OPERATING INSTRUCTIONS AND WARRANTY

THE FISHER

X-202

STEREOPHONIC
MASTER CONTROL AMPLIFIER

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 acquired came into being—its appearance, its functions, its quality of performance.

But the end step—your purchase—is merely a beginning. For you and your family, it will provide years of musical pleasure. The FISHER is from its inception designed to give long and trouble-free service. Some of the instruments we made twenty-two years ago are still in use today!

It is our continuing desire that your FISHER give you always the best performance of which it is capable. If you need our assistance at any time toward that objective, we are always at your service.

IN CLOSING...

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

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 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 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 Cascode 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).

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THE FISHER X-202

Stereophonic

MASTER CONTROL AMPLIFIER

Advanced electronic design, unusual versatility, and functional simplicity are combined in the FISHER *X-202* to provide the ultimate in a *stereophonic* Master Control Amplifier. Incorporated on one compact chassis, engineered to Laboratory Standards, are a dual-channel Preamplifier-Equalizer, a dual-channel 50-watt Power Amplifier, and a self-contained Power Supply. Sixteen inputs and five outputs will accommodate every type of cartridge, tape head, tape recorder and tuner on the market. Seventeen controls on the front panel make possible the selection of any desired program source, for either monophonic or stereophonic operation, and the adjustment of every nuance of volume and tonal characteristics over the entire audio spectrum.

A Center Channel output is provided to which a third amplifier and speaker system may be connected to broaden the stereophonic sound pattern. Provision is also made for the connection of THE FISHER RK-1 Remote Control, which permits the adjustment of volume and stereo balance from your favorite listening area. A special Stereo Dimension Control, which blends the dual-channel signals, can be used to obtain any degree of stereo separation.

The *X-202* represents more than two decades in the development of high fidelity instruments. Here is another example of the quality which has gained for THE FISHER a world-wide reputation.

A NOTE ON STEREOPHONIC SOUND

Stereophonic sound is a giant step forward in the history of high fidelity music reproduction. This unique dual-channel system offers a distinct advantage over monophonic (single-channel) systems by virtue of two important audio characteristics: the dimensions of *direction* and *depth*. These live sound qualities are for the most part missing in monophonic systems because recordings are made and reproduced over a single channel. This is somewhat analogous to listening to music with one ear. Stereophonic recording techniques, however, utilize two separate banks of microphones which are positioned in the left and right sections of the orchestra. In this arrangement, the microphones detect the musical sounds in much the same manner as the two ears of a listener. The sound picked up by each bank of microphones is then fed to independent channels and recorded on disks or tape, or transmitted over separate channels of a stereophonic broadcast.

To reproduce stereophonic realism in the home, two separate sound channels are required to achieve the stereophonic effect. The stereo sound output of a record player, tape recorder or tuner is fed to two separate amplifier channels, which in turn drive two separate speaker systems. Thus, instruments located on the left side of the orchestra are heard predominantly in the speakers to your left; instruments on the right side of the orchestra are heard predominantly in the speakers to your right; while instruments located in the center appear to be heard midway between the two speaker systems. The result is a startling sense of *presence* realized only at a live orchestral performance.

INSTALLING THE X-202

WARNING: The FISHER *X-202* must *not* be operated without first connecting speakers, or equivalent load resistors, to the Speaker Terminals in each channel. If you have not yet completed your stereophonic system, and are temporarily using only one channel of the *X-202*, use channel A and be sure to connect an equivalent load resistor to the Speaker Terminals of the unused channel. See "Speaker Connections."

This unit may be installed in any convenient location that is adequately ventilated. The *X-202* is designed for simple installation in your own custom cabinet. Directions and diagrams are provided in the last section of this booklet. Two FISHER cabinets, Model MC-1, in metal, and 10-U, in wood, available from your FISHER dealer, will convert the *X-202* into an attractive part of your room decor. Temporarily, place this unit in its approximate final location to permit an estimate of the necessary cable lengths to the associated components.

location of loudspeakers . . .

Note: Stereophonic sound utilizes the left speaker system, designated Channel A, for music originating on the left side of the orchestra; while the right speaker system, designated Channel B, is used for music originating in the right section of the orchestra. To recreate the original orchestral arrangement in your room, connect the speaker on your left to the Channel A amplifier section, and connect the speaker on your right to the Channel B amplifier section.

To obtain optimum stereophonic performance from your FISHER equipment, use two speaker systems as nearly alike as possible. Certain precautions should be observed in determining their final location.

Where possible, speakers should be set against a flat wall and separated by a *minimum* of five feet to achieve a satisfactory stereophonic effect. As a rule of thumb, the best listening area will be at a distance about 1½ times as great as the separation between the speakers. For example: if the speakers are six feet apart, listening will be best in an area about nine feet from, and opposite, the two systems. Because of varying acoustical conditions, however, the speakers may have to be re-positioned to achieve the best stereophonic results that circumstances permit.

If you place wall-type speakers in the room corners, undesirable effects may be introduced. Try placing them, instead, on the same wall, a short distance from the corners.

If you own two corner-type speaker systems, experiment by leaving one in a corner and placing the other against a flat wall. Then compare this arrangement with the original one.

In a long, narrow room, placing the speakers on the long wall may bring better results than placing them on the short one.

connecting a center channel . . .

In large rooms, where it may be necessary to space loudspeakers farther apart to increase the spread of stereophonic sound, a "hole" may develop in the center. This apparent absence of sound in the center will become more noticeable as the distance between the two speaker systems is increased. It is possible to fill in this gap with the addition of a center channel amplifier and loudspeaker system.

The *X-202* is equipped with a Center Channel Output jack which is connected to a divider network across the output stages of Channel A and B. Equal portions of the audio output from each channel are thus combined to provide a signal for a third "phantom" channel. By connecting an additional amplifier and loudspeaker to this output jack, and positioning the loudspeaker between the A and B systems, the stereophonic curtain of sound will be augmented.

The additional amplifier need not be equipped with audio controls, since these are provided by the *X-202*. A Center Channel Volume Control on the front panel is provided to adjust the signal level at the output jack. See "Center Channel Amplifier" on page 5.

NOTE: The third loudspeaker can also be placed in an adjoining room or some other remote location. Although the sound output from this speaker will be monophonic, it will contain the composite stereo signals.

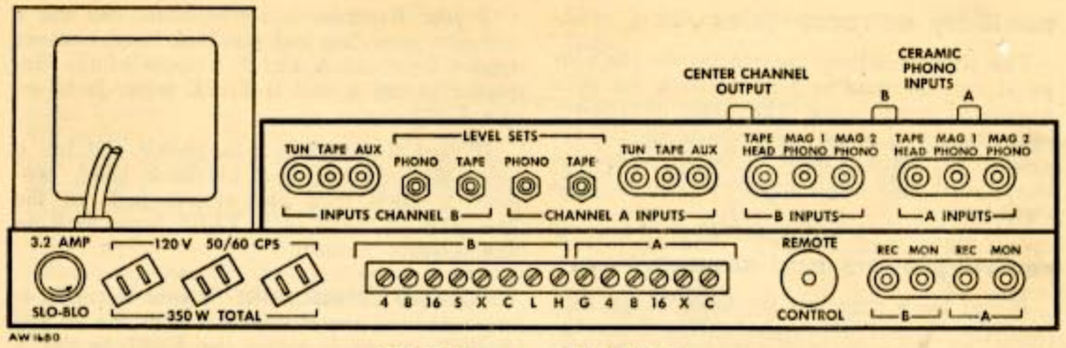

FIG. 1: Rear panel of X-202

speaker connections . . .

Speaker Terminal Strips are provided for each channel to accommodate speakers, or speaker systems, having an approximate impedance of 4, 8, or 16 ohms. In addition, each strip contains terminals for connecting a resistor to achieve different damping factors that may be specified by speaker manufacturers. (See Rear Panel, Fig. 1.)

Most speakers are designed to operate with amplifiers having a high damping factor. Because the *X-202* has an inherent damping factor of 10, it will accommodate all these speakers without the addition of a resistor. However, should the speakers you are using require a damping factor lower than 10, a table has been prepared which will enable you to select the proper resistor value. (See Table 1.)

Important: Connect the speakers that will be on your left to Channel A, and those on your right to Channel B. If you are temporarily using only one channel, use Channel A and connect an equivalent load resistor to the Speaker Terminals of Channel B. (Use wire-wound 7 watt, 20 to 40 ohm resistor across terminals L and H. Wire jumper should be across terminals S and 16.)

CONNECTIONS WITHOUT RESISTOR: If your loudspeakers do not require a lower damping factor, make connections from your left loudspeaker to the Speaker Terminal strip in Channel A, using Terminals G and 4, 8, or 16, depending upon the speaker impedance. Do *not* disconnect the jumper that is connected between Terminal G in Channel A and Terminal C in Channel B.

Connect the right loudspeaker to the Speaker Terminal strip in Channel B, using terminals L and H. Then, connect one end of the wire jumper from Terminal S to either 4, 8 or 16, depending upon the impedance of your speaker.

CONNECTIONS WITH RESISTOR: NOTE: Before making these connections *remove* the jumper connected between Terminal G in Channel A and Terminal C in Channel B. If your loudspeakers require a lower damping factor, make connections from your left loudspeaker to the Speaker Terminal strip in Channel A. Use Terminals C and 4, 8 or 16, depending upon the impedance of your speaker. Then connect a resistor across Terminals C and X. (See Table 1 for correct resistor value.)

Connect the right loudspeaker to the Speaker Terminal strip in Channel B, using terminals L and H. Connect a resistor from Terminal C to X. Then connect the wire jumper from Terminal S to either 4, 8, or 16 depending upon the impedance of your speaker. (See Table 1 for correct resistor value.)

TABLE 1 — RESISTOR VALUES FOR CHANGING DAMPING FACTORS

Nominal Speaker Impedance in Ohms	Manufacturer's Recommended Damping Factor	Value of Resistor To Be Connected Between C and X (In Ohms, ½ Watt)
16	0.5	68
16	1	180
16	2	390
8	0.5	100
8	1	270
8	2	680
4	0.5	150
4	1	390
4	2	1000

CONNECTING ASSOCIATED COMPONENTS

On the rear panel of the *X-202* are 16 input jacks and 3 output jacks to which can be connected Tuners, Tape Recorders, Tape Heads, Record Players and Changers with Ceramic and Magnetic cartridges. (See Rear Panel, Figure 1.) A special jack is also provided for the connection of the Fisher RK-1 Remote Control. Information for connecting the various types of components is provided in this section.

auxiliary ac receptacles . . .

The three auxiliary receptacles on the rear panel may be used as power outlets for your associated components. The combined power consumption of these components should not exceed 350 watts. Power to these receptacles is supplied only when power to the *X-202* is turned on.

record players and changers . . .

If you use a *magnetic stereo* cartridge, connect the A and B output cables from the Record Player to the A and B MAG 1 PHONO input jacks. (Use MAG 2 PHONO inputs for a second Record Player or Changer.)

If you use a *magnetic monophonic* cartridge, connect the output cable from the Record Player to the A *or* B MAG 2 PHONO input jack in MAG 1 PHONO for long playing records only.)

If you use a *Ceramic stereo* cartridge, connect the A and B output cables from the Record Player to the A and B CERAMIC PHONO input jacks at the *top* of the rear panel.

If you use a *ceramic monophonic* cartridge, connect the output cable from the Record Player to the A *or* B CERAMIC PHONO input jack.

IMPORTANT: 1—Do *not* connect Record Players to the CERAMIC PHONO and MAG 2 PHONO input jacks at the same time. These inputs are in parallel and will create a circuit mismatch.

2—Play 78 RPM records using MAG 2 PHONO or CERAMIC PHONO input jacks *only*.

tape recorders . . .

A standard stereophonic or monophonic Tape Recorder (equipped with its own preamplifier) may be used with the *X-202* in two ways. First, it can be used to record the output of either a Tuner or a Record Player, or another Tape Recorder or Tape Head being played through the *X-202*. Secondly, it can play through the *X-202* previously recorded program material. Permanent connections between the Recorder and the *X-202* can be made to carry out these functions.

PLAYBACK CONNECTIONS: If your Tape Recorder is *stereophonic* and has *separate* recording and playback heads, connect cables from the A and B output or playback jacks to the A and B MON input jacks on the *X-202*.

If your Recorder is *monophonic* and has *separate* recording and playback heads, connect a cable from the output or playback jack to the A *or* B MON jack on the *X-202*.

NOTE: The above connections will also permit you to monitor material that is being recorded.

If your Recorder is *stereophonic* and has a *common* recording and playback head, connect cables from the A and B outputs of the Recorder to the A and B TAPE input jacks on the *X-202*.

If your Recorder is *monophonic* and has a *common* recording and playback head, connect a cable from the output jack on the Recorder to the A *or* B TAPE input jack on the *X-202*.

RECORDING CONNECTIONS: If your Recorder is *stereophonic*, connect cables from the A and B REC output jacks on the *X-202*, to the A and B recording input jacks on the Recorder.

If your Recorder is *monophonic*, connect a cable from the A *or* B REC output jack on the *X-202* to the recording input jack on the Recorder.

tape decks . . .

A Tape deck is the tape transport mechanism minus the preamplifier and audio controls. To provide playback for recorded tapes, it must be connected to an amplifier. These facilities are furnished by the *X-202*.

If you have a *stereophonic* Tape Deck, connect A and B output cables from the Tape Deck to the A and B TAPE HEAD input jacks on the *X-202*.

If you have a *monophonic* Tape Deck, connect the single output cable from the Tape Deck to either A *or* B TAPE HEAD input jack.

tuners . . .

The *X-202* is equipped to accommodate various combinations of tuner outputs. These ininclude monophonic FM, monophonic AM, stereophonic FM-AM, stereophonic FM-FM, and the new stereophonic FM-Multiplex broadcasts.

If you have a monophonic FM or AM Tuner, or both, connect the output cable from the FM Tuner to Channel A TUN input jack, and the cable from the AM Tuner to Channel B TUN input jack.

If you have an FM-AM *monophonic* Tuner, connect the output cable to either Channel A *or* Channel B TUN input jack.

If you have an FM-AM *stereophonic* Tuner, connect the cable from the FM section to Channel A TUN input jack, and the cable from the AM section to the Channel B TUN input jack.

NOTE: The FM portion of an FM-AM stereophonic broadcast is heard on Channel A (left speaker,) while the AM portion of the broadcast is heard on Channel B (right speaker.) If you have an FM-AM *monophonic* Tuner, you must connect an additional AM or FM Tuner to the *X-202* to listen to FM-AM stereo broadcasts.

To listen to *FM-FM stereophonic* broadcasts, two separate FM Tuners are required. Connect one Tuner to the Channel A TUN input jack, the other to the Channel B TUN input jack. Determine from your newspaper which FM station is transmitting the left channel, and tune in this station on the Tuner connected to Channel A. Then tune in the right channel on the Tuner connected to Channel B.

To listen to FM-Multiplex stereophonic broadcasts, your FM Tuner must be equipped with an adaptor, such as the FISHER MPX-10 or MPX-20. Connect your FM Tuner and Multiplex Adaptor to the *X-202* as described in the operating instructions furnished with the Adaptor and Tuner.

other program sources . . .

If you wish to connect a short wave Tuner, or the audio output from your TV set, to the *X-202*, use the Channel A or B AUX input jacks. Consult with your serviceman if you are uncertain about making connections from your TV set. You can connect any other *high level* program sources to these AUX input jacks.

remote control . . .

A nine-pin jack on the rear panel, to the right of the Speaker Terminal strip, accommodates the FISHER RK-1 Remote Control. This device makes possible the adjustment of sound on both channels from your favorite listening area for achieving perfect stereophonic balance. Do not remove the dummy plug from this jack, if you are not using the RK-1; otherwise, the *X-202* will be inoperative. See the instructions accompanying the unit for installation and operation instructions.

center channel amplifier . . .

Connect a short length of low-capactitance shielded cable from the CENTER CHANNEL OUTPUT jack to the input of the third amplifier. The cable from the amplifier to the third speaker can be 100 feet or longer, depending on the type of amplifier output.

HOW TO OPERATE THE X-202

After you have made all required connections, plug the power cable into a wall outlet supplying 105 to 120 volts *AC only*, at 50 to 60 cycles. (Where line voltage is lower or higher, a step-up or step-down transformer will be necessary. Consult your serviceman.) Total power consumption of this unit, *not including associated components*, is 160 watts.

With the exception of the Level Sets on the rear panel, all operating controls are on the front panel as illustrated in Figure 2. An explanation of the function of each control is provided in this section. Like any fine electronic instrument, the *X-202* will operate at its full potential only if it is used properly. We therefore urge you to read the following information carefully.

NOTE: A simplified Step-By-Step Operating Guide is furnished at the conclusion of this section. This Guide will enable you to select any program source you wish to hear and set all significant controls in a matter of seconds.

ac off . . .

The AC-Off switch supplies power to the *X-202* and is combined with the Master Volume Control. Turning this switch slightly clockwise from the OFF position will turn power on for the unit, as well as any components connected to the auxiliary AC receptacles. One or two of the Channel Indicator lamps will light; (their purpose is explained under "Mono-Stereo.")

selector . . .

This seven-position switch is used to select the program source you wish to hear and also provides correct equalization. The positions shown have the following purpose:

TAPE HEAD: Selects a Tape Deck connected to the TAPE HEAD jacks.

78: Use this position to play 78 RPM records on a Record Player connected to the MAG 2 PHONO or CERAMIC PHONO input jacks *only*.

RIAA 1: Use this position for playing stereophonic or LP monophonic records on a Record Player connected to the MAG 1 PHONO input jacks.

RIAA 2: Use this position for playing stereophonic or LP monophonic records on a Record Player connected to either MAG 2 PHONO or CERAMIC PHONO input jacks.

TUNER: Selects a Tuner connected to the TUN input jacks.

TAPE: Selects a Tape Recorder with a *common* head connected to the TAPE input jacks.

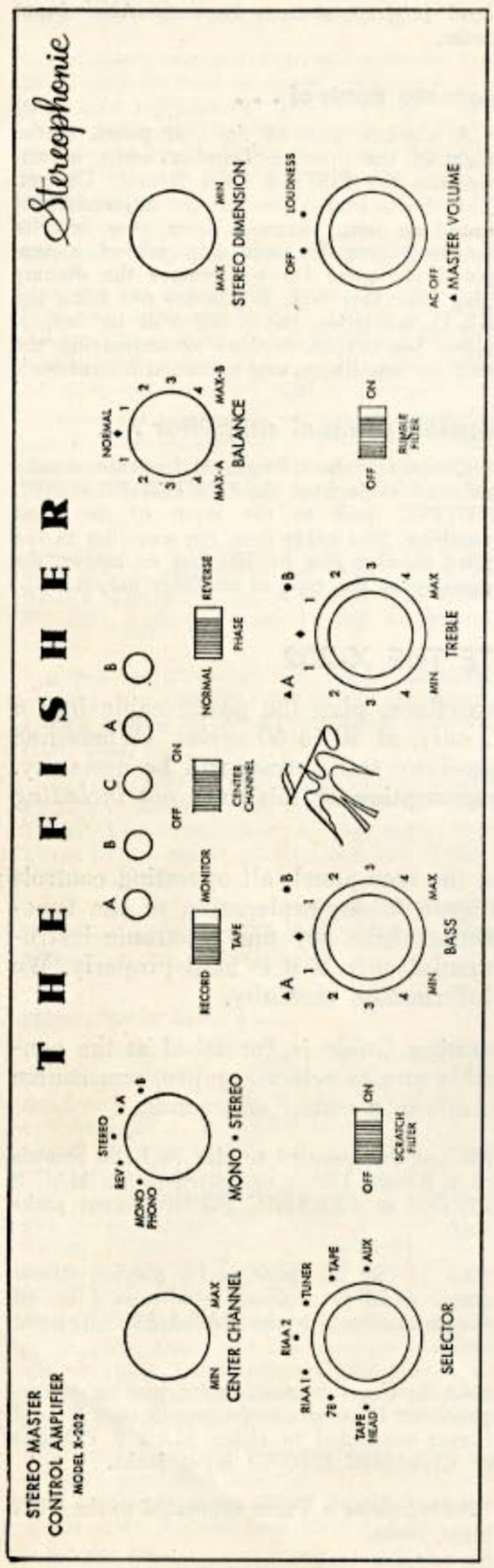

FIG. 2: Front panel of X-202

NOTE: To play a Tape Recorder with *separate* heads, move Tape switch to MONITOR position.

AUX: Selects a component connected to the AUX input jacks.

mono-stereo . . .

After you have set the Selector for a particular program source, the Mono-Stereo switch is set to determine whether operation will be monophonic or stereophonic. Different combinations of the Channel Indicator lamps will light for each position as explained below.

MONO PHONO: In this position, the signal from a *monophonic* record, playing through a *stereo* cartridge, is fed to both channels for a superior monophonic effect. Also, rumble and noise components due to vertical stylus movement are completely eliminated.

REV: In this position, the signal from Channel A is switched to Channel B, while the signal from Channel B is switched to Channel A. Use this position only if the stereo arrangement at the program source is reversed.

STEREO: This is the normal position for *all* stereophonic program sources.

A: In this position, the signal from any component connected to the input jacks in Channel A is fed to both channels. The use of the full power of both channels results in a superior monophonic effect.

B: In this position, the signal from any component connected to the input jacks in Channel B is fed to both channels to achieve a superior monophonic effect.

	A	B	C	A	B
MONO-PHONO	●	○	○	●	○
REV	○	●	○	●	○
STEREO	●	○	○	○	●
A	●	○	○	○	○
B	○	○	○	○	●

● = LIGHT ON

○ = LIGHT OFF

NOTE: CENTER CHANNEL LIGHT ("C") IS UNDER CONTROL OF CENTER CHANNEL SWITCH.

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TABLE 2: Channel indicator lights

channel indicator lights . . .

These lights provide an additional visual indication of the type of operation to which the Mono-Stereo switch is set and can be seen from any distance in the average room. Table 2 is a guide to the different light combinations.

tape record-monitor . . .

IMPORTANT: Leave this switch in RECORD position *at all times,* except when you wish to monitor a tape recording that is being made from a program source connected to the *X-202;* in which case, set this switch to MONITOR. Be sure to return this switch to RECORD position for listening to all other program sources.

balance . . .

This control is used to obtain equal sound levels from each speaker system — an important consideration for achieving the optimum stereophonic effect. (This is also advantageous for monophonic operation where two channels are used.) With the Balance Control pointing to NORMAL, the volume at the left and right speaker systems should be the same, theoretically. However, an imbalance may occur due to room acoustics, record characteristics, differences in stereo cartridge outputs or speaker efficiencies etc. This imbalance can be corrected with the Balance Control. Simply turn the knob toward MAX-A or MAX-B to increase the volume level at the left or right speaker system, as required. It should be pointed out that this is not a volume control; for, as the level of sound is increased on one speaker system, it is decreased on the other.

phase normal-reverse . . .

This switch provides a means of correcting improperly phased speakers without changing the connections to a speaker voice coil. (Improper phasing at the originating program source can also be corrected.) Proper phasing is necessary (with both speaker cones moving in the same direction at the same time) for the best stereophonic, as well as monophonic, results. By moving this switch to REVERSE position, the signal in Channel B is reversed 180 degrees.

An easy way to determine whether speakers are in phase is to play some *monophonic* low-frequency program material with the Phase switch at NORMAL. Then move the switch to REVERSE. If there is a noticeable increase in volume, your speakers are out of phase and the switch should be left in REVERSE position. However, if volume goes *down* when you move to REVERSE position, consider the speakers in phase and return the switch to NORMAL.

stereo dimension . . .

With this control, you can combine, or blend, the signals from both channels to any desired degree. At the OFF position, complete separation exists between both channels. As you advance this control toward MAX, the signals are progressively combined to fuse the total sound curtain. When listening to a stereophonic program source, this control can be used to reduce, or completely eliminate, any "ping-pong" effect (exaggerated separation between the channels.)

center channel volume . . .

If a third amplifier and loudspeaker system is connected to the *X-202* (as described on page 2) use this control to adjust the amount of signal being fed to the Center Channel output. Since the ultimate purpose of the Center Channel is to eliminate the "hole" between widely spaced speaker systems, the volume of the center speaker system should be increased just enough to establish a uniform curtain of stereophonic sound, without destroying the stereophonic effect.

center channel on-off . . .

Once you have established the desired level of volume on the Center Channel, you can use the Center Channel On-Off switch to turn on the sound to this channel without the need for resetting the volume level. (When this switch is in ON position, the red "C" Indicator lamp will light.)

master volume . . .

The Master Volume Control varies the level of sound simultaneously on both channels. Turning this control in a clockwise direction increases the sound level at both speaker systems.

loudness . . .

As the relative volume of sound is reduced, our natural hearing sensitivity drops off at both ends of the audio frequency range. The Loudness switch enables you to decrease the volume without losing these important high and low frequencies (treble and base tones.) If you wish to listen at low volume, move this switch (located behind the Master Volume Control) to ON. Compensation will be introduced to raise the highs and lows to a level with your middle-frequency hearing sensitivity. The amount of compensation will be automatically increased or decreased as the volume is lowered or raised.

NOTE: At high volume levels, leave this control in OFF position; otherwise, unrealistic sound will result.

bass and treble . . .

The Bass Control regulates the intensity of the low frequency, or bass, tones; while the Treble Control regulates the intensity of the high frequency, or treble, tones. Each set of controls has dual knobs mounted one behind the

STEP-BY-STEP OPERATING GUIDE FOR X-202

Program You Wish To Hear	Required Connections To Associated Components	Set Selector Switch To	Set Mono-Stereo Switch To	• Other Required Control Settings • *IMPORTANT:* Tape Switch must be in *RECORD* position *at all times* except as noted.
FM Broadcast	FM Tuner connected to Channel A TUN input jack.	TUNER	A	*NOTE:* If you are using an FM-AM monophonic Tuner, set Mono-Stereo switch to either A *or* B, depending upon Channel to which Tuner is connected.
AM Broadcast	AM Tuner connected to Channel B TUN input jack.	TUNER	B	
FM-AM Stereophonic Broadcast	FM Tuner section connected to A TUN input jack; AM Tuner section connected to B TUN input jack.	TUNER	STEREO	If AM Tuner has Bandwidth switch, use BROAD position.
FM-FM Stereophonic Broadcast	Separate FM Tuners connected to A and B TUN input jacks.	TUNER	STEREO	See local newspaper for left and right stereo broadcast arrangement.
FM-Multiplex Stereophonic Broadcast	Multiplex Adaptor connected to FM Tuner. (Use FISHER MPX-20 for use with FISHER Tuners.)	TUNER	STEREO	
Monophonic Record	Output cable from Record Player to Channel A *or* B MAG PHONO or CERAMIC PHONO input jacks depending on cartridge.	RIAA 2 for LP 78 for 78 RPM	A or B depending on Channel used.	*NOTE:* If you are using a stereo cartridge, set Mono-Stereo switch to MONO-PHONO.
Stereophonic Record	A and B output cables from Record Player to Channel A and B MAG PHONO or CERAMIC PHONO input jacks depending on cartridge.	RIAA 1 for magnetic cartridge RIAA 2 for Ceramic cartridge	STEREO ~~RIAA 1~~	
Tape from *monophonic* Tape Recorder with *Common* Head.	Cable from output jack on Recorder to Channel A *or* B TAPE input jack. *Recording Connections:* Cable from recording jack to Channel A or B REC jack (same channel as above.)	TAPE	A or B depending on channel used.	
Tape from *monophonic* Tape Recorder with *Separate* Heads.	Cable from output jack on Recorder to Channel A *or* B MON jack. *Recording Connections:* Cable from recording jack to Channel A *or* B REC jack (same channel as above.)	*Tape Switch* set at MONITOR	A or B depending on channel used.	
Tape from *monophonic* Tape Deck.	Cable from Tape Deck to Channel A *or* B TAPE HEAD input jack.	TAPE HEAD	A or B depending on channel used.	
Tape from *stereo* Tape Recorder with *Common* Head.	Cables from A and B output jacks on Recorder to Ch. A and B TAPE jacks. *Recording Connections:* Cables from A and B recording jacks to Ch. A and B REC jacks.	TAPE	STEREO	
Tape from *stereo* Tape Recorder with *Separate* Heads.	Cables from A and B output jacks on Recorder to Ch. A and B MON jacks. *Recording Connections:* Cables from A and B recording jacks to Ch. A and B REC jacks.	*Tape Switch* set at MONITOR	STEREO	
Tape from *stereo* Tape Deck.	Cables from Tape Deck to Ch. A and B TAPE HEAD jacks.	TAPE HEAD	STEREO	

other — the small knob with the gold triangle for Channel A, and the outer knob with the dot for Channel B. Turning either knob will turn the other, for they are "friction-fitted." However, if you wish to adjust the level for each channel separately hold one knob while turning the other.

To increase the Bass or Treble intensity, turn the knobs in a clockwise direction toward MAX. If the Mono-Stereo switch is at TAPE HEAD, 78 or one of the RIAA positions, keep these controls in flat position, (pointing straight up to the diamond figure,) to maintain the equalization that is provided. In the other positions of the Mono-Stereo switch, you can maintain a flat response, that is, hear the program material exactly as it has been recorded or broadcast, by leaving these controls in flat position. It should be remembered, however, that these controls may be set to satisfy individual listening tastes.

scratch filter . . .

Use this switch in the ON position to eliminate record surface noise, distant station interference, and other undesirable high frequency noises originating in your Record Player or Tape Recorder. Return this switch to OFF at all other times.

rumble filter . . .

Move this switch to ON position to eliminate turntable rumble or other low-frequency interference. Leave this switch in OFF position at all other times.

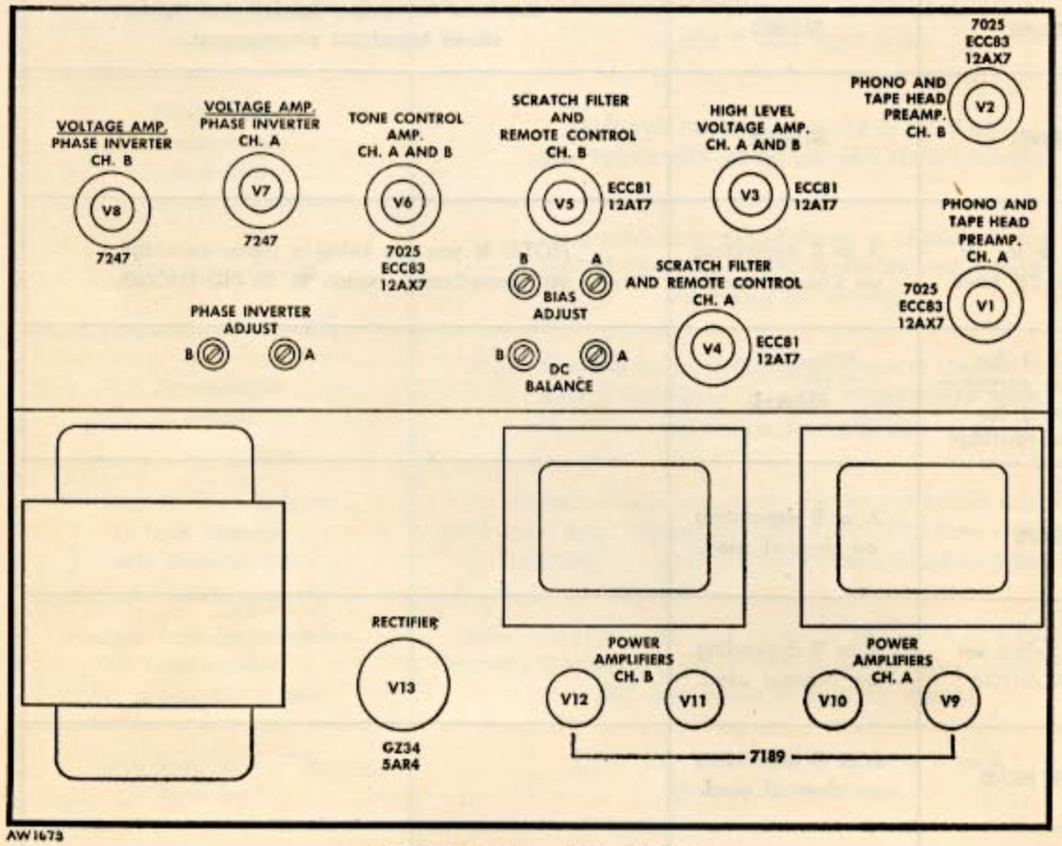

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FIG. 3: Tube layout for X-202

REAR PANEL CONTROLS

Four Level Sets, two for each Channel, are located on the rear panel. These Level Sets have been set at the factory for full signal strength (fully clockwise.) They may require resetting when the *X-202* is first installed, but are not normally used in subsequent operation.

Because of different levels of signal strength from the associated components, some program material may appear louder than others at the speaker systems when you change the setting of the Selector switch. This undesirable condition can be eliminated by equalizing the signal levels at the input jacks using the Level Sets.

Signal strength from a component can be adjusted by ear by turning the appropriate Level Set in a counterclockwise direction until the desired level is reached. However, to achieve a greater degree of accuracy, it is suggested that you use an FM broadcast as a reference level. This FM signal will provide you with a virtually unvarying signal yardstick. By simply switching the Selector back and forth, from the FM-AM position to the other positions, you can equalize signal levels quite accurately.

PHONO LEVEL SETS: control signals from components connected to the MAG PHONO and TAPE HEAD input jacks.

TAPE LEVEL SETS: control signals from components connected to the TAPE input jacks.

CIRCUIT ADJUSTMENT CONTROLS

Six Adjustment Controls, three for each channel, are located at the top of the chassis. Their purpose and method of adjustment are explained in the Service Manual for the *X-202*. Do not attempt to reset these controls if you are not equipped with the proper test equipment.

CUSTOM INSTALLATION

Two special custom cabinets, designed to accommodate the *X-202*, are available from your FISHER dealer. These are the Model MC-1 metal cabinet, and Model 10-U wood cabinet. Both are attractively designed to enhance room decor. The *X-202* may also be mounted in your own custom cabinet. Directions and illustrations are provided in this section.

Because adequate ventilation is an *absolute essential* for trouble-free operation, never install the *X-202* in a totally enclosed space, or too close to other heat-producing equipment. Also, do not install the *X-202* in a vertical position.

The *X-202* may be installed in two ways: with cleats, to raise it above the floor of the cabinet to provide ventilation; or, without cleats, in which case cut-outs must be made in the cabinet floor. The two-types of installation follow.

installing with cleats . . .

1 — Obtain a strip of wood ¾ inches square and 25 inches long. Cut this strip in half to form two 12½ inch cleats.

2 — Fasten the two cleats to the top of the mounting board with wood screws, in the positions shown in Fig. 4. Then locate and drill four ¼-inch holes through the mounting board and cleats as indicated.

3 — Saw a cutout through the front panel of your cabinet (4½ by 14¾) as shown in Fig. 5. The bottom edge of the cutout should be on a level with the top of the two cleats.

4 — Remove the four plastic feet from the X-202 and insert the chassis through the *front* of the panel cutout. Slide the chassis into the cabinet until the back of the control panel is tight against the panel of the cabinet.

5 — Insert the four 1½ inch screws supplied in the accessories bag through the holes in the bottom of the mounting board and fasten the chassis into place.

installing without cleats . . .

1 — Cutouts must be made in the mounting board beneath the ventilation holes in the bottom cover of the X-202, as shown in Fig. 4. The back of the cabinet must remain open.

2 — Locate and drill four ¼-inch holes in the mounting board as shown in Fig. 4.

3 — Saw a rectangular cutout through the front panel of the cabinet (4½ by 14¾) as shown in Fig. 5. Note that the bottom edge of the cutout is flush with the top of the mounting board.

4 — Remove the four plastic feet from the X-202 and insert the chassis through the *front* of the panel cutout. Slide the chassis in all the way until the back of the front panel fits tightly against the panel of the cabinet.

5 — Insert the four 1-inch screws supplied in the accessories bag through the holes in the bottom of the mounting board and fasten the chassis into place.

at your service . . .

It is our desire that THE FISHER operates 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 concerning how it is meeting your requirements.

your Fisher dealer . . .

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

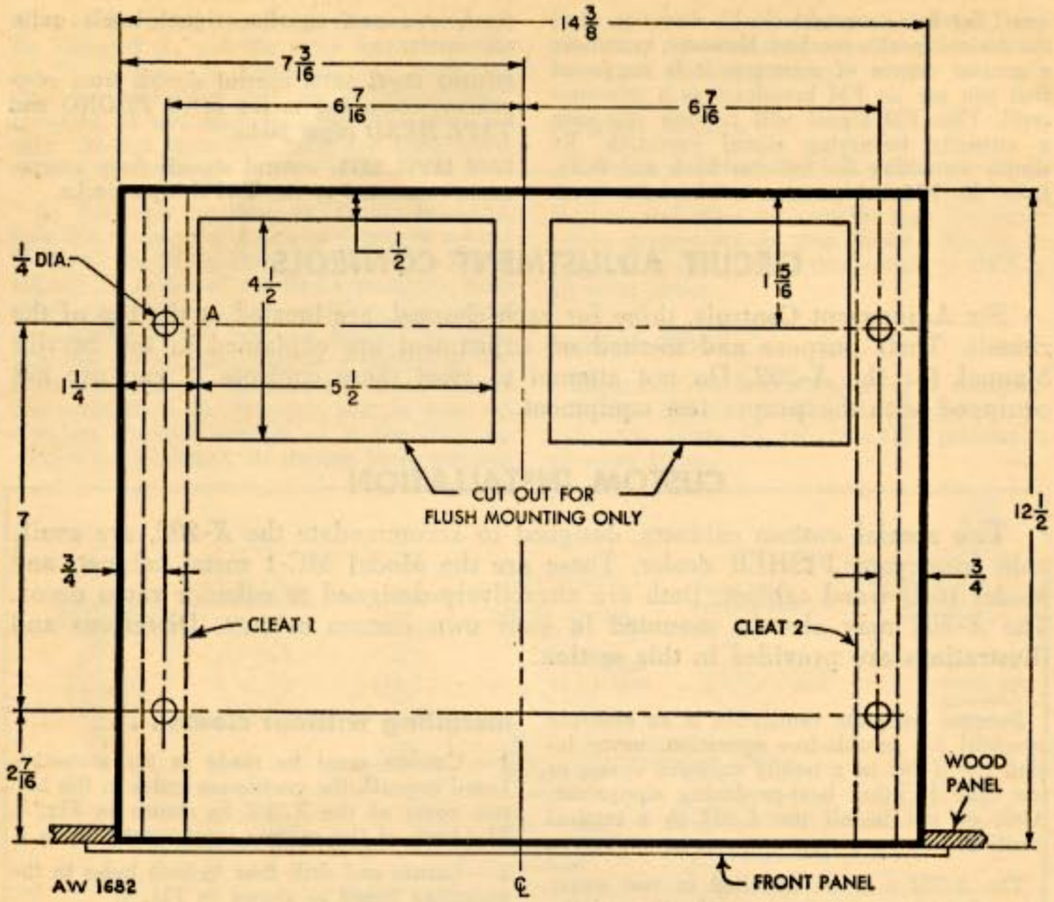

FIG. 4: Top view of custom cabinet installation

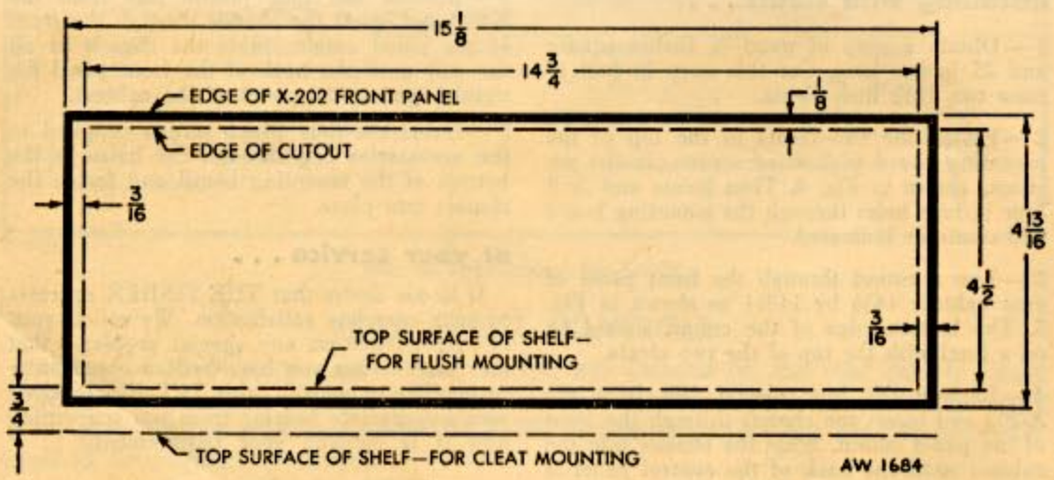

FIG. 5: Front panel cutout for mounting

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. This guarantee is void if the equipment has been altered, or if the purchaser has failed to return the Warranty Card *within 10 days.*

FOR WARRANTY SERVICE, CONSULT YOUR DEALER