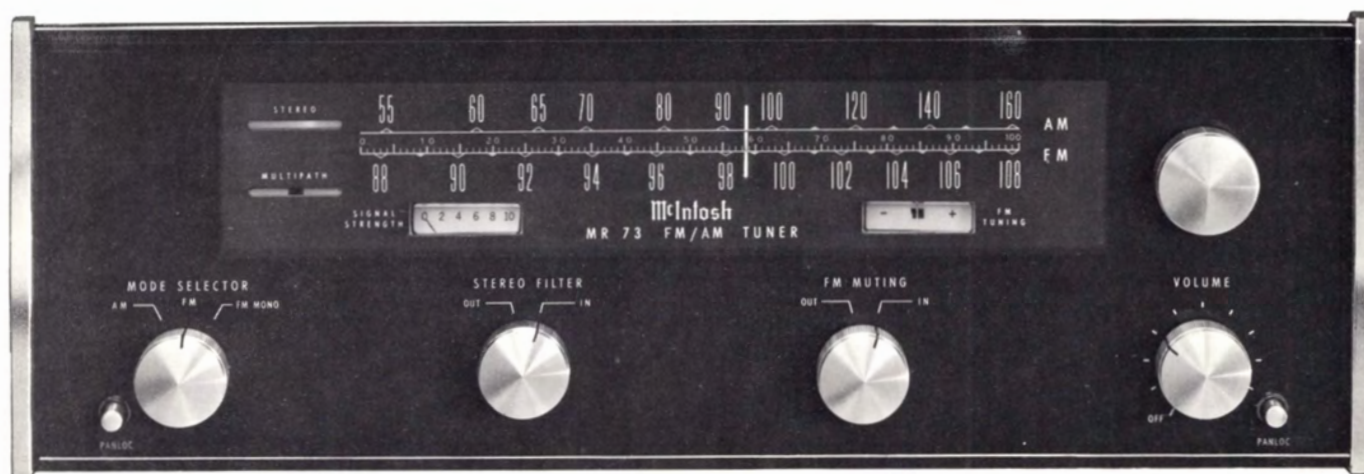


McIntosh
MR 73

OWNER'S MANUAL

THE McINTOSH MR 73 SOLID STATE FM/FM STEREO-AM TUNER



Price \$1.25

Your MR 73 FM/FM STEREO-AM TUNER will give you many years of pleasant and satisfactory performance. If you have any questions concerning the operation or maintenance of this instrument, please contact:

CUSTOMER SERVICE

McIntosh Laboratory Inc.
2 Chambers Street
Binghamton, New York 13903
Phone: 607-723-3512

**Take Advantage of 3 years
of FREE Factory Service . . .
Fill in the Application NOW.**

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GUARANTEE

McIntosh Laboratory Incorporated guarantees this instrument to be capable of performance as advertised. We also guarantee the mechanical and electrical workmanship and components to be free of defects for a period of 90 days from date of purchase. If such defects occur, McIntosh Laboratory or

one of its authorized agencies will repair the defect at no cost to the purchaser. This guarantee does not extend to components damaged by improper use nor does it extend to transportation to and from the factory or service agency.

THREE YEAR FACTORY SERVICE CONTRACT

An application for a FREE THREE YEAR FACTORY SERVICE CONTRACT is included with this manual. The terms of the contract are:

For Three Years from date of purchase —

1. McIntosh will provide all parts, materials and labor needed to return the measured performance of the instrument to the original performance limits free of any charge. The SERVICE CONTRACT does not cover any shipping costs to and from the authorized service agency or the factory.
2. Any McIntosh authorized service agency will repair all McIntosh instruments at normal service rates. To receive the free service under the terms of the SERVICE CONTRACT, the SERVICE CONTRACT CERTIFICATE must accompany the instrument when taken to the service agency.
3. Always have service done by a McIntosh authorized service agency. If the instrument is modified or damaged as a result of unauthorized repair the SERVICE CONTRACT will be cancelled.

4. The SERVICE CONTRACT is issued to you as the original purchaser. To protect you from misrepresentation this contract cannot be transferred to a second owner.
5. The SERVICE CONTRACT is given to purchasers who live in the 50 United States or Canada only.
6. For your protection McIntosh selects its dealers carefully. Only one dealer in ten qualifies for a McIntosh franchise. To receive the SERVICE CONTRACT your purchase must be made from a McIntosh franchised dealer.
7. Your completely filled in application for a SERVICE CONTRACT must be postmarked within 30 days of the date of purchase of the instrument.
8. To receive the SERVICE CONTRACT all information on the application must be filled in. The SERVICE CONTRACT will be issued when the completely filled in application is received at McIntosh Laboratory Incorporated in Binghamton, New York. If the application is not received at McIntosh Laboratory, only the service offered under the 90-day guarantee will apply.

Installation



Adequate ventilation extends the trouble-free life of electronic instruments. It is generally found that each 10° centigrade (18° F) rise in temperature reduces the life of electrical insulation by one half. Adequate ventilation is an inexpensive and effective means of preventing insulation breakdown that results from unnecessarily high operating temperatures. The direct benefit of adequate ventilation is longer, trouble-free life.

Allow at least 15 inches deep x 17½ inches wide x 6 inches high for mounting the MR 73. Always allow for air flow by either ventilation holes or space next to the bottom of the tuner and a means for a warm air to escape at the top.

It is recommended that the MR 73 be mounted in a normal or horizontal position. However, with adequate ventilation the tuner can be mounted in any position.

To prepare the MR 73 for installation remove the plastic protective covering. Turn the MR 73 upside down so that it rests on its top on the shipping pallet. Remove the four plastic feet fastened to the bottom of the chassis.

Next, place the mounting brackets, the parts bag and the mounting template at hand.

The PANLOC professional mounting design eliminates the need for any shelf or bracket to support the MR 73. It is completely supported by its own mounting brackets.

The design of the mounting template allows you to position or locate the cutout from the front or rear of the panel to which the instrument is to be mounted. Position the plastic mounting template over the area of the panel to be cut out for installation.



1. If the cutout is to be located from the front of the panel, begin at Step 2. If the cutout is to be located from the rear of the panel, begin here.

On the back of the cabinet panel, scribe a vertical centerline through the exact center of the area in which the cutout is to be made.

Place the template against the back of the panel and match the template centerline with the centerline on the cabinet panel.

Make sure that there is at least ¼ inch clearance between the bottom of the dashed line of the cutout area on the template and any shelf or brace below the proposed cutout.

Mark the two locating holes ("C" holes on the mounting template).

Drill the two locating holes. Be certain the drill is perpendicular to the panel.

Now position the template on the front of the panel by aligning the "C" locating holes on the template with the drill holes.

2. If the cutout is to be located from the front of the panel:

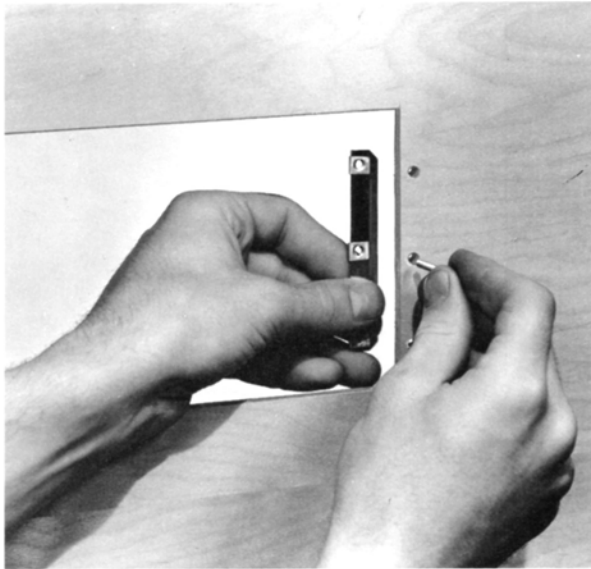
With the template in place against the cabinet panel, mark the "A" and "B" drill holes and the four small holes that identify the corners of the cutout. Join the corner marks with a pencil. The edge of the template can be used as a straight edge.

IMPORTANT: DRILL THE 6 HOLES BEFORE MAKING THE CUTOUT.

Accurately drill the three holes on each side of the cutout area with a $\frac{3}{16}$ inch drill.

With the saw on the **INSIDE OF THE PENCIL LINES** carefully cut out the rectangular opening.

Secure the mounting strips to the rear of the cabinet panel using two screws from the hardware package.

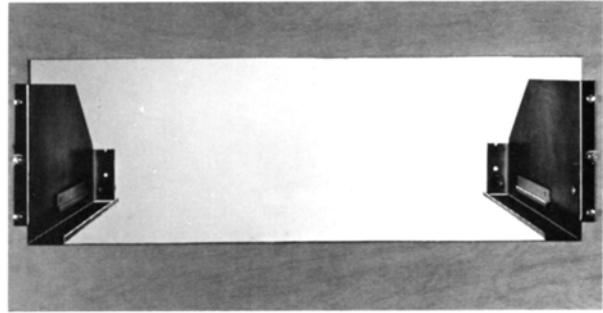


Insert the screws in the center holes of the cabinet panel ("B" holes on the template) and tighten. The screw head should pull into the wood slightly. (Use two $\frac{3}{4}$ inch long screws for panels under $\frac{1}{2}$ inch, or two $1\frac{1}{4}$ inch long screws for panels $\frac{1}{2}$ inch thick and larger.)

Attach the mounting brackets to the cabinet panel using four screws.

Place the template over the mounting screws. The mounting screws should be centered in the "A" and "B" holes on the template. The sides of the mounting brackets should match the vertical dash lines on the template. If necessary, loosen the screws and push the brackets into alignment and retighten.

Insert the power cord through the opening. Carefully slide the MR 73 into the opening so the rails on the bottom of the equipment slide in the track of the mounting brackets. Slide the instrument in

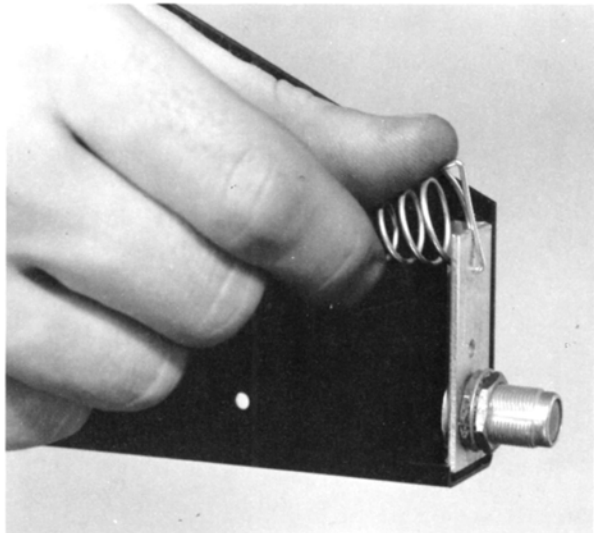


until it stops at the adjust position latches. Press the latches in and continue to slide the instrument in until the front panel is against the cabinet panel. At the bottom front corners of the PANLOC instruments are the PANLOC buttons. Depressing the PANLOC buttons will lock the instrument firmly in the installation. Depressing the PANLOC buttons a second time (as with a ballpoint pen) will release the instrument. You can then slide the instrument forward to the inspection-adjustment position. Depressing the inspection-adjustment position latches will allow the instrument to be slid completely out of the installation.

VERTICAL INSTALLATION

For vertical installation follow the above procedures. You may install two assist springs on the PANLOC brackets.

In the hardware packet are two helical springs. Fasten the springs to the small flanges at the rear of the PANLOC brackets. The flange has a notch and a hole to mount the spring. The springs assist in the removal of vertically mounted PANLOC equipment.



DO NOT USE THE SPRINGS ON HORIZONTALLY MOUNTED EQUIPMENT.

How to Connect



AUDIO OUTPUTS

Use the FIXED OUTPUT jacks to connect to a conventional control preamplifier which has its own volume control. The VOLUME CONTROL does not affect the output of the tuner at the FIXED OUTPUT jacks.

The output impedance at the FIXED OUTPUTS is 600 ohms. Longer cables than are normally supplied can be used to interconnect the MR 73 with other equipment. The length of the cable is limited by the capacity of the cable. The total capacity must not exceed 1,000 pF. For instance: cables with a capacity of 25 pF per foot may be 40 feet long; 13.5 pF per foot cable may be 75 feet long.

Use the FRONT PANEL CONTROLLED jacks to connect to a conventional control preamplifier when use of the tuner volume control is desired. These jacks may be used to connect to external equipment such as power amplifiers or tape recorders where control of volume at the tuner is necessary. The load impedance connected to the FRONT PANEL CONTROLLED jacks should be not less than 47,000 ohms. There is no difference in the signal quality or maximum output levels available at each pair of output jacks.

CONNECTING AN FM ANTENNA

One of three antenna systems can be used: (1) an outdoor FM antenna, or (2) a VHF-TV antenna, or (3) the indoor dipole supplied with the MR 73.

An outdoor antenna is recommended for optimum performance in all areas. In fringe (outlying) areas, best results will be obtained with a highly directional FM antenna used in conjunction with a rotator. Rotate the antenna until the best reception is obtained. Connect the 300 ohm antenna to the FM ANT (red) terminals.

CONNECTING A 75 OHM ANTENNA

An unbalanced 75 ohm antenna can be connected to the MR 73. A "type F" connector is used to connect the 75 ohm coaxial cable to the back panel FM ANT 75Ω input.

A VHF-TV antenna is often effective when it is designed for both FM and TV reception. Connect the two leads from the VHF-TV antenna to the 300Ω ANT (red) terminals.

CONNECTING AN INDOOR DIPOLE ANTENNA

The flexible folded dipole antenna (300 ohm) is for use in urban or high strength signal areas.

Connect the two leads from the dipole to the FM ANT (red) terminals. The flexibility of the thin flat wire assembly permits it to be placed under a rug, tacked behind the stereo . . . or, placed in any other convenient location. In some cases, it may be necessary to "position" the antenna for best signal reception. This should be done before it is permanently located.

Avoid locating the antenna next to other wires or metal objects. This antenna may not prove effective in houses having metal siding or metal foil insulation.

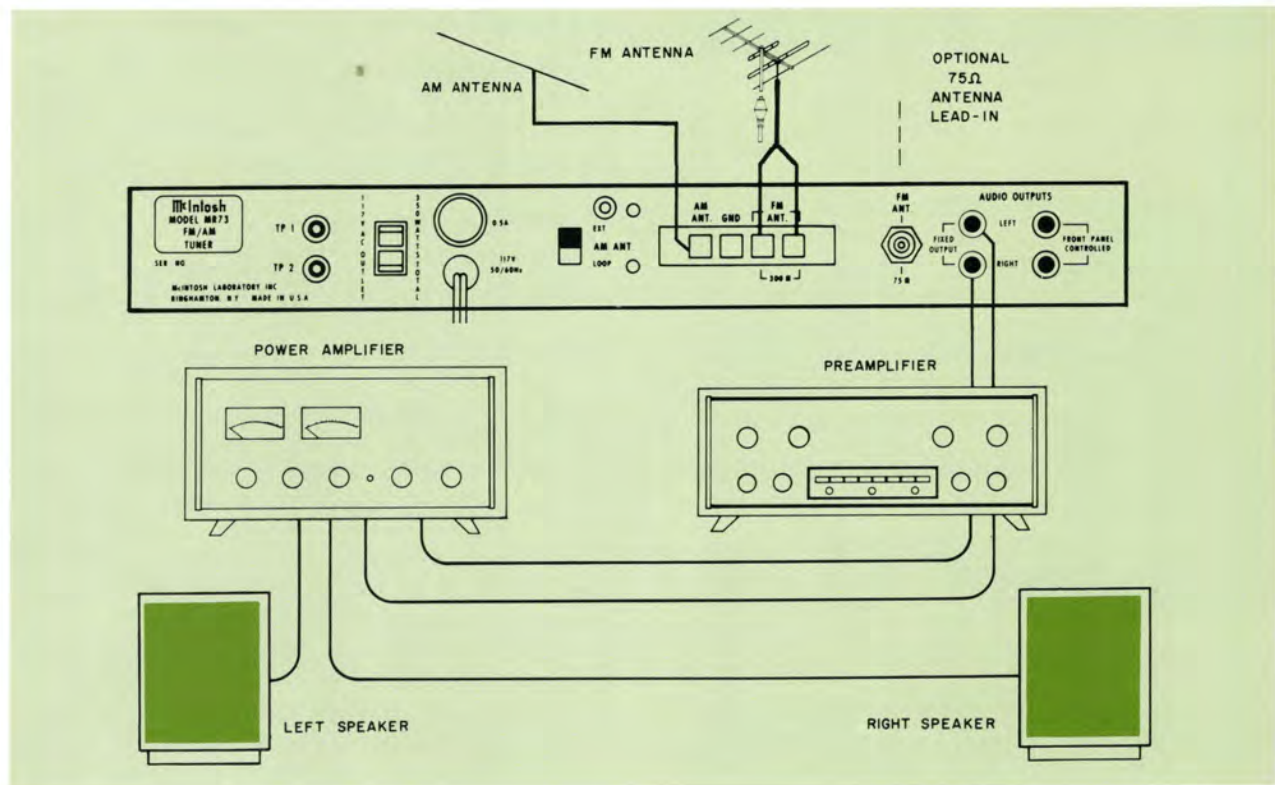
AM BUILT-IN ANTENNA

For most local and moderately distant AM reception the built-in ferrite loopstick antenna may be used. Set the AM ANT slide switch on the MR 73 back panel to the LOOP position.

AM OUTDOOR ANTENNA

For best long distance AM reception, use a copper antenna wire 50 to 150 feet in length. Suspend the wire in a straight line as high as possible. Attach the wire at each end with suitable glass or ceramic insulators. Connect a lead-in wire at any convenient point on the antenna. It is recommended that a lightning arrester be used with an outdoor AM antenna. The arrester should be well grounded to a suitable water pipe or copper or aluminum rod sunk into the ground.

Connect the lead-in wire to the AM ANT push connector on the antenna terminal strip on the back panel. Set the AM ANT Slide Switch to the EXT position.



Back Panel Information

TP1 and TP2

Test point TP1 and TP2 is provided for tuner circuit alignment. It is also used in conjunction with the McIntosh Maximum Performance Indicator.

117V AC OUTLET

Provides 117 volt AC power up to 350 watts for additional equipment such as amplifiers, or other equipment. This outlet is not fused. It turns on and off with the front panel AC power switch on the VOLUME control.

AC POWER CORD

Connect the AC power cord to a 117 volt, 50 to 60 Hz power line receptacle. The power used by the MR 73 is 20 watts.

FUSE

A 0.5 AMP fuse protects the tuner circuits. This fuse does not protect additional equipment connected to the back panel AC outlet.

AM ANT SWITCH

Adjust the MR 73 AM ANT switch to match the particular type of AM antenna used. EXT. position is for a conventional antenna, usually of the outdoor type, from 50 to 150 feet in length. LOOP position is for the built-in Ferrite Loopstick.

ANTENNA CONNECTION STRIP

Provides easy push type connectors for an AM antenna, a ground connection, and a 300 ohm FM antenna.

FM ANTENNA—75 OHM

Provides a type F male connector for a 75 ohm unbalanced FM antenna.

AUDIO OUTPUTS

The left-hand pair of AUDIO OUTPUT jacks provides audio signals unaffected by the MR 73 front panel VOLUME control. Use these output jacks to connect the tuner to a stereo control preamplifier which has its own master volume control.

The right hand pair of AUDIO OUTPUT jacks provides audio signal controlled by the MR 73 front panel VOLUME control. Use these output jacks to connect to external power amplifier, tape recorders, or any equipment which requires continuous front panel control of tuner output volume.

Front Panel Information

TUNING DIAL

The MR 73 has three dial scales:

1. AM—Marked 55 to 160 kHz
2. FM—Marked 88 to 108 MHz
3. Logging scale—Marked 0 to 100

The logging scale can be used to accurately retune any station. You may find it easier to keep a record of your favorite stations by use of the logging scale.

A small portion of dial pointer has been illuminated to increase the ease of tuning.

INDICATORS

The MR 73 has four indicators on the dial panel: STEREO indicator, MULTIPATH indicator, SIGNAL STRENGTH meter, and the TUNING meter.

STEREO INDICATOR

The STEREO indicator lights red when the dial pointer is tuned to or crosses a station broadcasting the 19,000 Hz carrier for stereo. The special circuit used will light only when the 19,000 Hz multiplex carrier is present in the signal. The indicator will not light on noise pulses or interference.

MULTIPATH INDICATOR

The MULTIPATH indicator is an exclusive McIntosh development.

The proper use of the MULTIPATH indicator makes it possible to improve FM reception with precise FM antenna positioning.

An electron ray indicator is used to show multipath reception. It operates by movement of electron beams inside a vacuum tube. When rotating the antenna, observation of the multipath indicator will show best orientation for the FM station being received. Multipath distortion causes the two beams on the indicator to fluctuate rapidly. When the antenna is rotated to the best position, the indicator beams tend to remain steady. The directional antenna then picks up the desired signal and rejects the reflected multipath signals. In some locations it is possible for the best reception to occur when the antenna picks up a strong reflected signal rather than the direct signal. Multipath distortion is practically independent of signal strength.

SIGNAL STRENGTH METER

The SIGNAL STRENGTH meter indicates the strength of the signal as received from the antenna. The higher the indication, the stronger is the signal.

FM TUNING METER

An FM station is correctly tuned when the meter needle is in the black area of the FM TUNING meter. The action of the TUNING indicator is independent of station signal strength.

MODE SELECTOR

Selects any one of three program sources.

AM—Connects the AM tuner section of the MR 73 to the output jacks.

FM—The FM position provides monophonic FM or FM stereo at the left and right channel audio output jacks automatically. With the MODE SELECTOR in the FM position a station broadcasting monophonic program will be heard in mono. When the station switches to stereo broadcast, the stereo indicator will light and the MR 73 will automatically switch to stereo operation. If mono broadcasting is resumed the MR 73 will automatically switch to mono.

FM-Mono—Connects the FM tuner sections of the MR 73 to the output jacks. This position bypasses the automatic stereo switching. The stereo indicator will light when a station is transmitting stereo, but the program heard from the loudspeakers will be mono.

STEREO FILTER

The STEREO FILTER reduces noise on weak stereo stations.

Turn the switch to the IN position on noisy stereo stations.

FM MUTING

Muting suppresses the background noise and hiss normally heard between stations. Turn the control to the IN position for muting. Weak stations that may not override noise and interference are also suppressed by the muting.

In the OUT position, the muting is turned off. This allows conventional FM tuning with the noise and interference present. The OUT position is used to tune weak or noisy stations.

VOLUME

The VOLUME control has been precision tracked throughout the listening range (0 to -65 dB) for accurate stereo balance. It adjusts the output level at the tuner FRONT PANEL CONTROLLED AUDIO OUTPUT jacks. The FIXED OUTPUT jacks are not affected by the volume control.

The POWER ON/OFF switch is part of the VOLUME control. Turning the VOLUME control totally counterclockwise turns the AC power to the MR 73 OFF.

PANLOC BUTTONS

At the bottom of the front panel corners are the PANLOC buttons. After a tuner is installed on the PANLOC bracket, pressing the PANLOC buttons will lock the tuner firmly in position. Depressing the PANLOC buttons (as with a ballpoint pen) will release the tuner. The tuner can then be slid forward to the inspection and adjustment position. The PANLOC system gives absolute ease of installation, operation and maintenance.

SECONDARY CONTROLS

On the top of the chassis behind the front panel are three secondary controls. They are MUTING adjust, AM SENSITIVITY, and DIAL SCALE INTENSITY.

MUTING

The MR 73 ultrasonic muting circuit suppresses all noise between stations. It suppresses all weaker stations not strong enough to override the background noise.

The muting threshold setting determines the strength of the signal which can be heard with muting in operation. The muting threshold is carefully adjusted to optimum at the factory using precision test instruments.

If it is found necessary to adjust the muting threshold, turn the MUTING ADJ to the LEFT (counterclockwise) to lower the muting threshold. This allows weaker noisier stations to be heard at the MUTING IN setting. Turn the control to the RIGHT (clockwise) to raise the muting threshold. This allows only the more powerful stations to be heard at the MUTING IN setting.

AM SENSITIVITY

When the AM SENSITIVITY switch is in the LOW position the noise between stations is reduced. The RF gain is not as great in the low position.

DIAL SCALE INTENSITY

Adjust the brightness of the dial panel lights by means of this switch. Set the switch to BRIGHT for maximum panel light. Set the switch to DIM for lower dial light.



Listening to the MR 73

LISTENING TO AM

Turn the MODE SELECTOR switch to AM. Turn the tuning knob to the desired station. The SIGNAL STRENGTH meter will indicate the relative strength of the particular AM station being received.

Adjust the VOLUME control to desired listening level. If the fixed AUDIO OUTPUT jacks are used, the tuner VOLUME control will not affect volume.

LISTENING TO MONOPHONIC FM

Turn the MODE SELECTOR to FM MONO to listen only to monophonic FM.

If you wish to have the MR 73 automatically switch to a stereo broadcast, set the MODE SELECTOR to FM.

Turn the STEREO-FILTER to OUT.

Turn the MUTING to IN.

Turn the tuning knob to the desired station. The station is properly tuned when the FM TUNING meter pointer comes to rest anywhere in the black area of the meter scale. While tuning across the dial you may notice movement of the tuning meter, without hearing a station. This is caused by a station so weak that it does not over-ride the background noise. With ultrasonic muting in operation signals that are marginal are automatically suppressed. To hear these weaker stations, turn the MUTING switch to OUT. Usually the listening quality will be rather poor due to the background noise.

Rotate the directional antenna for best reception as shown by the SIGNAL STRENGTH and MULTIPATH indicators.

Adjust the VOLUME control to desired listening level. If the fixed AUDIO OUTPUT jacks are used, the tuner VOLUME control will not affect volume.

LISTENING TO STEREO FM

Repeat the same procedure as for monophonic FM but turn the MODE SELECTOR to FM.

When the STEREO indicator is lighted, the station is broadcasting a 19,000 Hz carrier for stereo and the MR 73 will automatically switch to stereo. If a station is broadcasting monophonic FM program, the STEREO indicator will remain off and the tuner will automatically switch to mono.

Adjust the VOLUME control to desired listening level. If the fixed AUDIO OUTPUT jacks are used, the tuner VOLUME control will not affect volume. The STEREO FILTER reduces noise on weak stations.

Performance Limits

PERFORMANCE GUARANTEE

Performance Limits are the maximum deviation from perfection permitted for a McIntosh instrument. We promise you that the MR 73 you buy must be capable of performance at or exceeding the limits or you get your money back. McIntosh is the only manufacturer that makes this guarantee.

FM

USEABLE SENSITIVITY: 2.5 microvolts at 100% modulation (± 75 kHz deviation) for 3% total noise and harmonic distortion in accordance with IHF standards.

SIGNAL TO NOISE RATIO: 70 dB below 100% modulation.

HARMONIC DISTORTION: Mono: Will not exceed 0.3% at 100% modulation ± 75 kHz deviation. Stereo: Will not exceed 0.7%.

AUDIO FREQUENCY RESPONSE: ± 1 dB 20 Hz to 20,000 Hz with standard de-emphasis (75 μ SEC.) and 19,000 Hz pilot filter.

CAPTURE RATIO: 1.5% db at 100% modulation.

SPURIOUS REJECTION: 90 dB.

IMAGE REJECTION: 80 dB at 90 MHz; 70 dB at 100 MHz.

STEREO SEPARATION: 35 dB at 1,000 Hz.

SCA FILTER: 50 dB down at 67 kHz to 74 kHz, 275 dB per octave slope.

OSCILLATOR DRIFT: 25,000 Hz in an ambient temperature of 25° C.

OUTPUT: 2.5 volts; low impedance.

MUTING: AF injected ultrasonic muting: 60 dB noise reduction between stations.

FM ANTENNA INPUTS: 300 ohms balanced; 75 ohms unbalanced.

IF: Two IC's and two phase linear crystal filters.

RADIATION: FCC requirements.

STEREO INDICATOR: Front panel multiplex stereo light activated by 19,000 Hz carrier only.

AUTOMATIC MONO-STEREO SWITCH: McIntosh developed; all electronic automatic mono-stereo switching circuit.

AM

SENSITIVITY: 12 microvolts at 1,000 Hz (using the external antenna input).

SIGNAL TO NOISE RATIO: 55 dB.

HARMONIC DISTORTION: Will not exceed 1% at 30% modulation.

FREQUENCY RESPONSE: -6 dB at 5,000 Hz.

SELECTIVITY: -30 dB at 10,000 Hz.

IMAGE REJECTION: 60 dB at 1,000 kHz.

AM ANTENNA INPUTS: Built-in loopstick or external antenna switch selected.

SEMICONDUCTOR COMPLEMENT: 24 Transistors, 22 diodes, 2 Integrated Circuits, 1 Indicator Tube.

POWER REQUIREMENTS: 117 Volts, 50/60 Hz, 20 Watts.

MECHANICAL INFORMATION

SIZE: Front panel: 16 inches wide by $5\frac{1}{8}$ inches high; Chassis: 15 inches wide by 13 inches deep, including PANLOC shelf and back panel connectors; Knob Clearance: $1\frac{1}{2}$ inches in front of mounting panel.

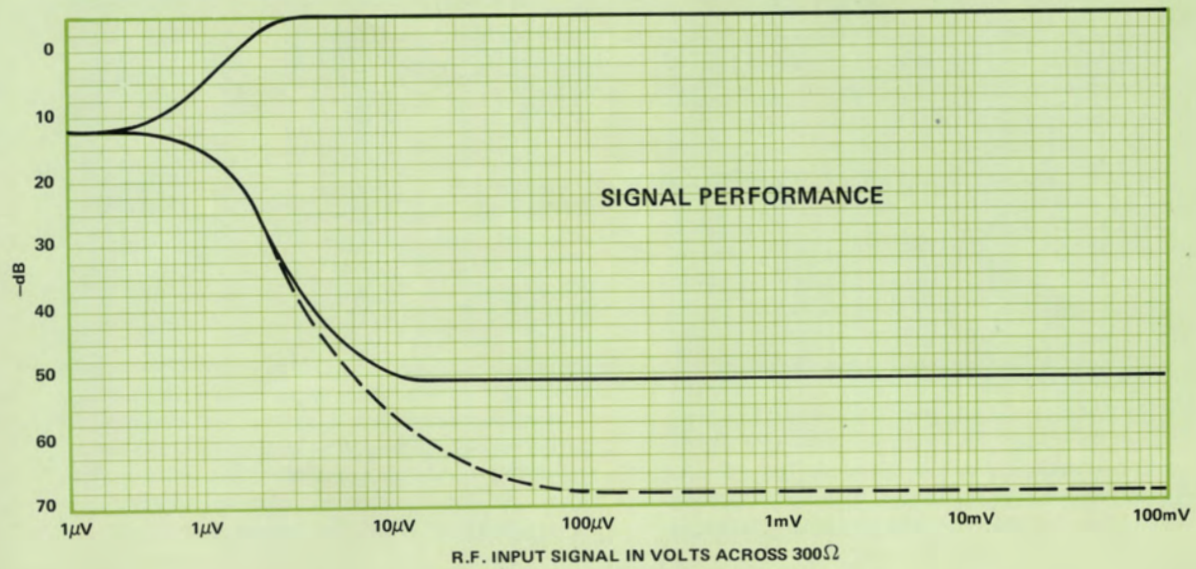
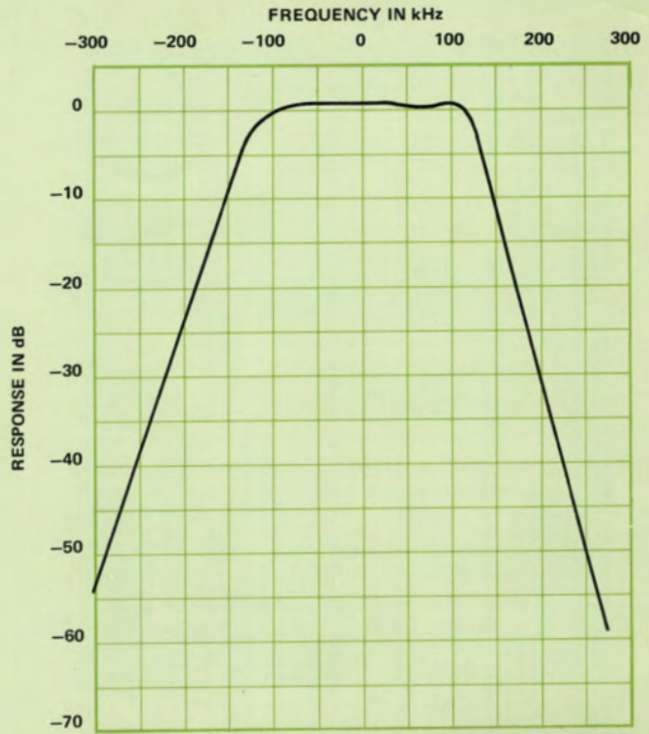
FINISH: Front panel: Anodized gold and black with special gold/teal panel nomenclature illumination.

CHASSIS: Chrome and black.

MOUNTING: McIntosh developed professional PANLOC.

WEIGHT: 24 pounds net, 36 pounds in shipping carton.

Performance Charts



AM FM

Technical Description

FM SECTION: This is divided into two separate modular sections:

- A. The 100 MHz Radio Frequency (RF) Section. This section houses the complete FM-RF front-end and part of the AM-RF circuits. A special, four section, variable tuning capacitor provides a high degree of RF selectivity and excellent spurious response rejection. The problem of image rejection has been greatly reduced in the RF section of the MR 73.

The two stage parallel-fed-cascode junction field effect transistor (JFET) RF amplifier gives better sensitivity and higher gain than conventional one-stage amplifiers. The use of JFET's helps to further reduce the problem of front end overload in strong signal areas.

A mixer using JFET has been designed for high sensitivity and freedom from overload. Low temperature coefficient components have been designed into the FM local oscillator to prevent frequency drift. The frequency stability inherent in the local oscillator makes automatic frequency control (AFC) unnecessary. The rate of drift of the local oscillator is less than ten parts per million per degree centigrade.

Both the FM and AM-RF front ends have been designed in the same completely encased metal modules. This design gives protection against radiation or interference. The RF circuits of the MR 73 exceed the FCC requirements for suppression of oscillator radiation.

The MR 73 has antenna connections for either 300 ohm twin lead transmission line or 75 ohm coaxial cable. The normal input impedance of the first RF amplifier is 75 ohms. Impedance match to 300 ohms is provided by a McIntosh designed balun transformer which has negligible losses. Connections for a 300 ohm line are made with new push type terminals. No tools are required. A type F male connector is furnished for 75 ohm coaxial cable.

For greater signal transfer and lower distortion, a special matching transformer has been designed to interface the FM-RF to the FM-IF amplifier. This matching transformer considerably enhances the linear phase characteristics of the IF amplifier.

- B. The FM-IF and Detector Section. The FM-IF and Detector design required extended engineering time and testing and uses the latest concepts in integrated circuits and crystal filters. The FM-IF consists of two integrated circuits and two phase linear crystal filters. They combine to give a total gain of over 120 dB (the signal is amplified to over 1,000,000 times its original level). The response curve has a nearly flat top with linear phase characteristics. The skirts of the response curve are very steep. The maximum width is 240 kHz at -3.0 dB and 400 kHz at -60 dB. The response curve is symmetrical each side of the center frequency. The crystal filters are permanently sealed and do not require adjusting. The IF cannot drift nor vibrate out of adjustment.

Each of the two integrated circuits used in the FM-IF of the MR 73 contain 16 transistors, 3 zener diodes, 5 diodes and 23 resistors, all on a single monolithic silicon chip.

The exceptionally high gain of the two integrated circuits assumes "hard limiting" at very low levels of input signals.

A "phase" or "Foster Seeley" discriminator has been designed to complement the integrated circuit IF section. The IF section has exceptionally high gain with hard limiting characteristics. It develops a capture ratio that is very low. The detected output signal of the discriminator is extremely low in distortion content. De-emphasis of the discriminator output restores the frequency amplitude characteristics to the same level they were before transmission.

- C. FM Stereo Multiplex Section. McIntosh Laboratory has developed a special detecting circuit in the multiplex section. A particular advantage of this circuit is the elimination of the critical adjustments necessary with commonly used matrixing circuits. The circuit detects the L-R

sidebands, then automatically matrixes the recovered information with the L + R main carrier signal. This yields the left and right program output with maximum separation.

The 19 kHz pilot signal is filtered from the composite stereo input signal, amplified by a special limiting amplifier, doubled to the 38 kHz carrier frequency, and then amplified again by a limiting amplifier. The composite signal minus the 19 kHz pilot is combined with the 38 kHz carrier signal. The new combination of signals is fed to the special detector circuit mentioned above. Balanced full wave detectors are used to cancel the 38 kHz components in the output.

The SCA (Subsidiary Communication Authorization) signal must be removed from the composite output. This is accomplished by the use of a new "Image Parameter" band elimination filter that has been computer designed. The SCA filter rejects SCA signals without impairing stereo performance. FM muting in the MR 73 operates by detecting ultra-sonic noise which is present when tuning between stations or when receiving a weak station. The muting circuit can be activated or defeated by the use of the muting switch on the front panel. The level of muting desired can be adjusted by the muting level control on the top panel. Varying the muting control adjusts the threshold at which the muting takes effect. When the 19 kHz carrier of a stereo signal is received, the automatic FM stereo switching circuit activates the multiplex decoding circuit. This lights the stereo indicator. The circuit switching is all done electronically with no clicks. The automatic stereo switching can be defeated by turning the mode selector switch to FM MONO. (In this position the stereo indicator will still light to indicate the presence of a stereo signal.) On monophonic transmissions the stereo switching is inactive at all times, assuring a greater signal to noise ratio. The stereo switching circuit has been designed so that noise will not activate it.

AM SECTION

Metal oxide silicon field effect transistors are used in the AM section. McIntosh engineering continuously pushes the limit of "the state of the art" in electronic technology. An AM-RF amplifier circuit includes a three section variable tuning capacitor in the metal enclosed shielded module, which also houses the FM-RF front end. The AM-RF amplifier uses a dual-insulated gate MOSFET to obtain more overload protection against strong local stations than can be obtained with conventional bipolar transistors.

The AM-RF mixer is also a dual-insulated gate MOSFET. The use of MOSFET's in the RF amplifier and mixer provides the MR 73 with very little cross modulation (spurious response) and the image rejection is very good.

Three double tuned IF transformers are used to obtain a high degree of selectivity yet still allow good AM fidelity. A 10 kHz whistle filter has been incorporated at the output of the AM detector. Its purpose is to suppress heterodyning that occurs between adjacent AM carriers.

To increase the "pulling power" of the AM section of the MR 73, connect an external antenna at the rear apron of the unit by using a push connector. An internal transformer matches the external antenna to the input impedance of the AM front end. An optional highly sensitive loopstick antenna is also provided for local or strong stations. A switch on the back panel selects either loopstick or external antenna.

An AM sensitivity switch has been provided to decrease both the gain of the RF amplifier and the noise between stations.

AUDIO PREAMPLIFIER SECTION

The audio amplifier increases the level of the program adequate to drive a preamplifier or other accessory equipment. It consists of two, three transistor amplifiers, one for each channel. The design uses considerable negative feedback to help achieve low distortion, wide frequency response, and excellent stability. Each audio amplifier delivers 2.5 volts to the FIXED OUTPUT jacks at 600 ohms impedance. A second pair of outputs are available where level can be varied by the VOLUME control.

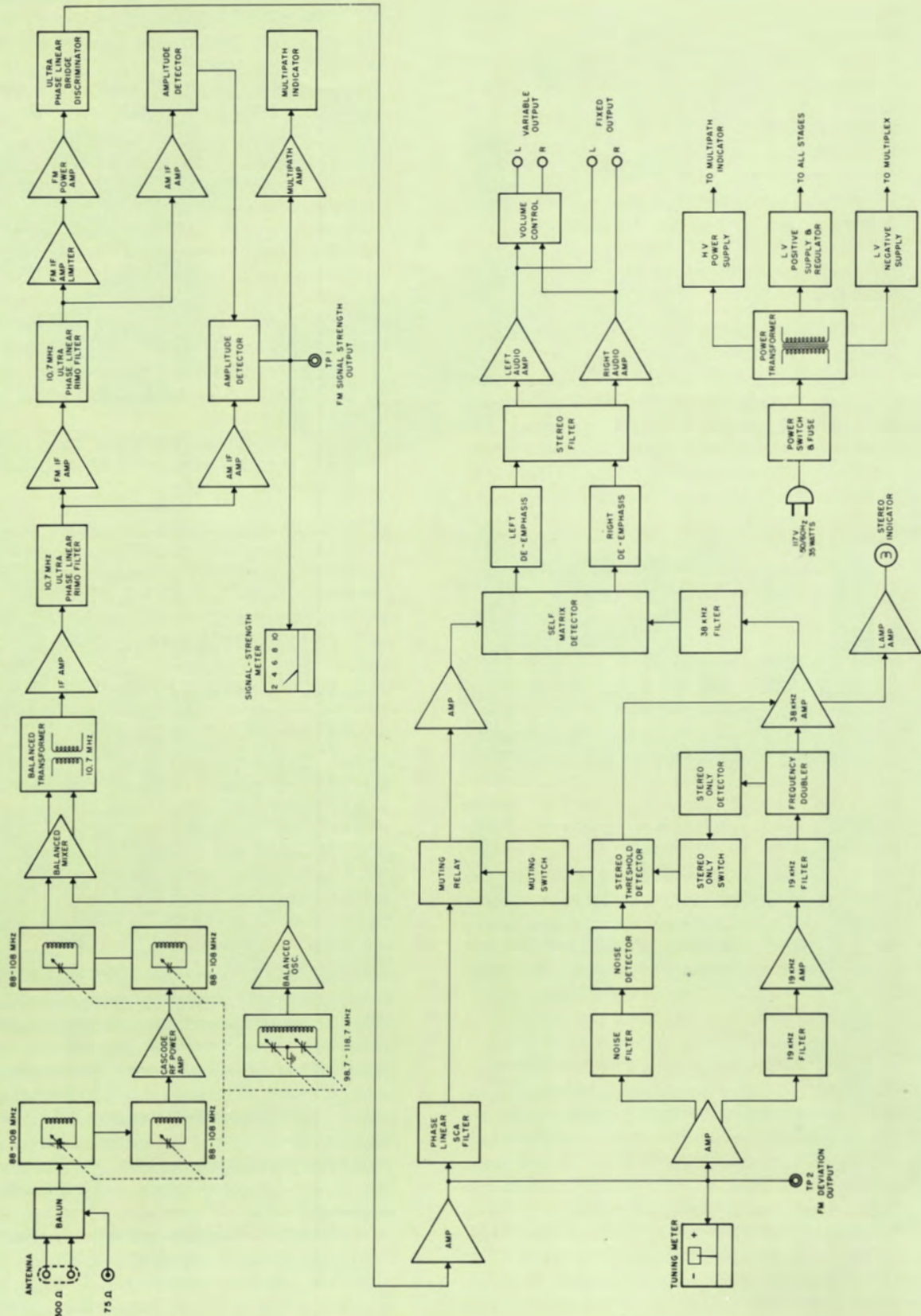
The STEREO FILTER is connected in the audio amplifier to reduce noise when listening to weak stereo stations. Careful design permits an ideal compromise between channel separation and noise rejection when using the STEREO FILTER.

POWER SUPPLY

Special design attention has been given to the power supply section. Two separate rectifier circuits are used. The first is a 16 volt regulated supply. The 16 volt regulator is very elaborate in design, using a specially selected transistor and associated circuit. The regulator uses electronic filtering to insure the lowest possible background hum level, maximum stability and extremely good regulation. All signal stages are powered from this regulator.

A half wave rectifier and filter supply the DC high voltage needed for the anode of the multipath indicator. The second power supply is a full wave rectifier which supplies DC to the multiplex indicator and to the voltage regulator.

Block Diagram



McIntosh

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