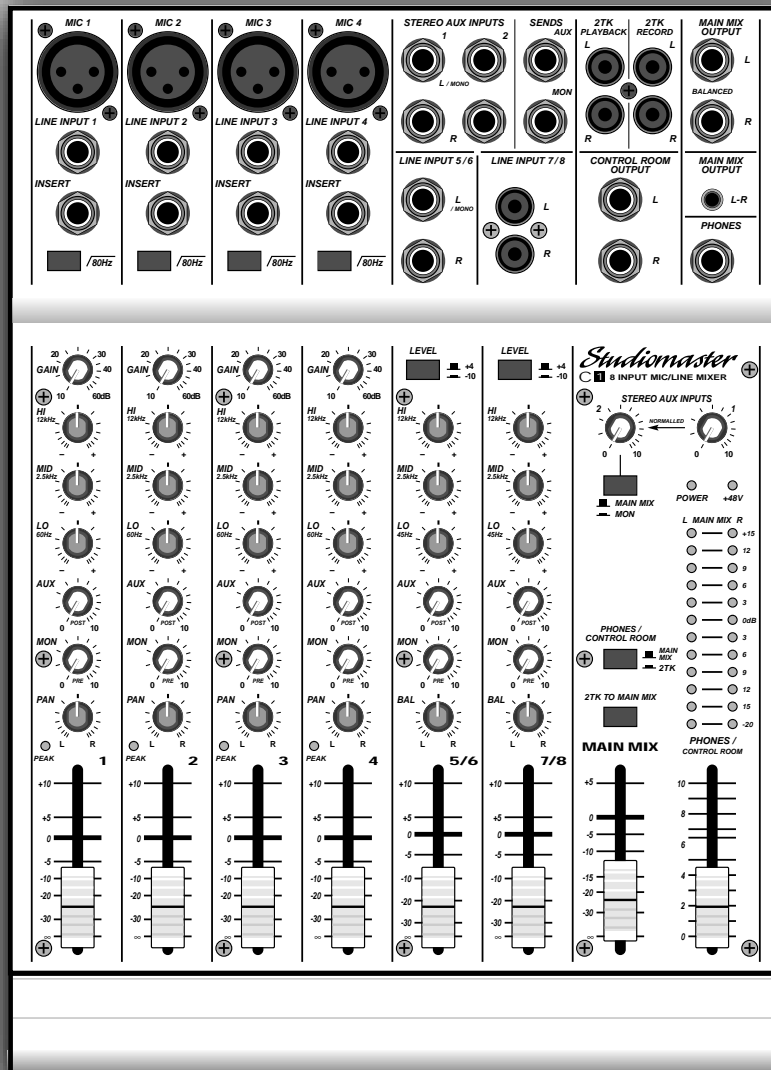


Studiomaster

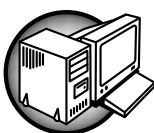
C1

8 INPUT MIC/LINE MIXER



operator guide

ENGLISH



<i>English</i>	
Introduction	1
Safety Instructions	1
Channels 1-4	2
Channels 5/6 & 7/8 and Aux Section	3
Output Section & Master Section	4
Rear panel	5
Trouble Shooting	6
Service Information	6
Glossary of Technical Terms	7
Suggested Set-ups	33
Wiring Connections	40
Block diagram	41
Technical Specification	42

Studiomaster

I N T E L L I G E N T A U D I O S O L U T I O N S

In accordance with our policy of progressive product development Studiomaster reserve the right to alter specifications without prior notice.



INTRODUCTION

Congratulations on your purchase of the Studiomaster C1 compact audio mixer. This is a high quality piece of equipment designed to be flexible enough to suit a range of applications at the same time as making it easy for the novice and professional alike to get great results.

READ THE OPERATOR GUIDE

No doubt you're eager to get your C1 running and find out what it can do, but we recommend that you read the operator guide in full at least once as it contains important safety information. The C1 also has some innovative features which you may not have encountered before, so try to experiment with it in the company of this guide before getting down to any serious work.

UNPACKING

Your new C1 is supplied with an external a.c. power supply unit, this operator guide and a warranty card. Retain the packaging in the eventuality that the unit needs to be returned for service or repair and please complete and return your warranty registration card. Returning the completed warranty registration card does not diminish your statutory rights in any way.

SAFETY INSTRUCTIONS

- Only use the external a.c. power unit supplied with your C1. If this becomes damaged, contact your Studiomaster dealer for a replacement .
- Do not attempt to remove screws or panels on your C1. There are no user serviceable parts inside.
- Do not operate the unit next to heat sources such as radiators.
- This unit should not be stored or operated near rain or moisture.
- Do not allow objects or liquids to enter the unit.
- This equipment must not be exposed to dripping or splashing and no objects filled with liquid should be placed on top of the mixer or a.c. power unit.
- Write the serial number in the box provided in the Service Information (page 6) for future reference.
- If the unit becomes damaged, has been dropped or appears to have developed a fault, refer to the Service Information section for details.

APPLICATIONS

Project studio

The C1 is tailor-made for home studio use, thanks to it's professional microphone preamps, computer soundcard-compatible mini jack output, dedicated control room output and flexible two-track routing. The high quality electronics and external power supply help to keep noise and distortion out of the mix and the handy Headphone / Control Room fader makes monitoring easy. We've even supplied phantom power for your valuable condenser microphones.

Live bands / Solos / Duos

Even the smallest gigs deserve quality sound, and the C1 provides exactly that in a portable, rugged package. High headroom microphone channels with effective e.q. and useful high-pass filters keep the music you create clean and pure, straight through to the amps. And the abundance of RCA phono in / outs makes connecting players for backing tracks or interval music and recording your live performance simple.

Multimedia

For the musician who values good quality sound from their home entertainment set-up, the C1 can integrate easily with hi-fi, video, television and computer systems. Whether your hi-fi amplifier has simply run out of inputs or you want to overdub your own music and voiceover onto home video tapes, we've made it easy.

Problem Solver

Run out of inputs on your studio mixer? Can't mix the PA, jukebox and background music into your club / hotel sound system? Need extra mics on your karaoke set-up? These are just some of the difficulties a C1 can help eliminate.

C1

CHANNELS 1-4

1 Balanced XLR microphone input

Use this for microphones equipped with a three-pin XLR connector (see Appendix for wiring details). Gain range for the microphone input is 10dB to 60dB to cope with the loudest to the quietest of signals.

2 Balanced 1/4" jack line input

Accepts a wide variety of inputs; use balanced or unbalanced microphones terminated with a 1/4" jack, keyboards, electric guitars, effects units and other line level equipment. Gain ranges from 10dB to 40dB.

3 Channel insert

With nothing plugged into this socket, the channel functions as normal. Using a correctly wired cable (see Appendix), a compressor, noise gate, graphic equaliser or other processor can be wired into the channel to process the signal before it is taken to the main mix.

4 80Hz high-pass filter

This control progressively removes frequencies lower than 80Hz. It is designed to reduce microphone handling noise, stage rumble and other nasties which 'muddy' an overall mix and waste amplifier power. It is recommended that this control is used all the time, except when the channel is used to handle anything with significant bass content – drums, keyboards, bass guitar etc.

5 GAIN control

Use this to match the incoming signal level to the optimum operating level of the C1. With the incoming signal playing and the channel fader (13) and Main Mix fader (37) at 0dB increase the gain until the required signal level is shown on the metering, typically illuminating the LEDs around the '0' mark. This maximises audio performance, minimises noise and distortion and ensures plenty of headroom. Avoid extreme combinations of fader and gain control settings to achieve the required signal level.

6 HI e.q.

This control can be used in the same manner as the 'treble' control on a hi-fi. Increase (boost) the HI e.q. (equalisation) to improve the clarity of a signal or to help it 'cut through' the mix, or decrease (cut) to help tame a harsh sound source. The characteristic of this control is 'shelving' at 12kHz (see Glossary).

TIP: Boosting any e.q. increases the overall gain of the channel – the GAIN control (5) may need to be reduced to avoid distortion.

7 MID e.q.

Used to control the mid-range of a signal, where most of the sonic activity is generally found. Boost here to give a voice more presence, for example, or cut to make a guitar sound less dominant in a mix. This e.q. is centred on 2.5kHz for optimum musical effectiveness.

8 LO e.q.

This control works in a similar manner to the 'bass' control on a hi-fi. It can be used to cut or boost bass sounds. The characteristic of this control is 'shelving' at 60Hz.

TIP: The combination of modest boost of the LO e.q. and selection of the high-pass filter (4) produces a 'peaking' response instead of shelving. This is useful for adding warmth to vocals and instruments and can also be used to produce a 'firm' bottom end to bass instruments and kick drums without excessively boosting the very low frequency range which may otherwise overstress speakers and amplifiers.

9 AUX control

Controls the amount of signal sent to the AUX SEND jack (23). Operates post-fader, i.e. nothing will be sent to the AUX SEND jack when the channel fader (13) is down, even with the AUX control fully clockwise. As the channel fader is raised, more of the signal is sent to the AUX SEND jack. Post-fader sends are useful for adding external effects (reverb, chorus, delay etc) to a sound.

10 MON control

In this case MON is short for MONitor, as this control is primarily designed as a stage / studio monitor send. It is assigned pre-fader, meaning that the position of the channel fader has no effect on the amount of signal sent to the MON SEND jack (24). Of course, with careful level matching, this can quite easily be used as an additional effects send in a recording environment. See the glossary for more information on pre- and post-fader sends.

11 PAN control

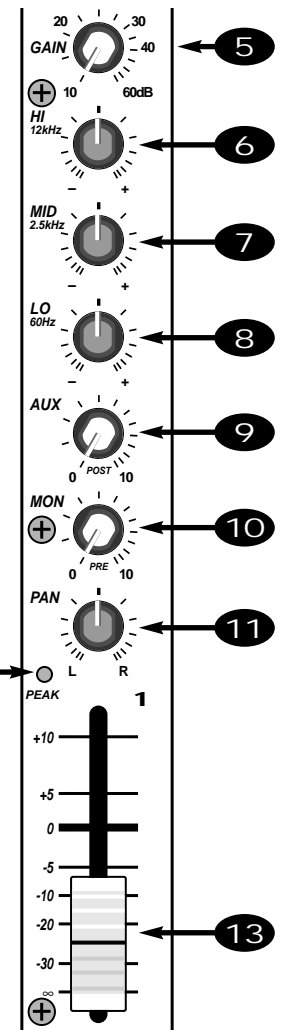
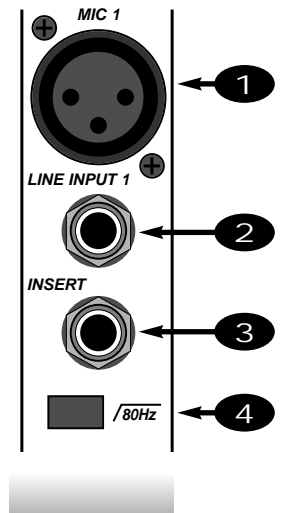
Like the 'balance' control on a hi-fi, moves the signal between the left and right stereo outputs – the signal is sent equally to both when the control is in the centre position. Does not affect the AUX or MON signals.

12 PEAK L.E.D.

Illuminates a few dB before the channel overloads and produces distortion. If this LED is regularly illuminated, there is too much gain on the channel. Reduce the GAIN control (5) until the LED stops illuminating. Occasional 'blinks' of the Peak LED are O.K.

13 Channel fader

Allows fine-tuning of channel levels once the GAIN control (5) has been set up. Should be set around the 0dB mark for optimum performance, which allows up to 10dB of extra gain trim during the mix.



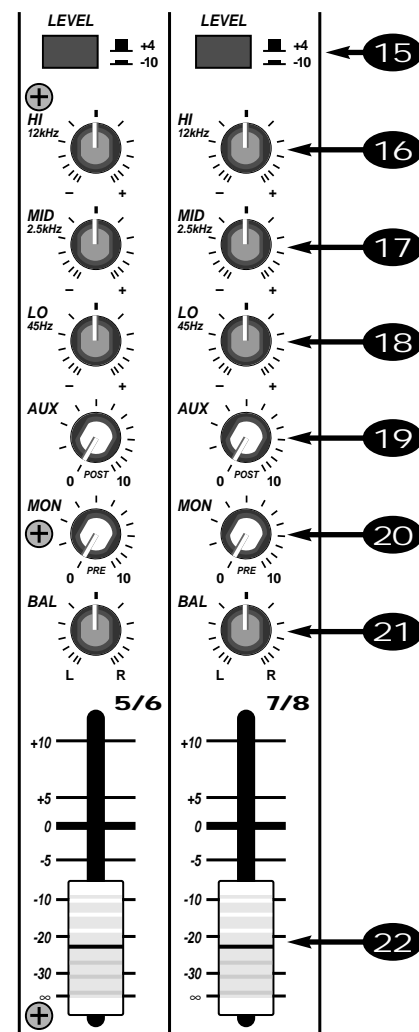
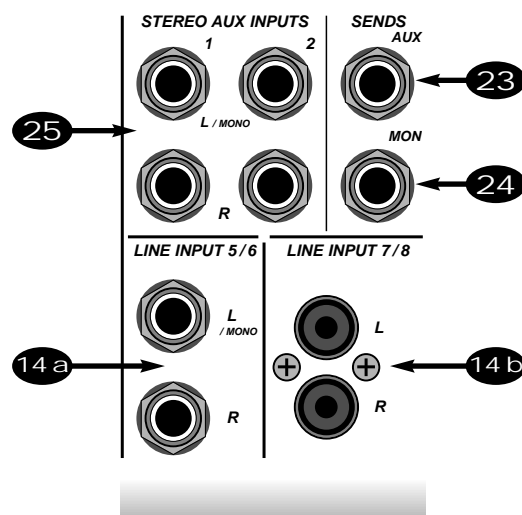
C1

CHANNELS 5/6 & 7/8

- 14 a** **Balanced 1/4" jack stereo line inputs (channel 5/6)**
Two line inputs configured as a stereo pair to accept keyboards, drum machines, sound modules etc. Can be used as a mono line input simply by plugging into the L/MONO jack only.
- 14 b** **Unbalanced RCA phono stereo line inputs (channel 7/8)**
A stereo input pair on hi-fi type connectors, ideal for the connection of CD / Minidisc players or tape machines without the need for adapters. These inputs are 'fixed stereo' i.e. a signal plugged into the left input will only appear at the left output. A stereo source with jack connectors can still be used with the appropriate cables or adapters.
- 15** **Level switch**
Use this switch to match the gain applied by the C1 to the output of your stereo device. Most 'professional' equipment (DAT recorders, effects units etc), as well as mains-powered CD players, have a nominal output of around +4dBu, meaning that they need no further gain – in this case keep the level switch in the 'out' (+4) position. Depress this switch to match the channel to –10dBV sources such as portable CD or Minidisc players, tape players etc.
- 16** **HI e.q.**
Operates in the same manner as the HI equalisation on the mono channels (6).
- 17** **MID e.q.**
Operates in the same manner as the MID equalisation on the mono channels (7).
- 18** **LO e.q.**
Operates in a similar manner to the LO control on the C1's mono channels (8), except that it applies cut/boost at 45Hz.
- 19** **AUX control**
Controls the amount of signal sent to the AUX SEND jack (23) – when the channel is used in stereo, a mono sum of the two inputs is taken. Post-fader (see (9)).
- 20** **MON control**
Controls the amount of signal sent to the MON SEND jack (24) – when the channel is used in stereo, a mono sum of the two inputs is taken. Pre-fader (see (10)).
- 21** **BAL control**
Alters the balance of the stereo signal between the left and right channels, or pans the signal when channel 5/6 is used in mono.
- 22** **Channel fader**
Allows fine-tuning of channel levels once the level switch (15) has been set. Should be set around the 0dB mark for optimum performance.

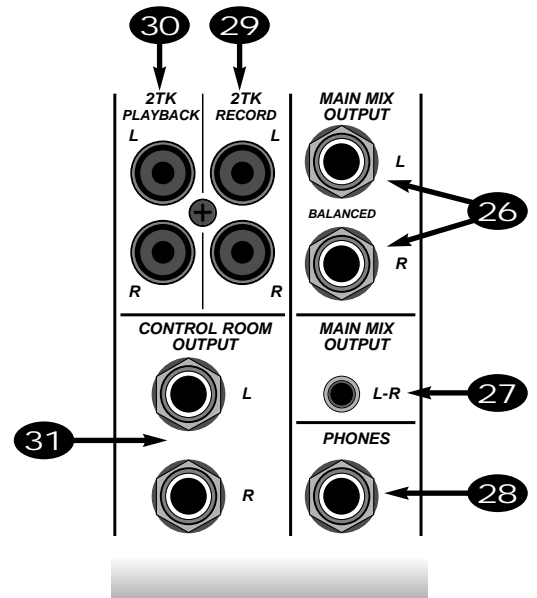
AUX SECTION

- 23** **AUX send**
Mono balanced compatible TRS 1/4" jack to feed effects units etc. Use the input level control of your effects unit (where applicable) to achieve optimum signal level – if it is not equipped with one, or the aux output level is still too high, reduce the AUX controls on the relevant channels until the level is acceptable.
- 24** **MON send**
Mono balanced compatible TRS 1/4" jack to feed stage / studio monitor systems or effects units. Use the input level control of your monitor amplifier or effects unit (where applicable) to achieve optimum signal level.
- 25** **Stereo Aux Inputs**
Two sets of balanced 1/4" jacks to return effects into the mix or for use as additional stereo inputs. Use the L/MONO jacks only for mono operation, see (32), (33) and (34) for details on levels and routing. Works with balanced and unbalanced signals.



OUTPUT SECTION

- 26** **Main Mix Output**
Balanced output on two TRS 1/4" jacks at a nominal +4dBu, for connection to professional mastering recorders or amplification systems (see Appendix for wiring diagrams). For unbalanced operation, simply plug in an unbalanced (TS) 1/4" jack.
- 27** **Main Mix L-R**
A duplication of the main mix output on a 3.5mm stereo minijack, wired tip = Left, ring = Right and sleeve = ground (screen). Ideal for a direct connection to most computer soundcard line (not microphone) inputs.
- 28** **Phones Output**
1/4" stereo jack wired tip = Left, ring = Right and sleeve = ground (screen) to connect headphones. Studio grade 150 to 400 ohm types are recommended, although any kind can be used. The level is controlled by the Phones / Control Room fader (38).
- 29** **2TK Record**
The main mix provided on unbalanced RCA phono sockets at a nominal -10dBV output level suitable for feeding a CD or Minidisc or tape recorder.
- 30** **2TK Playback**
A stereo input for a recorder, computer soundcard line output etc, routable to the main mix or to the Headphones / Control Room. For routing information see (35) and (36).
- 31** **Control Room Output**
Stereo pair of balanced compatible TRS 1/4" jacks for connection to your studio monitoring system. Level is controlled by the Phones / Control Room fader (38).

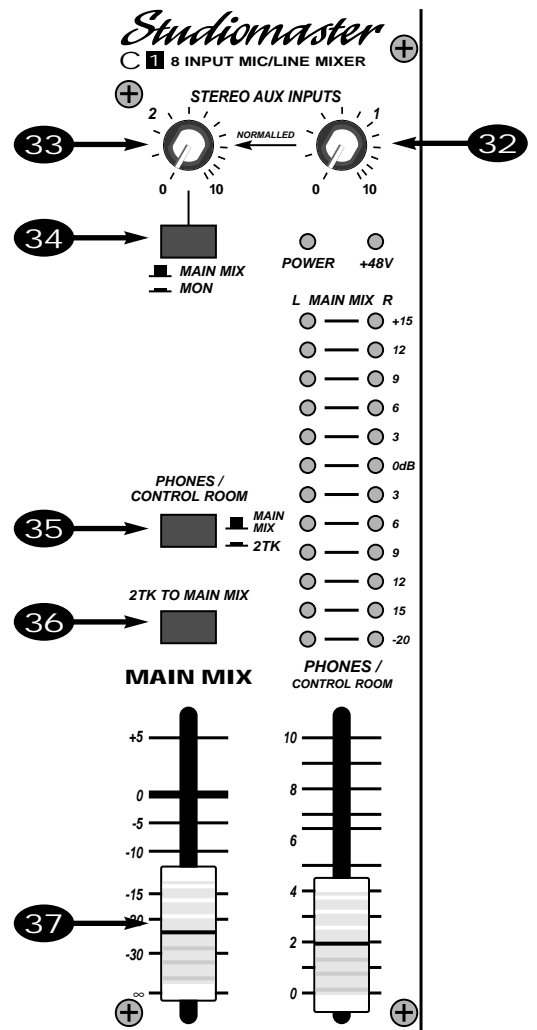


MASTER SECTION

- 32** **Aux Input 1 Level**
Controls the level of Aux Input 1 (25) to the Main Mix.
- 33** **Aux Input 2 Level**
Controls the level of Aux Input 2 (25).
- 34** **Aux Input 2 to Main Mix / Mon switch**
Stereo Aux Input 2 can be routed either to the main mix (switch 'out'), or to the MON send (24) (switch 'in'). Either way, the level is controlled by Aux Input 2 Level (33).

In addition to this, the Aux Inputs are 'normalled'. Put simply, this means that if there is a signal plugged into Aux Input 1 and nothing connected to Aux Input 2, both Aux Inputs 1 and 2 'share' the same signal. By combining this with the 'Aux Input 2 to Mon' switch, effects returned to Aux Return 1 can be routed to the main mix and to your stage monitors with individual level control, without tying up a whole input channel. Simply depress the switch and use Aux Input 1 level (32) to control the amount of effect to the main mix and Aux Input 2 level (33) to control the amount of effect sent to the stage monitors.
- 35** **Phones / Control Room Listen switch**
Selects whether the main mix or the 2TK Playback (30) is heard on the headphones and Control Room outputs and seen on the bargraphs (39). The position of this switch has no effect on the main mix outputs. Because of this, it can be used to check the output of a recorder or computer soundcard connected to record from the Main Mix / 2TK Record outputs and to play back through the 2TK Playback input (30). If you have equipment set up in this manner, do not engage the 2TK to Main Mix switch (36) as this will cause feedback.
- 36** **2TK to Main Mix switch**
This switch enables the 2TK Playback connectors (30) to be used to play back recordings or for interval / backing music. With this switch "in", the 2TK playback is added to the main mix; it does not replace it.
- 37** **Main Mix fader**
Controls the overall level of the main mix once all the channel faders have been set up. Always bring this fader down to '∞' before switching the unit on. This helps to avoid any unexpected clicks or thumps through your speakers. Recommended use at the 0dB position allows a modest 5dB increase in gain to compensate for a 'quiet' mix.

TIP: Switch any amplifiers on after the mixer to avoid thumps through your speakers. Similarly, switch amplifiers off before the mixer.



C1

38 Phones / Control Room fader

The level of the headphones and control room output is controlled by a fader instead of the more usual rotary control, to allow easier monitoring. If you use both the control room and the headphone output, set this fader to give you sufficient level on your headphones, and then adjust the volume of your monitor amplifier to suit. The position of this fader has no effect on the main mix.

TIP: If you do not require monitoring, this control can be used as a secondary ZONE level control.

39 Bargraphs

These highly accurate 3 colour, 12 segment LED ladders make level setting easy. As long as you don't have any channel peak lights on, your main mix should be distortion-free even when all the yellow LEDs are illuminated. If they persistently reach the +15dB point (the red LED), bring down the Main Mix fader (37) a little, and / or check the channel gains and fader positions.

40 Power LED

Indicates power is being supplied to the C1; see Power switch (43) / Power Supply Input (44).

41 +48V (Phantom Power) LED

Indicates that +48V phantom power is present at the balanced XLR microphone inputs to supply condenser mics, D.I. boxes etc. DO NOT use phantom power with unbalanced microphones as damage to the C1 or microphone may occur. In practise almost all mics with XLR connections will be balanced but it is worth checking 'electret' type condenser mics (usually self-powered with an internal battery). Consult the microphone manufacturer / dealer if unsure.

Always connect any microphones and bring the channel faders down before activating the phantom power; see Phantom Power switch (42) and the Glossary for more information.

REAR PANEL

42 Phantom Power switch

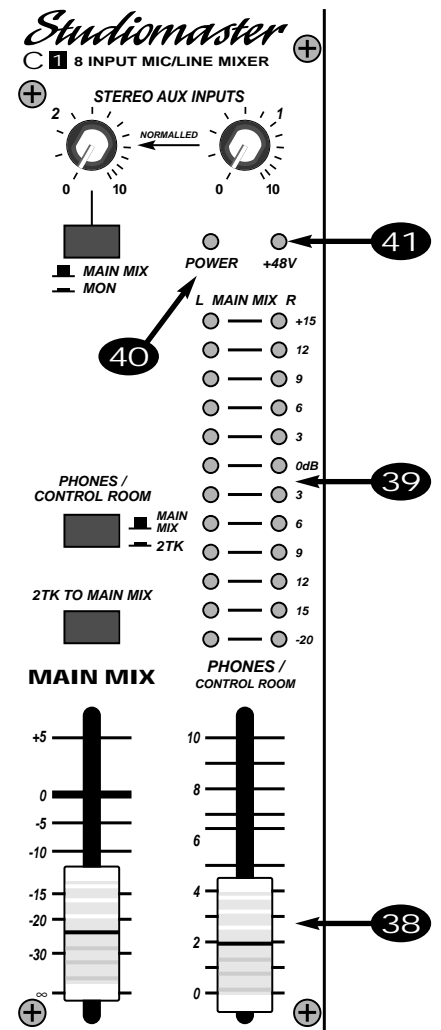
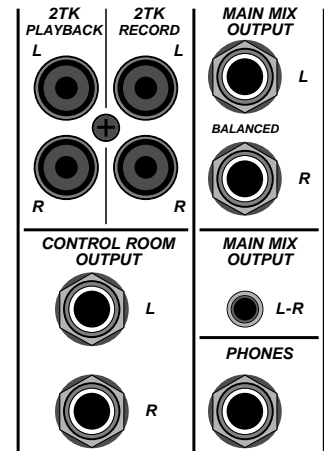
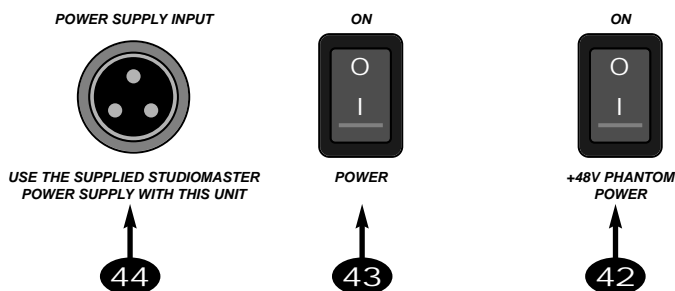
Turns +48V phantom power on and off – status indicated by +48V LED (41)

43 Power switch

Turns the C1 on and off. Bring the Main Mix fader (37) right down before switching on, power status is indicated by the Power LED (40).

44 Power Supply Input

The C1 comes with an external power supply unit fitted with a three-pin connector; attach this here. Do not use any other unit than the one supplied. If this becomes damaged, contact your Studiomaster dealer for a replacement.



TROUBLE SHOOTING

No Power On LED....

Check a.c. power cord/mains lead is connected to the wall supply and switched on.
 Check that the power supply is properly attached to the C1 rear panel socket and that its locking ring is tight.
 Check C1 is switched on.

No sound....

Check for a signal on the meters.
 Check that the amplifier and speaker system is connected and switched on.
 Use headphones to check the output of the C1.
 Check the sound source – is it on?
 Check that the fader of the channel being used and the Main Mix fader are raised to 'normal' positions (0dB).

Headphones distorting....

Is the phones level set too high?
 Are headphones being used with too low an impedance? 150-400 ohm types will give the best performance, 32-50 ohm types can be used but may give lower maximum sound level.
 TIP: So-called '8 ohm' headphones are best avoided.
 NOTE: The headphone amplifier uses a special I.C. capable of high volume levels – beware of potential hearing damage when used for long periods.

WARRANTY

The Manufacturer warrants all Studiomaster products to be free from defects in materials and workmanship for a period of one year. The Manufacturer reserves the right to the final decision on all warranty claims.

Exclusions to Warranty Cover

Damage caused by accident, misuse, improper installation or neglect.
 Damage caused by repair, modification or service by persons not authorised by Studiomaster.
 Products on which the serial number has been defaced, altered or removed.

Who is protected

This warranty is enforceable by the original purchaser and any subsequent owner(s) during the warranty period, providing a copy of the original sales receipt is submitted whenever a warranty service is required.
 It is recommended that you complete and mail the Warranty Registration Card supplied with your product.
 For your reference in the event of a warranty or service repair, please complete the following information and attach a copy of your original sales receipt.

Model :	<input type="text" value="C1 8 Channel Mic/Line Mixer"/>
Serial Number:	<input type="text"/>
Purchase Date:	<input type="text"/>
Purchased From:	<input type="text"/>

NOTE: THIS WARRANTY DOES NOT AFFECT YOUR STATUTORY RIGHTS.

SERVICE INFORMATION

If you have a problem with your Studiomaster product or think it has developed a fault you should first carefully check the Trouble Shooting section of this guide. If this does not solve the problem or if the product is physically damaged, contact your local dealer or distributor for service details.

Should it be recommended that you return the product to your nearest Studiomaster Service Centre you must first contact them. You will be asked for the Product type (model) and Serial Number. You will then be given a Returns Authorisation (RA) number. Pack the unit in its original carton to protect it from shipping damage.

You must have the Returns Authorisation number clearly marked on the outside of the carton or we may refuse the delivery.

Label the equipment clearly with your name and address and a clear description of the fault.

Important

No liability will be accepted by Studiomaster for any transit damage to units not returned in their original packing, for warranty repairs or otherwise.

A.C. POWER SUPPLY

In the case of the C1, an external power supply unit is used to minimise hum and noise. Refer to the user guide for details.

ASSIGN

To switch or route a signal to a specific signal path.

ATTENUATE

To reduce or make quieter.

AUX / AUXILIARY

An additional means of sending a signal to external equipment generally without affecting what is going on in the main mix.

BALANCE

The relative level of signals. Also refers to the left / right position in a stereo mix.

BALANCED

A 3 wire system for connecting audio which has 2 wires for the audio (HOT and COLD) and a totally separate connection for the screen. Balanced circuitry is widely used in audio equipment from inexpensive dynamic microphones to top quality studio devices. The balanced system is used as it cancels interference in the connecting cables resulting in a clearer signal.

BANDWIDTH

Bandwidth is the range of frequencies that will pass through a piece of equipment. Audio signals typically contain frequencies from 20Hz to 20kHz.

BUS

A common conductor that carries a signal, or number of signals, through a mixing console.

CLIPPING

Distortion caused by a signal exceeding the maximum level that the equipment can accommodate.

COLD

The negative phase of a signal. With a simple unbalanced two wire signal one wire is positive (HOT) and the other is negative (COLD).

COMPRESSOR

An electronic device used to control the rate that the level of a sound increases above a set threshold point. A compressor can usually also be used as a limiter to keep signal levels from overloading the input of a piece of equipment.

D.I.

Direct Injection. Often a small 'D.I. box' is used to send a signal directly from a guitar or bass into the mixer to avoid the need for a microphone to capture the sound. It also ensures a high quality signal into the mixer.

DECIBEL (dB)

A logarithmic ratio used to represent voltage or power gain. The reference to which the ratio is made is usually stated. 0dB means that the input and the output are at the same level.

DECIBEL (dBA)

A logarithmic measure of sound intensity. In this case 0dB is the lower threshold of human hearing. 100+dBA is 'loud'. Long term exposure to high level sound can ultimately cause hearing damage. Normal speech, such as in a quiet office is typically around 60dBA. 120dBA is normally quoted as the threshold of pain.

DELAY

An effect – now normally produced by digital means e.g. DDL (Digital Delay Line) or DSP (Digital Signal Processing). The effect unit 'samples' the signal and 'replays' it later. The delay time can be adjusted to give widely different effects.

DETENT

A soft 'click' in the travel of a rotary control usually indicating the centre point.

DRY

A signal which has not been processed by an effects unit.

ECHO

The effect produced when sound is reflected off hard surfaces. Often reproduced artificially using electronic equipment (see DELAY).

EFFECTS SENDS

Any outputs from a channel or console that can be connected to external equipment for extra sound processing. Usually effects sends are post fader so any level changes to the main mix also affect the signal sent for processing.

EFFECTS

Any device that alters a sound. Can be anything from a simple foot pedal to a sophisticated studio effects processor.

E.I.N.

Equivalent Input Noise. A technical specification used to measure the noise of a gain stage, usually the microphone preamplifier.

EQUALISATION (E.Q.)

Tone controls. Also in the case of analogue tape recording and vinyl records, frequency dependent gain used to correct limitations of the recording / playback process.

FADER

Volume control, often a linear or slider type volume control.

FEEDBACK

The deafening squealing sound produced when a microphone picks up its own amplified sound from a loudspeaker.

F.O.H.

Front Of House. The speaker system which is used to project the sound from the stage to the audience. It is also used to describe the position in the venue, where the main mixing console is situated.

FLAT (E.Q.)

When the signal has not been adjusted using the equaliser (e.q.) controls.

FOLDBACK

Sound which is sent from the main mixing position back to the stage so that performers can hear it. Often with a large sound system a totally separate foldback (or monitor) system with a dedicated console is located on one side of the stage so the performers can communicate easily with the operator.

GRAPHIC

Graphic equaliser. An equaliser that uses a row of slider controls to adjust the sound. Each of the sliders will adjust one part of the frequency spectrum giving a visual display of which areas have been cut or boosted.

GROUND

Earth.

HIGH PASS FILTER (HPF)

A filter that cuts only the sound below a pre-determined frequency. Usually used where the only contribution that sound below that point will make is rumble or hum.

HOT

The positive phase of a signal. With a simple unbalanced two wire signal one wire is positive (HOT) and the other is negative (COLD). Also a 'hot' signal is a term used to indicate a signal with an unusually large level.

HERTZ (Hz)

A measurement of frequency. 1Hz = 1 cycle per second.

HEADROOM

The amount of level (above the nominal operating level) that the equipment can accommodate before distortion occurs.

IMPEDANCE

Similar to resistance, but includes the effect of circuit capacitance and inductance which affects a.c. signals like audio.

INSERT

A point in the signal chain where external equipment can be attached or 'inserted'. A basic send/return on a single socket uses a cable with a three-pole (stereo) TRS jack split off to a pair of two-pole (mono) TS jacks, often called a Y-cable (see Appendix for wiring details).

A signal can be sent to the input of a processor and returned to the channel before it is routed to the main mix. Processors connected to insert points tend to be 'serial' devices such as graphic equalisers or compressors.

JACK PLUG (SOCKET)

Probably the most widely used connector for audio signals (see TS and TRS). 1/4" (6.35mm) jacks are used for 'professional' applications, 3.5mm and 2.5mm jacks are often found on 'consumer' equipment.

KILOHERTZ (kHz)

A measurement of frequency.
1Hz = 1cycle per second, 1kHz = 1000Hz

LEVEL

The size or 'amplitude' of a signal, at any given point, in an audio system.

LIMITER

A device used to prevent the signal level exceeding a set threshold. Most compressors can do this when their 'ratio' control is set to infinity (maximum). Good quality amplifiers often incorporate internal limiters to prevent excessive distortion (clipping) caused if they are overdriven.

LINE LEVEL

A standard reference level (voltage) used to simplify the interconnection of equipment.
Typically semi pro equipment is -10dBV (100mV) whilst pro equipment is +4dBu (1.23V) and often balanced.
Line level can be anything from 100mV to 4V (-15dBu to +15dBu).

MIDI

Musical Instrument Digital Interface. An industry standard which allows suitably equipped instruments and equipment to communicate with each other. Often used to play a sound module from a separate keyboard or sequencer.

MIC LEVEL

The very small output level of a microphone, typically around 1-30 millivolts (mV). A millivolt is 1/1000 of a volt.

MIC PREAMP

A very high quality 'pre-amplifier' that increases the tiny voltage from a microphone up to the internal operating level of the mixer.

MONO

Single channel sound source reproduction (short for monaural, meaning 'one ear').

MONITOR

Either the ability to hear signals within a console or the speakers used by performers to hear on-stage.

NOISE

Any sound you didn't want. Usually refers to the 'hiss' produced by high gain settings or poor quality equipment.

OHM Ω

A unit of electrical resistance.
1000ohms = 1k ohm (or 1000 Ω = 1k Ω)

PAN

The PAN control is used to set the Left / Right balance of a sound in stereo mix. Derived from the film industry term (panorama) where a camera would swing round to follow the action and the sound recordist had to pan the sound to follow the camera.

PARAMETRIC

A type of equalisation where the frequency and range (the 'Q factor') of the control is variable in addition to the cut and boost.

PFL

Pre Fade Listen. A function which allows the operator to monitor (usually on headphones and on meters) a signal even when the channel output fader is at its minimum level position.

PHANTOM POWER

Some types of microphone, known as condenser or capacitor microphones, need external power to operate. Although some use a battery, the majority draw this power from the mixing console to which they are connected. A switchable +48V supply is provided by Studiomaster consoles which covers all types of condenser mics. DO NOT use phantom power when working with unbalanced microphones or any other unbalanced equipment plugged into the XLR sockets. If in doubt check with the microphone manufacturer.

PHONES

Headphones (also known as 'cans').

PHONO (RCA JACK)

A simple, unbalanced two-pole connector used for connecting hi-fi and other line level equipment including some multitrack recorders.

POST FADE

Signal taken after (post) the fader.

PRE FADE

Signal taken before (pre) the fader.

REVERB

Reverberation. A series of very closely spaced echoes which continue after the original sound has finished. Probably the most widely used effect in modern recorded music. Clap your hands in a room and listen to the way the sound fades away; that is reverberation. Reverb as an effect is generally produced by electronic devices. Churches and concert halls are often specifically designed to be highly reverberant to enhance the type of music usually performed there.

REGEN

Regeneration. The control used to increase the amount of artificial echo or reverb that continues after a sound has finished.

RETURN

The connectors and controls used to bring a signal which has been processed externally back into the mixer.

SEND

The connectors and controls used to send a signal, to be used externally, out of the mixer.

SIGNAL TO NOISE

The ratio used to describe the relationship between the level of a signal and the background noise that accompanies it.

SHELVING

The characteristic of a type of equalisation where all frequencies above (or below) the quoted figure are unaffected.

STEREO

Two channel sound reproduction where the two signals are sent to separate left and right speaker systems.

SWEEP EQ

An EQ system which allows the centre frequency of the cut and boost control to be adjusted over a wide range to achieve the most effective result.

TRS

Tip, Ring, Sleeve, 1/4" three pole jack plug. Often referred to as a stereo jack plug. Used for balanced line signals, insert (send / return) points and stereo headphones.

TS

Tip, Sleeve, 1/4" two pole jack plug. Often referred to as a mono jack. Used for unbalanced signals.

UNBALANCED

Two wire connection protocol using one signal and one screen conductor.

WET

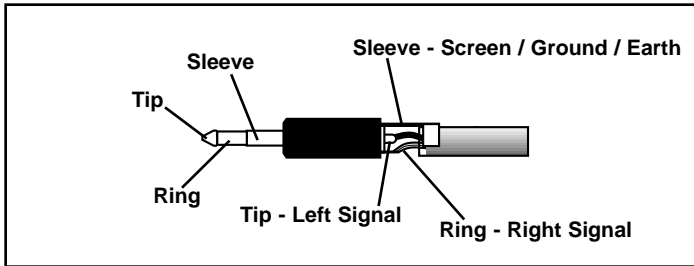
A signal which has been processed using an effects processor.

XLR

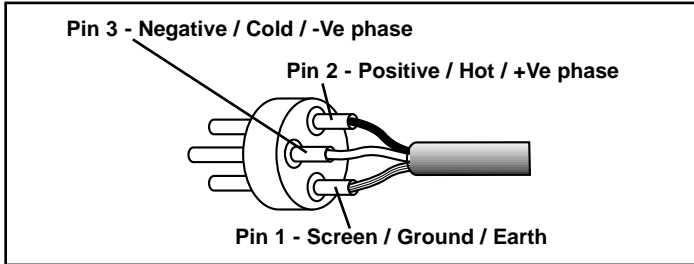
eXtra Low Resistance connector - a three pin connector widely used for balanced microphones. They are also used for line level balanced signals and are sometimes used for high power amplifier speaker outputs. 4, 5, and 6 pin XLRs also exist for specialist applications.

WIRING CONNECTIONS

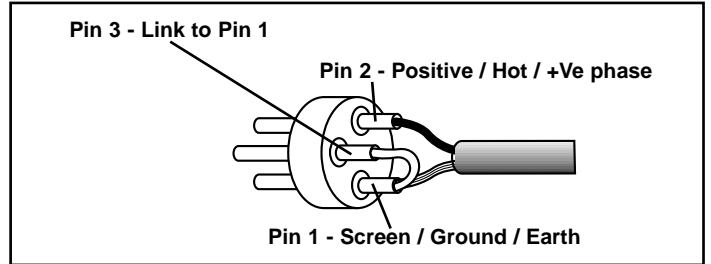
Minijack (3.5mm) / Headphone (1/4")



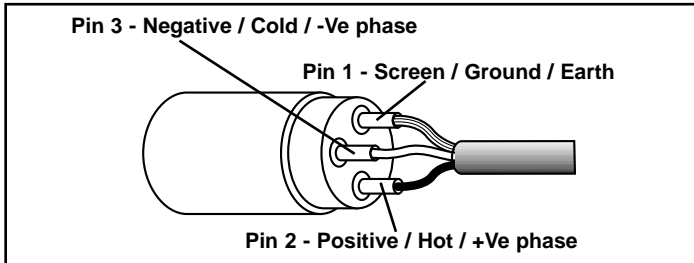
To connect a **Balanced microphone** to a mic input 3 pin XLR - male



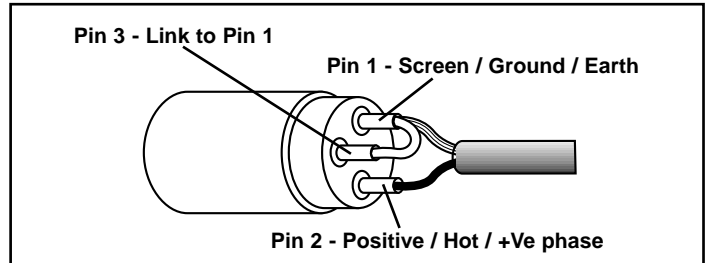
To connect an **Unbalanced microphone** to a mic input 3 pin XLR - male



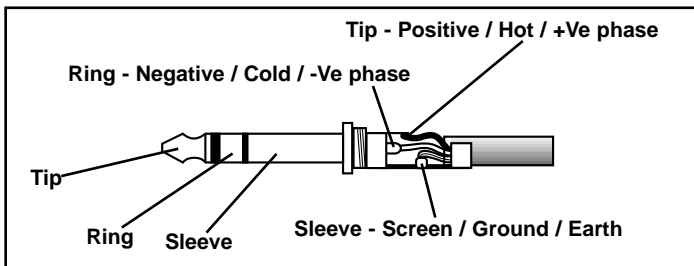
To connect a **Balanced microphone** to a mic input 3 pin XLR - female



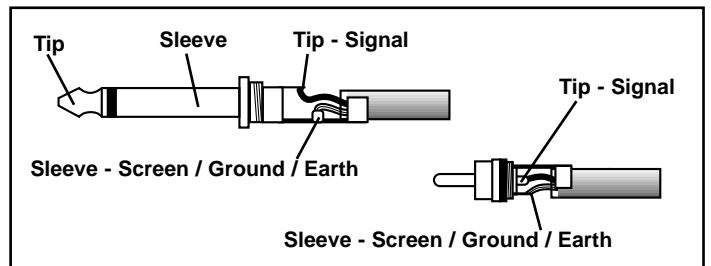
To connect an **Unbalanced microphone** to a mic input 3 pin XLR - female



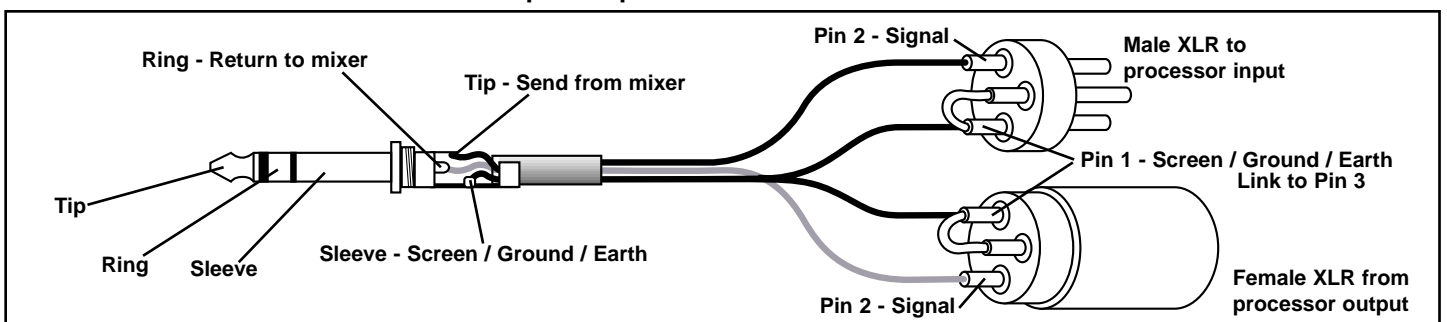
To connect **Balanced equipment** to an input or output



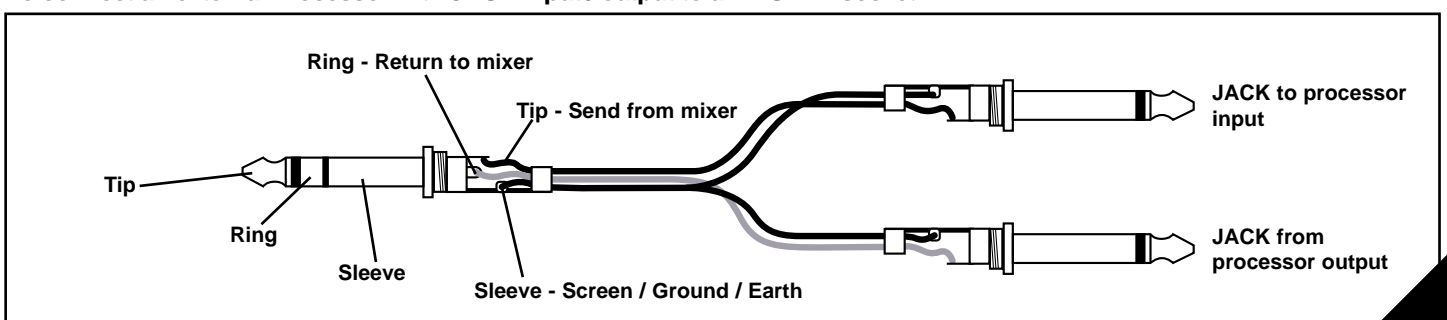
To connect **Unbalanced equipment** to an input or output

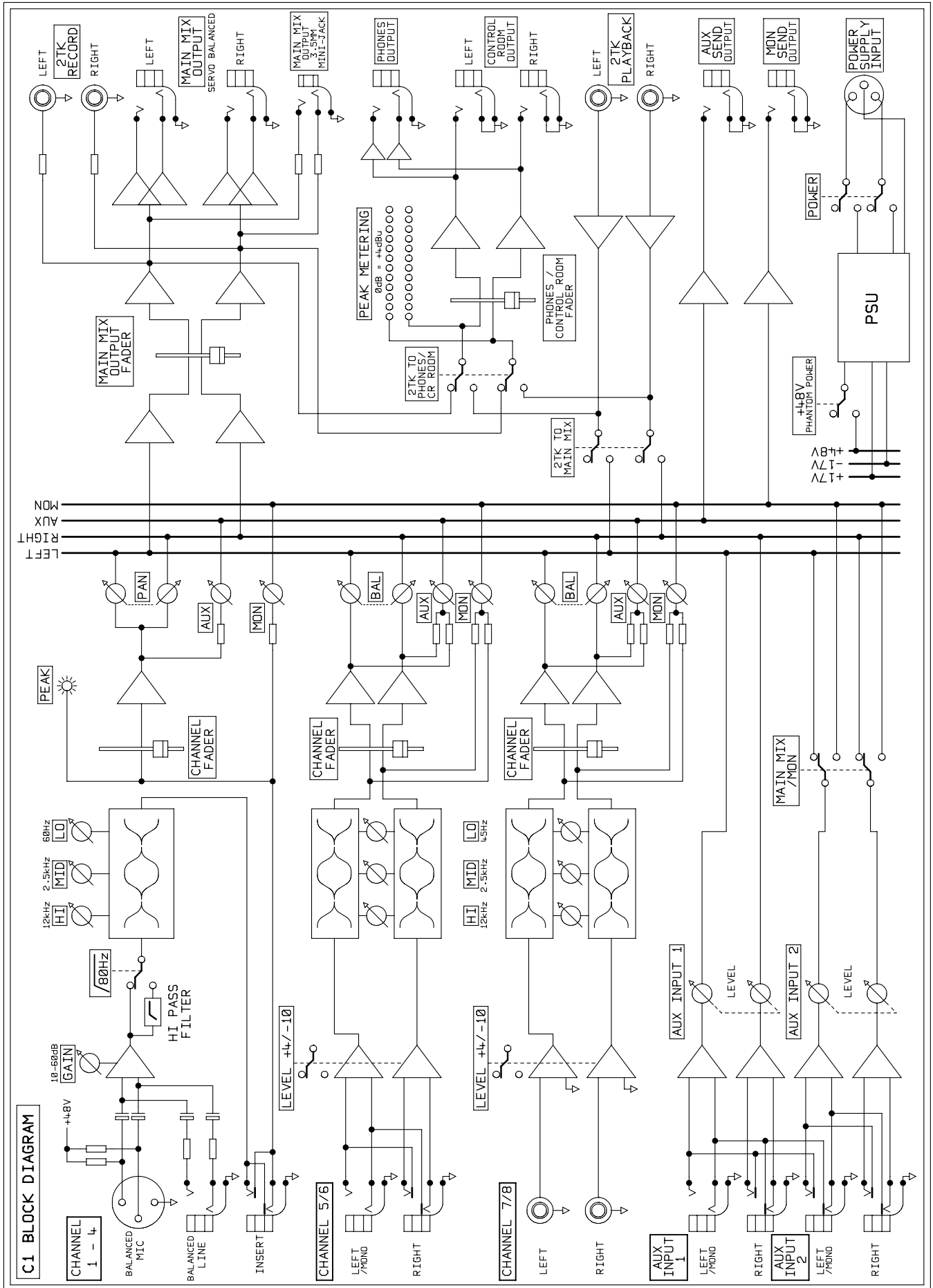


To connect an external Processor with XLR input / output to an **INSERT** socket



To connect an external Processor with JACK input / output to an **INSERT** socket





GAIN	MIN	MAX	RANGE
Mic (to insert)	10dB	60dB	50dB
Line (to insert)	-10dB	40dB	50dB
Stereo Line (to L/R output)	0dB	12dB	12dB
Stereo Aux Input (to L/R output)	10dB		

INPUT NOISE PERFORMANCE	E.I.N.-All at MAX Gain
Mic 150 ohm source	-129 dBu
Line 150 ohm	-97 dBu
Stereo Line 150 ohm	-100 dBu
Aux Input 150 ohm	-99 dBu

FREQUENCY RESPONSE Input to outputs			
Mic to Left, Right, Aux1,2 outputs	10Hz – 85kHz	+0/-1dB	@ 30dB Gain
Stereo Line to Left,Right, Aux1,2 outputs	10Hz – 75kHz	+0/-1dB	@ +4dB Gain setting
Aux Input to Left, Right outputs	10Hz – 120kHz	+0/-2dB	@ Max Gain

MIC INPUT CMRR @ 1KHz	-85dB @ 40dB Gain
------------------------------	-------------------

DISTORTION +18dBu @ 1kHz at L/R outputs (22Hz-22kHz)		
Mic	0.0068%	@ 30dB Gain
Line	0.0070%	@ 10dB Gain
Stereo Line	0.0015%	@ +4 Gain setting
Aux Input	0.0010%	@ Max Gain

EQUALISATION		
MONO CHANNELS	Frequency	Gain
Hi	12kHz	+/-15dB
Mid	2.5kHz	+/-15dB
Lo	60Hz	+/-15dB
STEREO CHANNELS		
Hi	12kHz	+/-15dB
Mid	2.5kHz	+/-15dB
Lo	45dB	+/-15dB

DYNAMIC RANGE	
2 Mic Channels @ 30dB Gain	109dB

NOISE	Bus Noise	S/N Ratio
1 Mic Channel @ 30dB Gain, EQ flat	-85dBu	89dB
All Mic channels @ 30dB Gain	-81dBu	85dB

CUT OFF @1KHz		
Channel fader (mic)	-73dB dB	ref 0dB mark
L/R fader	-80dB	

MAXIMUM INPUT LEVEL	At Max Gain	At Min Gain
Mic	-38dBu	+8dBu
Line	-19dBu	+27dBu
Stereo Line	+10dBu	+22dBu
Aux Input	+17dBu	n/a

INPUT IMPEDANCE		
Mic	2k ohms Balanced	1k ohms Unbalanced
Line	20k ohms Balanced	10k ohms Unbalanced
Stereo Input	10k ohms Balanced	10k ohms Unbalanced
Aux Input	10k ohms Balanced	10k ohms Unbalanced

OUTPUT LEVELS	Nominal	Maximum	Impedance
Mono Send/Return	+4dBu	+20.5dBu	< 10 ohms
Aux Sends 1-2	+4dBu	+23.0dBu	< 10 ohms
Left/Right Outputs	+4dBu	+28dBu	75 ohms
Control Room Outputs		+23dBu	600 ohms
Phones		+23dBu	33 ohms

DIMENSIONS & WEIGHTS				
WIDTH mm(ins)	HEIGHT mm(ins)	DEPTH mm(ins)	WEIGHT (NET) kg (lb)	WEIGHT (GROSS) kg (lb)
233mm (9.2")	85mm (3.3")	327mm (12.9")	2.5 kg (5.5 lb)	3.8 kg (8.3 lb)

POWER SUPPLY
External AC adaptor – 12 Watts maximum – 50/60Hz
Weight – 0.7 kg (1.5 lb)

What does the CE mark mean?

The CE mark has been introduced within the European Union as an indication that products conform to relevant European Directives. There are currently two Directives covering electrical and electronic products. From the 1st of January 1996 all such products must meet the requirements of the EMC Directive 89/336/EEC and from the 1st of January 1997 they must also meet the requirements of the Low Voltage Directive 73/23/EEC.

The so-called 'Low Voltage' Directive covers electrical safety for products connected to the domestic electricity supply and is relatively self explanatory. In our case it means that this equipment has been designed, manufactured (and from 1st January 1997 independently tested) for compliance with the electrical safety standard EN 60065. This standard is identical to the British standard BS 415 and is derived from the international standard IEC 65.

The requirement for Electromagnetic compatibility (or EMC for short) stems from the European Directive 89/336/EEC which requires that equipment should not generate interference that would be likely to cause other equipment to malfunction, and should also have an adequate level of immunity from interference itself.

Similar regulations covering interference generated by computers have existed in the United States for over a decade, known as the FCC Rules (part 15 - subpart J - computing devices). The concepts are similar, although the U.S. rules do not cover immunity.

This equipment has therefore been tested to recognised EMC standards. The exact standards used are listed in the declaration of conformity. Different types of equipment may use different standards. Please note the Directive requires only what is called an 'adequate' level of immunity. It does not mean that your equipment will be totally unaffected in all possible situations. As part of the requirements of the Directive we are obliged to explain the effects that may be observed.

Immunity

If this equipment is operated in environments with unusually high levels of emissions from other equipment, its performance may be degraded. Due to the large number of variables possible in the usage of this equipment and its control settings; it is impossible to define the exact degradation that may occur in every possible situation. For your guidance these are the effects of the tests in what we consider to be typical operating situations.

Susceptibility to 'fast transients' on the a.c. power and signal connections and to electrostatic discharges: - Results in small clicks or pops; operation otherwise unaffected. Since these events are usually infrequently encountered the resulting clicks should not give cause for concern.

High levels of mains transients may be caused by defective equipment. This may be determined by switching them off and on. Typical causes of transients on the mains are products containing thermostats such as heating controllers and refrigerators. Excessive clicks from such products may indicate a faulty or worn out thermostats. We would suggest replacement of any such defective part. If such remedial action is still unsuccessful then it may be possible for a competent electrician to add a contact suppressor.

If however you have an electricity supply which has a high and regular level of transients that appear to be unexplainable, we suggest that you contact your electricity supply authority. We know of instances where interference to domestic supplies has (for example) been caused by defective street lighting. Finally if all else fails you may wish to add an external filter which may be obtained from electrical retailers.

Susceptibility to radio frequency fields (3V/m): - Up to 15dB degradation in Signal to noise ratio.

Degradation only occurs at 'spot' frequencies, so, unless the product happens to be located near a transmitter radiating at exactly that frequency no degradation will occur. If affected, improvements can be made to minimise the reduction in performance by one or more of the following:

Relocation of the product, even to another room can be sufficient.

Check the quality of the ground connection to the product.

Determine the source of the interference by switching off and on other electrical and electronic products in the vicinity.

Move any interfering product to a more distant location.

Check quality and condition of interconnecting cables. (See General section at the end of this document).

Fit partial or complete R.F. screening (known as a Faraday cage) to the room in which the product is used.

In practice we are confident that you are unlikely to encounter any problems in normal everyday use.

Emissions

In practice most audio equipment is incapable of generating harmful interference unless it is misused or a fault exists. However products containing microprocessors or other digital systems such as DSP reverb modules operate at radio frequencies and may 'leak' some of this energy into the environment. This product has been tested for compliance with established standards. However as with immunity this does not mean that this product will not cause interference with other equipment under all circumstances (especially broadcast receivers). Similar guidelines to those for immunity apply for the minimisation of interference. Additionally if you believe that the product is causing interference to radio or television reception, which can be determined by turning the equipment off and on, you may be able to correct the interference by one or more of the following measures:

Relocate or reorient the receiver's aerial / antenna.

Increase separation between equipment and receiver.

Connect receiver to a different A.C. mains outlet.

Consult your dealer or an experienced radio/TV technician.

General

In order to minimise the possibility of interference we recommend the following:

XLR style connectors should have the screen connected to the shell of the connector as well as pin 1. Note that some XLR connectors do not have the shell connection available on a solder tag. XLR connectors providing this connection are available from several manufacturers including the following: Neutrik, Switchcraft, Deltron.

It is important that high quality screened cables are used for all signal connections. Note that low cost screened cables may have inadequate poor quality screening which does not fully cover the internal wires. Screened cable which relies on conductive plastic screening also has poorer R.F. characteristics. It is advisable to use cable that has full coverage lapped copper screening. We used Klotz Professional Microphone Cable in our EMC tests. Speaker connections can use unscreened cable.

Avoid unnecessarily long runs of cable when interconnecting equipment.

Use balanced connections wherever possible.

Don't place sensitive equipment directly next to units with large power transformers such as amplifiers.

Personal computers, monitors and associated peripherals may cause interference, especially older equipment.

In particular we suggest locating video monitors a prudent distance from any sensitive signals.