

# MASELEC MTC-2

mastering control and monitor system



<http://www.maselec.com/>

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## INSTALLATION

### 1. Unpacking

The system is shipped in a large box (L=580mm, W=400mm, H=750mm) containing three cardboard boxes with Master Control, Monitor Control and Master Router. Also included are two smaller boxes with the inter-connect cables:

- ☐ Audio: 16 cables
- ☐ DC (power): 4 cables
- ☐ Control: 2 cables

### 2. Mains voltage

Select the correct mains voltage on the rear panel of the Master Router:

- ☐ 115V or 230V Fuse: 1.0 AT (slow blow)

### 3. Rack mounting

Each of the three units can be horizontally or vertically mounted in 19" racks.

- ☐ Master Control: H=133mm W=483mm D=260mm
- ☐ Monitor Control: H=88mm W=483mm D=260mm
- ☐ Master Router H=133mm W=483mm D=260mm

Allow additional 100mm depth for cables and connectors.

Please avoid mounting the units directly above very hot equipment. Although components capable of operating at high temperature are used in the MTC system, reliability can be affected if the ambient temperature is high.

### 4. Grounding

The audio ground is internally linked to the metal case in all three units.

Please note that the metal covers are anodised, which does not conduct electricity. Use the Ground Posts on the rear panels if the ground needs to be separately connected.

All XLR's have pin 1 connected to audio ground. The XLR shells are connected to the metal cases.

Screens should normally be connected at both ends on audio cables (pin 1).

If ground loops are created, which causes 'hum'; the screen should be disconnected at the external equipment end.

Do not lift mains earths as this could cause danger!

### 5. Inter-Connects

All the cables are labelled for easy identification and installation. Each end is marked with text that relates to a specific connector on one of the three back panels. This makes it easier to trace cables during and after the installation.

*Note:* Since all the audio cables have 3-pin XLR's, extra care should be taken to avoid mix-up as this could cause accidental feedback.

**Audio cables:**

	Master Router	Master Control
1	Input Return left	Input left
2	Input Return right	Input right
3	Insert Feed A left	Insert Feed A left
4	Insert Feed A right	Insert Feed A right
5	Insert Feed B left	Insert Feed B left
6	Insert Feed B right	Insert Feed B right
7	Insert Return left	Insert Return left
8	Insert Return right	Insert Return right
9	Output Feed left	Output left
10	Output Feed right	Output right
11	FX Send left	FX Send left
12	FX Send right	FX Send right
13	FX Return left	FX Return left
14	FX Return right	FX Return right

	Master Router	Monitor Control
1	Monitor Return left	Stereo input left
2	Monitor Return right	Stereo input right

**DC cables:****Switch:** 5 pin XLR, 3-way cable.

1 = +18V  
 3 = ground  
 5 = -18V

**Audio:** 4 pin XLR, 3-way cable.

1 = +U  
 2 = ground  
 4 = -U

	Master Router	Master Control
1	Master Control switch DC	DC Switch Input
2	Master Control audio DC	DC Audio Input

	Master Router	Monitor Control
1	Monitor Control switch DC	DC Switch Input
2	Monitor Control audio DC	DC Audio Input

**Control cables:**

	Master Router	Master Control
1	Master Control (from router)	Control Output (to router)

	Master Router	Monitor Control
1	Monitor Source use 1A or 1B	To Router

**6. User back panel audio connections****Monitor Control:**

1	Stereo meter send left
2	Stereo meter send right
3	Surround channel 1 input
4	Surround channel 2 input
5	Surround channel 3 input
6	Surround channel 4 input
7	Surround channel 5 input
8	Surround channel 6 input
9	Surround channel 1 output (to amp) (Can be used to feed stereo amp left)
10	Surround channel 2 output (to amp) (Can be used to feed stereo amp right)
11	Surround channel 3 output (to amp)
12	Surround channel 4 output (to amp)
13	Surround channel 5 output (to amp)
14	Surround channel 6 output (to amp)
15	Stereo output left (to amp) Not used if channel 1 is feeding the stereo amp
16	Stereo output right (to amp) Not used if channel 2 is feeding the stereo amp
17	Aux output left (to aux speaker amp)
18	Aux output right (to aux speaker amp)

**Master Router:**

1	Meter send left (or surround channel 1)
2	Meter send right (or surround channel 2)
3	Output left
4	Output Right
5	Output left
6	Output Right

## 7. Router front panel signal processor connections

### Inserts:

1	Insert 1 send left	notes:
2	Insert 1 send right	
3	Insert 1 return left	
4	Insert 1 return right	

5	Insert 2 send left	notes:
6	Insert 2 send right	
7	Insert 2 return left	
8	Insert 2 return right	

9	Insert 3 send left	notes:
10	Insert 3 send right	
11	Insert 3 return left	
12	Insert 3 return right	

13	Insert 4 send left	notes:
14	Insert 4 send right	
15	Insert 4 return left	
16	Insert 4 return right	

17	Insert 5 send left	notes:
18	Insert 5 send right	
19	Insert 5 return left	
20	Insert 5 return right	

21	Insert 6 send left	notes:
22	Insert 6 send right	
23	Insert 6 return left	
24	Insert 6 return right	

25	FX Send left	notes:
26	FX Send right	
27	FX Return left	notes:
28	FX Return right	

29	Output send 1 left	notes:
30	Output send 1 right	
31	Output send 2 left	notes:
32	Output send 2 right	

## 8. Router front panel aux connections

### Master Control / Monitor inputs:

33	Source 1 left	notes:
34	Source 1 right	
35	Source 2 left	notes:
36	Source 2 right	
37	Source 3 left	notes:
38	Source 3 right	
39	Source 4 left	notes:
40	Source 4 right	

### Monitor inputs:

41	Source 5 left	notes:
42	Source 5 right	
43	Source 6 left	notes:
44	Source 6 right	
45	Source 7 left	notes:
46	Source 7 right	
47	Work-Station left	notes:
48	Work-Station right	

In a full analogue surround system, Router channels 1 and 2 are also used for stereo, which makes the stereo input on the Monitor Control redundant. In a surround installation (6 channels) three routers are used with all six monitor returns connected to the surround monitor inputs.

There is a choice of using the meter feed from the back of the Monitor Control or the Router. For full surround systems the Router meter outputs are normally used to feed a multichannel surround meter. If a separate meter is used for stereo, the meter feed on the back of Monitor Control should feed this. All meter outputs follow monitor source select and meter offset.

If the front surround speakers are also used as main stereo speakers, the Monitor Control can be set up to feed the stereo signal to surround outputs 1 and 2.

*Note:* This does not affect the aux speakers feed.

When surround FOLD (-down to stereo) is selected the stereo signal is routed to:

- ☐ Main stereo speakers
- or*
- ☐ Surround speakers 1 & 2

*Note:* This is an internal set up and does not affect aux speakers feed.

## 9. D-sub connectors for control signals

There is one 25-way cable between the Master Router and each of the other two units: Standard computer RS232 (fully connected), plug to socket, cable.

In addition there is a through connector for monitor control signals on the Master Router back panel. This should be used to link several (surround) routers.

The Master Control has three identical (parallel) *male* outputs. For a stereo system only one is used to connect to the Master Router.

The Monitor Control has two *female* D-sub connectors:

1. 25-way connector, which is connected to the Master Router.
2. 9-way connector, which can be used to access the following functions:
  - ☐ Surround mode. Closing contact between pin 1 and 6.
  - ☐ Alt speakers. Closing contact between pin 2 and 7.
  - ☐ Meter offset. Closing contact between pin 3 and 8.

These contact closures can be used for switching external equipment or indicators.

Do not use for direct audio switching!

## 10. FOLD (-down to stereo)

FOLD can only be selected in surround mode. The surround channels are mixed to stereo:

input	left output	right output
Ch-1 (LEFT)	-3.5dB	
Ch-2 (RIGHT)		-3.5dB
Ch-3 (C)	-7dB	-7dB
Ch-4 (LFE)	-7dB	-7dB
Ch-5 (Ls)	-3.5dB	
Ch-6 (Rs)		-3.5dB

## 11. Input CUT (switches)

The Cut's are located at the input *before* the FOLD circuits. You can therefore select the channels that are folded and monitor any channel(s) in the front speakers.

The FOLD output is fed into the same point as the stereo monitor input. This enables the use (for the whole stereo FOLD mix) of:

- ☐ L<>R (left and right channels reverse)
- ☐ Phase reverse
- ☐ Mono
- ☐ Aux speakers

The FOLD function could be compared with the MONO button, in normal stereo mode, with the additional benefit of being able to 'move' all channels to the front. It is not intended as a tool for producing stereo masters from surround programmes.

*Note:* The Cut switches for C, Ls, Rs and LFE are only active in surround mode!

## 12. FX Send and Return

The FX send and return is located at the input point of the output section of Master Control just before the output level and stereo image controls.

The output fader can be used to set the return level.

fader switch	return switch	output gain	return gain
out	out	fixed 0dB	off
out	in	fixed 0dB	via fader
in	out	via fader	off
in	in	via fader	fixed -10dB

The send gain is fixed to 0dB.

*Note:* The fixed return gain (-10dB) can be specified to between 0dB and -60dB.

## 13. Inputs

The signal path inputs are balanced and floating. They are symmetrical with identical impedance for pins 2 and 3 (both pins must be connected and for unbalanced sources one of them must be grounded).

## 14. Outputs

They are electronically balanced with symmetrical impedance for pins 2 and 3.

For unbalanced equipment either 2 or 3 must be grounded.

The output level remains the same for balanced and unbalanced operation.

## 15. Inserts

All inserts that are not selected into the signal path receive their signal directly from the input section of Master Control (post filters). This signal is labelled 'INSERT FEED B' and enables monitoring and A/B comparison of all inserts at all times (even when they are not in circuit).

Insert 6 can be selected PRE or POST fader on Master Control:

- ☐ Pre fader: Immediately after insert 5
- ☐ Post fader: After the output of Master Control but before the output XLR's on the Master Router front panel (Tape 1 & 2 Record Feeds and Output Sends 1 & 2).



## 16. Options

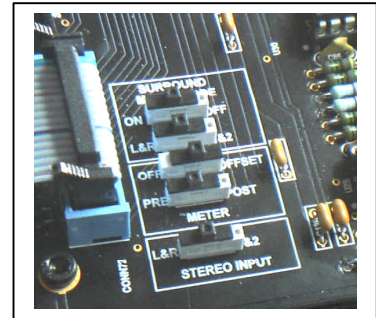
### 16.1 Monitor Control (7 slide switches on top pcb)

Meter Feed:

- ☐ Offset On/Off.
- ☐ Stereo source: Left & Right or Surround channels 1 & 2.
- ☐ Pre/Post: Cut, L&R Reverse, Phase Reverse and Mono.
- ☐ On/Off in Surround mode.
- ☐ Stereo or Surround inputs 1 & 2 in surround mode.

Stereo Speaker Feed:

- ☐ Main Stereo output or Surround channels 1 & 2.
- ☐ Fold (down) output to Main Stereo output or Surround channels 1 & 2.  
(Note: The Stereo output options do not affect the Aux speakers feed.)



Monitor Meter option switches

### 16.2 Master Router (3 slide switches on bottom pcb)

Meter Feed:

- ☐ On/Off in Surround mode.

SOURCE 7 Monitor Source:

- ☐ FX Return. With this option the SOURCE 7 monitor input on the lower row is unused.
- ☐ ALT Speaker switch on Monitor Controls toggles the input source between:
  1. SOURCE 7 - when ALT is off
  2. FX Return - when ALT is on.

## 17. D connector for control signals

There is a 9-way D connector on the Monitor Control back panel. This connector is used to access contacts that are closing when the following functions are activated:

- ☐ Surround mode      pin 1 and 6
- ☐ Alt speakers        pin 2 and 7
- ☐ Meter offset        pin 3 and 8

These contact closures can be used for switching external equipment or indicators.  
Do not use for direct audio switching!

## 18. FOLD (-down to stereo)

When FOLD is selected in surround mode channels 1-6 are mixed to stereo:

input	left output	right output
ch-1 (LEFT)	-3.5dB	
ch-2 (RIGHT)		-3.5dB
ch-3 (C)	-7dB	-7dB
ch-4 (LFE)	-7dB	-7dB
ch-5 (Ls)	-3.5dB	
ch-6 (Rs)		-3.5dB

## 19. Monitor Input CUT (switches)

The Cut's are located at the input before the FOLD circuits. You can therefore select the channels that are folded and monitor any channel(s) in the front speakers.

The FOLD output is fed into the same point as the stereo monitor input. This enables the use (for the *whole* stereo FOLD mix) of:

- ☐ L<>R (left and right channels reverse)
- ☐ Phase reverse
- ☐ Mono
- ☐ Aux speakers

The FOLD function could be compared with the MONO button in normal stereo mode with the additional benefit of being able to 'move' all channels to the front. It is not intended as a tool for producing stereo masters from surround programmes.

*Note:* The Cut switches for C, LS, RS and LFE are only active in surround mode!

## 20. FX Send and Return

The FX send and return is located at the input point of the output section of Master Control just before the output level controls. The returns are enabled by depressing the FX switch(es).

Return: The FX return input is mixed with the transfer signal.

Insert: The FX Send/Return becomes an *insert* located at the input of the output section.

The *stereo* output fader can be used to set the return level depending on the MTC-2 (stereo) Master Control FADER and RETURN switches:

MTC-2 fader switch	MTC-2 return switch	MTC-2 output gain	MTC-2 return gain	MTC-6 return gain
out	out	fixed 0dB	off	via fader
out	in	fixed 0dB	via fader	via fader
in	out	via fader	off	preset: -10dB
in	in	via fader	preset: -10dB	preset: -10dB

The send gain is fixed to 0dB.

*Note:* The *preset* return gain (-10dB) can be set to between 0dB and -60dB.

The output fader controls the FX Return levels for all six channels in a full (MTC-6) surround system. It can however only control the output levels of the front Left and Right channels.

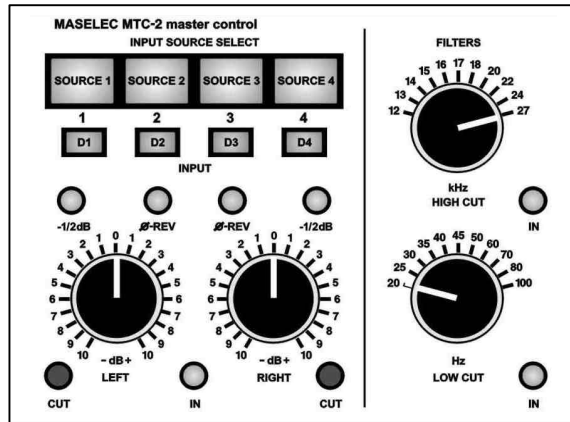
## 21. MTC-2 Master Control (stereo) channels 1 and 2

The Master Control consists of three sections:

### 21.1 Input section:

The input is selected from four different analogue sources and is then routed through +/-10dB level, phase reverse and cut controls for both channels.

Low Cut filters, 20Hz-100Hz, and High Cut filters, 12kHz-27kHz, are located just before the signal goes to the inserts.

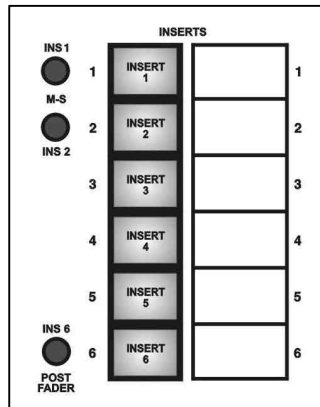


The digital AES source for a converter can be selected with a simple-to-use, four-into-one, passive selector: D1 to D4.

### 21.2 Inserts:

The inserts are hard-switched, without adding electronics to the audio path.

When an insert is not selected, its input receives signal from a separate feed. This assures isolation from the signal path but still provides signal for A-B comparisons. It also keeps compressors and other dynamic processors 'active'.



Inserts 1 and 2 can be switched to M-S (sum & difference). The left channel is the sum and the right channel is the difference.

This function can be used to modify stereo images with equalisers, filters, compressors, de-essers, etc.

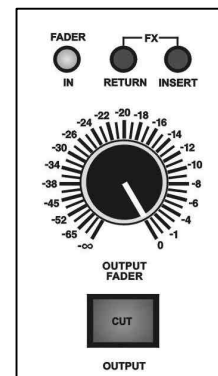
Insert 6 can be switched to 'POST FADER', moving it to after the output section.

### 21.3 Output section:

After the inserts, the signal is routed to the output section.

FX send and return (which can also be used as an additional insert) is located at the input of this section. See section 20 for detailed description.

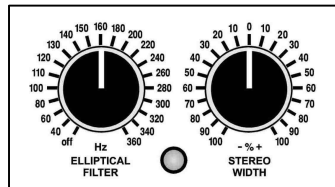
The output level can be controlled with the fader and the CUT switch.



The stereo image can be modified with two controls:

1. Elliptical filter:

This puts stereo signals, below 40Hz to 360Hz, into the centre of the image and cuts 'out-of-phase' signals without altering the mono sound.



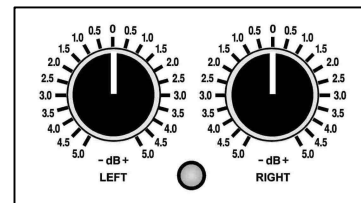
The elliptical filter can be used for subjective (artistic) adjustments and is essential for analogue disk cutting.

2. Stereo width:

This function adjusts the stereo width, +/-100%, without affecting the mono level. Not only can this improve stereo imaging, but it is also a powerful tool in combination with the elliptical filter (-100%=mono).

Both stereo image tools are designed around a minimum electronic configuration and do not use M-S matrixes. They are 100% mono compatible.

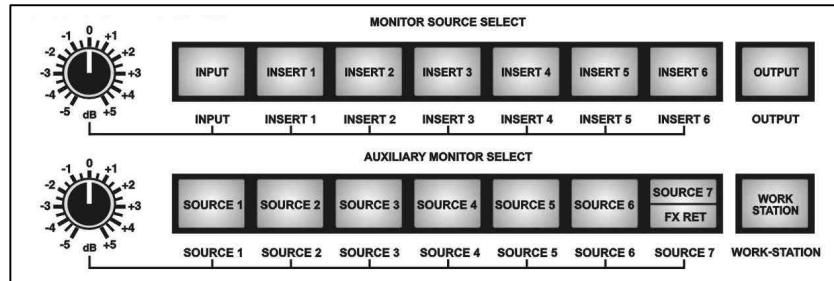
The output level can be adjusted in ½ dB steps and the rotary fader can be inserted immediately before the output.



- ❑ The 'POST FADER' option for Insert 6 is normally used when equipment need to be closely matched to the input of the destination. If a peak limiter is used to protect an A-D converter from 'overs', it should be connected to Insert 6 with the post function switched in.
- ❑ All functions on the Master Control are normally bypassed.

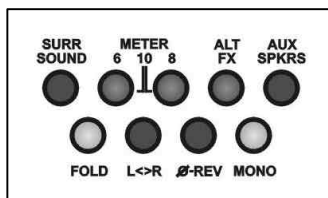
## 22. MTC-6 Monitor Control

The Monitor Control is linked to the Master Router where the actual source switching takes place. The transfer chain is isolated from all monitor points with balanced, high impedance amplifiers. Because audio switching is done at source, monitoring functions do not extend the transfer signal path, yet all points in the path can be monitored and A-B compared.



16 monitor inputs:

- ☐ Input (post filters) and Inserts 1 to 6. Trim: +/-5dB.
  - ☐ Source 1 to Source 7 Trim: +/-5dB.
  - ☐ Output (post insert 6 if 'POST FADER' is engaged): No level trim.
  - ☐ Workstation (analogue return): No level trim.
- 
- ☐ SURR SOUND changes the monitor to surround mode and activates the six separate surround inputs and outputs.



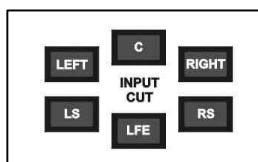
- ☐ METER switches (two) engages 6dB, 8dB or 10dB meter offset.
- ☐ ALT FX remote switches (a) external functions or (b) monitor of FX return.
- ☐ AUX SPEAKERS routes the stereo output to auxiliary speakers.
- ☐ FOLD down-mixes the surround channels to stereo.
- ☐ L<>R Reverse flips left and right on the stereo input (including FOLD mixes).
- ☐ PHASE REVERSE changes the left channel's phase (including FOLD mixes).
- ☐ MONO folds stereo to mono (including FOLD mixes). Can be used to monitor the sum signal when the M-S function is used.

Engaging the phase reversal and mono switches simultaneously enables monitoring of the difference between left and right channels ('S' signal). This can be used for balancing left and right and for monitoring the vertical cut when cutting analogue disks. It can also be used for monitoring the difference signal when the M-S function is used.

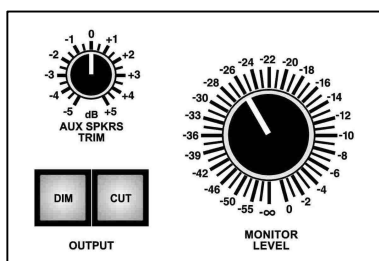
Mono and stereo monitoring levels remain compatible regardless of the various monitor switch selections. Unless either left or right is cut, the mono switch reduces levels with -6dB.

The 'ALT FX' switch can be used to monitor the FX return. With this option the 'SOURCE 7' switch selects the FX Return as monitor source if 'ALT FX' is also engaged.

With the 'ALT FX' switch in the 'off' position 'SOURCE 7' selects analogue input SOURCE 7 (located on the lower row on the Router).



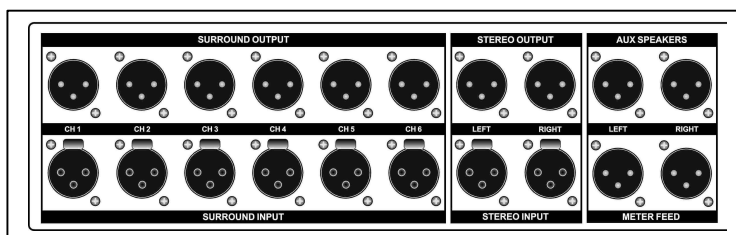
INPUT CUT switches cut the signal at the monitor input. This makes it possible to isolate and monitor individual channels in surround mode.



- ❑ The Aux Speakers output has a stepped +/-5dB level trim.
- ❑ All speaker levels are controlled by the main MONITOR LEVEL control (24 steps).
- ❑ DIM reduces the output proportionally to the setting of the Monitor Level control: -26dB at full level (0dB) and -6dB at the lowest level (-55dB).
- ❑ CUT separates the outputs galvanically from the electronics. Non-activated outputs are cut in this way.

There are four groups of Monitor outputs:

1. Main stereo speakers
2. Aux stereo speakers
3. Surround speakers
4. Stereo meters



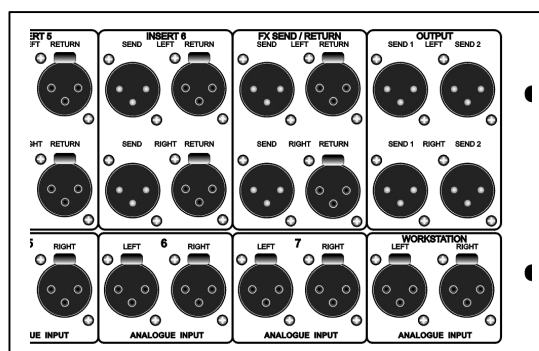
The main stereo speakers can be set up to be fed from surround outputs 1 and 2, making it easier to share the same front left and right speakers for both stereo and surround.

## 23. Master Routers

Auxiliary equipment is connected to the Front Panel XLRs of the Routers.

The integrated Patch Panels make rearranging, changing and adding equipment easy. The scribble pad, on the MTC-2 Master Control, can be used to keep track of equipment changes.

When an insert is activated, it is automatically put in series with the signal path without routing the signal through additional electronics.



The main Power Supplies are located in the Master Router with additional remote DC regulation in the Master Control and Monitor Control units.

Master Control 25-way Male D-Sub:

1	Insert 1	14	Insert 2
2	Insert 3	15	Insert 4
3	Insert 5	16	Insert 6
4	M-S	17	Insert 6 Post
5	FX Insert	18	Source 4 input select
6	Source 3 input select	19	Source 2 input select
7	Source 1 input select	20	MTC-6 FX return gain DC feed
8	From: MTC-6 FX Return Switch	21	To: MTC-6 Output Cut
9	Insert 1	22	Insert 2
10	Insert 3	23	Insert 4
11	Insert 5	24	Insert 6
12		25	
13			

Monitor Control 25-way Female D-Sub:

1	Source 1	14	Source 2
2	Source 3	15	Source 4
3	Source 5	16	Source 6
4	Source 7	17	Workstation
5	Input	18	Insert 1
6	Insert 2	19	Insert 3
7	Insert 4	20	Insert 5
8	Insert 6	21	Output
9	Meter Offset –6dB	22	Meter Offset –8dB
10		23	
11		24	Surround Mode
12	ALT FX	25	
13			

Monitor Control 9-way Female D-Sub:

1	Surround Mode. Common	6	Surround Mode. N.O.
2	ALT FX Common	7	ALT FX N.O.
3	Meter Offset. Common	8	Meter Offset. N.O.
4		9	
5			

## 24. MTC-2 Specification

- ❑ All inputs and outputs are balanced.

### Inputs:

- Line Input ..... 50kohms
- Monitor Inputs ..... 100kohms
- Insert Returns 1 to 6..... 50kohms
- FX Return..... 10kohms
- Maximum Level ..... +28dBu

### Transfer Outputs:

- Maximum Level ..... +29dBu
- Output Impedance ..... 34ohms

### FX Send Outputs:

- Maximum Level ..... +28dBu
- Output Impedance ..... 43ohms

### Monitor Outputs:

- Maximum Level ..... +24dBu
- Output Impedance ..... 66ohms

### Meter Output (Monitor Control):

- Maximum Level ..... +28dBu
- Output Impedance ..... 43ohms

### Meter Output (Master Router):

- Maximum Level ..... +28dBu
- Output Impedance ..... 43ohms

### Transfer Signal Path:

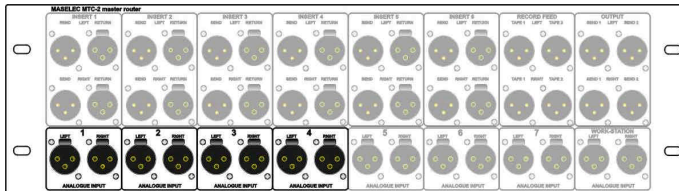
- Noise..... <-95dBu
- Distortion..... <-105dB
- Dynamic range..... > 124dB



## 25. Master Router connections:

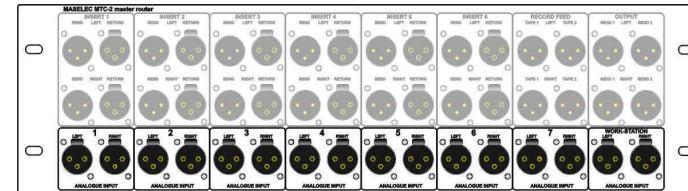
### Line Inputs

Analogue source equipment that can be selected as Master Control Inputs: Source 1 to Source 4.



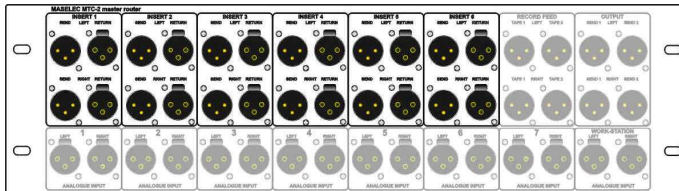
### Monitor Inputs

Analogue monitor sources: Source 1 to Source 7 and WorkStation.



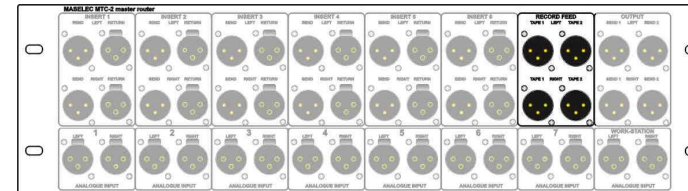
### Inserts

Signal Processing Equipment.  
Top row: Left channel  
Lower row: Right channel



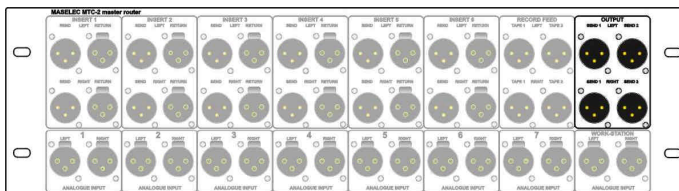
### FX Send and Return

Signal Processing Equipment.  
Top row: Left channel  
Lower row: Right channel



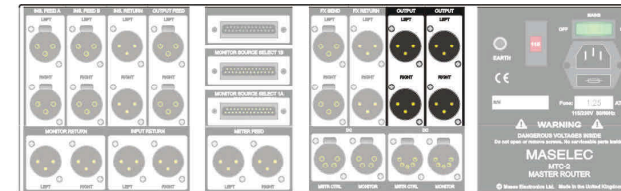
### Line Output

Analogue output. Connect to equipment for easy "patching".  
Top row: Left channel  
Lower row: Right channel



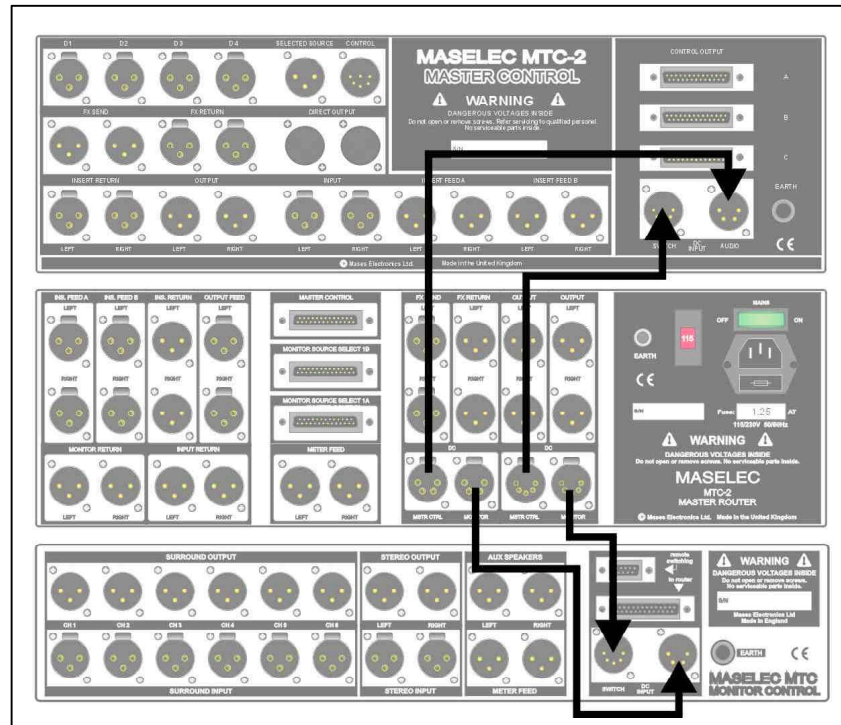
### Line Output

Analogue output. Connect to equipment that do not need "patching".  
Top row: Left channel  
Lower row: Right channel

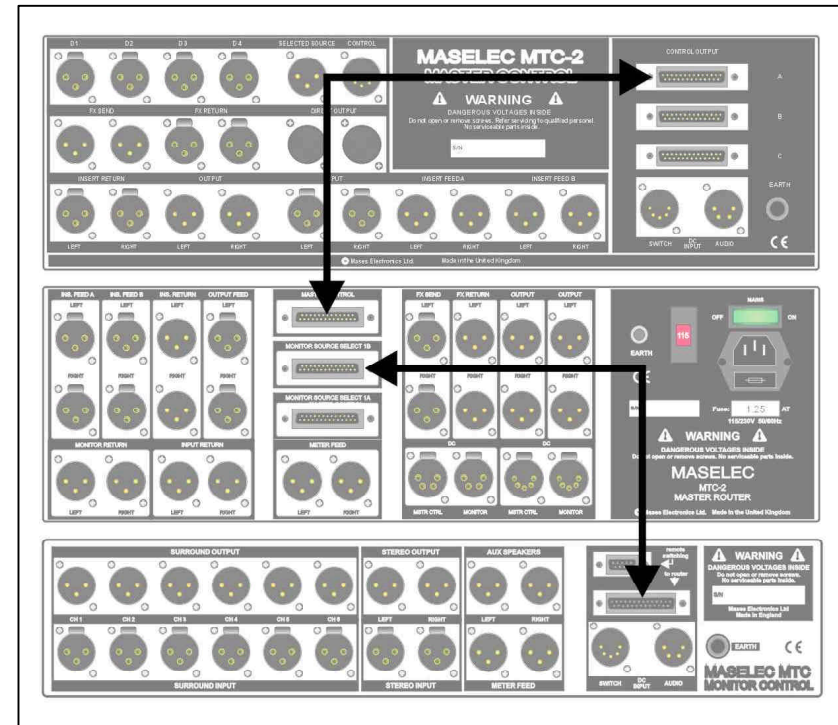


## 26. Inter-Connections:

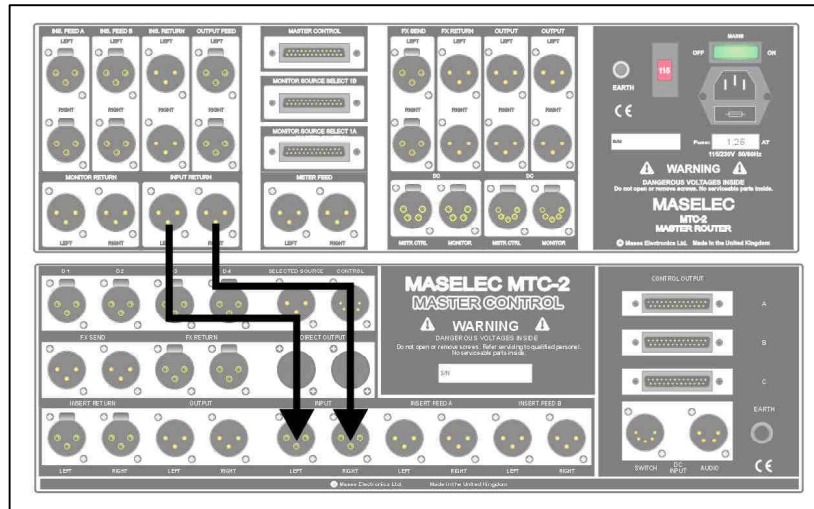
### DC Cables



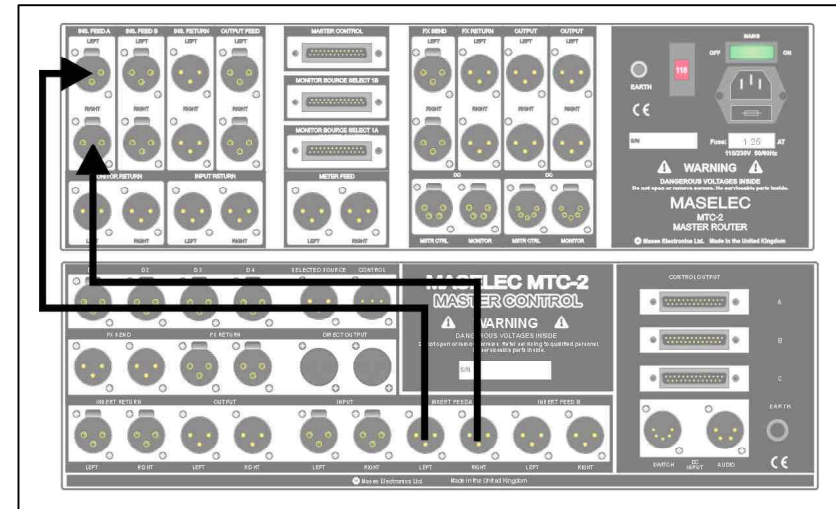
### RS232 Control Cables



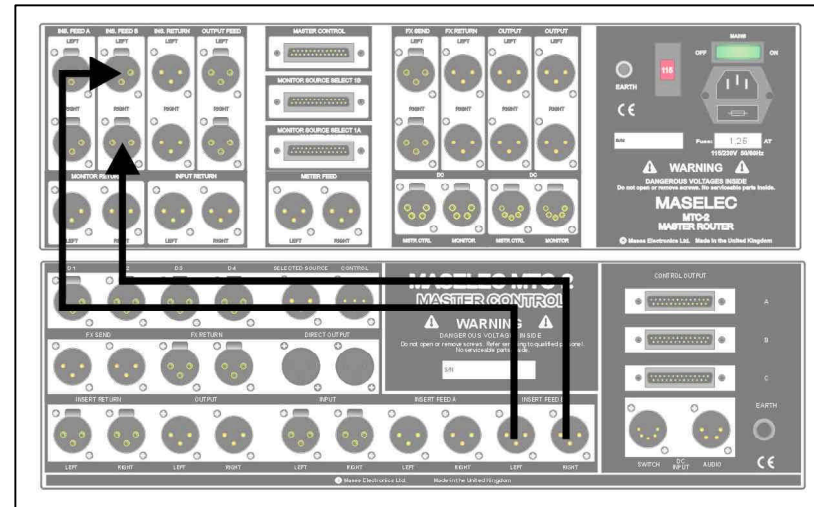
## Input Return



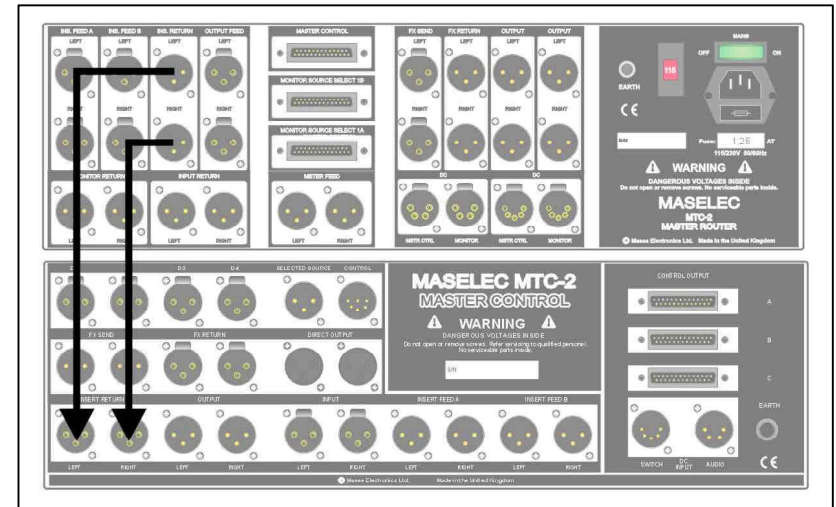
## Insert Feed A



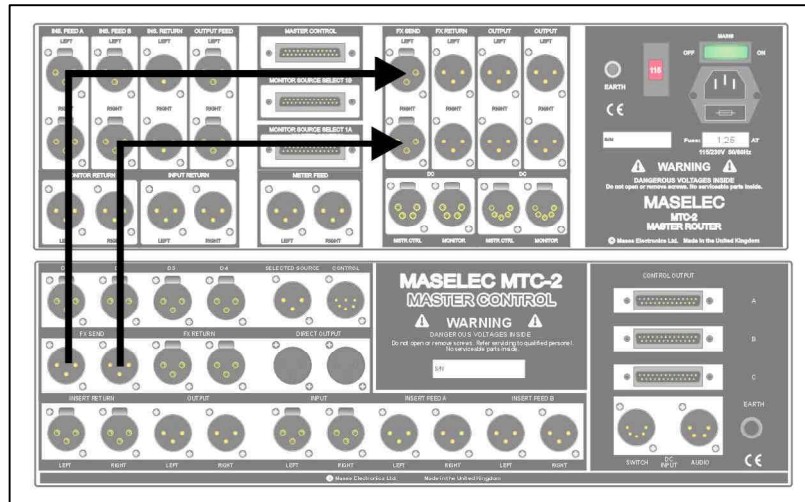
## Insert Feed B



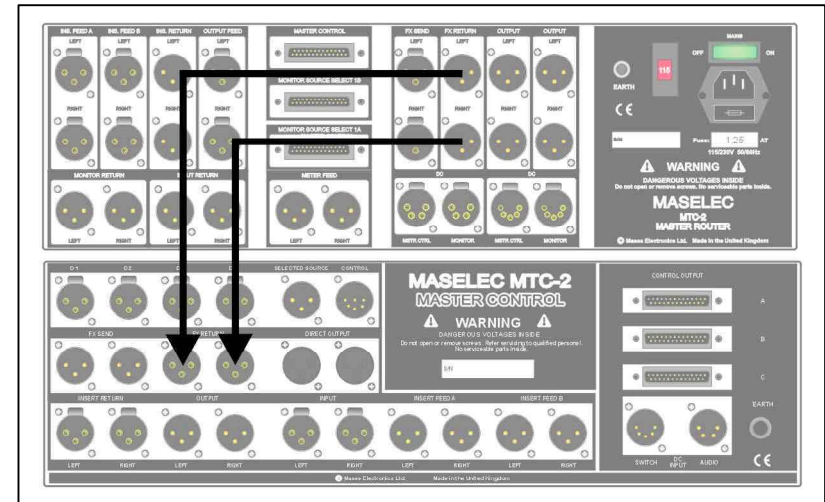
## Insert Return



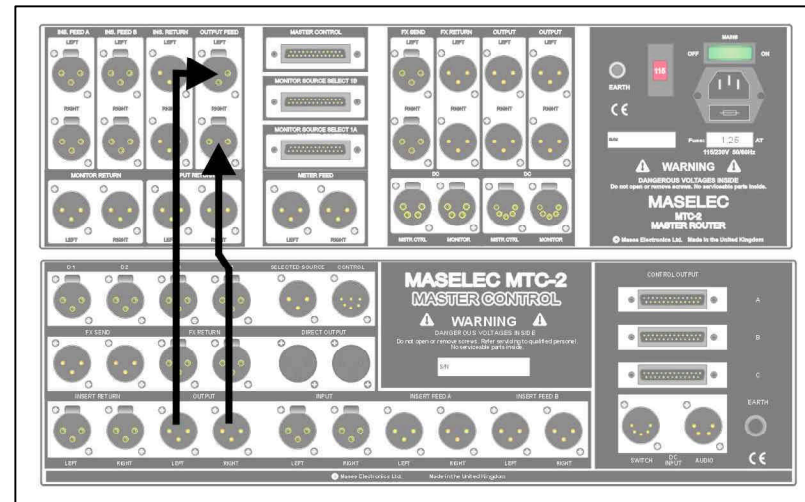
## FX Send



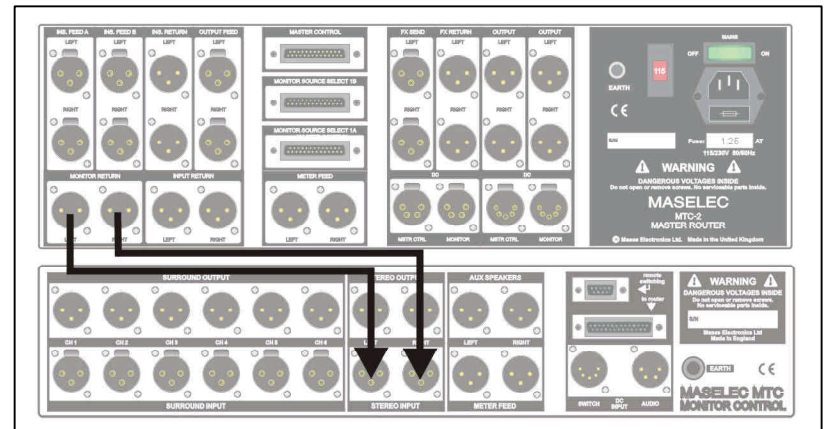
## FX Return



## Output Feed



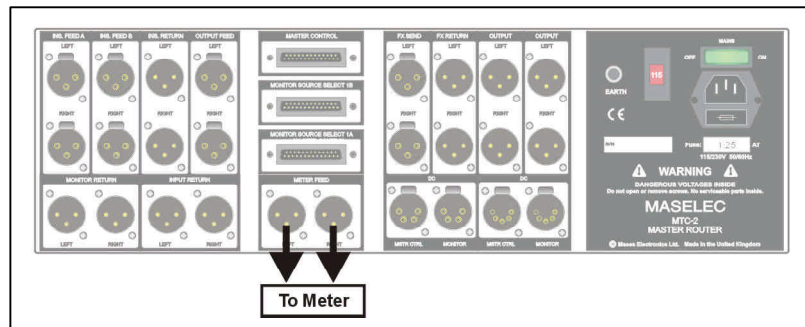
## Monitor Return



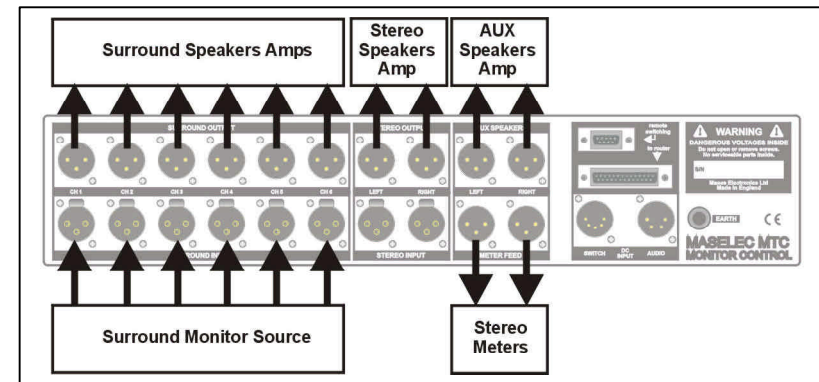


## 27. Other connections:

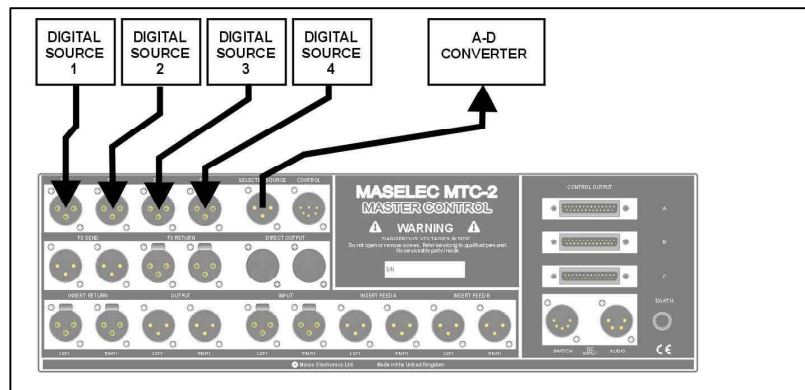
### Meter Feed (surround or stereo)



### Monitor Connections



### Digital AES Connections



### Suggested cable 'dressing'

