

McIntosh engineering has advanced power amplifier technology and performance five times since 1949. Experience and knowledge are the foundation on which the engineering superstructure is built that supports the fact that McIntosh is recognized as *Laboratory Standard* for the world. A new level of technology and a higher level of amplifier performance is realized in the NEW MC 2205 Power Amplifier.

- McIntosh life testing of components permits component selection for trouble-free performance; added care in production engineering and manufacturing results in long product life
- McIntosh engineers developed a unique output stage circuit arrangement that is completely temperature accurate that delivers clean output power at any level without crossover distortion
- McIntosh POWER GUARD assures maximum amplifier power without clipping distortion
- McIntosh Output Autotransformer delivers full power output and multiple feedback loops assure lowest distortion at all power levels and all speaker impedances
- McIntosh designed turn on/mute circuits provide positive protection from "turn-on transients" and other potentially damaging noises

McINTOSH
RESEARCH AND
BIPOLAR EPITAXIAL
TRANSISTOR TECHNOLOGY
HAS PRODUCED
STARTLING
NEW ADVANCES
IN SAFE
COOL
SUPERIOR
AMPLIFIER PERFORMANCE



Shown in optional
walnut veneer cabinet

McIntosh MC2205

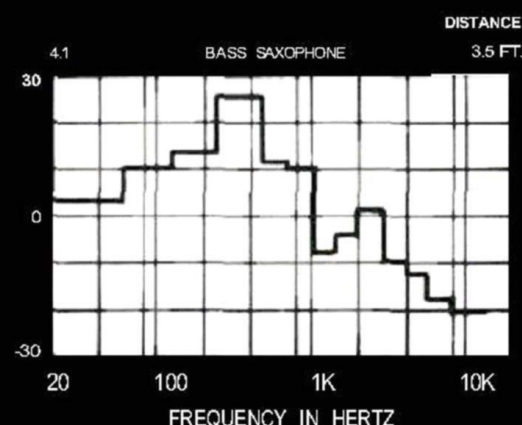
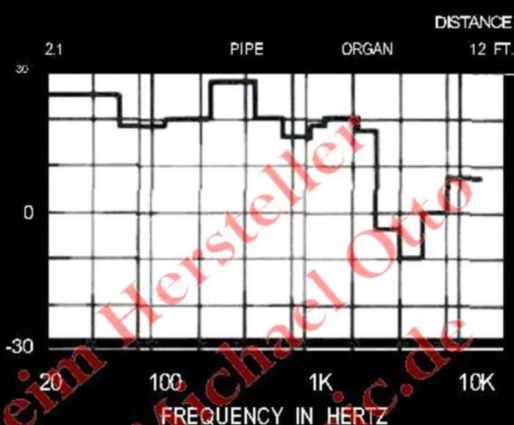
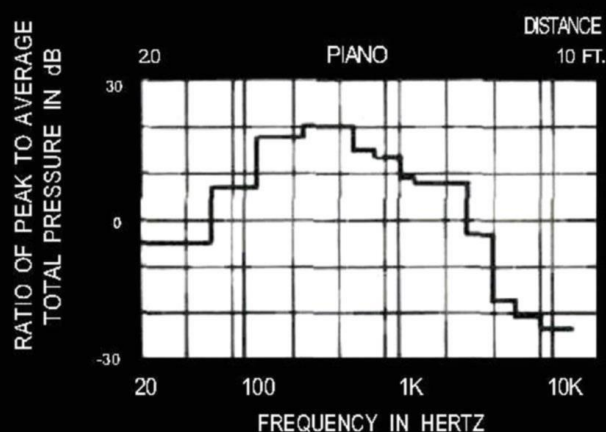
Higher power demands on amplifiers have presented music listeners with a form of unpleasantness in listening, amplifier overload (hard clipping) that looks and acts like square waves. Clipping is caused when the amplifier is asked to produce more power output with low distortion than it can deliver. Clipping of a complex waveform is largely composed of odd order harmonics and intermodulation products. High order odd harmonics and intermodulation products are dissonant and are not musically related to the signal being amplified. They are heard as great

and disappointing discordance and distortion.

In the past years McIntosh has substantially improved the ability of amplifiers to deliver lower distortion within their rated power. The improvement has removed the masking of the unpleasant, harshly distorted sounds of clipping. Music demands high peak power reproduction ability without clipping.

Although we may listen to surprisingly

low average power output, the peak power requirements can be very high. Consider these graphs of the power demanded of an amplifier reproducing the pipe organ, the piano, and the bass saxophone. The charts show that the peak power demands is almost 30 dB or 1000 times the average power demand. Since it is necessary that these short interval power spikes be reproduced with low distortion, it means the average power output of the power amplifier must be limited to 1/1000th of its capability or the listener must accept the discordant distortion of clipping.



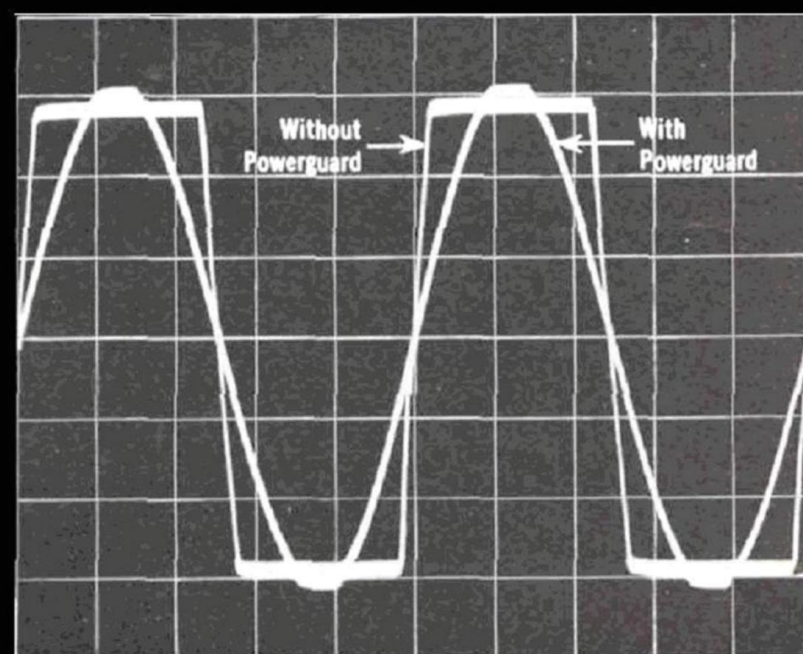
Amplifiers when driven to clipping are capable of delivering up to twice the heat load to the loudspeaker. In addition, they can have more than 40% harmonic distortion. The extra heat energy content of the clipped signal will damage most speakers. McIntosh leadership in engineering has developed a new circuit that ... (1) dynamically prevents power amplifiers from being overdriven into hard clipping ... (2) which reduces the heat developed in the loudspeakers ... (3) assures that the amplifier will produce its maximum output without increased distortion. That new circuit we call "POWER GUARD."

HOW POWER GUARD WORKS

In Power Guard, a waveform comparison circuit detects minute amounts of waveform difference between the output signal and the input signal. A sampling of the program material at the output of the amplifier is constantly compared with the program material at the amplifier input. You are alerted, by a front panel indicator, to waveform differences of 0.5%. Should the differences reach 1%, Power Guard goes to work. Power Guard dynamically reduces input level to prevent amplifier overload yet permits the amplifier to deliver its absolute maximum power output without extra distortion.

In addition, the output of the "waveform comparator" activates the front panel NORMAL and LIMIT indicators. Any time that the input circuit is fed excessive amounts of signal

causing a waveform difference of 0.5% in the output the indicators change from green NORMAL to red LIMIT automatically and instantaneously. You are always assured that the power of your amplifier is as clean and distortion free as it can be.



Oscilloscope of output waveform with and without Power Guard. Input overdriven for each trace 20 dB.

McIntosh developed output monitoring meters add to your operating ability. The meters are unusually flexible in that they read directly in watts, can be made to hold the highest reading and continuously update on higher power or can be switched to be peak reading — peak locking decibel meters.

When used as a watt meter all the information is direct reading, without conversions or complicated mathematics. In addition, as direct reading watt meters they are calibrated in average watts for a sine wave signal but respond to signal peaks.

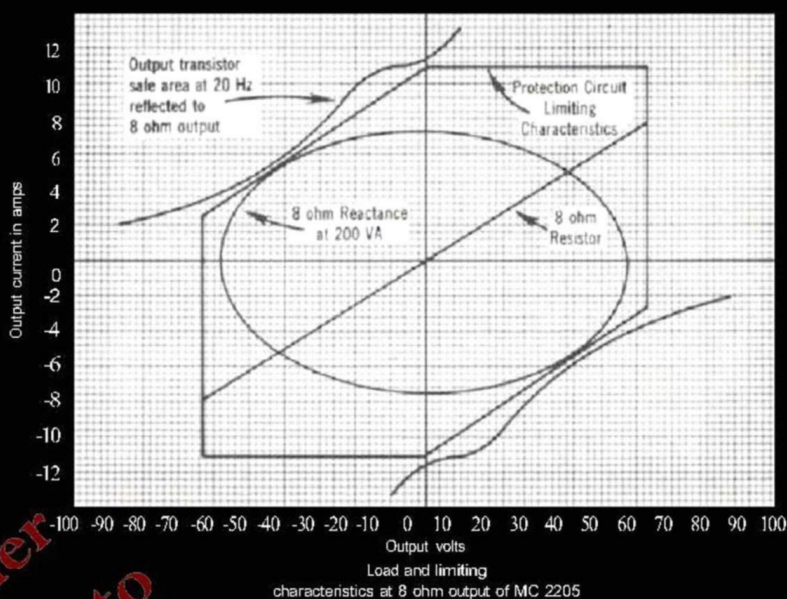
Ordinary meters are incapable of indicating the short interval information in a sound wave. The mass of the meter movement is too great to respond to the nearly instantaneous changes in music program material. That short interval information can have a duration as short as one-half of one thousandth of a second. Should the meter be capable of the high velocity movement the human eye could not perceive the information.

McIntosh engineering pursued both problems electrically. By developing new electronic circuits the meters are made to respond to short intervals with an accuracy of 98%! To permit the eye to see such high speed motion the electronic circuits that drive the meter pointer are time stretched so the meter pointer position can register in the persistence of vision characteristics of the human eye.

To achieve long trouble free life in an amplifier it is essential to have cool operation. Cool operation is the result of careful design of the output circuit. Correct matching of the output circuit to the loudspeakers with an autotransformer and a mechanical layout that uses generous sized, adequately ventilated heat sinks complete the design for cool operation.

The use of bipolar epitaxial output transistors in the McIntosh output circuit allows the amplifier to operate as cool as possible. The predriver, driver, and output stages are fully complementary and have high circuit efficiency which mini-

mizes heating. Additionally, when there is no signal output no output transistor is conducting." When there is no signal no output device is conducting. Conservative McIntosh engineering keeps operating temperatures low assuring long life.



The interleaved multifiler wound McIntosh designed autotransformer transfers all the power you paid for to all impedance taps. You are not power penalized for operating at an output impedance of less than 8 ohms. The McIntosh autotransformer does its outstanding job without adding phase shift, (common in other designs) limiting frequency response or power output. In short, the McIntosh autotransformer is the ideal answer to a difficult problem.

Heat sinks must be large and they must have adequate ventilation for proper cooling. The MC 2205 has 1100 square inches (7.64 square feet) of radiating surface. In addition, the chassis has been designed to permit the maximum amount of air to flow over the heat sinks to conduct away the life limiting heat.

With the McIntosh MC 2205 power amplifier you are *McIntosh protected* in five ways

1. The patented McIntosh Sentry Monitoring circuit constantly monitors the output signal. At signal levels up to rated output this circuit has high impedance and has no effect upon the output. If the power output exceeds design maximum, the Sentry Monitoring circuit operates to limit the signal to the output transistors. In the event of a short circuit across the amplifier output or severe impedance mismatch the Sentry Monitoring circuit will protect the output transistors from failure. Both positive and negative halves of the output signal are monitored independently.
2. Should the temperature of the heat sinks

rise above normal through restricted ventilation or other causes, the AC is disconnected from the amplifier by an automatic heat sensing relay. The AC will be restored when the temperature returns to normal.

3. Any DC component in the output circuit from whatever cause is shunted to ground through the McIntosh autotransformer. You and your speakers are protected completely from this kind of amplifier failure.

4. McIntosh gives you a money back guarantee of performance. Your McIntosh instrument

must be capable of meeting its published performance limits or you get your money back. No other manufacturer offers you this money back guarantee of performance.

5. The famous McIntosh 3 Year Service Contract protects you from any cost of repair for three full years because McIntosh will provide all parts, materials and labor needed to return the measured performance 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.

MC 2205 PERFORMANCE LIMITS

PERFORMANCE GUARANTEE

Performance Limits are the maximum deviation from perfection permitted for a McIntosh instrument. We promise you that the MC 2205 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.

PERFORMANCE

McIntosh audio power ratings are in accordance with the Federal Trade Commission Regulation of November 4, 1974 concerning power output claims for amplifiers used in home entertainment products.

POWER OUTPUT

STEREO

200 watts minimum sine wave continuous average power output, per channel, both channels operating into 1 ohm, 2 ohms, 4 ohms, or 8 ohms load impedance, which is:

14.1 volts RMS across 1 ohm
20.0 volts RMS across 2 ohms
28.3 volts RMS across 4 ohms
40.0 volts RMS across 8 ohms

MONO

400 watts minimum sine wave continuous average power output into 0.5 ohm, 1 ohm, 2 ohms, or 4 ohms load impedance, which is:

14.1 volts RMS across 0.5 ohm
20.0 volts RMS across 1 ohm
28.3 volts RMS across 2 ohms
40.0 volts RMS across 4 ohms

OUTPUT LOAD IMPEDANCE

STEREO

1 ohm, 2 ohms, 4 ohms, and 8 ohms; separate terminals are provided for each output

MONO

0.5 ohm, 1 ohm, 2 ohms, and 4 ohms; obtained by connecting together the appropriate terminals of both channels

RATED POWER BAND

20 Hz to 20,000 Hz

TOTAL HARMONIC DISTORTION

STEREO

0.1% maximum harmonic distortion at any power level from 250 milliwatts to 200 watts

per channel from 20 Hz to 20,000 Hz, both channels operating

MONO

0.1% maximum harmonic distortion at any power level from 250 milliwatts to 400 watts from 20 Hz to 20,000 Hz

INTERMODULATION DISTORTION

STEREO

0.1% maximum if instantaneous peak power output is 400 watts or less per channel with both channels operating for any combination of frequencies, 20 Hz to 20,000 Hz

MONO

0.1% maximum if instantaneous peak power output is 800 watts or less for any combination of frequencies, 20 Hz to 20,000 Hz

FREQUENCY RESPONSE (at one watt output)

20 Hz to 20,000 Hz, +0 -0.25 dB

10 Hz to 100,000 Hz +0 -3.0 dB

NOISE AND HUM

95 dB below rated output

RATINGS

OUTPUT VOLTAGES

25 volts for distribution lines

DAMPING FACTOR

STEREO

16 at 1 ohm output, 50 at 2 ohms output, 30 at 4 ohms output, 16 at 8 ohms output

MONO

16 at 0.5 ohms, 50 at 1 ohm, 30 at 2 ohms, and 16 at 4 ohms output

INPUT IMPEDANCE

100,000 ohms

INPUT SENSITIVITY

Switchable: 0.75 volt or 2.5 volts—Level control provided for higher input voltages

GENERAL INFORMATION

POWER REQUIREMENTS

120 volts 50/60 Hz, 50 watts at zero signal output, 750 watts at rated output

SEMICONDUCTOR COMPLEMENT

49 silicon transistors

45 silicon rectifiers and diodes

8 integrated circuits

MECHANICAL INFORMATION

SIZE

Front panel measures 16 3/16 inches wide (41.12 cm) by 7 1/8 inches high (18. cm). Chassis measures 15 inches wide (38.1 cm) by 6 9/16 inches high (16.67 cm) by 14 1/2 inches deep (36.83 cm), including connectors. Knob clearance required is 1 1/2 inches (3.81 cm) in front of mounting panel

FINISH

Front panel is anodized gold and black with special gold/teal nomenclature illumination. Chassis is chrome and black

WEIGHT

85 pounds (38.6 kg) net, 97 pounds (44.0 kg) in shipping carton

Franchised Dealer:

McIntosh

2 Chambers St., Binghamton, N.Y. 13903

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