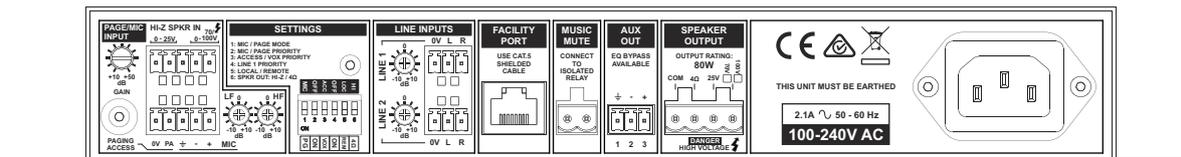


MA80FT Front Panel



MA80FT Rear Panel

## General Description

The MA80FT is a very compact mono amplifier designed for integration into audio and AV systems where de-centralised installation is advantageous, and is suitable for use with either low impedance loudspeakers or 100/70/25 V-line systems. It is intended as an “install-and-forget” component, and is small enough to be fitted into wall or ceiling voids or in any convenient location adjacent to projectors, flat screen displays or loudspeakers. A simple set of controls and configuration options makes it easy to integrate into any audio system. It is highly suitable for use with in-store digital signage, gallery and museum exhibits and fixed or mobile tour guide systems.

The MA80FT can drive low-impedance speakers down to a minimum total impedance of 4 ohms, or 100/70/25 V-line loudspeaker systems via the internally fitted output transformer. The output power is 80 W in either case. The power amplifier stage is fully protected against DC offset and over-current, and is also thermally protected. A switch-on delay function mutes the output during power-up and power-down to protect loudspeakers.

The amplifier mixes two unbalanced stereo line inputs with a balanced microphone input; the stereo inputs are summed to mono internally to form the ‘music channel’. LINE 1 can be set to have priority over LINE 2 via a rear panel DIP switch to allow the connection of message stores, etc. The mic input can be configured by further DIP switches to function as a paging mic input, with the usual Cloud options for mic-over-music priority and paging control via either VOX or contact closure at the access port. The MA80FT is directly compatible with the Cloud PM1 single-zone paging mic. 12 V phantom power is available at the mic input, selectable by internal jumper.

To allow integration into existing 100/70/25 V-line PA/VA systems, the mic channel also has a high impedance input which allows the local subsystem being driven by the MA80FT to carry paging and/or emergency announcements made using the building’s main system. If the building’s existing system is used for background music, the high impedance connection can alternatively be routed to the LINE

2 input by moving an internal jumper: this permits the background music to be fed into the area covered by the MA80FT, with the advantage of local or remote level control for that area alone.

Front panel controls are provided for MIC, LINE 1 and LINE 2 levels; additionally there are LF and HF EQ controls for the music channel which allow the amplifier’s response to be optimised to suit the loudspeakers in use and room acoustics. A PEAK LED illuminates if the amplifier’s dynamic clip protection becomes active, and thus clearly indicates the onset of distortion. On the rear panel, each line input has a preset control for gain, while the mic input has preset gain and LF and HF EQ controls.

A balanced, auxiliary line output is provided to allow additional power amplifiers to be connected, to drive active loudspeakers, or for any other purpose. The signal available at this output is the same mix of mic and line inputs fed to the power amplifier stage, but by moving an internal jumper, the source point may be changed so that the front panel EQ controls are bypassed (though they will still affect the main output).

A particularly useful feature of the MA80FT is the Facility Port; this allows a remote input module from the Cloud LM-2 Series (for wired sources) or BT-1 Series (for Bluetooth wireless sources) to be connected via easy-to-install screened Cat 5 cable. Microphones, and/or line sources - such as radio mics, DJ mixers, MP3 players, laptops or other audio sources - including Bluetooth-equipped laptops, tablets and smartphones - can then be connected locally, simplifying the use of the area for presentations where portable audio sources are in use. The Facility Input is equipped with a fixed threshold noise gate to eliminate background noise in the absence of an input signal. LM-2 modules also provide remote control of music level and LINE 1/LINE 2 selection.

In common with most Cloud products, a Music Mute Input is provided, which may permit compliance with local Fire Authority regulations; the microphone input remains active when the Music Mute is applied. A front panel MUTE LED illuminates if the Music Mute function becomes active.

To assist the MA80FT in meeting local installation regulations, an optional conduit adapter plate is available, which may be retrofitted to the rear panel, replacing the IEC inlet connector\* with a non-removable mains connection to the amplifier. This makes the MA80FT suitable for permanent installation in ceilings or similar plenum spaces.

The MA80FT is very energy-efficient\*\* and draws very little power in a quiescent state. A user-selectable automatic power-down function puts the module into an ultra-low-current standby mode after a preset period with no signal. A bicolour front panel LED indicates active status, and flashes red or green if a fault condition arises, the colour depending on the nature of the fault.

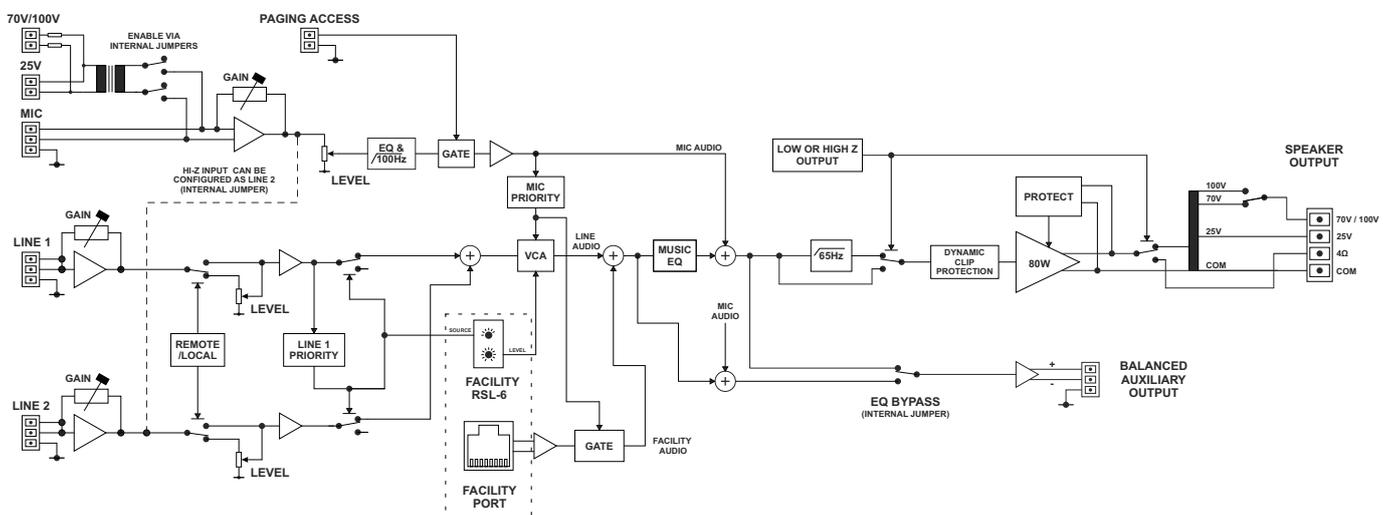
\*Local regulations may apply: may require installation by a suitably qualified person.

\*\*ENERGY STAR certification applied for.

## Key features

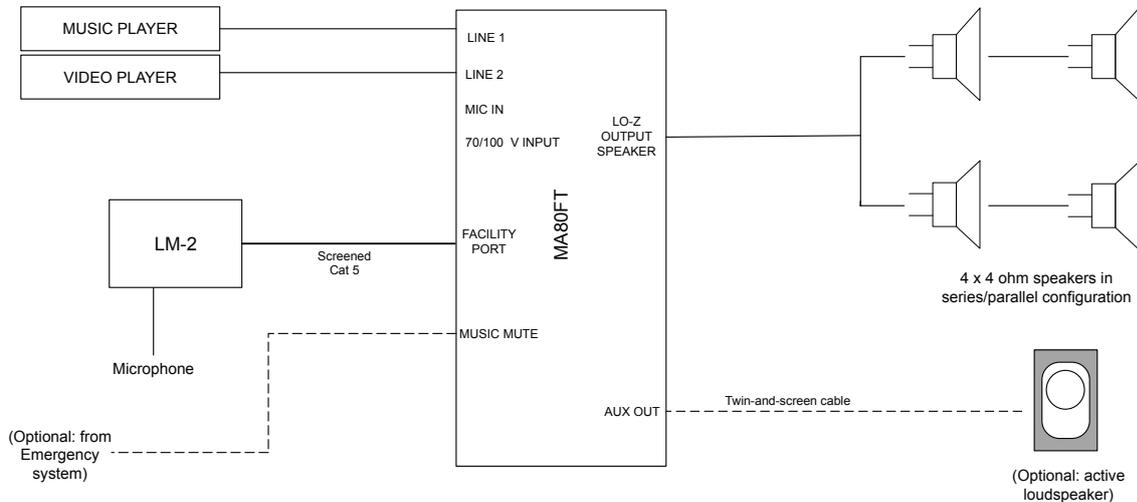
- Compact mono amplifier module for “install-and-forget” situations
- Suitable for use with either lo-Z speakers or 100/70/25 V-line systems (internal transformer fitted as standard): selectable by rear panel switch
- Two (unbalanced) stereo line inputs with individual gain trims
- Electronically-balanced mic input with separate gain and HF/LF EQ controls
- Phantom power selectable by internal jumper
- Front panel control of music level, mic level and music channel HF & LF EQ
- MIC input configurable for direct connection to 100/70/25 V-line system: allows MA80FT to receive announcements made via main building PA/VA system
- 100/70/25 V-line input can be routed to LINE 2 for integration with existing background music system
- MIC input can be used with paging mics
- Paging configurable as automatic voice-over-music (VOX mode) or contact closure via access port
- Selectable LINE 1-over-LINE 2 priority
- Facility port for connection of LM-2 remote mic/line input module via screened Cat 5 cable; also allows remote control of music level and line input selection
- Facility Port supports BT-1 Bluetooth input module
- 80 W power amplifier
- Electronically-balanced auxiliary output with source selectable pre- or post music EQ
- Music Mute control input (N/O or N/C) for interface to emergency system
- 65 Hz high-pass filter enabled when 100/70/25 V-line output is selected
- Automatic power-down function (user-selectable)
- Optional conduit adapter plate available: permits permanent mains connection
- Less than 1 W power consumption in sleep mode
- Convection cooled – silent in operation
- Power requirements: 100 to 240 V AC, 50 to 60 Hz

## Block Diagram



## System Examples

### Tour guiding with an MA80FT

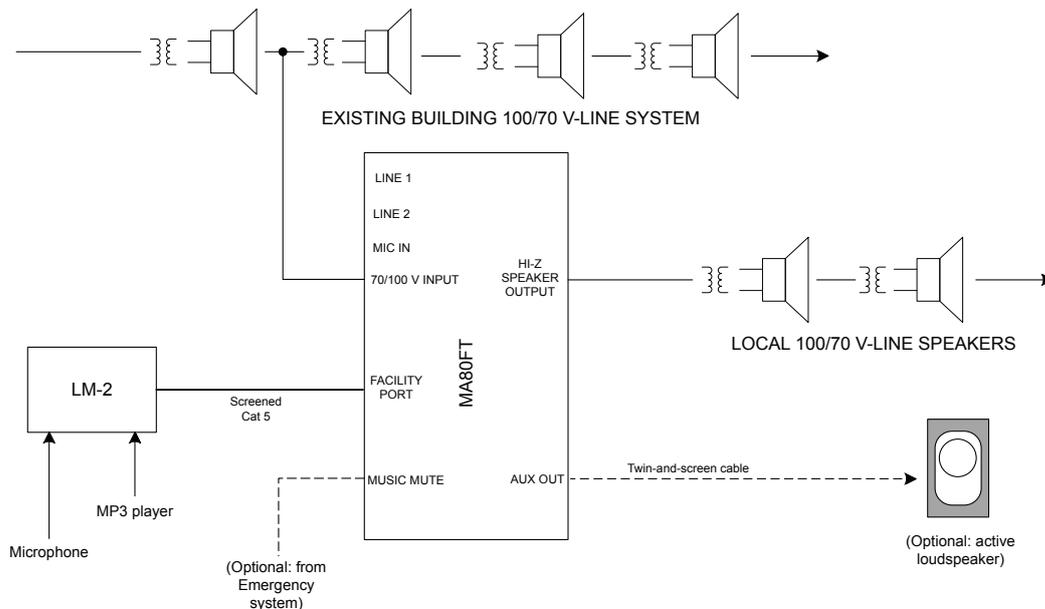


The system shown here uses an MA80FT to provide the commentary and music in a museum or theme park attraction, or similar.

A music player and a video player are connected to the two line inputs; an LM-2 mic/line input module could be installed remotely at the guide's location and connected to the MA80FT with screened Cat-5 cable. The guide's microphone would be plugged in here; he/she would also have the ability to control music volume from the LM-2.

Four loudspeakers are shown, connected in a series/parallel arrangement for maximum coverage. One or more powered loudspeakers could be driven from the Auxiliary Output, either additionally or alternatively.

### Extending an existing hi-Z speaker system with an MA80FT



In this example, an MA80FT is used to provide local music and microphone amplification in a particular part of a building (possibly a new extension), while at the same time ensuring that the local loudspeakers are integrated with the main building PA/VA system.

This is achieved by simply tapping into the existing building loudspeaker wiring and connecting the feed to the MA80FT's hi-Z microphone input. Setting the priority configuration switches correctly will ensure that building-wide announcements will always interrupt any local programme sources.

The MA80FT can drive 100/70/25 V-line systems directly, so consistency of loudspeaker type throughout the building can be achieved.

## Technical Specifications

Line Inputs		
Frequency Response	±1 dB, 20 Hz to 20 kHz	
THD+N	<0.05% @ 1 kHz, full power (22 kHz bandwidth)	
Sensitivity	-12 dBu to +8 dBu (195 mV to 2.0 V)	
Input Gain Control	20 dB range	
Input Impedance	47 kohms	
Headroom	16 dB	
Noise	<-90 dB rms (22 kHz bandwidth)	
Music Equalisation	LF: ±10 dB @ 50 Hz, HF: ±10 dB @ 10 kHz	
Microphone Input		
Frequency Response	-3 dB @ 100 Hz (fixed filter) to 20 kHz ±1 dB	
THD+N	<0.05% @ 1 kHz, full power (22 kHz bandwidth)	
Gain	-50 dBu to -10 dBu (2.45 mV to 245 mV)	
Input Impedance	3.3 kohms (balanced)	
Headroom	16 dB	
Noise (EIN)	-127 dB, 22 Hz to 22 kHz (Rs = 150 ohms)	
Phantom Power	12 V (internal jumper)	
Mic Equalisation	LF: ±10 dB @ 100 Hz, HF: ±10 dB @ 5 kHz	
Hi-Z Input		
Frequency Response	Via Mic i/p	-3 dB @ 100 Hz (fixed filter) to 20 kHz ±1 dB
	Via Line 2 i/p	±1 dB 20 Hz to 20 kHz
Input Gain Control	10 dB to 20 dB	
Noise	<88 dB rms (22 kHz bandwidth)	
Facility Input		
Frequency Response	±1 dB 20 Hz to 20 kHz	
Sensitivity	0.775 V (0 dBu)	
Input Impedance	10 kohms (balanced)	
Headroom	18 dB	
Noise Gate	-60 dBu	

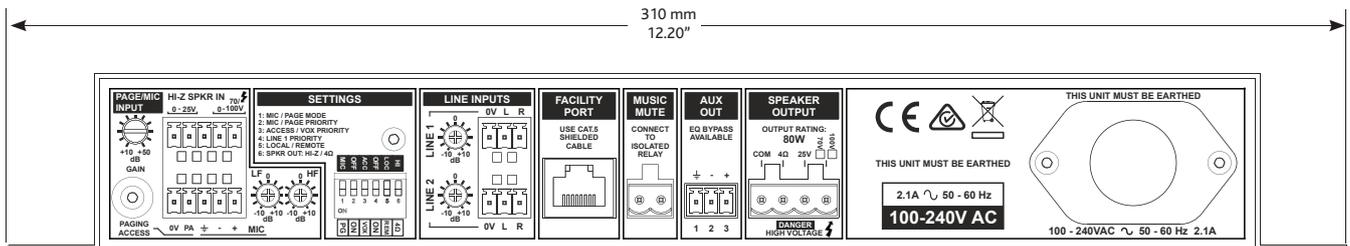
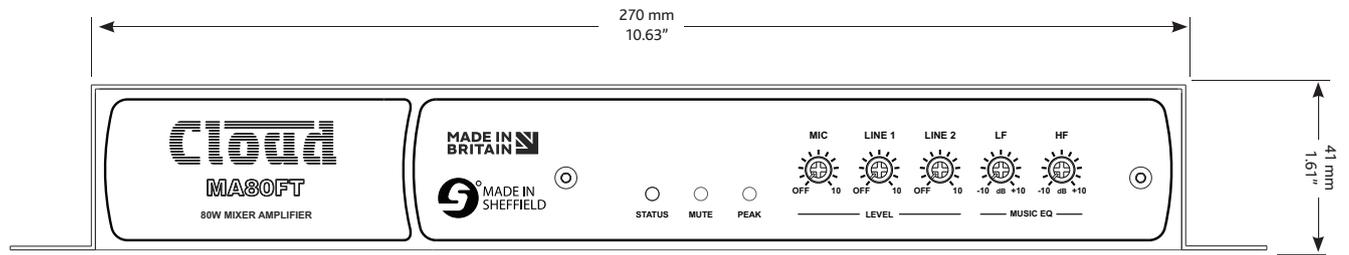
Main Output			
Output Power (1 kHz continuous sine wave)	80 W		
Lo-Z Output	Minimum load	4 ohms	
	Frequency Response	±1 dB 20 Hz to 20 kHz	
Hi-Z Output	Minimum load	100 V: 125 ohms; 70 V: 62 ohms; 25 V: 7.8 ohms	
	Frequency Response	-3 dB @ 65 Hz (filter), -1.5 dB @ 20 kHz	
THD + N	<0.05% @ 1 kHz, full power (22 kHz bandwidth)		
Amplifier protection	Fixed level signal limiter Protection against DC, PSU overcurrent, amplifier overcurrent, over-temperature. Resettable internal breaker (no fuses)		
Auxiliary Output			
Max output level	0 dBu (0.775 V)		
General			
Power Input	Universal type, 85 V to 264 V, 47 to 63 Hz		
Normal operating temperature	0°C to 35°C (Note. performance and specifications cannot be guaranteed outside of this range)		
Power consumption	Standby <sup>1</sup>	0.94 W, 7.5 VA	
	Idle <sup>2</sup>	6.1 W, 14.8 VA	
	1/8th Power (4 ohms) <sup>3</sup>	Lo-Z Output:	16.2 W, 30.6 VA
		Hi-Z Output:	17.9 W, 33.4 VA
	1/3rd Power (4 ohms) <sup>4</sup>	Lo-Z Output:	32.9 W, 54.6 VA
Hi-Z Output:		36.4 W, 60.0 VA	
Heat Loss	Standby <sup>1</sup>	3.4 KJ/hr (3.2 BTU/hr)	
	Idle <sup>2</sup>	22.0 KJ/hr (20.8 BTU/hr)	
	1/8th Power (4 ohms) <sup>3</sup>	Lo-Z Output:	28.6 KJ/hr (27.1 BTU/hr)
		Hi-Z Output:	32.3 KJ/hr (30.7 BTU/hr)
	1/3rd Power (4 ohms) <sup>4</sup>	Lo-Z Output:	41.6 KJ/hr (39.5 BTU/hr)
Hi-Z Output:		53.1 KJ/hr (50.4 BTU/hr)	
Dimensions (w x h x d)	Net	310 mm x 41 mm x 180 mm, 12.20" x 1.61" x 7.09"	
	Shipping	400 mm x 145 mm x 255 mm, 15.75" x 5.71" x 10.00"	
Weight	Net	2.55 kg, 5.71 lb	
	Shipping	3.25 kg, 7.28 lb	

Notes re Power Consumption and Heat Loss measurements:

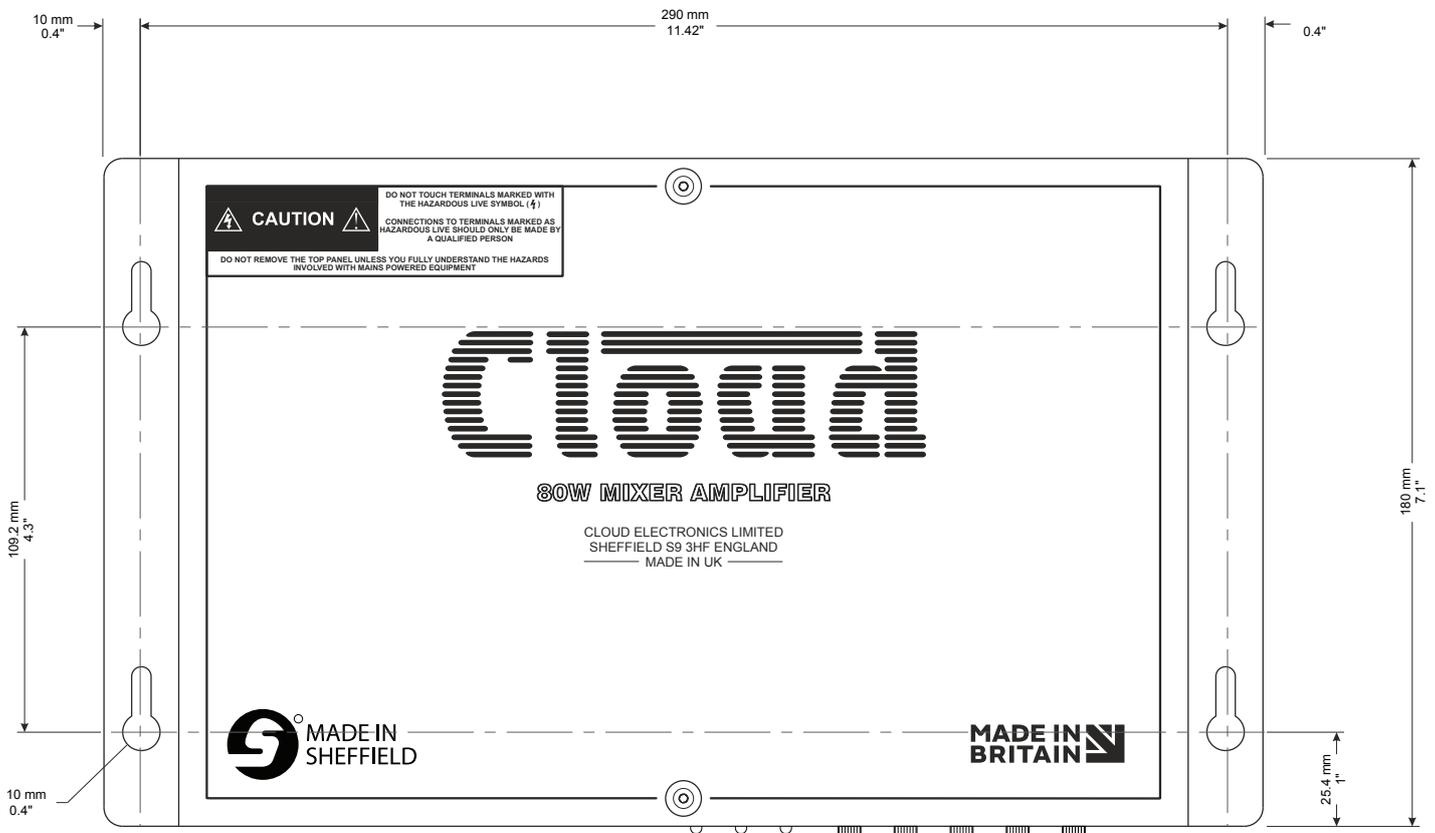
All measurements at 230 VAC 50 Hz power input

- Standby: amplifier in standby state (STATUS LED steady red)
- Idle: amplifier not in standby state (STATUS LED steady green), but no audio output
- 1/8<sup>th</sup>. Power: constant sound level at 10 W output (audio mainly clean, only occasional clipping)
- 1/3<sup>rd</sup>. Power: constant sound level at 27 W output (audio beginning to become compressed, limited or heavily clipped)

## Dimensions: MA80

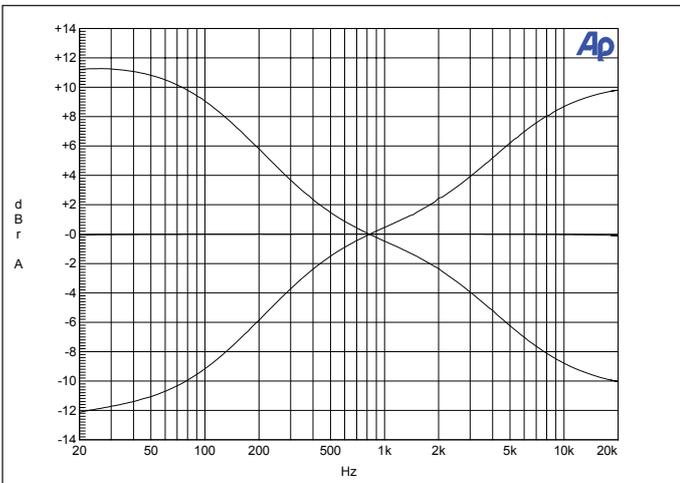


Shown fitted with optional conduit adaptor



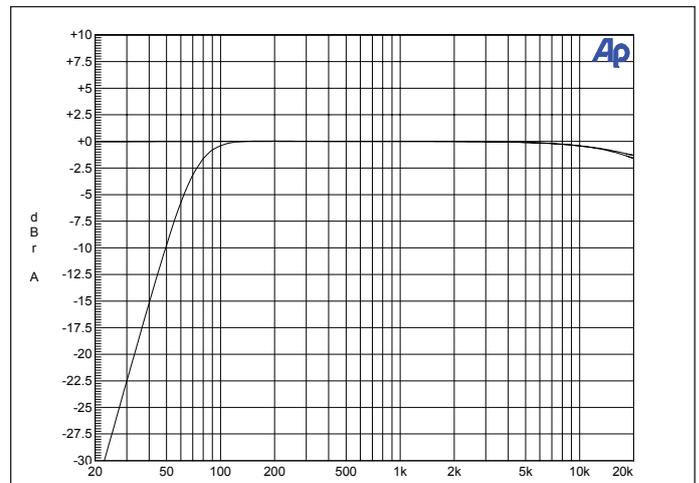
## Performance Graphs

Music EQ



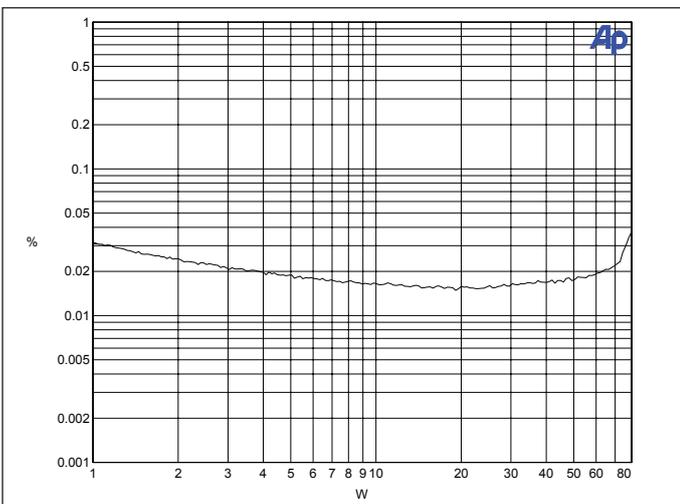
Frequency response of Music EQ (front panel) applied to line input.  
Load = 8ohm

Line Frequency Response



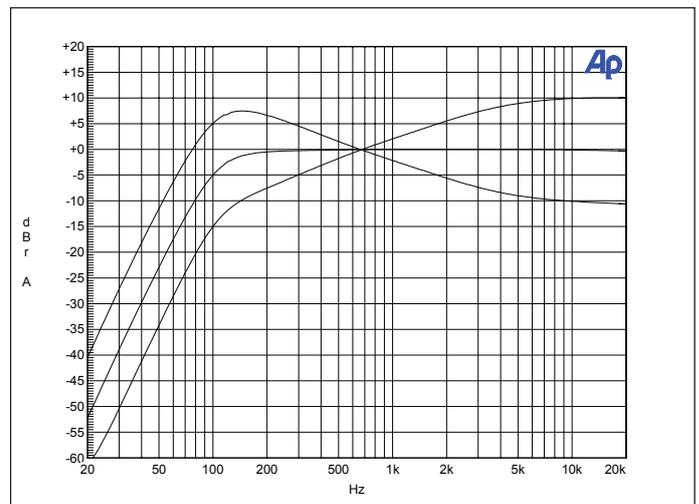
Frequency Response of Line input in both Low & High Impedance output.  
Low Z output: 4ohm load  
High Z output: 125ohm load (65 Hz HPF evident)

Line THD vs Power



THD+N (%) vs Output Power (W) into a 4ohm load.  
1kHz sine wave input  
20 - 22kHz analyser signal bandwidth

Mic Frequency Response



Mic input frequency response, including the rear panel Mic EQ response.  
Load 8 ohm, middle is flat (MIC LF / HF set to 0)  
100 Hz HPF evident

## Architect's and Engineer's Specification

The single channel amplifier shall be able to deliver 80 W into a 4 ohm load. It shall be fitted with an internal transformer providing a high-impedance output suitable for driving 100 V-line, 70 V-line or 25 V-line loudspeaker distribution systems, and also able to deliver a power output of 80 W into such a system. It shall be possible to select the low-impedance or high-impedance output with an externally accessible switch. The output connector shall be a plug-in screw terminal type.

The amplifier shall be equipped with two unbalanced stereo line inputs and an electronically balanced microphone input; the line inputs shall be summed internally to mono (the music channel), and mixed with the microphone input. Each input shall have a rear panel sensitivity control and the microphone input shall have rear panel controls for two-band equalisation adjustment; these controls shall be of the preset type. The front panel shall be fitted with a microphone level control, separate level controls for each line input and HF and LF equalisation controls for the music channel. Phantom power shall be available at the microphone input, selectable by an internal jumper. An alternative microphone input shall also be provided, which should be suitable for connection directly to a 100 V-line, 70 V-line or 25 V-line loudspeaker system. All input connections shall be via plug-in screw terminal connectors. There shall be visual indication on the front panel if any input signal activates the amplifier's clip protection.

A control input shall be provided to activate the microphone input by external contact closure. It shall be possible to configure the amplifier such that this function is overridden and the microphone input is always active. It shall also be possible to configure the mixer to perform the following functions: i) detection of a signal on the microphone input will automatically mute the music signal, ii) detection of a signal on one line input will automatically override the other. It shall be possible to select all configurations, including the choice of microphone input, without removing any part of the amplifier housing.

The amplifier shall be provided with a multi-function control port using a connector of the RJ45 type. Optional active input modules shall be available which may be wired to this connector using standard screened Category 5 cable. One version of active module shall enable external mic and/or line level signals to be routed to the zone from a remote location and also to select either

input and adjust overall amplifier volume via this control port. An alternative version of module, which shall also connect using standard Category 5 cable, shall permit stereo audio to be routed to the control port using Bluetooth wireless connectivity. The multi-function control port shall also permit the direct connection of a balanced audio source, and provide DC power for the remote modules.

An auxiliary output shall be available; this shall be balanced and at nominal line level. The connector shall be of the plug-in screw-terminal type. The output shall carry the same mix of music channel and mic signal as the main output. It shall be possible to select whether the music channel element of the mix is derived pre or post the front panel EQ.

An external control input shall be provided on a plug-in screw terminal connector to allow muting of the music channel by a fire alarm or other external emergency system via isolated, 'voltage-free' contacts, and this input shall be configurable to respond to either a short or open external circuit. There shall be visual indication of the mute input's state on the front panel.

The amplifier shall be compliant with the relevant provisions of EnergyStar® Eligibility Criteria Ver. 3.0 for Audio-Video Products. In the absence of an input signal, it shall automatically enter "standby" mode wherein the DC power consumption shall be less than 1 W. It shall be possible to override this mode by an internal jumper.

The amplifier shall be built in a robust steel housing suitable for installation in unattended locations. Cooling shall be by natural convection. The amplifier shall operate from any AC mains supply voltage from 100 V to 240 V. The power input connector shall be a standard IEC type. It shall be possible for suitably-qualified personnel to replace the IEC connector with a standard 20 mm diameter cable inlet conduit to permit the amplifier to be installed in sealed environments where a permanent AC supply is mandated. The conduit adapter shall be available as an optional accessory.

The amplifier shall be the Cloud MA80FT. The optional active modules shall be the Cloud LM-2 Series (for wired devices) and the Cloud BT-1 (for wireless devices).