

# OWNER'S MANUAL

THE McINTOSH MR 74 SOLID STATE AM FM/FM STEREO TUNER





Your MR 74 AM FM/FM STEREO TUNER will give you many years of pleasant and satisfactory performance. If you have any questions please contact:

## CUSTOMER SERVICE

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

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.**

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

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## 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:

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. Damage by improper use or mishandling is not covered by the SERVICE CONTRACT.
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. For your protection McIntosh selects only dealers who have technical competence to guide purchasers fairly, and provide service when necessary. To receive the SERVICE CONTRACT your purchase must be made from a McIntosh franchised dealer.
6. Your completely filled in application for a SERVICE CONTRACT must be postmarked within 30 days of the date of purchase of the instrument.
7. 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.



It is recommended that the MR 74 tuner be mounted in a normal or horizontal position. However, with adequate ventilation the tuner can be mounted in any position.

Adequate ventilation extends the trouble-free life of electronic instruments. It is generally found that each 18° F rise in operating 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 benefits of adequate ventilation is longer, trouble-free life.

The MR 74 tuner requires a mounting space that is at least 15 inches deep, 17½ inches wide and 6 inches high. Provide additional space for the air flow across the bottom of the tuner and a means for warm air to escape at the top.

Remove the tuner, shelf brackets, parts bag and mounting template from the carton. Remove tuner from the plastic bag and place the tuner upside down on the shipping pallet, then remove the four plastic feet fastened to the bottom of the chassis.

The installation may be accomplished in six steps:

1. POSITION TEMPLATE AND MARK

Position the plastic mounting template over the area of the cabinet panel where the MR 74 is to be installed. Be sure that the edges of the template clear any shelves, partitions or existing equip-

ment located behind the panel. With the template in place mark the six "A" and "B" holes and four small holes locating the corners of the cutout. Next, join the four corner marks with pencil lines; the edge of the template may be used as a straight edge.

2. DRILL HOLES

Holding a drill perpendicularly to the panel, drill the six "A" and "B" holes using a 3/16 inch drill.

**THE SIX HOLES MUST BE DRILLED BEFORE MAKING THE CUTOUT.**

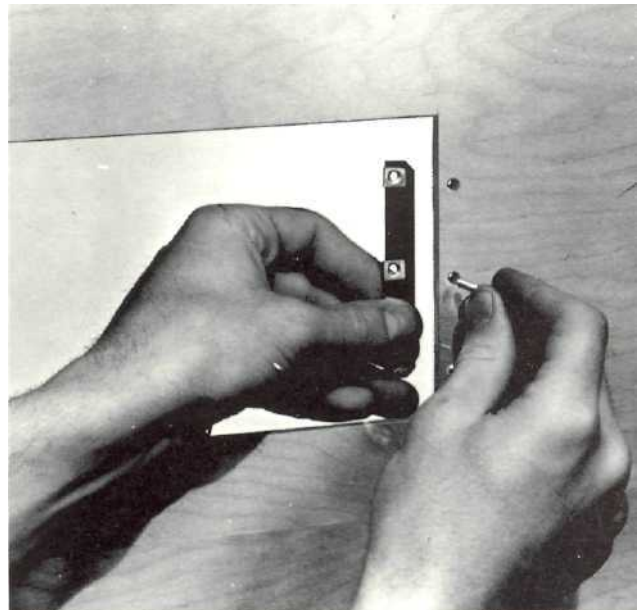
3. SAW CUTOUT

Using a saw carefully cut the rectangular opening on **the inside** of the pencil lines.

4. SECURE MOUNTING STRIPS

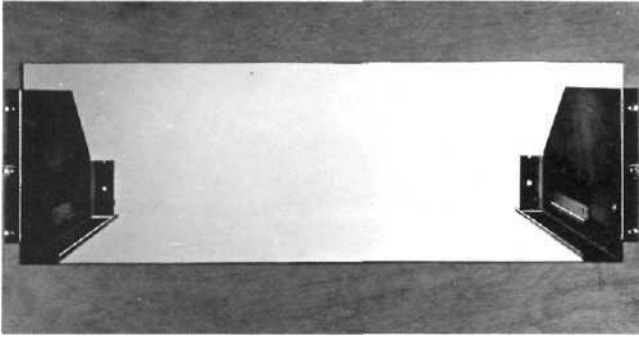
Secure mounting strips (supplied in the hardware package) on the inside of the cabinet panel.

Insert two screws (supplied in the hardware package) into the center holes ("B" holes on the template). Use the ¾-inch long screws for panels under ½-inch thick or **1¼-inch** screws for panels ½-inch thick or over. Place a mounting strip on the back of the cabinet panel as shown. Align it with the three holes in the panel and tighten the screw. The screw head should pull slightly into the wood panel. Attach the other mounting strip by repeating the procedure.



5. MOUNT PANLOC SHELF BRACKETS

Attach the Panloc shelf brackets to the cabinet panel using four screws of the proper length. Place the template over the mounting screws. The screws should be centered on the "A" and "B" holes in the template. If necessary, loosen the screws and push the mounting brackets into alignment then retighten.

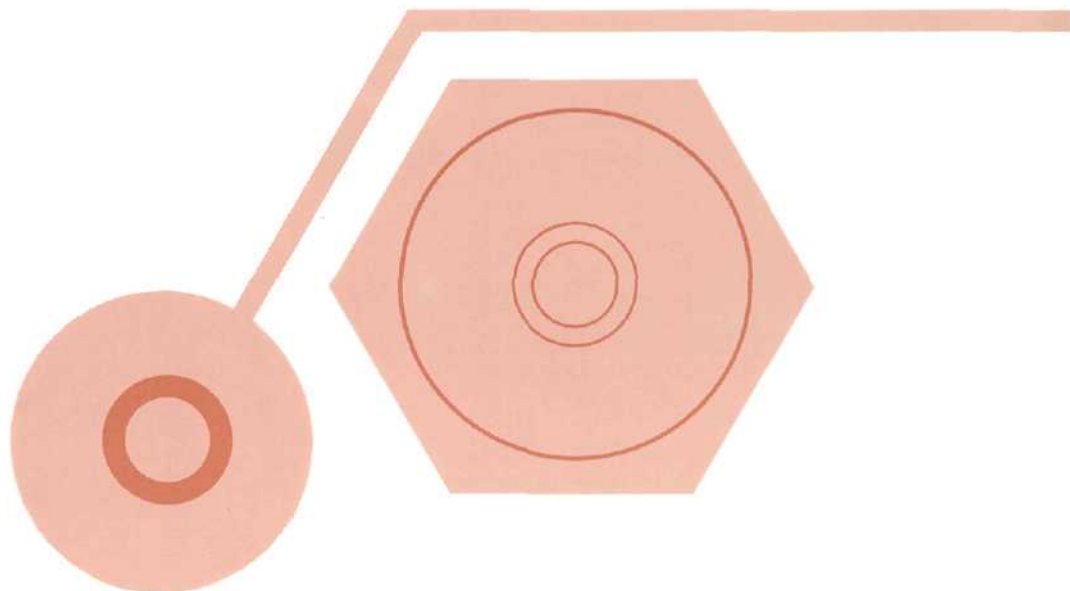


#### 6. INSTALL THE UNIT

Thread the power cord through the opening on the cabinet panel. Carefully slide the instrument into the opening so the rails on the bottom engage the track on 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 until its front panel is flush with the cabinet panel. At the bottom front corners of the instrument are the PANLOC buttons. Depressing the PANLOC buttons will lock the instrument firmly in the cabinet. Depressing the PANLOC buttons a second time will release the instrument. You can then slide the instrument forward to the adjust position. Depressing the adjust position latches will allow the instrument to be removed from the cabinet.



# How to Connect



## AUDIO OUTPUTS

Use the FIXED OUTPUT jacks to connect to a stereo control preamplifier or other equipment 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 74 with other equipment. The length of the cable is limited by the capacity of the cable. The total capacity must not exceed 1600 pF. For instance: cables with a capacity of 32 pF per foot may be 50 feet long; 16 pF per foot cable may be 100 feet long.

Use the FRONT PANEL CONTROLLED jacks to connect to equipment such as power amplifiers or tape recorders where control of volume at the tuner is desired. The load impedance connected to FRONT PANEL CONTROLLED jacks should not be less than 10,000 ohms. There is no difference in the signal quality or maximum output levels available at either pair of output jacks.

## CONNECTING AN FM ANTENNA

One of three antenna systems can be used: (1) an outdoor FM antenna, (2) an all channel (UHF-VHF-TV) antenna, or (3) the indoor dipole supplied with the MR 74.

An outdoor antenna is recommended for optimum performance in all areas. In fringe 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 300Ω ANT (red) terminals.

An UHF-VHF-TV antenna is often effective but the antenna must be designed for both FM and TV reception. Connect the leads from the UHF-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 300Ω 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 this antenna next to other wires or metal objects. This antenna may not prove effective in houses having metal siding or metal-clad insulation.

## AM ANTENNA

A high-quality loop-stick antenna is provided. It can be rotated through nearly 180° in all directions for maximum performance, optimum signal reception or minimum interference. With this mobility you will not suffer loss of sensitivity regardless of the angle at which the instrument is mounted. A back panel antenna jack is provided for connecting an external antenna if desired.

## CONNECTING AN 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 a ground rod sunk into the ground.

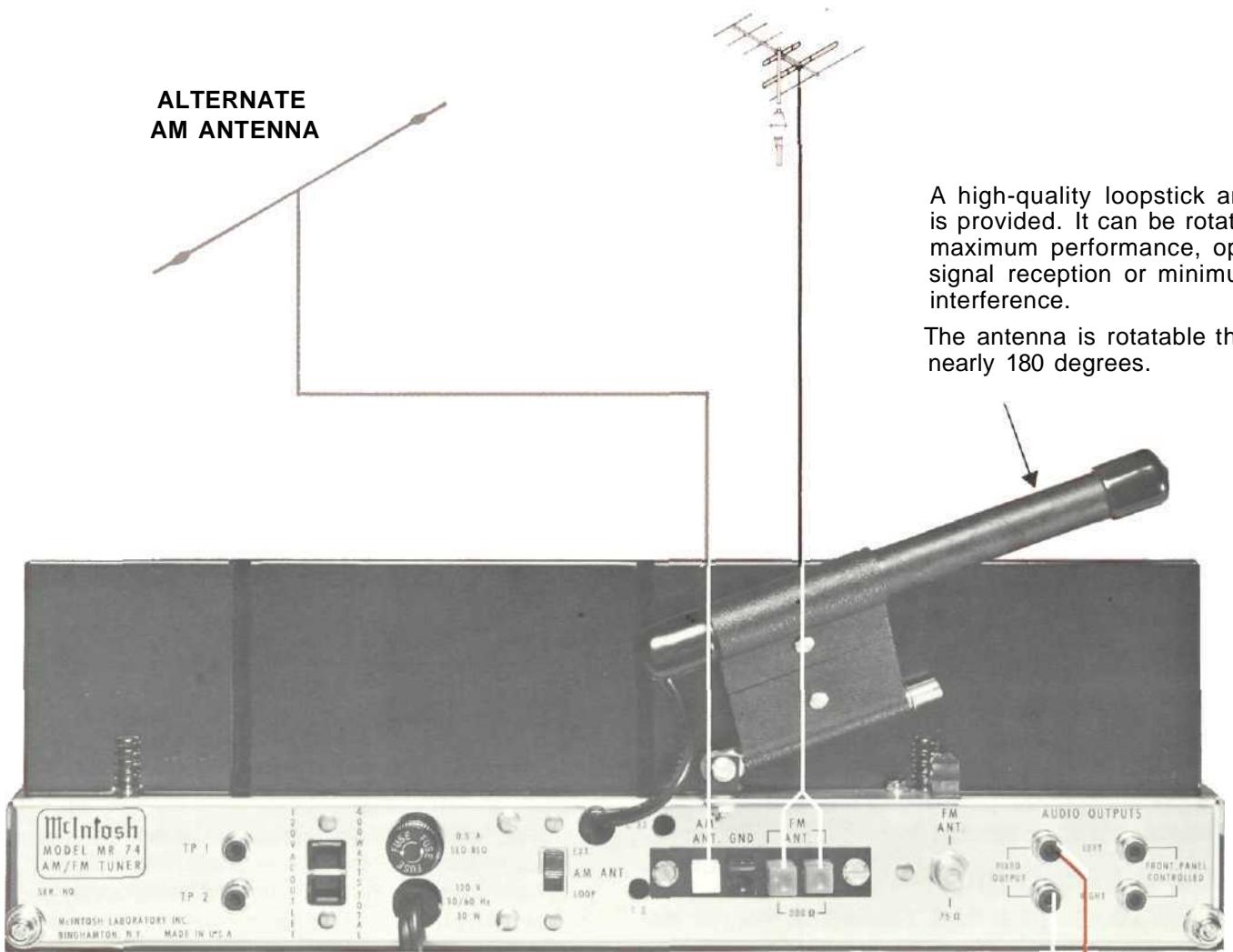
Connect the lead-in wire to the AM ANT push connector on the antenna terminal strip on the back panel. Set the AM ANT slide switch to EXT position.

**FM ANTENNA**

**ALTERNATE  
AM ANTENNA**

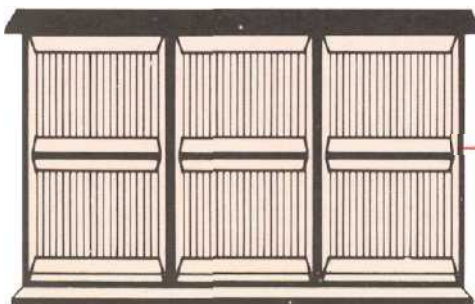
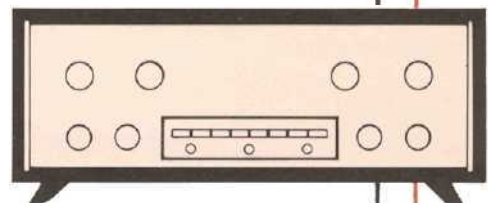
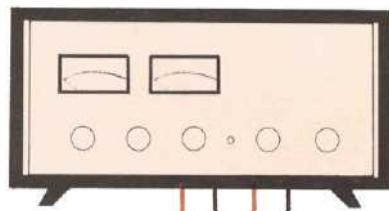
A high-quality loopstick antenna is provided. It can be rotated for maximum performance, optimum signal reception or minimum interference.

The antenna is rotatable through nearly 180 degrees.

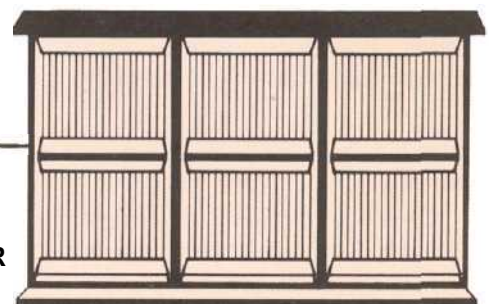


**POWER AMPLIFIER**

**PREAMPLIFIER**



**LEFT SPEAKER**



**RIGHT SPEAKER**

# Back Panel information

## TP1 and TP2

Test points TP1 and TP2 are provided for tuner circuit alignment. They are also used in conjunction with the McIntosh Maximum Performance Indicator.

## 120 AC POWER OUTLET

Provides 120 volt AC power up to 400 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 120 volt, 50 to 60 Hz power line receptacle. The power used by the MR 74 is 30 watts.

## FUSE

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

## AM ANT SWITCH

Adjust the MR 74 AM ANT switch to match the particular type of AM antenna used. EXT position is used for an outdoor antenna. 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 FIXED OUTPUT pair of AUDIO OUTPUT jacks provides audio signals unaffected by the MR 74 front panel VOLUME control. Use these output jacks to connect the tuner to a stereo preamplifier or other equipment which has its own master volume control.

The FRONT PANEL CONTROLLED pair of AUDIO OUTPUT jacks provides audio signal controlled by the MR 74 front panel VOLUME control. Use these output jacks to connect to external power amplifier, tape recorders, or any equipment which requires front panel control of tuner output volume.

# Front Panel information

## TUNING DIAL

The MR 74 has three dial scales:

1. AM — Marked 55 to 160
2. FM — Marked 88 to 108
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 74 has four indicators on the dial panel: STEREO indicator, MULTIPATH indicator, SIGNAL STRENGTH meter, and the FM 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 FM antenna positioning.

An electron ray indicator is used to show multipath reception. 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.

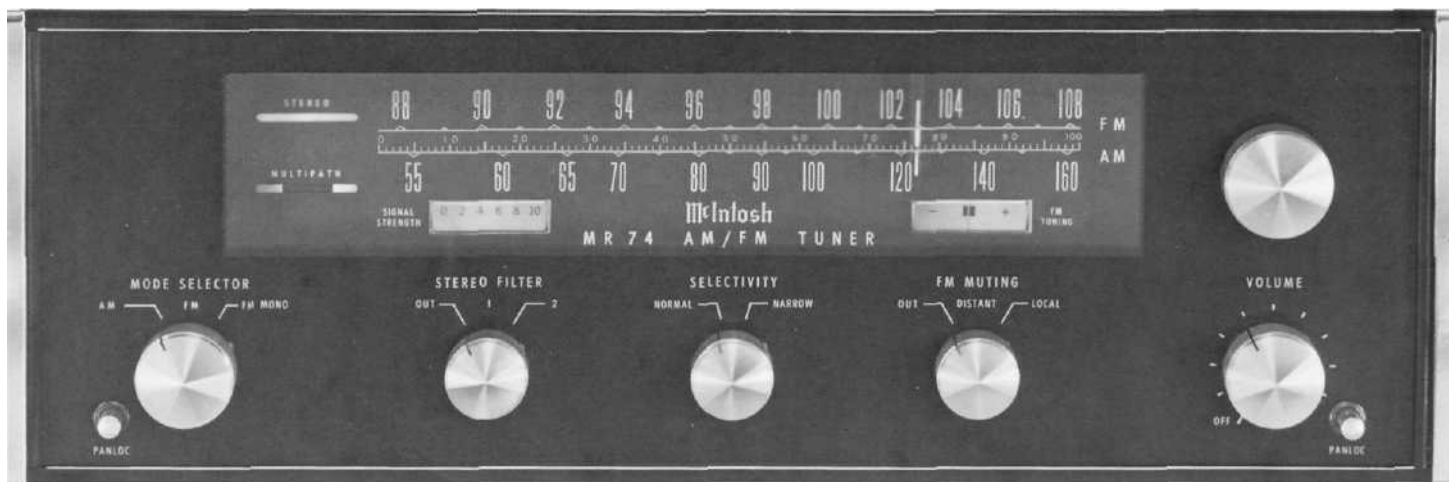
## SIGNAL STRENGTH METER

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 meter is independent of station signal strength.

### MODE SELECTOR

Selects any one of three sources:

**AM**— Connects the AM tuner section of the MR 74 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 74 will automatically switch to stereo operation. If mono broadcasting is resumed the MR 74 will automatically switch to mono.

**FM-MONO** — Connects the FM tuner sections of the MR 74 to the output jacks. This position bypasses the automatic stereo switching. The stereo indicator will light when a station is transmitting stereo, but all programs are heard monophonically.

### STEREO FILTER

The STEREO FILTER reduces noise on weak stereo stations.

Position 1 reduces noise by approximately 10 dB.

Position 2 reduces noise by approximately 20 dB.

### SELECTIVITY

In **NORMAL**, a very low distortion 10-pole filter is connected to the IF system. Use this position of the SELECTIVITY switch for normal reception conditions.

In **NARROW**, a sharp 6-pole filter is added to the low-distortion 10-pole filter. This yields a low-distortion, highly selective 16-pole composite filter. Use this switch position to reduce interference on distant stations.

### FM MUTING

Muting suppresses the background noise and hiss normally heard between stations. Turn the control to either **LOCAL** or **DISTANT** 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 to allow FM tuning with the noise and interference present.

### 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 fully counterclockwise turns the AC power to the MR 74 **OFF**.

### PANLOC BUTTONS

At the bottom of the front panel corners are the **PANLOC** buttons. After a tuner is installed on the **PANLOC** brackets, pressing the **PANLOC** buttons will lock the tuner firmly in position. Depressing the **PANLOC** buttons 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 is the **DIAL SCALE INTENSITY** switch. Adjust the brightness of the dial lights by means of this switch. Set the switch to **BRIGHT** for maximum dial light; set the switch to **DIM** for subdued dial light.

# Listening to Your MR 74

## LISTENING TO AM

Turn the MODE SELECTOR switch to AM and the SELECTIVITY switch to NORMAL. 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 to monophonic FM. In this position all programs will be mono. The stereo light will be seen on stereo stations but the program heard will be mono.

Set the STEREO FILTER switch to OUT

Set the MUTING switch to OUT

Set the SELECTIVITY switch to NORMAL

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 weak station that does not over-ride the background noise. With muting in operation signals that are marginal are automatically suppressed. To hear these weaker stations, set the FM MUTING switch to OUT. Usually

the listening quality will be rather poor due to the background noise.

If an antenna rotator is used, 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

Turn the MODE SELECTOR to FM

Set the STEREO FILTER switch to OUT

Set the MUTING switch to OUT

Set the SELECTIVITY switch to NORMAL

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.

When the STEREO indicator is lighted, the station is broadcasting a 19,000 Hz carrier for stereo and the MR 74 will automatically switch to stereo. If a station is broadcasting a monophonic FM program, the STEREO indicator will remain off and the tuner will automatically switch to mono.

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



# Performance Limits

**PERFORMANCE GUARANTEE** — Performance limits are the maximum deviation from perfection permitted for a McIntosh instrument. We promise you that the MR 74 you buy must be capable of performance at or exceeding these limits or you get your money back. McIntosh is the only manufacturer that makes this guarantee.

## FM SECTION

TUNING RANGE: 88 to 108 MHz  
ANTENNA INPUTS: 300 ohms balanced; 75 ohms unbalanced  
INTERMEDIATE FREQUENCY (IF): 10.7 MHz  
SENSITIVITY: 2.5  $\mu$ V at 100% modulation ( $\pm$  kHz deviation) for 3% total noise and harmonic distortion  
SIGNAL TO NOISE RATIO: 70 dB below 100% modulation  
HARMONIC DISTORTION: MONO — 0.3% at 100% modulation + 75 kHz deviation; STEREO — 0.5% at 100% modulation  
DRIFT: 25,000 Hz for the first two minutes; thereafter 5,000 Hz at 25°C in 24 hours  
FREQUENCY RESPONSE:  $\pm$  1 dB 20 Hz to 15,000 Hz with standard de-emphasis (75  $\mu$  sec.)  
CAPTURE RATIO: 1.5 dB minimum

### SELECTIVITY:

Switch Setting	NORMAL	NARROW
Adjacent Channel:	6 dB	15 dB
Alternate Channel:	68 dB	88 dB

SPURIOUS REJECTION: 90 dB  
IMAGE REJECTION: 95 dB; 88 to 108 MHz (IHF)  
MUTING: 50 dB noise reduction in LOCAL position  
MUTING THRESHOLD: DISTANT position 3  $\mu$ V; LOCAL position 10  $\mu$ V  
SCA FILTER: 50 dB down from 67 kHz; 275 dB per octave slope  
STEREO SEPARATION: 35 dB at 1,000 Hz

STEREO FILTER: 10 dB noise reduction in Position 1  
20 dB noise reduction in Position 2

## AM SECTION

SENSITIVITY: 75  $\mu$ V (external ant.)  
SIGNAL TO NOISE RATIO: 55 dB at 100% modulation; 45 dB minimum  
HARMONIC DISTORTION: 1% at 30% modulation  
SELECTIVITY, ADJACENT CHANNEL: 35 dB in NORMAL position; 45 dB in NARROW position  
IMAGE REJECTION: 65 dB 540 kHz to 1600 kHz  
FREQUENCY RESPONSE: SELECTIVITY SWITCH IN  
NORMAL position 3500 Hz, 6 dB down  
NARROW position 2100 Hz, 6 dB down  
All tuner performance limits were measured with selectivity switch set at normal; unless otherwise stated

## GENERAL

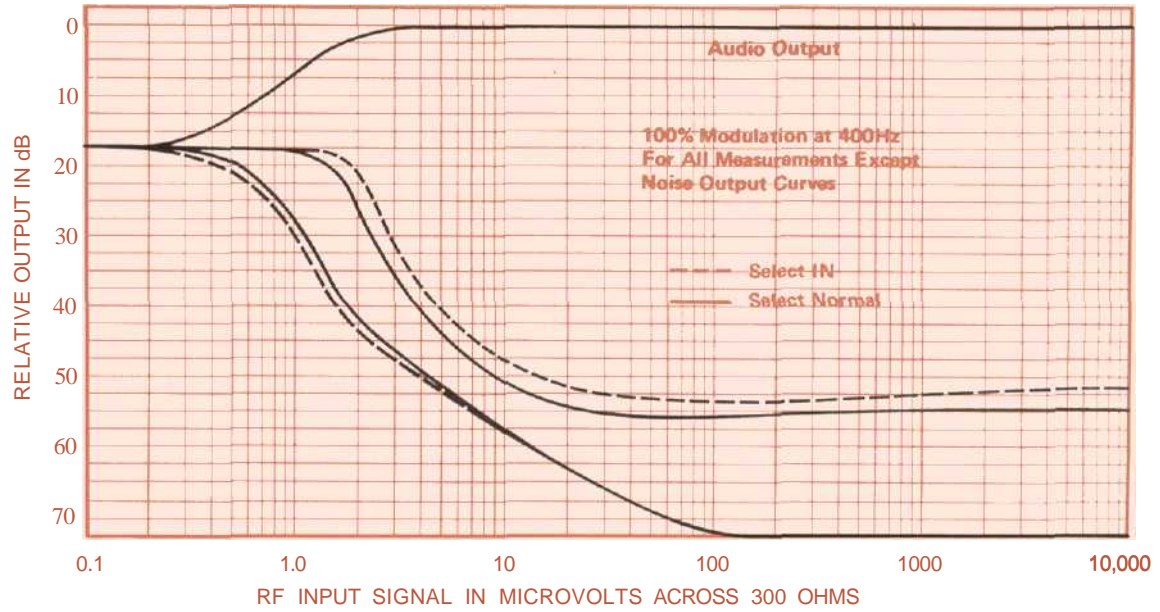
AUDIO OUTPUT: front panel controlled: 2.5 volts into 47,000 ohms. Fixed Output: 2.5 volts into 47,000 ohms; 1.0 volt into 600 ohms  
POWER REQUIREMENTS: 120 volts, 50/60 Hz, 30 watts  
SEMICONDUCTOR COMPLEMENT: 5 FETs, 17 transistors, 2 ICs, 30 diodes, 1 indicator tube

## MECHANICAL INFORMATION

SIZE: Front panel: 16 inches wide (40.64 cm) by 5-7/16 inches high (13.81 cm); Chassis: 15 inches wide (38.1 cm) by 13 inches deep (33.02 cm), including PANLOC shelf and back panel connectors; Knob clearance: 1½ inches (3.81 cm) in front of mounting panel  
WEIGHT: 25 pounds (11.34 kg) net; 37 pounds (16.78 kg) in shipping carton  
FINISH: Front Panel: Anodized gold and black with special gold/teal panel nomenclature illumination; Chassis: Chrome and black  
MOUNTING: McIntosh developed professional PAN-LOC

# Performance Charts

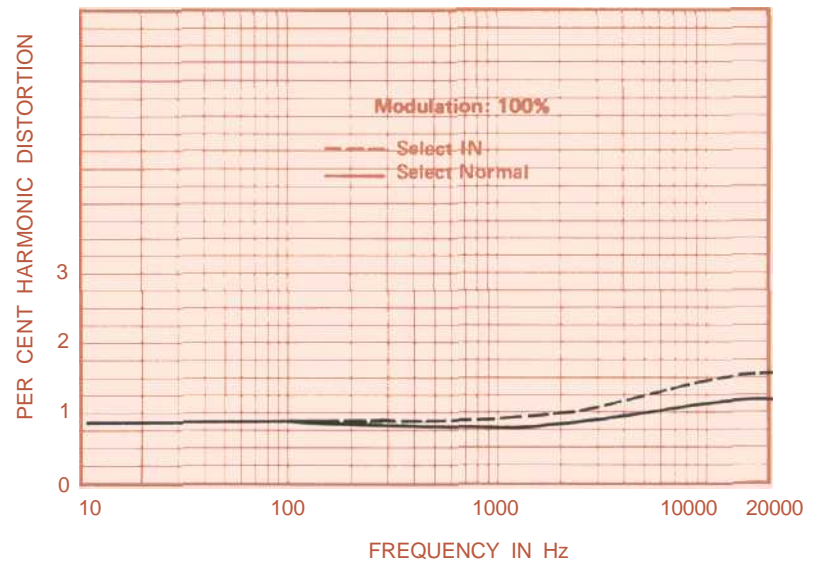
## FM SIGNAL PERFORMANCE



## FM - IF CHARACTERISTIC

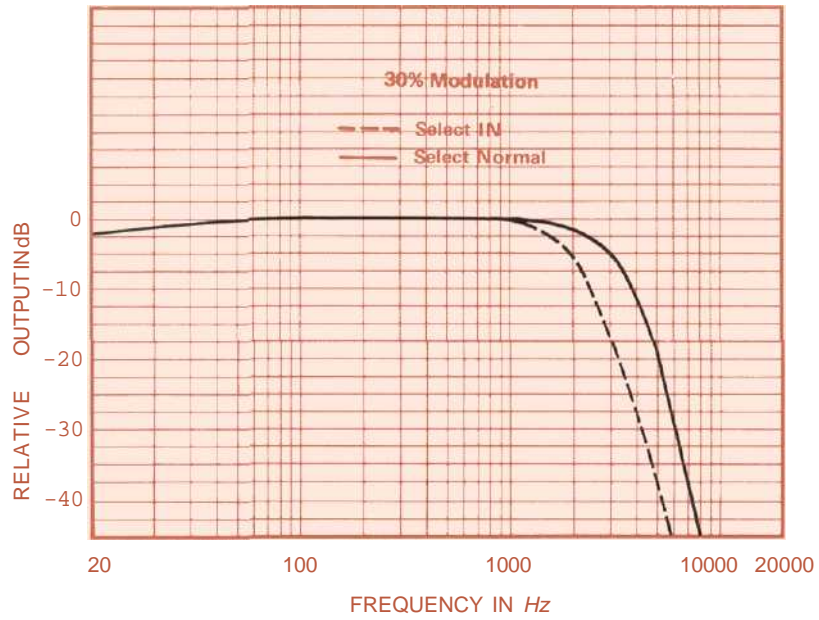


## FM HARMONIC DISTORTION

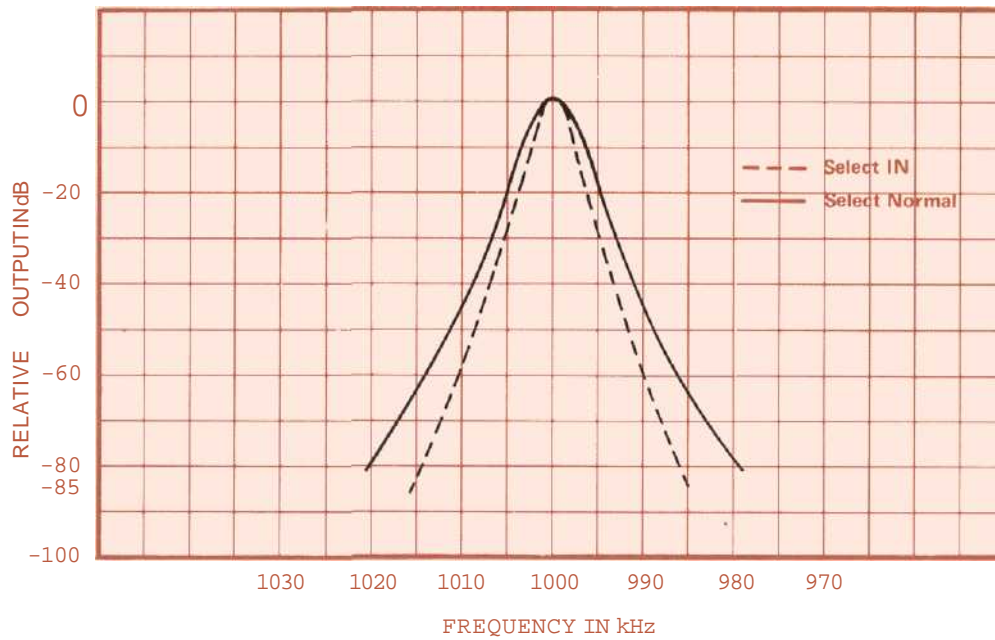




### AM FREQUENCY RESPONSE



### AM SELECTIVITY AT 1000 kHz





# AM FM STEREO FM Technical Description

## TUNING MECHANISM AND DIAL DRIVE

In the MR 74, unique design and careful manufacture of the mechanical dial drive assembly gives smooth flywheel tuning.

By controlling the relationship of mass and mechanical resistance, and by dividing the workloads in the dial drive system, it becomes nearly impossible to detect any backlash. Yet, the entire dial drive is a model of mechanical stability.

For added ease and increased tuning accuracy, a section of the dial pointer is illuminated.

### FM

The Radio Frequency (RF) section houses the complete FM-RF front-end and part of the AM-RF circuit.

A seven-section variable capacitor is the heart of the RF section. Four sections of the variable capacitor are in the FM front end and the remaining three

are in the AM section. By interleaving the sections (FM-AM-FM-etc.) spurious responses and oscillator pulling are significantly reduced. The four FM sections of the variable tuning capacitor provide a high degree of RF selectivity and excellent spurious rejection. Use of the latest "state of the art" field effect transistors with a well-designed variable tuning capacitor provides an excellent RF front end.

All of the RF circuits, including the selectivity circuit and the AM sections of the variable capacitor are encased in a metal module. Each FM-RF section is isolated in a separate compartment by metal shielding. Careful design and manufacturing increase the protection against radiation and interference. The MR 74 exceeds the FCC requirements for suppression of local oscillator radiation.

A dual insulated gate metal oxide silicon field effect transistor (MOSFET) is used as first and second RF amplifier. Each gate of the transistor is internally protected by back-to-back diodes against incoming transients. Use of MOSFET's greatly reduces the cross-modulation products over a wide dynamic range. A wide dynamic range permits the input circuits to accept extremely strong signals without overload. Since both RF amplifiers have insulated gate configurations, external neutralization is not required. This design results in a very stable RF amplifier circuit.

Low temperature coefficient components for the FM local oscillator 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.

The mixer design uses a junction field effect transistor (JFET) for high sensitivity and freedom from overload. The mixer delivers the composite FM signal at the 10.7 MHz intermediate frequency. The path of the IF signal is controlled by the front panel SELECTIVITY selector switch.

At the NORMAL position, the SELECTIVITY switch directs the signal through an IF preamplifier stage that uses a JFET and a double-tuned IF transformer. The signal then goes to the FM-IF and discriminator module for further amplification. Setting the SELECTIVITY selector switch to NARROW routes the signal through two double-tuned transformers, a ceramic filter network, and a single-gate MOSFET. The sides of the IF curve are compressed by this circuit narrowing the IF bandpass. In this mode of operation weak stations adjacent to strong stations can be tuned.

Antenna connections for either 300 ohm twin lead transmission line or 75 ohm coaxial cable are provided on the back panel. The normal input impedance of the RF amplifier is 75 ohms. Impedance match to 300 ohms is provided by a negligible loss balun transformer designed by McIntosh. Connec-

tions for both 300 ohm twin lead and 75 ohm coaxial cable are made with push type terminals.

### **FM-IF AND DISCRIMINATOR**

The MR 74 uses linear-phase IF filters. The IF filters have equal time delay in their pass band region. Any error in time delay causes FM distortion. All other IF filters have delay distortion, some as much as 100% of the 10.7 MHz transit delay. The MR 74 has less than 1.0% delay distortion from antenna input to discriminator output. This makes possible the overall low distortion performance limit for the FM tuner and multiplex section.

Amplification of the IF signal is provided by two high gain integrated circuits, each containing 16 transistors, 3 zener diodes, 5 diodes, and 23 resistors, all on a single monolithic silicon chip. The exceptionally high gain of the integrated circuit assures "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 detected output signal of the discriminator is extremely low in distortion content.

Paralleling the main signal path through the FM-IF and detector module, a secondary amplifying and de-modulating process is used to activate the signal strength meter and to provide test point TP1 with a signal to be used with the McIntosh Maximum Performance Indicator.

### **FM STEREO MULTIPLEX**

The 19,000 Hz pilot signal, broadcast by an FM station, is filtered from the composite stereo input signal, amplified by a special limiting amplifier, doubled to the 38,000 Hz carrier frequency, and then amplified again by a limiting amplifier. The composite signal minus the 19,000 Hz pilot is combined with the 38,000 Hz 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 38,000 Hz components in the output. The SCA (Subsidiary Communication Authorization) signal is 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.

When the 19,000 Hz 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. The automatic stereo switching can be defeated by setting 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, assuring optimum signal to noise ratio. The stereo switching circuit has been designed so that noise will not activate it.

FM muting in the MR 74 operates by detecting ultra-sonic noise. When noise is present the muting circuit can be activated or defeated by the use of the muting switch on the front panel.

The STEREO FILTER is provided to reduce noise when listening to weak stereo stations. Careful design permits an ideal compromise between channel separation and noise rejection.

### **AM**

The AM-RF amplifier circuit includes a three section variable tuning capacitor in the metal enclosed shielded RF module which also houses the FM-RF front end. A three section variable capacitor is used for greatest spurious rejection. The RF amplifier is unique. The circuit has constant sensitivity, constant selectivity, and high image rejection across the complete AM band. Ordinary AM-RF circuits cannot do all of these simultaneously. The circuit design achieves high sensitivity even at the low end of the band. Spurious, image, and intermediate frequency rejection are all superior. The same circuit delivers equal selectivity across the entire band.

In addition, there is no loss of audio frequency response at the low end of the band, common in AM receivers. Another advantage of the McIntosh circuit is freedom from cross modulation and overloading by strong local stations.

A high-quality loopstick antenna is provided. It can be rotated for maximum performance, optimum signal reception or minimum interference. In each MR 74, the loopsticks are individually tuned for optimum performance. After tuning, the loopstick is sealed. This custom matching of the loopstick to the AM-RF front end maximizes the performance of the loopstick antenna. The antenna is rotatable through nearly 180 degrees. With this mobility you will not suffer loss of sensitivity regardless of the angle at which the instrument is mounted. A back panel connector is provided for an external antenna. The antenna is coupled to the tuner through a carefully designed matching transformer which provides optimum performance regardless of antenna length.

To maintain the excellent image rejection and lack of spurious cross modulation of the AM-RF amplifier an autodyne converter circuit was used in producing the AM-IF signal.

AM-IF uses two double tuned IF transformers designed to obtain a high degree of selectivity yet allowing good audio fidelity. With the SELECTIVITY switch in NARROW, a narrow band ceramic filter is added to the AM-IF amplifier.

A 10,000 Hz active filter eliminates the 10,000 Hz whistle and irritating noise caused by an adjacent station. Because an active filter is used, the output level at 10,000 Hz, or the whistle frequency, is down over 20 dB or one hundredth of what it would be

without filtering. With the SELECTIVITY switch in NARROW position, the active filter cutoff frequency is lowered. The filter then effectively suppresses the 5,000 Hz whistle from nearby television receivers.

The AVC (automatic volume control) system was designed to prevent blasting when the AM is tuned through a strong signal. Distortion at low audio frequencies is minimized by using two AVC filter sections instead of the conventional one.

### AUDIO AMPLIFIER

The audio amplifier increases the level of the program adequate to drive a preamplifier or other accessory equipment. It consists of two, two-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. A second pair of outputs are available where level can be varied by the VOLUME control.

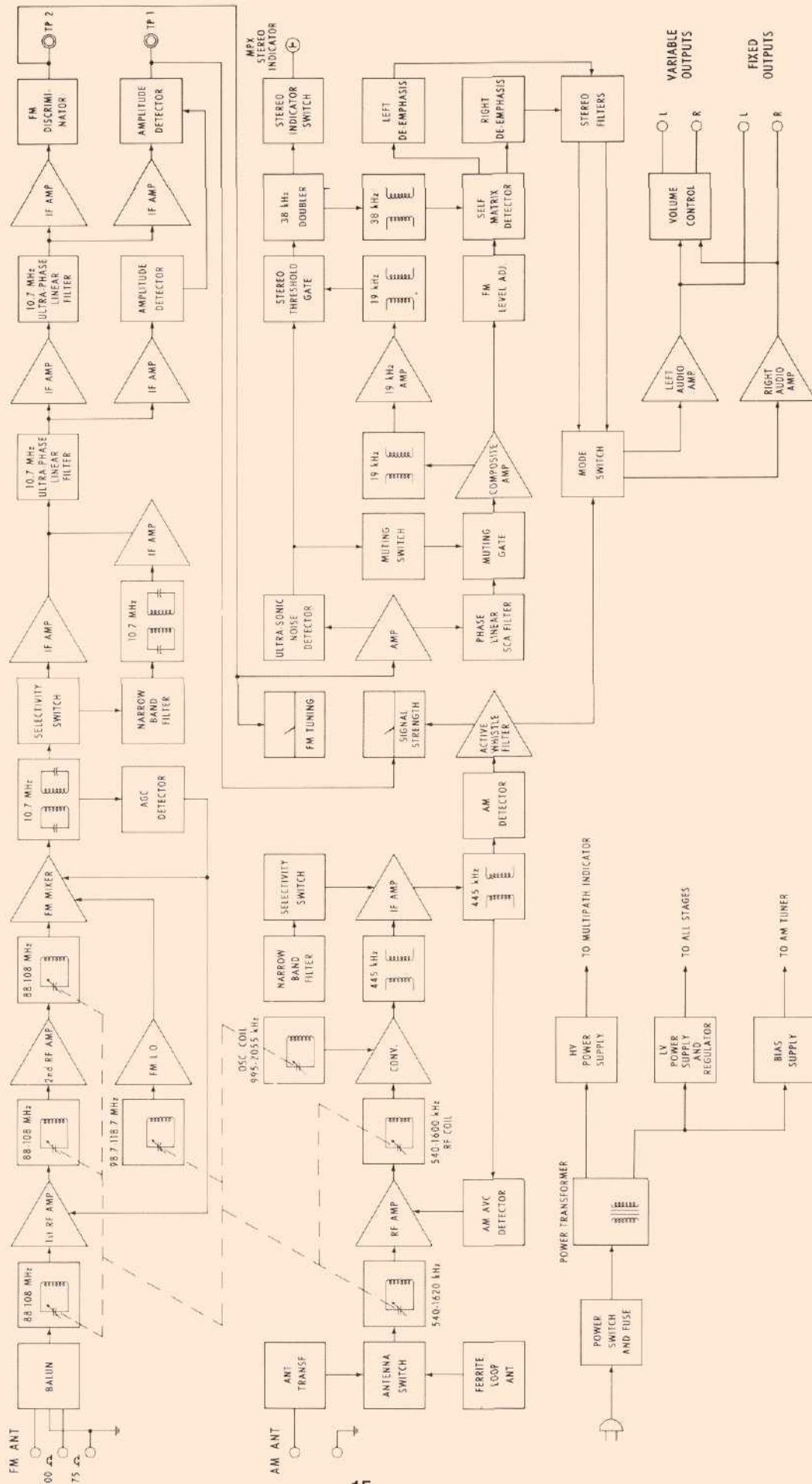
### POWER SUPPLY

Special design attention has been given to the power supply section. Three separate power supply circuits are used. The first is a 24 volt regulated supply. This 24 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.

The second circuit is a half wave rectifier and filter for the DC high voltage needed for the anode of the multipath indicator. The third power circuit is a half wave rectifier which supplies DC to the AM section.



# Block Diagram









# McIntosh

**McINTOSH LABORATORY INC.**

**2 CHAMBERS ST., BINGHAMTON, N. Y. 13903**

607-723-3512

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Printed in U.S.A.

038-839

BE112003