

PRODUCT BRIEF

MC58

EIGHT CHANNEL POWER AMPLIFIER

P1147

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Promotional Highlights

- CR10, CR12 and CR16 Multi-Room Interface
- Remote Power Control
- High Output Current Capability
- Over 60 Joules of Energy Storage
- Configurable Outputs
- Gold Plated Output Terminals
- Ultra Low Distortion
- Wide Power Bandwidth
- Power Guard
- Thermal Protection
- DC Output Protection
- Turn On Delay
- Modular Construction

Channels 1&2, 3&4, 5&6 or 7&8 can be operated either in the normal STEREO MODE at 50 watts x 8

Features and Benefits

CR10, CR12 and CR16 MULTI-ROOM INTERFACE

A seven pin DIN connector on the rear of the MC58 can receive remote power and output control signals from the CR10, CR12 or CR16. When any area of the Multi Room Controllers is activated, the power and speakers for that area are automatically turned ON. Audio signals from the CR10 to the MC58 must be carried to the inputs by RCA cables.

The CR12 and CR16 have a 25 pin Subminiature "D" connector that can be used for a single 25 conductor cable interconnect. This cable carries all the audio signals and power control commands from the CR12 or CR16 to the MC58 Power Amplifier.

REMOTE POWER CONTROL

High power amplifiers draw high current from the AC power line. Therefore, it is important that they plug directly into the wall outlet. Also, most owners desire that there be one power switch for the whole audio system. The MC58 is equipped with a circuit that provides remote POWER CONTROL from your McIntosh preamp or control center. A patch cord between 1/8" headphone jacks on the preamp and the MC58 is all that's required. When you turn on your preamp a digital "1" (+5V) signal operates the power relay in the MC58.

The MC58 also has a remote POWER CONTROL OUT jack. The POWER CONTROL signal from this jack is delayed by a fraction of a second so that the turn on power surge of the next power amplifier occurs at a later time. This helps prevent power circuit overload that could pop circuit breakers or blow fuses.

HIGH OUTPUT CURRENT

Greater than 10 amperes peak output current to drive uneven speaker loads. Some poor speaker designs have input impedances that dip to 1 or 2 ohms at various frequencies. The MC58 has the output current reserve to drive them.

OVER 60 JOULES OF ENERGY STORAGE

Huge main filter capacitors that guarantee an excellent signal to noise ratio and the energy storage necessary for the wide dynamic range that "Digital Audio" demands.

GOLD PLATED OUTPUT TERMINALS

McIntosh gold plated output terminals will deliver full output power to all speakers.

CONFIGURABLE OUTPUTS

channels, or each pair can be independently BRIDGED for 100 watts 4 channels 8 ohms. Other combinations can

also be selected.

Three 100 watt channels for LEFT, CENTER and RIGHT front and two 50 watt for LEFT and RIGHT surrounds make an ideal Home Theater arrangement.

ULTRA LOW DISTORTION

Distortion so low that it defies measurement, even with the finest distortion analyzers. At mid-frequencies, 8 ohm load, the distortion meter reads the residual distortion of the oscillator with or without the MC58 in the circuit. This means the amplifier distortion is lower than the analyzer is capable of measuring.

WIDE POWER BANDWIDTH

Full power output capability well above and below the frequencies that can be heard by humans.

POWER GUARD

The exclusive McIntosh circuit that prevents harsh sounding clipping and protects your speakers from damage.

THERMAL PROTECTION

Thermal sensors that turn off the speakers if improper loading or ventilation causes the amplifier to over heat.

DC OUTPUT PROTECTION

A circuit that turns off the speakers if for any reason a DC voltage appears at the speaker terminals. This prevents speaker damage.

TURN ON DELAY

The MC58 has a circuit that delays amplifier operation for about two seconds after turn on. This prevents pops or thumps generated in other equipment from causing annoying noises or damaging your speakers.

MODULAR CONSTRUCTION

If service should be required, modular construction makes repairs easier.

Performance Specifications

WIDE BAND DAMPING FACTOR

8 ohm, 200
4 ohm, 100

POWER REQUIREMENTS

120 volts 50/60Hz, 8 amps

POWER OUTPUT PER CHANNEL

50 watts into 4 ohm loads or 30 watts into 8 ohm loads minimum sine wave continuous average power output per channel, all channels operating. The output RMS voltage is:

15.49 across 8 ohms
14.14 across 4 ohms

BRIDGED

100 watts into an 8 ohm load is minimum sine wave continuous average power output, which is 28.28 volts RMS.

OUTPUT LOAD IMPEDANCE

NORMAL, 4 or 8 ohms.

BRIDGED

8 ohms.

RATED POWER BAND

20Hz to 20kHz

TOTAL HARMONIC DISTORTION

0.005% maximum harmonic distortion at any power level from 250 milliwatts to rated power per channel from 20Hz to 20,000Hz, all channels operating.

DYNAMIC HEADROOM

1.8dB

FREQUENCY RESPONSE

+0, -0.25dB from 20Hz to 20kHz
+0, -3.0dB from 10Hz to 100kHz

INPUT SENSITIVITY

1 volt (2.5V at gain control center detent)

INPUT IMPEDANCE

20,000 ohms

A WEIGHTED SIGNAL TO NOISE RATIO

92dB (112dB below rated output)

INTERMODULATION DISTORTION

0.005% maximum if instantaneous peak per output does not exceed twice the output rating per channel, with all channels operating, for any combination of frequencies from 20Hz to 20,000Hz.

Front Panel Information

POWER GUARD

The all glass front panel of the MC58 has eight power

guard indicators.

AC POWER SWITCH

An AC POWER switch is provided to turn AC power ON or OFF. When in the OFF position the MC58 is disconnected from the power line.

Rear Panel Information

GAIN CONTROLS

The input sensitivity of the MC58 is 1V with the gain controls full CW. If one desires to match the 2.5V rating for McIntosh preamps simply turn each gain control CCW to the detent position on the control. The controls should be full CW for Home Theater operation.

The number 1, 3, 5 & 7 gain controls control the gain in the BRIDGED mode of operation.

INPUTS

In the normal mode of operation all input jacks accept signal. For BRIDGED operation use only the 1, 3, 5 & 7 input jacks and place the MODE switch in the BRIDGED position.

OUTPUTS

For normal operation, output connections for impedances of 4 to 8 ohms are provided on secure, screw type, gold plated terminals. Connections for BRIDGED output are marked above the terminals.

AC POWER

The MC58 is rated for 120 volts, 50/60 hertz. It uses .8 amperes when there is no signal output and up to 10 amperes with all channels delivering rated power. A 10 ampere fuse protects the MC58 electrically.

POWER CONTROL SWITCH

The POWER CONTROL switch has two positions. LOCAL and REMOTE. In the LOCAL position, the front panel POWER switch controls ON or OFF. The REMOTE position provides a circuit that operates the power relay from a logic "1" (5V) signal. This signal is applied through the POWER CONTROL IN jack (tip-input, sleeve-control ground). The POWER CONTROL OUT jack provides a large active-region safe operating area. These characteristics and the automatic tracking bias system eliminate cross-over distortion. The distortion graphs show clearly that there is no increase at low power output levels.

OVER 60 JOULES OF ENERGY STORAGE

Huge main filter capacitors are used to guarantee an excellent signal to noise ratio and the energy storage necessary for the wide dynamic range that "Digital Audio"

power ON signal for the NEXT power amplifier. This signal is delayed by approximately .2 seconds so that inrush current peaks are sequenced.

Technical Description

The MC58 is a eight channel power amplifier designed to operate with loudspeakers having a nominal impedance of 4 or 8 ohms.

It features a new circuit design that holds harmonic distortion far below the amplifiers remarkably low noise floor. Only by using special spectrum analysis measuring techniques is the distortion measurable at all.

The secret to this performance will sound very simple, but it is more difficult to carry out than it may seem. The principle used in the design of the MC58 was to arrange every stage of voltage or current amplification to be as linear as possible. This linear operation is accomplished by using several different techniques.

1. Each transistor is selected to have nearly constant current gain (Beta) over the entire range of currents at which the transistor must operate.
2. The load impedance presented to each amplification stage is made to be as uniform as possible for all signal levels.
3. The input impedance of stages is increased and linearized where possible by using emitter degeneration.
4. Resistors and capacitors in the signal path are carefully selected to have exceedingly low voltage coefficients (low change of resistance or reactance with applied voltage). Precision metal film resistors and low dielectric absorption film capacitors are used in all critical circuit locations.
5. Output transistors are chosen for matched current gain, high current gain-bandwidth product, and

demands.

PROTECTION CIRCUITS

Some manufacturers of power amplifiers advertised that their products do not require or use protection circuits and that such circuits compromise performance. McIntosh Laboratory agrees that diligent measures are required to allow unrestricted performance, but we also insist that protection circuits are desirable and necessary to prevent amplifier or loudspeaker damage due to abnormal

circumstance and that they actually enhance performance. The MC58 incorporates seven protection circuits to enhance its performance, assure its reliability and to protect loudspeakers.

POWER GUARD

Power Guard, a unique feature of McIntosh amplifiers, assures that each channel of the MC58 will deliver full power free of clipping distortion. Clipping is caused when an amplifier is asked to produce more power output than its design is capable of delivering with low distortion. Amplifiers that are overdriven may deliver large quantities of power when they are clipping but they have more than 40% harmonic distortion. In this mode, the sound is grossly distorted and the extra energy content of the clipped signal will damage most loudspeakers. The McIntosh Power Guard circuit protects your ears and your speakers from this kind of damage.

The Power Guard circuit consists of a waveform comparator which monitors the wave shape of the amplifier input and output signals. Normally there is no disparity between these signals and the comparator produces no output. When the amplifier is driven beyond its maximum power capacity a difference will develop. If this difference exceeds 0.3% (equivalent to 0.3% total harmonic distortion) the comparator output causes the amber POWER GUARD indicator to light.

If there is a further increase in THD the comparator output controls an electronic attenuator at the amplifier input to reduce the amplifier gain. This holds the amplifier output to a low distortion value.

Overdrive by 14dB is possible before the output distortion exceeds 2%.

SENTRY MONITOR

All power transistors have limits for the maximum amount of power they can handle. The MC58 output transistors and power supply have been designed to allow very high current flow into properly matched load impedances. If, however, a short circuit or very low value of load impedance is applied to the output of the MC58, destructive current levels could be reached. The Sentry Monitor Circuit senses the dynamic operating time, voltage, and current of the amplifier output stage and controls the current flow. It is confined to nondestructive limits. Sentry Monitor **does not** limit the power output available from the amplifier.

THERMAL CONTROL

The power output amplifier uses two stages of voltage amplification followed by three stages of current amplification. All have been individually optimized for best linearity. This means that the amplifying stages have less

All power transistors have limits for the maximum amount of heat they can tolerate. The MC58 uses a highly efficient amplifying circuit which produces relatively little heat for the output power produced. The amplifier has oversized heatsinks to dissipate transistor generated heat.

Natural convection air flow is sufficient for cool operation. Should the cooling air be blocked or should the amplifier operating temperature become too high, thermal cutouts within the amplifier will turn off the speakers. POWER GUARD indicators will light continuously to show thermal protection is operating. When the amplifier has cooled, it will automatically turn on again.

TURN-ON DELAY

The MC58 has a turn-on delay circuit that delays amplifier operation for about 2 seconds after power turn on.

This prevents pops or thumps generated in other equipment from causing annoying noises or damaging your loudspeakers.

DIRECT CURRENT FAILURE PROTECTION

A circuit is provided that turns off the speakers if for any reason a DC voltage appears at the speaker terminals. This prevents speaker damage.

POWER LINE INRUSH PROTECTION

Turn on inrush current is cushioned by a thermistor in the power transformer primary circuit. A soft start is achieved that eliminates component stress during turn-on.

CIRCUIT OPERATION

The audio input passes through the gain control to the power guard attenuator. A preamplifier follows the attenuator. The preamplifier also includes inversion for bridged mode and supplies low impedance drive to the output amplifier.

total harmonic distortion and less negative feedback is required to achieve ultra low distortion.

The signal is fed to one input of the differential stage. Feedback from the amplifier output is applied to the other

input. The differential amplifiers drive a cascode connected voltage amplifier stage. Current mirrors are also used to improve bandwidth and linearity.

The cascode voltage amplifier output feeds complementary Darlington connected driver transistors. These supply the signal to complementary connected output transistors. Ancillary components for Power Guard, Sentry Monitor and other protection circuits interconnect with the amplifier circuits. The power supply uses a massive power transformer, full wave bridge rectifiers and large filter capacitors having 60 joules of energy storage. Large heatsinks provide cooling for the output power transistors.

The mechanical and electrical design of the MC58 is the result of the many years of engineering and manufacturing experience held by the staff at McIntosh. This "know how", the meticulous attention to design and production details, makes the MC58 one of the finest amplifiers ever produced by McIntosh Laboratory.

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