DMR12

Operators and Maintenance Manual

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DMR12 Operators and Maintenance Manual

C O N T E N T S

Section 1.....General Information

1.1 General Information

The DMR12 is a 24 track console with 12 discrete buses, with routing access to all 24 tracks. Full 24 track monitoring with 4 band EQ is provided, and the largest frame can accomodate up to 44 inputs, plus 12 output/monitors modules.

Flexible auxiliary architecture provides facilities for controlled effects sends from each channel, and a direct effects return to the stereo mix on each input.

Mic and two line inputs are provided per channel. On each output module, the monitor source can be selected between BUS and TAPE.

The advantages of the auxiliary architechture and routing system provide easy methods of doubling line input capacity in mixdown, and several methods of forming audio sub-groups for mixing or track bouncing.

The Power Supply is an external rack-mountable (3U) unit, with voltage selection for 100-120v and 220-240v.

Various options are available which are listed in the specifications, Section 1.3.

1.2 Warranty

1.21. If within the period of twelve months 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 no faulty design) to such an extent that the effectiveness and/or the usability therof 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.

1.22. 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.

1.23. This Warranty shall only be available if:–

i) The Equipment has been properly installed in accordance with the instructions contained in this manual; and
ii) The End User has notified the Distributor or DDA in writing within 14 days of the defect appearing; and
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; and
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.

1.24. 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, defficiency in electrical power, air conditioning or humidity control.

1.25. Benefit of this Warranty may not be assigned by the End User.

1.26. 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.

1.27. 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 the Equipment, which is not approved by DDA

iii) Modifications made by non – authorised persons, or by using non – recommended parts, or incorrectly made.

1.3 Specifications

The following specifications are common to all DMR12 consoles, and are minimum specifications normally exceeded by all units.

DDA reserves the right to alter the design of the unit or change the specification without notice in the interest of product development.

Frequency Response

Mic to Mix (gain = 55dB)	20Hz – 0.75dB 20kHz – 0.25dB
Line to Mix (gain = 0dB)	20Hz – 0.75dB 20kHz – 0.25dB

Noise (DIN Audio)

Microphone (gain = 55dB, EIN ref 200 ohm)	< – 127dBv
Line (gain = 0dB, 16 inputs)	< – 84dBv

Distortion

Microphone (– 50dBv input, + 4dBv output)	< 0.05%
Line (+ 4dBv input, + 4dBv output)	< 0.05%

Crosstalk

Adjacent channel	1kHz – 90dB
Group to Mix	1kHz – 80dB

Input Impedance

Microphone	> 2kohm
Line	> 10kohm

Output Impedance

All outputs electronically balanced	< 75 ohm

Output capability

All outputs (to balanced input)	+ 22dBv
Insert Send (unbalanced)	+ 21dBv

Gain

Microphone (Channel input to Mix output)	65dB
Line (Channel input to Mix output)	10dB

Power Requirements

100/110v 50 – 60 Hz
220 – 240v 50 – 60 Hz

Options

Input Transformers (microphone)
Floor Stand
BBC PPM Meters
LED Bargraph Metering
Console VCA automation system
Midi Muting System

Section 2.....Installation

Section 2.....Installation

2.1 Unpacking and assembly

The console is supplied completely assembled, with the power supply packed separately.

The crate, once opened, should include two lifting straps, which can be used to assist in lifting the console from the wooden crate without dismantling the whole crate.

It may be that your console was supplied in a flight case, in which case the above does not of course apply.

The console is now ready for connection to the PSU (supplied separately) and to the audio system.

2.11 Floor Stand Assembly

The DMR12 floorstand comprises of seven parts, and the rear legs of the stand also form cable ducts up to the cable entry holes in the bottom of the console, for easy access from the rear of the console.

Begin assembly by bolting the cross member to the rear legs, fitting it inside the legs and securing with three screws from the front of each leg. Now bolt the rear legs to the feet with three bolts each side.

Attach the front legs to the feet with two screws, and make sure the frame is stable before lowering the console onto it. Once in place, secure the console to the stand with two long bolts through the top of the front legs, and two screws through the top of the rear legs on each side. Finally, tighten all bolts and screws. The rear panels screw onto the rear legs for cable duct cover. See diagram 2.1.

2.2 Wiring Considerations

To take full advantage of the excellent audio performance of DDA mixing consoles, it is essential that the installation is carried out with care and attention. All audio signals are referenced to the system earth, which must be clean and noise-free, and essentially equipotential. In addition, the earth system integrity is absolutely necessary for safety. Do not disconnect the mains earth wire from each piece of equipment as this could create a hazardous situation. If in doubt consult a competent engineer and your local electricity supply company to ensure that safety regulations are not infringed or negated.

2.21 Decide on a central point for the main earth system and star feed to all mains outlets and equipment racks from this point. Common electrical wiring practice is to daisy-chain earth wires from outlet to outlet, but this is not recommended for audio installations. The location of the earth system star point should be in a convenient, easily accessible position, such as the main equipment rack. The star point must then be connected to the incoming mains earth or in extreme cases to a totally separate technical earth (if local regulations permit).

2.22 Install separate clean and dirty mains outlets, wired individually to the mains distribution box. Use the clean supply for all audio equipment, and the dirty supply for all lighting, vending machines etc. Do not mix the two systems.

2.23 It may be necessary to install an isolating transformer for the clean supply to ensure adequate isolation from mains-borne interference. The isolating transformer must be of adequate current capability and should incorporate a Faraday Shield, connected to the incoming mains earth.

2.24 All audio connecting cables should be good quality twin screened cable. Do not use single screened cable.

2.25 It is very important that the screen is not used as the signal return. Therefore connect the screen at one end only. Connecting the screen at both ends will cause an earth loop into which external hum fields will be induced.

2.26 In areas where high levels of radio frequency interference are present the open end of the screen can be connected to earth through a 0.01 microfarad capacitor. This will appear as a short circuit at high frequencies, and lower the effective shield impedance to earth. However at audio frequencies the reactance of the capacitor will be sufficiently high to not cause an earth loop.

2.27 In general, the screen should be connected at the signal source, and not at the signal destination. The exception to this rule of thumb is when connecting to an unbalanced input or to an electronically balanced input. In these cases the wires being screened are referenced to the destination earth.

2.28 Electronically balanced outputs which are to be operated in the unbalanced mode should be unbalanced at the output connector, not at the signal destination so that the signal current returns to earth via the shortest, least reactive route.

2.29 Rack mounted equipment which has unbalanced inputs and outputs may need to be electrically isolated from the equipment rack and/or other equipment to avoid earth loops. DO NOT DISCONNECT THE MAINS EARTH.

Connect all equipment in a logical sequence, starting with the monitor systems, followed by the multitrack and then the stereo machines and the peripheral devices and isolate any earth loop problems as they occur. It is very difficult to rectify a problematical installation after everything has been connected due to interaction between the various earth loops.

2.3 PSU Connections

The rack-mount PSU connects to the console by one cable, which has a large multiway connector at each end. These connectors are non-reversible.

The PSU is connected to the mains by a standard 3 pin IEC lead, supplied with the PSU.

WARNING - ENSURE THAT THE CORRECT VOLTAGE HAS BEEN SELECTED ON THE PSU BEFORE SWITCHING ON THE UNIT.

2.31 Mains Voltage Selection

(Refer also to Section 6, Schematics)

The selection of the mains input voltage is made by removing the fuse holder from the rear panel of the PSU, and replacing it in the correct orientation for the local voltage supply. Ensure that the correct value fuse is fitted to correspond to the supply.

2.4 Audio Connections

2.41 XLR Inputs

All Mic input connections are made by standard XLR type 3 pin connectors, wired to the convention of pin 2 hot, ie

Pin 1 – Ground

Pin 2 – Signal +ve

Pin 3 – Signal –ve

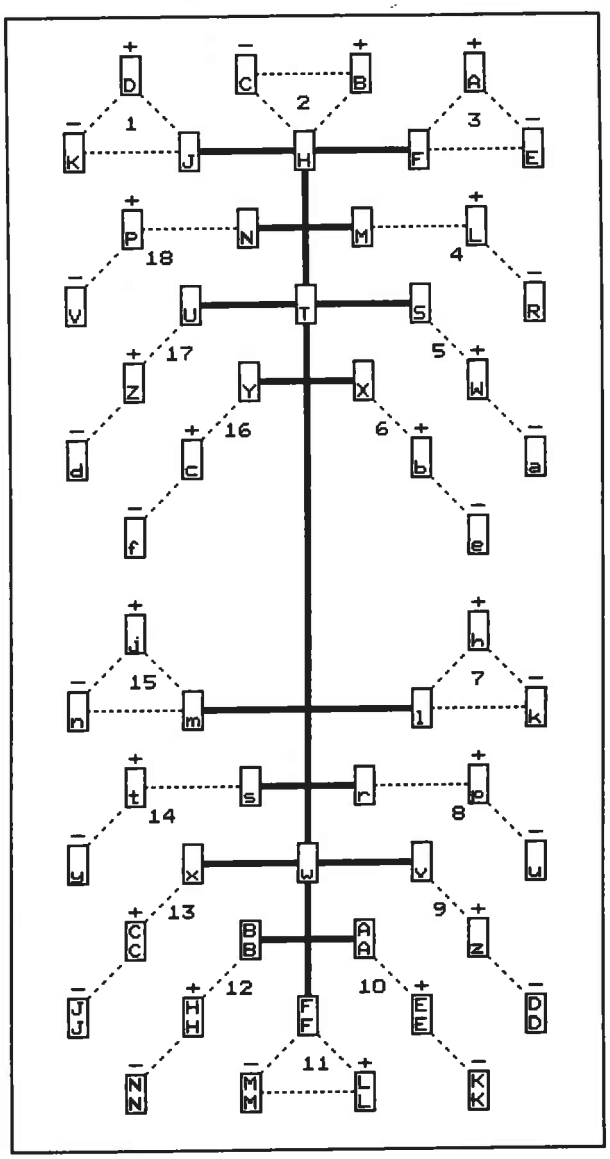
All inputs and outputs are electronically balanced. To unbalance an input or output, connect pin 3 to ground (or pin 2 if the device to be connected is wired to the other pin 3 hot convention).

2.42 Multiway Connections

The pin–outs for the multiway conectors on given on the following pages. They are all based on the layout given in diagram 2.4, which is a 56 way EDAC connector.

Insert sends and returns are unbalanced.

Figure 2.4 EDAC Connector Layout



VIEWED FROM SOLDER SIDE OF FEMALE CONNECTOR.

N.B.

Pins labelled + correspond to XLR pin 2.

Pins labelled – correspond to XLR pin 3.

The Bus Link connects all grounds together at the console, on the pcb.

2.43 Multitrack Interface

DESCRIPTION: DMR12 MULTITRACK EDAC					
PAIR			EDAC A	EDAC B	EDAC C
1	D K	+ −	RECORD 1	RECORD 5	RECORD 9
2	B C	+ −	PLAY 1	PLAY 5	PLAY 9
3	A E	+ −	RECORD 13	RECORD 17	RECORD 21
4	L R	+ −	PLAY 13	PLAY 17	PLAY 21
5	W a	+ −	RECORD 2	RECORD 6	RECORD 10
6	b e	+ −	PLAY 2	PLAY 6	PLAY 10
7	h k	+ −	RECORD 14	RECORD 18	RECORD 22
8	p u	+ −	PLAY 14	PLAY 18	PLAY 22
9	z DD	+ −	RECORD 3	RECORD 7	RECORD 11
10	EE KK	+ −	PLAY 3	PLAY 7	PLAY 11
11	LL MM	+ −	RECORD 15	RECORD 19	RECORD 23
12	HH NN	+ −	PLAY 15	PLAY 19	PLAY 23
13	CC JJ	+ −	RECORD 4	RECORD 8	RECORD 12
14	t y	+ −	PLAY 4	PLAY 8	PLAY 12
15	j n	+ −	RECORD 16	RECORD 20	RECORD 24
16	c f	+ −	PLAY 16	PLAY 20	PLAY 24

2.44 Line Inputs 1 – 32

DESCRIPTION: DMR12 CHANNEL LINE INPUT EDAC						
PAIR			CHAN 1-8	CHAN 9-16	CHAN 17-24	CHAN 25-32
1	D K	+ –	LINE 1 CHANNEL 1	LINE 1 CHANNEL 9	LINE 1 CHANNEL 17	LINE 1 CHANNEL 25
2	B C	+ –	LINE 2 CHANNEL 1	LINE 2 CHANNEL 9	LINE 2 CHANNEL 17	LINE 2 CHANNEL 25
3	A E	+ –	LINE 1 CHANNEL 2	LINE 1 CHANNEL 10	LINE 1 CHANNEL 18	LINE 1 CHANNEL 26
4	L R	+ –	LINE 2 CHANNEL 2	LINE 2 CHANNEL 10	LINE 2 CHANNEL 18	LINE 2 CHANNEL 26
5	W a	+ –	LINE 1 CHANNEL 3	LINE 1 CHANNEL 11	LINE 1 CHANNEL 19	LINE 1 CHANNEL 27
6	b e	+ –	LINE 2 CHANNEL 3	LINE 2 CHANNEL 11	LINE 2 CHANNEL 19	LINE 2 CHANNEL 27
7	h k	+ –	LINE 1 CHANNEL 4	LINE 1 CHANNEL 12	LINE 1 CHANNEL 20	LINE 1 CHANNEL 28
8	p u	+ –	LINE 2 CHANNEL 4	LINE 2 CHANNEL 12	LINE 2 CHANNEL 20	LINE 2 CHANNEL 28
9	z DD	+ –	LINE 1 CHANNEL 5	LINE 1 CHANNEL 13	LINE 1 CHANNEL 21	LINE 1 CHANNEL 29
10	EE KK	+ –	LINE 2 CHANNEL 5	LINE 2 CHANNEL 13	LINE 2 CHANNEL 21	LINE 2 CHANNEL 29
11	LL MM	+ –	LINE 1 CHANNEL 6	LINE 1 CHANNEL 14	LINE 1 CHANNEL 22	LINE 1 CHANNEL 30
12	HH NN	+ –	LINE 2 CHANNEL 6	LINE 2 CHANNEL 14	LINE 2 CHANNEL 22	LINE 2 CHANNEL 30
13	CC JJ	+ –	LINE 1 CHANNEL 7	LINE 1 CHANNEL 15	LINE 1 CHANNEL 23	LINE 1 CHANNEL 31
14	t y	+ –	LINE 2 CHANNEL 7	LINE 2 CHANNEL 15	LINE 2 CHANNEL 23	LINE 2 CHANNEL 31
15	j n	+ –	LINE 1 CHANNEL 8	LINE 1 CHANNEL 16	LINE 1 CHANNEL 24	LINE 1 CHANNEL 32
16	c f	+ –	LINE 2 CHANNEL 8	LINE 2 CHANNEL 16	LINE 2 CHANNEL 24	LINE 2 CHANNEL 32

2.45 Stereo Tape Interface

DESCRIPTION: DMR12 MIX EDAC			
Pr 1	D K	+ –	TAPE 1 RECORD LEFT
2	B C	+ –	TAPE 1 PLAY LEFT
3	A E	+ –	TAPE 2 RECORD LEFT
4	L R	+ –	TAPE 2 PLAY LEFT
5	W a	+ –	EXTERNAL INPUT LEFT
6	b e	+ –	N/U
7	h k	+ –	N/U
8	p u	+ –	N/U
9	z DD	+ –	TAPE 1 RECORD RIGHT
10	EE KK	+ –	TAPE 1 PLAY RIGHT
11	LL MM	+ –	TAPE 2 RECORD RIGHT
12	HH NN	+ –	TAPE 2 PLAY RIGHT
13	CC JJ	+ –	EXTERNAL INPUT RIGHT
14	t y	+ –	
15	j n	+ –	
16	c f	+ –	

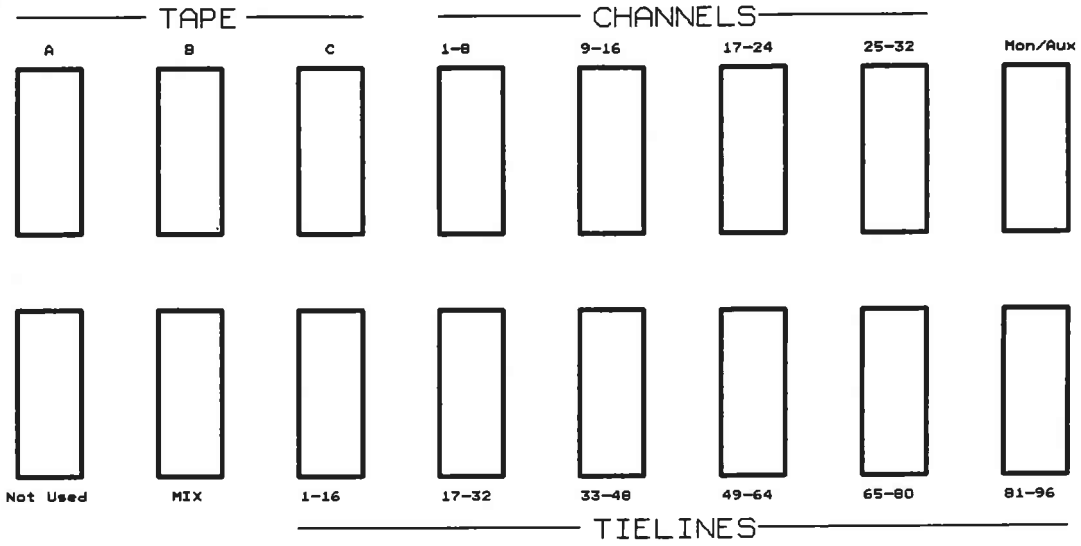
2.46 Monitoring & Auxiliary Interface

DESCRIPTION: DMR12 MONITOR EDAC			
Pr 1	D K	+ –	CONTROL ROOM SPEAKER LEFT
2	B C	+ –	CONTROL ROOM SPEAKER RIGHT
3	A E	+ –	ALTERNATE SPEAKER LEFT
4	L R	+ –	ALTERNATE SPEAKER RIGHT
5	W a	+ –	STUDIO SPEAKER LEFT
6	b e	+ –	STUDIO SPEAKER RIGHT
7	h k	+ –	
8	p u	+ –	
9	z DD	+ –	AUXILIARY 1
10	EE KK	+ –	AUXILIARY 2
11	LL MM	+ –	AUXILIARY 3
12	HH NN	+ –	AUXILIARY 4
13	CC JJ	+ –	AUXILIARY 5
14	t y	+ –	AUXILIARY 6
15	j n	+ –	AUXILIARY 7
16	c f	+ –	AUXILIARY 8

2.47 Tie Lines 1 – 96

DESCRIPTION: DMR12 TIELINE EDAC								
PAIR			TIE 1-16	TIE17-32	TIE33-48	TIE49-64	TIE65-80	TIE81-96
1	D K	+ –	1	17	33	49	65	81
2	B C	+ –	2	18	34	50	66	82
3	A E	+ –	3	19	35	51	67	83
4	L R	+ –	4	20	36	52	68	84
5	W a	+ –	5	21	37	53	69	85
6	b e	+ –	6	22	38	54	70	86
7	h k	+ –	7	23	39	55	71	87
8	p u	+ –	8	24	40	56	72	88
9	z DD	+ –	9	25	41	57	73	89
10	EE KK	+ –	10	26	42	58	74	90
11	LL MM	+ –	11	27	43	59	75	91
12	HH NN	+ –	12	28	44	60	76	92
13	CC JJ	+ –	13	29	45	61	77	93
14	t y	+ –	14	30	46	62	78	94
15	j n	+ –	15	31	47	63	79	95
16	c f	+ –	16	32	48	64	80	96

2.48 EDAC layout
(patchbay rear)



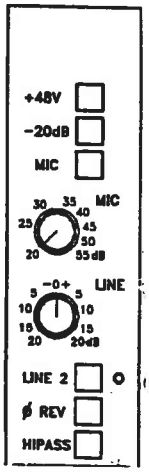
EDAC Layout based on 56 Module Chassis
46 Module Chassis Does not have Tielines 81-96
or Channels above 20

Layout seen from rear of patchbay/console

Section 3.....Module Descriptions

3.1 Input Module

The channel has independent electronically balanced microphone and line level inputs, providing very low noise, minimal phase shift and transient distortion and excellent common mode rejection performance. Interface is by separate XLR type connectors on the connector rear panel for microphone and line level inputs.



+48v
Phantom power for capacitor microphones.

−20dB
Input attenuator to prevent microphone input overload from high output capacitor microphones.

MIC
Input selector between microphone and line level inputs. When depressed, Mic is selected.

MIC GAIN
The microphone gain control adjusts the gain from +20 to +55dB. Used with the −20dB input attenuator gives an effective control range of 55dB. This is centre detented at 0dB.

LINE GAIN
The line gain control adjusts the gain of the line level input from −10 to +10dB about the unity gain point. This control is centre detented at 0dB.

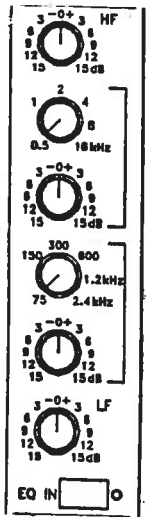
LINE 2
Two line inputs can be selected to the input of the channel. When depressed, LINE 2 is the selected line input.The non−selected input is available as an effects return input or additional line input during mixing, when by pressing AUX RET it is fed through Auxiliary 7 & 8 to the stereo mix.

ϕ REV
Reverses the phase on both the microphone and line level inputs.

HI PASS
Attenuates low frequency signals below 70Hz at a rate of 12dB/octave to eliminate air conditioning or rumble.

Equaliser

The 4 band equaliser provides high and low frequency shelving sections and 2 sweep frequency mid-range sections. The frequency selection controls are detented for easy resetting, and the boost/cut controls are centre detented for quick zeroing.



H.F
+/-15dB at 12KHz with a shelving characteristic.

HI MID
+/-15dB continuously variable between 500Hz and 16kHz. Q (bandwidth) is 1.5.

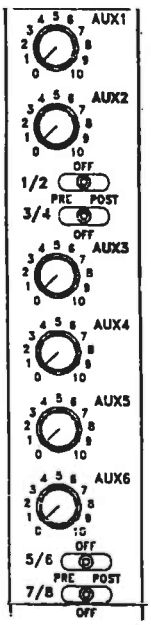
LOW MID
+/-15dB continuously variable between 75Hz and 2.4Hz. Q (bandwidth) is 1.5.

L.F
+/-15dB at 50Hz with a shelving characteristic.

EQ IN
Switches the equaliser into the signal path, with LED indication.

Auxiliaries

Individual auxiliary controls feed the eight buses, with Pre/Off/Post switching in pairs. Three controls can be changed in their function to offer sophisticated send and return facilities.



SEND 1
Adjusts the amount of channel signal sent to Auxiliary mix 1.

SEND 2
Adjusts the amount of channel signal sent to Auxiliary mix 2.

PRE/OFF/POST
Selects Sends 1 & 2 to be pre or post the channel fader or to be muted.

SEND 3
Adjusts the amount of channel signal sent to Auxiliary mix 3.

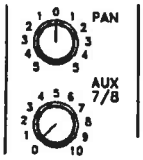
SEND 4
Adjusts the amount of channel signal sent to Auxiliary mix 4.

PRE/OFF/POST
As for sends 1 and 2.

SEND 5
Adjusts the amount of channel signal sent to Auxiliary mix 5.

SEND 6
Adjusts the amount of channel signal sent to Auxiliary mix 6. If **DIR** is depressed, SEND 6 will route the channel signal to its direct output, providing a dedicated post – EQ controlled effect send.

PRE/OFF/POST
Selects sends 5 & 6 to be pre or post the channel fader or to be muted.



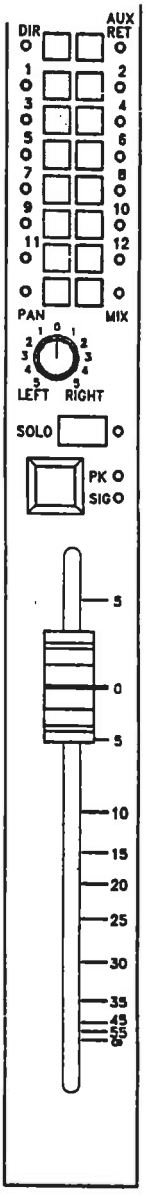
PAN
Pans the channel signal between Auxiliary mixes 7 & 8, or if **AUX RET** is depressed, pans the return signal (from the non – selected line input) across the stereo mix.

SEND 7/8
Adjusts the amount of channel signal sent to Auxiliary mixes 7 & 8.

PRE/OFF/POST
As sends 5 and 6.

Routing

The channel can be routed to the individual Sub – Groups independently of the pan pot. If desired the pan pot can be switched into signal path in which case the odd numbered Sub – Groups are fed from pan left and the even numbered from pan right. The channel signal can also be routed to the main Stereo output busses.N.B. The Stereo outputs are always routed Via the pan pot. All routing switches are accompanied by LEDs as is the pan insertion switch giving easy indication of assignments.



DIR
Alters the function of Auxiliary Send 6 to become a controlled send to the channel direct output.

AUX RET
When depressed, AUX RET feeds Auxiliary level 7/8 (and Pan) with the non – selected line input signal. This is then fed to the stereo mix bus, and can be used as an effects return or extra line input on mixdown.

1
Routes the channel signal to Sub – Group 1.

2 to 12
As for above but to Sub – Groups 2 – 12.

PAN
Selects the pan pot into the signal path to the Sub – Group routing. The channel signal will be panned between odd and even numbered groups.

MIX
Routes the channel signal to the main Stereo mix outputs via the pan pot.

SOLO
Feeds the channel signal to the main monitoring system and stereo meters.

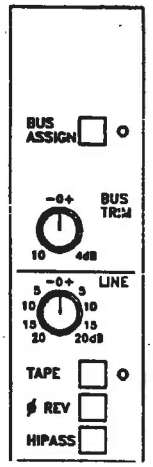
CUT
Cuts the channel signal and all post – fader selected auxiliary sends.

PEAK
Illuminates when the channel signal is within 4dB of clipping

SIG
Illuminates when a signal is present above a threshold of – 20dBm.

3.2 Output Module

The Output module is essentially identical to the input module, with the exception that it has the group summing amplifiers and BUS TRIM control. Inputs to this module are BUS and TAPE. There is no second line input on this module.



BUS ASSIGN
Routes the summed bus signal to BUS 1 or BUS 13 as selected (similar for output modules 2 – 12).

BUS TRIM
Adjusts the overall level of the group signal feed to tape.

LINE GAIN
The line gain control adjusts the gain of the line level input from – 10 to + 10dB about the unity gain point. This control is centre detented at 0dB.

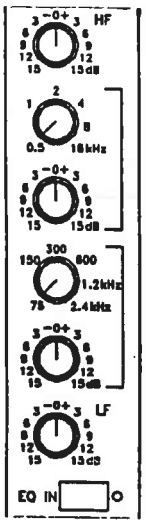
BUS/TAPE
Selects the monitoring signal source to be BUS or TAPE return. The non – selected input is available as a signal feed to Auxes 7 & 8 when AUX RET is depressed. (See Input Module)

ϕ REV
Reverses the phase on both the microphone and line level inputs.

HI PASS
Attenuates low frequency signals below 70Hz at a rate of 12dB/octave to eliminate air conditioning or rumble.

Equaliser

The 4 band equaliser provides high and low frequency shelving sections and 2 sweep frequency mid-range sections. The frequency selection controls are detented for easy resetting, and the boost/cut controls are centre detented for quick zeroing.



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+/-15dB at 12KHz with a shelving characteristic.

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+/-15dB continuously variable between 500Hz and 16kHz. Q (bandwidth) is 1.5.

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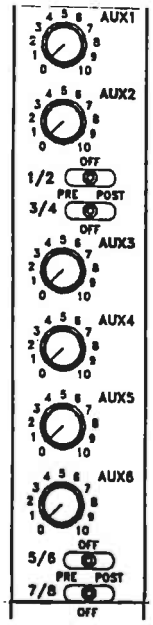
+/-15dB at 50Hz with a shelving characteristic.

EQ IN
Switches the equaliser into the signal path, with LED indication.

Auxiliaries

Individual auxiliary controls feed the eight buses, with Pre/Off/Post switching in pairs. Three controls can be changed in their function to offer sophistaicated send and return facilities.



SEND 1
Adjusts the amount of channel signal sent to Auxiliary mix 1.

SEND 2
Adjusts the amount of channel signal sent to Auxiliary mix 2.

PRE/OFF/POST
Selects Sends 1 & 2 to be pre or post the channel fader or to be muted.

SEND 3
Adjusts the amount of channel signal sent to Auxiliary mix 3.

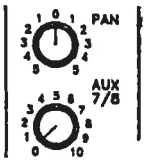
SEND 4
Adjusts the amount of channel signal sent to Auxiliary mix 4.

PRE/OFF/POST
As for sends 1 and 2.

SEND 5
Adjusts the amount of channel signal sent to Auxiliary mix 5.

SEND 6
Adjusts the amount of channel signal sent to Auxiliary mix 6. If **DIR** is depressed, SEND 6 will route the channel signal to its direct output, providing a dedicated post – EQ controlled effect send.

PRE/OFF/POST
Selects sends 5 & 6 to be pre or post the channel fader or to be muted.



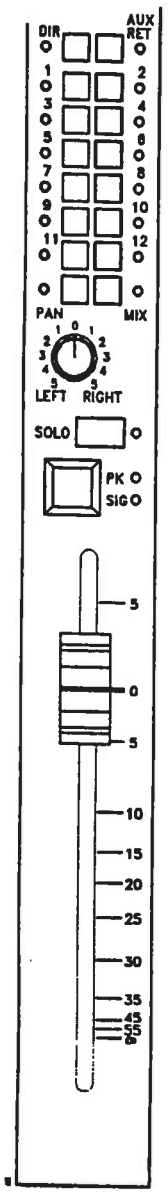
PAN
Pans the channel signal between Auxiliary mixes 7 & 8, or if **AUX RET** is depressed, pans the return signal (from the non – selected line input) across the stereo mix.

SEND 7/8
Adjusts the amount of channel signal sent to Auxiliary mixes 7 & 8.

PRE/OFF/POST
As sends 5 and 6.

Routing

The channel can be routed to the individual Sub – Groups independently of the pan pot. If desired the pan pot can be switched into signal path in which case the odd numbered Sub – Groups are fed from pan left and the even numbered from pan right. The channel signal can also be routed to the main Stereo output busses.N.B. The Stereo outputs are always routed Via the pan pot. All routing switches are accompanied by LEDs as is the pan insertion switch giving easy indication of assignments.



DIR
Alters the function of Auxiliary Send 6 to become a controlled send to the channel direct output.

AUX RET
When depressed, AUX RET feeds Auxiliary level 7/8 (and Pan) with the non – selected line input signal. This is then fed to the stereo mix bus, and can be used as an effects return or extra line input on mixdown.

1
Routes the channel signal to Sub – Group 1.

2 to 12
As for above but to Sub – Groups 2 – 12.

PAN
Selects the pan pot into the signal path to the Sub – Group routing. The channel signal will be panned between odd and even numbered groups.

MIX
Routes the channel signal to the main Stereo mix outputs via the pan pot.

SOLO
Feeds the channel signal to the main monitoring system and stereo meters.

CUT
Cuts the channel signal and all post – fader selected auxiliary sends.

PEAK
Illuminates when the channel signal is within 4dB of clipping.

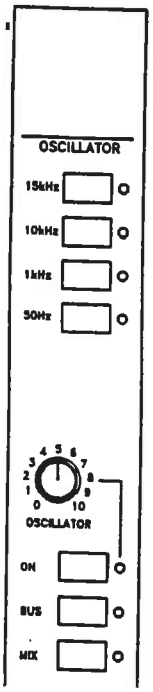
SIG
lluminates when a signal is present above a threshold of – 20dBm.

3.3 Stereo Input Module

Available late 1990. Modifications may be necessary in order to fit stereo modules to your desk. Consult DDA or your Distributor for details.

3.4 Stereo Master Module

The stereo master module contains the controls for monitoring as well as the talkback and internal test oscillator systems.



Oscillator

15kHz/10kHz/1kHz/50Hz
Select the operating frequency of the internal test oscillator, with led indication.

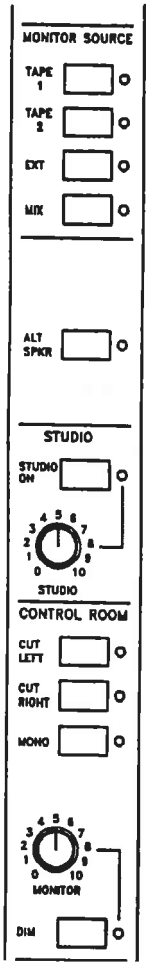
OSC LEVEL
Adjusts the output level of the internal test oscillator.

ON
Switches on the internal test oscillator.

BUS
Assigns the oscillator signal to the buses for tape identification (slate).

MIX
Assigns the Oscillator signal to the stereo mix for tape identification (slate).

Monitor



TAPE 1
Selects Stereo Tape return 1 to the main monitoring system.

TAPE 2
Selects Stereo Tape return 2 to the main monitoring system.

EXT
Selects an external stereo source to the main monitoring system.

MIX
Selects the Stereo Mix output to the main monitoring system.

ALT
Selects an alternate pair of monitor loudspeakers. The level is controlled by the Control room monitor pot.

STUDIO ON
Switches on the signal to the Studio Monitor System.

STUDIO VOL
Adjusts the volume of the Studio Monitor speakers.

Control Room

CUT L
Mutes the left channel signal feed to the main monitors.

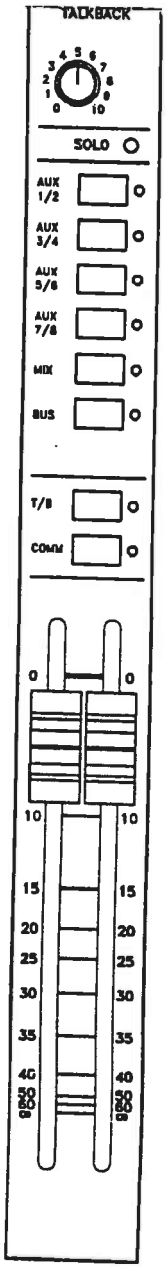
CUT R
Mutes the right channel feed to the main monitors.

MONO
Switches the main monitoring system to Mono, for compatibilty checks.

CONTROL ROOM VOL
Adjusts the volume of the Control Room Monitor speakers. Signal source is selected on the Master module, but is over-ridden by any Solo operation.

DIM
Attenuates the monitor system by 20dB.

Talkback



T/B LEVEL
Adjusts the level of the talkback system.

SOLO
Warning LED illuminates when any solo function in the mixer is activated, in conjunction with a local LED indication.

AUX 1/2
Assigns the Talkback signal to Auxiliary buses 1 & 2. (Comm)

AUX 3/4
As above, for Auxes 3 & 4.

AUX 5/6
As above, for Auxes 5 & 6.

AUX 7/8
As above, for Auxes 7 & 8.

MIX
Assigns the talkback signal to the Mix bus.

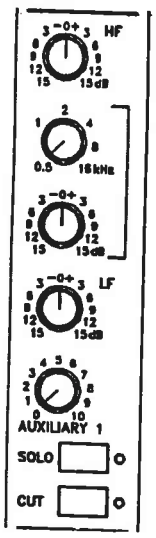
BUS
Assigns the talkback signal to the all BUS outputs.

STUDIO
Assigns the talkback signal to the studio monitoring system. It will automatically enable the studio monitoring system if it is switched off. and to the rear panel XLR connector. When Talkback is operated the monitor outputs are attenuated to prevent feedback, and allow 2 way conversation.

COMM
Assigns the talkback signal to the destinations selected on the Talkback assign switches.

3.5 Auxiliary Master Module.

Aux 1



H.F
+/−15dB at 10kHz with a shelving characteristic.

MID
+/−15dB continuously variable between 500Hz and 16KHz.

L.F
+/−15dB at 100Hz with a shelving characteristic.

LEVEL
Master level control for the relevant Foldback or Auxiliary output.

SOLO
Switches the relevant Foldback or Auxiliary mix directly to the Monitor outputs and main Stereo Mix meters for quality and level check. Signal take−off point is AFL. (Post master level control.)

CUT
Cuts the Auxiliary output signal.

Aux 2 — 8

As above

3.6 Operational Modes

This section describes the ways in which the DMR12 can be set up in use.

3.61 Recording

In normal recording mode, the input is selected from Mic or Line, and routed through the module to the routing matrix. Here it can be assigned to any of the twelve buses (1 – 12). If it is desired to send a signal (or combination of signals) to track 15 say, the signals are routed to BUS 3 on the inputs, and the BUS ASSIGN switch depressed on the output module. This method of routing is much more flexible than systems where the 'shift' function is a part of the routing matrix on the input module, where only tracks 1 – 12 or 13 – 24 could be accessed. With the DMR12, an input may be assigned to track 1,4, 20 and 23 if desired (and any combination, as long as the chosen tracks are not mutually exclusive eg tracks 2 and 14).

The overall level to tape is governed by the BUS TRIM control on the respective output module, and monitored on the meters and main monitoring system by selecting BUS or TAPE as the input to the monitor return section of the output module.

It is possible to monitor both the tape return and the Bus output by pressing AUX RET on the routing switches. Here, the Tape return will be fed through the Aux 7/8 control directly to the stero mix. This mode also allows overdubbing to be easily controlled, as there are individual level controls for each of the BUS and TAPE signals.

3.62 Mixdown

In mixdown mode, the normal position of the TAPE return signal will be on the 12 output modules and the 12 input modules to their immediate right. TAPE is selected on the outputs, and LINE 1 on the inputs. The inputs are sent to the stereo mix using MIX on the routing section.

Effects sends are accessible on Aux buses 1 – 8 of course, but the DIR switch allows an individual channel to feed its signal out of the module directly to an effect (via the patchbay). This means that it is possible to utilise up to 56 such direct outputs, and still access the other 7 Auxiliary buses, more than enough Auxiliary combinations!

The remaining inputs can of course be used in mixdown, with selection of LINE 1 or LINE 2 and routing to MIX.

At all times, either during recording or mixing, the EQ section in the main signal path is identical on all modules.

There are additional line inputs available for use as effects returns or tape inputs (or synthesiser, hard disc systems, etc). On each input module, the non – selected line input may be routed directly to the stereo bus by pressing AUX RET on the routing section. This frees normal channel modules from being used up as effects returns, and doubles the input capacity of the console.

On the output module, if TAPE is selected then the BUS input is available through Aux 7/8 when AUX RET is selected. This input can be utilised to provide sub – grouping (see below) or by cross – patching any other line input from the tie – lines.

3.63 Sub – Group Formation

Sub – groups may be easily formed for many uses:

Track bouncing

Select the tracks you wish to mix to another track, and select TAPE as the input to those modules.
Route them on the matrix to the desired bus, and use the BUS TRIM to adjust their overall level.

Audio Sub – group to mix – method 1

Use the method as described for track bouncing, and select the MIX switch to send the summed signal to mix.
The overall level of the sub – group is controlled by the BUS TRIM.

Audio Sub – group to mix – method 2

Select the desired sub – group channels, and route them to another unused bus. Now switch the module input to TAPE, and the Aux 7/8 to AUX RET and use these controls to feed the summed signal to the stereo mix.

3.64 Overdubbing

It is possible using the AUX RET facility to provide simple methods of overdub monitoring while in recording mode.

If your tape signal is monitored using the TAPE/BUS switch selected to BUS so that the signal to be recorded is going through the channel, AUX RET will bring the monitor return back to the mix through the Aux 7/8 controls.

Alternatively, 'dry' signals sent to the bus can be monitored using AUX RET, while the tape return is monitored by switching the module input to TAPE.

3.7 Patchbay

The patchbay is arranged in three main sections: Output modules, Input modules and masters. There are also a number of tie – lines for extra input patching. On the 56 Channel version there are 96 tie – lines, and 48 on the 44 channel desk.

3.71 Output Modules

There are twelve rows of jacks concerning the output modules. Each row (from left to right) gives jacks for two tracks eg tracks 1 and 13, 2 and 14 etc.

For tracks 13 – 24, the inputs are to an 'input' type module, so two line inputs are accessible through the patchbay. Inserting a jack into the BUS 13 socket will access LINE 1 on the module which retruns track 13 monitor on its LINE 2 input. Of course, the module must be set to TAPE 1 or TAPE 2 to monitor the signal as desired.

If on an output module, a bus higher than 12 is selected, then the corresponding output in the 1 – 12 section will be broken ie if BUS 14 is assigned, BUS 2 output is broken.

3.72 Input Modules

The next rows are divided into Inputs and the Masters and tie – lines. The Input module jacks on each row are for two channels, eg 1 and 2, 3 and 4 etc.

These are for the rest of the 'input' style modules that are not normalled as TAPE returns.

3.73 Masters

The master section consists of 4 rows on the right section of the bay, with jacks for Mix Out (with insert send/returns), Oscillator and Talkback outputs, Mono output (sum of L + R), and stereo tape send and playback. As well as outputs for the 8 Auxiliary buses, there are two sets of four – way parallels, allowing multiple signals to be connected together. These are uncommitted sockets.

3.74 Tielines

On the larger size console, there are 96 tie – lines provided as standard. These are wired to EDAC connectors on the rear of the patchbay.

Section 4.....Optional Signal Routing

4.1 General Information

This section describes the settings of internal links on the various modules to allow the user to decide the take – off points for signal feeds within the console.

4.2 Input Module

4.21 SOLO Signal feed

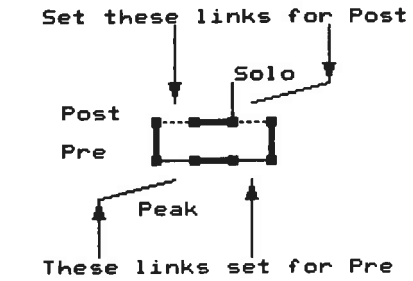
A link on the PCB allows the signal feed for the SOLO audio line to be AFL or PFL. This link is located on the main module pcb, behind the mix pan pot at the bottom of the module.

For AFL, cut the existing link, and join the POST pads as shown.

4.22 Peak/Sig Present

Another link allows the signal feed to the peak and signal present leds to be pre or post fader, and is located in the same place as above.

For Pre, cut the existing link and join the POST pads as shown.



Seen from solder side of PCB

4.3 Output Module

4.31 SOLO Signal feed

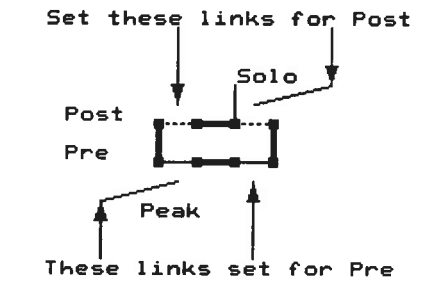
A link on the PCB allows the signal feed for the SOLO audio line to be AFL or PFL. This link is located on the main module pcb, behind the mix pan pot at the bottom of the module.

For AFL, cut the existing link, and join the POST pads as shown.

4.32 Peak/Sig Present

Another link allows the signal feed to the peak and signal present leds to be pre or post fader.

For Pre, cut the existing link and join the POST pads as shown.



Seen from solder side of PCB

4.3 Mains Earthing

The mains safety earth is permanently connected to the power supply metalwork and via the power supply cable, to all modules in the mixer. The mixer ground (audio common) is not directly connected to mains earth, but only through a parallel 100R resistor and a 100n capacitor, located on the power supply printed circuit board. This can be replaced by a link if required although it is then vital that the grounding integrity and freedom from external earth loops is maintained to prevent to performance degradation.

Section 5.....Servicing

5.1 Mechanical Servicing

The frame and construction of the DMR12 console allows easy and quick maintenance of all parts. Should it be necessary to replace any mechanical components not covered in this manual, please contact DDA.

5.11 Module Removal

The extrusion system forming the heart of the DMR12 allows very quick and easy removal and replacement of the channel modules.

To extract a module from the frame, it is necessary to remove the module clamping bar at the lower end of the modules.

First, remove the lower ident strip, which is held in by a "velcro" style fastener. It should simply pull out.

There are a number of large cross-headed screws in the bottom of the clamping bar, which when removed allow the clamping bar to be lifted off the frame.

To remove a module, lift the lower end by about 150mm, and pull the top end gently from underneath the clamping extrusion at the top of the frame.

Now carefully remove the bus connector (40 way ribbon) by releasing the strain release clips at each end of the connector and pulling the connector away from the module PCB.

Finally, carefully disconnect the ribbon connector which links the module to the patchbay, and any molex plugs for mic and meter connections.

Replacement is a straightforward reversal of the above process.

5.12 Meter Panels

The panels holding the meters can be removed by first removing the meter bridge cover panels, a simple task, and accessing the screws holding in the meter panels themselves.

The screws securing the meter panels are located top and bottom of the panel. Remember that the meters are wired to the modules.

5.2 Meter Bulb Replacement

It is not necessary to remove the meter panel to replace a blown bulb.

Remove the meterbridge rear covers, which will expose the rear of the meters. There is a small brass nut retaining a spring clip, which in turn keeps the bulb in place, and in circuit via the spring pressure. To replace the bulb, loosen the brass nut, and slide the spring clip to one side. Remove the bulb, and replace it. Carefully slide the spring clip back into place and tighten the brass nut. Make sure that the spring clip pressure is sufficient to keep the bulb in place and in good contact.

5.3 Alignments and adjustments

During normal operation of the console no adjustments should be necessary. Replacement of components may however necessitate some re-alignment to take account of component tolerances & characteristics.

5.31 Input Common Mode Adjust

The trim pot located on the input PCB can be adjusted for best common mode rejection.

To adjust, set up the inputs and outputs as follows:-

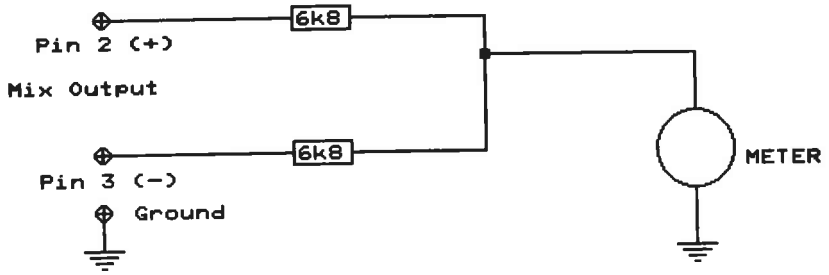
To both the hot and cold pins of the Mic input (pins 2 & 3) apply a signal of 1kHz, at -16dB. Set the mic gain control fully down (anticlockwise), and the pad switched out.

Set the input fader at 0, and route the signal to MIX.

Set the Master fader to give an output of +4dB.

Wire two 6.8 kohm resistors across the hot and cold signals of the mix output as shown below, and measure the signal across their join to earth.

Adjust the trim pot for minimum signal, which should be less than -55dB.



5.32 Meter Adjust

On the output module, there is a trim pot which adjusts the sensitivity of the VU meter. This pot is shown on the relevant PCB layout in Section 6.

Adjustment is straightforward.

From the internal oscillator route a 1kHz sine wave signal to the outputs and adjust the fader to give an output of +4dB. The meter can now be adjusted to read 0 VU.

This can also be used to set the meter at 0 VU for other operating levels if desired.

If the console has been fitted with PPM's, follow the procedure given in Section 8, which deals with special options and modifications.

Note: Before adjusting the meters, the output balancing should first be checked if any component has been replaced on the module. This is not necessary for a change of meter.

5.33 Group Output balance

Also on the output module is the adjustment potentiometer for the group output balance. Consult the appropriate PCB layout for the relevant part. To adjust, follow the procedure detailed below. The output balancing circuitry is shown on drawing CD1008.

Connect two 1kohm resistors across the hot and cold signals of the group output. From the centre tap of these connect a voltmeter to ground (see drawing CD1008).

Set the output balance trim pot for minimum output at 1kHz.

5.34 Group Output Gain

The gain of the group output stage (fixed at the factory) can adjusted by changing the value of resistor R2 (see drawing CD1008).

To increase the gain, lower the value of R2.

5.4 Power supply unit

The DMR12 power supply is a fully regulated linear type circuit, using monolithic devices.

Should repair be necessary, the only adjustment required may be the setting of the +18V and −18V rails, accomplished using the trim pots located on the PCB.

Section 6.....Schematics

This section contains full circuit diagrams and PCB component layouts, in addition to module block diagrams.

Errata

Modifications to PCB's not yet included in circuit diagrams:

Master PCB – APCB10–209

R116 was 10K is now 100K
R180 was 24K is now 68K
R181 was 24K is now 68K

Master Sub PCB – APCB10–194

C47 was 33pF is now 100pF
C48 was 33pF is now 22pF
R517 was 220K is now 100K
R519 was 220K is now 100K

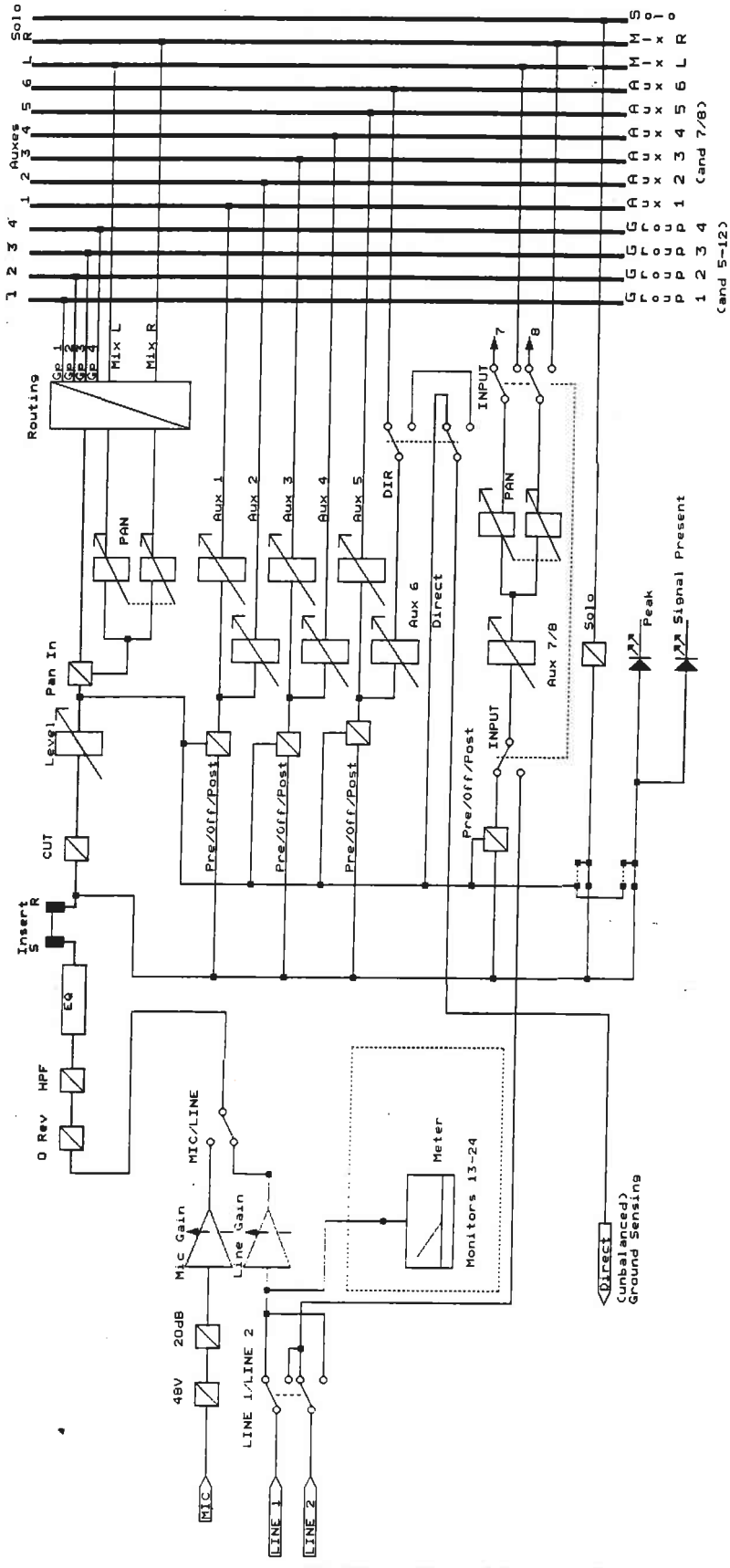
Aux Master PCB – APCB10–210

R105 was 100K is now 470R
also R205, R305, and R405

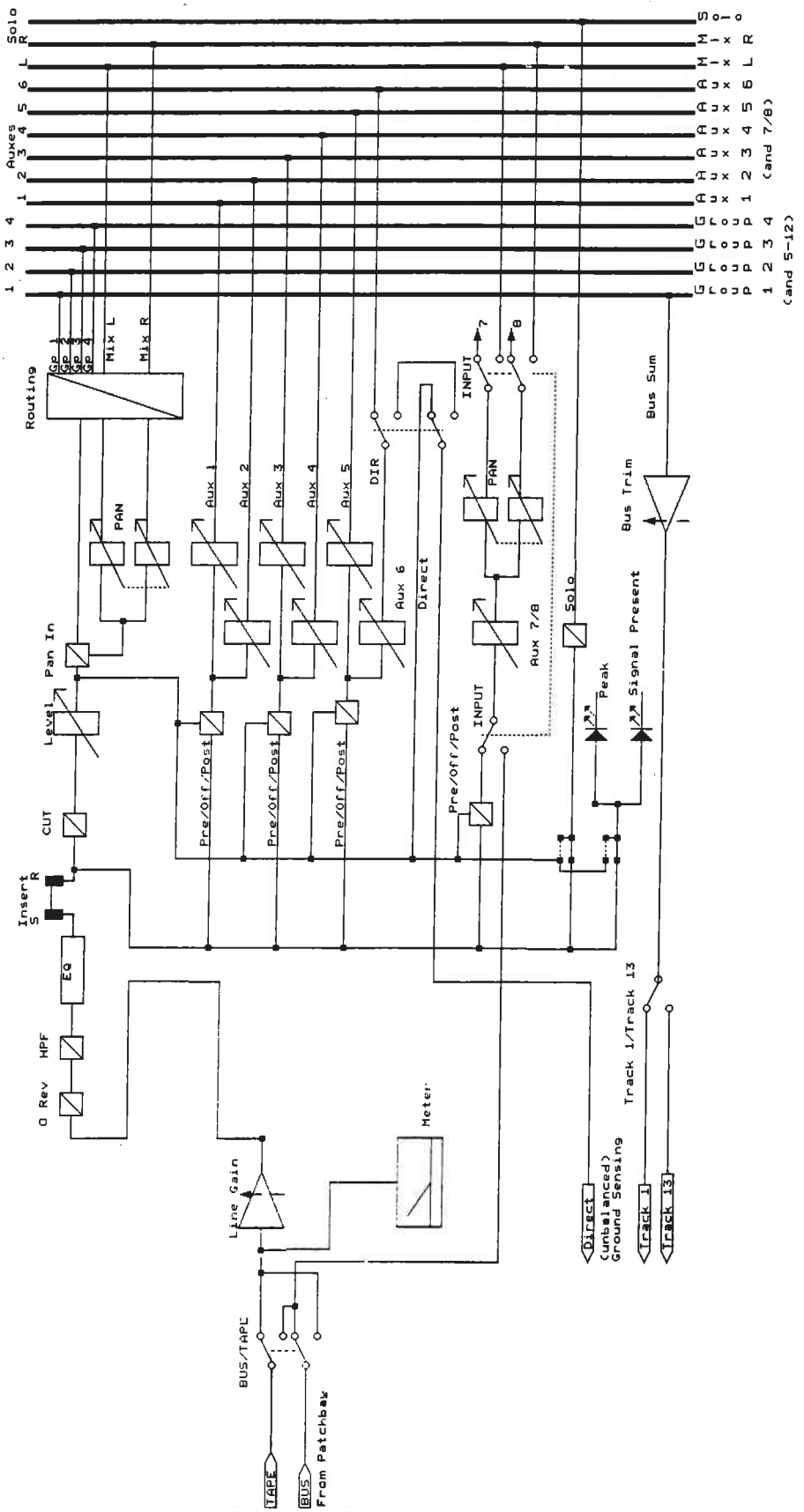
Input Module – APCB10–196
Output Module – APCB10–198

D18 is replaced by a wire link
C69 was 22uF/25V, is now 100uF/16V
Added 2.2nF capacitor across the solo enable line on the solo switch, between the switch common, and R139.

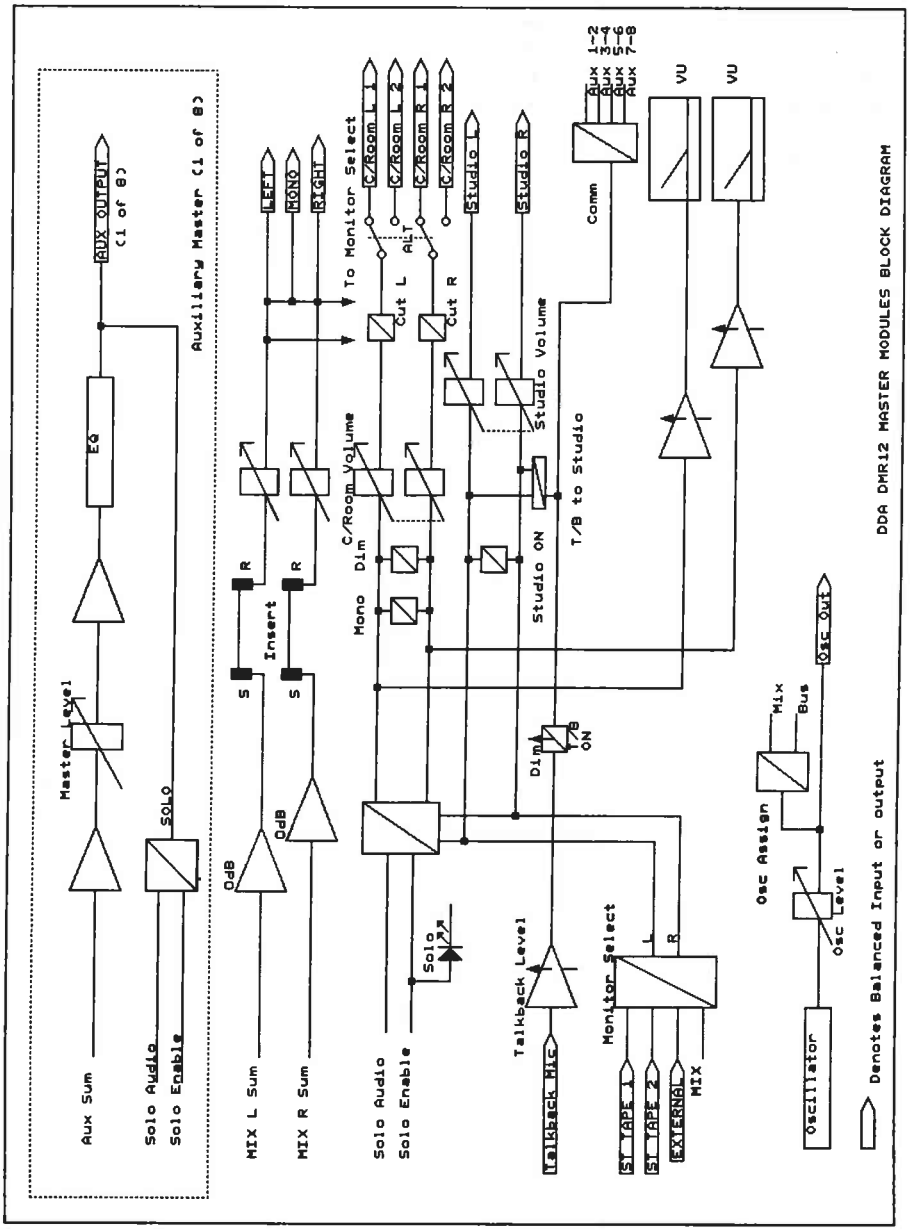
6.1 Input Module Block Diagram



6.2 Output Module Block Diagram



6.3 Master Modules Block Diagrams

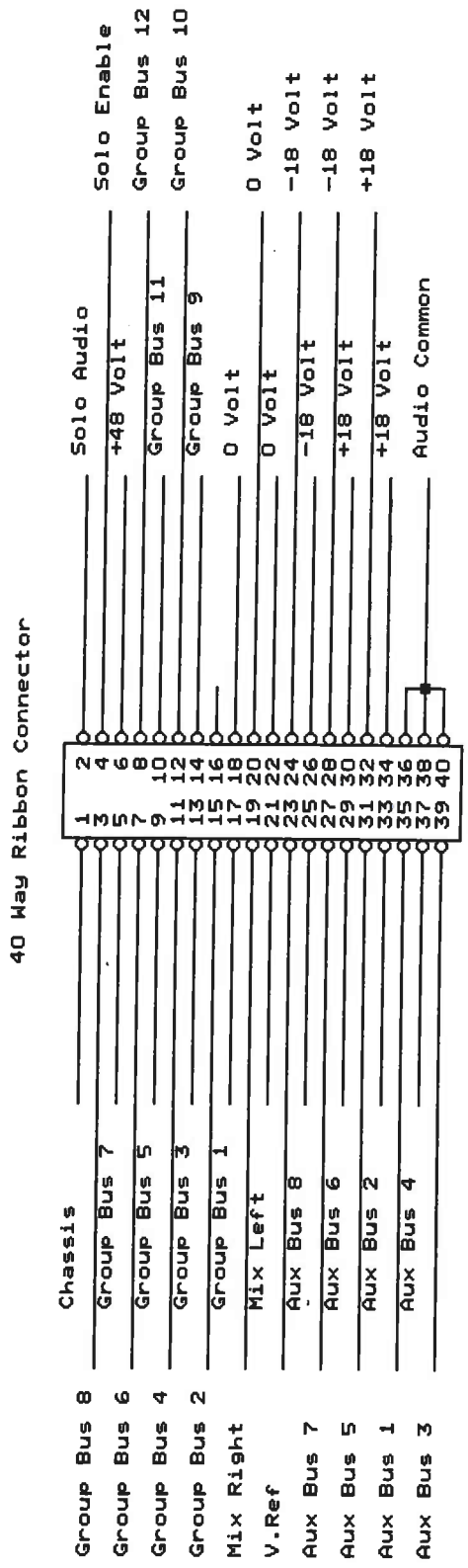


6.4 PSU Cable pinout details

Audio PSU Cable Pinout

Pin 1	Ground Link
Pin 2	+18V
Pin 3	+18V
Pin 4	−18V
Pin 5	−18V
Pin 6	0V
Pin 7	0V
Pin 8	0V
Pin 9	0V
Pin 10	+48V
Case	Chassis

6.5 DMR12 Bus Structure



Section 7.....Spare Parts List

7.1....Mechanical Parts

7.2....Electronic Parts

7.3....Module Assemblies

7.1 Mechanical parts

7.11 Pots/Faders

4K7 Dual pot	POT01 – 0001
10K Inverse log pot	POT01 – 0002
10K Log pot	POT01 – 0003
10K Log dual pot	POT01 – 0004
47K Linear pot	POT01 – 0005
100K Inverse log dual pot	POT01 – 0006
P&G Fader, mono	POT03 – 0002

7.12 Switches

SUN 2 pole	SWT01 – 0001
4 pole	SWT01 – 0002
6 pole	SWT01 – 0003
SUJ 2 pole	SWT01 – 0004
4 pole	SWT01 – 0005

7.13 Meters

VU Meter	MTR01 – 0002
BBC PPM Meter	MTR02 – 0004

7.14 Connectors

XLR Male, 3 pin chassis	CON02 – 0003
XLR Female, 3 pin chassis	CON02 – 0004
Jack socket, mono	CON02 – 0001
Jack socket, stereo	CON02 – 0002
PSU Connector, chassis male	CON05 – 0001
PSU Connector, chassis female	CON05 – 0002
PSU Connector, free male	CON05 – 0003
PSU Connector, free female	CON05 – 0004
IEC Mains connector, chassis (incorporates fuse holder)	CON04 – 0002
Ribbon connector, bus, 40 WAY	CON03 – 0004
Ribbon connector, bus, 34 WAY	CON03 – 0018
Audio connector, 8 way AMP F.	CON01 – 0002

7.15 Knobs

P&G Fader knob, WHITE	FRN04 – 0008
P&G Fader knob, RED	FRN04 – 0007
P&G Fader knob, YELLOW	FRN04 – 0006
SUN switch cap, GREY	FRN03 – 0003
SUN switch cap, BLACK	FRN03 – 0002
SUN switch cap, RED	FRN03 – 0001
SUJ switch cap, GREY	FRN03 – 0005
SUJ switch cap, BLUE	FRN03 – 0006

Control knob, DARK GREY BODY	FRN01 – 0008
Control knob, GREY BODY	FRN01 – 0009
Control knob cap, DARK GREY	FRN01 – 0002
Control knob cap, GREY	FRN01 – 0005
Control knob cap, RED	FRN01 – 0003
Control knob cap, BLUE	FRN01 – 0010
Control knob cap, GREEN	FRN01 – 0012

7.16 Fixings

Module fixing screw	HWR01 – 0015
Module fixing washer	HWR02 – 0004

7.17 Fuses

6.3 A	CSM02 – 0007
3.15 A	CSM02 – 0002
250 mA	CSM02 – 0002

7.2 ELECTRONIC PARTS LIST

7.21 Integrated Circuits

TL071	SEM06 – 0001
TL072	SEM06 – 0002
TL074	SEM06 – 0003
5534	SEM06 – 0004
5532	SEM06 – 0009

7.22 Transistors

BC182	SEM04 – 0004
BC212	SEM04 – 0005
BC184	SEM04 – 0003
2SB737	SEM04 – 0006
BC441	SEM04 – 0007
BC461	SEM04 – 0008
2N3055	SEM04 – 0001
PN3055	SEM04 – 0002
KBL02	SEM03 – 0002
261 – 491	SEM03 – 0001

7.23 Diodes

1N4148	SEM02 – 0001
IN4002	SEM02 – 0002
ZENER, 12V	SEM02 – 0003
ZENER, 56V	SEM02 – 0004
ZENER, 25V	SEM02 – 0005
ZENER, 4.7V	SEM02 – 0006
ZENER, 6.8V	SEM02 – 0007
ZENER, 9.1V	SEM02 – 0008
ZENER, 22V	SEM02 – 0009

7.24 Indicators

VU Meter bulb	LMP01 – 0002
LED, Red	SEM01 – 0002
LED, Green	SEM01 – 0001

Section 8.....MUSIC Midi Mute System

MUte and Solo Interface Computer

8.1 MUSIC Description

The Midi Muting system designed for the DMR12 is based on a self-programming microprocessor, with static and midi interfacing.

It offers the addition of 10 Mute Groups, plus enabling the Solo-in-place function on all channels. Groups can be SOLO'd together, providing a simple means of SOLOing a channel together with any effects returns.

Complete console mute settings are known as snapshots, and 128 such snapshots may be stored in the internal memory, and sent via a MIDI link to an external storage system or sequencer.

The MIDI channel used for data transfer may be programmed on the keyboard, and the main system data may also be dumped down the MIDI port as a system exclusive message.

8.2 MUSIC System Retrofitting

Retrofitting MUSIC to existing consoles is not a difficult task, but may be time consuming, as additional components have to be fitted to each module.

The details are given below:

8.21 Module Removal

It is probably easier if all the modules are removed from the chassis, taking care to note which of the output modules are programmed for buses 1 – 12, so that they are replaced in the correct positions later. To remove the modules, first pull off the ident strip below the faders (held on by velcro). Undo and remove the large cross – head screws securing the module ganging bar, and remove the bar (one piece).

Carefully lift the lower end of one module, and unplug the main ribbon bus near the centre. Lift the module out of the top end of the frame and unplug the remaining connectors such as patchbay, mic, or meter connectors. Take care to leave the wiring harnesses tidy.

8.22 MIDI Connector panel and Controller

At the rear of the chassis, there is a blank panel in the connector area about 3 inches wide. This should be removed and replaced by the panel carrying the three DIN connectors.

The main controller box locates at the bottom of the patchbay. Remove the blank patch panel, and replace it with the controller box. Do not screw it down yet, nor fix the front dress panel.

The D – type connector on the rear of the controller connects to the MIDI connector panel, and the power distribution PCB in the console.

8.23 Mute Interface PCB's

These are arranged as PCB's in groups of 16 channels. They are supplied with self – adhesive mounting pillars, and should be mounted inside the armrest extrusion, central in position to the group of channels they will serve. Before mounting them inside the armrest, connect the distribution ribbon cable and ensure that the channel cables are fitted to the interface card ready to be plugged into the modules.

Once the distribution cards are in position, you can connect the ribbon cables to the controller, onto the IDC connectors on the rear of the box.

8.24 Power Connection

There are two wires supplying DC power to the controller. These should be attached to the relevant screw terminals on the main console power distribution board, located at the rear inside of the chassis near the PSU connector. Wired to pin 1 on the D-type is the +18 volts connection, Pin 9 is Chassis Ground, and Pin 2 is 0 volts. This is the arrangement of the separated wires on the ribbon cable. It is adviseable to check continuity before wiring up to the PCB.

Two reservoir capacitors, 4700uF, 25V, should be fitted to this PCB, in the spaces available.

8.25 Module Modifications

There are some checks that need to be carried out as well as some simple modiifications to components. In addition, there is a choice of how to wire the midi-mute interface onto the module itself.

a) Electronic Checks and Modifications:

First, check that the 5 volt regulator, REG 1 is of type 78LO5. It is located at the fader end of the PCB, and should be a three-legged device similar to a transistor. This is to ensure that the module gives out 5 volts to the interface.

Secondly, the module may have either a diode or a wire link in position D18. Either way, it should now be removed so there is nothing in that position.

b) Mute wiring Interface - 10 way molex PCB's

There are two choices on wiring up the mute wiring. The first makes removal of the module for servicing easier, but makes modification time longer. The second is easier.

It may be possible that your modules have already been fitted ready for the mute interface, so further modification is unnecessary (see 6 way molex pcb's).

The first method involves removal of the fader molex (a 10 way connector), and rewiring the audio connections on the pad from the current three solder pads to the three pads at the other end of the fader molex. These pads are attached normally to pins 4,5, and 6, and now attach to pins 8,9, and 10. The fader wires then are removed from the 10 way connector, and placed on the corresponding pins 8,9, and 10 of the supplied 6 way connector. This frees the top three pins of the pcb molex for the mute interface to be a separate three pin molex, making later module removal easier.

The mute wiring should be supplied with your system, and is non-reversible, but check that pin 1 on the distribution pcb is wired to pin 2 on the module, and pin 2 on the distribution board to pin 1 on the module. There is no connection to pin 3 on either pcb.

The second method is simply to attach the mute wires to pins 1 and 2 of the 10 way molex, taking care to observe the reverse wiring arrangement detailed above. This method is easier and far quicker, but module removal entails unplugging the mute from the distribution pcb.

See the diagrams for further information.

Diagram 8.1 – PCB component Identification

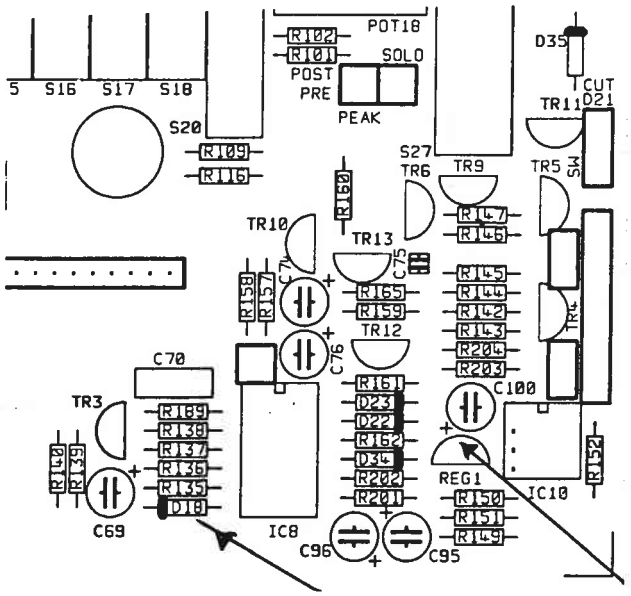
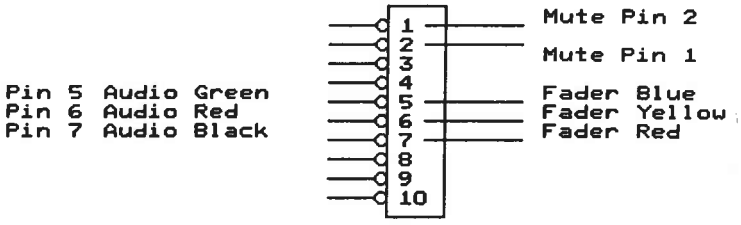


Diagram 8.2 – Fader molex wiring

10 way molex



6 + 3 way molexes

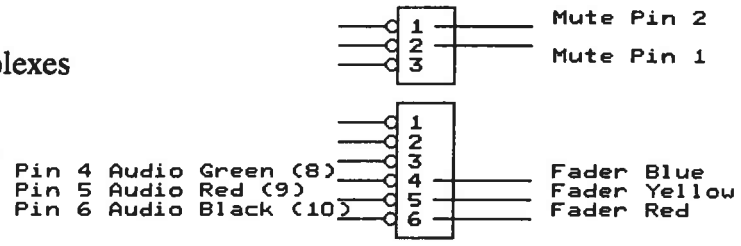


Diagram 8.3 MUSIC System Interconnection Details

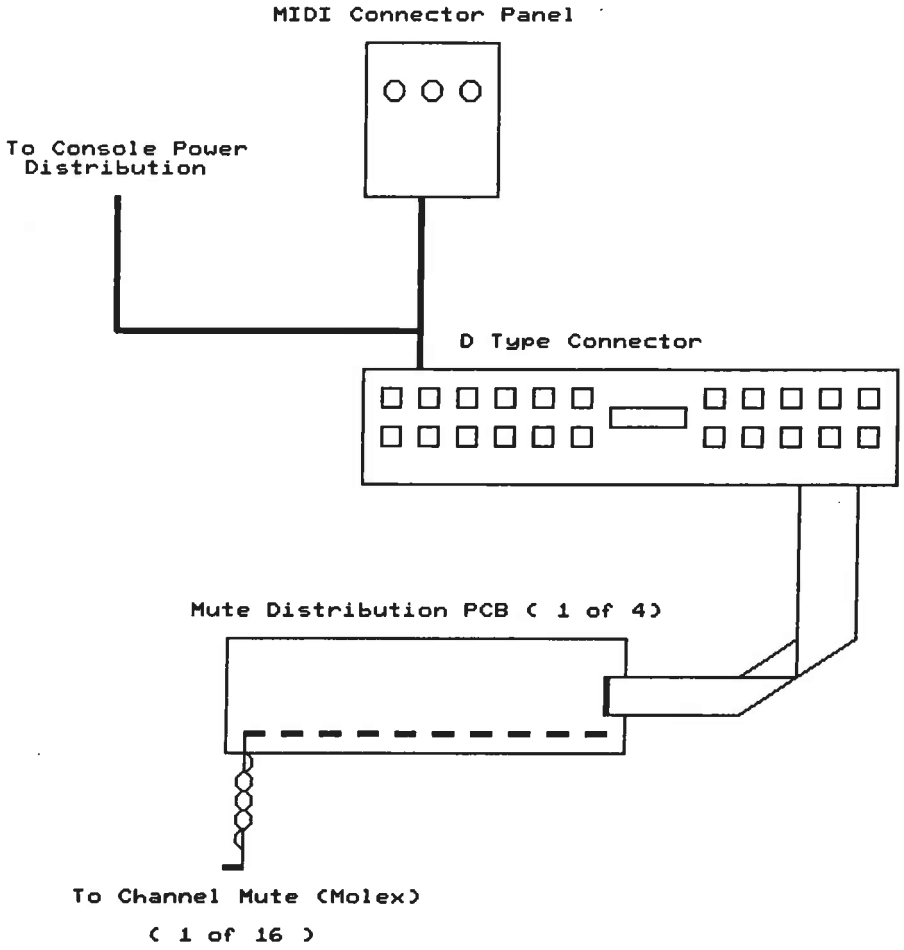
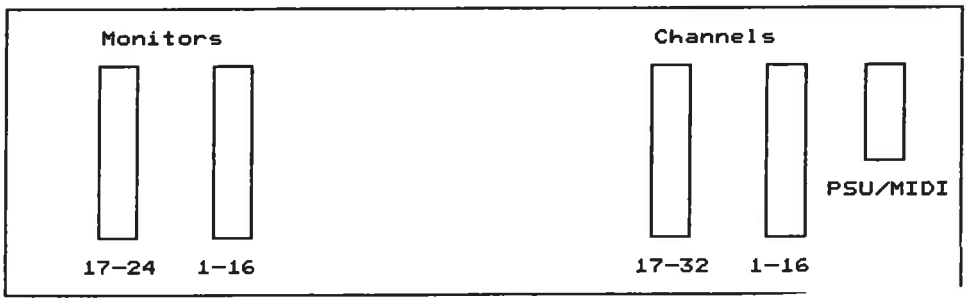


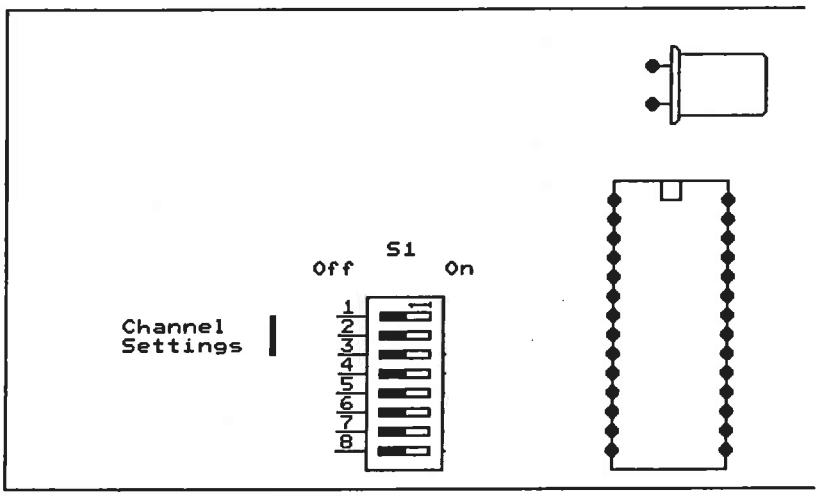
Diagram 8.4 Rear view of controller box



8.26 Switch settings

On the main Midi Logic PCB there is an 8 way DIP switch. The first three of these are used to set the number of the highest channel in use, normally on a large frame 56.

You should set the switches according to the following table for the maximum number of channels in use, adding the maximum inputs to the maximum monitors. Ignore 'missing' inputs to get a figure. If in doubt, check with DDA or your Distributor.



Channels	S1-1	S1-2	S1-3
8	On	On	On
16	On	On	Off
24	On	Off	On
32	On	Off	Off
40	Off	On	On
48	Off	On	Off
56	Off	Off	On
64	Off	Off	Off

8.3 MIDI MUTE Operation

Operation of the system is very straightforward, remembering that the channel mute switches are used for both mute and Solo-In-Place functions, and that key routines must be completed by a STORE, CLEAR, or RECALL function to take effect, as there is no ENTER key.

On switchon, the led display in the controller should read

8.31 Clear all memories

It is advisable after switching on to clear all memories of data which may have been stored on testing. To do this, press

[STORE] [CLEAR] and [CLEAR] again

8.32 Store a Group

There are ten group memories which can contain as many channels as desired. To store channels into a group, use the channel MUTE switch as a selector when in group store mode:

For example, for Group 2, use

[GROUP] [2] {mute} {mute} {mute} [GROUP]

where {mute} means the MUTE switch of the desired channels.

Channels may be added or deleted by entering the Group set-up as above, and pressing the additional channels MUTE keys, or deleting channels by pressing the MUTE so the led is extinguished. Finish with [STORE] as usual.

8.33 To MUTE a Group

The controller should be in MUTE mode (led on). Simply press the Group number key on the controller, and again to unmute the group.

8.34 To Clear a Group or Groups

To clear a single group eg Group 3, press

[GROUP] [3] [CLEAR] [GROUP]

To clear all groups, press

[GROUP] [CLEAR] [CLEAR] [GROUP]

8.35 Console Mute Snaphots

To store a snapshot of the console mute settings, press

[STORE] [snap no] [STORE]

[Snap no] is entered on the keypad, and can be from 1 to 128. It is possible to overwrite existing snapshots using the sequence above, so be careful!

8.36 To recall a snapshot

Snapshots can be manually recalled, eg snap 99:

[RECALL] [99] [RECALL]

Alternatively, once a snap is active, the memories may be stepped through using the INC and DEC keys to step up or down the snapshot memories.

8.37 Clearing Snapshot memories

To clear a single snapshot, eg 98

[STORE] [98] [CLEAR] [STORE]

To clear all snapshot memories

[STORE] [CLEAR] [CLEAR] [STORE]

8.38 Copying Snapshots

It is easy to copy or make an amended copy using a recall and store sequence.

[RECALL] <snap no> [RECALL],

and if desired, amending the set-up, then

[STORE] <new snap no> [STORE]

8.39 SOLO mode

To enter the SOLO mode, press SOLO so that the led is on.

Pressing a channel MUTE switch will now SOLO that channel, muting all other channels. Pressing it again will un-mute all the other channels. This provides the SOLO-IN-PLACE function.

It is also possible to SOLO any stored group, by pressing the group number key while in solo mode, and again to un-solo it.

This latter method allows channels to be solo'ed along with their effects returns, without needing a SOLO SAFE function. Then channels can be solo'ed individually or in a group, without further switch changes.

Be careful - it is very easy to get confused by solo-ing more than one group at a time.

8.4 Operation with MIDI

Interface with an external MIDI sytem is provided through three standard 5 pin DIN connectors for MIDI IN, MIDI OUT and MIDI THROUGH.

Firstly, you will need to select a MIDI channel for the system. To do this, press

[MIDI] [channel no] [MIDI]

Now, when in use, the system will transmit mute on/offs, mute group recalls, and snapshot recalls as MIDI data messages to the external sequencer device, and will respond to that data when replayed by the sequencer.

The DUMP function will send all current system data such as group set-ups, snapshot memories and current snap setting to the sequencer for storage.

Further details on using MUSIC with MIDI will be available at a later date.

8.5 Interfacing to DMR12 MUTE

The Electronic Mute circuitry of the DMR12 allows the console to be very effectively used with a proprietary Fader Automation system which offers independent fader and mute operation.

Interfacing to the fader is simply a matter of interrupting the fader wiring to the module, and re-routing it via the VCA interface cards. Details on this depend on the system chosen.

Interfacing to the DMR12 mute requires special considerations. Two signals would be required, MUTE IN and MUTE OUT. The MUTE OUT is the command sent from the module to the automation when a MUTE switch is pressed. MUTE IN is the automation return signal instructing the module to mute or un-mute.

Both signals on the DMR12 are 5 volt TTL level signals.

The MUTE OUT is a 5V high for as long as the CUT button is pressed.

The MUTE IN should be a latched high for channel CUT, and a latched low for channel ON.

Further advice can be obtained from DDA.

8.6 Known Software Anomolies

Ver. AESMUTE

There is a known anomolies in the AESMUTE software:

a). Copying a snapshot and some changes to a new location works but when the last STORE command is given, the display reverts to the previous snapshot number, but the console stays set to the new set-ups. It should reset the console to the previous set-up.

This problem will be fixed in the next issue of software.

Section 9.....Special Modifications

This section may contain details of any special modifications made to your console.

Section 10.....Service Bulletins

1.2 MUSIC System Retrofitting

Retrofitting MUSIC to existing consoles is not a difficult task, but may be time consuming, as additional components have to be fitted to each module.

The details are given below:

1.21 Module Removal

It is probably easier if all the modules are removed from the chassis, taking care to note which of the output modules are programmed for buses 1-12, so that they are replaced in the correct positions later. To remove the modules, first pull off the ident strip below the faders (held on by velcro). Undo and remove the large cross-head screws securing the module ganging bar, and remove the bar (one piece).

Carefully lift the lower end of one module, and unplug the main ribbon bus near the centre. Lift the module out of the top end of the frame and unplug the remaining connectors such as patchbay, mic, or meter connectors. Take care to leave the wiring harnesses tidy.

1.22 MIDI Connector panel and Controller

At the rear of the chassis, there is a blank panel in the connector area about 3 inches wide. This should be removed and replaced by the panel carrying the three DIN connectors. The main controller box locates at the bottom of the patchbay. Remove the blank patch panel, and replace it with the controller box. Do not screw it down yet, nor fix the front dress panel. The D-type connector on the rear of the controller connects to the MIDI connector panel, and the power distribution PCB in the console. The cable from the connector panel should be routed under the master module to the armrest, and then to the mute controller.

1.23 Mute Interface PCB's

These are arranged as PCB's in groups of 16 channels. They are supplied with self-adhesive mounting pillars, and should be mounted inside the armrest extrusion, central in position to the group of channels they will serve. Before mounting them inside the armrest, connect the distribution ribbon cable and ensure that the channel cables are fitted to the interface card ready to be plugged into the modules.

Once the distribution cards are in position, you can connect the ribbon cables to the controller, onto the IDC connectors on the rear of the box according to diagram 1.4.

1.24 Power Connection

There are two wires supplying DC power to the controller. These should be attached to the relevant screw terminals on the main console power distribution board, located at the rear inside of the chassis near the PSU connector. Wired to pin 1 on the D-type is the +18 volts connection, Pin 9 is Chassis Ground, and Pin 2 is 0 volts. This is the arrangement of the separated wires on the ribbon cable. It is adviseable to check continuity before wiring up to the PCB.

Inside the controller, a 2200uF 40V capacitor should be fitted across the +18V and 0V rails. Check that this is so. Two reservoir capacitors, 4700uF, 25V, should be fitted to this PCB, in the spaces available. (Early consoles only)

You should note that issue 1 of the power distribution pcb had the polarity of the two capacitors reversed, and the legending of the main power connections also wrong. Connections and capacitors should be fitted as per the Issue 2 drawing enclosed.

1.25 Module Modifications

There are some checks that need to be carried out as well as some simple modiifications to components. In addition, there is a choice of how to wire the midi-mute interface onto the module itself.

a) Electronic Checks and Modifications:

First, check that the 5 volt regulator, REG 1 is of type 78L05. It is located at the fader end of the PCB, and should be a three-legged device similar to a transistor. This is to ensure that the module gives out 5 volts to the interface.

Secondly, the module may have either a diode or a wire link in position D18. Either way, it should now be removed so there is nothing in that position.

Thirdly, resistor R136, next to IC8, should be 330kohms. Resistors are supplied with this kit should they be incorrect.

On the Master module, a 680nF capacitor should be fitted in place of the 0V/Chassis link.

b) Mute wiring Interface - 10 way molex PCB's

There are two choices on wiring up the mute wiring. The first makes removal of the module for servicing easier, but makes modification time longer. The second is easier.

It may be possible that your modules have already been fitted ready for the mute interface, so further modification is unnecessary (see 6 way molex pcb's).

The first method involves removal of the fader molex (a 10 way connector), and rewiring the audio connections on the pad from the current three solder pads to the three pads at the other end of the fader molex. These pads are attached normally to pins 4,5, and 6, and now attach to pins 8,9, and 10. The fader wires then are removed from the 10 way connector, and placed on the corresponding pins 8,9, and 10 of the supplied 6 way connector. This frees the top three pins of the pcb molex for the mute interface to be a separate three pin molex, making later module removal easier. Later modules have a dedicated connector for connection with the Midi system.

Issue 2 Mute Distribution PCB's

The mute wiring should be supplied with your system, and is non-reversible, but check that pin 1 on the distribution pcb is wired to pin 1 on the module, and pin 2 on the distribution board to pin 2 on the module. There is no connection to pin 3 on either pcb.

The second method is simply to attach the mute wires to pins 1 and 2 of the 10 way molex, taking care to observe the wiring arrangement detailed above. This method is easier and far quicker, but module removal entails unplugging the mute from the distribution pcb.

See the diagrams for further information.

Issue 1 Mute Distribution PCB's

As above except that pin 1 on the pcb goes to pin 2 on the molex, and pin 2 to pin 1.

Check the issue of the PCB's. All current PCB's are issue 2.

Diagram 1.1 - PCB component Identification

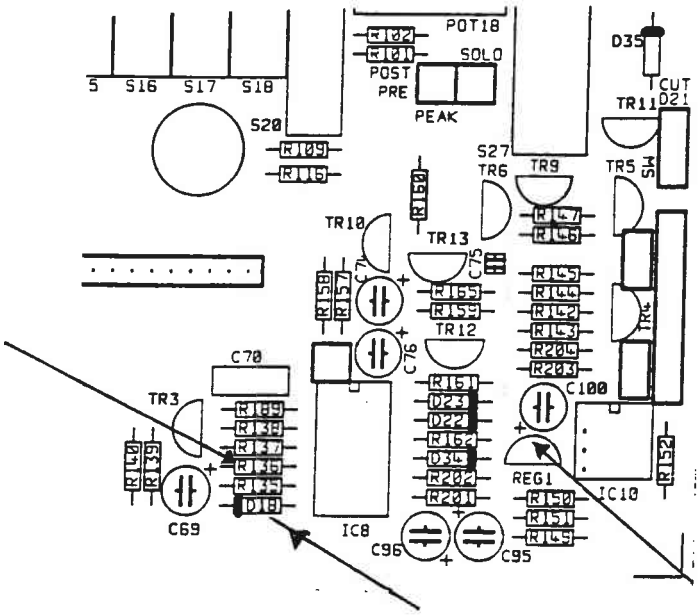
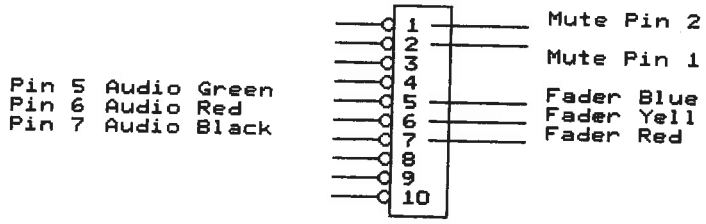


Diagram 1.2 - Fader molex wiring

10 way molex



6 + 3 way molexes

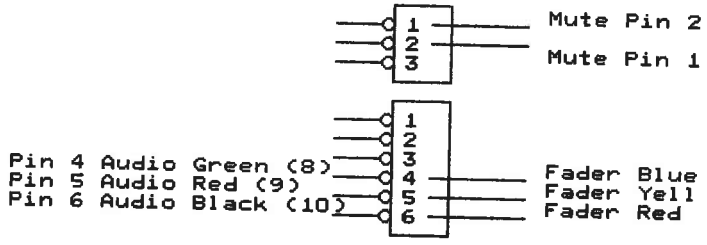


Diagram 1.3 MUSIC System Interconnection Details

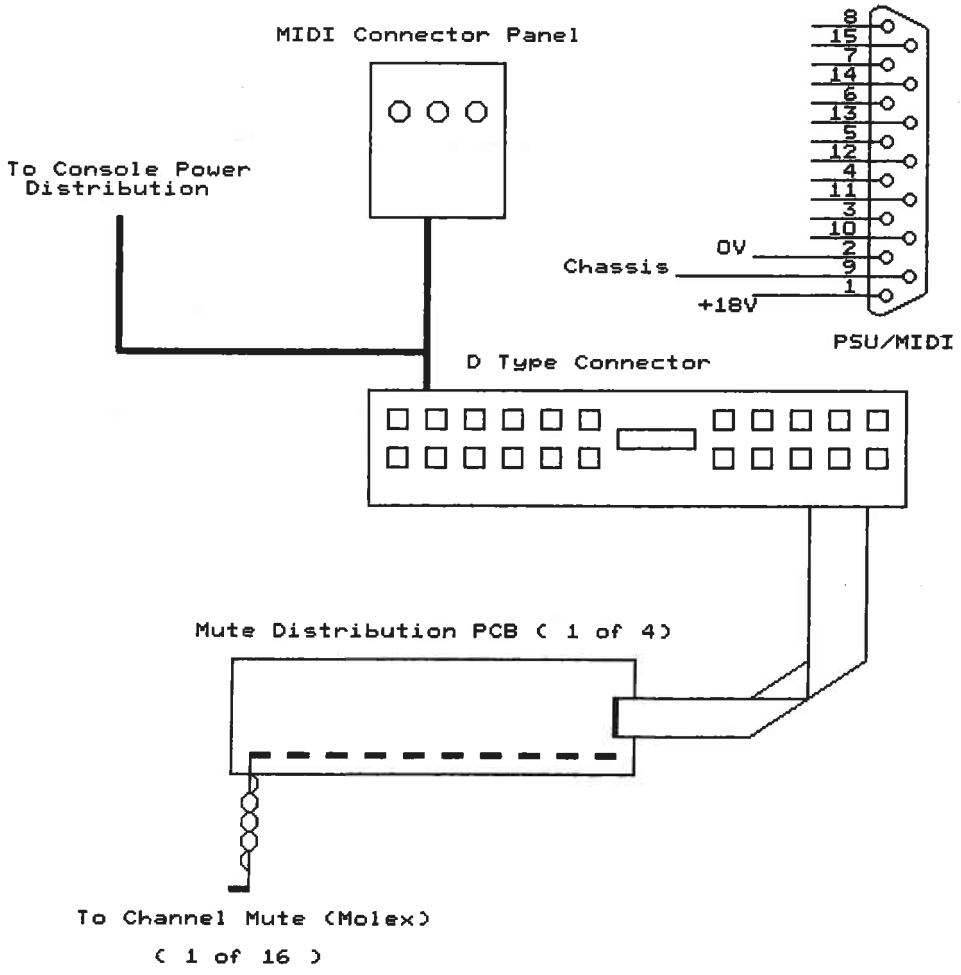


Diagram 1.4 Rear view of controller box

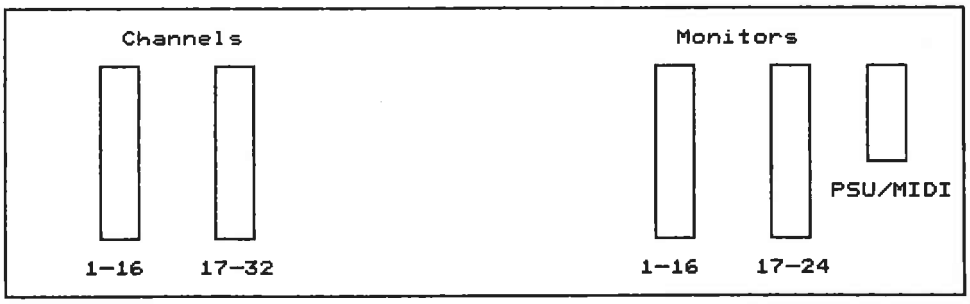


Diagram 1.5 Issue 1 Power Distribution PCB

Note markings are incorrect. This is how you can easily distinguish between Issue 1 and Issue 2.

Capacitors should be fitted and power wired according to the layout of the Issue 2 pcb.

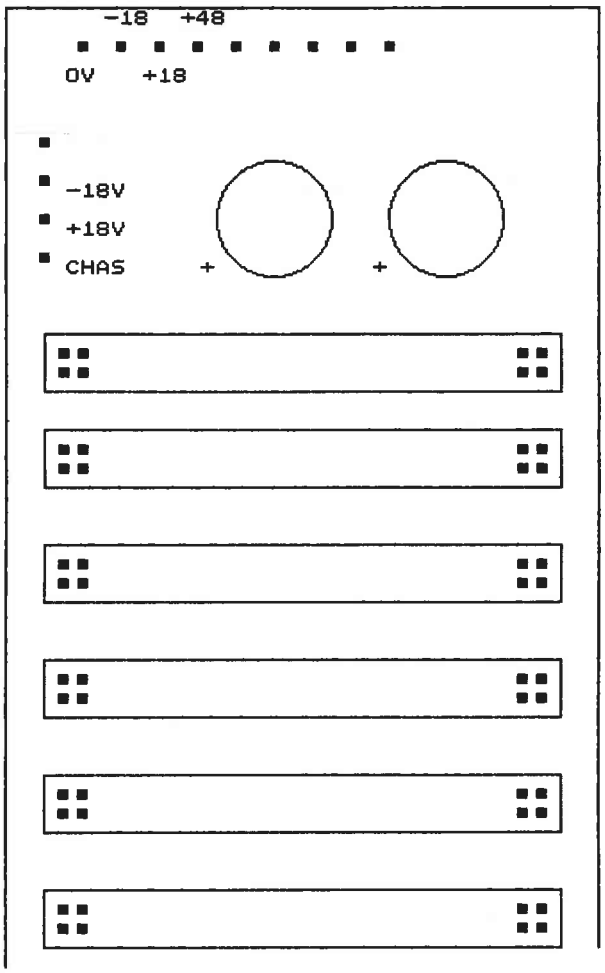
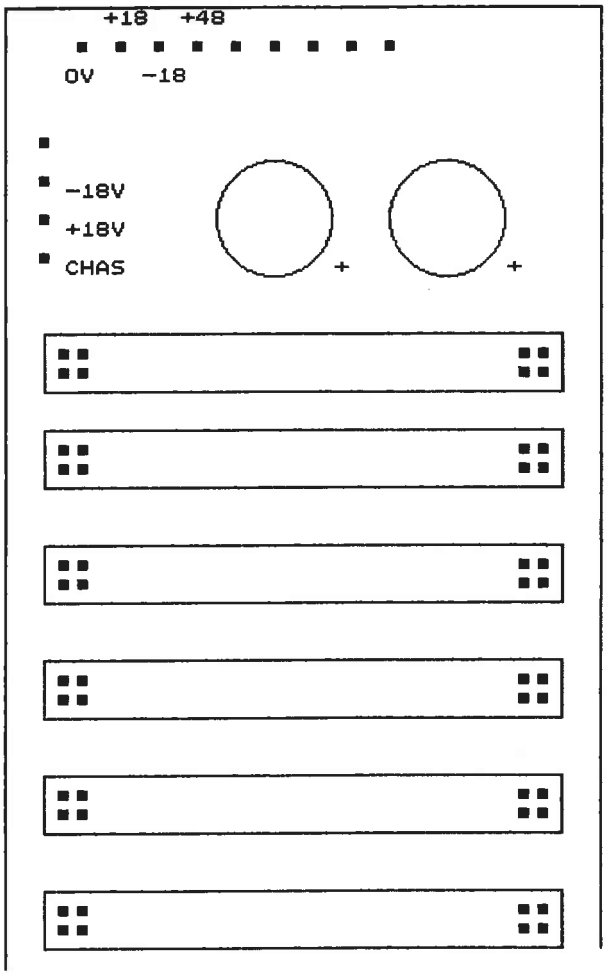


Diagram 1.6 Issue 2 Power Distribution PCB

All systems should be wired to these markings.



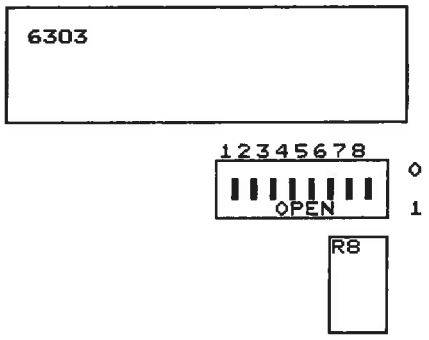
1.26 Switch settings

On the main Midi Logic PCB there is an 8 way DIP switch. The first three of these are used to set the number of the highest channel in use, normally on a large frame 56.

You should set the switches according to the following table for the maximum number of channels in use, adding the maximum inputs to the maximum monitors. Ignore 'missing' inputs to get a figure. If in doubt, check with DDA or your Distributor.

Switch No.	Description
1	Number of channels - Binary code for groups
2	Number of channels | - of eight channels with
3	Number of channels - an offset of 8.
4	[1] No Note offset.
	[0] Add Note offset of 21.
5	[1] Send Mute Off's as velocity '1'.
	[0] Send Mute Off's as velocity '0'.
6	[1] Sysex repetition rate 1 second.
	[0] Sysex repetition rate 2.5 seconds.
7	[1] Ignore All Notes Off/All Controllers Off.
	[0] Respond to All Notes Off's/All Controllers Off.
8	[1] Note On/Off data sent.
	[0] Controller data sent.

NO. OF CHANNELS	SWITCHES 321
8	000
16	001
24	010
32	011
40	100
48	101
56	110
64	111



Notes about bit assignments

A note offset of 0 or 21 can be assigned so as to either be compatible with existing mixes or get around sequencer note range restriction problems. If Note On/Off changes are selected then Mute Off's can be sent as Note's with a velocity of '1' or '0'. When using 'Cubase'with this mode of operation, a velocity of '1' needs to be selected in order that the sequencer records Mute Off's if they occur before Mute On's. Some sequencers such as Steinberg's PRO24 III will record Note Off's if they occur before Note On's.

Midi continuous controllers 0 to 15 (dec) are used for the channel mutes, and controllers 16,17 and 18 for the Group Mutes. Each controller has 4 bits of mute data encoded bit-wise within the 4 least significant bits of its data field. The data needs to be bit encoded in order for the sequencer to chase the events. There are only 4 bits of mute data per controller to reduce the amount of processing time.

1.3 MIDI MUTE Operation

Operation of the system is very straightforward, remembering that the channel mute switches are used for both mute and Solo-In-Place functions, and that key routines must be completed by a STORE, CLEAR, or RECALL function to take effect, as there is no ENTER key.

On switch on, the led display in the controller should read

\- - -

1.31 Clear all Snapshot memories

It is advisable after switching on to clear all snapshot memories of data which may have been stored on testing. To do this, press

[STORE] [CLEAR] [CLEAR] [STORE]

1.32 Store a Group

There are ten group memories which can contain as many channels as desired. To store channels into a group, use the channel MUTE switch as a selector when in group store mode:

For example, for Group 2, use

[GROUP] [2] {mute} {mute} {mute} [GROUP]

where **{mute}** means the MUTE switch of the desired channels.

Channels may be added or deleted by entering the Group set-up as above, and pressing the additional channels MUTE keys, or deleting channels by pressing the MUTE so the led is extinguished. Finish with [STORE] as usual.

1.33 To MUTE a Group

The controller should be in MUTE mode (led on). Simply press the Group number key on the controller, and again to unmute the group.

1.34 To Clear a Group or Groups

To clear a single group eg Group 3, press

[GROUP] [3] [CLEAR] [GROUP]

To clear all groups, press

[GROUP] [CLEAR] [CLEAR] [GROUP]

1.35 Console Mute Snaphots

To store a snapshot of the console mute settings, press

[STORE] [snap no] [STORE]

[Snap no] is entered on the keypad, and can be from 1 to 128. It is possible to overwrite existing snapshots using the sequence above, so be careful!

1.36 To recall a snapshot

Snapshots can be manually recalled, eg snap 99:

[RECALL] [99] [RECALL]

Alternatively, once a snap is active, the memories may be stepped through using the INC and DEC keys to step up or down the snapshot memories.

1.37 Clearing Snapshot memories

To clear a single snapshot, eg 98

[STORE] [98] [CLEAR] [STORE]

To clear all snapshot memories

[STORE] [CLEAR] [CLEAR] [STORE]

1.38 Copying Snapshots

It is easy to copy or make an amended copy using a recall and store sequence.

[RECALL] <snap no> [RECALL],

and if desired, amending the set-up, then

[STORE] <new snap no> [STORE]

1.39 SOLO mode

To enter the SOLO mode, press SOLO so that the led is on.

Pressing a channel MUTE switch will now SOLO that channel, muting all other channels. Pressing it again will un-mute all the other channels. This provides the SOLO-IN-PLACE function.

It is also possible to SOLO any stored group, by pressing the group number key while in solo mode, and again to un-solo it.

This latter method allows channels to be solo'ed along with their effects returns, without needing a SOLO SAFE function. Then channels can be solo'ed individually or in a group, without further switch changes.

Be careful - it is very easy to get confused by solo-ing more than one group at a time.

1.4 Operation with MIDI

Interface with an external MIDI sytem is provided through three standard 5 pin DIN connectors for MIDI IN, MIDI OUT and MIDI THROUGH.

Firstly, you will need to select a MIDI channel for the system. To do this, press

[MIDI] [channel no] [MIDI]

Now, when in use, the system will transmit mute on/offs, mute group recalls, and snapshot recalls as MIDI data messages to the external sequencer device, and will respond to that data when replayed by the sequencer.

The notes corresponding to a channel mute are as follows:

NOTE	-2	-1	0	1	2	3	4
C	1	13	25	37	49		Gr8
C#	2	14	26	38	50		Gr9
D	3	15	27	39	51		
D#	4	16	28	40	52		
E	5	17	29	41	53	Gr0	
F	6	18	30	42	54	Gr1	
F#	7	19	31	43	55	Gr2	
G	8	20	32	44	56	Gr3	
G#	9	21	33	45		Gr4	
A	10	22	34	46		Gr5	
A#	11	23	35	47		Gr6	
B	12	24	36	48		Gr7	

When a channel is muted, the MIDI sequencer will be sent a NOTE ON code, with a velocity of 127 (ie maximum velocity). When a channel is un-muted, a velocity 0 or 1 note is recorded, corresponding to a NOTE OFF command.

The DUMP function will send all current system data such as group set-ups, snapshot memories and current snap setting to the sequencer for storage

1.5 Interfacing to DMR12 MUTE

The Electronic Mute circuitry of the DMR12 allows the console to be very effectively used with a proprietary Fader Automation system which offers independent fader and mute operation, if the MUSIC system is not fitted.

Interfacing to the fader is simply a matter of interrupting the fader wiring to the module, and re-routing it via the VCA interface cards. Details on this depend on the system chosen.

Interfacing to the DMR12 mute requires special considerations. Two signals would be required, MUTE IN and MUTE OUT. The MUTE OUT is the command sent from the module to the automation when a MUTE switch is pressed. MUTE IN is the automation return signal instructing the module to mute or un-mute.

Both signals on the DMR12 are 5 volt TTL level signals.

The MUTE OUT is 5V high for as long as the CUT button is pressed.

The MUTE IN should be a latched high for channel CUT, and a latched low for channel ON.

Further advice can be obtained from DDA.

Appendix

Midi Parameter Configuration.

The midi switch status setup can be modified from the front panel keys via key sequences :

```
[MIDI][20]     :displays ram settings on seven segment display.
[MIDI][21]      :toggles switch one's setting
[MIDI][22]      :toggles switch two's setting
```

and so on for all 8 switches. These settings are not remembered when the console is powered down.

The RAM settings are displayed in the following format after pressing [MIDI][2][0][MIDI] :

Sevensegment Display	Meaning
Chn	The number of channels the desk has been setup for will then be shown after a small delay. This value can be any multiple of eight from 8 to 64.
OFS	Note Offset when using Note ON/OFF's. Either 000 or 021.
NOF	Note Off velocity. The velocity which is sent for Mute Off's when switch 8 is set to send Note On/Off's. Either 0 or 1.
Srt	System Exclusive rate. The rate at which Sysex's are sent when using Note On/Off's. Either 1 or 2 seconds.
RtA	Respond to All notes Off. Either Yes or No.
SCd	Send Controller data. Either Yes or No. If No then Note On/Off's are sent.
DIA	This show whether the midimute system is in diagnostic mode. "Yes" or "No" will indicate which mode.

Special Notes for Cubase Users.

When using Cubase and Midimute the following options should be set in variance from the default settings:

i. In Syncronization Menu: Set Midi clock to Atari.

ii. In Midi Setup Menu: Select Note On priority.
Set length correction = 0

[Select Reset On Stop] if the user requires all channels to be muted on Stopping a mix. Also need to setup midimute for this option using switch 7.

iii. In Midi Filter Menu: Enable System exclusive recording. If Mutes are being sent as Note data then in order to use Cubase the velocity switch will need to be set for a Mute Off encoded as Note On velocity '1'.

General Notes.

Regardless of which sequencer is being used, in order that it can chase events sent out by midimute it must have the ability of recording System exclusives. Filter options need to be set up so that these are recorded and replayed.

A Midi clock needs to be sent in order that the system exclusives sync up.

The DDA manufacturer system exclusive is ($00,$20,$17).

Notes on Editing.

The following gives a method for editing mixes in Cubase:

i. Remove all System exclusives from the track, taking note of the initial desk mute state.

ii. Do the edit.

iii. Set up the desk to the initial mute status.

iv. Replay the track whilst recording onto another.
{System Exclusives will be recorded onto this track}

v. Merge the two tracks.

Model: MUSIC MIDI Implementation Chart. Version: 2.52

FUNCTION	TRANSMITTED	RECOGNIZED	REMARKS
Basic Default Channel Default	1 1-16	Omni 1-16	
Mode Default Messages Altered	3 X X	X X X	
Note Number True Voice	0-84 0-63	0-84 0-63	Dictated by setup
Velocity Note ON Note OFF	O v=1,127 O $9n,v=0	0 v=1,127 0 $9,v=0 $8n v=1-127	Dictated by setup
After Keys Touch Channels	X X	X X	
Pitch Bender	X	X	
Control 0-18 Change	O	OX	Depends on Setup.
102	O	O	Mute Mode
103	O	O	Solo Mode
121	O	O	All Mutes On
123	O	O	All Mutes On
Prog Change True #	O 0-127	O 0-127	Snapshot Changes
System Exclusive	O	O	
System:Song Posn :Song Sel Common:Tune	X X X	X X X	
System :Clock Real- : Time :Commands	Start X Stop X Cont X	O O O	Sync of SYSEX
Aux :Local On/Off Mess-:All Notes Off ages :Active Sense :Reset	X X X X	X O X X	All Mutes ON

Mode 1: OMNI ON,POLY Mode 2: OMNI ON,MONO O: Yes
Mode 3: OMNI OFF,POLY Mode 4: OMNI OFF,MONO X: No

Midimute Diagnostic Mode.

A new diagnostic feature has been included in the Midimute software v2.5, inorder to make it clear just how the desk has been wired up. This will clarify which notes correspond to which channels in the desk.

Operation

To select diagnostic mode you must do the following :

Press: **[MIDI][2][9][MIDI]**

Once you are in diagnostic mode the Note number for a Channel Group Mute is displayed on the seven segment display both when sending to a sequencer and receiving from it.

If once you are in diagnostics you press:

[MIDI][0][1][MIDI]

The Midimute system will output a mute for each channel of the desk and then unmute it starting at channel 1 and rippling through to channel 56. Whilst this goes on, the seven segment display will again show which Midi note numbers are being sent out to the sequencer.

Getting out of Diagnostics

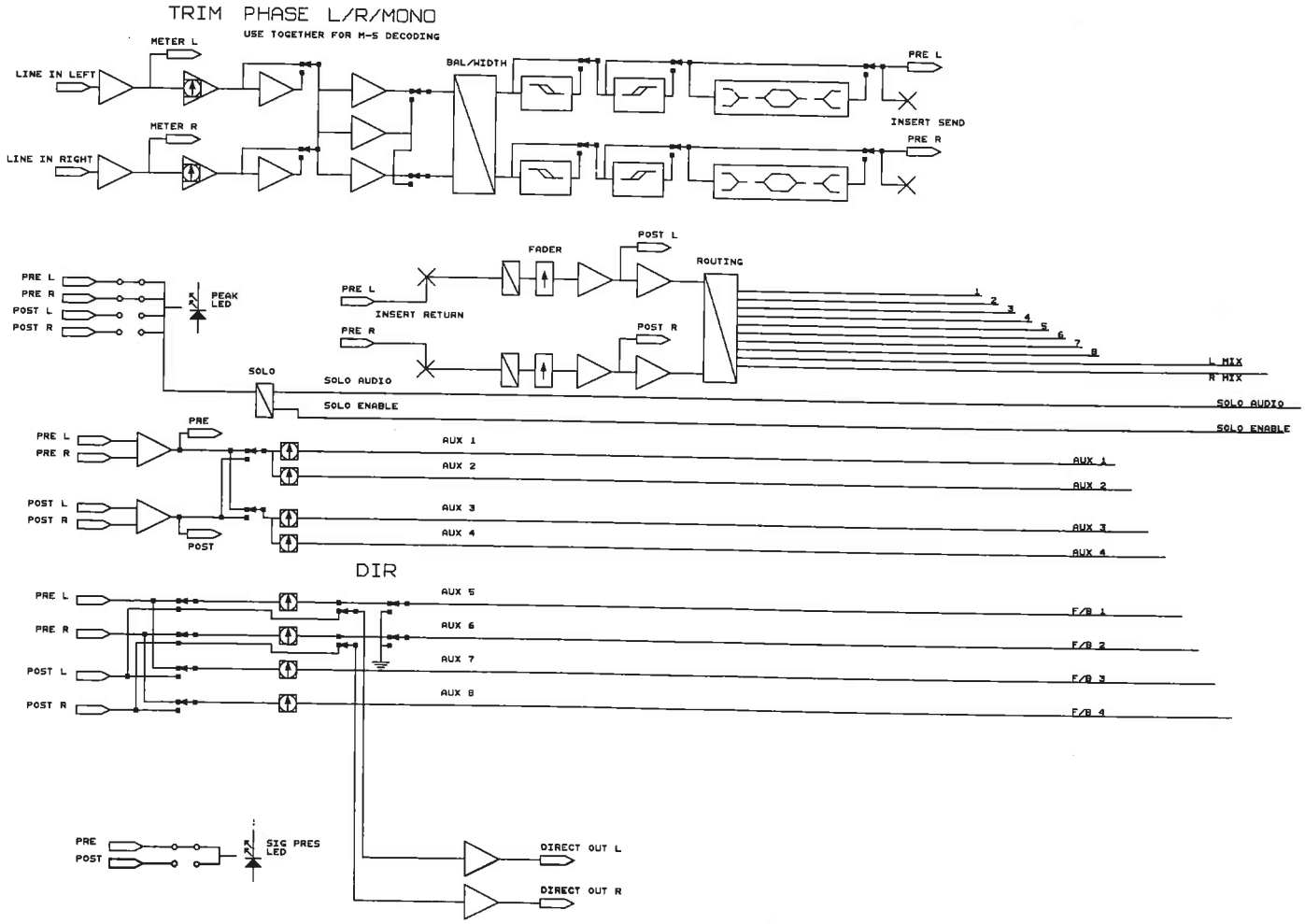
To get out of diagnostic mode you just press:

[MIDI][2][9][MIDI]

You may find out if you are in diagnostics at any time by typing:

[MIDI][2][0][MIDI]

which will display all the midimute setup parameters the last one being DIAgnostics. If they are ON then the message "YES" will be displayed.



DMR12 STEREO INPUT

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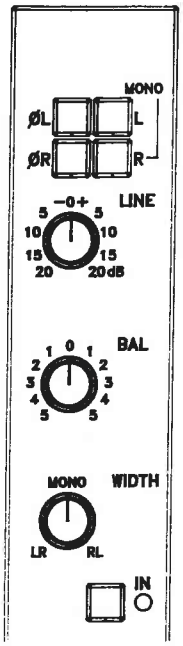
DMR12 STEREO INPUT MODULE

This module may be fitted to the DMR12 console in order to provide an input for line level stereo sources. A new patch card is required for use with the stereo modules and one patch card will support two stereo modules. For this reason it is convenient to install the stereo modules in pairs. New patch cabling is also required and for ease of installation the modules should be located in the highest available INPUT position - in a large frame console this will be positions 31 and 32.

INPUT SECTION

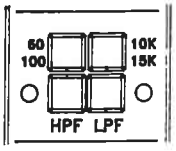


This contains phase reverse switches and cut switches for the left and right inputs. When both cut switches are operated any input signal is monoed to both the left and right outputs. By operating the Right Phase Reverse Switch along with both Cut switches it is possible to decode an M and S stereo microphone signal.

The LINE TRIM control gives +/- 20dB of gain adjustment.

The BALANCE control has a range of +2/-6 dB and this is followed by a WIDTH control which can be switched in or out of circuit. If this control is in circuit and turned fully to the left then this is equivalent to stereo operation. As the knob is rotated clockwise the image narrows until at the centre point of rotation a mono image is obtained. Further clockwise rotation gives an increasingly wide but reversed stereo image.

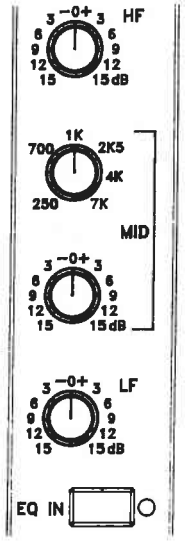
FILTER SECTION



Two switches provide the ability to switch HIGH and LOW pass filters into the signal path. A further two switches allow the filter frequencies to be selected. All filters have a cut off rate of 12dB per octave.

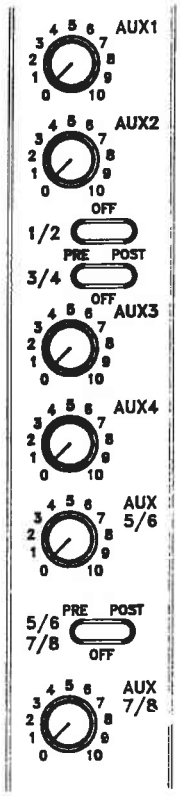
HIGH	10kHz	15kHz
LOW	60Hz	100Hz

EQUALIZER SECTION



The EQUALIZER can be switched in or out of the signal path and consists of a high frequency section, a low frequency section and a sweepable mid section. The boost and cut range on all sections is 15dB.

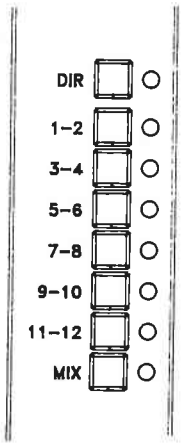
AUXILIARIES



This section is similar to the auxiliary section of a mono module but with important differences.

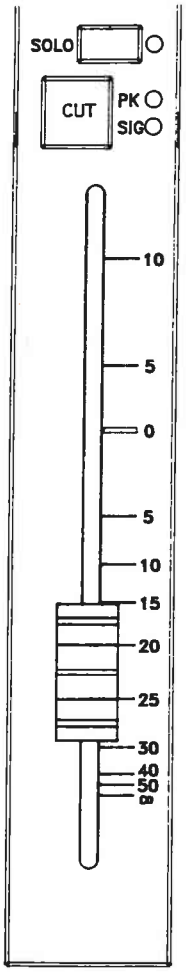
The mono auxiliaries 1 - 4 are fed from a mono sum of the stereo input signal either pre or post fade while the stereo auxiliaries do not require a pan pot - left is routed to left and right to right.

ROUTING MATRIX



The stereo signal is routed to the busses or to the mix in pairs. The DIRECT button allows auxiliary 5/6 level control to control the direct output of the channel. If this is not in use the direct output is post cut and post fader.

FADER SECTION



The facilities provided here are identical to the standard input module and are as follows:-

Channel CUT button
Channel SOLO button
Channel PEAK and SIGNAL PRESENT indicators
Channel FADER.

INSTALLATION

The following is based upon the premise that two modules will be installed into the input side of a large frame DMR12 and will occupy positions 31 and 32.

1) Remove standard input modules 31 and 32, the master modules (3) and the monitor modules (24).

2) Remove the patchcard for input channels 31 and 32. This is most easily done by opening the hatch underneath the patchbay and removing the connectors on the card nearest to the front of the console. From above, remove the two screws securing the card and it should fall free from the console.

3) As the patchbay wiring is done in blocks of 4 modules it is not possible to remove the patchbay to module wiring if only one pair of modules is being installed. If two pairs are installed then the old patchbay to module wiring can be removed after withdrawing the next patchcard.

4) Install the new 20 way patch cables following the existing route in the console.

5) Install the new modules by connecting the patch cable and the bus cable and placing them in the console. Note that there is no microphone connection to the stereo module and it should be tied back.

6) Install the new patchcard from the underside of the patchbay, securing it with two screws from above.

7) Connect the 20 way cables from the modules to the patchcard. CON 1 goes to module 31 and CON 2 goes to module 32.

8) Connect the 10 way cable onto CON 3. This connects the patchcard to the rear mounted EDACs.

9) NOTE that you will now have a spare 20 way cable which would normally be used to carry tielines to the EDAC panel. The installation of the stereo modules, however, makes this redundant and it should be neatly tied back.

10) Re-assemble the console.

Assuming that the above has been successfully carried out then Line Inputs 1 and 2 for modules 31 and 32 should be the Left and Right stereo inputs for the stereo modules. The patchbay allows these inputs to be overplugged if required and also gives facilities for insert points and direct outputs.