1) in upper bearing and the lower spindle bearing at (2) are to be lubricated with white vaseline. The teeth of worm and gear at (3) are to be lubricated with Edison graphite lubricant. Governor bearings at (4) and (5) and shaft at (6) on inside of sliding collar are to be lubricated with Edison oil. Felt pad at (7) riding on governor disc is to be lubricated with Edison oil. These lubricants may be obtained from Thomas A. Edison, Inc., Orange, N. J.

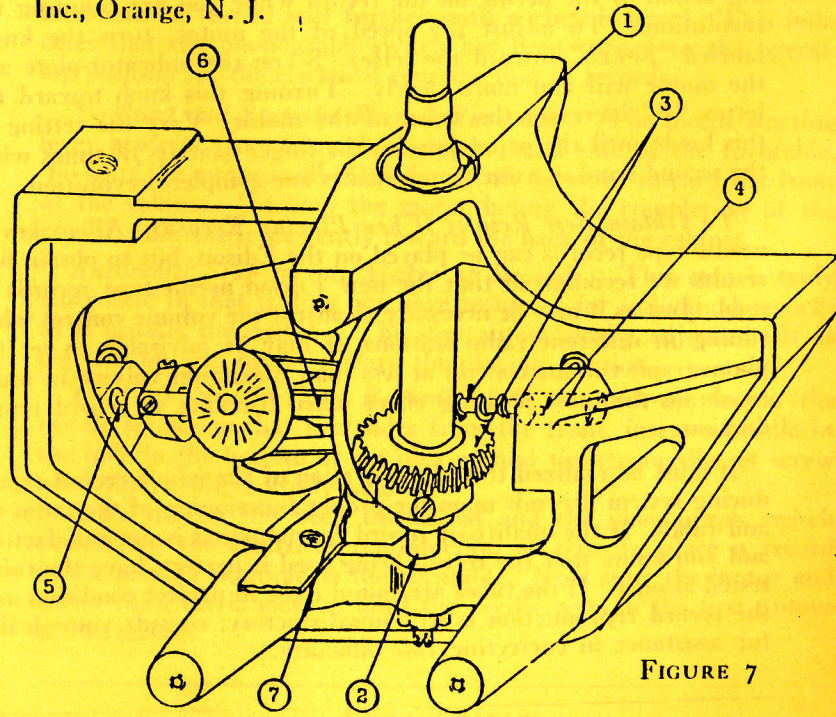


FIGURE 7

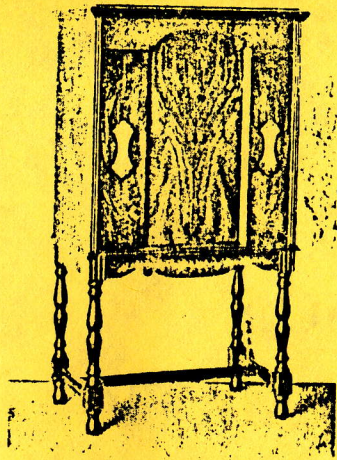
INSTRUCTIONS

FOR

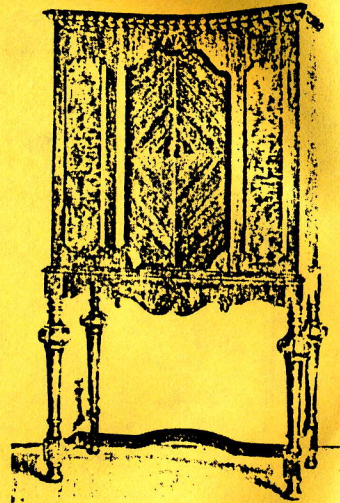
EDISON LIGHT-O-MATIC RADIO RECEIVERS

THOMAS A. EDISON, INC.
ORANGE, N. J.

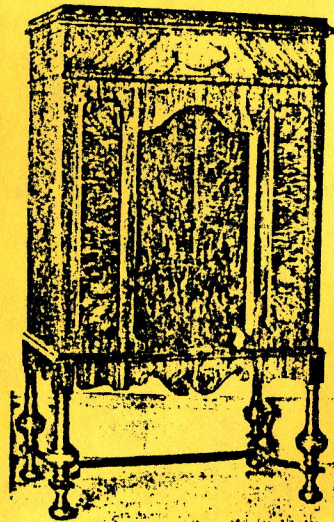
No. 5019-30M-10-'29



THE NEW EDISON RADIO
Model R-5



THE NEW EDISON RADIO
Model R-4



THE NEW EDISON RADIO
and Electric Phonograph
Model C-4

LICENSE NOTICE

Patented

Licensed by Radio Corporation of America under the following patents:

1,128,292	1,277,384	1,459,412
1,129,942	1,282,439	1,465,332
1,158,123	1,313,094	1,520,994
1,173,079	1,329,283	1,559,679
1,183,875	1,334,118	1,617,428
1,195,632	1,349,252	1,618,017
1,201,272	1,377,405	1,631,646
1,231,764	1,398,665	1,686,570
1,251,377	1,426,754	1,707,617
1,273,627	1,432,022	

Licensed under the foregoing patents only for radio amateur, experimental and broadcast reception uses and for electric phonograph reproduction from grooved records; licensed for use in connection with electric phonograph devices sold by, or manufactured and sold under license from Radio Corporation of America, except as in this license notice expressly provided. The sale of this apparatus confers no license under any of the foregoing patents or under any other patents under which Radio Corporation of America may have the right to grant licenses, to make, use or sell any other apparatus either in combination with this apparatus or otherwise. With respect to broadcast reception and electric phonograph uses, licensed under the foregoing patents only for private use in homes for entertainment and educational purposes otherwise than in combination or in connection with apparatus in field of wire telephony or apparatus for projection or production, either directly or by electric currents, waves or impulses, of still or motion pictures.

NEUTRODYNE

Reg. U. S. Patent Office

Licensed by Hazeltine Corporation and Latour Corporation only for radio amateur, experimental and broadcast reception, under the following patents:

1,450,080	1,405,523	Reissue 16,461
1,489,228	1,648,808	
1,533,858	1,614,136	

Licensed by B. F. Miessner under patent applications and the following patents:

1,718,059
1,719,189

FOREWORD

It is within the memory of many now living, of a world without electric lights, telephones and electric railways. Many recall days when such things as phonographs, business dictating machines, movies and radios were unheard and undreamt of. And yet today, these are all commonplace.

The wonder is not so much that we have these and many other marvelous conveniences, but that they emanated, either completely or in major part, from the brain of one man, Thomas Alva Edison. His fundamental inventions, improvements and discoveries have wrought wondrous changes in human life during the last fifty years.

The art of radio, in particular, is absolutely dependent on Edison's basic work, for in 1875 he discovered the hitherto unknown phenomenon caused by electric waves in free space, which he called "Ethereic Force." This discovery might well be called the birth of radio, for without "Ethereic Force," radio might never have been thought of. In 1883 Edison discovered the "Edison Effect"—the fundamental principle on which every radio tube is based. The microphone, so indispensable in broadcasting, is merely a glorified form of the carbon telephone transmitter, entirely the invention of Edison. Generation of electric current, systems for its distribution, and methods for its measurements, all important to radio in these days of electrical receivers, were all made possible by the work of the great inventor.

Ever since Thomas Alva Edison invented the phonograph in 1877, the Edison Laboratories have continued their tireless search for greater and greater perfection in reproducing music. And now they introduce to the world the Edison Light-O-Matic Radio, a product that represents the culmination of more than fifty years' successful experience in the building of sound reproducing equipment. Being a development of the Edison Laboratories, where researches are inspired by Mr. Edison's own genius, there is assured every purchaser of the Edison Light-O-Matic Radio a mechanical correctness, a standard of inbuilt quality, and a degree of performance that one would expect from a radio receiver bearing the great name of Edison.

THE INDUSTRIES THAT MAKE THE EDISON LIGHT-O-MATIC RADIO

In one form or another, Thomas A. Edison has maintained a corporate organization for the promotion of his various enterprises continuously for a period of over fifty years. This organization has successfully weathered many periods of depression and panic and has endured seven times the average corporate lifetime.

The Thomas A. Edison Industries, sometimes called the "House of Edison," is today a world-wide organization creating, manufacturing and marketing many different articles of merchandise through a number of major divisions, each operating independently of the other, yet all responsible to the general executive board, of which Thomas A. Edison himself is chairman, and his son, Charles Edison, president.

The plants of the Edison Industries are located at Orange, Newark, Bloomfield and Stewartville, N. J.; at New London, Wisconsin; and at St. Thomas, Ontario, Canada. Business offices are maintained in the principal cities of this country, in London, England, and in Australia. The Edison Export Division directs the distribution of Edison-made products to the farthest corners of the world.

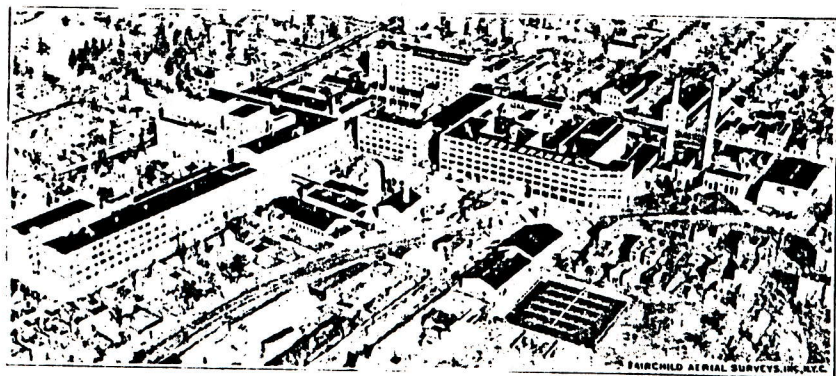
The plants of the Edison Industries are on properties totalling over 1,500 acres of land. While the money value of the plants runs into large figures, this enduring organization, being founded and guided by Mr. Edison, himself, has never subjugated its interests to the making of unreasonable profits, but has dedicated its entire resources to the service of the public by building useful and enduring articles of quality that materially contribute to the well-being of mankind.

The Edison Industries manufacture and distribute Edison Storage Batteries, Edison Mine Safety Lamps, Edison Portland Cement, Ediphones for business dictation, Edicraft Automatic Toasters and Coffee Siphonators, Edison Phonographs and Records, Edison Primary Batteries, stock tickers, call boxes and other telegraph equipment, mechanical and electrical parts and equipment and card tables, juvenile furniture, wood products, electroplatings and, of course, Edison Light-O-Matic Radios and Radio-Phonograph Combinations.

The Edison Wood Products Co., located at New London, Wisconsin, is one of the largest plants in this country for the manufacture of the finest furniture. Here, all the cabinets for Edison Radios and Phonographs, are made.

Also, associated with the "House of Edison" are the Edison Botanic Research Corporation, investigating domestic production of rubber; the E-K Medical Gas Laboratories, producing medical gases, oxygen and nitrous oxide (laughing gas); the Ediplate Corporation, producing seamless floats and other electro-deposition products; The Edison Laboratories, where extensive experiments and researches are carried on, and where machinery is designed and manufactured for the various divisions.

This is a brief description of the industries that developed and manufacture the outstanding radio receiver of the day—The Edison Light-O-Matic Radio. This great institution, the Thomas A. Edison Industries, with a past replete with achievement, and a future promising even greater accomplishments, is staunchly built on a foundation upholding the high standards and noble ideals of the genius, Thomas A. Edison, whose immortal work inspired and created it.



TO THE PURCHASER OF AN EDISON LIGHT-O-MATIC RADIO

In presenting to the public the Edison Light-O-Matic Radio, our aim has been to incorporate into each receiver the finest expressions of engineering research and skill that have been developed in the art of sound reproduction. We offer you your Edison Light-O-Matic Radio with the hope that in it you will find the perfection, both musically and artistically, for which the world of music lovers has so eagerly awaited.

Your Edison Light-O-Matic Radio has undergone the most thorough inspections all through the various processes of its manufacture. Before it left our factory as a finished product, it passed a rigid test to determine whether it fully met the exacting requirements that are set for all Edison-made products. Please remember, that every Edison Radio set is a sensitive electrical apparatus, built with scientific precision, which we have designed to perform even under extraordinary conditions. It will give uniformly satisfactory service unless subjected to abuse. Should you at any time encounter conditions which are not fully described and explained in this booklet, do not fail to get in touch with the Edison dealer from whom you purchased your instrument. Edison Radio dealers have been selected with great care and we are confident you will find their service reliable.

It is a matter of greatest interest to Thomas A. Edison, Inc., that your ownership of an Edison Radio or Radio-Phonograph Combination should provide you with a maximum of enjoyment and satisfaction. With this thought uppermost in our minds, we recommend to your careful reading the following instructions, in order that you may become fully acquainted with the proper installation, operation and care of your Edison receiver.

GENERAL DESCRIPTION

Models, Parts and Accessory Equipment

MODELS

Models R-4, R-5 and C-4 are designed to operate on 60 cycle alternating current electric power lines at voltages of 100 to 133 volts, 60 cycles. (These models are also available for 25, 30 and 40 cycle operation.)

Models R-4 and R-5 differ only in design and artistry of cabinet. Each is equipped with a phonograph switch and jacks for the connection of an external electric phonograph pick-up.

Model C-4 combines both radio and electric phonograph mechanisms, being equipped with a silent dependable induction motor, a specially designed electric pick-up (needle type) and an automatic stop that operates on all types of records without setting.

Edison Light-O-Matic tuning is a feature of all three models.

CABINETS

All cabinets are made of selected stock, in our own wood-working plants, with the superior craftsmanship so long associated with Edison products. Each model represents the mature experience of competent designers and are master-pieces of artistic furniture that will harmonize with the decoration of any home.

Model R-4 is a rich, dignified console bearing the impress of the world's finest artistry. It is of blended walnut finish, has quarter matched sliding doors and raised butt walnut panels. The appearance of the R-4 cabinet is enhanced by carved mouldings and ornaments. Its dimensions are 46" x 26 $\frac{3}{4}$ " x 17".

Model R-5 is a strikingly handsome console of blended walnut finish. It has pilasters of matched butt walnut with birdseye maple reliefs, and matched butt walnut sliding doors. The size is 42 $\frac{1}{2}$ " x 23 $\frac{1}{4}$ " x 15 $\frac{1}{2}$ ".

Model C-4 cabinet is designed especially to afford the finest housing for a combined all-electric radio and phonograph. It is of blended walnut finish, with sliding doors of matched butt walnut. The front of this exquisite cabinet is relieved with butt walnut panels. Its dimensions are 48" x 28 $\frac{5}{8}$ " x 19".

RECEIVER UNIT (Type 7-R)

A standard receiver unit is employed in all of the Light-O-Matic Models, containing three stages of radio frequency, detector, first audio stage, and Light-O-Matic Mechanism.

Dimensions, R-4 and R-5, 10" high, 16 $\frac{3}{4}$ " long, 10 $\frac{7}{8}$ " wide. The C-4 receiver unit, which differs only in height, is 11".

Approximate weight is 19 lbs.

The front panel is fastened directly to the receiver unit. If service is at any time necessary, all one need do to remove the receiver unit is unscrew the wing nuts underneath the receiver unit shelf and withdraw the unit with its attached panel from the cabinet. All parts will be found readily accessible.

LIGHT-O-MATIC MECHANISM

The Edison Light-O-Matic mechanism is a part of the dial drum assembly. It provides for the convenient registering or logging of all important stations and affords ready means for locating them. Its operation is explained under "OPERATING INSTRUCTIONS."

VARIABLE TUNING CONDENSERS

Two twin gang condensers are mounted on either side of the dial mechanism. Three point suspension is employed in mounting. Each condenser is separately shielded and each assembly is inclosed in an individual shield housing.

These condensers are matched within limits of one micro-microfarad, plus or minus. Such accuracy is seldom, if ever, maintained in any commercial product.

CIRCUIT

The radio frequency unit comprises a neutrodyne circuit with exclusive Edison refinements providing "constant gain and sensitivity" over the entire dial range from 550 to 1,500 kilocycles.

COMBINED VOLUME CONTROL AND PHONOGRAPH SWITCH

The double action volume control has been specially designed by Edison radio engineers for the Light-O-Matic Models. The two actions take place simultaneously and consist of a variation of antenna-ground shunt and a variation of the grid bias on the second and third radio frequency amplifying tubes. The first is essentially a control of input and the second a control of sensitivity.

The phonograph switch is attached to the volume control and is operated by turning the volume control knob to the extreme left until click is heard.

ANTENNA CONNECTIONS

All Light-O-Matic Models have a built-in antenna which can be satisfactorily used for reception from local broadcast stations. Light-O-Matic Models will perform satisfactorily when connected to either an outside antenna or indoor antenna.

SOCKETS

Self centering sockets are employed rendering easy the insertion of tubes under most difficult lighting conditions. All sockets are color coded, reducing the hazard of inserting tubes in wrong sockets. All sockets are marked with tube numbers, indicating which tubes they accommodate.

ELECTRIC PICK-UP JACKS

Electric pick-up jacks are provided on the receiver unit shelf. When the phonograph switch is operated, the jacks are automatically connected to the audio system of the receiver, thus providing for its use as an amplifier for the electrical reproduction of phonograph records.

TUBES

The following tubes must be employed in all Light-O-Matic Models:

	Position	Type of Tube
<i>Receiver Unit</i>	1st R. F.	'27
	2nd R. F.	'27
	3rd R. F.	'27
	Detector	'27
	1st A. F.	'27
<i>Power Unit</i>	2nd A. F.	Two '45s
	Rectifier	'80

SHIELDING

Auto body steel is employed in chassis and housing structures. Radio frequency coils are completely shielded within copper and aluminum containers. Variable condensers are shielded one from another and each condenser assembly is housed in a complete shield.

HUM ADJUSTER

A variable hum adjuster is located on the receiver unit to correct possible excessive hum due to varying line conditions and slight differences in individual vacuum tubes.

POWER UNIT

All models have a separate power unit, containing a second audio stage in push-pull arrangement, rectifier, power transformer, filter condensers and electro-dynamic speaker.

Dimensions: 11½" x 16¾" x 11¾".

Weight: Approximately 41 lbs.

Underwriters' requirements are fully complied with. All high voltage wires and connections are completely insulated and inaccessible to the owner, thereby eliminating all possibility of electric shock under normal operating conditions. All transformer cores are grounded to cases and properly impregnated.

LINE VOLTAGE REGULATION

The primary winding of the power transformer is provided with three taps, each of which is connected to a separate lug located on the terminal board of that transformer. These lugs are plainly marked for line voltages of 105, 115 and 125.

This provision makes it possible to maintain proper tube voltages under all practical line voltages which will be encountered, ranging from 100 to 130 volts.

PUSH-PULL AUDIO AMPLIFIER

Two of the new type '45 tubes are employed in a push-pull second stage audio circuit which afford a total undistorted output exceeding three watts.

PUSH-PULL BALANCING RESISTANCE

An adjustable resistance unit is located within the power unit, between the '45 tube sockets. This resistance permits the increase of the bias voltage on either of the push pull amplifying tubes at will by the amount necessary, with any two given tubes, to balance out any residual hum in this stage. It is particularly to be noted that this

balance for hum results in substantially exact audio frequency balance, which is a condition that must be attained for most efficient utilization of push-pull amplification.

FIXED CONDENSERS

Fixed condensers in all Light-O-Matic Models are manufactured to our own specifications. Filter condensers are manufactured in our own plants. The latter are built up from four layer dielectric and exhaustive tests give proof of ample safety factor.

TRANSFORMERS

Audio Transformers. The first audio transformer has a core section $\frac{1}{2}$ inch square. The second audio transformer has a core section $\frac{1}{2}$ " x $\frac{3}{4}$ ". Allegheny electric metal (known as "A" metal) has been employed for core material. Laboratory tests show that this metal has a very high permeability.

Power Transformers. The power transformer has a core section $1\frac{3}{8}$ " x $1\frac{7}{8}$ " and develops 350 volts on each plate of the 280 tube. The primary is wound with No. 20 enameled wire and wire as large as No. 30 is employed in the secondary. Temperature attained in continuous operation will not exceed 39 degrees Centigrade.

RECTIFIER

A single type '80 tube (full wave rectifier) is employed in the power circuit for the supplying of direct current to the electro-dynamic speaker field winding and to the plates of all tubes.

ELECTRO-DYNAMIC SPEAKER

The electro-dynamic speaker used in the Edison Light-O-Matic Models is especially designed to give a very uniform response curve. More than one hundred speakers were tested in the Edison Laboratories and after careful scientific comparisons, this speaker was selected because of its excellent tone quality, its efficiency, and its mechanical and its electrical correctness.

POWER RATING

All Light-O-Matic Models have a power input rating of 100 watts. Model C-4, with its phonograph motor has a combined power input rating of 140 watts.

Although designed for operation on 60 cycles alternating current, each of the Light-O-Matic Models will perform quite satisfactorily on 50 cycles alternating current.

INSTALLATION

Construction of the Antenna. Lightning Arrester. Ground. Location of the Receiver in Your Home. Insertion of Tubes. Line Voltage Adjustment. Connection of the Receiver to Power Line. Adjustments to be Made When the Receiver is Installed.

ANTENNA CONSTRUCTION

(See Figure 1, Pages 16 and 17)

Where it is not possible or desirable to construct an outside antenna, the "built-in" antenna shown in Figure 1 will be found to function admirably for all local broadcasting stations. When using the "built-in" antenna, it should always be connected to the post marked "ANT."

Wherever possible, however, an outside antenna should be erected. Great care should always be exercised in making such an antenna installation.

The flat top portion of the antenna system should preferably be made up of seven strand phosphor bronze wire. If this is not available, single strand No. 14 copper wire may be employed. It is recommended that the overall length of the antenna be from 75 to 125 feet. The insulators at each end of the flat top portion should be attached to masts or other supports, but wherever possible, such supports should be placed so that the antenna will be at least two feet above surrounding structures (as high as possible in all cases).

The lead-in wire should be of the same size wire as that used in the flat top portion of the antenna, and soldered to it at "E". It should be kept clear of the building as much as possible, and never be tacked directly to the side of the building. Whenever practical, the clearance should be approximately two feet to the point of entrance into the room containing the receiver.

As shown in Figure 1, a lead-in strap can be used for bringing the "lead-in" wire through the window opening. Connections to the lead-in strap, both outside and inside the window, should be soldered. If it is desired, or when a lead-in strap is not obtainable, the lead-in wire itself can be continued through the building wall, passing through a porcelain tube, as shown by the dotted outline in Figure 1.

The lead-in wire is continued inside the room to the receiver unit. Connection is made to the post marked "ANT" if the overall length of the antenna is less than 50 feet, or to the post marked "LONG ANT" if the overall length is more than 50 feet.

If desired, an indoor or inside antenna can be installed. Without exception an indoor antenna should be connected to the post marked "ANT". Never use both inside and outside antenna connected to antenna posts simultaneously, nor have an external antenna system connected when the set is operating on the "built-in" antenna, otherwise the selectivity of the set will be impaired.

LIGHTNING ARRESTER

A lightning arrester must be used on all outside antenna systems to conform with Fire Underwriters' Regulations. Your dealer will recommend the one to be used and it should be installed in accordance with instructions supplied with it.

GROUND

The ground connection is also important. It should be as short and direct as possible. The ground connection is made from the post marked "GND" to a cold water-pipe, whenever possible. If a cold water-pipe is not available, use a radiator, but never a gas-pipe. If it is not possible to make the ground connection to a water-pipe or radiator, connection may be made to a galvanized pipe or rod, or to a copper plate that has been buried in damp ground. In making the ground connection use a copper strap firmly clamped around the pipe, radiator, etc., being sure to scrape the metal clean before affixing the strap. The ground wire should be soldered to the strap or plate.

LOCATION OF RECEIVER IN THE HOME

The receiver should be placed as near as possible to the point of entrance of the lead-in wire from the antenna system (where outside antenna is used) and convenient to a power outlet or wall receptacle.

INSERTION OF TUBES

All radio tubes should be handled carefully. Follow Figure 1, Pages 16 and 17, to aid in locating sockets for the proper tubes. Unless tubes are placed in their proper positions, serious damage or the complete destruction of them may result.

All sockets are plainly marked for the tubes that go into them. Note that the receiver unit has five tube sockets, all taking the '27 type tube. The detector shield must be removed in order to insert

detector tube in this socket. *Be sure* to place shield back in position after detector tube is in place.

The power unit has three tube sockets, the two on the left take type '45 tubes, and the one on the right takes the type '80 rectifying tube.

WARNING! Type '45 tube filaments will be immediately destroyed if a type '45 tube is placed in the type '80 socket.

LINE VOLTAGE ADJUSTMENT

When installation is made and before operating the receiver, the line voltage should be measured at the electric wall receptacle or lamp socket to which the set will be connected.

If the line voltage is between 110 and 120 volts, no adjustment is necessary. All power units are adjusted for these voltages when shipped from our factory.

Should the line voltage be lower than 110 or higher than 120 volts, it is necessary to make an adjustment on the bottom of the power unit, that is, if best results are to be experienced in the operation of your receiver, and to prolong the life of the tubes.

Figure 2, Page 18, shows the location of three lugs marked "105", "115" and "125" on the bottom of the power unit. When the set leaves the factory, the two wires "A" and "B" are connected to the lug marked "115". This connection is correct for all line voltages between 110 and 120, and is so made because approximately 70% of the power lines in the U. S. A. deliver voltages ranging from 110 to 120 volts.

When the line voltage measures less than 110 volts, the two wires "A" and "B" should be transferred to the lug marked "105". Similarly, if the line voltage is found to be more than 120 volts, connection of these two wires should be made to the lug marked "125".

CAUTION: Correct line voltage adjustment is absolutely necessary to insure longest possible life from all vacuum tubes. Low line voltage will endanger the life of some tubes just as much as will high line voltage. It is therefore necessary that this adjustment be given proper consideration and correct adjustment made when the instrument is installed.

CONNECTION OF RECEIVER TO POWER LINE

A standard socket plug and line cord (see Figure 1) is provided with each receiver. This plug must be inserted into an electric wall receptacle or lamp outlet supplying alternating current, 100 to 130 volts.

The receiver is now ready to operate.

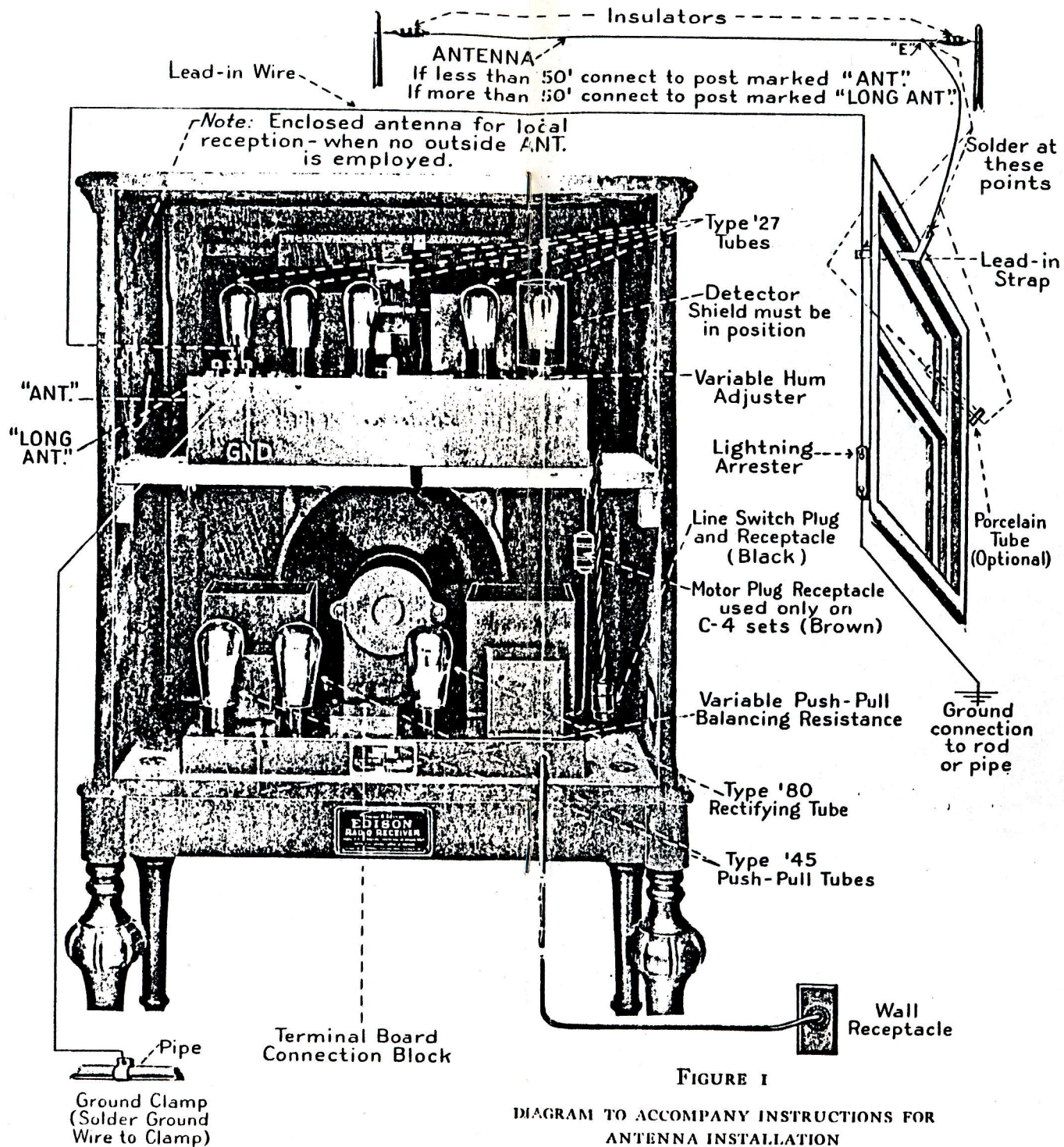
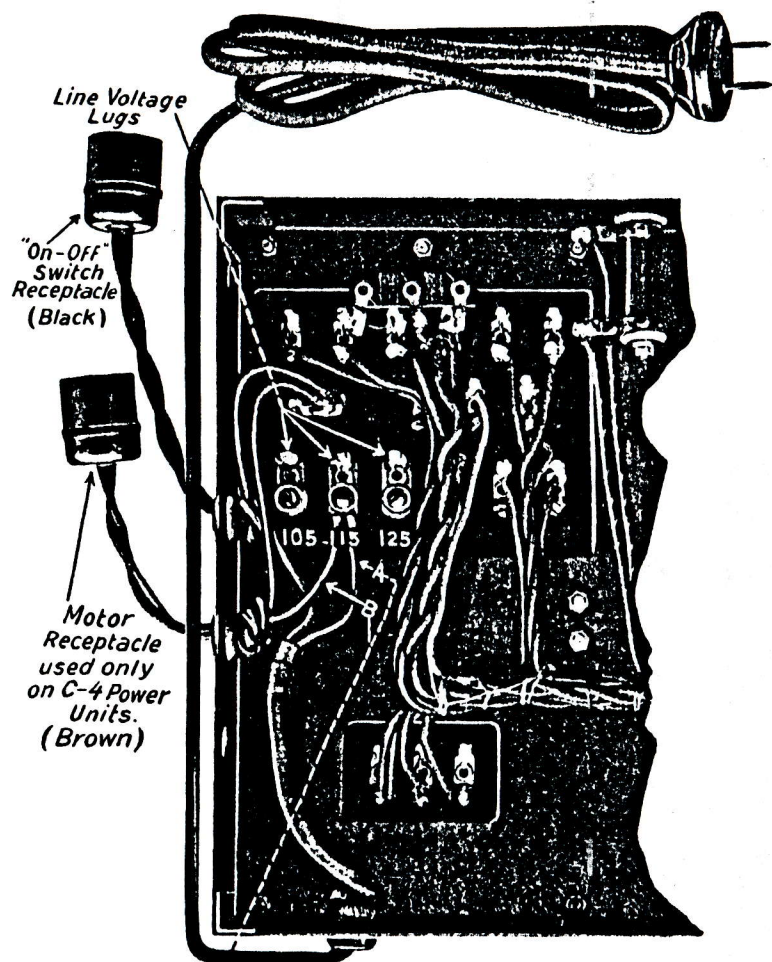


FIGURE I

DIAGRAM TO ACCOMPANY INSTRUCTIONS FOR ANTENNA INSTALLATION



Wires A and B must be connected Simultaneously to either 105, 115 or 125 lug, depending upon the line voltage.

FIGURE 2

SHOWING PRIMARY TAPS FOR LINE VOLTAGE REGULATION
(TAPS LOCATED ON BOTTOM SIDE OF THE POWER UNIT)

ADJUSTMENTS TO BE MADE WHEN RECEIVER IS INSTALLED

Elimination of Hum. Located on the receiver unit shelf at the point indicated in Figure 1, will be found an adjustment screw. This screw operates a variable resistance which is known as the detector hum adjuster. By inserting a screw driver and turning this adjustment screw from extreme left to extreme right you will note one position, approximately midway between extremes which is free from hum, or where the hum level is at a minimum.

The attainment of zero hum level is governed almost entirely by the tube characteristics and general line conditions. That is, with a set of perfect tubes and proper line conditions, no hum will exist after correct adjustments have been made.

Push-Pull Balancer. The push-pull balancing adjustment screw is shown in Figure 3, located between the '45 tube sockets on the power unit. This adjustment controls the grid biasing voltages applied to each of the two push-pull type '45 tubes. Upon turning

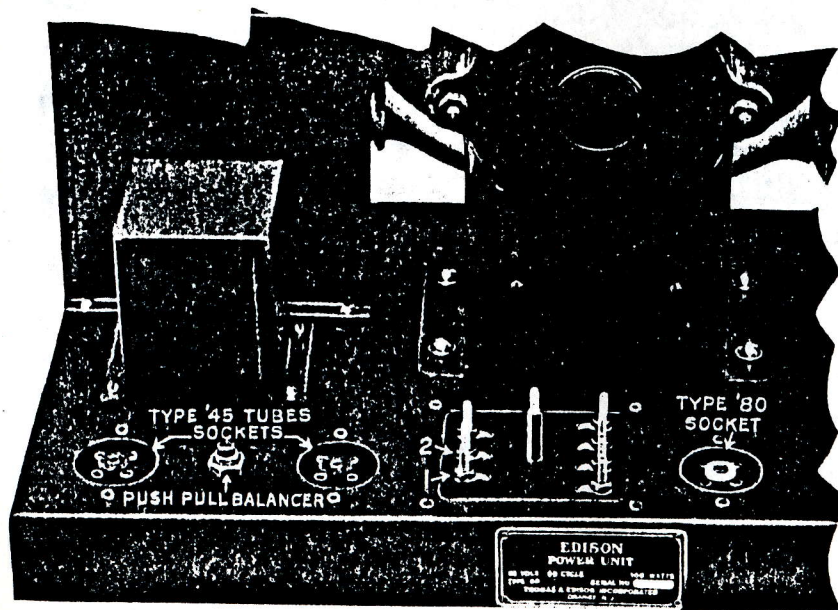


FIGURE 3

this screw from extreme left to extreme right a position will be noted where the resultant hum is also at a minimum or zero level. The point of exact balance is the point of minimum hum. This position is the proper adjustment.

NOTE: To isolate the second audio stage, permitting most accurate adjustment to reduce hum, remove the cable connection "shield cover," on power unit base, and short points No. 1 and No. 2, as indicated in Figure 3. This short may be affected with a small piece of wire or a screw driver blade while the above mentioned adjustment is being made for minimum hum position. The wire or screw driver must be removed before replacing shield cover.

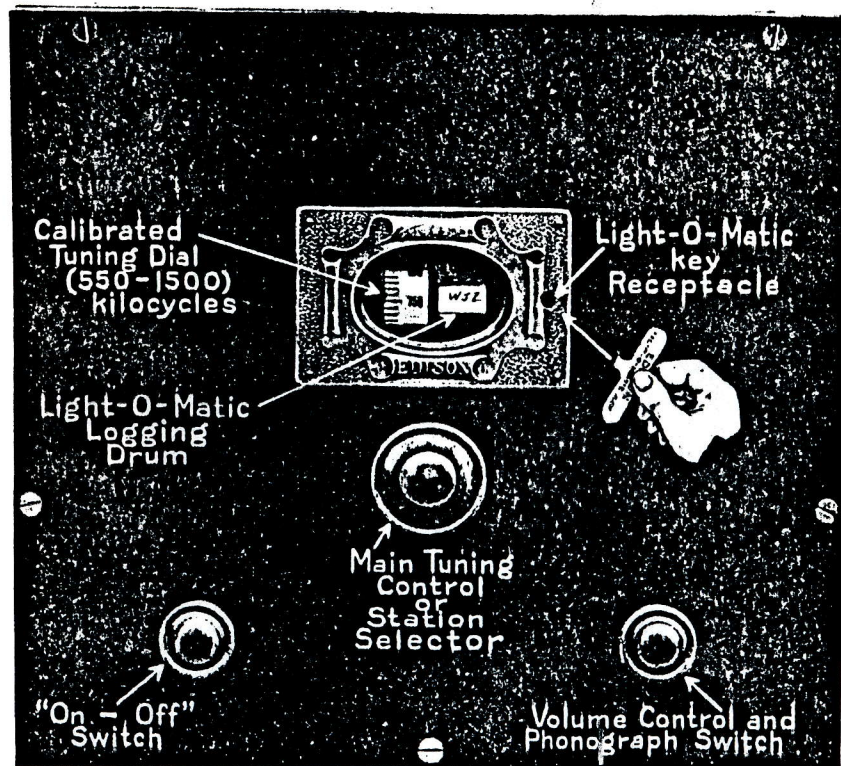


FIGURE 4
CONTROL PANEL
(Used on Light-O-Matic Models R-4, R-5 and C-4)

OPERATING INSTRUCTIONS

(See Figure 4, Page 20)

To turn on power rotate the left hand knob gently to the right. A click will be heard, indicating the operation of the "On-Off" switch mechanism. A short time, a matter of seconds, is required for the tubes to warm up when the set is then ready to operate. The calibrated dial window is illuminated when the "On-Off" switch is thus turned on, unless pilot light is loose in socket or burned out.

To turn off power, rotate this knob to the left until a "click" is heard, when the calibrated dial will no longer be illuminated.

The volume control knob operates a combined volume control and phonograph switch, permitting change from radio to phonograph and vice versa. Volume of the radio is controlled by rotation of this knob, turning it to the right to increase volume, or to the left to decrease volume.

To actuate the phonograph switch which is combined with this knob, turn the knob all the way to the left, to its position of minimum or zero volume. When the end has been reached, by exerting slightly greater twisting force the knob can be turned still further, causing a click to be heard which indicates that the phonograph switch has been turned to the operating position for the electric reproduction of records.

To change back to radio, rotate the knob to the right until a "click" is heard, and then continue turning the knob to the right to obtain the desired volume.

Tuning the receiver for the broadcasting station desired is accomplished by rotating the main tuning control knob located at the center of the panel. This knob drives the dial mechanism with its associated parts. Rotation of the tuning knob, to the right or left, causes the calibrated dial, seen through the left hand window in the escutcheon plate, to move, enabling you to select any station from 550 to 1,500 kilocycles.

When tuning for nearby or local stations the volume control knob should be turned leftward to a position where normal room volume will result. If tuning for more distant and weaker stations the volume control must be turned to a position more in the reverse direction, that is to the right. For very weak stations, turn the volume control knob to the extreme right. The tuning knob should be turned until the desired station is received, rotating the volume control knob simultaneously in either direction to increase or decrease volume as desired.

OPERATION OF EDISON LIGHT-O-MATIC TUNER

(See Figure 4, Page 20)

To operate your set with the Light-O-Matic Tuner rotate the tuning knob until you hear a broadcast station, for instance "WJZ," or one of your favorite stations.

NOTE: The greater care you exercise in this tuning operation the greater satisfaction you will derive from the use of Light-O-Matic Tuning. As a suggestion to one inexperienced in tuning a radio set, it might be well to tune in a station, reduce the volume as low as possible, again rotate the tuning knob back and forth and stop the dial in the *exact* position where the station is heard with greatest volume.

Then, and then only, write or preferably print, the call letters "WJZ" on the Light-O-Matic dial. This Light-O-Matic dial is the plain white dial seen through the smaller window at the right of the escutcheon plate.

NOTE: To protect the dial from scratches during manufacture, a thin sheet of glazed paper is attached to the celluloid dial. If this paper is attached to the dial when the set is installed, the paper should be removed.

This paper is cemented at each extreme end of the dial. See instructions:—Tear off as directed in Figure 5.

Now insert the Light-O-Matic Key (one key accompanies each set) into the Light-O-Matic Key Receptacle and make a quarter-turn to the right. As the key is turned, a punching pin embosses a copper disc, which in turn operates a contact plunger, and closes the filament circuit through the Light-O-Matic bulb. This illuminates the call letters "WJZ" within the Light-O-Matic window.

NOTE: When releasing the Light-O-Matic Key, the Light-O-Matic window should remain lighted. If not, you did not turn the key far enough to the right—turn key again with slightly greater force to insure proper embossing.

Thereafter, to tune in "WJZ" all one need do is turn the tuning knob until the call letters "WJZ" are seen within the Light-O-Matic window. At the same time that the letters "WJZ" appear in view they instantly and automatically become illuminated.

In the same way any station can be registered or logged, and thereafter instantly located with precision tuning.

It is quite possible to register or log approximately forty stations on the Light-O-Matic dial. Logging need not necessarily be restricted to local stations. Any desired distant station, once located on the tuning dial, may then be registered on the Light-O-Matic dial and tuned in at will, whenever reception of that station is possible.

The Light-O-Matic dial assembly contains a copper embossing disc secured to the dial drum by a clamping ring. When it is desired to change the location of stations on your dial (as is necessary in the event of reallocation of wave-lengths by the Federal Radio Commission), the markings in the right window can be easily erased, the clamping ring removed (as shown in Figure 5) and the punching disc lifted from the dial assembly. Then insert new disc in the dial assembly and push the clamping ring back in place. The Light-O-Matic dial can again be logged, recording the stations desired.

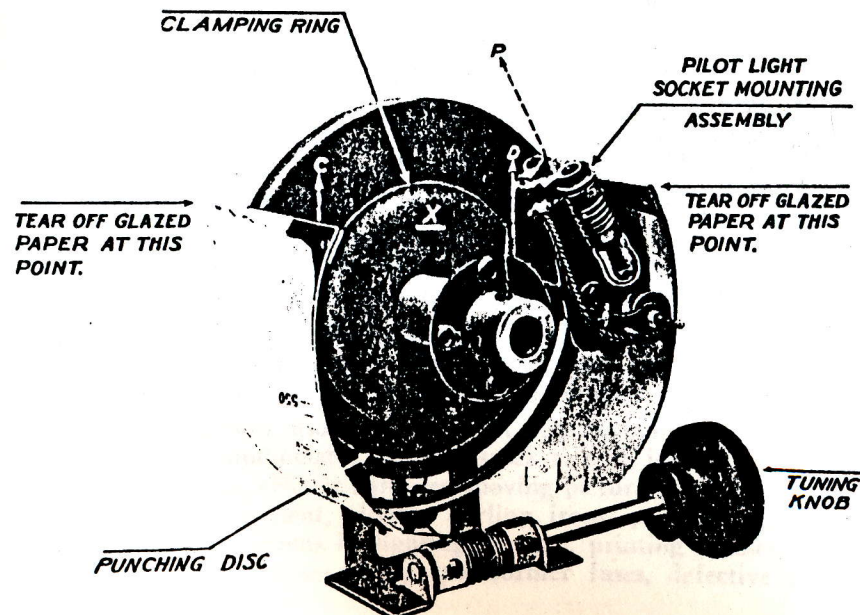


FIGURE 5

LIGHT-O-MATIC DIAL MECHANISM ASSEMBLY

**DIRECTIONS
FOR
REMOVING EMBOSSING DISC
AND
REPLACING PILOT LIGHTS**

REMOVING EMBOSSING DISC (See Figure 5).

First remove the clamping plate by grasping it at point X, and pulling away from shaft in direction indicated by arrows at C and D. The copper embossing disc may now be removed by prying it away from the metal drum until clear of locking pins, rotating it 180 degrees and pulling it away from the shaft in the direction indicated by arrows at C and D in Figure 5.

To replace, slide copper disc in position against drum, rotating it 180 degrees until it slips over the locking pins and push the clamping plate back into position. It is absolutely necessary that the copper embossing disc rest flat against the supporting drum.

TO REPLACE PILOT LIGHTS (See Figure 5).

Rotate the tuning knob until the dial drum scale is in the approximate position as illustrated in Figure 5. The dial light socket assembly is now accessible and can be easily withdrawn from the holding plate by pulling in the direction indicated by the dotted line at "P".

Replacement of either or both lamps can then be made by simply unscrewing and removing the defective light bulb and screwing the new one into the socket.

**INTERFERENCE
NOISES—SOMETIMES REFERRED TO AS
"MAN-MADE STATIC"**

In some locations sounds will be emitted from the loud speaker not associated with entertainment as transmitted from the broadcast stations. The radio listener may attribute such noises to the radio receiver. Generally this is an incorrect assumption because most properly designed radio sets are free from inherent noises when properly installed.

Usually one can quickly determine if such noises originate within the set itself or from outside sources by momentarily disconnecting the antenna lead-in wire from the antenna binding post. If the noises cease when the lead-in wire is removed it is usually an indication that the noise is being generated by an outside source and not due to any fault within the receiver.

Such interfering noises are caused by electrical and mechanical devices and may be effectively eliminated if traced to their sources.

These noises can originate from the following sources: corroded or otherwise defective joints and connections in power lines, leaky insulators, defective lightning arresters, transformers, generators and motors. Other sources of interference are arc light circuits, telephone and telegraph equipment and lines, pole changers and converters, improperly bonded rails on street car and electric railway systems, smoke and dust precipitators, and sign flashers.

Household appliances such as electric pads, violet ray machines, flat irons, door bells, light switches, vacuum cleaners, washing machines, electric fans, etc., are frequent sources of interference.

Interference may also come from: X-Ray machines, storage battery chargers, annunciator systems, stock tickers, ignition systems, electric elevators, electric furnaces, moving picture equipment, high voltage test equipment, electric curling irons, percolators, leaky cables, bad connections in lighting systems, printing presses, hair clippers, motor brushes, leaky transformer fuses, defective light sockets.

Electrical appliances such as are used in the home should be properly maintained to eliminate this source of interference produc-

tion. Street car interference usually prevails in smaller municipalities, and is rapidly being overcome, as is also telephone and telegraph interference. X-Ray machines and high frequency apparatus, when sources of trouble, are usually immediately corrected by the professionals employing them, as they do not wish to lose the good will of their local practice.

Static.

There is another kind of interference commonly called "static," caused by atmospheric disturbances over which man has no control.

This interference is more prevalent in summer than in winter, and is sometimes annoying, especially when selecting or listening to distant stations. Static noises accompany atmospheric disturbances and science has failed to discover ways and means of eliminating entirely its effects on radio reception.

Summer static originates with lightning and thunderstorms, static manifesting itself before as well as throughout the duration of the disturbance.

Snow and rainstorms sometimes are and sometimes are not accompanied by static noises in the radio receiver.

Intense static noises at sea invariably announce the approach of a squall, in some cases before the storm may otherwise be observed.

Northern lights or auroral displays are credited with responsibility for the prevalence of static noises, however it is known that static does not always accompany auroral displays.

POOR RECEPTION

Outlining Some of its Causes and Suggested Remedies.

Lack of Volume.

Lack of volume or low volume may be caused by poorly soldered antenna and lead-in connections or by antenna or lead-in wire touching and shorting to some metal fixture such as a fire escape, copper gutter, etc., or the lead-in wire may be broken within the insulation, such a break usually occurring at a sharp bend or turn. It is of course understood that the antenna and lead-in wire should be clear of all obstructions such as tree foliage, roofs, etc., which, when wet, would cause a lack of volume and probably intermittent noises.

Defective tubes will result in loss of volume. If any one tube is low in emission, or as sometimes styled "weak," volume will be reduced. When you are sure that no trouble, as above described, exists in the antenna installation it is advisable to have all the tubes tested. Any reliable radio shop will test them for little or no charge, when the tubes are delivered to the shop.

If the volume is normal when the set is first turned on and then gradually fades away to stillness it is possible that a type '27 tube has a defective filament which opens when heated and closes when cool, that is lighting up and going out intermittently. This of course rarely occurs. Such a tube is defective and must be replaced with a perfect tube.

Fading.

Fading is very often attributed to the radio receiver when it is most probably caused by a poor antenna connection. The lead-in wire may not be soldered to the antenna or the lead-in wire may be touching intermittently the gutter or other metal objects. The lead-in wire may be broken within its insulating cover, providing intermittent connection with the swaying movement of the wire. If a lead-in strip is used the wires attached thereto may not be soldered. Any badly corroded connection in the antenna system may cause fading.

There are certain atmospheric conditions that can cause fading while in certain locations particular stations are known to fade consistently on every radio receiver. Sometimes nearby stations may fade badly. This condition prevails in certain localities, that is the same station may be received consistently at more remote places. This condition may result from absorption or deflection of the waves from the transmitting station.

Any locality may have stations that fade consistently. Such stations may be local or distant ones. In Orange, certain stations fade at regular intervals quite consistently. The remedy for this condition is not to be found in radio receiver construction.

Extremely distant stations are expected to fade in and out in accordance with atmospheric conditions. Stations that come in clear one night may be barely audible the following night.

Heterodyning.

Heterodyning describes the whistling sounds which may accompany reception from certain stations. These noises arise from broadcast difficulties, such as shifting wavelengths, etc., and cannot be controlled in receiver design.

If a station should vary badly from its allotted frequency so that it is trespassing on another station's frequency, a heterodyne, resembling a high pitched whistle, might be set up and spoil reception of that particular station entirely.

Microphonic Howling or Moaning Sounds.

Such noises usually result from defective tubes, or tubes with loose, vibrating elements. If after the receiver is turned on and the tubes begin to warm up, a faint howl is heard which grows louder, it is best to try different tubes in either the detector or first audio frequency socket as this sound is probably caused by a microphonic type '27 tube.

NOTE: Make sure the detector shield cover is in its proper position, otherwise the above noise may prevail.

Interference Between Stations.

There is always the possibility that one of the smaller or less powerful stations may vary from its allotted frequency in which case there is the possibility of its interfering with another station, rendering both stations unintelligible.

A likely cause for interference between stations might be the use of too long an antenna or the direct connection of a long antenna to the short antenna binding post. In either case the remedy is obvious.

Intermittent Buzzing.

Such interference, similar to the noise emitted by a bumble bee, is usually caused by a defective type '27 detector tube. Most of the tubes manufactured today are designed to eliminate this source of trouble, however, you may occasionally find a tube subject to such noise.

ELECTRIC PHONOGRAPH UNIT
IN
THE EDISON LIGHT-O-MATIC
RADIO PHONOGRAPH COMBINATION
MODEL G-4

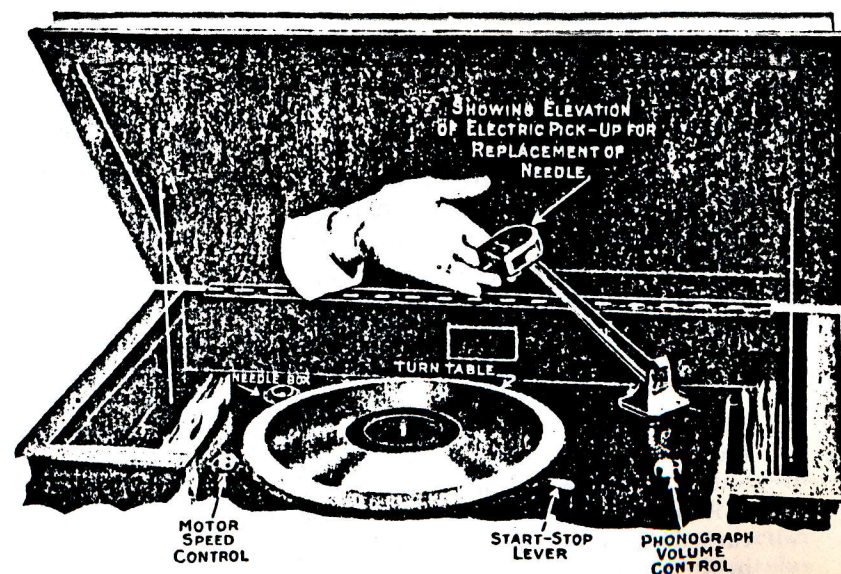


FIGURE 6
SHOWING RECORD PLAYING COMPARTMENT

CARE AND OPERATION
OF
EDISON LIGHT-O-MATIC
RADIO-PHONOGRAPH COMBINATION
MODEL C-4

Radio. Instruction for the proper installation and operation of the Edison Light-O-Matic Radio is thoroughly explained in the preceding pages of this Instruction Book.

Electric Pick-up Connections. At the back of the radio chassis, next to the ground binding post, are two pin-jacks in which the tips on the ends of the wires leading from the electric pick-up are to be inserted. (See Figure 1, Pages 16 and 17.)

Operation of the Phonograph Switch. The phonograph switch is combined with the radio volume control. To actuate this switch turn the volume control knob all the way to the left, which is its position of minimum or zero volume. When this point has been reached, by exerting slightly greater turning force, the knob can be turned still further until a click is heard. This indicates that the phonograph switch has been turned to the operating position for the electrical reproduction of records.

To Start and Stop the Record Turntable. The motor starting lever projects from beneath the right hand side of the turntable. To start the motor, pull this lever gently forward toward the front of the cabinet. To stop the motor before the completion of the record, push the lever gently toward the back of the cabinet.

Automatic Stop for all Makes of Records. This stop is truly automatic in that it does not have to be set for individual records as is usually the custom. The stop automatically adjusts itself as the pick-up arm moves toward the playing position.

To Play Needle-Type Records. Lift the pick-up, loosen the needle set screw that protrudes from the front, insert a needle in the hole in the bottom of the pick-up and tighten needle set screw until the needle is firmly held.

After the set has been turned on and the phonograph switch turned for the electrical reproduction of records, place a record in the playing position on the turntable. Now start the motor and lower the electric pick-up until the needle rests in the first groove of the record.

To Control Volume of Record Reproduction. The volume control is located at the right side of the turntable as shown in Figure 6. This knob controls only the volume of record reproduction and has no connection with the radio volume control.

Speed Adjustment. The small knob located at the left of the turntable controls the speed of the motor. This should be adjusted so that the turntable makes 78 revolutions a minute, which is correct for the playing of the majority of records now being manufactured. If the motor runs at a lower rate of speed, it lowers the pitch of the music reproduced. If the motor runs at a greater rate of speed, it raises the pitch. Either of these conditions results in unnatural reproduction.

Method of Adjusting Speed of Turntable. The speed of the turntable can be ascertained by placing a strip of paper beneath a record when on the turntable so that it projects just beyond the edge of the turntable. By holding the finger where the paper will strike it, the number of revolutions per minute can be counted. It is advisable to have the record playing so as to allow for the retarding action of the needle on the record while you are counting the revolutions. To adjust the speed of the motor, turn the knob, labeled "SPEED" toward the letter "S" on the indicator-plate and the motor will run more slowly. Turning this knob toward the letter "F" increases the speed of the motor. Vary the setting of this knob until the paper touches the finger exactly 78 times while the second hand of your watch makes one complete revolution.

To Obtain Best Results When Playing Records. All makes of needle-type records can be played on the Edison, but to obtain best results we recommend that the new Edison needle-type records be used. Just as it may be necessary to adjust the volume control when tuning in different radio stations, it may be advisable to set the phonograph volume control at less than maximum volume in order to obtain the most pleasing effect when listening to record reproduction.

It must be realized that the operation of the whole record reproducing system depends upon the proper functioning of the radio set and tubes. If the quality of record reproduction is not satisfactory and you know that the record being used is perfect, have the tubes tested at once. If the tubes are found to be in perfect condition and the record reproduction is still unsatisfactory, consult your dealer for assistance in correcting this difficulty.