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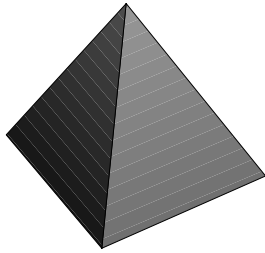
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Manual Version 9601.



**MARK IV AUDIO**  
Console Engineering.

## Declaration of Conformity

### The Directives Covered by this Declaration.

89/336/EEC Electromagnetic Compatibility Directive, amended by 92/31/EEC & 93/68/EEC

### The Products Covered by this Declaration.

Model CS3 Mixing Console.

### The Basis on which Conformity is being Declared

The Products named above and hence the Variants thereof listed above comply with the requirements of the above EU directives by meeting the following standards:

EN 55013 (1990)

EN 55020

Signed:

G.M.Squires

Authority: Product Support Manager.

Date: 1st January, 1997

### Attention

The attention of the specifier, purchaser, installer, or user is drawn to special limitations to use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures and limitations to use are available on request, and are also contained in product manuals.

## **SAFETY PRECAUTIONS**

### **IMPORTANT - PLEASE READ BEFORE INSTALLING YOUR CS3 CONSOLE**

Strong sources of electromagnetic radiation e.g. high power cabling, video monitors and radio transmitters may cause degradation of the audio quality due to induced voltages in the chassis and connection leads. Site the console away from such sources. For the same reason it is advisable to site the power supply away from the console.

- Ö Electronic components are susceptible to conditions of excessive heat or extreme cold so take care not to use your console under such conditions.
- Ö Before powering up the console make sure that the power supply voltage selection matches the local mains supply.
- Ö Never connect or disconnect the power cable without switching off the power supply. Similarly switch off the console before removing or servicing modules.
- Ö Do not attempt to wipe clean the console with a cleaning liquid. Most surfaces can be simply cleaned with a soft dry brush. Should the chassis or channel ident strips need cleaning use only water or isopropyl alcohol. Solvent based products should not be used as they may damage these parts.
- Ö Use a wax based crayon to write on the scribble strips. The use of adhesive backed tapes may damage the screen printing on the modules

## **TRANSPORT**

It is recommend that you retain all the packing from your console should you ever need to return it for service or move the console to other premises.

If the console has to be moved regularly then we suggest that you purchase a foam lined flight case available from your distributor if you cannot purchase one locally.

Only use the power supply and cables provide. Your warranty is invalidated if other supplies or cables are used.

If you experience any problem with the local mains, or during thunder storms, switch off the power supply and unplug it from the mains supply.

## WARRANTY

If within a period of three years from the date of delivery of the equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship (but not faulty design) to such an extent that the effectiveness and/or the usability thereof is materially affected, the Equipment or the faulty component shall be returned to the Distributor or DDA and subject to the following conditions the Distributor or DDA will repair or at its option replace the defective components. Any components replaced will become the property of DDA.

Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Distributor or DDA) and postage and/or freight charges must be prepaid.

This Warranty shall only be available if:-

- i) The Equipment has been properly installed in accordance with the instructions contained in this manual.
- ii) The End User has notified the Distributor or DDA in writing within 14 days of the defect appearing.
- iii) No persons other than authorised representatives of DDA or the Distributor have effected any replacement of parts, maintenance adjustments or repairs to the Equipment.
- iv) The End User has used the Equipment for such purposes as DDA recommends with only such operating supplies as meet DDA's specifications or approval and otherwise in all respects in accordance with DDA's recommendations.

Defects arising as a result of the following are not covered by this Warranty :-

Faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air conditioning or humidity control.

Benefit of this Warranty may not be assigned by the End User. End Users who are consumers should note that their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.

DDA shall not be liable for any damage caused to persons or property due to :-

- i) Incorrect usage of the Equipment
- ii) Other equipment attached to the Equipment, which is not approved by DDA
- iii) Modifications made by non-authorised persons, or by using non-recommended parts, or incorrectly made.

In no circumstances shall DDA be liable for any indirect or consequential costs, damages or losses (including loss of business profits, operating time or otherwise) arising out of the use or inability to use the product, whether or not the likelihood of damage was advised to DDA or its distributor.

Fuses and filament lamps are specifically excluded from this warranty.

This notice does not affect your statutory rights.

## SPECIFICATIONS

### Frequency Response

20Hz - 20kHz +/-1dB

(Equaliser in circuit, any input to any output)

### Maximum Input Level

Mic Input 0dBu (+30dBu when line switch is depressed)

Line Input +30dBu

### Maximum Output Level

Better than +26dBu on all balanced outputs into 10kohms

Better than +24dBu on all balanced outputs into 600 ohms

Better than +20dBu on all unbalanced outputs into 10kohms

### Microphone Input

EIN -127.5dBu ref 200 ohms

-128.7dBu ref 150 ohms

-129.7dBV ref 200 ohms

-130.9dBV ref 150 ohms

### Microphone Input Distortion

Maximum gain, +20dB out 0.007% at 1kHz

Minimum gain, +20dB out 0.003% at 1kHz

### Line Input Distortion

Maximum gain +20dB out 0.005%

Minimum gain +20dB out 0.003%

Signal Present LED On at -18dBu

Peak LED On 3dB below clipping

Mute Attenuation > -95dB

Signal to Noise Ratio >76dB ref +4dBu

(measured with 16 inputs, faders at 0dB, unity gain, equaliser in)

Maximum Power Consumption :- 200W

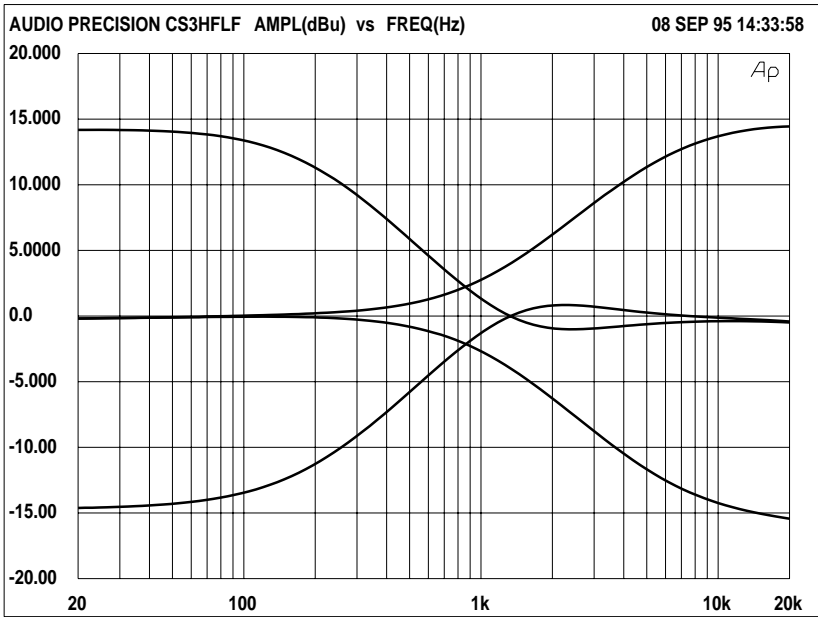
Current demand for +18V, -18V rails :-

16/4/2 1.4 Amps

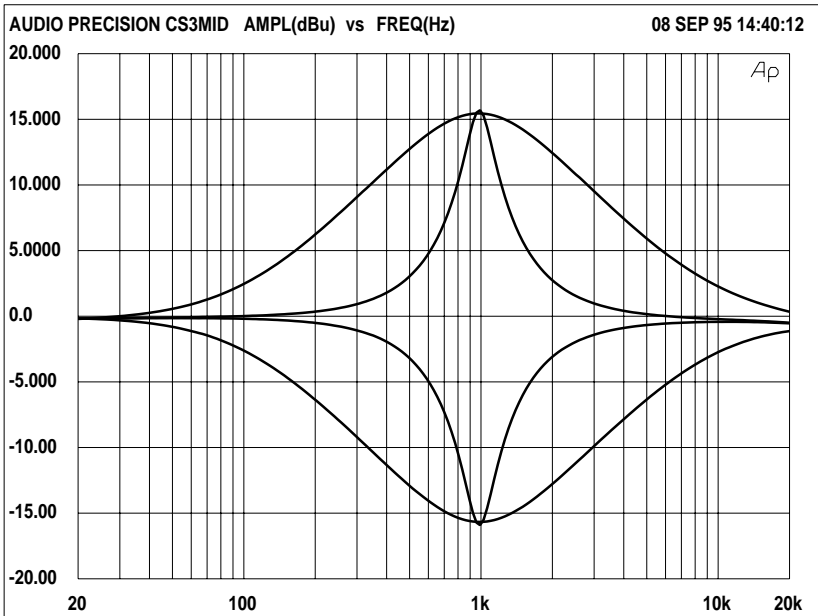
24/4/2 1.8 Amps

32/4/2 2.2 Amps

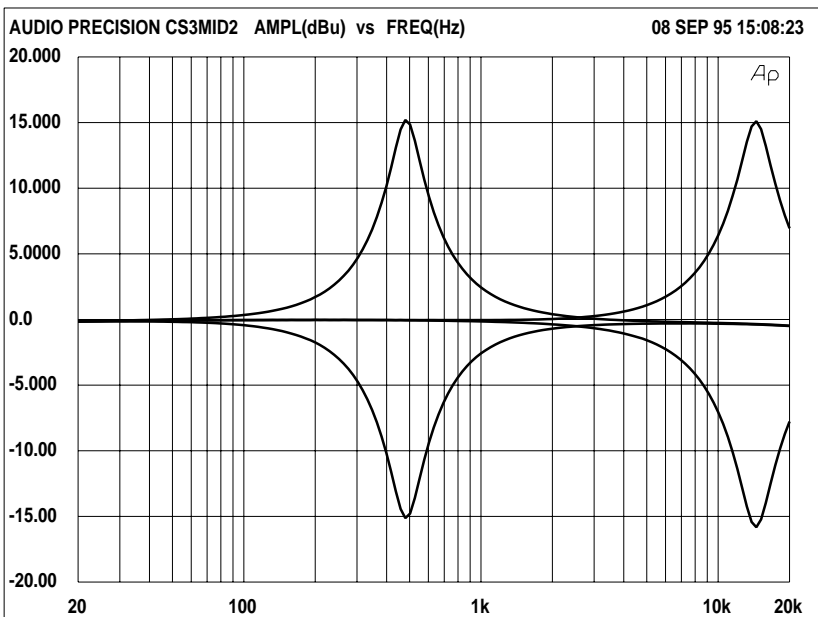
40/4/2 2.6 Amps



THE HIGH AND LOW FREQUENCY EQUALISER RESPONSE



THE MID FREQUENCY EQUALISER RESPONSE SHOWING VARIATION IN Q



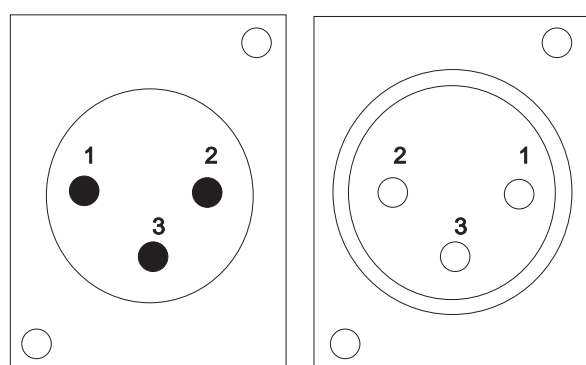
THE MID FREQUENCY EQUALISER RESPONSE SHOWING FREQUENCY RANGE

## A TECHNICAL PRIMER

Before any console is switched on many decisions will have been made with regard to what channels the signal sources will appear on and in fact this may even have influenced the build of the console. Some operators favour all the microphones to the left side of the console with other sources to the right while other people may prefer a layout more akin to the actual physical layout of the microphones and other signal sources.

### A WORD ABOUT CONNECTORS

Two types of connector are used to interface the console to external signals. Firstly XLR type connectors are used for the microphone inputs. These connectors have a large contact area and therefore are very suitable for low level signals.



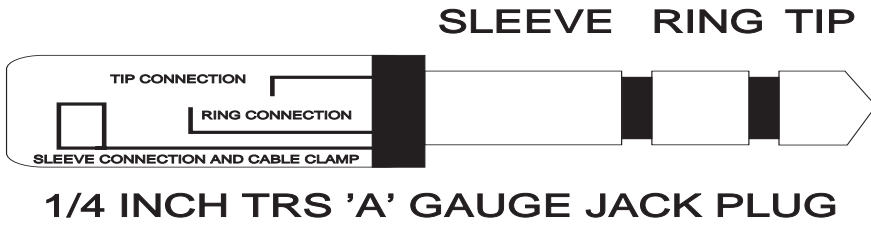
**MALE XLR-3**

**FEMALE XLR-3**

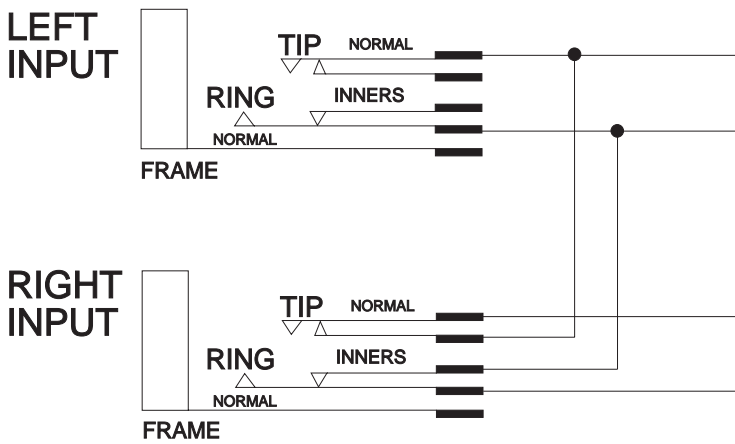
It is perhaps worth mentioning at this point that there are two different conventions for the wiring of XLR connectors. The international convention uses pin 2 as the hot pin while the older American convention uses pin 3 as the hot pin. When going from balanced input to balanced output this is of little consequence but when unbalanced signals such as those found on the insert points are used then phase reversal can result. The CS3 and all DDA products are wired PIN 2 HOT.

1/4 inch TRS jacks are used for high level signals such as the line inputs and the stereo return inputs. These jacks are used in 3 different ways.

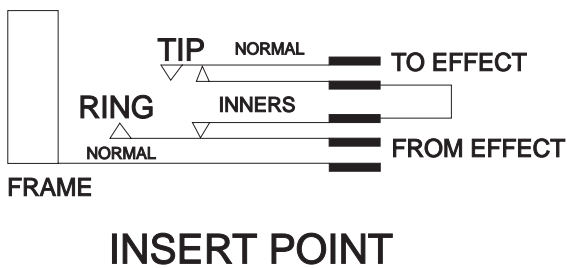
- 1 To carry a balanced signal, the line input for example.
- 2 To carry an unbalanced signal, the direct output for example.
- 3 To carry an unbalanced signal in and out through the same connector at the same time, the insert point for example. The TIP is used to send signal while the RING receives signal. The sleeve is a common ground.



A technique known as "normalling" or "innering" can be used to carry signal through jacks which have no plugs inserted. The jack socket is equipped with spring terminals making contact with the tip, ring and sleeve connections until a plug is inserted. Signal wired to these sprung connections will normally connect to the tip, ring and sleeve connections and an example of this is where the auxiliary left input is also used as a mono input by wiring it through to the right input connector.



Thus a mono input signal is fed to both left and right signal paths. If a stereo input is required then the insertion of a jack plug into the right jack cuts off the signal from the left jack letting the right and left signals go the appropriate signal paths. Another example is the insert jack where the tip and ring inner connections are wired together. When the insert point is not in use signal fed to the tip is returned to the ring through the normalled connections then to proceed through the remainder of the module.



## BALANCED OR UNBALANCED ?

Relating to a home stereo system unbalanced operation is the norm with the ground being used as the signal return path. This can be prone to interference especially with the longer cable lengths used in professional applications.

To counter this, balanced operation is usually preferred where the signal send and return use two individual signal wires which will normally have an overall screen. Thus XLRs have 3 pins, two for the balanced signal and one for ground which is now used for screening purposes, rather than as a signal return path. It is common practise to have the ground connected at one end of a cable only to reduce the risk of ground loops which can induce hum and interference into the wanted audio signal. When jacks are used they must be of the TRS (Tip, Ring, Sleeve) type to carry a balanced circuit.

The internal electronics of the console are unbalanced therefore every balanced input must have a balanced to unbalanced input stage and every balanced output must have an unbalanced to balanced output stage. These stages also modify the level of the signal such that the internal console signal is optimised for noise and distortion.

## INTERCONNECTION

A number of points require to be addressed when connecting inputs and outputs together if either or both are unbalanced. The crucial points are grounding and how the screen is connected. The following table gives an indication of the connections under all possible cases. Note that "balanced" means balanced and floating such as from a transformer while "differential" refers to an electronically balanced input or output which cannot float.

<b>Output</b>	<b>Input</b>	<b>Screen</b>	<b>See Note</b>
Unbalanced	Unbalanced	Source	
Unbalanced	Balanced	Source	
Unbalanced	Differential	Source	
Balanced	Unbalanced	Destination	1
Balanced	Balanced	Source	
Balanced	Differential	Destination	2
Differential	Unbalanced	Source	3
Differential	Balanced	Source	
Differential	Differential	Source	

- 1 The shield is connected to the destination earth point, which is the opposite of normal practice, because the signal wires being shielded are referenced to the input earth, not the output earth.
- 2 If the output transformer is centre tapped to earth, the screen should be connected at the source.

- 3 When an active differential output is operated in unbalanced mode, it is very important that the output current returns to earth via the shortest, least reactive route. Check for instability at the output.

A simple test to show the vulnerability of any piece of equipment to earth currents has been proposed by John Windt in the June 1995 issue of the Journal of the Audio Engineering Society. The test consists of passing a peak AC current of 100mA through the ground system of a piece of equipment and measuring the degradation in signal to noise ratio. In its simplest form this would be at 50/60Hz, although a more elaborate test could consist of a wide band frequency sweep from 20Hz to 200kHz as suggested by Cal Perkins in the same issue of the AES Journal. Of course, there are many different ground paths possible, so it is necessary to try as many as possible, such as pin 1 to pin 1 of any XLR connectors or to the jack sleeves or to the metalwork etc. The results of this test are far from subtle, with 30-50db reductions in signal to noise ratio quite commonly observed! The scary thing is that this can actually represent a real world situation, unlike a simple bench test measurement of noise, which is usually taken in an idealised situation. A well designed and implemented internal grounding method, as found in the CS3, should ensure that there is negligible effect on performance.

#### DECIBELS (dBs)

Many signal levels are quoted in dBs as this relates more to the perceived effect of the signals. 0dBm relates to a power level of 1mWatt into 600 ohms giving 0.775 Volt. Normally 600 ohm impedances are not used and dBu are quoted meaning 0.775 Volt independent of impedance. dBV are encountered more and more frequently and they are referenced to 1V. Thus there is a difference of 2.2dB between 0dBu and 0dBV. When dBs are used without a suffix it simply means that they are a ratio of two readings and the absolute measurement is not important. Thus the ratios in dBu's or dBV's are the same but absolute measurements are made to different reference levels.

Many products operate at +4dBu while many newer semi-professional products including some 1 inch multi track tape machines operate at -10dBV. This leads to approximately a 12dB difference between signal levels as -10dBV equates to -7.8dBu.

#### PANNING

When a signal is split across a stereo bus some compromise is involved regarding the levels sent to the buses for the following reasons.

Two identical signals, when combined electrically, will double in amplitude which is an increase of 6dB. If the signals are fed through a stereo loudspeaker system then the acoustic summing and perceived effect is that the signal amplitude has increased by 3dB. There is thus a 3dB difference between the two summing mechanisms.

For a console optimised for sound reinforcement the pan pot should be 3dB down in the centre position while for broadcasting where peak levels are important due to transmitter and land line overloading, the pan pot should be 6dB down. 4.5dB is often chosen because it is halfway between the extremes. An error of 1.5dB is acceptable in most situations.

Splitting the signal across an LCR bus is similar as only two of the buses are active at any time. If the signal is centrally panned then only the centre (mono) output is active.

The CS3 pan pots are 3dB down in the centre position relative to fully left and right panned signal levels.

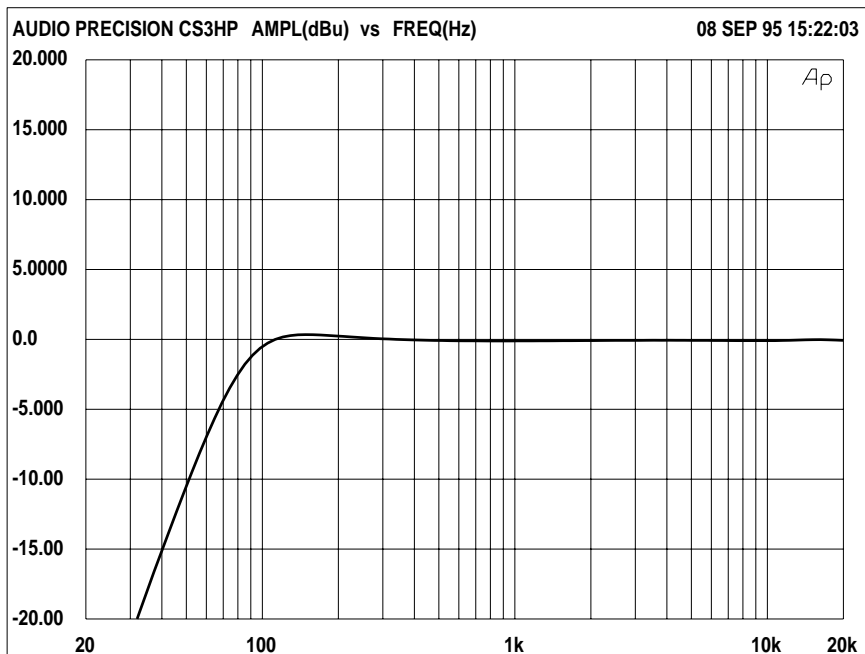
## AN OVERVIEW OF THE CONSOLE

### THE INPUT SECTION

Channels to be used with microphones should have their MIC/LINE switches set in the MIC position. Some microphones require phantom power and if this is the case then the 48V switch should be depressed. This is likely to cause a loud click or thump and it is recommended that the switch is pressed with the channel fader closed. It is also advisable to plug the microphone in before switching on the phantom rather than to plug the microphone in with the phantom voltage already on.

### FILTERS

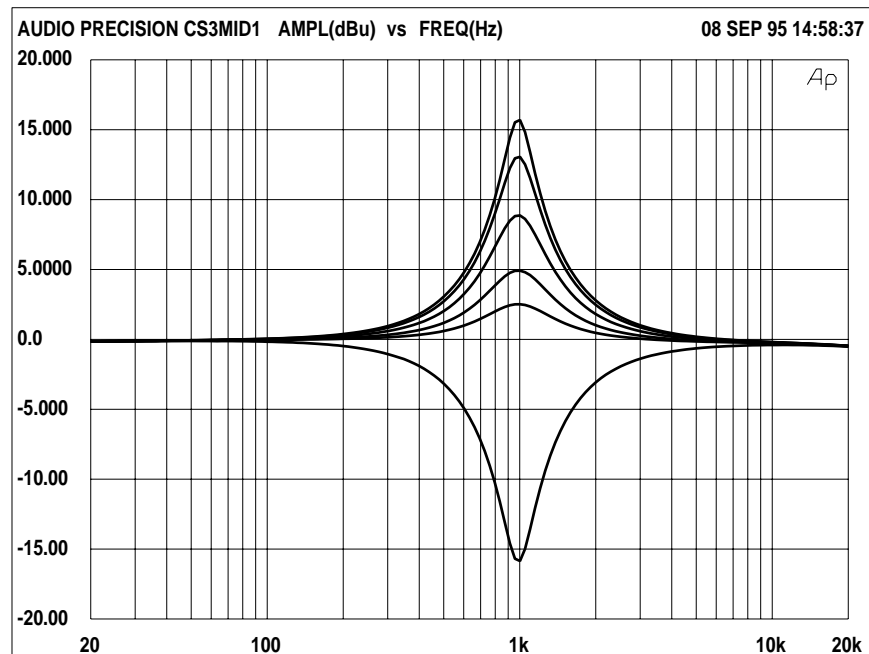
The High Pass Filter can be used to filter out LOW frequency sounds that are not part of the intended signal. These sounds could include stage noise transmitted through a microphone stand, air conditioning noise, rumble from an underground railway system or even overflying aircraft. Sometimes the filter frequency is selectable in order that as much of the interfering source can be removed with minimal damage to the intended signal. A Low Pass Filter is an inverse of the high pass filter and it attenuates high frequency signals. An example of this might be the line frequency whine from a television monitor located close to the console. The following illustration shows the HIGH PASS filter response of the CS3.



## EQUALISATION

The equaliser can be used to correct or alter the frequency spectrum of the channel signal. In its simplest form there will be two sections giving high and low frequency boost and cut. This is very similar to the tone controls found on home audio systems and adjustment will depend upon the difference between the source signal and the required sound. The characteristics of the equaliser can sometimes be changed from peaking to shelving and this affects the way the extremes of the frequency ranges are adjusted. A peaking section will, when adjusted to boost a high a frequency signal, boost the signal maximally at one frequency before its effect diminishes towards the audible limit. A shelving section will modify all frequencies equally after the initial boost or cut.

Further scope for adjustment can be given with a mid frequency section which is always a peaking section. Usually the frequency is adjustable along with the level of boost/cut. In some cases a Q or WIDTH control can also be fitted - known as a parametric equaliser. This controls the bandwidth of the equaliser and allows the frequency correction to be more accurately targeted without affecting other parts of the spectrum. Both boost and cut are available and this control could be used to notch out unwanted sounds rather than boosting wanted sounds. The following illustration shows the mid range response of the CS3 equaliser at one frequency.



## INSERT POINTS

Insert points allow the signal path in the module to be broken and for an effect device such as a compressor to be inserted. With no jack inserted signal is normalised through to the insert return point but when a jack is inserted this path is broken and the signal from the jack is forced out of the module through the effect unit and back through the insert return to join the main signal path again.

## AUXILIARIES

Auxiliary outputs can have many uses and it is probably simplest to consider the auxiliaries as additional mixing buses. They can be used to send signal to an effect unit such as a reverberation device or to develop another mix for use as foldback or monitoring.

Each auxiliary has a master level control which equates to the master faders of the console. This controls the output level of the auxiliary and the individual channel levels can be adjusted from the controls located on the modules. Signals to the auxiliary sends can be switched pre or post fader. In pre fade mode the auxiliary signal will only depend upon the position of the auxiliary send pot but in post mode the signal will depend both upon the channel fader position and the position of the auxiliary pot.

## DIRECT OUTPUTS

Direct outputs can be used to feed effects devices or even the inputs to a multitrack tape recorder. The Direct Output is post fader/post cut and therefore its level depends on the channel fader. Only the signal going through the module is available on the direct output and no mixing with signals from other channels can take place inside the console.

## ROUTING AND PANNING

Routing switches allow the signal to be sent to the various mix buses within the console. In addition to the groups it is possible to send to the L/R or stereo mix bus and the mono or centre bus.

A pan control allows the signal to be panned or spread across a pair of groups or the stereo mix creating a stereo signal from a mono one. The pan control effectively splits the signal into left and right components with their amplitudes depending upon the rotation of the pan control. In the centre position equal levels should be sent to both left and right or odd and even groups. If panned hard left then the left signal should be 3dB higher than with the pan control in the centre position while there should be no signal on the right side. This situation is reversed with a hard right pan.

The pan control can also be switched into LCR mode and rather than panning from left to right the pan will now work between left/centre and centre/right. With the pan in the centre position then signal will only appear on the centre output.

## THE SOLO SYSTEM

The solo system can often be one of the more complex aspects of a console. The intention is to allow signal to be previewed without affecting the outputs of the console, other than the monitor output. Solo can also be referred to as AFL, PFL or SIP.

AFL or after fade listening gives the ability to listen to signals in isolation which are derived from a point after the channel fader.

PFL or pre fade listening allows signals derive from before the channel fader to be monitored. Both AFL and PFL modes use dedicated buses which are switched through to the monitor outputs of the console when required.

SIP or Solo-In-Place operates very differently by cutting all the other signals routed to the main buses of the console allowing the selected signal to be heard in isolation.

## THE MASTER MODULE

The simplest signal path to follow is when the signal is routed to the stereo mix bus. The mix outputs are located on the master module and contain an insert point, a peak indicator, a fader and a balanced output stage. The insert point can be used to insert an effect device as is the case with the input module. Note that the bus peak led comes before the insert point and therefore any gain introduced at the insert point will not be indicated by it.

A tape recorder output is also connected at the insert send point operating at -10dBV and unbalanced. The master output is taken from after the master fader, operates at a nominal level of +4dBu and is fully balanced. If required the output can be run into an unbalanced load without any modification. The output of the master fader is taken to the master meters for a visual indication of the console output level. If a solo is selected on any module then the left meter will indicate the solo level and the monitoring will switch so that the solo can be heard

The master module has provision for a tape return and this can be assigned through a level control to the L/R and Mono outputs of the console or it can be assigned to the monitor system.

Tape to L/R assigns the tape signal to the main buses AFTER the main fader giving an intermission playback facility independent of the master faders in the console.

## THE GROUP OUTPUTS

The group output stages are located on the group modules and have their own master faders to give overall control of the group level.

The group output may be used either to feed a tape recorder or to send to another destination such as a power amplifier. If required the group can be sub mixed down onto the stereo bus of the console. This makes it easier to control the level of all the channels assigned to the group as only the one master fader will alter the level of the entire group. Individual faders on the channels can of course still be moved to alter the balance within the group.

The group output is almost identical to the main output having a group insert point, a peak led, a group fader and a balanced group output stage. In addition there is a group meter, a group CUT switch, a group solo switch, and a pan control working with the MIX switches. These allow the signal to be sub mixed onto either the stereo or the mono buses of the console and LCR panning can be selected. If required signal could be taken from the group output at the same time as the group is subbed onto the L/R and MONO mix buses but without independent level control.

#### THE AUXILIARY OUTPUTS

The auxiliary master outputs are located on the same modules as the group outputs and have a simple signal path. The signals on the auxiliary buses are mixed and then go through an auxiliary insert point before the master level control which is a rotary potentiometer rather than a fader. The output of the level control goes to a balanced output stage. There is no meter associated with the auxiliary outputs although they can be soloed to check the signal level.

#### STEREO INPUTS

There is a stereo input associated with each group output. This allows a line level stereo (or mono) signal to be fed into the console through a fader for level control, to be balanced and then to be routed to the group buses or the main L/R or Mono buses. In the event of a large mix they may assist in creating the required number of inputs or if consoles are linked together then they may be used to carry the outputs of the slave console onto the buses of the master console. The input jacks are wired such that if a mono signal is fed to the left input then it will also be routed to the right input through the normalling connections of the jack sockets.

# INSTALLATION GUIDE

There are a number of points to consider when installing a mixing console. Many of these points will have been addressed before the console is even unpacked but it is worth repeating them again.

## POSITION

The console should be located in a convenient space commensurate with the use to which the console is being put. Ideally a cool area is preferred not in close proximity to power distribution equipment or other potential sources of interference. Provision should be made for some flat surface surrounding the console to prevent people using it as a table top. One of the worst fates that can befall a console is for a cup of coffee to be tipped into it by someone resting it on the control surface!

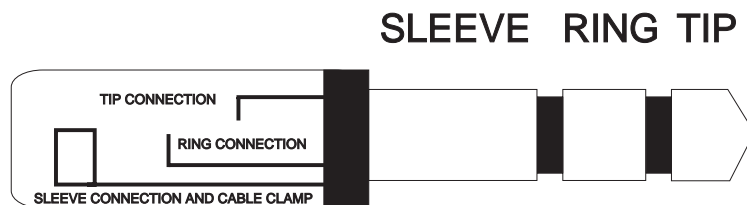
## POWER

The power supply should be located as far from the console as the connecting cable will allow. It should be set for the appropriate line voltage and plugged into the mains outlet using the supplied cable.

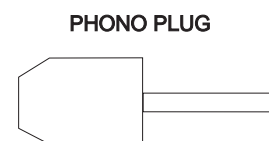
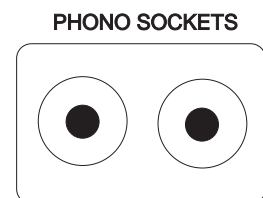
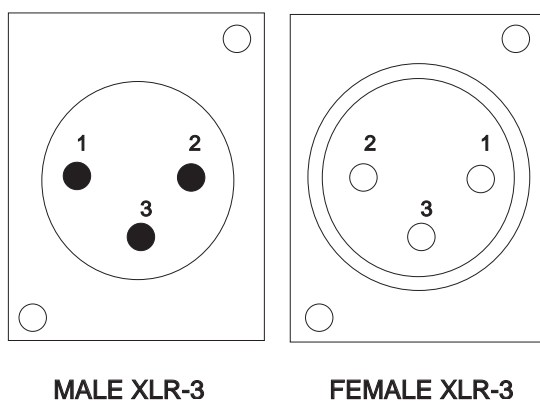
## WIRING

The console uses four different connector styles:-

TRS jack sockets, XLR male connectors, XLR female connectors and phono connectors.



## 1/4 INCH TRS 'A' GAUGE JACK PLUG



The cables used should be of as high a quality as possible. Many installation problems can be traced back to poor or faulty cables and connectors.

As mentioned before there are two different conventions for the wiring of XLR connectors. The international convention uses pin 2 as the hot pin while the older American convention uses pin 3 as the hot pin. When going from balanced input to balanced output this is of little consequence but when unbalanced signals such as those found on the insert points are used then phase reversal can result. The CS3 and all DDA products are wired PIN 2 HOT.

## **ATTENTION**

### **CABLES**

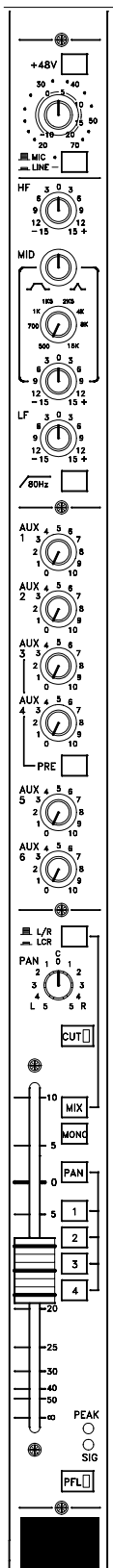
This product should only be used with high quality, screened twisted pair audio cables, terminated with metal bodied 3-pin XLR connectors. The cable shield should be connected to Pin 1. Any other cable type or configuration for the audio signals may result in degraded performance due to electromagnetic interference.

### **ELECTRIC FIELDS**

Should this product be used in an electromagnetic field that is amplitude modulated by an audio frequency signal (20Hz - 20kHz), the signal to noise ratio may be degraded. Degradation of up to 60dB at a frequency corresponding to the modulation signal may be experienced under extreme conditions (3V/m, 90% modulation).

No permanent damage or degradation of performance will be caused by these conditions.

## THE INPUT MODULE



The input modules contain the signal processing circuits that match external signals to the internal electronics of the console.

An input stage is followed by a filter and equalisation stage before the signal is passed through the fader to be routed to the various outputs of the console.

The equaliser can be used creatively to modify signals either because they contain unwanted sounds or because they need to be matched more closely to other sounds in the overall balance.

### LCR EXPLAINED

Three channel left centre right panning differs from the normal stereo panning arrangement in that where the conventional left/right pan moves the signal across the stereo image, LCR panning moves the signal between three distinct positions. Using LCR panning gives a more spatial effect, offers more control over vocals and effect positioning and really brings performances to life.

In LCR mode the pan pot acts as follows:-

When panned hard left the signal is only fed to the left channel of the main output. As the pan is rotated towards the centre, the signal to the left decreases and the signal to the centre channel increases until at a dead centre the signal only goes to the centre output. At this point no signal is fed to the right channel.

Rotating the pan pot further to the right decreases the centre feed while the right feed increases until at full clockwise rotation the signal is only on the right channel.

Soloists are typically mixed to the centre channel while back up vocals, an orchestra or a band can be wrapped around the soloist in stereo or panned across the three channels.

#### +48V

Provides 48 volt phantom power for a condenser microphone, or D.I. box. Optional balancing transformers may be fitted on the Mic/Line input.

#### GAIN

The gain control is a wide range rotary potentiometer, and is active on both Mic and Line Inputs. With Mic selected the gain can be adjusted from 20dB to 70dB. For Line inputs, the adjustment is from -10dB to +20dB.

#### MIC/LINE

Switching this inserts an attenuator into circuit with the microphone/line input and alters the range of gain adjustment available. This should be pressed when high level or line level signals are connected to the channel through the line input jack. Note that if a jack is not inserted into the line input socket then the XLR connector may be used as the line input.

#### EQUALISER

The equaliser on the input module is a three band design, incorporating a parametric mid-range section and fixed frequency shelving high and low frequency sections.

#### HF

A high frequency equaliser, providing 15dB of boost or cut at 12kHz.

#### MID

A parametric middle frequency equaliser, providing 15dB of boost or cut. The frequency is adjustable from 500Hz to 15kHz and the Q or bandwidth can be swept between the values of 0.7 and 4.5. In octave values this means 2 octaves at the widest (low Q) setting and about a third of an octave at the narrowest (high Q) setting. This enables the part of the audio spectrum requiring adjustment to be targeted very precisely and reduces the effect on parts of the signal that require no modification.

#### LF

A low frequency equaliser, providing 15dB of boost or cut at 80Hz.

#### FILTER

The Filter switch inserts a 80Hz highpass filter with a rolloff of 18dB per octave into circuit after the input amplifier. This may be used to eliminate unwanted low-frequency noises transmitted to the microphone through a floorstand for example.

An insert point is located after the EQ section allowing the introduction of an effect unit or similar into the signal path..

#### AUXILIARIES

There are six auxiliary outputs. Additionally, the channel direct output may be used to provide a dedicated auxiliary send.

#### AUX 1

Controls the level of the channel signal fed to Auxiliary 1. This signal is normally pre-fader.

#### AUX 2

Controls the level of the channel signal fed to Auxiliary 2. This signal is normally pre-fader.

#### Link Options

Link 3 is normally installed causing the signal fed to auxiliaries 1 and 2 to be pre fade, although they will mute if the channel is muted.

Link 4 will make the signal pre equaliser and independent of the mute.

Link 5 will enable the auxiliaries to send post fader signal.

Link 10 allows auxiliaries 1 and 2 to be fed from an output of the pre switch and links 8 and 9 will then determine which pre signal is selected.

Link 8 is normally installed giving a pre fade, post cut signal.

Link 9 will give a pre equaliser feed.

#### AUX 3

Controls the level of the channel signal fed to Auxiliary 3.

#### AUX 4

Controls the level of the channel signal fed to Auxiliary 4.

#### PRE

Normally this operates on auxiliaries 3 and 4 to change them from a post fade feed to a pre fade feed.

#### Link Options

Links 6 and 7 determine the pre feed fade. Link 6 is normally installed giving a pre fade, post cut signal. If link 7 is installed the PRE feed will be pre equaliser. If link 10 is installed the PRE button will affect auxiliaries 1 and 2.

If link 12 is installed the PRE button will affect auxiliaries 5 and 6.

#### AUX 5/AUX 6

Controls the level of the channel signal fed to Auxiliary 5 and Auxiliary 6.

Link 11 is normally installed giving auxiliaries 5 and 6 a post fader feed.

#### Link Options

If link 12 is installed the feed will depend on the PRE switch.

If link 13 is installed the feed will be pre-equaliser.

If link 14 is installed the feed will be pre fade, post cut.

#### ROUTING AND STATUS

### L/R (LCR)

This changes the pan pot into a left, centre, right pan pot. The signal now pans between left and centre or right and centre. It is not possible therefore to have signal on the left and right buses simultaneously from one module if LCR mode is selected. With the pan pot in the centre position there will only be signal on the centre output.

### PAN

When PAN is set to centre in L/R mode, equal levels are sent to the left/right (odd/even) buses, with a 3dB drop relative to the fully clockwise or anticlockwise positions. Setting the PAN control fully anticlockwise sends full level to the Left bus, cutting the send to the Right bus. Fully clockwise rotation sends full level to the Right bus, cutting the feed to the Left bus.

### CUT

The CUT switch disables the channel signal path, and is indicated by an led in the switch when the channel is muted. When CUT, all post-fade auxiliary sends and routing assignments are muted in addition to the pre fade, post cut sends.

### MIX

Routes the post-fade, post-pan channel signal to the stereo mix bus or the left, centre and right buses if LCR panning is selected.

### MONO

Routes the post fader signal to the mono or centre bus. In L/R pan mode with MIX selected no signal will be routed to the mono output if this switch is not depressed. With the pan control in LCR mode and MIX selected the centre output of the pan pot is routed to the mono or centre bus without this button being pressed. If the button is pressed the the pan pot output will be replaced by the post fade signal.



### PAN

Pressing this allows the output of the pan pot to be sent to the groups. An odd and an even group should be used when panning across groups and the pan control will operate as described for the left and right buses above. If this switch is not pressed then the selected groups will receive identical mono signals which are not dependent upon the pan pot position. Pan mode should be set for L/R operation.

1 (or 2,3,4)

Routes the post-fade, (post-pan if selected) channel signal to output group 1 (or 2, 3, 4).

### PFL

The PFL button feeds the post insert return signal to the Monitor Section (loudspeakers or headphones), replacing the selected monitor source. The main stereo and centre outputs of the console are not affected. The led in the PFL switch will illuminate when the PFL function is active and PFL signals from different channels that are active simultaneously will be mixed together. If Solo In Place mode is selected (on the master module) then all other channels on the console will be muted while only the channel initiating the solo will be heard. This allows signals to be previewed exactly as they will appear in a mix but in isolation. Note that this is no longer PFL.

### PEAK

This led (light emitting diode) indicates when the signal is getting close to clipping level. If clipping occurs the signal will be severely distorted and the channel input gain should be reduced.

### SIGNAL

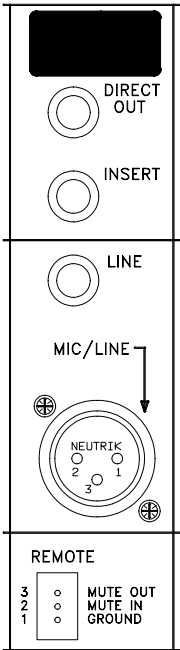
This led shows when signal is present in the channel and is simply a useful aid on occasions when no output can be found from the console. It establishes that there is input signal and that maybe there is a routing or some other problem.

### FADER

The fader is the main signal level control for the channel, and is a long-throw type giving smooth control of the channel level. Note that the fader is calibrated and the normal operating position is expected to be close to the 0dB mark.

If the fader is significantly lower than this then the input signal is too high and either the input gain control (near the top of the module) should be reduced or the MIC/LINE switch pressed to select the line input. If this action is not taken distortion may result.

If the fader has to be pushed above the 0dB point then this indicates that the input signal is low and that the input gain should be increased or the MIC/LINE switch set for microphone operation. If this action is not taken the signal may contain more noise than necessary.



**CONNECTORS AND PIN DEFINITIONS**

Mic Input : 3 Pin Female XLR type, Balanced  
 Nominal Input Level: -16dBu to -66dBu  
 Pin 2 : Signal +ve (Hot)  
 Pin 3 : Signal -ve (Cold)  
 Pin 1 : Ground  
 Input Impedance : >2 kOhm

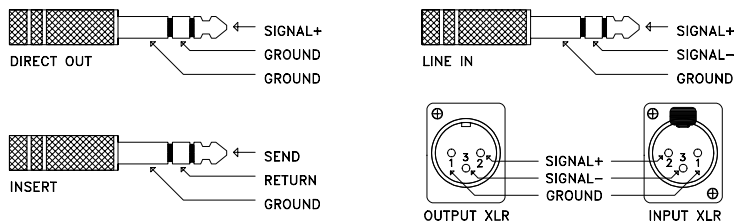
Line Input : 1/4" TRS Jack Socket, 'A' Gauge, Balanced  
 Nominal Input Level: -16dBu to +14dBu  
 Tip : Signal +ve (Hot)  
 Ring : Signal -ve (Cold)  
 Sleeve : Ground  
 Input Impedance : >10 kOhm

Insert Point : 1/4" TRS Jack Socket, 'A' Gauge, Unbalanced  
 Nominal Input/Output level: -2dBu  
 Tip : Insert Send  
 Ring : Insert Return  
 Sleeve : Ground  
 Output Impedance: <75 Ohm  
 Input Impedance : >10 kOhm

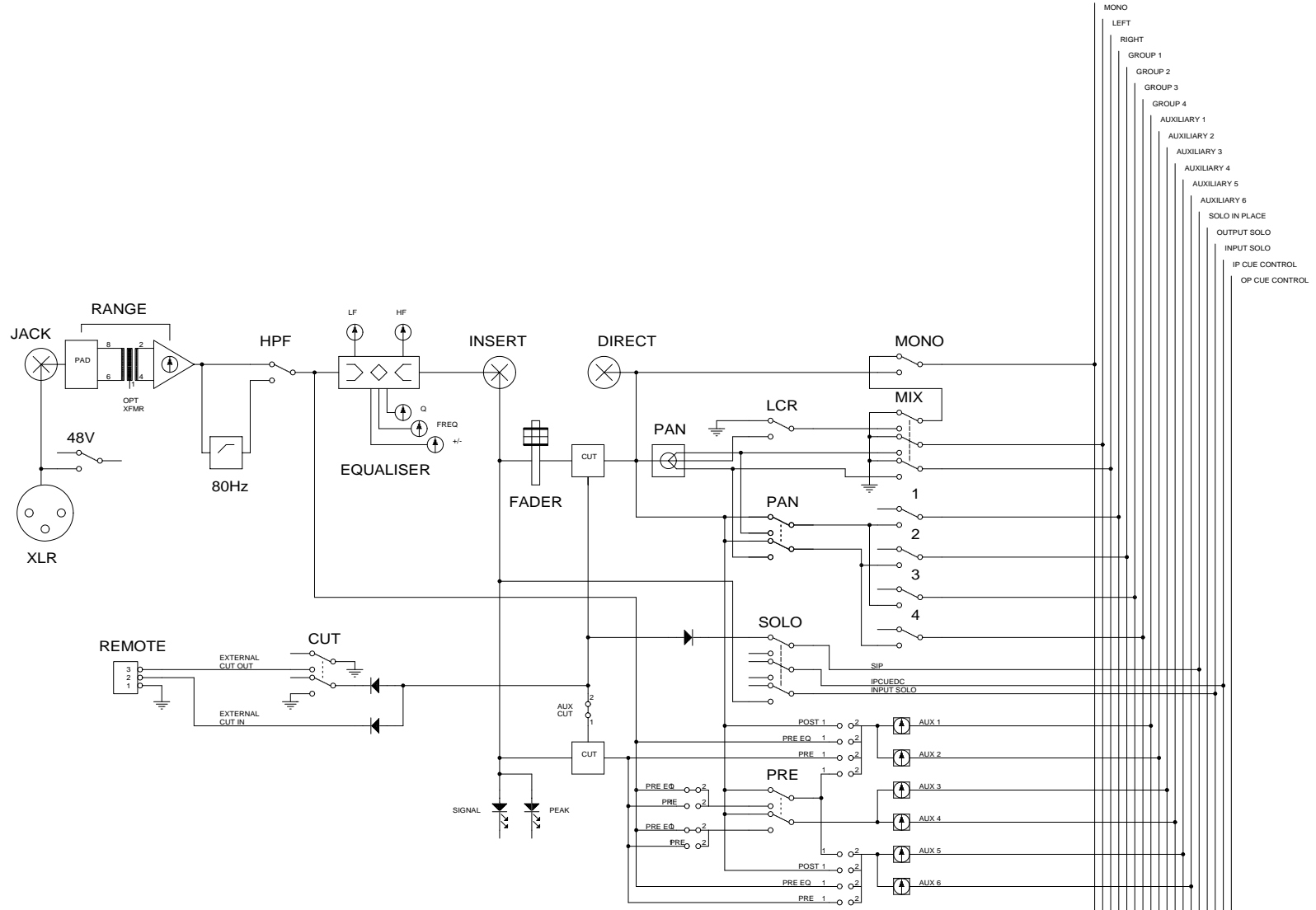
Direct Output : 1/4" TRS Jack Socket, 'A' Gauge, Unbalanced  
 Nominal Output level: -2dBu  
 Tip : Signal  
 Ring : Ground  
 Sleeve : Ground  
 Output Impedance: <75 Ohm

**Remote Connector**

- 1 Ground
- 2 Mute Input      Grounding this pin mutes or cuts the channel.
- 3 Mute Output      This pin is grounded when the CUT switch is depressed.



# INPUT MODULE BLOCK DIAGRAM

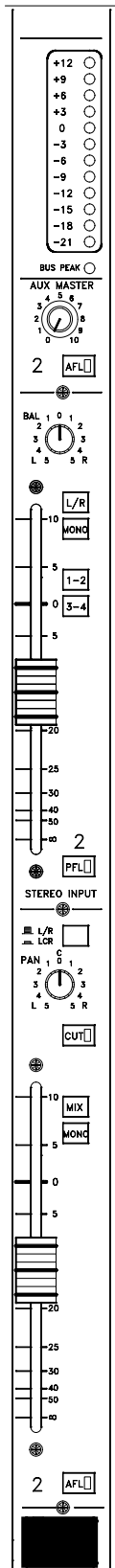


## INPUT MODULE LINKS

LINK	FUNCTION	FACTORY FITTED	NOTES
1	AUXILIARY PRE CUT FUNCTION	Y	
2	AUXILIARY PRE CUT FUNCTION	N	
3	PRE 2 TO AUX 1, 2	Y	
4	PRE 1 TO AUX 1, 2	N	
5	POST TO AUX 1, 2	N	
6	PRE 2 TO AUX 3, 4	Y	
7	PRE 1 TO AUX 3, 4	N	
8	PRE 2 TO AUX 5, 6	Y	
9	PRE 1 TO AUX 5, 6	N	
10	AUX 1,2 FOLLOW PRE SWITCH	N	
11	POST TO AUX 5, 6	Y	
12	AUX 5,6 FOLLOW PRE SWITCH	N	
13	PRE 1 TO AUX 5, 6	N	
14	PRE 2 TO AUX 5,6	N	
15	DIRECT OUTPUT POST FADE	N	
16	DIRECT OUTPUT PRE EQ	Y	

The above links will not normally require to be altered unless the console is reconfigured for any reason.

## THE GROUP OUTPUT MODULE



Each Group Output Module contains a Group Output stage, an Auxiliary Output stage and also a Stereo Input, for use, for example, with external effects devices. The group and auxiliary outputs are electronically balanced and may optionally be transformer balanced.

The stereo input can be routed to the stereo mix, the centre bus or the group buses. Insert points are provided in the group and auxiliary send signal paths allowing the connection of external processing devices such as limiter/compressor units.

A twelve segment led meter reads the signal present on the Group output. It is post fade and post cut and therefore will show no signal if the fader is down or the group is muted.

The group outputs can be used in their own right as console outputs to be fed to loudspeaker systems or tape machine inputs. They can also be sub mixed onto the main left, right and centre buses of the console creating the ability to control the level of several input channels onto the main buses with one (group) fader.

### STEREO INPUT SECTION

This is a high (line) level stereo input that can be routed to the left, right, centre and group buses of the console. It could be used to bring a tape machine into the console without tying up two modules or the output of an effect device whether stereo or mono. The input of the effect device would normally be fed from an auxiliary output of the console.

### BALANCE

Adjusts the relative left/right levels of the return signal. This is not to be confused with the balance referred to in the case of balanced inputs for example !

Note that if a mono signal is connected to the left input and nothing is plugged into the right input the signal will be sent to the left and right signal paths. This saves a special cable having to be made or used for mono signal sources. If a mono input is connected to the right input then only the right signal path will receive this signal.

### FADER

This is the level control for the return signal, and adjusts the amount of level sent to the routed outputs.

### L/R

Routes the return signal to the L/R stereo mix.

### MONO

Routes the return signal to the mono or centre mix. The left and right signals are combined to mono for this.

### 1-2, (3- 4)

Routes the return signal to groups 1 and 2 (or 3 and 4).

### PFL

This allows the pre fade auxiliary return signal to be soloed. The solo is pre fader and therefore will not depend on the position of the stereo input fader. In effect it allows the input signal to be viewed on the solo meter and monitored.

#### METER

This meter indicates the level of the group output. It has a VU characteristic.

#### BUS PEAK

This indicates when the group mix bus level is very high and the signal is in danger of becoming distorted. The signals routed to the group should be reduced in level by pulling their faders down or reducing the input gain of the routed channels.

#### THE AUXILIARY MASTER SECTION (1 OF 4)

Each group output stage contains one auxiliary output section.

#### LEVEL

This controls the auxiliary output level.

#### AFL

This allows the auxiliary signal to be previewed. The post fade auxiliary signal is used and therefore it is dependent on the position of the output level control.

There is an auxiliary insert point allowing the insertion of an effect unit into the auxiliary signal path, pre the level control.

## THE GROUP OUTPUT SECTION

### L/R (LCR)

This changes the pan pot from standard mode to LCR mode where the signal will pan between left and centre or right and centre.

### CUT

The CUT switch disables the channel signal path, and is indicated by a led in the switch when the group is muted.

### PAN

This adjusts the relative levels of signal sent to the left and right outputs or the left, centre and right outputs depending upon the selected pan mode when MIX is pressed.

### FADER

The fader controls the level of the group output. As with the input module, fader operation close to the 0dB calibration point is expected and any large deviation from this would indicate that the signal from the modules feeding the group are too high or too low.

### MIX

When MIX is pressed the group signal is sent to the stereo mix. The pan control can be switched to LCR mode and the centre bus will then be fed with the centre output of the pan pot without the MONO button being pressed.

### MONO

This feeds the post fade group signal to the mono or centre bus of the console when pressed. In LCR mode the centre output of the pan pot will be replaced by the post fader signal if this switch is pressed. In L/R mode the centre output will not receive a signal until this switch is pressed.



### AFL

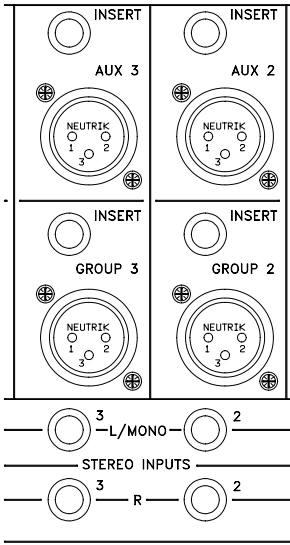
Allows the post fader pre cut group signal to be soloed. Thus the AFL level indicated on the solo meter will depend upon the group fader but not on the CUT switch.

There is a pre-fader group insert point allowing an effect unit or similar to be introduced into the signal path.

## GROUP MODULE LINKS

LINK	FUNCTION	FACTORY FITTED	NOTES
1	BUS 1 TO GROUP OUTPUT	Y	Depends upon the module position. Position 1 illustrated.
2	BUS 2 TO GROUP OUTPUT	N	
3	BUS 3 TO GROUP OUTPUT	N	
4	BUS 4 TO GROUP OUTPUT	N	
5	BUS 5 TO GROUP OUTPUT	N	
6	BUS 6 TO GROUP OUTPUT	N	
7	BUS 7 TO GROUP OUTPUT	N	
8	BUS 8 TO GROUP OUTPUT	N	
9	AUX 1 BUS TO AUX OUTPUT	Y	Depends upon the module position. Position 1 illustrated.
10	AUX 2 BUS TO AUX OUTPUT	N	
11	NOT USED		
12	AUX 3 BUS TO AUX OUTPUT	N	
13	AUX 4 BUS TO AUX OUTPUT	N	
14	AUX 5 BUS TO AUX OUTPUT	N	
15	AUX 6 BUS TO AUX OUTPUT	N	
16	REMOVE IF TRANSFORMER USED ON AUX OUTPUT	Y	Used to bypass the transformer position.
17	REMOVE IF TRANSFORMER USED ON AUX OUTPUT	Y	
18	REMOVE IF TRANSFORMER USED ON GROUP OUTPUT	Y	
19	REMOVE IF TRANSFORMER USED ON GROUP OUTPUT	Y	
20	MATRIX BUS ASSIGNMENT	N	OPTION

The above links will not normally require to be altered unless the console is reconfigured for any reason.



## CONNECTORS AND PIN ASSIGNMENTS

Group Output : 3 Pin Male XLR Type, Balanced

Nominal Output Level: +4dBu

Pin 2 : Signal +ve (Hot)

Pin 3 : Signal -ve (Cold)

Pin 1 : Ground

Output Impedance : <75 Ohm

Auxiliary Output : 3 Pin Male XLR Type, Balanced

Nominal Output Level: +4dBu

Pin 2 : Signal +ve (Hot)

Pin 3 : Signal -ve (Cold)

Pin 1 : Ground

Output Impedance : <75 Ohm

Stereo Inputs : TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level: +4dBu

Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve: Ground

Input Impedance : >10 kOhm

Insert Points : TRS Jack Socket, 'A' Gauge, Unbalanced

Nominal Input Level: -2dBu

Tip : Insert Send

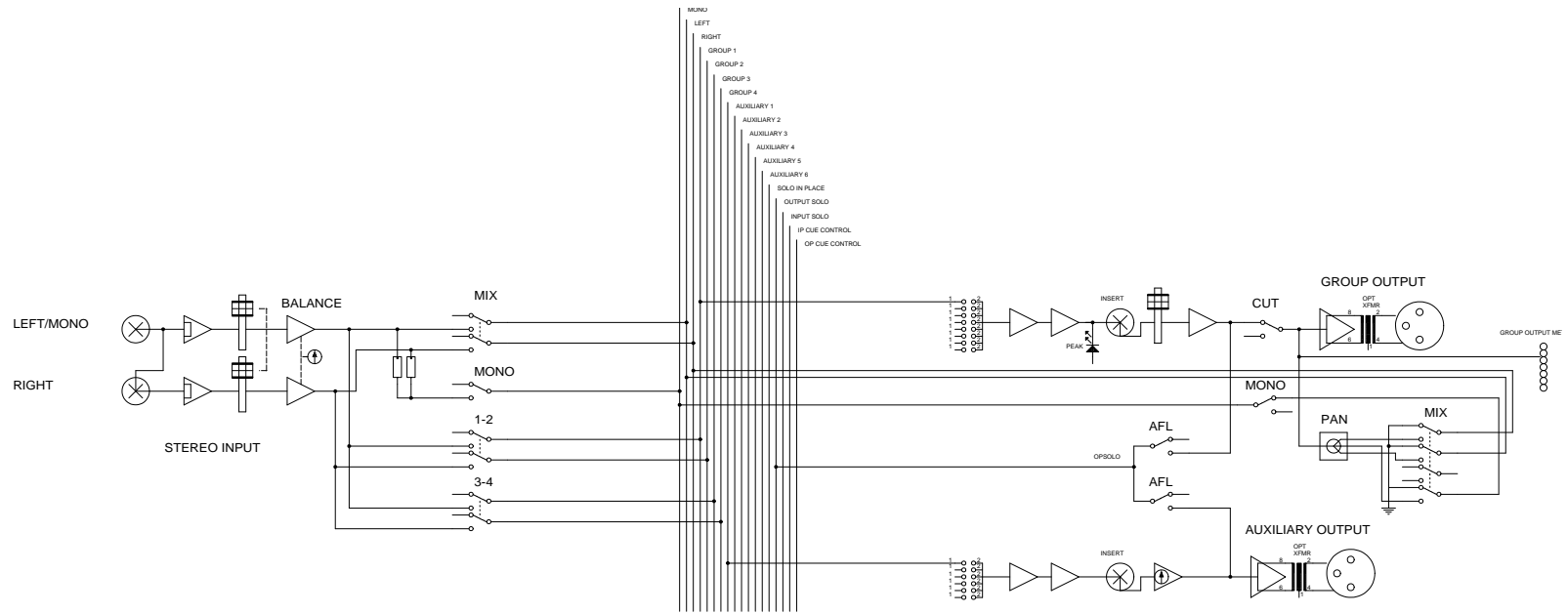
Ring : Insert Return

Sleeve: Ground

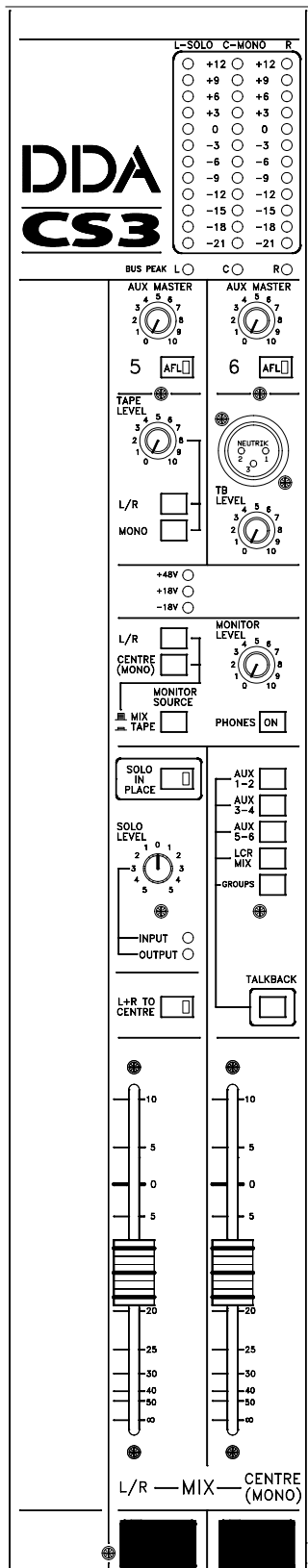
Output Impedance : <75 Ohm

Input Impedance : >10 kOhm

# GROUP MODULE BLOCK DIAGRAM



## THE MASTER MODULE



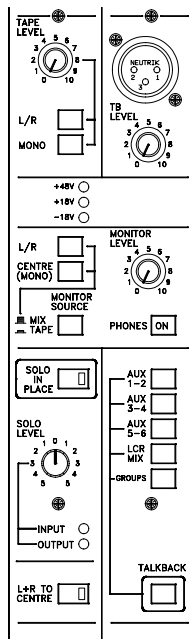
The Stereo Master module contains the main stereo and centre outputs, two Auxiliary master outputs, the monitoring section and a talkback microphone input. In addition, an XLR connector is provided for a gooseneck light if the console is to be operated under low or poor lighting conditions (maximum power, 5 Watts at 12V).

Insert points are provided pre-fader in the left, right and centre output signal paths. Plugging in a jack automatically breaks the normal signal path to insert the external equipment.

The Stereo Mix, Group, and Auxiliary outputs have a nominal operating level of +4dBu and can be transformer balanced.

The three led bargraph meters follow the output of the stereo mix under normal operating conditions. If any PFL or AFL button is pressed, the left meter shows the level of the soloed signal.

There is also an unbalanced stereo output on phono connectors taken from before the mix insert points which can be used to feed a tape recorder or DAT machine for example. The nominal operating level is -10dBV. This allows the feed to the tape recorder to remain unaffected by any device connected to the master module insert points and to be independent of the master faders



## COMMUNICATIONS

### TALKBACK MIC

A microphone may be plugged in to this socket to provide talkback facilities to the output buses. The microphone may be a dynamic type, or by using an internal link for phantom powering, may be a condenser microphone.

### TB LEVEL

This adjusts the level of the talkback microphone signal.

### AUX 1-2

If 1-2 is pressed, the talkback microphone signal is routed to the Auxiliary 1 and 2 buses.

### AUX 3-4

If 3-4 is pressed, the talkback microphone signal is routed to the Auxiliary 3 and 4 buses.

### AUX 5-6

If 5-6 is pressed, the talkback microphone signal is routed to the Auxiliary 5 and 6 buses.

### MIX

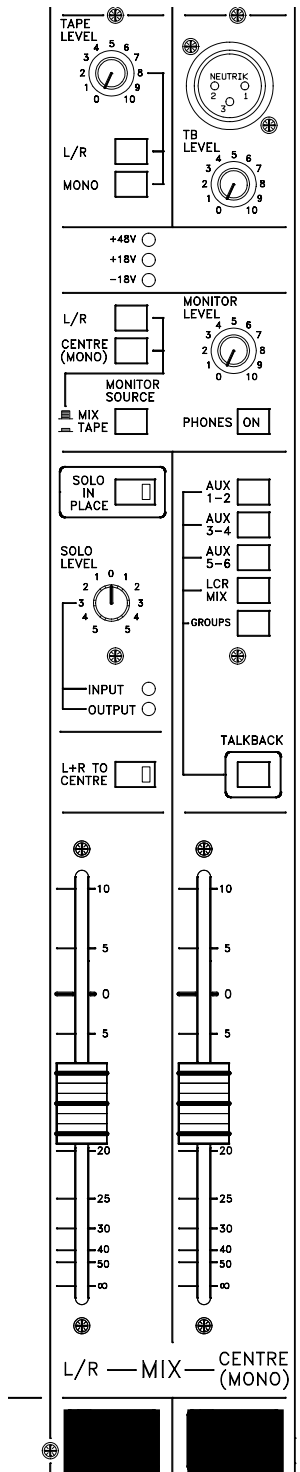
If pressed the talkback signal is routed to the L/R and Mono (centre) buses.

### BUS

If pressed the talkback microphone signal is routed to all the group outputs.

### TALKBACK

This allows the talkback signal to pass to the selected destination. When pressed the monitor output of the console will dim by 10dB to reduce the possibility of feedback. In normal operation only this switch would be pressed when talkback is required while the routing switches would be left assigned to the required destinations.



## MONITORING

### MONITOR LEVEL

This controls the level of the local monitor or headphone output.

### PHONES ON

Pressing this enables alternative monitoring through stereo headphones.

### MONITOR SOURCE

This switch selects the tape input as the source for the monitoring system when pressed.

### L/R

This selects the Left/Right outputs of the console to the monitoring system when MIX is the selected source, (Monitor Source UP).

### CENTRE (MONO)

This selects the centre bus to the monitoring system where it is mixed equally onto the left and right monitor signal paths. If TAPE is selected the centre feed is cut off and no signal will indicate on the centre meter.

### TAPE LEVEL

This controls the level of the stereo tape return signal when selected by the following switches to feed the left, right or centre outputs of the console.

### L/R

The feeds the tape return signal onto the master left and right outputs of the console. Note that this feed is injected after the master faders and the level is adjusted by the TAPE LEVEL control.

### MONO

This feeds the tape return signal onto the mono or centre output of the console. Note that this feed is injected after the master faders and the level is adjusted by the TAPE LEVEL control.

The above facilities may be referred to as an intermission playback facility.

#### AFL/PFL/SIP

Selection of any SOLO (AFL/PFL/SIP) signal will override the monitor selection.

#### SOLO LEVEL

This control allows the audio level of a soloed (PFL/AFL) signal to be adjusted. This will not affect the solo meter reading.

#### INPUT SOLO

This led will indicate when a solo has been selected on an input to the console.

#### OUTPUT SOLO

This led will indicate when a solo has been selected on an auxiliary output or group output.

Priority is given to an input solo. If an output solo is active and an input solo is then activated the output solo cannot be heard for the duration of the input solo.

#### SOLO IN PLACE

Solo In Place is a solo mode where the monitor system does not change over to listen to the solo bus. For SIP mode to operate the monitor selection must be set to MIX. The monitor system remains listening to the mix outputs and when a solo on an input module is requested a signal is sent from the master module to mute all other input modules. Thus only the channel with the solo key pressed will be heard. Output solos will continue to operate as normal and will take priority over input solos. More than one channel can be SIPed at any one time.

#### L+R TO CENTRE

This mixes the post fader left and right outputs onto the centre output of the console.

#### +18/-18/+48

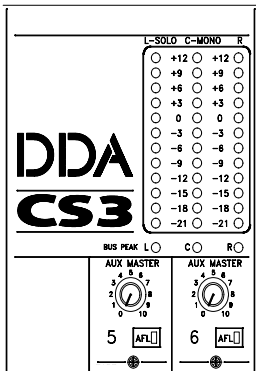
These 3 leds indicate the presence of the two power rails and the phantom voltage supply.

#### FADERS

A stereo LEFT/RIGHT fader and a CENTRE (MONO) fader are provided, giving smooth control of the output signals.

#### HEADPHONES

Stereo headphones with impedances from 100 ohms to 600 ohms may be plugged into the headphone socket. This socket is located below the armrest and to the right hand side of the console.



## METERS

The three meters indicate the levels of the left, centre (mono) and right outputs of the console. The left meter is additionally used to indicate solo levels in which case the remaining two meters will not indicate.

## BUS PEAK LEDS

There are three leds to indicate peak level on the left, centre and right buses. Any indication here will mean that the level from the input modules, the groups if sub-mixed into the main outputs, or the stereo inputs is too high and should be reduced to avoid distortion.

## THE AUXILIARY MASTER SECTION

Auxiliary master 5 and 6 are locate here.

### LEVEL

This controls the auxiliary output level.

### AFL

This allows the auxiliary signal to be previewed. The post fade auxiliary signal is used and therefore it is dependent on the position of the output level control.

There is a pre-fader auxiliary insert point allowing the introduction of an effect unit or similar into the auxiliary signal path.

## MASTER MODULE LINKS

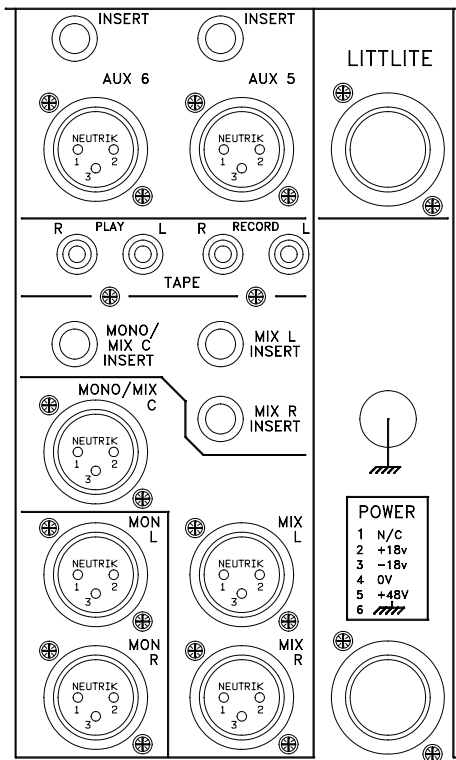
### MASTER MIX CIRCUIT BOARD

LINK	FUNCTION	FACTORY FITTED	NOTES
1	REMOVE IF TRANSFORMER USED ON AUX 5 OUTPUT	Y	Used to bypass transformer position.
2	REMOVE IF TRANSFORMER USED ON AUX 5 OUTPUT	Y	
3	REMOVE IF TRANSFORMER USED ON LEFT MIX OUTPUT	Y	
4	REMOVE IF TRANSFORMER USED ON LEFT MIX OUTPUT	Y	
5	REMOVE IF TRANSFORMER USED ON RIGHT MIX OUTPUT	Y	
6	REMOVE IF TRANSFORMER USED ON RIGHT MIX OUTPUT	Y	

### CENTRE MIX CIRCUIT BOARD

LINK	FUNCTION	FACTORY FITTED	NOTES
1			
2	REMOVE IF TRANSFORMER USED ON AUX 6 OUTPUT	Y	Used to bypass transformer position.
3	REMOVE IF TRANSFORMER USED ON AUX 6 OUTPUT	Y	
4	REMOVE IF TRANSFORMER USED ON CENTRE MIX OUTPUT	Y	
5	REMOVE IF TRANSFORMER USED ON CENTRE MIX OUTPUT	Y	

The above links will not normally require to be altered unless the console is reconfigured for any reason.



## CONNECTORS AND PIN DEFINITIONS

Left and Right Outputs : 3 Pin XLR type, Balanced  
 Nominal Output Level: +4dBu  
 Pin 2 : Signal +ve (Hot)  
 Pin 3 : Signal -ve (Cold)  
 Pin 1 : Ground  
 Output Impedance : <75 Ohm

Mono (Centre) Output : 3 Pin XLR type, Balanced  
 Nominal Output Level: +4dBu  
 Pin 2 : Signal +ve (Hot)  
 Pin 3 : Signal -ve (Cold)  
 Pin 1 : Ground  
 Output Impedance : <75 Ohm

Tape Play Inputs : Phono Sockets  
 Nominal Input Level: -10dBV  
 Tip : Signal +ve (Hot)  
 Sleeve: Ground  
 Input Impedance : >40 kOhm

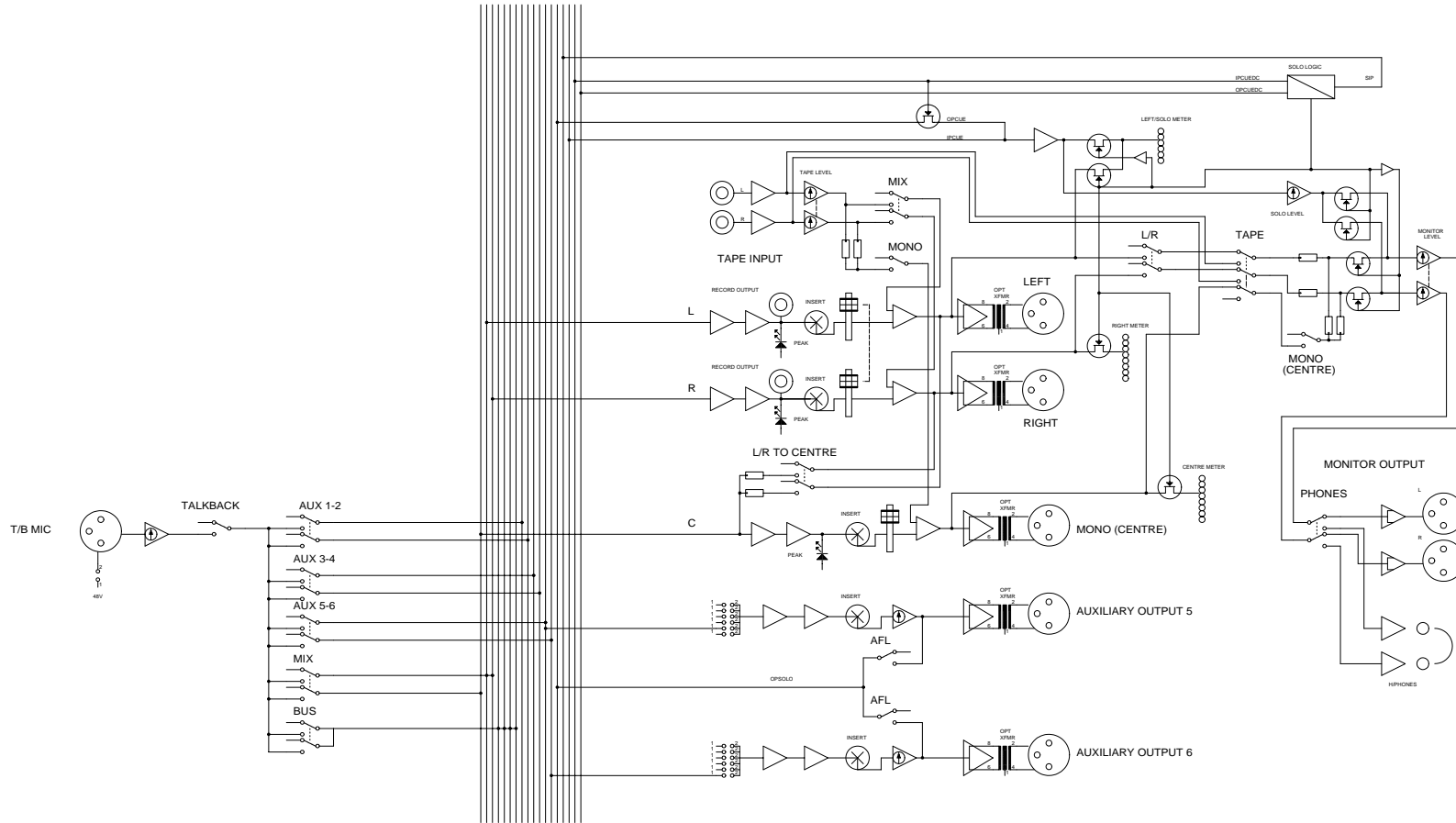
Tape Record Outputs : Phono Sockets  
 Nominal Output Level: -10dBV  
 Tip : Signal +ve (Hot)  
 Sleeve: Ground  
 Output Impedance : 1k5 Ohm

Insert Points : 1/4" TRS Jack socket, 'A' Gauge, Unbalanced  
 Nominal Input level: -2dBu  
 Tip : Insert Send  
 Ring : Insert Return  
 Sleeve: Ground  
 Output Impedance: <75 Ohm  
 Input Impedance: >10 kOhm

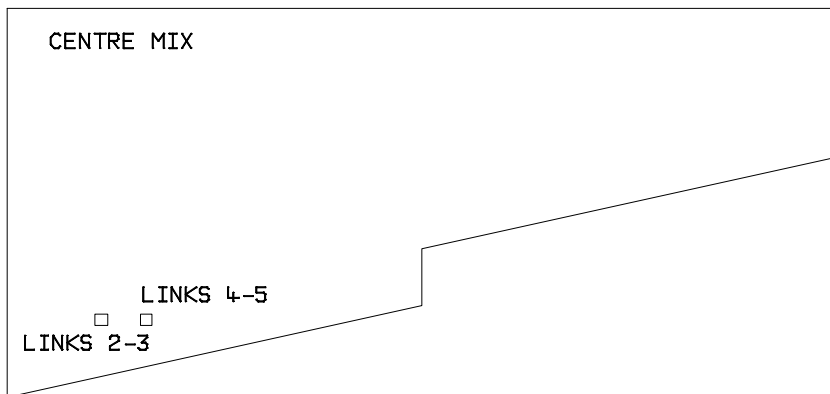
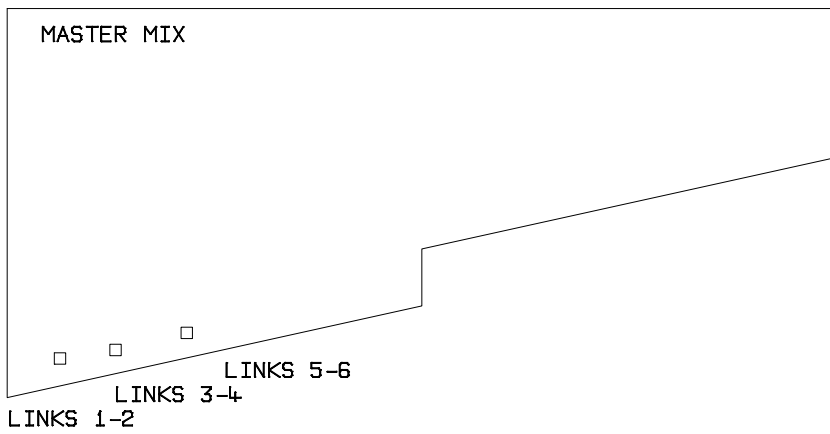
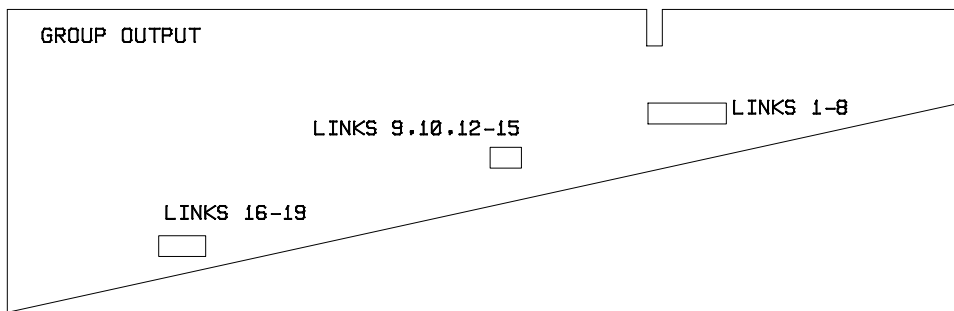
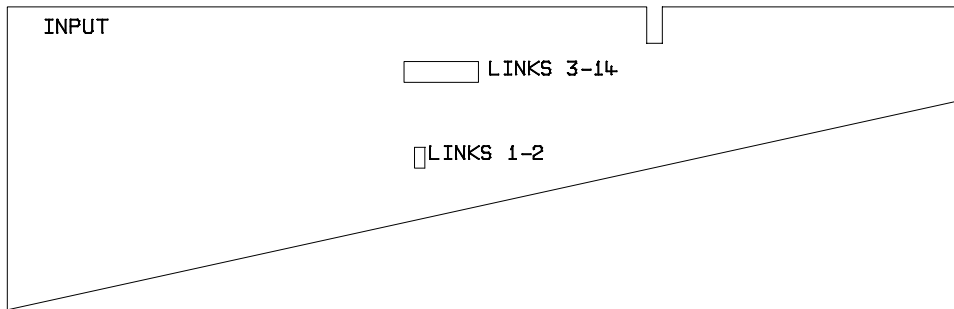
Monitor Outputs : 3 Pin XLR type, Balanced  
 Pin 2 : Signal +ve (Hot)  
 Pin 3 : Signal -ve (Cold)  
 Pin 1 : Ground  
 Output Impedance : <75 Ohm  
 Nominal Output level: +4dBu

Headphone Output : TRS Jack Socket, 'A' Gauge  
 Nominal Output level: +14dBu  
 Tip : Left Channel  
 Ring : Right Channel  
 Sleeve: Ground

# MASTER MODULE BLOCK DIAGRAM



# MODULE LINK POSITIONS



## THE POWER SUPPLY

The PSU350 power supply for the console is a free standing unit and operates from either 230V or 120V AC, 50-60Hz. Optional metalwork allows the unit to be mounted in a 19 inch rack, occupying 2U of space and clearance should be allowed in the rack such that sufficient cooling can take place - 2U above the unit is suggested. For 100V operation the PSU350J must be used.

The outputs are rated as follows :-

+/-18V at 3.0 Amps maximum  
+48V at 350mA maximum.

The outputs are electronically protected and in the event of a shut down the supply must be switched off to reset it. The positive and negative rails track so that if one fails the other will shut down to minimise any damage caused to the console. The output cable is captive and 3 metres long.

### DC Pinout

1	Not connected
2	+18 Volts
3	-18 Volts
4	0 Volts
5	+48 Volts
6	Chassis

The PSU350 power supply carries the following approvals:-  
CSA, UL, IEC95 and conforms to the EC Directive for Electromagnetic Compatibility.

Always connect the power supply to the console and the electricity supply before switching on. To switch ON press the upper end of the power switch located on the front panel such that the red O is hidden from view.

Fusing:	230V	CSM02-0017	2.5A 20mm S/B Fuse (I.E.C.))
	120V	CSM02-0016	2.5A 20mm S/B Fuse (U/L)
	100V	CSM02-0006	3.15A 20mm S/B Fuse (PSU350J only)

**REFER SERVICE AND REPAIR TO A QUALIFIED AND COMPETENT PERSON OR DEALER.**

**WARNING: THIS SUPPLY MUST BE EARTHED**

## GLOSSARY

This section provides a simple explanation of some of the terms used when describing the console features.

### “A” GAUGE JACK

This is a 1/4" jack which has a large tip diameter compared with a “B” gauge jack which has a smaller diameter tip and is usually found in broadcast use. Both types could be described as TRS (Tip, Ring, Sleeve) and it is the A Gauge that is used on DDA product.

### AFL

After Fade Listen. For listening to post fade signals - those controlled by the channel fader.

### AUXILIARY SENDS

These are extra signal paths out of the console which are separate from the main mix and group outputs. Each auxiliary output is like a separate mixer and can be controlled independently of the main faders. They are used to provide special mixes to artists as they are recording (normally called FOLDBACK) or as a signal to be sent to an effect such as a reverberation or delay device.

### BUS

This is the term used to describe the summing or mixing of a number of signals. A number of signals routed to the same bus will appear as one signal at the output of the bus mixing amplifier.

### BUS TRIM

A control used to adjusted the level of all signals going to a Group Output.

### CHANNEL PATH

The path used by the signal going to tape in an in-line console.

### D.I.

Direct Inject is an input used for high level devices such as keyboards where the line input would not be sensitive enough.

### DIM

This reduces the monitor level by a preset amount, usually 20dB in DDA products.

### DIRECT OUTPUT

This refers to the individual output of a channel which is available even if the channel is not routed.

### EBO

Electronically Balanced Output.

### EQ

Equaliser or Tone Control.

## FOLDBACK

This is the signal which is usually fed to the artists headphones.

## GROUND SENSING OUTPUT

An output stage where any ground noise is injected into the feedback loop in such a way that it appears in phase on the amplifier output. As the ground should be the reference for the following stage, if it is moving and the signal is moving in the same way then no net signal results.

## GROUP OUTPUT

An output usually routed to a multitrack tape recorder input. This output is derived from a bus and one group output stage is required for each bus.

## HF

High Frequency

## HIGH PASS FILTER (HPF)

A filter which cuts out frequencies below its operating frequency. It can be used to filter out rumble picked up by a microphone for example.

## INSERT POINT

Sometimes referred to as a patch point. This is an interruption to the signal path to allow for the insertion of a signal processing device.

## INTERMISSION PLAYBACK

This allows a signal to be played out from the master outputs of the console with the master faders closed thus preventing stage microphones or other signal sources from reaching the master outputs.

## LF

Low Frequency.

## LINE INPUT

An input designed to accept high level signals as opposed to microphone level signals. The expected level is usually +4dBu but increasingly inputs and outputs are being designed so that they can be altered to operate at -10dBV which is now quite a common operating level.

## LOW PASS FILTER (LPF)

This is the inverse of a HIGH PASS filter and is used to reduce frequencies above the operating frequency

## MASTER

This normally refers to the main stereo output section which controls the level of the stereo mix and associated functions such as monitoring.

#### MIX PATH

The path used by the signal going to the stereo mix.

#### PARAMETRIC EQ

An equaliser section which has variable frequency, level and Q.

#### PAN

A pan control or Pan Pot or Panoramic Potentiometer is used to spread a mono signal across multiple buses.

#### PEAKING EQ

In this form of equaliser the response is tailored to enhance a selected frequency relative to the frequencies above and below it. Peaking equalisers are normally used as the mid sections of an equaliser. Also known as "bell shaped".

#### PFL

Pre Fade Listen. For listening to pre fade signals.

#### POST-FADER

A signal derived after a fader and therefore dependant upon the position of the fader.

#### PRE-FADER

A signal derived before a fader and therefore not dependant upon the position of the fader.

#### Q

Associated with peaking equalisers the Q is the factor which describes how wide the peak or trough of enhancement is. The smaller the Q the wider the bandwidth of the equaliser will be. Typically a fixed Q equaliser will have a Q of about 1.5 equating to a bandwidth of about 1 octave.

#### QUASI BALANCED

An arrangement whereby a bus is terminated with a differential input. The bus however is not truly balanced, instead a bus common is used to pick up any interference which will also be picked up by the true bus. The interference then appears as a common mode signal at the mixing amplifier.

#### RETURN

Any signal that is sent out of the console and is returned after some form of processing.

#### ROUTING

The sending of a signal to a bus normally by pressing a switch. Signal can be routed to several buses simultaneously if required.

### SCRIBBLE STRIP

An area of the console reserved for the user to write on, usually in order to identify channel useage.

### SEND

The output from a channel insert point is called the (insert) send.

### SHELVING EQ

This means that the response of the equaliser becomes constant after the turnover or corner frequency has been passed. Thus a high frequency shelving equaliser operating at 10kHz will have a rising response as the frequency approaches 10kHz but will be flat after 10kHz. This is normally used on the high and low frequency sections of an equaliser.

### SIP

Solo in Place. This mode cuts all the input channels that are not soloed.

### SLATE

The ability to talk to tape from the operating position of the console.

### SWEEP FREQUENCY

A control which selects a centre frequency to operate around. Most often used with peaking equalisers but it can also be used to determine the roll off point of shelving EQs as well.

### TRS JACK

A Tip, Ring, Sleeve 'A' gauge jack.

### VCA

Voltage Controlled Amplifier. An amplifier whose gain can be controlled by a DC Voltage applied to its control port.

### WRITING STRIP

See scribble strip.

### XLR

The XLR (in fact a specific manufacturer's model reference) is an industry standard connector of high quality and is normally used for balanced signals, primarily microphones and balanced outputs. The most common is a three pin version, although there are types with more pins for other purposes. In fact XLR is derived from eXtra Low Resistance !

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