

MicroMeek MQ3



Professional recording interface

User's Guide

The MicroMeek MQ3 is a piece of precision electronics designed to get the absolute best performance out of a musical instrument, microphone, recorder and the final mix. Read the instructions carefully; they have been written as a result of practical experience.

Ted Fletcher

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Ted Fletcher

This instruction book was written by Ted Fletcher; the designer of the original JOEMEEK compressor and the whole JOEMEEK range of professional audio equipment. Ted worked in the studio with Joe Meek, the legendary record producer, in the mid 1960s.

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THE JOEMEEK MQ3



WHAT IT IS

The JOEMEEK MicroMeek MQ3 is an input conditioner. A microphone or musical instrument preamplifier designed to bridge the gap between the performing musician and the recording studio.

It has been designed specially to be easy to operate, yet will give the finest professional 'glitter' to the sound; but without hours of tweaking knobs and switches with unrecognisable names!

QUALITY AND BIG SOUNDS

It's my theory that 'big' sounds can only be produced if the lower frequencies in an input amplifier are kept absolutely flat and under control. To achieve this, the JOEMEEK MICROMEEK has an extended frequency range down well below 20Hz. This ensures that there are no sudden phase shifts in the low end. The proof of the theory is that it sounds great!

OVERLOAD MARGINS

In the mid 1970s I designed a range of mixers specifically for Independent Local radio stations and the BBC. One of the specification clauses insisted on by them was an extreme overload margin on the microphone amplifier. The reason was that although momentary overloads (transients) are not audible, they have an effect on the quality of the sound you hear. A high overload margin amplifier just sounds better. Nowadays, many of these notions have been forgotten and 'quality' electronics is getting rarer and rarer. But the JOEMEEK range of Studio channels and the MQ3 apply these professional rules and you can hear the difference!

The function of a microphone preamplifier is not too difficult and the microphone/input amplifiers on normal professional mixers do it quite well; BUT they cut costs and corners. The JOEMEEK MQ3 has a specialist approach, it uses a super quality transformerless input stage in combination

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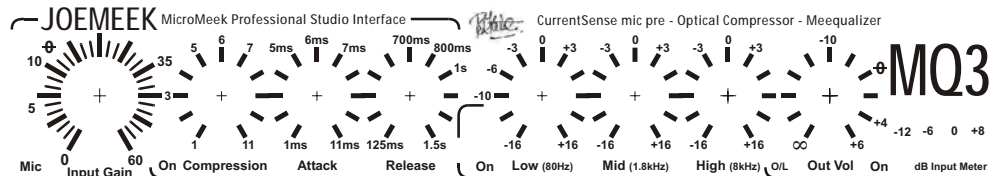
with a low-noise line amplifier; the overall design produces a virtually unburstable input stage with excellent low noise characteristics.

An interesting fact is that the cost and quality of the parts in the MQ3 input amplifier are on a par with those used in the very top professional mixers and microphone amplifier outboards.

As well as giving the best performance with keyboards, guitars and basses, the MQ3 is also designed to work well with the best capacitor microphones; it is particularly good with the JOEMEEK JM47, Neumann range, the AKG C414, Microtech Gefell, and Audio Technicas.

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WHAT'S IN IT



It's best to think of the JOEMEEK MQ3 as three separate pieces of equipment:

- 1) The Input amplifier.
- 2) The JOEMEEK Compressor.
- 3) The Meequalizer

THE CurrentSense INPUT AMPLIFIER

The input amplifier takes audio signals from any microphone (XLR socket), musical instrument or high level source (1/4 inch jack socket), and amplifies them up to 'line' level; that is, from a few millivolts, up to about a volt. The phantom power supply (rear panel push-button switch) provides power to capacitor microphones. Dynamic or ribbon microphones should be used with the phantom power turned off, then full advantage can be taken of the extreme low noise performance of this amplifier. The CurrentSense mic pre amp design, unique to JOEMEEK, allows optimised performance from all types of microphones, from dynamic, to condenser, to classic ribbon types.

THE JOEMEEK COMPRESSOR

And now for the part of the JOEMEEK MQ3 that gives it character; - the compressor.

It can pull voices forward, control recording volume levels, help with internal mix balance, and add 'presence' to your sound.

To get the best use out of the compressor it is necessary to get technical; so even if you're not technical, read the next bit carefully and get to be a compressor Guru!

A LIMITER is a device which stops the output of a signal path going above a predetermined level. It is mainly used to protect amplifiers and recorders

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(and radio transmitters) against overload. The sound of a limiter is a bit like compression but it tends to be flat and uninteresting.

A COMPRESSOR is a device which reduces the dynamic range of programme material. Its use is necessary to squeeze both the loudest and softest sounds onto records so that they can be listened to in all environments; ie, in the car! A secondary use of compression (and most important for us) is to introduce some artificial dynamics into sound to make it sound more exciting. This is what the JOEMEEK compressor does best.

WHAT IS A COMPRESSOR?

A perfect compressor is an amplifier where the input/output ratio is constant: So using a 2:1 compressor, increasing the input by 2dB gives a corresponding 1dB increase in the output.

Early compressors which used variable mu thermionic tubes or photoelectric devices only approximated true compression over a limited range. They had a soft 'threshold' where compression started and held to a predictable ratio up to a certain level, then they returned to a more linear amplification allowing transients through. This is in stark contrast to modern VCA compressor/limiters where it seemed 'sensible' to combine the functions of compressor and limiter and to 'stonewall' any and all signals above a certain level; excellent for technical level control but hopeless for musical effect. Generally, (I know I'm over simplifying) modern VCA compressors sound muddy and flat, while old compressors sound lively and retain sparkle. The compressor in the JOEMEEK MQ3 is unique; it is a recreation of an early photoelectric compressor in use in the mid 1960's. It is capable of producing the same punchy sounds that were so characteristic of the pop records of the time: I know; I used to make them!

THE Meequalizer (Equalizer)

The equalizer controls the volume in three audio bands. It's used to modify the tonal sound of the signal in the MQ3. The three bands are set at 80Hz at the 'low' end, 1.5KHz in the mid frequencies, and 8KHz in the high frequencies. The equalizer is after the input amplifier and before the insert point and the compressor.

The effect of the equalizer can be switched in and out with the EQ IN/OUT switch. When the EQ is in circuit, a yellow light shows beside the switch.

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The general rule about using EQ is to be very careful about too much 'lift'. Increasing the gain by say 10dB in the high frequencies has the effect of taking the MQ3 closer to overload. This is generally OK as the MQ3 is designed with very generous overload margins, but when using EQ this has to be remembered. The rule is that when 'lift' is used, it's often necessary to compensate by reducing the input gain.

Note, always alter sound from the ground up; i.e. with the EQ controls set to the 'flat' or 0 position.

A red LED indicator shows overload conditions at the output of the equalizer section of the MQ3. When this indicator flashes, it shows that the audio signal is within 6dB of the overload point. This a very useful indicator as it allows you to operate the EQ knowing that there will not be distortion in the output.

If the overload light flashes more than 'occasionally', then decrease the input gain control. - See block diagram for detail on overload indicators.

MQ3 CONTROL EXPLANATIONS.

'INPUT GAIN' changes the audio amplification of the input amplifiers of the MQ3. Too little gain and the sound will be too quiet and electronic background noise from various sources could become a problem; too much and the MQ3 could become overloaded and distorted.

'MIC' when pressed in enables the microphone input on the rear panel. When out, the unit will respond to the line input

'COMPRESSION' simply adds gain to the compression sidechain and so increases compression. In simple terms this changes the 'threshold' of the compression although with this compressor the 'threshold' is not clearly defined; the compression starts very gradually and the compression ratio changes with programme content and volume. For practical purposes, winding up the compression control increases the amount of compression. In use you will find that musically, all controls are interrelated.

'ATTACK' sets the time that the compressor takes to act. At maximum (slowest) it's possible to make the compressor 'overshoot' on some percussive programme material: This means that the compression

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electronics are driven hard before the gain has been controlled by the light cells. The cells catch up and over-compress momentarily giving a tiny dip immediately following the start of the 'note'. This is best demonstrated when recording drums. Used sparingly this can contribute to musical drive. Faster attack times (set to minimum) are used where the compression needs to be less obvious, and more reliably gain controlling.

'RELEASE' sets the time during which the path gain returns to normal after compression. Generally, the longer the time, the less obvious is the compression.

LF controls the volume of low frequencies in the audio spectrum. This is a 'shelving' control with the full level of lift and cut available at and below 80Hz.

MF controls the mid frequencies in the audio spectrum and it is centred around 1.8KHz. The use of 'mid' control can affect the relative position of instruments in a mix. The control is a 'peaking' control with a 'Q' value of 1.

HF controls the volume of the high frequencies in the audio spectrum. This is a 'shelving' control with the full level of lift and cut available at and above 8KHz. Increasing HF content tends to make sounds appear closer and more 'present'.

'OUT VOL' is simply a volume control for the output level. It operates after the LED VU meter so does not affect the overload margin of the MQ3 unit.

'PHANTOM' (situated on rear panel) when pressed in, enables 48V phantom power on the microphone XLR connector. Most condenser type microphones will require phantom power to operate.

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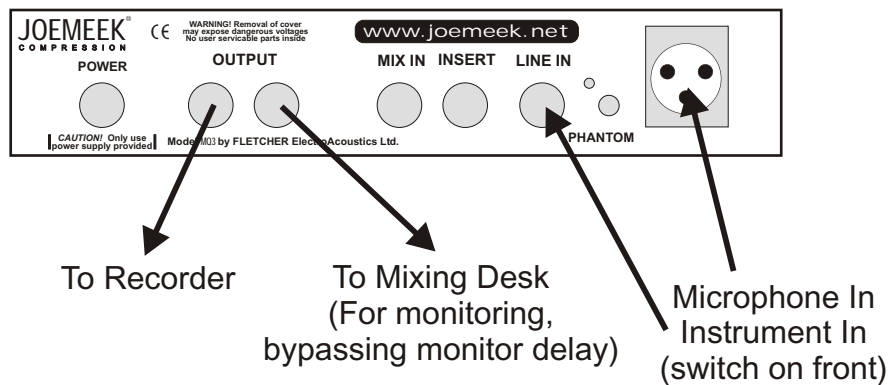
MAKING IT GO

CONNECTING YOUR MQ3

The MQ3 can be used in many applications, from recording to live work. This section will help you get connected as well as explaining the connections on the MQ3 to help you get the most from your Pro Channel.

Sample recording set up

Here, we are using the MQ3 as a replacement front end for a mixing desk/hard disk recording setup. This configuration may be used for a performance vocal or instrument source in the studio to get richer sounds on disk, as well as eliminating any digital delay when monitoring.



The mix input may be used to add additional sources at the performance, and the insert point may be used to add effects by diverting the line level signal through an external processor (i.e. reverb unit or amp simulator).

This use of the MQ3 will improve the quality of sound recorded by its high performance mic/instrument amplifier. Also, the compressor will significantly improve the perceived impact of a sound.

Note that the compressor and equalizer may be added to a track after it has been recorded by using the line input from recorder group output.

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MQ3 INPUTS AND OUTPUTS

MICROPHONE.

The microphone input is an XLR connector. All microphone impedances and types are suitable for the JOEMEEK CurrentSense circuit.

Connections are: Pin 1 is ground or screen.
 Pin 2 is positive phase or 'hot'
 Pin 3 is negative phase (or ground for unbalanced).

To avoid deafening 'clonks' try to remember to plug in capacitor microphones before turning on the phantom power.

INSTRUMENT/ LINE INPUT - This input is a high impedance unbalanced 1/4 inch jack input suitable for any line or instrument level audio signal.

This input is for line level unbalanced signals from instruments or equipment. It's not normally used for microphone inputs; but can be suitable for some high output unbalanced microphones (such as battery powered Electret types).

INSERT POINT - This is used to insert another effect or outboard equipment into the ProChannel. The input amplifier output appears on the tip of the 1/4 inch jack socket, the 'ring' is the return input. When no jack is inserted, the socket is 'normalised' (internally linked).

MIX INPUT - This is an auxiliary 1/4 inch jack line input which mixes with the normal mic or line. It can be used to add a second signal post EQ and pre compression. Ideal for mixing an acoustic guitar with a voice.

OUTPUTS - The two output sockets are 1/4 inch jack balanced low impedance, and are connected in parallel. The output is auto balancing and may be unbalanced without affecting output level. One can be used as a recording output while the other is used for monitoring/PA.

POWER - Power input is 12Volt AC only.

IMPORTANT: POWER THE MQ3 ONLY FROM THE JOEMEEK POWER SUPPLY PROVIDED. USE OF OTHER POWER SUPPLIES WILL DAMAGE THE MQ3 AND INVALIDATE ALL WARRANTIES.

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USING THE INPUT AMPLIFIER

Selection of 'MIC' or 'LINE' input is via the 'MIC' button on the front panel. When pressed in, the mic input (XLR) will be active.

Turn the INPUT GAIN knob down to minimum then, If you are using a capacitor microphone, plug in the microphone into the XLR socket, then switch on the phantom power by pressing in the 'Phantom' switch. (Do it in that order)

CAUTION - When using UNBALANCED MICROPHONES DO NOT USE PHANTOM POWER, It could damage the microphone and will certainly cause noise on the output. An LED light shows on the rear panel as a warning that the phantom power is turned on.

Turn up the INPUT GAIN until sound into the microphone registers on the LED VU meter. Adjust the level so that the second yellow LED (the next-to-highest light) lights occasionally.

USING THE COMPRESSOR

First, get a sound going through the MQ3 so that the LED meter is flickering.

Press the 'COMP' push-button and turn up the 'COMPRESSION' control so that the compression LED starts to flicker on audio peaks. You should now be able to hear a compression effect. Adjust the ATTACK control to the desired setting, a fast attack is used for smooth effects, a slower attack is used when the compression needs to be more noticeable. Adjust the release control to set the time that the compression takes to 'die out' and increase the input gain control to get more compression.

Note that compression effect is always a combination of settings between the input, attack and release controls. They are always interdependent so experiment with different combinations for best effect.

When using the compressor, remember what it is doing; it's pulling down the volume of the louder sounds in a particular way that fools your ears into thinking that the sound is actually louder than it really is!

There is always the danger (particularly with the smooth response of the JOEMEEK compressor) of increasing the input gain too far and causing

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excessive noise or even distortion; it's easy to apply 20dB of compression without realising it!

USING THE EQUALIZER

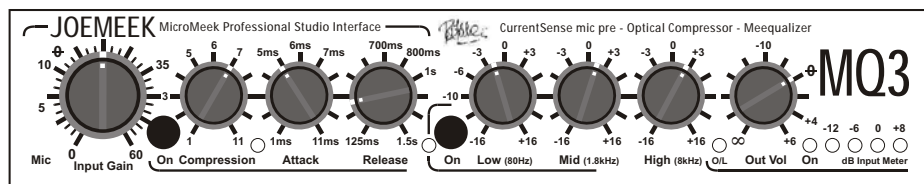
Always start with the equalizer controls set to '0' (the control knobs set vertical). Experiment with combinations of settings of EQ always trying to picture how the audio signal will be affected by changing the frequency bands. Avoid using high levels of 'lift', and whenever 'lift' is applied, keep a close eye on the overload LED. If this LED comes on more than occasionally, turn down the input.

- Use the EQ IN/OUT button to do instant comparisons between EQ and non EQ signals.

SAMPLE SETTINGS

This section is aimed at providing a good starting point for getting good results. While these settings do not guarantee a good sound, they do work in most situations. The correct level of the input gain and output gain cannot be predicted. This depends on your source and monitoring equipment. Always try to run these as high as you can without creating any audible distortion.

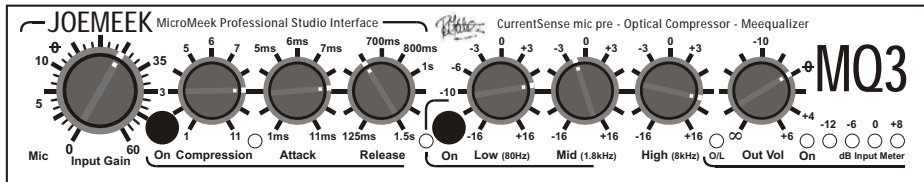
Switches : denotes pressed IN. denotes OUT.



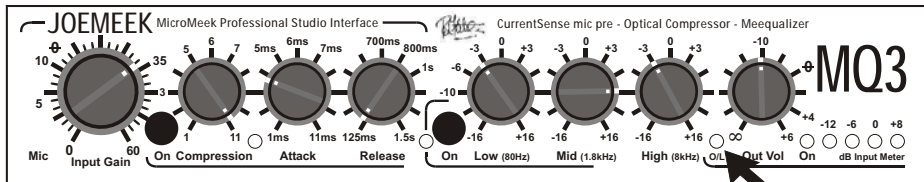
- RECORDING VOCALS

Medium compression, slow attack, medium release, brightening eq but keep subtle for this program material.

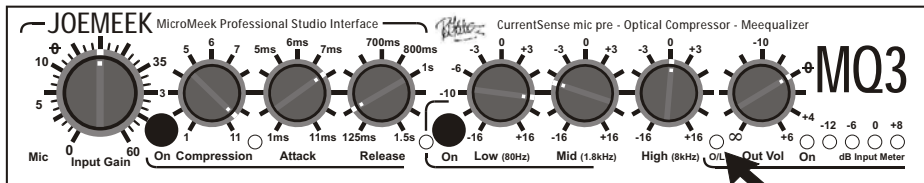
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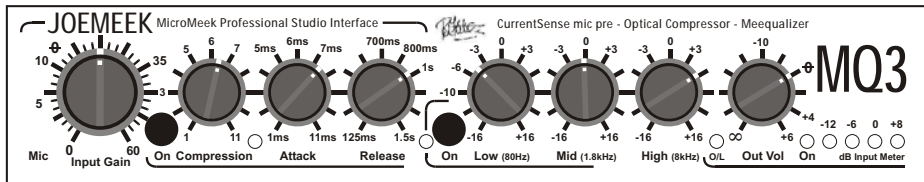
- Mike'd acoustic guitar
Heavy compression, slow attack, medium release, aggressive eq



- Electric guitar
Heavy Heavy compression, fast attack, short release, 'cutting' eq



- BASS/Drums
Heavy Heavy compression, slow attack, fast release, plenty of bass boost, and mid range cut - (especially good with slap styles)



- Cymbals
Compression, slow attack, long release, brightening eq

COMMON PROBLEMS

- 1) The microphone doesn't work!
 - Check cabling, and always use XLR input for mics
 - Check that mic button is pressed in
 - Is the phantom power on? (capacitor microphones).
 - Is the output volume control up?

- 2) Got signal going through, but no compression.
 - Is there enough signal?
 - Is the compressor push-button engaged.
 - Have you turned the COMPRESSION control high enough?

- 3) It's noisy.
 - The ProChannel input amplifier and compressor are extremely quiet, but by definition compressors raise the level of quiet passages, and EQ can contribute high frequency hiss if overused; this also means that if there is noise in the microphone channel, there will be more noise on the compressed and EQ'd signal. It's a compromise so try reducing compression and HF EQ.
 - If you still have excessive noise, either there is serious noise in the input signal being fed into the unit, or something is still turned up far too high.
 - Start turning things down.

- 4) It distorts.
 - No it doesn't! Distortion inside the compressor is virtually impossible, however it is possible that the microphone amplifier is overcooking; turn down the COMPRESSION control and readjust.
 - Too much EQ can sometimes sound like distortion.

- 5) I can't make the compression gentle enough!
 - It takes practice. The setting of the COMPRESSION control is quite critical.

- 6) I can't make it compress hard enough!
 - Is the 'Comp on' switch in?
 - Again it takes practice; generally you are not pushing it hard enough. Try slowing the attack (turn clockwise) and the release to minimum, then with the compression control near full up turn up the input gain control.

TECHNICAL PERFORMANCE

THE INPUT STAGE

The 'front end' is an entirely new 'CurrentSense' design using 4 complete stages of amplification controlled by a single volume control. The design gives (microphone) input headroom of more than 30dB; the input is floating balanced and will easily accept microphone levels from -70dB up to more than 0dB. Phantom power is provided for capacitor microphones.

- Noise performance is up to finest laboratory standards (125.5dB below input 20Hz to 20KHz 200ohm input termination)
- The line input is designed for unbalanced circuits and will accept -30dB up to +24dB.

The nominal operating level at the 'insert' point is -10dB. but as maximum output at that point is +24dB the MQ3 can operate with any mixer or outboard equipment.

THE OUTPUT STAGE

An LED 'meter' shows levels immediately before the output stage. An output volume control gives the choice of output volume levels. The two output jack sockets are identical. Output is balanced 75 ohm with maximum output +26dB. Noise is approx. -80dB.

THE COMPRESSOR

The built-in JOEMEEK compressor is slightly different from the big studio units like the JOEMEEK SC2.2, so that it is easier to operate with musical instruments. The 'ATTACK' control is variable so that the impact of the compression sound can be varied from a gentle effect (with the attack adjusted fast) to more powerful sounds with longer attack times. The compression release is variable from 125mS up to 1.5 seconds giving a wide range of effects. An in/out switch allows comparison between compressed and uncompressed sound.

Technically, the compressor is a feedback optical device where the compression is provided by a light dependent resistor. The light source works in a servo loop, the compression effect is carefully controlled and the compression ratio varies with the amount of compression applied. During slight compression, the ratio can be as low as 1.2:1. During heavy compression, the ratio rises to about 7 to 1 although a feature of the JOEMEEK compressor is that the ratio momentarily decreases during

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transient signals; this effect works to retain brightness that is often lost with other types of compressor.

THE EQUALIZER

The equalizer is so called because it 'equalizes' or corrects the sound. It does this by modifying the relative volume levels of the various frequencies in the audio signal.

The MQ3 equalizer is a phase correcting equalizer with shelving high and low frequency correction, and a mid control with a 'Q' value of 1. As high frequencies are added, the phase of those frequencies is moved forward. This makes those frequencies sound more prominent and 'pulls the sound forward'. This makes for an extremely natural and pleasing sounding equalizer without harshness.

THE METER (input meter)

The first green LED of the meter array stays on all the time to show that power is on.

The second green LED lights at an output level of -12dB

The first yellow LED lights at an output level of -6dB

The second yellow LED lights at an output level of 0dB

The red LED lights at an output level of +8dB

(these levels refer to the output when the output control is at nominal zero)

OVERLOAD INDICATOR

There is also a separate overload indicator, set to light when the input amplifier (mic/instrument pre) is 4dB below clip. - this should be observed closely when the unit is being driven hard, and/or heavy compression is being used.

OVERALL PERFORMANCE

Frequency response +0 -0.5dB 10Hz to 50KHz Low frequency accuracy maintained to get clear unmuddled bass sounds onto digital recorders.

Harmonic distortion less than 0.01% except where compression affects low frequency wave shape.

Noise generally 100dB below input (125.5dB below input on mic at more than 50dB gain)

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THE POWER SUPPLY

An external 12V AC power supply provides the power for the unit.

DO NOT ATTEMPT TO POWER THE UNIT FROM ANY POWER SUPPLY OTHER THAN THE ONE SUPPLIED WITH THE UNIT.

Circuitry inside the MQ3 converts the 12V AC into 14.5-0-14.5V and a 48V DC supply for the phantom power.

Power rating is 5 watts.

SAFETY

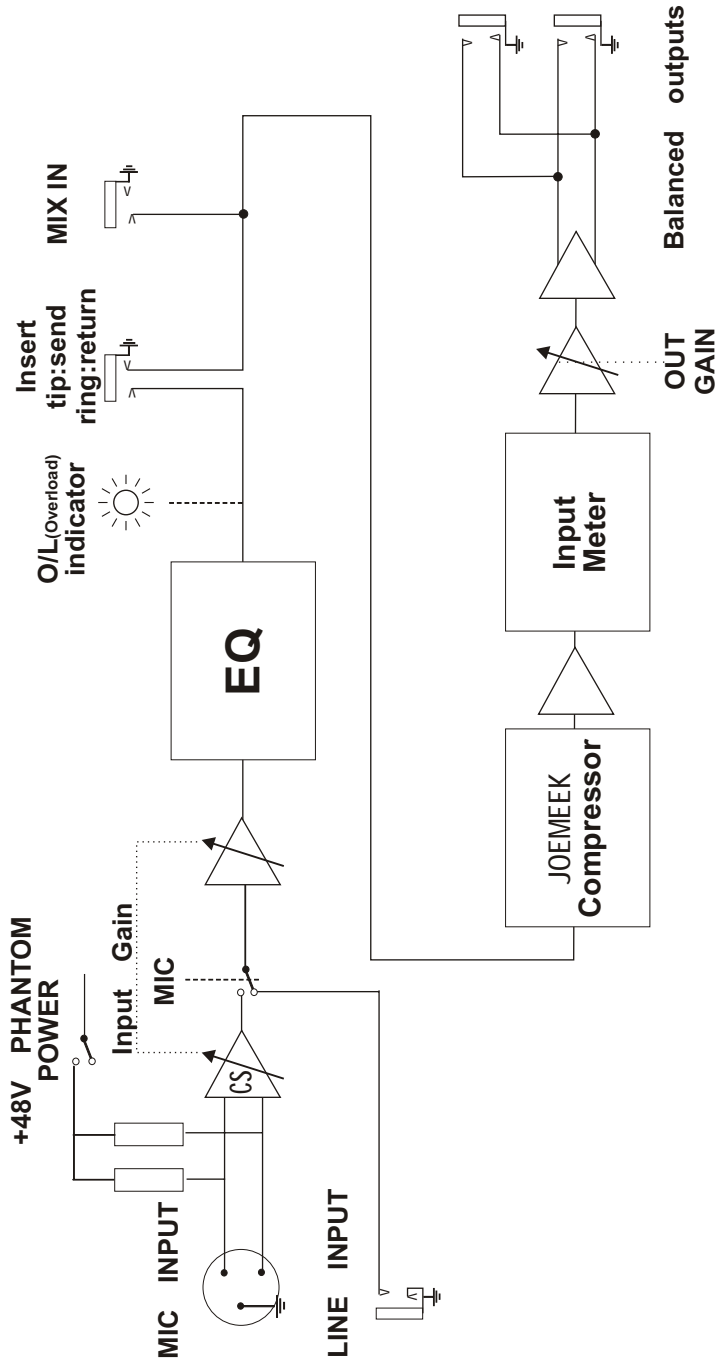
The unit complies fully with European Cenelec requirements (CE) and may be used in all territories subject to safety approval of the power supply to local regulations.

WARRANTY

In the unlikely case of a breakdown, please return the unit and power supply in its original packing through the supplier.

The unit will be attended to immediately and returned to your supplier. If any breakdown occurs (excluding physical mistreatment) within 12 months of purchase, no service charge will be made.

JOEMEER MQ3 Block diagram



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MQ3 User Settings- Use this page to record your favourite settings

JOEMEER MicroMeek Professional Studio Interface *Blue2* CurrentSense mic pre - Optical Compressor - Meequalizer

Mic 0 Input Gain 60 On Compression 1 11 5ms 6ms 7ms 700ms 800ms 1s 1ms 11ms 125ms 1.5s -6 -3 0 +3 -3 0 +3 -3 0 +3 -10 +4 -12 -6 0 +8

On Low (80Hz) Mid (1.8kHz) High (8kHz) O/L Out Vol On dB Input Meter

Notes:

JOEMEER MicroMeek Professional Studio Interface *Blue2* CurrentSense mic pre - Optical Compressor - Meequalizer

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LOOK OUT FOR OTHER JOEMEEK PRODUCTS!

More JOEMEEK Q range products:

THE JOEMEEK STUDIO CHANNEL VC1Qcs

Amazing mic amp + compressor, eq and enhancer channel



JOEMEEK VC6Q - mic/instrument pre, compressor, eq



THE JOEMEEK JM47 - True condenser microphone,
case, shockmount and cable.



FLETCHER ElectroAcoustics Ltd.
St Marys, Barton Road, Torquay, Devon. TQ1 4DP. ENGLAND
Tel : +44 1803 321921 Fax : +44 1803 321922
e-mail : sales@joemeek.net www.joemeek.net

DECLARATION OF CONFORMITY.

This analogue audio processing equipment conforms to the standards and requirements of the European Economic Community.

The EC Harmonised standards that have been applied are;

- a) Electrical equipment (safety) Regulations 1994 (S.I. 1994/3260)
- b) Electromagnetic Compatibility Directive (89/336/EEC) incorporating (S.I. 1992/2372)

"If it sounds right; it is right"

Joe Meek, 1964