OPERATING INSTRUCTIONS AND WARRANTY

THE FISHER

MPX-200

UNIVERSAL

Stereophonic Multiplex Adapter

PRICE $1.00

WORLD LEADER IN HIGH FIDELITY

Congratulations!

With your purchase of a FISHER instrument you have completed a chain of events that began many months ago, in our research laboratories. For it is there that the basic concept of the equipment you have just acquired came into being—its appearance, its functions, its quality of performance, its convenience of use.

But the end step—your purchase—is merely a beginning. A door has now opened, for you and your family, on virtually unlimited years of musical enjoyment. Recognizing that one of the keys to pleasurable ownership is reliability, we have designed this instrument to give long and trouble-free service. In fact, instruments we made over twenty-five years ago are still in use today.

Remember always that we want this equipment to give you the best performance of which it is capable. Should you at any time need our assistance toward that objective, please write me personally.

AN IMPORTANT SUGGESTION

Many hours have been spent by our engineers and technical writers to create this instruction book for your guidance and enjoyment. If you want the *most* out of your FISHER, there is only one way to obtain it. With the equipment before you, please read this booklet carefully. It will be time well spent!

Avery Fisher *Founder and President*

Fisher Firsts – Milestones In the History of High Fidelity Reproduction

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 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 Cascode 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 use 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 Golden Cascode FM Tuner.
1957 First MicroRay Tuning Indicator.
1958 First Stereophonic Radio-Phonograph with Magnetic Stereo Cartridge.
1959 First high-quality Stereo Remote Control System.
1959 First complete Stereophonic FM-AM Receiver (FM-AM tuner, audio control, 40-watt amplifier).
1959 First high-compliance plus high-efficiency free-piston speaker system.
1960 First to use MicroRay for FM tuning and as a Recording Audio Level Indicator.
1960 First complete stereo FM-AM receiver with 60-watt power amplifier and new 7591 output tubes.
1960 Smithsonian Institution, Washington, D.C., accepts for its collection America's first commercially manufactured high fidelity radio-phonograph, made by Avery Fisher in 1937.
1960 First reverberation device, for use in high fidelity equipment — The Fisher Dynamic Spacexpander.
1960 First stereo tuner with MicroTune.
1960 First FM tuner with six IF stages.
1960 First FM tuner with five limiters.
1960 First front panel antenna selector switch, 72-300 ohm, Local-Distant positions.
1961 First Multiplex units with Stereo Beacon and automatic switching, mono to stereo.
1961 First complete receivers with Multiplex.
1961 First FM-Stereo-Multiplex tuners with Stereo Beam.
1961 First loudspeaker system with frameless woofer cone, eliminating all parasitic resonance.
1961 First internal switching system to permit immediate tape playback with use of all controls and switches.

THE FISHER MPX-200

UNIVERSAL

Stereophonic Multiplex Adaptor

THE FISHER *MPX-200* is a compact multiplex adaptor designed to convert your present AM-FM tuner to receive FM-Stereo-Multiplex broadcasts in full stereophonic sound. The experience, which FISHER has gained by its many years of leadership in the design and manufacture of quality FM tuners, is incorporated in this magnificently designed unit. Quality, convenience, and compactness of design make the *MPX-200* the best performing multiplex adaptor in its class. Included in the design of this unit is a steep roll-off filter, above 15 kc, to remove the 38 kc carrier signal. The most important feature of the *MPX-200* is that it can be used with any high quality FM tuner or receiver manufactured in the last few years. This *Universal* adaptor has been given every careful detail of assembly, and the highest quality parts that have made FISHER the world-wide leader in durability and reliability.

FM MULTIPLEX STEREO

FM BROADCASTING has a frequency range far in excess of the normal hearing range. For example, Fisher wide-band tuners have a frequency range which extends to 100 kc, while the normal hearing range does not exceed 17 kc. This extra "space" in the frequency response has now been put into service for the transmission of a second and third signal simultaneously with the main carrier. The third (and highest) signal is used in commercial applications (for background music) and will not be received on home high fidelity equipment. The other two signals, however, are used for the reception of stereo programs. During multiplex broadcasts, the main carrier, which can be picked up by any FM tuner or receiver, contains the sum or blended signal from both stereo channels (left plus right). The second, supersonic signal contains the information necessary for stereo. This system makes it possible for an ordinary FM set to receive a fully balanced monophonic program during multiplex transmission. At the same time, however, the circuits of the *MPX-200* separate the two stereo channels, thus providing you with all the added benefits of full stereo sound.

INITIAL ADJUSTMENTS

ALL FISHER TUNERS AND RECEIVERS will give excellent results when used with the *MPX-200*. Your *MPX-200* has also been designed to operate with any high quality tuner or receiver employing either a ratio detector or a discriminator to demodulate the FM signal.

TABLE OF CONTENTS

	PAGE
FM MULTIPLEX STEREO	1
INITIAL ADJUSTMENTS	1
GENERAL INSTALLATION	3
INSTRUCTIONS FOR OWNERS OF FISHER TUNERS AND RECEIVERS	4
TUNER CONNECTION AND ADAPTOR SETTING GUIDE	5
OPERATION	6

Naturally, a mutliplex adaptor designed to operate perfectly with such a wide variety of tuners must be provided with special controls. As a result of careful design and the use of precision parts, however, it was possible to reduce the number of controls on the *MPX-200* to only three: the Separation control on the top panel, and the Output Level controls also on the top panel. The Separation control must be adjusted to provide the maximum degree of stereo separation between channels for each particular model tuner. In addition, two MPX input jacks are provided on the top panel, one to match tuners with low level outputs and the other to match those with high outputs. These adjustments need be made only once, when installing the *MPX-200*.

Consult Table 1 on page 5 for the correct MPX input jack and Separation control setting for your tuner. If your model tuner is not listed, determine whether it employs a balanced ratio detector, unbalanced ratio detector, or discriminator.

Ratio Detector Tuners

The MPX output jack of all ratio detector tuners should be connected to the LOW LEVEL input jack on the top panel of the *MPX-200*. The Separation control on the *MPX-200* should be set at 3 for unbalanced ratio detectors and at 4 for balanced ratio detectors.

Discriminator Tuners

The Separation control of the *MPX-200* should be set at 4.5 for all discriminator tuners. If the output of the discriminator for full modulation (at the MPX output jack) is above 1.5 volts, connect the MPX output of your tuner to the HIGH LEVEL input jack on the top panel of the *MPX-200*. If the maximum output is below 1.5 volts, connect the MPX output of your tuner to the LOW LEVEL jack.

NOTE: If your instruction manual does not contain this information, you may have to contact your dealer or the manufacturer. If you find it impossible to determine the maximum discriminator output of your tuner, use the LOW LEVEL jack initially. Change to the HIGH LEVEL jack if distortion shows up.

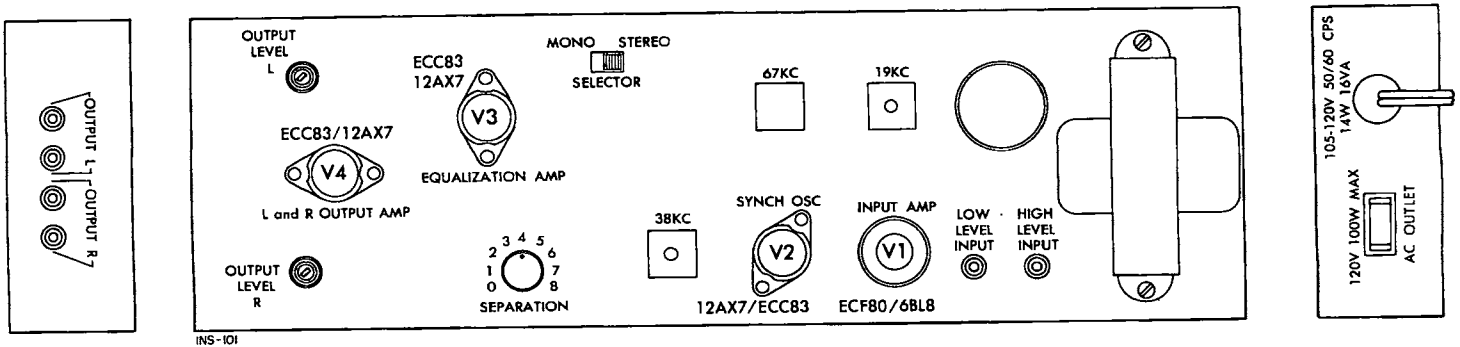

FIGURE 1. Tube Layout and cable connections for the *MPX-200*.

GENERAL INSTALLATION

THE *MPX-200* operates on *AC only* at 105-120 volts. One three-foot cable and two four-foot cables are included to make connections to associated equipment. Any additional connections should be made with the same type of cable. Be sure to use the *three-foot* cable for the connection from the MPX output jack on your tuner since longer cable lengths will cause some loss of the higher frequencies. Both *MPX-200* outputs are low-impedance anode followers, permitting cable lengths up to 10 feet between the *MPX-200* and your amplifier. We recommend that you keep the *MPX-200* right beside your tuner (but away from power transformers) for ease of operation and best performance.

Installation

1 — Connect the AC power-line of the *MPX-200* to a switched AC outlet (preferable on your FM tuner).

NOTE: If the AC outlet on the FM tuner is presently occupied, take the AC power-line now attached to the outlet, and place it in the outlet provided on the *MPX-200*. If there is no outlet on your FM tuner, place the AC power-line of the FM tuner into the outlet on the *MPX-200*, and the AC power-line of the *MPX-200* into the outlet previously occupied by the FM tuner.

2 — Connect the MPX output of the tuner to the High or Low Level input jack of the adaptor. Table 1 on page 5 indicates which jack to use.

3 — Connect one of the left and one of the right outputs of the adaptor to the left and right AUX inputs of the amplifier.

4 — The second set of outputs from the *MPX-200* can be used for "off the air" tape recordings. Connect one of the left outputs of the *MPX-200* to channel A of the recorder input, and one of the right outputs of the *MPX-200* to channel B of the recorder input.

TUNER MODEL	SET SEPARATION CONTROL AT:	CONNECT TUNER MPX OUTPUT TO JACK MARKED
Altec-Lansing		
306-A	4.5	HIGH LEVEL
Bell		
670	4	LOW LEVEL
2421	4.5	HIGH LEVEL
2425	4.5	HIGH LEVEL
2441	4	LOW LEVEL
3070	4	LOW LEVEL
Bogen		
3RB-40	4.5	HIGH LEVEL
SRB-20	4.5	HIGH LEVEL
ST442	4.5	HIGH LEVEL
ST662	4	LOW LEVEL
STP52	4.5	HIGH LEVEL
Grommes		
102GT	4.5	HIGH LEVEL
103GT	3	LOW LEVEL
120GAT	4.5	HIGH LEVEL
GRT-3	4.5	HIGH LEVEL
Harmon-Kardon		
TA-260 (Festival II)	4.5	HIGH LEVEL
TA-224 (Recital)	4.5	HIGH LEVEL
T-230 (Sonnet)	4.5	HIGH LEVEL
T-220 (Aria)	4.5	HIGH LEVEL
ST-360A (Madrigal)	4.5	HIGH LEVEL
FA-10 (Sonata)	4.5	HIGH LEVEL
F-10 (Tempo)	4.5	HIGH LEVEL
Citation III	3	LOW LEVEL
F500	3	LOW LEVEL

TUNER MODEL	SET SEPARATION CONTROL AT:	CONNECT TUNER MPX OUTPUT TO JACK MARKED
Karg		
CT-3	4.5	HIGH LEVEL
McIntosh		
MR-55	4	LOW LEVEL
MR-65	3	LOW LEVEL
Pilot		
602	4.5	HIGH LEVEL
654	4.5	LOW LEVEL
680	4.5	HIGH LEVEL
Realistic		
40-T	4.5	HIGH LEVEL
Scott		
All models	3	LOW LEVEL
Sherwood		
S-2000	4.5	HIGH LEVEL
S-2200	4.5	HIGH LEVEL
S-3000	4.5	HIGH LEVEL
S-7000	4.5	HIGH LEVEL

OPERATION

SELECTOR SWITCH: The Selector Switch should be in the STEREO position at all times, unless a monophonic recording of an "off tbe air" stereo broadcast is being made. Only then should the switch be placed to the MONO position.

LEVEL SETS: Two level sets are provided on the top panel of the *MPX-200*, for adjustment of the sound level on both channels of the *MPX-200*. These level sets should be adjusted for *equal* volume between both the Left and Right channels, and also for equality between tuner and other switch positions of the Input Selector.

NOTE: During the adjustment of the two Level sets, the Selector switch should be placed to the MONO position. This will result in a combined signal at each of the speakers, and allow easier equalization between the two channels. After this adjustment, return the switch to the STEREO position.

Antennas

Because FM Multiplex requires new equipment and new techniques at FM broadcasting stations, it is to be expected that not all programs will be of the same high technical calibre during the first few months. Such occasional problems as may arise initially will no doubt be solved quickly, as the stations gain experience with the new procedures. It is important to keep in mind, however, that the stereo subcarrier is inherently more noisy than the main carrier. In order to receive weak or distant stations with acceptably low noise levels, you may find it necessary to change to an antenna with higher gain, or to relocate your present antenna in a more favorable position.

If you have difficulty in receiving weak stations, the following measures should be taken:

1—*Reverse the antenna leads.*

2—*Reposition the FM Antenna.* If you are using a folded dipole antenna, rotate it horizontally about its axis to determine the orientation which produces a null or minimum received signal as indicated on the tuning meter or tuning eye. Then rotate the antenna 90 degrees for the best position. The antenna should be as high as possible, horizontal and away from all large metal objects and electrical wiring. It may also be necessary to relocate the antenna to achieve a usable signal. Indoor antennas, especially in metal frame buildings, will give improved results when located close to outside windows.

3—*Change to Rooftop Antenna.* In extreme cases, where an indoor antenna was used for monophonic reception, it may be necessary to change to an outdoor, rooftop antenna, or even a highly directional yagi antenna. Directional antennas should be rotated for maximum received signal strength.

Although the problems inherent in FM multiplex have been stressed, it is not expected that they will arise very frequently. In general, they can be solved simply by increasing the strength of the received signal (and removing the distortion caused by multipath transmission) through a change in the antenna system.

At Your Service

It is our desire that your FISHER equipment operate to your *complete* satisfaction. We solicit your correspondence on any special problems that may arise. After you have had an opportunity to familiarize yourself with THE FISHER, we would appreciate hearing from you on how it is meeting your requirements.

Your Fisher Dealer

Be sure to consult your FISHER dealer promptly if any defect is indicated. He stands ready to assist you at any time.

LOGGING CHART

STATION	MPX	LOGGING SCALE NUMBER

NOTE: This chart may be used as a handy guide for quick tuning to the stations in your area.

TECHNICAL SPECIFICATIONS

Frequency Response (covers full transmitted signal)	20—15,000 cps ± 1 db
Stereo Separation (at 1 kc)	Better than 35 db
Sensitivity (Minimum 19 kc required input)	20 millivolts
Maximum Allowable Input (at 100% modulation)	
(Low Level Input)	2 volts
(High Level Input)	6 volts
Gain	15.5 db
Harmonic Distortion (2 volts output, at 1 kc)	Less than 0.5%
Hum and Noise (Below 2 volts output)	Better than 70 db
Input Impedance (High Level Input)	40 megohms
(Low Level Input)	20 megohms
Output Impedance	5000 ohms
Power Consumption (105-120 volts, 50/60 cycles)	14 watts

INSTRUCTIONS FOR OWNERS OF FISHER TUNERS AND RECEIVERS

NOTE: Left (or L) designation corresponds to Channel A; Right (or R) corresponds to Channel B.

FM-40, FM-50, FM-90(X), 90R, FM-100, FM-200, 202-R, 100-R:

Follow the appropriate instructions given in the preceding section.

600 and 800

1 — Connect the MPX output of the receiver to the LOW LEVEL jack of the *MPX-200*. Use the 3-foot cable supplied.

2 — Connect the L and R OUTPUTS of the adaptor to the MPX Channel A and Channel B inputs of the *600* or *800*.

3 — Turn both level sets on the receiver marked MPX A and MPX B to the maximum clockwise position.

4 — To listen to FM, AM and FM-AM, operate as usual. To listen to FM-Stereo-Multiplex: turn the Selector switch to FM-MPX position — and the Mono-Stereo switch to STEREO.

500-S

1 — Connect the MPX output on the receiver to the LOW LEVEL jack of the *MPX-200*. Use the 3-foot cable supplied.

2 — Connect the L and R outputs of the *MPX-200* to the MPX Channel A and Channel B inputs of the *500-S*.

3 — To listen to FM, AM or FM-AM, operate as usual. To listen to MPX stereo: Turn the *500-S* Selector switch to MPX.

100-T

1 — Connect the MPX output on the tuner to the LOW LEVEL jack of the *MPX-200*. Use the 3-foot cable supplied.

2 — Connect the L and R OUTPUTS to the Channel A and B AUX inputs of the *100-T*.

3 — Tune as normal to the FM station desired and then switch to AUX STEREO to listen to FM-Multiplex-Stereo.

202-T

1 — Connect the MPX output on the tuner to the LOW LEVEL jack of the *MPX-200*. Use the 3-foot cable supplied.

2 — Connect the L and R outputs to the Channel A and B AUX inputs of the *202-T*.

3 — To listen to multiplex stereo, tune as normal to the desired station (Selector in TUNER position); then turn the Selector to AUX and the Mono-Stereo switch to STEREO. For monophonic FM broadcasts, operate as usual.

101-R

Follow the General Installation instructions.

90-T

1 — Connect the MPX output of the *90-T* to the LOW LEVEL jack on the adaptor.

2 — Connect the L and R outputs of the *MPX-200* to the corresponding amplifier inputs marked AUX.

50-R, 70-RT, 80-R, 80-T, FM-80

Although Models FM-80, 50-R and 70-RT, and early production models of the 80-R and 80-T are not equipped with multiplex output jacks, these tuners can easily be adapted for multiplex by adding a standard RETMA phono jack to the chassis close to the 6AL5 tube socket. This jack is connected through a .01 mfd, 250V capacitor to Pin 5 of the 6AL5 tube on the 50-R and 70-RT and Pin 1 of the 6AL5 tube on the 80-R, 80-T and FM-80. The 3-foot cable supplied with

the *MPX-200* should be used to connect this jack to the jack on the *MPX-200* marked HIGH LEVEL. Feedthrough connections should be made from the main outputs of these units to the L and R INPUT jacks on the *MPX-200*.

Custom Electra (E-44)

1 — Connect the MPX output of the *Custom Electra* to the LOW LEVEL jack on the *MPX-200*. Then connect the L and R outputs of the *MPX-200* to the AUX STEREO inputs on the *Electra*.

2 — To listen to monophonic FM, AM or stereo FM-AM, operate as usual. To listen to stereo FM multiplex: Turn the *Electra* Selector switch to AUX STEREO.

Philharmonic (P-22)

1 — Connect the MPX output of the *Philharmonic* to the LOW LEVEL jack on the *MPX-200*. Then connect the L and R outputs of the *MPX-200* to the AUX A and B inputs on the Philharmonic.

2 — To listen to FM or AM, operate as usual. For stereo FM multiplex, turn the Philharmonic Selector switch to AUX STEREO.

Statesman (1010)

Follow instructions for the *202-T*.

Coronet (C-55 and C-55A)

Follow instructions for the *100-T*.

Coronet (C-55B)

Follow instructions for the *500-S*.

Executive (880)

For serial number above 60,000 follow General installation instructions.

President (6000)

Follow General Installation instructions.

TABLE I.

TUNER CONNECTION AND ADAPTOR SETTING GUIDE

TUNER MODEL	SET SEPARATION CONTROL AT:	CONNECT TUNER MPX OUTPUT TO JACK MARKED
Fisher		
FM-40	4	LOW LEVEL
FM-50	4	LOW LEVEL
FM-90(X)	4	LOW LEVEL
FM-100	4	LOW LEVEL
FM-200	4	LOW LEVEL
90-R	4	LOW LEVEL
90-T*	4	LOW LEVEL
100-R	4	LOW LEVEL
100-T	4	LOW LEVEL
101-R	3	LOW LEVEL
202-R	4	LOW LEVEL
202-T*	4	LOW LEVEL
TA-500*	4	LOW LEVEL
500-S	4	LOW LEVEL
600 (Serial No. below 49999)	3	LOW LEVEL
600 (Serial No. above 50000)	4	LOW LEVEL
800	4	LOW LEVEL
50-R**	4.5	HIGH LEVEL
70-RT**	4.5	HIGH LEVEL
80-R***	4.5	HIGH LEVEL
80-T***	4.5	HIGH LEVEL
FM-80**	4.5	HIGH LEVEL

**Requires additional stereo amplifier.*
***Multiplex output jack must be added. See page 4 for instructions.*
****Multiplex output jack must be added to early production models. See page 4 for instructions.*

Warranty To Owner

THE FISHER equipment you purchased was carefully tested and inspected before leaving our laboratories. If properly installed and operated in accordance with the instructions furnished, it should give you the finest results of which it is capable. This equipment is unconditionally guaranteed against all defects in material and workmanship for ninety days from date of sale to the original purchaser. Any part of the equipment which under normal installation and use, discloses such a defect, will be adjusted or replaced by the dealer from whom purchased. To protect your warranty, be sure to mail this card *within 10 days* from date of purchase.

FOR WARRANTY SERVICE, CONSULT YOUR DEALER

AVERY FISHER
Founder and President,
Fisher Radio Corporation

The Man Behind the Product

TWENTY-FIVE YEARS AGO, Avery Fisher introduced America's first high fidelity radio-phonograph. That instrument attained instant recognition, for it opened a new era in the faithful reproduction of records and broadcasts. Some of its features were so basic that they are used in all high fidelity equipment to this day. One of these models is now in the permanent collection of the Smithsonian Institution as an example of the earliest high fidelity instruments commercially available in this country.

The engineering achievements of Avery Fisher and the world-wide reputation of his products have been the subject of descriptive and biographical articles in *Fortune, Time, Pageant, The New York Times, Life, Coronet, High Fidelity, Esquire, The Atlantic,* and other publications. Benefit concerts for the National Symphony Orchestra in Washington and the Philadelphia Orchestra, demonstrating recording techniques, and the great advances in the art of music reproduction, used FISHER high fidelity instruments both for recording and playback, to the enthralled audiences. FISHER equipment formed the key part of the high fidelity demonstration at the American National Exposition in Moscow, July 1959. FISHER FM and FM-AM tuners are the most widely used by broadcast stations for monitoring and relay work, and by research organizations—under conditions where absolute reliability and maximum sensitivity are a 'must.'

The FISHER instrument you have just purchased was designed to give you many years of pride and enjoyment. If you should desire information or assistance on the installation or performance of your FISHER, please write directly to Avery Fisher, President, Fisher Radio Corporation, Long Island City 1, New York.