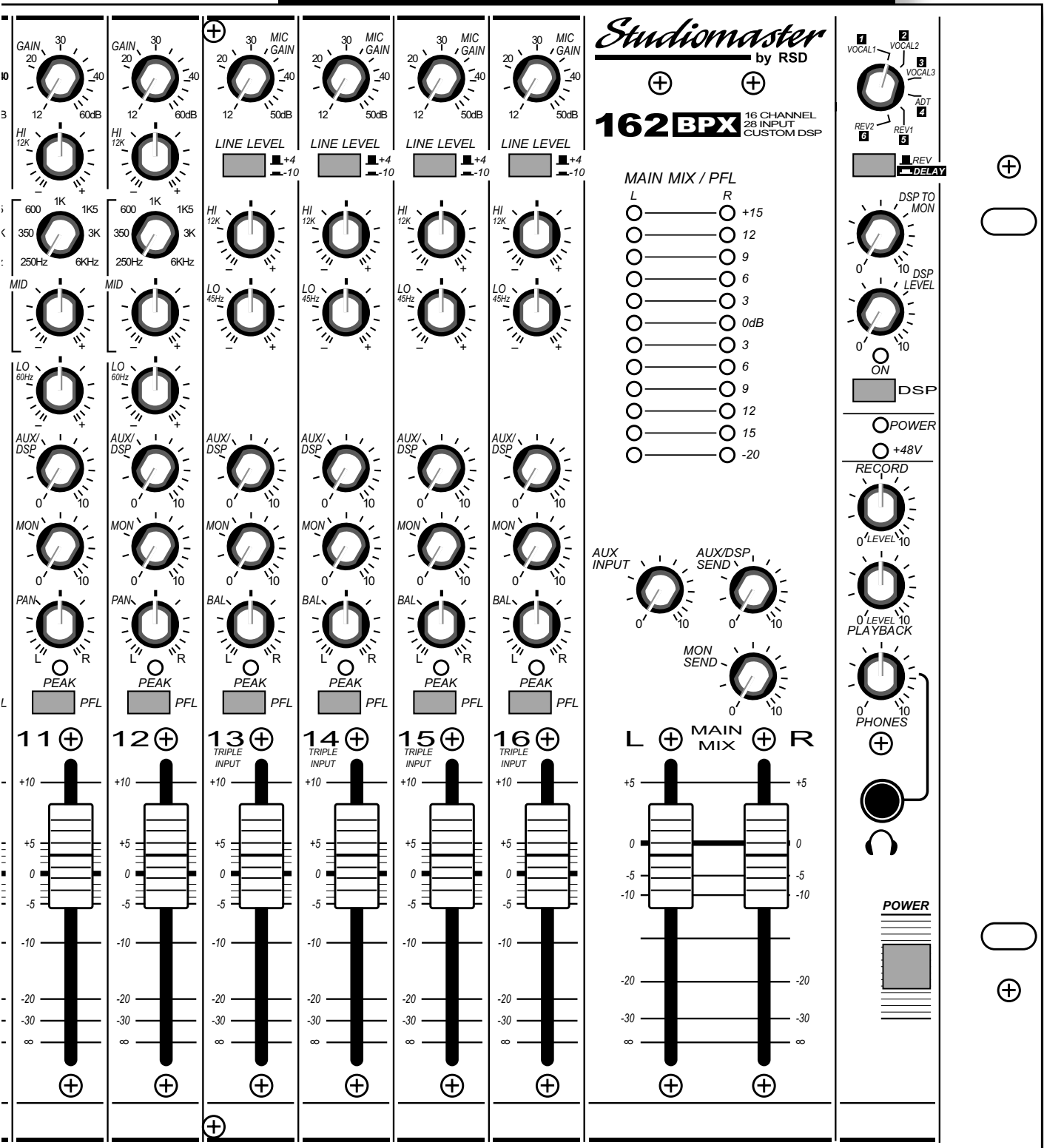


Studiomaster

by RSD



162 BPX 16 CHANNEL
28 INPUT
CUSTOM DSP

**USER
GUIDE**

162BPX

INDEX

1	Introduction
1	Read the User Guide
1	Unpacking
1	Safety Instructions
2	Controls & Features - Mono channels 1-12
3	Controls & Features - Mono/Stereo channels 13-16
4	Controls & Features - Output / DSP Section
5	Controls & Features - Rear Panel Output Section
6	Controls & Features - Rear panel Input Section
7	Trouble Shooting
7	Internal Options
8	Wiring Connections
9	Technical Specification
10	Warranty
11	Service Information

162BPX

INTRODUCTION

Thank you for buying this Studiomaster product. The 162BPX is a 16 channel, 28 input compact audio mixer designed specifically for the requirements of the working sound engineer.

The 162BPX features ultra quiet mic preamps, renowned Studiomaster EQ and ease of use, all housed in a stylish 6U rack mountable package.

The 162BPX also features Studiomaster's custom designed DSP providing ultra clean reverbs and delay effects to enhance the vocal performance.

READ THE USER GUIDE

Despite the sophisticated design the 162BPX is very easy to use although to get the best from your new purchase, we recommend you read this User Guide before getting down to any serious work.

It also contains important safety information as well as practical hints.

UNPACKING

Remove your Studiomaster product from its packing and ensure that along with this User Guide you have an A.C. power cord / mains lead and a warranty card.

Retain the packing carton in the eventuality that the unit needs to be returned for service or repair, and please complete and return your warranty card. Returning the completed warranty card does not diminish your statutory rights in any way.

SAFETY INSTRUCTIONS

1. Before connecting the A.C. power cord make sure the Voltage selector (located on the rear panel) is set to your local supply voltage. See Voltage selector on Page 6.
2. Only use the A.C. power cord / mains lead supplied with the product. Replace if it becomes damaged in any way.
3. Never operate without, or remove the safety ground (earth) from the A.C. power cord / mains lead.
4. Do not attempt to remove screws or panels on your 162BPX audio mixer. There are no user serviceable parts inside.
5. Do not operate the unit next to heat sources such as radiators.
6. The unit should not be operated or stored near rain or moisture.
7. This equipment must not be exposed to dripping or splashing and no objects filled with liquids should be placed on top of it.
8. Write the serial number in the box provided in the Warranty section for future reference.
9. If the unit gets damaged, has been dropped or appears to have developed a fault refer to the Service Information section for details.

WARNING

THIS APPARATUS MUST BE EARTHED (GROUNDED)

CONTROLS & FEATURES

WHAT HAPPENS IF I PRESS THIS?

Controls & Features - Mono Channels 1-12

- 1 **GAIN** : The Gain control is used to match the incoming signal level to the internal operating level of the 162BPX. This ensures the best performance, reduces noise and avoids distortion. The Mic Gain range is 12 to 60dB
- 2 **HI** : The HI control cuts or boosts the high frequency (or treble) element of the sound. In the centre (12 o'clock) position, the sound is unaffected. The HI control works at 12kHz.
- 3 **MID** : The MID consists of two controls. The lower control operates in the same way as the HI & LO. The upper control (the 'sweep') adjusts the frequency at which it operates. The MID frequency sweep control adjusts between 250Hz and 6kHz.
- 4 **LO** : The LO control operates in the same way as the HI control except that it affects the low frequency (bass) part of the sound. The LO control operates at 60Hz.

Tone controls : HI, MID & LO

The controls marked HI, MID and LO are very useful for changing the characteristics or tone of the sound. For simplicity or for new users set these controls to the centre position, which effectively turns off or bypasses the tone control section and you will not need to worry about these controls until you feel more confident.

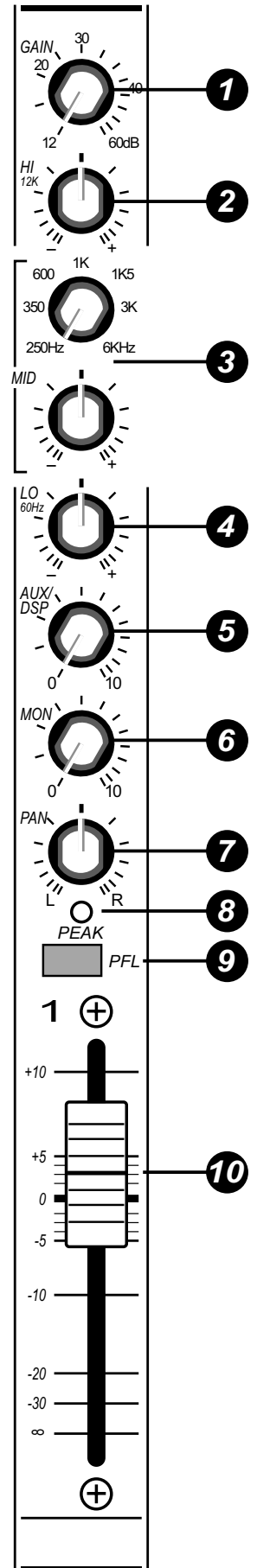
However to get the best out of your audio system or if you just want to experiment read on....

Adding a little HI on CDs can add brightness to the sound. For microphones increasing the MID ranges tends to 'lift' the vocal adding clarity to the voice.

For CDs, adding LO makes the bass section of music more prominent. For microphones doing the opposite and removing a little bass helps stop the 'popping' or 'boomy' sound often apparent when a microphone is used too close to the mouth.

For best results with microphones or CDs, don't be over enthusiastic with the tone controls as this can make the sound unnatural. With guitars or other instruments more extreme tone setting can be used to create more of a sound effect.

- 5 **AUX/DSP** : The AUX/DSP control is assigned post - fader and used to send the sound in the channel to the internal DSP (digital signal processor). The sound is also sent to the AUX SEND output for use with external effects processors.
- 6 **MON** : The MON control can be used when an additional or different mix of sound is required (such as using stage monitor speakers or multiple headphones for the musicians). As the MON control is turned clockwise more of the sound in the channel is routed, via the MON SEND control (24), to the MON SEND output on the rear panel. This would then be connected to an amplifier to power the stage monitor speakers or headphone system. Mon and AUX controls are very similar except that adjusting the channel fader does not affect the sound at the MON SEND. Musicians listening to the sound from the MON SEND do not want it changing when a channel fader is adjusted. The opposite is required when an effects loop is used, the effect needs to change with the position of the channel fader. This keeps the blend of original and treated signal constant.
- 7 **PAN** : Adjusts the position of the channel signal between left or right output channel.
- 8 **PEAK** : The Peak LED indicates that the channel signal is approaching its maximum level. If the Peak LED remains lit, reduce the channel GAIN (1) control setting until the LED flashes only on signal peaks.
- 9 **PFL** : Depressing the PFL (pre fade listen) button allows the selected channel (or channels) to be monitored via the headphone output. When the PFL button is activated the Peak LED stays fully illuminated and the level is also shown on the Main Mix bargraph meters.
- 10 **FADER** : The fader adjusts the level from the channel to the main output. The fader acts as a volume control for each channel. they join all the various sounds together creating a blend or 'mix' of sounds. The long, smooth faders make small adjustments easy as well as giving a visual representation of sound levels. In use, aim to set the fader at the 0dB position. It can then be raised or lowered to adjust the sound (mix).



CONTROLS & FEATURES

WHAT HAPPENS IF I PRESS THIS?

Controls & Features - Mono/Stereo Channels 13-16

11 **MIC GAIN** : Sets the level of the incoming mic signal. The mic gain range is 12 to 50dB.

12 **LINE LEVEL** : This sets the level of the incoming stereo line signal. In the out (or up) position the gain structure is optimised for +4dB operation. The in (or down) position matches the input channel to signal levels of -10dBV.

The Gain control (or LEVEL switch) allows the signal coming into the 162BPX to be matched (as close as possible) to the internal operating level helping to preserve the 'signal to noise ratio' throughout the 162BPX. The line level switch will also increase the gain of the mic signal. This can be useful if the mic gain at maximum is not enough in certain situations.

13 **HI** : The HI control cuts or boosts the high frequency (or treble) element of the sound. In the centre (12 o'clock) position, the sound is unaffected. The HI control works at 12kHz.

14 **LO** : The LO control operates in the same way as the HI control except that it affects the low frequency (bass) part of the sound. The LO control operates at 45Hz.

15 **AUX/DSP** : The AUX/DSP control is assigned post - fader and used to send the sound in the channel to the internal DSP (digital signal processor). The sound is also sent to the AUX SEND output for use with external effects processors.

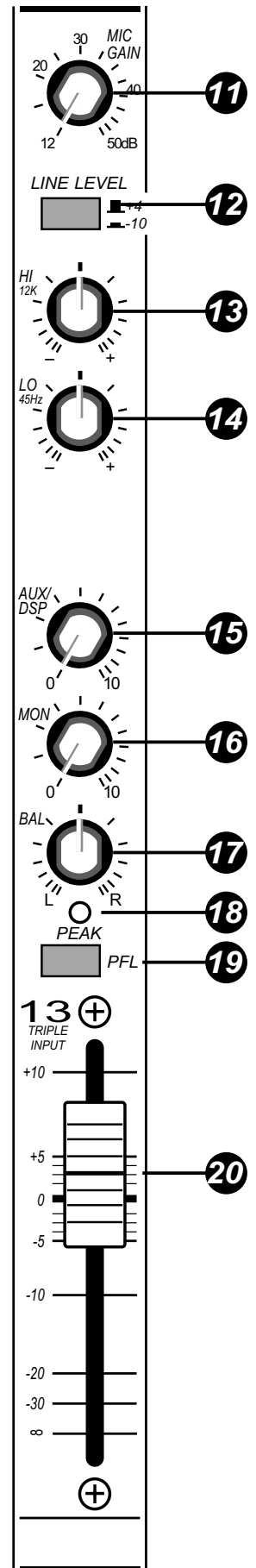
16 **MON** : The MON control can be used when an additional or different mix of sound is required (such as using stage monitor speakers or multiple headphones for the musicians). As the MON control is turned clockwise more of the sound in the channel is routed, via the MON SEND control (24), to the MON SEND output on the rear panel. This would then be connected to an amplifier to power the stage monitor speakers or headphone system. Mon and AUX controls are very similar except that adjusting the channel fader does not affect the sound at the MON SEND. Musicians listening to the sound from the MON SEND do not want it changing when a channel fader is adjusted. The opposite is required when an effects loop is used, the effect needs to change with the position of the channel fader. This keeps the blend of original and treated signal constant.

17 **BAL** : BALANCE - Sets the Left / Right balance of the stereo line signals or pans the mic signal.

18 **PEAK** : The Peak LED indicates that the channel signal is approaching its maximum level. If the Peak LED remains lit, reduce the channel GAIN control setting until the LED flashes only on signal peaks.
Note : On stereo line channels the input level is adjusted using the level switch. If the peak LED remains lit, it may be necessary to reduce the output volume of the equipment connected to the channel.

19 **PFL** : Depressing the PFL (pre fade listen) button allows the selected channel (or channels) to be monitored via the headphone output. When the PFL button is activated the Peak LED stays fully illuminated and the level is also shown on the Main Mix bargraph meters.

20 **FADER** : The fader adjusts the level from the channel to the main output. The fader acts as a volume control for each channel. they join all the various sounds together creating a blend or 'mix' of sounds. The long, smooth faders make small adjustments easy as well as giving a visual representation of sound levels. In use, aim to set the fader at the 0dB position. It can then be raised or lowered to adjust the sound (mix).

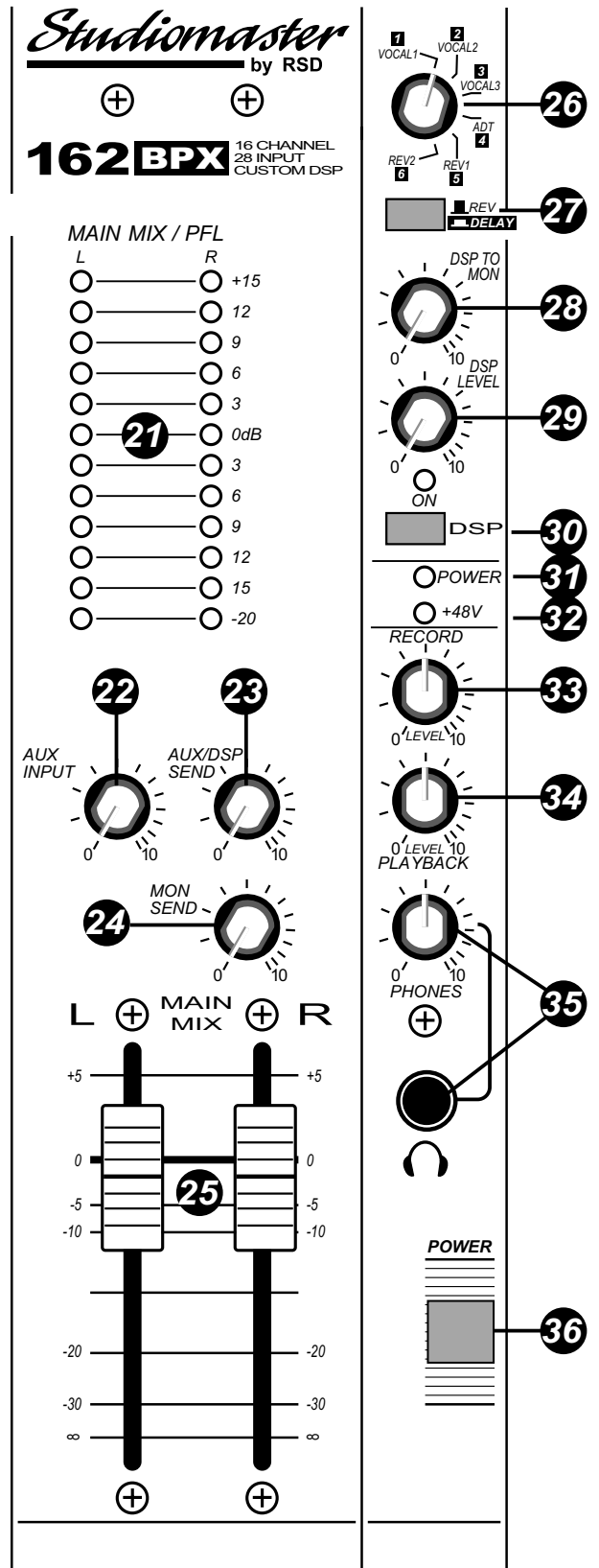


CONTROLS & FEATURES

WHAT HAPPENS IF I PRESS THIS?

Controls & Features - Output / DSP Section

- 21 **METERS** : The meters have a PPM characteristic and normally monitor the Left and Right stereo mix.
When one or more PFL buttons are depressed, the meters automatically switch to monitoring the PFL buss.
- 22 **AUX INPUT** : Controls the level of signals sent to the MAIN MIX output from stereo aux input connectors (44).
- 23 **AUX/DSP SEND** : Controls the overall signal level sent from each channel to the internal DSP and AUX SEND OUTPUT.
- 24 **MON SEND** : Controls the overall signal level sent from each channel to the MON SEND OUTPUT.
- 25 **LEFT & RIGHT FADERS** : These faders control the level of the main mix to the left and right outputs (40).
- 26 **DSP PROGRAM** : The rotary program switch selects any of 6 Reverb effects or 6 delay programs.
- 27 **DSP BANK SWITCH** : This switch selects either reverb or delay effects when choosing your effect from the rotary program switch.
- 28 **DSP TO MON** : Routes the sound from the DSP to the MON SEND control / output.
- 29 **DSP LEVEL** : Controls the amount of sound from the DSP sent to the main mix. The sound then mixes with the original untreated sound giving the required effect.
- 30 **DSP ON/OFF** : Turns on and off the selected DSP program.
- 31 **POWER LED** : The Power LED indicates the 162BPX is switched on.
- 32 **+48V LED** : Indicates that +48V phantom power is available to microphone channels (see rear panel switch 39).
- 33 **RECORD LEVEL** : Controls the level to the RECORD Left/Right RCA phono sockets on the rear panel (37).
- 34 **PLAYBACK LEVEL** : Controls the level from the PLAYBACK Left/Right RCA phono sockets on the rear panel (38).
- 35 **PHONES** : Controls the headphone output level. The headphones monitor the MAIN MIX or PFL signal (if more than one PFL buttons are depressed).
The Phones jack will accept stereo headphones with a 1/4" stereo TRS jack. Wired Tip=Left, Ring=Right, Sleeve=Ground.
The best headphones to use with the 162BPX are studio grade 150-400ohm types, although most types can be used but may not sound as loud.
WARNING : Care should be taken when using headphones as prolonged excessive volume can damage hearing.
- 36 **POWER** : Turns the 162BPX On or OFF.



DSP PROGRAMS

Reverb effects	Delay programs
VOCAL1 Delay + medium 3sec reverb	1 120mS
VOCAL2 Delay + short 2sec reverb	2 240mS
VOCAL3 Delay + long 4sec reverb	3 360mS
ADT Short delay + ambient reverb	4 480mS
REV1 Warm reverb	5 600mS
REV2 Plate reverb	6 720mS

CONTROLS & FEATURES

WHAT HAPPENS IF I PRESS THIS?

Controls & Features - Rear Panel Output Section

37 **RECORD (L&R)** : Unbalanced Phono (RCA) line level outputs that can be connected to an external unit such as minidisc or other recording equipment.

38 **PLAYBACK (L&R)** : Unbalanced Phono (RCA) line level Left/Right inputs that route the output of a minidisc or CD player back into the 162BPX main mix. Nominal input level -10dBV.

Note : Some recorders (minidisc / CD-R) internally route the input signal back to the playback connectors to allow monitoring while recording. If the machine you intend to use operates in this way, disconnect the playback connectors from the 162BPX or a feedback loop will occur.

39 **+48V PHANTOM POWER** : This recessed switch connects standard 48V phantom power to mic inputs 1 to 12 for use with capacitor/condenser mics or active DI boxes that require phantom power.

Unbalanced mics must not be used when the phantom power is switched on as damage may occur. The switch is recessed to prevent accidental operation and should be operated using a plastic ball-point pen or similar instrument. A warning LED (32) on the front panel indicates that the Phantom Power is turned on.

If any channels require the 48V to be disconnected from channels 1 to 12 or added to channels 13 to 16 see options section.

40 **OUTPUT (L&R)** : Balanced XLR connectors to feed main PA amplifier / multitrack recorder etc.

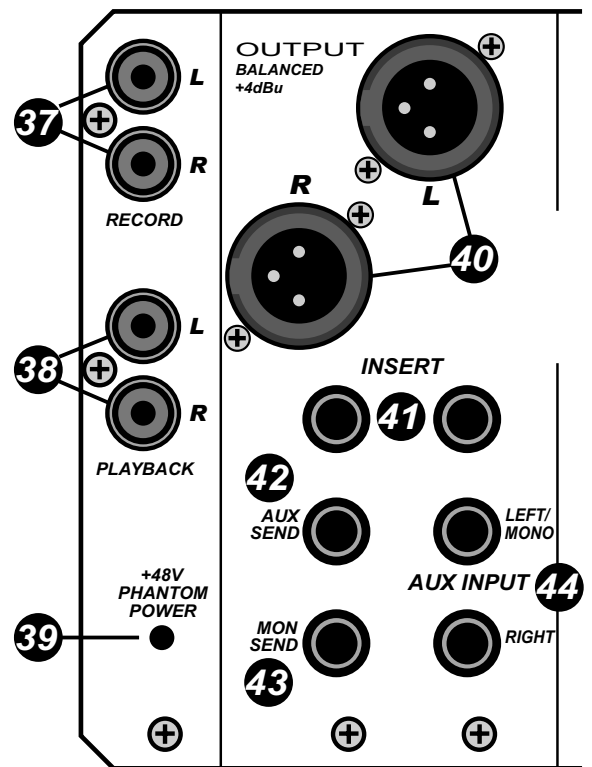
41 **INSERT** : A send/return for the main output on a single 1/4" TRS (tip, ring, sleeve) jack. Use a 'Y' - cable to connect the tip to the input and the ring to the output of a serial effects device (compressor, equaliser, etc).

42 **AUX SEND** : Balanced compatible output on 1/4" TRS jack.

43 **MON SEND** : Balanced compatible output on 1/4" TRS jack.

44 **AUX INPUT** : Balanced stereo input on 1/4" TRS jacks for minidisc/CD players, effect returns, drum machines etc.

For mono operation use LEFT/MONO connector only.



CONTROLS & FEATURES

WHAT HAPPENS IF I PRESS THIS?

Controls & Features - Rear Panel Input Section

- 45 **MIC** : MIC 3 pin XLR input - For balanced, low impedance microphones.

48V phantom power may be applied globally to all Mic inputs by depressing the recessed 48V switch on the rear panel using a plastic ball-point pen or similar object. A status LED on the front panel confirms that the phantom power is operational.

Do not use +48V phantom power with unbalanced mics connected to the console.

If any channels require the +48V to be disconnected see options section.

- 46 **LINE Channels 1 - 12** : LINE 1/4" TRS jack input for use with balanced, line level signals.

The line input is electronically balanced but may also be used with unbalanced sources by simply plugging in an unbalanced jack (TS) lead.

High impedance sources such as electric guitars should be fed in via a DI box or suitable preamplifier for best results.

- 47 **LINE (LEFT/MONO & RIGHT) Channels 13 - 16** : Line 1/4" TRS jack for the connection of stereo line-level devices (drum machines, keyboards, effect processors, etc). For mono operation plug into the LEFT/MONO jack only.

The line input is electronically balanced by may also be used with unbalanced sources by simply plugging in an unbalanced jack (TS) lead.

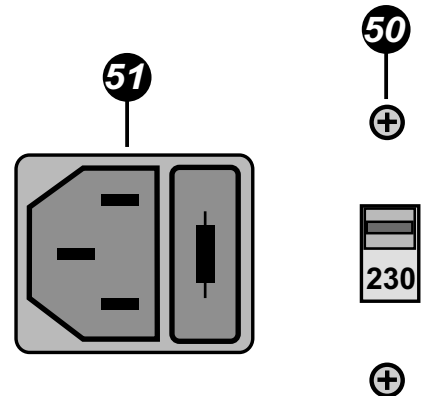
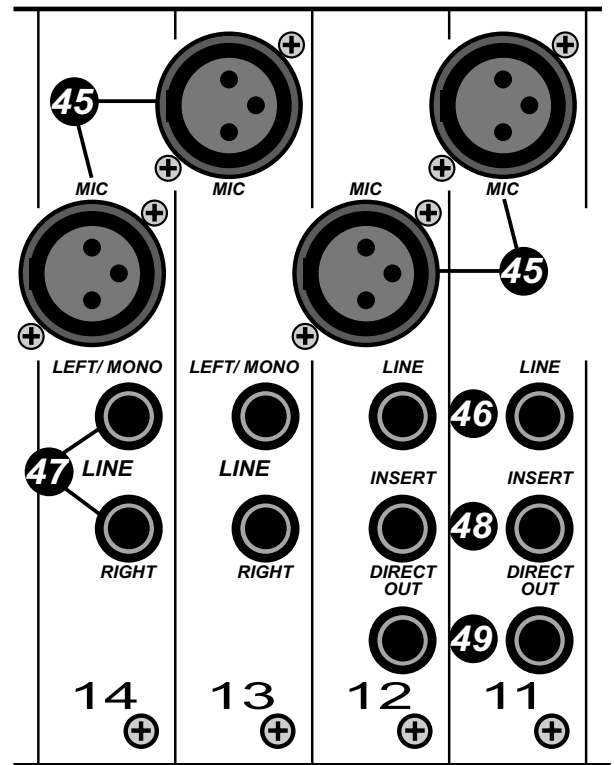
- 48 **INSERT** : In effect a send/return for the channel on a single 1/4" TRS (tip, ring, sleeve) jack.

Use a 'Y' - cable to connect the tip to the input and the ring to the output of an inline device (compressor, equaliser, etc).

- 49 **DIRECT OUT** : An output taken from the channel to be routed elsewhere - multitrack recorder, monitor mixer, etc. The signal is post - EQ and post - fader, so signal from the direct out is exactly the same as that sent to the main outputs. (To change the signal source see Options Section)

- 50 **VOLTAGE SELECTOR** : Do not adjust this switch when the A.C. power cord / mains lead is connected. For supplies between 220 and 240V use the 230V position. For supplies between 110 and 120V use the 115V position.

- 51 **POWER CONNECTOR** : The A.C. power connector also contains the internal A.C. power fuse.



TROUBLE SHOOTING

WHY IS IT NOT WORKING!

No power on LED.....

Check A.C. Power cord/mains lead is connected to wall supply and switched on.
UK Only - Check fuse in mains plug.

Check A.C. Power cord/mains lead is fully pushed into the rear panel socket (51).

Check it is switched on.

Check correct voltage is selected (50).

No Sound.....

Check for a signal on the meters.

Check the amplifier and speaker system is connected and switched on. Use headphones to check the output of the 162BPX.

Check that the fader of the channel being used and the Main Mix faders are raised to 'normal' positions (0dB).

Check the sound source - is it on?

Headphones distorting.....

Is the phones level set too high?

Are headphones being used with too low an impedance? 150-400 ohm types will give best performance, 32-50 ohm types can be used but may give lower maximum sound level.

INTERNAL OPTIONS

SERVICE CENTRES ONLY

The following options are accessed by removing the front panel. ONLY qualified service personnel should undertake this work.

Mono Mic channels (1 - 12)

Internally selectable	AUX SEND	Factory set : Post fader Option : Pre fader (move JP1, marked on PCB)
	MON SEND	Factory set : Post EQ / Pre fader Option : Pre EQ / Post fader (move JP2, marked on PCB)
	DIRECT OUT	Factory set : Post fader Option : Pre EQ (move JP3, marked on PCB)
	PHANTOM POWER	Can be removed from individual channels (CONN3)

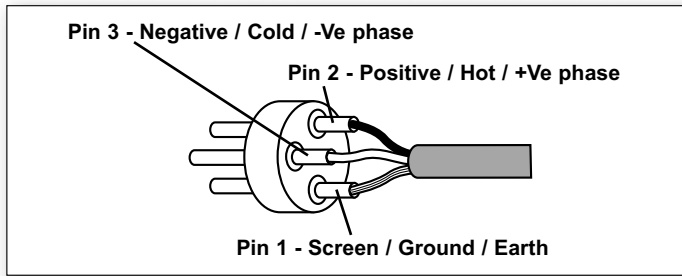
Mono / Stereo channels (13 - 16)

Internally selectable	AUX SEND	Factory set : Post fader Option : Pre fader (move JP1, marked on PCB)
	MON SEND	Factory set : Post EQ / Pre fader Option : Pre EQ / Post fader (move JP2, marked on PCB)
	PHANTOM POWER	Can be added to individual channels (CONN4)

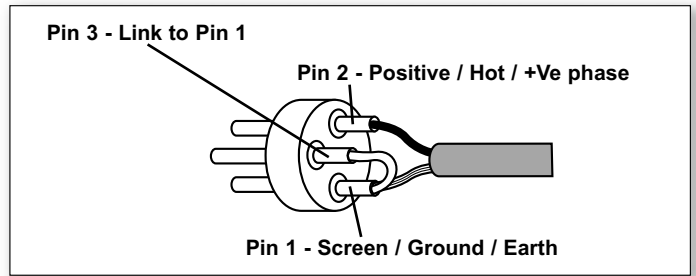
WIRING CONNECTIONS

HOW DO I KNOW I HAVE THE RIGHT LEADS

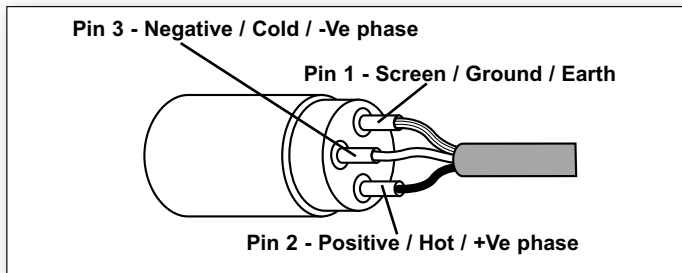
To connect a Balanced Microphone to a mic input 3 pin XLR - male



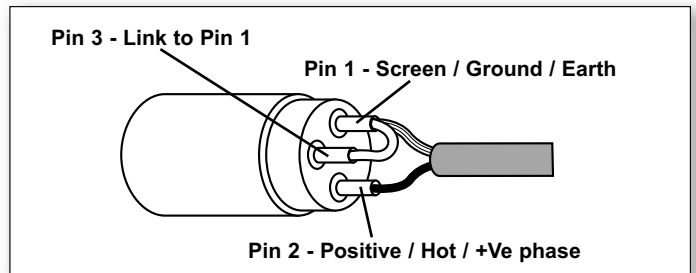
To connect an Unbalanced Microphone to a mic input 3 pin XLR - male



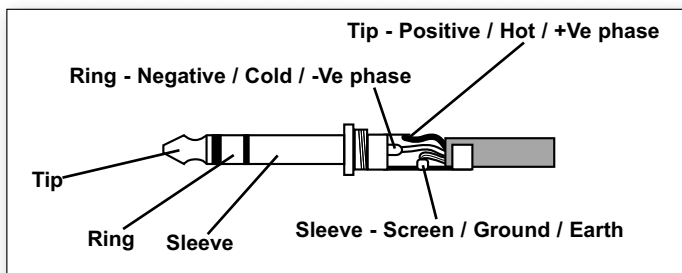
To connect a Balanced Microphone to a mic input 3 pin XLR - female



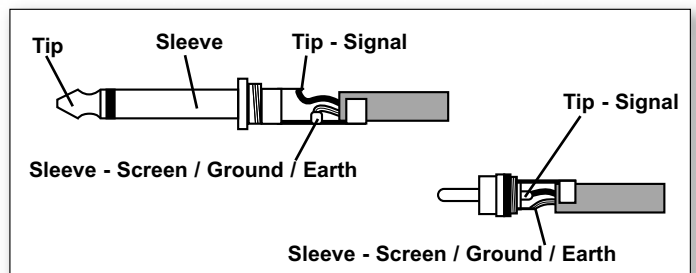
To connect an Unbalanced Microphone to a mic input 3 pin XLR - female



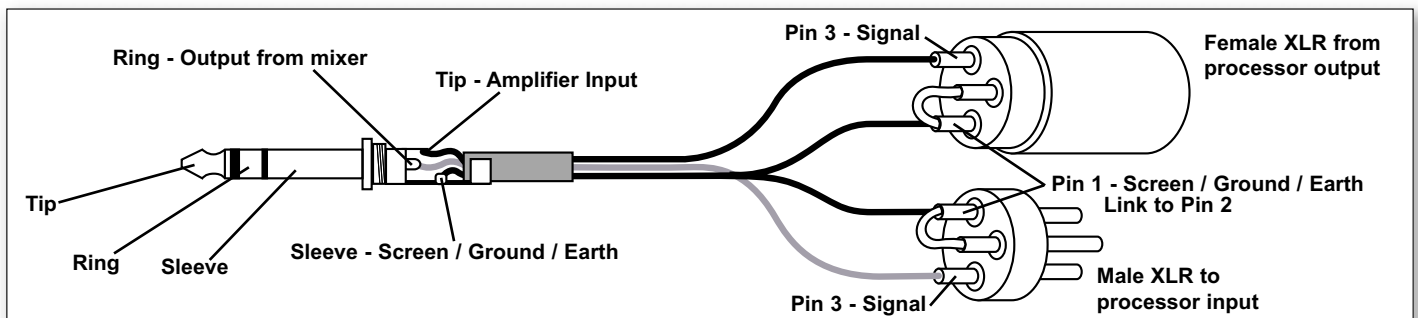
To connect Balanced equipment to an input or output



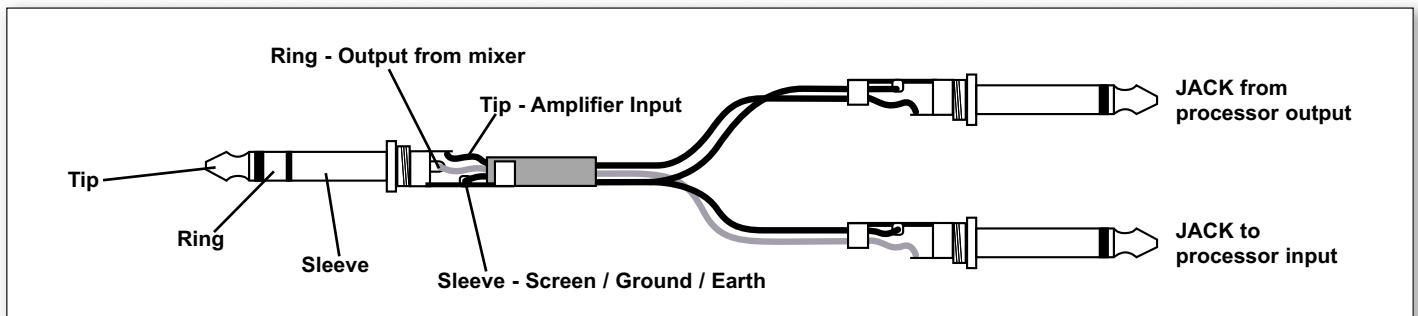
To connect Unbalanced equipment to an input or output



To connect an external Processor with XLR input / output to an INSERT (SEND/RETURN) socket



To connect an external Processor with JACK input / output to an INSERT (SEND/RETURN) socket



TECHNICAL SPECIFICATION

FACTS & FIGURES

Input Gain	Min	Max	Range
Mic (to L/R)	2dB	60dB	48dB
Line (to L/R)	-8dB	40dB	48dB
Stereo Line (to L/R)	0dB	12dB	12dB
<hr/>			
Equalisation (all +/-15dB)	Lo	Mid	Hi
Mic Channels	60Hz	250Hz-6kHz	12kHz
Stereo Input	45Hz	-	12kHz
<hr/>			
Frequency Response (any Input)	10Hz - 45kHz +/-0.5dB		
<hr/>			
Distortion (any Input)	0.03%		
<hr/>			
Noise			
Mic EIN	-128dBu		
Signal to noise ratio	>85dB (unweighted) with typical control settings		
Dynamic range	>108dB		
<hr/>			
DSP			
Reverb mode	3 Vocal, 1 ADT, 2 Reverb		
Delay mode	6 settings between 100ms and 720ms		
<hr/>			
Metering	Peak reading 12 segment 3 colour LED bargraphs		
<hr/>			
Maximum Input Level	At Max gain	At Min gain	
Mic	-38dBu	+10dBu	
Line	-21dBu	+28dBu	
Stereo Line	+10dBu	+22dBu	
Aux Input	+16dBu	+22dBu	
<hr/>			
Output Levels	Nominal	Maximum	Impedance
Mono Insert	+4dBu	+22dBu	<22 ohms
Aux Sends 1/2	-	+22dBu	100 ohms
L/R Outputs	+4dBu	+28dBu	75 ohms
L/R Insert	-2dBu	+22dBu	<22 ohms
Phones	-	+22dBu	33 ohms
<hr/>			
Power Supply			
230V range	+/-10%, ~50/60Hz, 150mA Max		
115V range	+/-10%, ~50/60Hz, 300mA Max		
<hr/>			
Dimensions			
Width	482mm (19")		
Height	266mm (10.5") when racked, the unit occupies 6 rack spaces (6U)		
Depth	120mm (4.8")		
<hr/>			
Weight			
Net	7kg (15.4lbs)		
Shipping	8.2kg (18.1lbs)		
<hr/>			

WARRANTY

ARE YOU COVERED?

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

Exclusions to Warranty Cover

Damage caused by accident, misuse, improper installation or neglect.

Damage caused by repair, modification or service by persons not authorised by Studiomaster.

Products on which the serial number has been defaced, altered or removed.

Who is Protected

This warranty is enforceable by the original purchaser and any subsequent owner(s) during the warranty period, providing a copy of the original sales receipt is submitted whenever a warranty service is required.

It is recommended that you complete and mail the Warranty Registration Card supplied with your product.

For your reference in the event of a warranty or service repair, please complete the following information and attach a copy of your original sales receipt.

Model : _____

Serial Number : _____

Purchase Date : _____

Purchased From : _____

Note : THIS WARRANTY DOES NOT AFFECT YOUR STATUTORY RIGHTS

SERVICE INFORMATION

HOW TO GET MY PRODUCT REPAIRED

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

Should it be recommended you return the product to your nearest Studiomaster Service Centre you must first contact them.

You will be asked for the product type and serial number. You will then be given a Returns Authorisation (RA) number.

Pack the unit in its original carton to protect it from shipping damage.

You must have the Returns Authorisation number clearly marked on the outside of the carton or we may refuse the delivery. Studiomaster cannot be held responsible for damage resulting from the equipment being packed incorrectly.

Label the equipment clearly with your name and address and include a clear description of the fault. The more information you supply helps the service engineer, minimising repair cost when out of warranty.

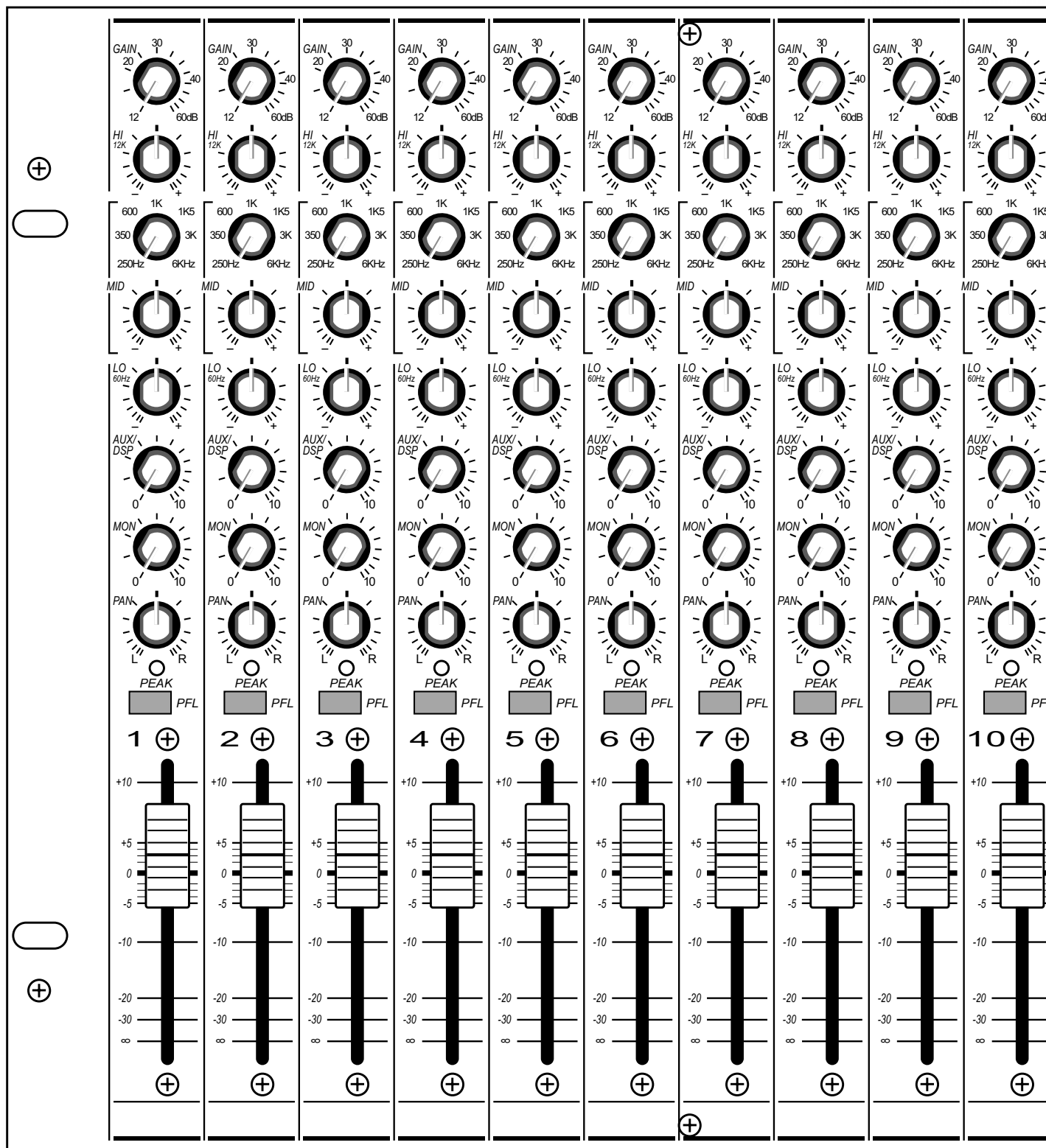
Important : No liability will be accepted by Studiomaster for any transit damage to units not returned in their original packing, for warranty repairs or otherwise.

In Accordance with our progressive product development, Studiomaster / Recording Studio Design reserve the right to change features and specifications without prior notice.

EXPECT THE BEST



EXPECT THE BEST



Recording Studio Design Limited
 7 Eden Way, Pages Industrial Park, Leighton Buzzard, Bedfordshire LU7 4TZ UK
 Tel : 44 (0)1525 217111 Fax : 44 (0)1525 378466 Email : enquiries@studiomaster.com

www.studiomaster.com