



## The Dangerous MQ Manual

Thank you for choosing products from the exciting line of **Dangerous Music** recording equipment. Many years of dependable and trouble-free service can be expected from our gear. This has been made possible by careful design, construction, and top-shelf component choices by recording industry veterans.

**MQ** stands for “Meters and Cue system”. It is a multipurpose device designed to give the recording engineer quick and precise mix level awareness as well as an easy to use, dual stereo cue system complete with headphone amplifiers and talkback communications.

The Metering section has a pair of Sifam Clarity Focus VU movements for the analog inputs. A Prime LED digital meter with custom ballistics is used for the AES input. These accurately calibrated meters allow for optimum level adjustment for recording, mixing, mastering, and system calibration. The Cue section consists of a simple mixer and a talkback system that feeds two built-in power amplifiers. The MQ hooks up in minutes to become an indispensable component of your recording studio.

### Table of contents

Introduction .....	1
Safety review.....	2
Overview.....	3
Hook up.....	3
MQ front panel.....	4
Calibration and internal jumpers.....	6
Specifications.....	8
Warrantee information .....	9

## Safety Review

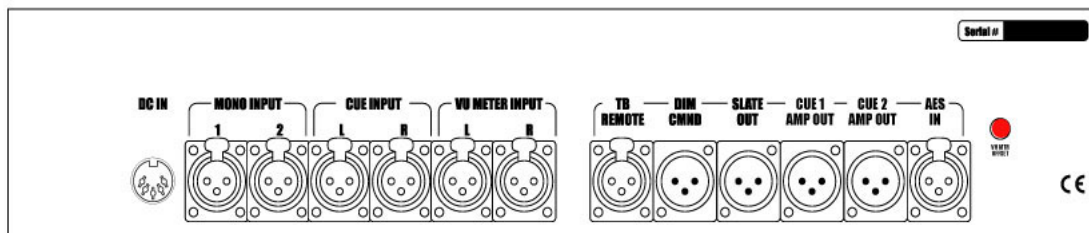
Certain precautions should be taken when using electrical products. Please observe the safety hints by reading the manual and obtaining qualified help if necessary to adhere to the precautions.

1. Always use a properly grounded power supply cord with this product. Please do not defeat the ground pin on the mains plug. This connection provides earth to the chassis and signal grounds inside the device for clean and quiet operation. The “calibration and internal jumpers” page can help clear up a buzz problem if one develops.
2. Avoid high temperature operation in equipment racks by providing air circulation. The number one killer of electronic gear is HEAT. The life expectancy of electrolytic capacitors (the usual casualty in a heat situation) goes from 10 or 15 years to 10 or 15 weeks if the temperature *inside* the box is allowed to rise beyond 140 degrees F. Vented rack panels may look like wasted space to an interior decorator, but they look like *beauty* to a technician or equipment designer! If the front panel is hot, it is roasting inside the box.
3. Avoid areas of high magnetic fields. The steel chassis of MQ is designed to shield the circuits from EMI and RFI (magnetic and radio interference). When installing equipment in racks, it is prudent to put power amplifiers and large power supplies at least several rack spaces, if not in a different rack, away from equipment that deals with low level signals. Separation of high level and low level equipment can pre-empt trouble caused by heat and EMI.
4. Care should be taken to avoid liquid spills around equipment. If a spill occurs, please shut off the gear. A qualified technician should investigate accidents to prevent further equipment damage or personnel hazards caused by spills.
5. Every attempt has been made by the designers to provide versatility in the set-up and calibration of MQ. As such, there ARE user serviceable jumpers and calibrations inside. If one is uncomfortable with opening gear and changing jumpers or making adjustments, please seek qualified help.
6. If adjustments or jumper changes are required, please unplug the power before opening the top. Dropped screws or tools on a live circuit board can ruin your day and subsequent damage is not covered by the warranty.

## Overview

The **MQ** is designed to provide accurate **metering** and **mixing** for the **cue** environment. High quality analog and digital meter movements are fed from the meter sends of the **Dangerous Monitor** or other source. There are two headphone amplifiers that are fed from a simple mixer on the front panel. A talkback microphone with inject levels rounds out the package. A “Dim” signal is sent back to the **Monitor** to dim the control room speakers when the talkback key is pressed if desired. The **MQ** and **Monitor** were made for each other but can also work independently.

## Hooking up your MQ

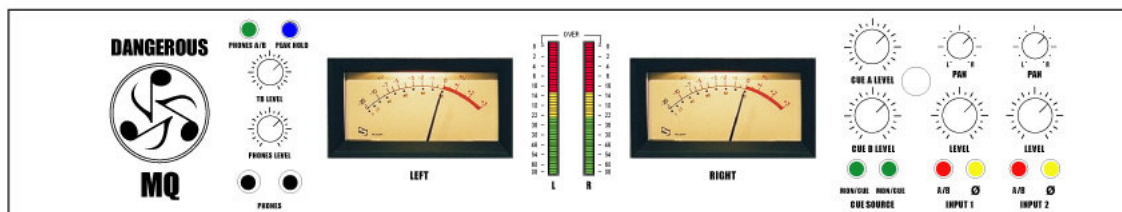


1. The first connector is for the power supply. It is good engineering practice to make all the other connections to **MQ** before applying power.
2. The next six connectors are audio inputs that feed the cue mixer and analog meters. The exact functions of these inputs and usage examples will be explained in the next section.
3. The talkback switch and cable gets plugged into the “TB REMOTE” jack to activate the talkback microphone. A regular mic cable or XLR tie line can be used to extend the talkback switch. A foot-operated switch can also be used (See pg 8 for connector pinout.)
4. The “DIM CMND” jack sends a signal to the **Dangerous Monitor** to dim the control room speakers. This prevents feedback and loud music from getting into the cue system upon talkback activation.
5. When the talkback switch is pressed, the “SLATE OUT” jack provides the talkback signal for slating mixes, driving a PA system or phone patch.

6. The “Cue Amp Out” jacks are for feeding two separate sets of headphones. The two power amplifiers can drive several pairs of medium impedance headphones each (like Sony MDR series for example). Since the XLR’s are at full amplifier level, they are designed to drive a headphone level control box like the Redco *Little Red Cue Box* or similar devices. Connector pinouts and sources are listed on the “Connector Pinouts” page of this manual.
7. The “AES IN” jack is for driving the digital meter with a standard AES digital signal.
8. The “VU MTR OFFSET” switch turns the meter sensitivity down if the type of music worked on warrants it (prolonged meter pinning can damage the movements.) This is factory set to  $-4$  dBu.

The VU METER INPUT, DIM CMND, and the AES IN signals hook up seamlessly to the **Dangerous Monitor**. It is easy to incorporate the **MQ** into other systems by buying or making the appropriate cables using the information on the “Connector Pinouts” page (8.)

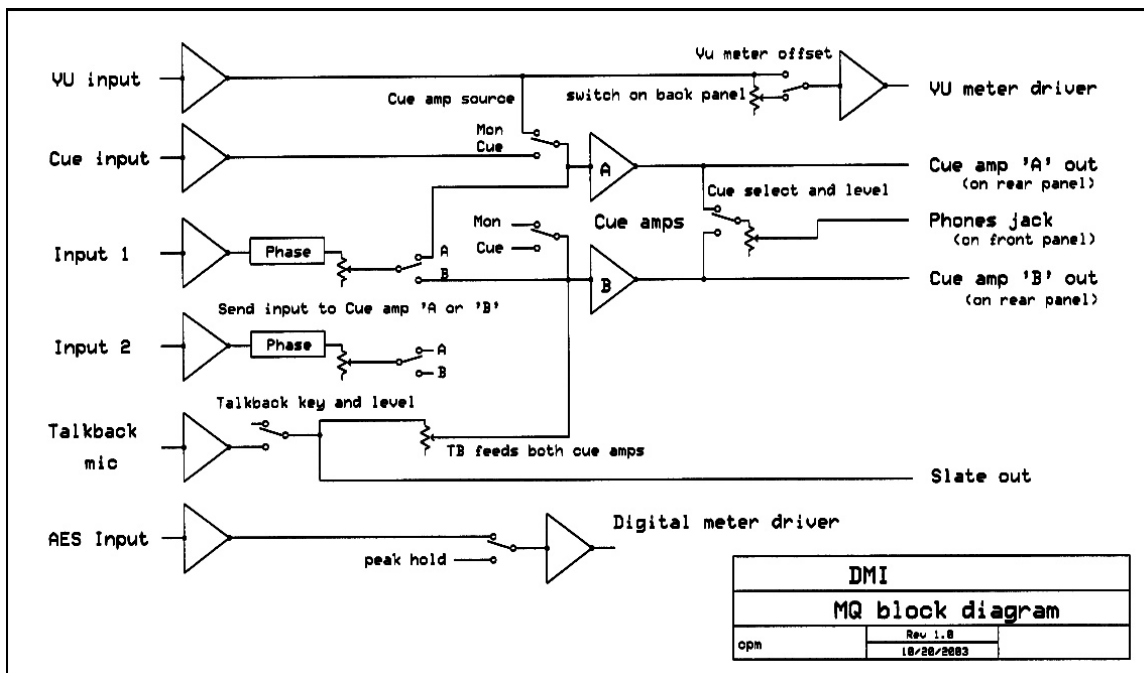
### MQ front panel



The cue mixer section is next to the right VU meter and has the master level controls (Cue A Level and Cue B Level) along with the Cue Source selectors. The mono inputs (Input 1 and Input 2) have level and pan pots along with phase flip and Cue Assign switches. Setting all the pots to the 12:00 position is a safe place to start when setting up the MQ for the first time. The engineer’s headphone level usually winds up around 2:00 and the talkback level also runs around 2:00 for most applications.

The cue amps get their source from the VU meter input (Mon) or a separate Cue input (Cue) that the engineer provides. The mono inputs are to inject click track, vocal, or whatever is needed into either cue amp as selected by the A/B switch.

On the left side, there are controls for Talkback Level, Headphone Level for the front panel jacks, and switch to select which cue mix the engineer wants to monitor. There is also a Peak Hold switch for the digital level meter.



A powerful feature of this system is the ability to provide a latency free vocal headphone mix by multhing the mic signal just before A/D conversion and patching it into one of the mono inputs. Adjust Level and Pan controls to taste. This gives the talent a signal in their cue mix that doesn't have any delay caused by A/D conversion or signal processing in the computer. The phase switch is to compensate for polarity reversals anywhere along the line from the microphone to the headphones. Push the phase switch while the artist is singing into the mic and select the switch position that produces the most comfortable mix. The phase switches are also handy to *subtract* a signal from a cue mix. It is easy to send the control room mix to a singer and turn down the bass for instance by assigning the bass to one of the mono inputs, pushing the phase switch, and adjusting the level control to cancel some of the bass signal in the main mix of the singer's headphones. These common tricks of the trade regularly used in recording studios of the past are once again made available and easy with MQ.

Another good trick of the recording trade that seems to be becoming rare these days is having *really good, accurate* meters for proper system calibration and level setting. The VU movements are top-notch Sifam Clarity Focus movements with backlighting and an Offset switch to turn the sensitivity down in when listening to high levels of program modulation (i.e. in mastering). The VU meter sensitivity switch is located on the rear panel.

The digital meter is a Prime LED set with custom ballistics designed to provide simultaneous average and peak level indication. An Over Modulation indicator lights when three consecutive words at full scale are detected to tell you if there is serious clipping of program material.

## MQ calibration and user configuration

The MQ is carefully calibrated and configured for immediate use right out of the box. There are meter gain adjustments and jumpers for altering the talkback mode and cable shielding if desired. This requires opening the top of the case. Please disconnect the power before removing the top, as mother nature’s way of telling you that you dropped a screw on a powered motherboard is usually a nice crater. This type of damage tends to be expensive and is not warranty material. If one is not comfortable with opening equipment, please seek the help of a qualified technician. The VU movements are also delicate. They tend to not respond well to physical shock. Dropping an MQ, shipping it without the proper packing material or prolonged pinning of the meters will damage the Sifam movements. The next page has a drawing of the MQ main board. There are three areas of adjustments.

Meter Calibration: The “meter gain” pots are set by running a 1kHz tone at +4dBu into the “VU Meter” inputs and turning the pots so that the movements read “0VU”. The “meter offset gain” pots set the sensitivity down to avoid pinning the meters when running high levels through the system without the benefit of the “-6VU” button on the **Monitor**. The factory calibration for this offset is -4dB to accommodate the two most popular 0VU settings (-14dBfs for mastering = +4dBu, and -14dBfs for recording = +8dBu). The offset position has several dB of range to accommodate different levels.

<i>Volts AC</i>	<i>dBu</i>	<i>dBfs (mastering)</i>	<i>dBfs(Recording)</i>
9.75	+22	over	-0
6.15	+18	-0	-4
1.95	+8	-10 ( <i>VU level compressed</i> )	-14 0VU
1.23	+4	-14 0VU	-18

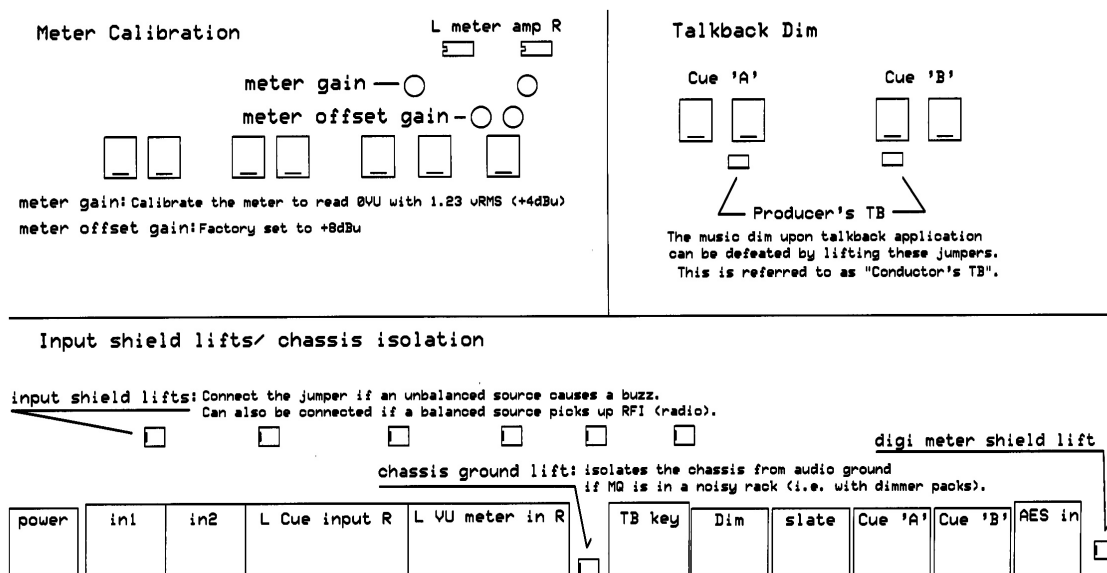
### Why the meters are set the way they are:

VU meters have been historically set up in recording studios to read “0VU” at +4 dBu. It was found by equipment designers that typical music had around 14 to 18dB peaks above 0VU and that corresponded with peak levels in a system of +18 to +22dBu. When recording went digital, strict attention to peak levels had to be maintained, as digital systems do not have wiggle room above full scale. One hits full scale, one records distorted music. It turns out however, that there are two major kinds of distortion depending on what one is doing, namely *Amplitude* and *Slew Rate* distortion. Amplitude distortion is the kind most people think of by simply recording at too high a level. Mastering engineers know of slew rate distortion by having a compressed, bright, hot signal overload the components in a system even if the level (amplitude) is not at peak. The two camps tended to pick their *maximum voltage levels* in their systems to reflect the different problems they encountered, hence the two different popular A/D alignment standards. In recording, it is important to not clip the A/D, so the standard alignment

allows signals to go up to +22dBu. In mastering, it is important to be able to modulate the A/D to full scale without slew rate distortion so the maximum level has migrated to +18dBu in many mastering houses. We put a switch on the back of MQ so that either system could be accommodated without overloading (pinning) the meters. Mastering compressed material may require the offset even with the maximum system level set to +18dBu.

**Talkback Dim:** There are individual jumpers on the headphone amplifiers that enable the “cue dim on talkback activation” function. The jumpers can be lifted to provide what is known as “conductor’s talkback” where communication with the artist happens without dimming the music feed.

**Input shield lifts/chassis isolation:** These jumpers can correct a buzz or hum problem with unbalanced sources that don’t have a ground reference by connecting the audio ground to the input cable shield. If a buzz is encountered with an individual input, change the jumper setting of that input. This will almost always clear up the problem. The chassis lift jumper is provided if MQ is bolted in a rack with electrically noisy devices (light dimmer packs for instance) that cause interference. It is not recommended to lift the ground on AC plugs of equipment to cure ground buzzes. An in depth treatise of this subject is available in the Monitor manual at dangerousmusic.com.



This is a view of the MQ main board, connectors towards the reader.



## Connector Pin-outs and Specifications page

All the analog input connectors are 3-pin XLR females wired pin 2 hot. The nominal level for these inputs is +4dBu.

The AES meter input is also pin 2 hot and will lock to an AES digital input with a sample rate between 32 kHz and 96 kHz.

### *DC IN*

Shell	ground
1,2	common
3	+5v at 5 amps
4	-15v .8 amps
5	+15v .9 amps

### *Talkback Remote*

1	cable shield
2	relay coil
3	relay common

connect pins 2 and 3 to operate the talkback function

### *Slate Out*

1	cable shield
2	audio +
3	audio -

### *Cue Amp Outputs*

1	audio common
2	left power amp +
3	right power amp +

The cue amps are rated for .006% THD+N at 20 watts per channel into 8 ohms. They are not heat-sinked to drive speaker loads. They can drive several pairs of headphones to way beyond comfortable levels. Please use caution driving headphones to not damage equipment or injure the talent! The XLR outputs are designed to feed cue boxes like the Redco *Little Red Cue Box* or similar devices available at pro audio dealers or from Redco.com





**Dangerous Music, Inc.**  
**154 East 2<sup>nd</sup> Street #4**  
**New York, NY 10009**  
**[www.dangerousmusic.com](http://www.dangerousmusic.com)**

### **Warrantee information**

MQ is warranted from defects of manufacturing for a period of 90 days from purchase, subject to factory inspection. This increases to two years from date of purchase when the warranty card is sent back to *Dangerous Music, Inc.* before the first period is over. Damage caused by improper shipping, unauthorized repairs or modifications will incur service charges. *DMI* reserves the right to update designs at its discretion. Returned warranty cards help us keep our paperwork straight and alert users to updates. Information on warranty cards is always treated as confidential and will not be disclosed to third parties for any reason.