MAC 4275
AM/FM RECEIVER

CONTENTS
Performance Specifications .................. 2-3
Mechanical Views ................................ 4
Block Diagrams .................................. 5-6
Section Locations ................................ 7
Section 1 — Audio .............................. 8-13
Section 2 — Tuner ............................... 14-16
Alignment Procedure ......................... 19-20
Repacking Instructions ....................... 22

McIntosh Service Manual
Performance Specifications

AMPLIFIER SECTION
STEREO POWER OUTPUT
75 watts into 8 ohm loads or 100 watts into 4 ohm loads is the minimum sine wave continuous average power output per channel, from 20 to 20,000Hz, with both channels operating.

POWER BANDWIDTH
20 to 20,000Hz

TOTAL HARMONIC DISTORTION
0.03% maximum at any power level from 250 milliwatts to rated power per channel, 20 to 20,000Hz, both channels operating.

INTERMODULATION DISTORTION
0.03% maximum at any power level from 250 milliwatts to rated power per channel, for any combination of frequencies from 20 to 20,000Hz, with both channels operating.

FREQUENCY RESPONSE
-0.5 to +0.5dB from 20 to 20,000Hz at rated power.

INPUT SENSITIVITY
Phono (MC) 0.12mV
Phono (MM) 2.5mV produces rated output
Tape, Aux 250mV produces rated output
Power Amp 1.5V produces rated output

SIGNAL TO NOISE RATIO, A-WEIGHTED
Power Amp 105dB below rated output
Tape, Aux 95dB below rated output
Phono 90dB with 10mV input

MAXIMUM INPUT SIGNAL
Phono (MC) 4.1mV
Phono (MM) 80mV
High level 8V

INPUT IMPEDANCE
Phono (MC) 100 ohms
Phono (MM) 70k ohms
Tape, Aux 30k ohms
Power Amp 10k ohm

DAMPING FACTOR
Greater than 50 at 8 ohms

TAPE OUTPUT
Phono 250mV with rated input
Tape 250mV with rated input
Tuner 1.5V at 100Hz modulation (FM)

PROGRAM EQUALIZER
±12dB at 30, 750, and 10kHz

FM SECTION

USABLE SENSITIVITY
15.5dB which is 1.0uV across 75 ohms

50dB QUIETING SENSITIVITY
Mono 15.2dB which is 1.6uV across 75 ohms
Stereo 27dB which is 6uV across 75 ohms

SIGNAL TO NOISE RATIO
Mono 80dB
Stereo 75dB

FREQUENCY RESPONSE
Mono ±0.5, ±0.5dB from 20 to 15kHz
Stereo ±0.5, ±0.5dB from 20 to 15kHz

HARMONIC DISTORTION
Mono 0.15% at 100Hz
0.1% at 1k
0.1% at 10k
Stereo 0.1% at 100Hz
0.1% at 1k
0.2% at 10k

INTERMODULATION DISTORTION
Mono 0.1%
Stereo 0.2%

CAPTURE RATIO
1.5dB

ALTERNATE CHANNEL SELECTIVITY
±60dB

SPURIOUS RESPONSE
95dB

IMAGE RESPONSE
90dB

AM SUPPRESSION
60dB

STEREO SEPARATION
35dB at 100Hz
45dB at 1k
40dB at 10k

SCA REJECTION
65dB
AM SECTION

SENSITIVITY
25µV (External Antenna)

SIGNAL TO NOISE RATIO
50dB at 30% modulation
60dB at 100% modulation

HARMONIC DISTORTION
1.0% maximum at 30% modulation
(0.25 typical)

FREQUENCY RESPONSE
+0, -6dB to 300Hz to 3.5kHz

ADJACENT CHANNEL SELECTIVITY
50dB minimum at 8kHz

IMAGE REJECTION
50dB minimum

IF REJECTION
45dB minimum

Fig. 1 Rear View

GENERAL INFORMATION

SEMICONDUCTOR COMPLEMENT
78 Silicon Diodes
13 Tuning Devices
24 Light Emitting Diodes
7 Seven Segment LED Displays
59 Bipolar Transistors
3 Field Effect Transistors
36 Integrated Circuits

POWER REQUIREMENTS
120 volts, 50/60Hz, 60 to 575 watts

WEIGHT
25 pounds (11.3kg) net, 32 pounds
(14.5kg) in shipping carton.
Mechanical Views

Fig. 2 Top View

Fig. 3 Front View
Alignment

Procedure

FM ALIGNMENT

A. SYNTHESIZER FREQUENCY ADJUSTMENT
1. Connect a Frequency Counter between TP106 and ground.
2. Tune the Receiver to 88MHz.
3. Adjust C309 as the local oscillator frequency shown by the Frequency Counter reads 108,700MHz.

B. FRONT-END ALIGNMENT
1. TUNING VOLTAGE
   a. Connect a DMM to TP104.
   b. Tune the Receiver to 88MHz and adjust L5 if the voltage is not 3.5V +/-0.5V.
   c. Tune to 100MHz and check that the voltage is within 21 to 26 volts.

2. TRACKING ADJUSTMENT
   a. Connect the FM Generator to the 75 ohm antenna input, and a Detector Probe to Pin 1 of IC1E5 and ground. (See how to make the Detector Probe in figures 5 and 6 on page 35).
   b. Tune the receiver to 160MHz and adjust the generator so a waveform is displayed on the Oscilloscope.
   c. Adjust L2, C9, C15 and C14 for maximum waveform height.
   d. Tune to 200MHz and adjust the Generator so a waveform is displayed on the Oscilloscope.
   e. Adjust L1, L2, L3 and L4 for maximum waveform height.
   f. Repeat above steps a few times as necessary to obtain the maximum waveform height.

C. IF ADJUSTMENT
1. Tune the Receiver to 88MHz and adjust the Generator to display a curve on the Oscilloscope.
2. Adjust L3 in the front-end for maximum output, and L101 for a symmetrical output curve, using as little input as possible such as 2V at the antenna input.

D. DETECTOR ALIGNMENT
1. Remove the Detector Probe and connect the tuner output to the Oscilloscope and Distortion Analyzer.
2. Connect a DC Meter across TP102 (+) and TP103 (+)
3. Tune the Receiver and Generator to 200kHz feeding 50uV to the antenna input.
4. Adjust L102 secondary for minimum distortion.
5. Adjust L102 primary for CV center.
6. Repeat above steps for best result.
7. Adjust L3 in the front-end for minimum stereo L or R distortion.
8. Adjust L101 in the same way for the same result.
9. Repeat above steps for best result.
10. Check to confirm that the DC Meter reads CV +/-50mV

E. DISTORTION
1. Tune the Receiver and Generator to 88MHz and feed 50uV to the antenna input.
2. The Distortion should be within the following limits:
   Less than 0.125% MONO
   Less than 0.15% L-R, L, R, L+R

F. SEPARATION
1. Tune the Receiver and Generator to 90MHz and feed 50uV to the antenna input.
2. Modulate L Channel only and adjust R119 for minimum output on L Channel VTVM and Oscilloscope.
3. Modulate R Channel only and adjust R119 for minimum output on R Channel VTVM and Oscilloscope.
4. Readjust R119 if necessary to obtain the same reading on both channels.
5. Check and confirm that the reading is more than 4dB on each channel.

G. AUTO BLEND
1. Tune the Receiver and Generator to 97.5MHz and feed 50uV to the antenna input.
2. Check and confirm that the S/N ratio is more than 60dB.
3. Adjust the attenuator of the FM Generator so the S/N ratio reads 60dB.
4. Adjust R137 so the S/N reading is 2dB down.

H. SIGNAL MIXER
1. Tune the Receiver and Generator to 97.5MHz and feed 15dBv to the antenna input.
2. Adjust R119 so the second LED lights at this output level.

I. AUTO STOP AND STEREO LEVEL
1. Tune the Receiver and Generator to 97.5MHz and feed 3.5uV to the antenna input.
2. Connect a DMM to TP101.
3. Adjust R110 to obtain a high level.
4. Next, adjust R151 to the Stereo Indicator LED lights.

AM ALIGNMENT

A. TUNING VOLTAGE ADJUSTMENT
1. Connect a DMM to TP105.
2. Tune the Receiver to 620kHz and adjust L149 and C150 so the voltage reads within 1.6 to 1.7V.
3. Tune to 710kHz and check that the voltage is within 26 to 28V.
4. Repeat above steps until within specified voltage.

B. TRACKING ADJUSTMENT
1. Tune the Receiver and Generator to 1400kHz and feed 10uV to the antenna input.
2. Adjust C148 and C149 for maximum output.
3. Tune to 1200kHz.
5. Repeat above steps as necessary.

C. SIGNAL MIXER
1. Tune to 1000kHz and feed 100uV to the antenna input.
2. Adjust R179 so the third LED lights.

SCHEMATIC DIAGRAM OF DETECTOR PROBE

Diodes should be point contact germanium, some commonly available types are: OA88, AA119, BA83, IN33, IN117.

PICTORIAL DIAGRAM OF DETECTOR PROBE

Keep leads as short as possible to minimize stray signal pickup.
POWER AMPLIFIER BIAS ADJUSTMENT

1. Operate the Receiver 3 to 5 minutes without a signal (volume control CCW).
2. Connect a DC millivolt meter from TP101 to TP103 in the left channel.
3. Adjust R175 bias control for 33mV ± 2mV.
4. Connect a DC millivolt meter from TP102 to TP104 in the right channel.
5. Adjust R176 bias control for 33mV ± 2mV.
### Repacking Instructions

In the event it is necessary to return the MAC 4275 to McIntosh Laboratory for service, the unit must be repacked carefully using all of the original pads and carton.

If a shipping carton is needed, please call or write the Customer Service Department of McIntosh Laboratory.

Order using the part numbers on the accompanying list.

Use the original shipping carton only if the pads and carton are in good serviceable condition.

<table>
<thead>
<tr>
<th>QTY</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>03512</td>
<td>Shipping carton only</td>
</tr>
<tr>
<td>1</td>
<td>03513</td>
<td>foam pad, left</td>
</tr>
<tr>
<td>1</td>
<td>03514</td>
<td>foam pad, right</td>
</tr>
<tr>
<td>1</td>
<td>04587</td>
<td>Shipping carton complete</td>
</tr>
</tbody>
</table>