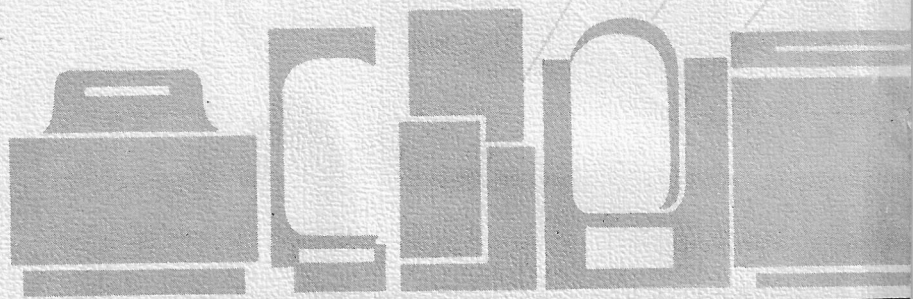


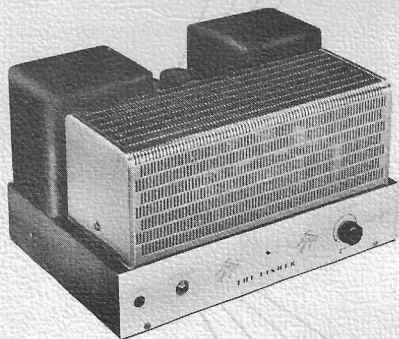
ANNIVERSARY SERIES



15

INSTALLATION

OPERATING
INSTRUCTIONS



THE "200"
60-Watt
Audio Amplifier

THE FISHER





AVERY FISHER
Founder and President,
Fisher Radio Corporation

The Man Behind the Product

TWENTY YEARS AGO, Avery Fisher introduced America's first high fidelity radio-phonograph. That instrument attained instant recognition as heralding a new era in the enjoyment of reproduced music. A number of the features of that early high fidelity radio-phonograph were so basic that they are used to this day in all high fidelity equipment. The engineering achievements of Avery Fisher and the world-wide reputation of his products have been the subject of articles in *Fortune*, *Time*, *Pageant*, *The New York Times*, *Coronet*, *Life*, *High Fidelity*, *Esquire*, and other publications.

Benefit concerts for the National Symphony Orchestra in Washington and the Philadelphia Orchestra, demonstrating the great advances in reproducing equipment, used FISHER instruments to play back the recordings that had just been made in the presence of the audience. "Fascinating evening, acoustically and musically," was the *Philadelphia Inquirer's* comment, "the reproduction had remarkable fidelity." *TIME* magazine stated, "Listeners could hardly tell the difference between real and electronic."

The FISHER instrument you have just purchased has been designed to give you many years of pride and enjoyment. It is the product of a company dedicated to bringing reproduced music in its finest form, to the homes of America. If at any time you should desire information or assistance regarding the performance of your FISHER instrument, please do not hesitate to write directly to Avery Fisher, President, Fisher Radio Corporation, Long Island City 1, New York. Your communications will be welcome.

FISHER 'FIRSTS' — Milestones In Audio History

- 1937 First high fidelity sound systems featuring a beam-power amplifier, inverse feedback, acoustic speaker compartments (infinite baffle and bass reflex) and magnetic cartridges.
- 1937 First exclusively high fidelity TRF tuner, featuring broad-tuning 20,000 cycle fidelity.
- 1937 First two-unit high fidelity system with separate speaker enclosure.
- 1938 First coaxial speaker system.
- 1938 First high fidelity tuner with amplified AVC.
- 1939 First Dynamic Range Expander.
- 1939 First 3-Way Speaker in a high fidelity system.
- 1939 First Center-of-Channel Tuning Indicator.
- 1945 First Preamplifier-Equalizer with selective phonograph equalization.
- 1948 First Dynamic Range Expander with feedback.
- 1949 First FM-AM Tuner with variable AFC.
- 1952 First 50-Watt, all-triode amplifier.
- 1952 First self-powered Master Audio Control.
- 1953 First self-powered, electronic sharp-cut-off filter system for high fidelity use.
- 1953 First Universal Horn-Type Speaker Enclosure for any room location and any speaker.
- 1953 First FM-AM Receiver with a Cascade Front End.
- 1954 First low-cost electronic Mixer-Fader.
- 1954 First moderately-priced, professional FM Tuner with TWO meters.
- 1955 First Peak Power Indicator in high fidelity.
- 1955 First Master Audio Control Chassis with five-position mixing facilities.
- 1955 First correctly equalized, direct tape-head master audio controls and self-powered preamplifier.
- 1956 First to incorporate Power Monitor in a home amplifier.
- 1956 First All-Transistorized Preamplifier-Equalizer.
- 1956 First dual dynamic limiters in an FM tuner for home use.
- 1956 First Performance Monitor in a high quality amplifier for home use.
- 1956 First FM-AM tuner with TWO meters.
- 1956 First complete graphic response curve indicator for bass and treble.
- 1957 First Gold Cascade FM Tuner.
- 1957 First MicroRay Tuning Indicator.
- 1958 First Stereophonic Radio-Phonograph with Magnetic Stereo Cartridge
- 1959 First high-quality Stereophonic Remote Control System.
- 1959 First complete Stereophonic FM-AM Receiver (FM-AM tuner, audio control, 40-watt amplifier).



Anniversary Series

THE FISHER Model 200 60-Watt Audio Amplifier

THE FISHER 200 High Fidelity Audio Power Amplifier is a worthy representative of the tradition for excellence in design, construction and performance that has won for THE FISHER a world-wide reputation. Even on first acquaintance, the dazzling capabilities of THE FISHER will amply demonstrate what true high fidelity means in terms of your personal enjoyment.

OPERATING INSTRUCTIONS

introduction . . .

The few moments you spend reading these instructions will bring you far greater enjoyment of the 200 than would be possible if you plunged right in! You will find the information that follows concise, yet complete. Keep it handy, particularly during the first few weeks of operating your FISHER, and you will rapidly become familiar with its performance and fabulous flexibility.

The 200 can be placed in nearly any location convenient to its use, providing only that adequate ventilation is available. Operating as a basic amplifier with remote AC switching, the 200 can be installed out of sight at the rear of your equipment cabinet, or even in a remote location. Complete directions for shelf mounting are provided in the last section of this manual.

For the time being, simply place it in its approximate final location, allowing yourself room to get at the rear apron of the chassis. In this way you can determine the cable lengths necessary for connecting the 200 into your high fidelity installation. The sections that follow provide the detailed information you need to assure you of maximum performance from your FISHER Audio Amplifier.

THE FISHER AND YOUR HIGH FIDELITY SYSTEM

When properly connected, the 200 serves as the power amplifier in your high fidelity system, driving one or more speaker systems with ease. Any audio source capable of supplying about one volt to the 200 can drive the amplifier to its full rated output of 60 watts. This signal may be the output of a tuner, a preamplifier, or an audio control. Whatever the audio source, we highly recommend that it include controls for regulating volume, bass and treble tone, and loudness contour. The low-level output of a magnetic-type phonograph cartridge or a tape playback head requires, in addition, a preamplifier-equalizer. The output of a microphone is also at low level, requiring preamplification before it can be used. All connections to your high fidelity system are made from the rear panel, as illustrated in Figure 1. For the time being, make no AC connections to any of your equipment.

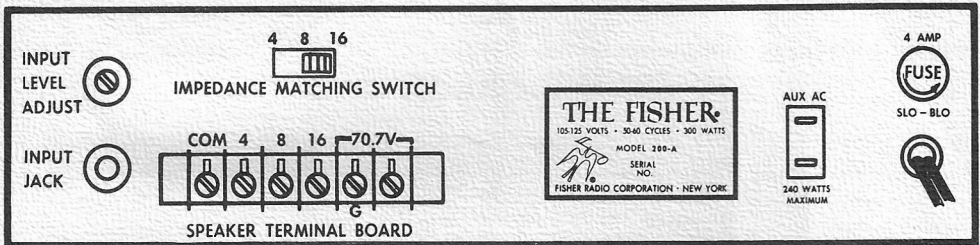


FIGURE 1. MODEL 200 REAR PANEL

output connections . . .

Important! Do not attempt to operate THE FISHER Audio Amplifier without first connecting a speaker or equivalent load to its speaker output terminals.

THE FISHER has output terminals for speakers with a voice-coil or system impedance of 4, 8, or 16 ohms, plus a 70.7-volt line. The term *speaker* covers a single, coaxial, or tri-axial unit, a two-way or three-way system, etc. The term *multiple speaker system*, as used below, refers to two or more speakers, installed at separate locations and used independently of each other. The special 70.7-volt terminals on the 200 provide a way of connecting a multiple speaker system so that each separate, or remote, speaker can be operated individually without affecting the power output or performance of the speakers at other locations.

DANGER!

Extremely high voltages capable of causing serious injury exist inside the chassis both during and for some time after the power is turned off. The bottom cover should not be removed for any reason whatever, except by an authorized and fully qualified serviceman.

NOTE TO SERVICEMEN: Disconnect the AC POWER Cord before removing the bottom cover. Discharge all electrolytic capacitors to chassis ground before working inside.

4, 8, AND 16-OHM SPEAKERS: For indoor installation, ordinary two-wire insulated lamp cord can be used to connect the speaker to the 200. Commercially available two-wire speaker cable should be used wherever weather exposure may be encountered, as on a porch or in a patio. Connect a 3 to 5-ohm speaker to the COM (common) and 4 terminals on the Speaker Terminal Board, and set the IMPEDANCE MATCHING Switch to 4. If you have a 6 to 10-ohm speaker, use the COM and 8 terminals, setting the IMPEDANCE MATCHING Switch to the 8 position. A 13 to 19-ohm speaker is connected to COM and 16, with the IMPEDANCE MATCHING Switch set in the 16 position.

If you are using two speaker systems operated through a speaker switch, then connect the two leads from the switch to the 200 terminals that represent the equivalent impedance of the two speakers. Connected in parallel, for example, two 16-ohm speakers have an impedance of 8 ohms. If you are in doubt about the equivalent impedance, ascertain the values of impedance for each separate speaker. Determine, also, whether the speakers are wired in series or parallel when connected by the speaker switch. Your FISHER Dealer will then be able to advise you on how to make this connection correctly. If this is inconvenient, forward the information directly to us.

Caution! The terminal marked COM must not be used for a chassis ground lead at any time.

70.7-VOLT LINE: The 70.7-volt terminals are used with multiple speaker systems as defined above. **Caution!** Do not touch the 70.7-volt terminals while the amplifier is in operation. In a

typical multiple speaker system, each speaker is connected to the secondary of a transformer. This secondary has several taps so that the total power available from the amplifier can be divided among the various speakers in the manner desired. The individual speaker installation can have both an on-off switch and a volume control, for which a commercially available "T" or "L" pad may be used. The primaries of these speaker transformers are then connected in parallel, series, or series-parallel, depending on the installation. The two leads are brought to the 70.7-volt terminals on the Speaker Terminal Board of the 200. Each speaker in the system can then be operated in complete independence of all the others so long as the total power consumed by the system does not exceed the rated power of the amplifier. For proper operation, the impedance of the multiple speaker system should be no less than 84 ohms, which is the optimum load.

When using the 70.7-volt line, the Z-MATIC Control must be in the Z-MATIC OFF position. The terminal marked c must *not* be used for a chassis ground lead, although it may be necessary to use it as the speaker installation ground where polarity with reference to the 70.7-volt line is a consideration. If this is the case, and there is no output from the speakers, reverse the amplifier connections.

input connection . . .

Most tuners and audio controls are supplied with an output cable, one end of which can be plugged directly into the 200 INPUT Jack, located on the rear panel. If you do not have this cable, or if the one you have does not fit the 200 INPUT Jack, a standard RETMA plug is supplied for your convenience.

In fabricating a new cable, use the low-capacitance shielded type of the length required. The maximum permissible cable length is determined by the type of output stage in the equipment driving the 200, and should be ascertained before proceeding. Where FISHER

components are being used, cable length can be at least 50 and as much as 200 feet. The single wire of the cable is soldered inside the pin of the RETMA plug, and the braided shield is soldered to the plug's metal shell.

ac connections . . .

A convenient auxiliary AC Receptacle is located on the rear panel of the 200. This outlet can supply up to 240 watts of AC power. Be careful not to exceed this rating.

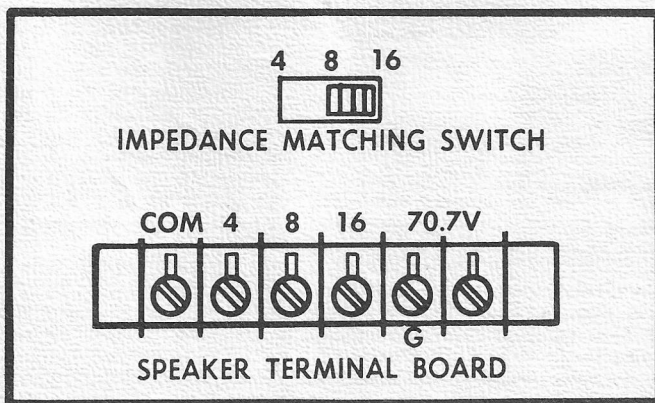
The 200 AC Cord is normally plugged into an AC receptacle on the rear of your main audio component, so that the amplifier will be switched on and off along with your other equipment. If you intend to use the full 240 watts available from the Model 200 AC Receptacle, you must remember that the amplifier itself uses up to 300 watts. This means that the AC receptacle used to supply the 200 should be rated at 550 watts, if the amplifier is used at maximum ratings. Normally, however, the equipment connected to the 200 AC Receptacle will draw less than 50 watts, in which case the receptacle used for the amplifier can safely have a rating of 350 watts.

ac power . . .

The Model 200 is designed to operate from any receptacle which supplies AC current at 105 to 125 volts, and 50 to 60 cycles. Other voltages, at 50 to 60 cycles, can be utilized by adding a step-down or step-up transformer.

caution . . .

If you have read this far, you have now reached a dilemma—should you plunge into using the equipment right off and trust to luck, or should you read on. Based on long experience, we urge you to resist the temptation to stop here. The next few paragraphs are *the most important of all*.



USING THE CONTROLS FOR BEST PERFORMANCE

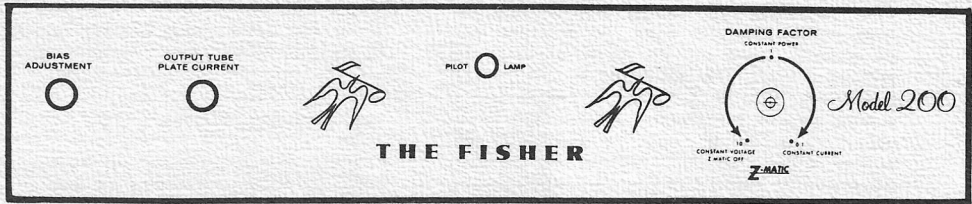


FIGURE 2. MODEL 200 FRONT PANEL

Ideally, a basic power amplifier should have no controls which need to be used during normal operation. This is the case with THE FISHER. Out of the five controls on the 200, two are factory pre-set, and need to be checked only under the specific conditions set forth below. The remaining three require installation adjustment only, and need be checked only if the installation is changed, or service is performed.

ac on-off . . .

There is no AC switch on the Model 200. As described above, the AC Cord is plugged into the receptacle usually provided for the amplifier on the back of your tuner or audio control, enabling the 200 to be turned on and off along with the rest of your equipment. To ascertain whether power is being supplied to the 200, an indicator lamp is located in the center of the front panel.

impedance matching . . .

This switch is located on the rear panel of the amplifier. It has 4, 8, and 16-ohm positions which correspond to the connections made at the Speaker Terminal Board. Its use is fully described in the previous section on input connections. The IMPEDANCE MATCHING Switch is not used with the 70.7-volt line.

the Z-Matic control . . .

The unique Z-MATIC Variable Damping Factor Control, exclusive with FISHER, can be used in two ways to obtain maximum uniformity of *audible* power from your speaker. It can be used to set the damping factor as recommended by the speaker manufacturer. It also provides a way of matching the speaker to the 200, even if the damping factor is unknown.

DAMPING FACTOR SCALE: The damping factor is a ratio between the internal impedance characteristic of the amplifier output stage and the impedance of the speaker. It is expressed simply as a number. Do not confuse this number with the speaker impedance, which is always given in ohms. A certain speaker, for example, may have an impedance of 16 ohms, and a damping factor of 1. While speaker impedance is normally specified, the damping

factor may not be. Where the damping factor is not known, set the control on the 200 as described in the paragraph below on the Z-MATIC Scale of the control.

The DAMPING FACTOR Scale consists of the numbers 10, 1, and 0.1 around the Z-MATIC Control. The control is continuously variable, and can be set for any damping factor required from 10 to 0.1, traveling clockwise. This range is sufficient to cover all known speakers. Setting the control with laboratory precision is not necessary. The maker of a typical quality speaker, for example, recommends a damping factor of 1. Setting the control to its mid-position of 1 completely fulfills this condition. If a damping factor of 5 is recommended, simply set the control at a point halfway between the calibrated points of 10 and 1. Where damping factors greater than 10 are mentioned, set the control for 10, which is the highest factor having practical value in terms of audible effect.

input level . . .

Since only about 1 volt of signal is needed to drive the 200 to its full rated output, an INPUT LEVEL Control is provided to prevent overloading of the amplifier. The control is located just above the INPUT Jack on the rear panel. In normal usage, rotate the INPUT LEVEL Control clockwise until you obtain the volume you desire from the speaker. This setting should be such that the controls on the associated equipment have the desired range.

Z-MATIC SCALE: It is not necessary to know the recommended damping factor for a speaker in order to make full use of the Z-MATIC Control. A little care and patience in carrying out the instructions below will enable you to adjust the Z-MATIC Control for the best results.

Using program material of good quality, set the audio controls for average listening volume and good tonal balance. Do this with the Z-MATIC Control in the z-MATIC OFF position. If your equipment has a loudness contour control, turn it off.

With your equipment operating in this manner, slowly rotate the Z-MATIC Control clockwise through its entire range until you find the point which produces the cleanest reproduction. *Ignore all changes* in volume and tonal balance while making this adjustment.

It may be necessary to rotate the Z-MATIC Control through its range several times to be sure you have found the point providing the cleanest reproduction. While you are doing this, do *not* re-adjust either the volume or tone controls on your other equipment. Once you have located the point of cleanest reproduction, leave the Z-MATIC Control in this position so long as you make no change in your speaker system. For convenience, you can mark the setting with a ball-point pen.

Having established the correct setting of the Z-MATIC Control, use the audio controls on your equipment to suit your listening tastes.

bias . . .

This front-panel adjustment is pre-set at the factory and should not be changed unless the amplifier output tubes are replaced.

To make the adjustment a zero-to-150 milli-ampere DC meter is necessary. The meter is connected to the OUTPUT TUBE PLATE CURRENT Jack by a cable with a type PJ-055B plug.

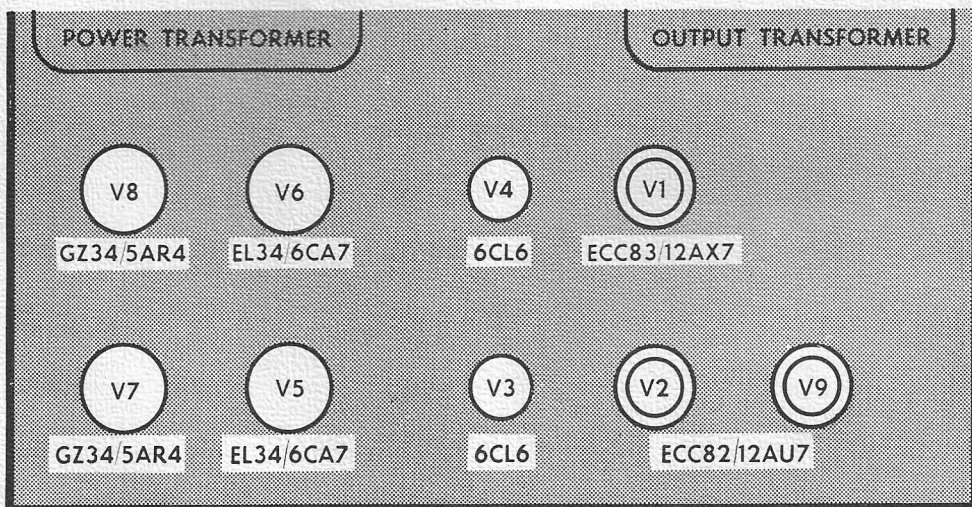
Turn the INPUT LEVEL Control on the 200 fully counterclockwise to the zero-input position. The speaker remains connected as in normal use. Turn on the amplifier and allow it to warm up for 30 minutes. Remove the snap-on cover button on the front panel, exposing the BIAS Adjustment. Using a small *insulated* slot-head screwdriver, rotate the control until the meter reads 125 milliamperes.

phase inverter balance . . .

This adjustment is located on the underside of the chassis, and has been carefully pre-set at the factory. If a defect is suspected in the phase inverter, consult your FISHER Dealer.

complete music system . . .

When THE FISHER 200 is used with a careful selection of associated equipment, the result is a perfectly matched high fidelity music system. Those seeking the ultimate will find it in THE FISHER Master Audio Control, combined FM-AM Tuner and Audio Control, separate or combined FM and AM Tuners, and other equipment. Complete specifications will be sent to you promptly on request.



V1, First Voltage Amplifier and Phase Inverter.

V2, Push-pull Second Voltage Amplifier.

V3/V4, Push-pull Driver.

V5/V6, Push-pull Power Amplifier.

V7/V8, Push-pull Parallel Power Rectifier.

V9, Voltage Regulator.

FIGURE 3. MODEL 200 TUBE LOCATION DIAGRAM

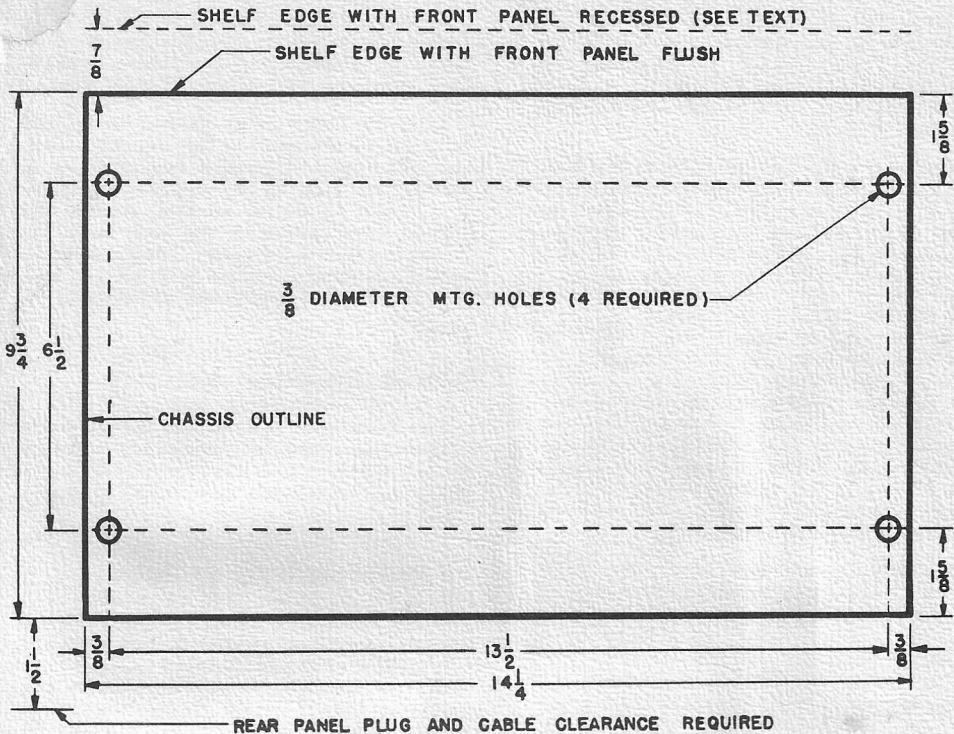


FIGURE 4. MODEL 200 MOUNTING HOLE DIAGRAM

CUSTOM INSTALLATION

The directions and illustration in this section enable you to carry out a neat and attractive mounting of your FISHER in a custom cabinet or installation. Adequate ventilation is a necessity. THE FISHER must *never* be installed in an enclosed space, nor should it be placed close to other heat-producing equipment.

Using the mounting screws and washers supplied, install the amplifier in accordance with the information in Figure 4. If the chassis dimensions are measured from the front edge of the shelf, the front panel will be flush with the shelf edge and the control knob will project about $\frac{7}{8}$ inch. The chassis can be mounted so that the knobs do not project over the shelf edge by measuring from the dashed line noted at the top of Figure 4. Allow a minimum of

1½ inches depth behind the chassis for connecting plugs and cables to the rear panel.

at your service . . .

Our constant desire is to have your FISHER equipment give you its best possible performance. After you have had an opportunity to familiarize yourself with THE FISHER, we would appreciate your letting us know how it is meeting your requirements.

To keep your FISHER at peak performance over the years, may we suggest that you avail yourself of the facilities and factory-trained personnel at our SERVICE DEPARTMENT, or the competent services of your FISHER Dealer.



FISHER RADIO CORPORATION • 21-21 44th DRIVE • LONG ISLAND CITY 1, N. Y.



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