

# **Studiomaster Powerhouse Vision 700/Horizon 1200 series operator guide**

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## **POWERED LIVE SOUND CONSOLES**

Congratulations on purchasing your Studiomaster Powerhouse console, one of the most sophisticated, yet portable powered mixing systems currently available. In addition to a state of the art mixer and a pair of powerful internal power amplifiers, the Powerhouse Vision 700 and Horizon 1200 series include two assignable graphic equalisers plus an on-board digital effects processor capable of producing a large variety of different reverb and delay/echo treatments. Further features include a memory system that allows key console parameters, including effects, to be called up manually or over MIDI. The amplifiers are linked to an intelligent power management system that protects the amplifier circuitry at all times and activates the variable speed fan cooling system only when necessary.

The Powerhouse 700 & 1200 series can safely be used as a conventional (unpowered) mixer with no speakers connected.

A bright alpha-numeric fluorescent display window shows the effect and programming status. It also provides help messages or fault condition warnings in a choice of four languages.

## **FORMATS**

### **Powerhouse Vision 708:**

350 + 350 watts 6 mic/line channels plus 2 stereo line/mono mic channels and rack-mounting option.

### **Powerhouse Vision 712:**

350 + 350 watts 10 mic/line channels plus 2 stereo line/mono mic channels.

### **Powerhouse Vision 716:**

350 + 350 watts 12 mic/line channels plus 4 stereo line/mono mic channels

### **Powerhouse Horizon 1208:**

600 + 600 watts 6 mic/line channels plus 2 stereo line/mono mic channels and rack-mounting option.

### **Powerhouse Horizon 1212:**

600 + 600 watts 10 mic/line channels plus 2 stereo line/mono mic channels.

### **Powerhouse Horizon 1216:**

600 + 600 watts 12 mic/line channels plus 4 stereo line/mono mic channels.

## **READ THE MANUAL!**

Despite the sophistication behind the control panel, the Powerhouse 700 & 1200 series are very easy to use, though to get the best from your new purchase, we recommend you read this manual in full. They incorporate numerous advanced features which may not be obvious from a casual exploration of the front panel, and the manual also contains important safety information as well as practical hints on operating a live sound system.

## **UNPACKING**

Remove your Studiomaster Powerhouse from its packing and ensure that with this manual you have a mains lead and a warranty card. Retain the packing case in the eventuality that the unit needs to be returned for service or repair. Please complete and return your warranty card. Returning the completed warranty card does not diminish your statutory rights in any way but will ensure that you receive information on software upgrades and other product information as soon as they become available.

## **DON'T SWITCH ON YET ! READ THIS SECTION FIRST.**

## **WARNING: THIS APPARATUS MUST BE EARTHED (GROUNDED)**

### **IMPORTANT**

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals, proceed as follows:

The wire which is coloured green and yellow must be connected to terminal which is either marked E, marked by the earth safety symbol  $\perp$ , or coloured green and yellow. The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

### **IMPORTANT**

Do not use your mixer in environments having a high humidity or where liquids may accidentally enter the console. Always ensure the ventilation slots are clear and never be tempted to remove the mains earth to cure a buzz or hum caused by faulty wiring. Connect the loudspeakers to the amplifier and turn the red Left and Right faders fully down before switching on. If external signal processors or effects are being used, these should also be connected and switched on before the mixer is powered up. The Powerhouse 700 & 1200 series can be used without speakers.

**FUSES**

In the event that the rear panel fuse blows, replace it only with the same type and rating of fuse (see technical specification). The amplifiers are also protected by internal fuses, but these will normally only blow if a fault has developed. If a fault occurs that replacing the external fuse does not cure, return the unit to your dealer or to an authorised service agency. Do not attempt to replace the internal fuses yourself as this could be dangerous and will void the warranty.

**MIC/LINE CHANNEL**

Control panel diagrams are reproduced at the rear of this manual and it is recommended that these be consulted when familiarising yourself with the location and function of the controls.

Each Mic/Line channel is fitted with balanced XLR mic and a balanced ¼" jack line inputs. Do not use the mic and line sockets at the same time. 48V phantom power may be applied globally to all Mic/Line channels by depressing the recessed 48V switch in the master section of the console. Dynamic microphones wired for balanced operation may be used when phantom power is active. If in doubt, check with the microphone manufacturer. When phantom power is active all microphones should be plugged in before switching the console on. Before using a microphone with phantom power active check it is designed for +48V operation. **Unbalanced microphones must not be used in any channel where Phantom Power active.**

**CONNECTORS Also see connector wiring at rear of manual**

<b>MIC</b>	XLR mic input for use with balanced, low impedance microphones. <i>Pin 1 = Ground</i> <i>Pin 2 = +Ve/in-phase</i> <i>Pin 3 = -Ve/out of phase.</i>		
<b>LINE</b>	TRS ¼" jack input for use with line level sources eg. electronic keyboards, drum machines etc. <i>Balanced Tip = +Ve/in-phase      Unbalanced Tip = +Ve/Signal</i> <i>Ring = -Ve/out of phase      Sleeve = Ground</i> <i>Sleeve = Ground</i>		
<b>SEND/ RETURN</b>	Insert point for connecting an external processor for use on an individual channel. Send/return sockets are best used with dynamics processors (compressors, gates etc.) as all the signal from the channel is processed. <i>Tip - Send</i> <i>Ring - Return</i> <i>Sleeve - Ground.</i>		

**CONTROLS**

<b>GAIN</b>	Sets the level of the incoming mic or line signal.
<b>HF</b>	High frequency control providing up to 15dB of cut or boost at 12kHz. This control has a "bell" response.
<b>MF +/-</b>	Mid frequency control providing up to 15dB of cut or boost at whatever frequency is selected using the Frequency control directly below it. This control has a "bell" response.
<b>MF FREQUENCY</b>	Varies the operating frequency of the Mid control over the range 350Hz to 6kHz.
<b>LF</b>	Low frequency control providing 15dB of cut or boost at 60Hz. The control has a "bell" response.
<b>REV</b>	Adjusts the level of the channel signal being fed to the internal effects processor.
<b>AUX</b>	Post-fade send control which adjusts the level of the channel signal being sent to the AUX output socket. This would normally be used to drive an external effects unit.
<b>AUX 2</b>	(HORIZON 1200 SERIES ONLY) Pre-fade send control which adjusts the level of the channel signal being sent to the AUX 2 output socket. This would normally be used to set up a second stage monitor mix.
<b>FB</b>	Foldback control to provide a pre-fade send for use in setting up a stage monitor mix.
<b>PAN</b>	Pans the channel signal towards the left or right output channel allowing sounds to be positioned anywhere between the two PA speakers.

**SWITCHES & INDICATORS**

<b>PEAK LED</b>	Indicates that the channel signal is too high and is in danger of clipping. If the Peak LED flashes more than very briefly on the loudest signal peaks, reduce the channel GAIN control setting until it flashes only on the loudest signals.
<b>LISTEN SWITCH</b>	When a LISTEN button is down the signal overrides the source selected by the METER/PHONES SELECT switch, allowing signals to be seen on the meters and heard via the PHONES output. When this button is down the PEAK LED lights, and remains on, to show Listen is selected.
<b>LR/GROUP SWITCH</b>	Routing button to direct the channel signal either directly to the Left/Right mix or via the Group fader. This enables groups of sounds (such as drum mics) to be controlled in level by the Group fader rather than having to adjust several channel faders simultaneously. If the Group facility is not required, this button may be used as a channel mute. For Mute operation, the Group fader must be fully down.
<b><u>CHANNEL FADER</u></b>	Controls the level of the channel signal fed either to the Group or Left/Right buss, depending on the setting of the L-R/GROUP button. These faders feature a special taper which gives far better control than a conventional log taper around the most important centre or "0dB" position.

**MON:STER (STEREO) CHANNELS**

The MON:STER (Mono mic/Stereo line) channel is similar to the Mic/Line channel except that it accommodates stereo signals when working at line level. Additionally, it is equipped with a single Mic input which has its own gain control; the Mic signal is mixed with the Stereo Line Inputs allowing both sets of inputs to be used simultaneously, the overall level being controlled by the channel fader in the usual way. Both the Mic and Stereo Line Inputs share the same channel EQ and Aux Send settings.

The equaliser features three fixed bands (MF @ 2.5kHz) and the Pan control is replaced by a Balance control. If a line level signal is fed into the Left input only, the channel will function as a mono channel with the Balance control working as a Pan control.

**DIGITAL EFFECTS & CONTROL**

The Powerhouse 700/1200 series incorporate a high quality stereo digital effects processor which can provide many different reverb and delay effects. In addition, the user may also choose from pre-set EQ curves with the REVERB EQ button. The REGEN fader enables the user to control how long echoes take to die away on Delay settings. Information is provided by a bright alpha-numeric display.

**REVERB TYPE/DATA ENTRY CONTROL**

Normally this is used to select a different effect pre-set. Turning the control scrolls through the available effects, the effect name is shown on the display. The effect selected when the console is switched off is recalled when the console is turned back on.

**AUX MUTE SWITCH & LED**

Mutes the Aux Send output. A yellow LED denotes that the Aux Send is muted. This facility is used to disable any external equipment connected via the Aux Send.

**DELAY SWITCH & LED**

When the delay button is pressed the green LED lights and the display shows delay effects. There are 2 types, time(ms) and beats per minute(BPM). REGEN can be activated in this mode.

**STANDBY SWITCH & LED**

Mutes the Left-Right and Foldback outputs. This is particularly useful for turning off the sound system without disturbing any other control settings. When Standby is selected as part of a Program or Memory the word **STANDBY** is displayed and the red STANDBY LED is illuminated.

**PEAK LED** Indicates the input to the effects section is overloading. If this occurs, the channel REV controls should be backed off until the light no longer flashes. The effects processor has a 'soft overload' input stage to provide a safety margin before distortion becomes audible.

**REVERB ON/OFF SWITCH**

Switches the effects processor on or off. A green status LED indicates the effects are active.

**REVERB TO FB CONTROL**

This fader controls the amount of effect added to the Foldback mix. A centre detent is provided as a typical starting position.

**REVERB EQ SWITCH**

Steps through four EQ option of Flat (Off), Bright, Warm or Warm + Bright.

**WARM/BRIGHT LED's**

The Warm and Bright status LED's indicate which Reverb Eq setting has been selected.

**REGEN SWITCH & ON LED**

Enables the Regeneration control. This function is only available on delay settings. When the green status LED is illuminated, Regeneration is active.

**REGEN**

This fader controls the amount of regeneration on a delay setting. A centre detent is provided as a typical starting position for "echo" effects.

**GETTING STARTED WITH THE EFFECTS**

- o Connect a Microphone to an input channel
- o Press the REVERB button - Check green LED illuminates
- o Set REVERB fader to 0dB.
- o Turn REV control on input channel clockwise until you get desired effect level
- o Select desired effect using REVERB TYPE control and DELAY button if required.
- o If REGEN is required when using delays press REGEN button - Check green LED illuminates
- o Adjust REGEN fader until required REGEN is achieved.
- o If more adjustment is needed press REVERB EQ button.

Note : The effects processor has an overload indicator marked PEAK. If the PEAK led flashes more than occasionally the effect will distort. If this occurs turn down REV controls on input channels. The REVERB fader only controls the output of the effects unit so will not prevent an overload.

**MEMORY SECTION**

The Memory section uses two similar ways of storing and recalling effects and other settings on the console. These are MEMORIES and PROGRAMS.

**MEMORIES**

The Memory section comprises the display window, the REVERB TYPE/DATA ENTRY control and buttons MEM 1 - 4 to store and recall memories. The parameters that can be stored as a memory are:-

- |                            |                     |
|----------------------------|---------------------|
| • Effect type              | SEE DISPLAY         |
| • Aux Send On/Off          | AUX MUTE + LED      |
| • Delay On/Off             | DELAY + LED         |
| • Effects processor On/Off | REVERB + LED        |
| • Effects EQ setting       | WARM + BRIGHT LED's |
| • Regen On/Off             | REGEN + LED         |
| • Standby On/Off           | STANDBY + LED       |

An optional footswitch can also be used to step through memories.

**STORING & RECALLING MEMORIES**

There are four memory buttons numbered MEM1 - 4, these provide a quick way to store and recall up to four different set-ups. For example, you might have one set-up with a long, warm reverb for ballads, one with echo for your Elvis impressions, another with a shorter reverb for regular pop songs and one with no reverb for making announcements between songs.

**To store the console settings as a memory**

- o Press one of the MEM buttons, the LED will light.
- o For delay effects press the DELAY button, the DELAY LED will light.
- o Select the effect using the REVERB TYPE/DATA ENTRY control.
- o The effect description or delay time will be displayed.
- o Select Aux Mute, Regen, Reverb, Reverb Eq or Standby, the selected LED's will light.
- o Press the MEM button again to store the settings and return to normal operation.

**To recall the memory settings**

- o Press one of the MEM buttons, the LED will light.
- o This will now recall you stored set-up regardless of current console settings.

To overwrite a set-up, simply repeat the above procedure.

**PROGRAMS**

For those wanting more set-ups and the ability to recall those set-ups from MIDI, the Powerhouse 700/1200 series incorporate 16 user programs. These are able to store the same parameters as the four Memory buttons, plus you can

also name the program and allocate a MIDI program change number to each one allowing you to change set-ups from your sequencer, MIDI keyboard or drum machine.

The following edits may be carried out in any order. You do not have to name a program or assign a MIDI program change number.

#### To create and store a program

- o Press the PGM button and the green LED will light.
- o Select the required program using the DATA ENTRY control.
- o Press the EDIT button, the green PGM LED will flash to indicate EDIT mode.

#### To name a program

- o The program name will be displayed with a flashing cursor below the first character.
- o Use the DATA ENTRY control to select the character to be changed.
- o If you move the cursor too far to the right, a new screen will appear.
- o To get back to the original screen, simply move the cursor to the left.
- o Press and hold the PARAMETER button.
- o Use the DATA ENTRY control to scroll through the characters available.
- o Release the PARAMETER button and move the cursor to the next character.
- o Repeat this procedure for all ten characters (or spaces) as required.

#### To select the effect

- o Turn the DATA ENTRY control to the right and the effects screen is displayed
- o For delay effects press the DELAY button, the DELAY LED will light.
- o Press and hold the PARAMETER button.
- o Select the effect using the DATA ENTRY control.
- o The effect description or delay time will be displayed.
- o Release the PARAMETER button
- o Select Aux Mute, Regen, Reverb, Reverb Eq or Standby, the selected LED's will light.

#### Select a MIDI program change number as follows

For the Powerhouse to respond to MIDI you must turn MIDI on and assign a MIDI channel (see MIDI).

- o Turn the DATA ENTRY control until **PGM CHANGE** is displayed
- o Press and hold the PARAMETER button.
- o Select the MIDI Program change number **0** to **127** or **OFF** using the DATA ENTRY control.
- o Release the PARAMETER button
- o A different MIDI program change number must be used for each program.
- o If the Program Change value of the keyboard or drum machine is not known, select the Program required and the Powerhouse will "learn" and display the MIDI program change number received.
- o The Powerhouse uses MIDI Program numbers 0 to 127 as specified in the MIDI standard. Some MIDI equipment uses programs 1 to 128, you will have to allow for this when assigning a MIDI Program change number.
- o Press the EDIT button to save the program and return to PGM mode.
- o Press the PGM button to save the program and return to normal operation.

#### To view the Program currently selected, from Normal or Memory mode

- o Press the PGM CHECK button once to see the Program number.
- o If the Program is a Standby setting - **STANDBY** will be displayed.
- o Press the PGM CHECK button twice and the effect type will be displayed.
- o If the Program is a Standby setting - **STANDBY** will be displayed.

### MIDI

The Powerhouse 700 & 1200 series use MIDI to control two functions:

- Programs and memories may be recalled using MIDI Program Change messages
- MIDI Start/Stop messages may be used to turn the internal effects processor on and off.

The Powerhouse can receive MIDI data on any one of the 16 channels.

#### To set the desired MIDI channel

- o Press the MIDI button, the MIDI LED will light and the screen will read **MIDI CHAN** followed by the MIDI channel number **1** to **16** or **OFF**.
- o Press the PARAMETER button while turning the DATA ENTRY control to select a MIDI channel
- o If **OFF** is selected, MIDI program changes and Start/Stop messages will be ignored.

The MIDI Start/Stop function can be extremely useful when using drum machines or sequencers. MIDI can be used to switch off the effect when the song finishes, ready for you to introduce the next song.

**To set the MIDI Start/Stop function**

- o Press the MIDI button, the MIDI LED will light.
- o Turn the DATA ENTRY control to the right until **START/STOP ON** or **OFF** is displayed.
- o Press and hold down the PARAMETER button
- o Turn the DATA ENTRY control to select **ON** or **OFF**.
- o Press the MIDI button to save the setting, exit MIDI mode and return to normal operation.

**FOOTSWITCH**

An optional footswitch may be used to operate a selected function. One of the following may be selected:

- |                       |                            |
|-----------------------|----------------------------|
| • Off                 | <b>MODE - OFF</b>          |
| • Reverb On/Off       | <b>MODE - REV ON/OFF</b>   |
| • Regeneration On/Off | <b>MODE - REGEN ON/OFF</b> |
| • Standby             | <b>MODE - STANDBY</b>      |
| • Memory Cycle        | <b>MODE - MEM CYCLE</b>    |
| • Program Step        | <b>MODE - PGM STEP</b>     |

In Memory Cycle mode, the footswitch steps through the four memories in ascending order.

In Program Step mode, the footswitch steps through the 16 Programs (when PGM mode is selected).

**To set up the footswitch mode**

- o Press the F/S button, the LED will light.
- o The screen will display **MODE** - as above
- o Press and hold down the PARAMETER button
- o Turn the DATA ENTRY control to select the mode required
- o Release the PARAMETER button
- o Turn the DATA ENTRY control, the screen displays **TYPE - MOMENTARY** or **CHANGEOVER**
- o Press and hold down the PARAMETER button
- o Turn the DATA ENTRY control to select **TYPE - MOMENTARY** or **CHANGEOVER**
- o Release the PARAMETER button
- o Press the F/S button to save the setting and return to normal operation
- o If **MOMENTARY** is selected and a footswitch is plugged in, the internal microprocessor checks the type of switch (normally open or normally closed) at power up and responds accordingly.

**ON LINE HELP**

The Powerhouse 700/1200 series consoles are unusually friendly. Press the HELP button and a help message will be displayed relating to the mode you're currently in. Pressing the button again will cancel the help message. The display also shows warning messages if the amplifier overheats or develops a fault.

The display can be set up to operate in one of four languages, the factory default being English. To set the language, power up the console while holding down one of the four MEM keys. Once set, the language will be remembered on power off. The language will then be configured as follows:

MEM1 = English                      MEM2 = French                      MEM3 = German                      MEM4 = Spanish

**METERS**

The two meters normally monitor the Left and Right output levels. In Split mode, the Left meter follows the main PA mix and the Right meter follows the Foldback Level. The red LED (peak) at the top of each meter column indicates maximum amplifier power. When the AMP LEVEL control is fully clockwise, the meters indicate the true power being delivered (into a 4 ohm load) by the amplifiers (see ACTIVE SPEAKER SYSTEM CONTROL UNITS). When any LISTEN buttons are down the signal from the selected channels will be displayed.

**GRAPHIC EQUALISERS**

The graphic equalisers provide seven bands of precision tone control across the whole audio spectrum. In normal operation, the upper Graphic Equaliser affects the Left output channel and the lower Graphic the right. Though graphics may be used to produce Eq effects, in the context of PA, they normally help compensate for poor venue acoustics or to cut troublesome frequencies where feedback is a problem.

If the Graphic Equaliser is not required to correct venue problems, it may be assigned to the Group bus allowing equalisation to be applied only to those signals that need it. For example, you might want to feed all your drum mics to the Group, assign the Graphic Equaliser to Group, and use the equaliser to improve the sound of the drum kit.

In SPLIT mode, where the PA runs in mono (and with the Graphic Equaliser assigned to AMP L-R), the upper equaliser looks after the main PA mix and the lower one is assigned to the Foldback output. This is exceptionally useful as the

close proximity of the stage monitors to the performers can often aggravate feedback problems. Again, the Graphic Equaliser can be used to pull back troublesome frequencies. As a rule, graphic equalisers are used to cut rather than boost. Applying a significant amount of boost to any part of the audio spectrum increases the risk of feedback at that frequency.

## **FADERS**

### **GRAPHIC**

(50Hz, 150Hz, 330Hz, 1kHz, 2.5kHz, 5kHz & 10kHz)

Each fader has a centre detent or click stop to indicate the neutral (flat) setting. By each fader the frequency at which it operates is printed. This is the centre point of a narrow band of frequencies covered by the fader. Each band overlaps slightly with the next to provide total cover of the whole audio spectrum. Up to 12dB of cut or boost can be applied although, under normal circumstances, only a fraction of this range will be used. (See Graphic Assign)

### **GROUP**

Controls the overall level of any channels routed to the stereo Group. This is a valuable feature for controlling sets of instruments or sounds such as drum mics or backing vocals.

### **FB**

Controls the overall level of the Foldback mix originating from the channel FB controls. The foldback signal is available on the rear panel of the console to feed an external power amplifier /stage monitor system. The console may also be used in Split mode which enables one of the internal amplifiers to be used for the main PA speakers and the other to drive the stage monitors. In Split mode, both the main PA mix and the Foldback mix are mono. This mode of operation is perfect for small club or pub gigs where you need a simple, compact system

### **REVERB**

Controls the overall output level of the internal effects processor fed into the stereo mix. The individual effects input levels are controlled by means of the channel Rev controls.

**LEFT & RIGHT** Control the level of the main PA mix.

## **STEREO AUX INPUT**

Provides a useful extra stereo line input. Any stereo line level signal can be connected, stereo drum or keyboard sounds, CD or the return from an external stereo processor.

**CONNECTORS** Unbalanced ¼" jacks. For mono operation use the Left/Mono connector only.

*Wired Tip = +Ve/Signal  
Sleeve = Ground.*

## **CONTROLS**

### **LEVEL**

Adjusts the level of the signal from the Stereo Aux Input jacks.

### **TO FB**

Adjusts the amount of Stereo Aux Input signal going to the Foldback mix. This allows any external effect to be heard in the Foldback mix.

## **TWO TRACK**

These sockets may be used to record a live gig - always a good idea if you want to see how well you actually performed. The sound quality of the Powerhouse makes it suitable for use as a recording console. They may also be used to feed a backing tape or CD player into the mix. The Graphic Equalisers will only affect the record output signals if they are assigned to Group.

## **CONNECTORS**

### **RECORD**

Phono (RCA) sockets to carry the stereo mix output to an external tape recorder.

### **PLAYBACK**

Phono (RCA) sockets route the output of a tape machine back into the Powerhouse.

## **CONTROLS**

### **PLAYBACK**

### **SWITCH**

Connects or disconnects the tape machine from the PLAYBACK input. When recording, switch the tape machine out of the L-R mix (button up), in case the tape output is sent back into the playback input causing feedback.

## **+48V PHANTOM POWER SWITCH & LED**

Connects 48V phantom power to all mono channel mic inputs. For use with +48V Phantom powered mics or DI boxes. See Options page for alternative arrangements. The switch is recessed to prevent accidental operation and should be operated using a ball-point pen or similar instrument. A red warning LED indicates that the Phantom Power is turned on. When phantom power is active all microphones should be plugged in before the console is switched on. Before using +48V Phantom power always check the microphone is suitable for +48V operation.

**Unbalanced microphones must not be used in any channel where Phantom Power is active.**



**GRAPHIC ASSIGN****AMP L-R/GROUP SWITCH**

Assigns the equaliser either to the main output mix or to the Group mix. If assigned to AMP L-R, then all channels will be affected by the equaliser settings. If assigned to GROUP, then only those channels routed to Group will be affected by the equaliser.

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**L-R/SPLIT SWITCH**

Splits the two internal amplifiers so instead of stereo operation, one amplifier is used for the main PA speakers (mono) and the other amplifier powers the foldback monitor speakers. See Graphic Equalisers

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**AMP LEVEL CONTROL**

Sets master level of the internal amplifiers. For maximum power turn this control fully clockwise to the NORM position. When set at NORM, the LED meters display true power using the scale printed between the meters. The top red LED's (100%/PEAK) indicate maximum power.

**HEADPHONES****METER/PHONES SELECT SWITCH**

Switches the meters and phones to monitor either the main PA (L-R) of the foldback (FB) mix. When any LISTEN buttons are down, their signals will monitored

**PHONES CONTROL**

Adjusts the headphone level.

**PHONES CONNECTOR**

Stereo jack for stereo headphones with a conventional ¼" TRS ("stereo") jack. For best results use 200 - 600 headphones. 8 or 15 'phones can be used but will produce lower volume.

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**OPTIONAL ACTIVE CROSSOVER (See OPTIONS)**

Compact, full-range speaker cabinets are the ideal solution for smaller venues, but where high sound levels are required they are limited by the amount of bass they can reproduce. The ideal solution is to use an active system where dedicated bass cabinets, driven by separate amplifiers, handle only the bass frequencies leaving the compact cabinets to handle the mid range and high frequencies. Free from the burden of reproducing high levels of bass, the full-range cabinets can be used at a significantly higher level.

Such an 'active' system requires two sets of amplifiers, one for the bass and one for the mid/high. A crossover circuit ensures that the bass amplifiers are fed only with bass frequencies and the mid/high amplifiers are fed only with mid/high frequencies.

The Powerhouse 700 & 1200 series are designed to be easily converted to active use by means of an optional plug-in Active Crossover module. The crossover module replaces the cover plate at the lower right hand corner of the mixer front panel. The connection system has been arranged so that the module can be installed easily with no need for soldering.

Once the crossover is fitted and activated, the Bass signal (to feed an external stereo power amplifier) comes from the Line Output sockets while the Mid/High signal feeds the internal amplifiers. The relative level of the bass signal may then be adjusted using the gain control on the bass power amplifier. The crossover module is fitted with a recessed on/off switch and active LED indicator. This enables the Powerhouse to be quickly switched back to full range operation.

The crossover frequency required will usually depend on the speakers. So long as the crossover frequency is within the frequency ranges of both the bass and high/mid cabinets the choice of crossover is largely a matter of personal preference. Below 150Hz sound becomes non directional allowing the use of a single bass bin with a stereo high/mid system and it is perhaps for this reason that 150Hz crossover modules are the most popular. We recommend 150Hz for our own speaker systems.

## **REAR PANEL CONNECTORS**

### **MIDI IN & THRU**

5 Pin MIDI connectors for interfacing the Powerhouse with a drum machine, sequencer or other MIDI equipment. The Powerhouse does not generate MIDI data, however it will respond to any suitable messages and any MIDI data received will be re-transmitted via the THRU socket.

**AUX** TRS ¼" jack auxiliary output. Balanced compatible For unbalanced, use a 2 pin (TS) ¼" jack.

**AUX 2** (HORIZON 1200 SERIES ONLY) TRS ¼" jack auxiliary output. Balanced compatible For unbalanced, use a 2 pin (TS) ¼" jack.

### **LINE OUT LEFT & RIGHT**

TRS ¼" jack outputs. Balanced compatible For unbalanced, use a 2 pin (TS) ¼" jack. For connecting additional amplifiers or when the optional crossover module is used (see OPTIONS). The Powerhouse 700 & 1200 series can safely be used as a conventional (unpowered) mixer, with no speakers connected The line outputs can be connected to external power amplifiers or recording equipment.

### **FS (FOOTSWITCH)**

¼" TS jack socket for connection of a footswitch. (See Digital Effects/Footswitch).

## **SPEAKER OUTPUTS**

The speaker outputs are SPEAKON™ NL4 connectors (and ¼" jacks on the Vision 700 series only), wiring details are printed on the rear panel of the console. The two types of socket on the Vision 700's are wired in parallel and may be used simultaneously providing the total load per channel does not fall below 4 Ω. The speakers can be left disconnected if the Powerhouse is used for recording.

The use of the SPEAKON™ connectors is recommended and the speaker cable should be as heavy as possible to prevent power loss. Instrument cables such as guitar leads should not be used to connect the loudspeakers as these exhibit too high a resistance and will cause a loss of both signal level and sound quality. Always ensure all speaker cables are wired the same way. When a pair of cables has the pin wiring reversed, speakers will be out of phase often resulting in a loss of volume particularly in a stereo or multi speaker systems.

SPEAKON™ NL4FC connectors should be wired 1+ = Positive, 1- = Negative, Pins 2+ & 2- are unused. If ¼" jacks are used they should be wired Tip = Positive, Sleeve = Negative.

## **AMPLIFIER INSERTS**

¼" TRS Send/Return sockets. Wired Tip = power amp input, Ring = mixer output, Sleeve = Ground.

The Amplifier Inserts allow the connection of a processor between the mixer section and the internal power amplifiers. These would normally be used with loudspeaker systems that require an external electronic, pre-power amp equalisation box or controller. With conventional speaker systems the inserts may be used to connect any other type of processor.

## **ACTIVE SPEAKER SYSTEM CONTROL UNITS**

The meters derive their signal at the mixer left-right outputs prior to the AMPLIFIER INSERT sockets and amplifier inputs. When an Active Speaker Controller is connected to the AMPLIFIER INSERTs it may increase the signal level going into the amplifier. This means that the meters may only climb part of the scale before the PEAK (top red LED) illuminates showing maximum output to the speakers. This will not affect the operation of the system as the PEAK LED's can still be used as maximum output indicators. However, if the full scale of the meter is required, turn the AMP LEVEL control anti-clockwise and raise the Left & Right faders to compensate for the decrease in level to the amplifiers.

## **USING THE INTERNAL AMPLIFIERS WITH OTHER EQUIPMENT**

If access to the internal amplifiers, from external equipment is required, connect a 2 pole (mono) 0.25" jack plug (Wired Tip = +Ve/Signal, Sleeve = Ground) to the AMPLIFIER INSERT socket(s). This function can also be used to run two separate foldback mixes by connecting the output of the FB and AUX (AUX 2 on the Horizon 1200 series) sends to the inputs of the internal amplifiers as described above. When the AMPLIFIER INSERTS are used in this way the 40Hz sub sonic filters are automatically disconnected.

## **THE AMPLIFIERS**

The Powerhouse 700 & 1200 series use bipolar circuitry in the amplifiers for superior sonic performance, especially in the vital bass end of the spectrum. The total load on each channel should never be less than 4 ohms, otherwise overheating may occur, resulting in the protection circuitry switching the amplifiers off. 8 and 16 ohm speaker systems may be used, though there will be a reduction in the sound output level.

The amplifiers employ our AMCS™ (Amplifier Management Control System) for protection and to achieve the best possible performance under all operating conditions. It operates in the following ways :

- **THERMAL AND LOAD SENSING FAN COOLING** - Fan speed is proportionate to the amplifier temperature, minimising fan noise. The load and impedance sensing circuitry anticipates heat build up within the amplifier and applies cooling in advance, increasing component life.
- **ELECTRONICALLY GATED POWER SUPPLY** - Mutes the amplifier output at power on and off avoiding the use of unreliable relays and speeding up protection time if the power is interrupted.
- **CROW BAR SPEAKER PROTECTION** - This thyristor activated protection circuit prevents harmful d.c. voltages from reaching the loudspeakers. Problems associated with mechanical relays are eliminated.
- **SUBSONIC FILTERS** - Two high pass filters roll off all frequencies below 40Hz before they reach the amplifiers. This saves power that would otherwise be wasted amplifying frequencies that most people cannot hear and most loudspeakers cannot reproduce. It also results in a "tighter" bass response.
- **SIGNAL LIMITERS** - These circuits limit the signal fed into the amplifiers, reducing distortion at the maximum output level and making it virtually impossible to overdrive the amplifiers.

The AMCS™ circuitry also allows the Powerhouse 700/1200 series to be used as an unpowered mixing console (without speakers) without danger of damage to the unit.

### **VENTILATION**

The Studiomaster Powerhouse is fitted with cooling vents both at the front and rear, these must be kept free from blockages while the unit is in use. If the amplifiers overheat for any reason, a warning message will be displayed by the console prior to the amplifiers shutting down in order to protect their components.

### **OUTPUT POWER**

We rate the power output in Watts Dynamic r.m.s. (WDRMS) with both channels driven. Measurements using a tone burst or sine wave give no representation of how an amplifier operates in the real world. With WDRMS the figure is the actual r.m.s. power available to the loudspeaker using representative program material (i.e. music). This is how we measure the dynamic output power level:- Both amplifier channels are fed a limited dynamic range signal and the speaker outputs are connected to 4 ohm loads. The input signal level is increased until the largest signals are at the clip point. The signal is measured and the equivalent sine wave voltage is calculated as follows:-

$$V \text{ (peak to peak)} / 2 \times 0.7071 = V_{rms}$$

The power is then calculated:-  $V_{rms}^2 / 4 \text{ (ohm load)} = \text{Watts}$

An amplifiers maximum output is the largest signal it can produce before clipping, which is exactly what dynamic r.m.s. is. The reason music is used as the signal source is because that is what the amplifiers have been designed to reproduce.

### **SETTING UP A PA**

In most small and medium sized venues, the PA works as a sound reinforcement system, helping to boost the sound of on-stage instrument amplifiers (and possibly drum kits) as well as handling all the vocals and acoustic instruments. Because of the wide range of sounds, the PA speakers need to be able to reproduce the full audio spectrum, but their main job will be to lift the vocals and acoustic instruments over the level of the back-line.

For smaller venues, it's sometimes easier to use low-powered back-line amplification and mic it up. This reduces spill from the back-line amplifiers into the vocal mics making the mix easier to control.

If the room is very reverberant, getting a clear vocal sound can be difficult. Because of the way in which sound is reflected, the reverb may sound the same wherever you are in the room, whereas the vocal sound from the speakers will get quieter the further away you are. Once you get so far back in the room that the reverberant sound overwhelms the direct sound, vocal clarity is compromised. The choice and positioning of loudspeakers is critical in projecting a clear sound, the Studiomaster KMXV range are perfectly matched to the Powerhouse Vision range of mixers

The main PA speaker cabinets should be positioned in front of the vocal mics so as to reduce the risk of feedback and should be set up on stands so that the sound being absorbed by the front row of the audience. The ideal position is to have the speakers slightly above the audience's head height, angled slightly downwards so as to concentrate all the sound on the audience and not on the back wall or ceiling. Also angle the speakers away from the side wall if possible. As well as making the most use of the available power, this will also reduce the effect of room reflections making the sound clearer, even in troublesome rooms.

## **MONITORING**

Stage monitors may be thought of as a separate sound system, comprising power amplifiers and speakers, running from the foldback output of the mixing console. To maximise on versatility, the internal amplifiers on the Powerhouse 700 & 1200 can be split so that one feeds the main PA and the other the monitoring system, which is ideal for small venues such as pubs and clubs. When working in larger halls, both amplifiers may be dedicated to the main PA and a separate power amplifier used to feed the monitors. The most important job of a small foldback system is to ensure that the vocalists can hear themselves properly. For smaller venues it's rarely necessary to feed much in the way of instruments back through the monitor system. Stage monitors often take the form of floor-standing, wedge-shaped speaker enclosures, and they must be fitted with high quality, full-range speaker systems, otherwise feedback will almost certainly become a major problem.

Power amps, whether for main PA or monitor use, need enough power to deliver a clean signal at the full rated power of the loudspeakers. This is because once an amplifier is driven into clipping, it produces a lot of high frequency harmonics, which can damage speakers in a very short space of time. The amplifiers are designed to handle extremely high peak signal levels without clipping, but if you do see the clip warning LED's coming on, back off the power until you're operating at a safe level.

To get the most power from an amplifier, it should be run into the lowest impedance load so that it can safely handle, which for the Powerhouse series, is four ohms per amplifier. If the amplifiers are used with eight ohm speakers, the available power will be significantly less. It is important to use heavy duty speaker cable and to keep the cable runs as short as possible so as not to lose power through cable resistance. Guitar leads or other coaxial screened cables are no use for this job, ordinary heavy duty, twin-core mains cable is fine.

## **MICROPHONES**

Dynamic cardioid microphones are usually chosen for live work because they are robust, they produce a full, confident sound, and their cardioid response helps prevent feedback by keeping unwanted sounds out of the mic. Powerhouse consoles are designed to work with low impedance microphones so that long cable lengths won't compromise the sound quality. Both balanced and unbalanced microphones may be used although balanced mics provide a better immunity to interference.

A common problem is that the vocal mic doesn't just pick up the singer, it picks up sound from all along its axis, so anything going on directly behind the singer will also be picked up, to some degree. If you put the drums or a loud guitar amp behind the singer, whenever you turn up the vocal level you will increase the level of that as well. A microphone also 'hears' some of the sound generated by the PA system itself, either directly from the speaker cabinets or reflected from the walls. If too much sound from the PA gets back into the mic it will build up in level resulting in the familiar squeal known as feedback.

Feedback has to start at a particular frequency and, as you might expect, this is influenced by the room acoustics. Speakers or mics with peaky frequency responses also provoke feedback at the frequencies where they have most gain. The Powerhouse has two on-board graphic equalisers which can be used to 'pull down' troublesome frequencies. The best way to set up the system is to slowly increase the sound level until feedback just starts to occur, then use the graphic EQ to pull that frequency down in level slightly. Graphic equalisation can't provide a complete cure for feedback but, used carefully, it can enable you to squeeze those extra few vital dBs out of the system. Switching off mics when they are not in use also reduces the risk of feedback.

Monitor systems are also prone to feedback, especially as they are so close to the performers. Careful positioning of the monitor speakers, so as little sound as possible gets back into the stage mics, will help considerably. When using Split mode, one of the on-board graphic equalisers may be used to fine tune the monitor mix in the same way as for the main PA. If the graphic equalisers are not required to compensate for room acoustics, or if a separate equaliser has been patched into the insert point to handle this task, the on-board graphic equalisers may be assigned to the Group mix allowing specific groups of instruments or vocals to be treated independently of the rest of the mix. As a rule, avoid extreme EQ settings, and if you can use cut rather than boost to achieve the desired result, feedback is less likely to be a problem.

When doing the pre-gig soundcheck, set the maximum safe vocal operating level first and then balance the instruments to the vocals rather than attempting to work the other way around. Once the maximum safe level before feedback has been found, back off the master faders slightly so as to leave a little power in hand. Finally, select a vocal reverb or echo setting, though be aware that in a typical venue, there may already be quite a lot of natural reverb so you may not need to add as much as you think.

**OPTIONS**

**RACK ADAPTER OPTION** These are available for the Powerhouse 708 and 1208 to convert from free-standing to 19" rack mounting. The Rack Kit comprises the following:

- 1 pair right and left hand adapters.      6 off M5 hex head bolts.

**FITTING INSTRUCTIONS**

Disconnect AC power. Remove the right and left side cheeks via the 6 off M5 x 30mm Hex socket head screws using a 3mm Allen Key. Fit the right and left rack adapters using the 6 off M5 x 12 Hex head screws and washers supplied. Do not use screws of any other length as damage could result. Check all six screws and washers are fitted and fully tightened before fitting the unit into a rack.

To fit the Powerhouse securely into a rack we recommend the use of 6 x 6mm (or equivalent) rack screws with plastic or nylon washers underneath the screw heads to avoid damage to the paintwork.

The Powerhouse 700/1200 series have cooling slots on the front and rear of the chassis. When rack mounting, at least 1U of empty rack space should be left above and below the console.

**ACTIVE CROSSOVER**

Six crossover modules available. The part numbers are:

- 150Hz Crossover Module      PHVX150
- 200Hz Crossover Module      PHVX200
- 250Hz Crossover Module      PHVX250
- 300Hz Crossover Module      PHVX300
- 450Hz Crossover Module      PHVX450
- 800Hz Crossover Module      PHVX800

The following options may be implemented only by an authorised Studiomaster dealer or service centre. Any modification attempted by persons will invalidate the warranty.

**MONO INPUT CHANNELS** The following options can be fitted by adding or removing the relevant solder links.

Phantom powering is available to all mono input channels as standard.

- o To disconnect an input channel from the phantom power supply, remove link LK6.
- o REV and AUX can be configured, in pairs, PRE FADER by removing LK1 and fitting LK2.
- o FB can be configured POST FADER by removing LK8 and fitting LK7. The PRE FADER (standard) source is normally POST EQ. It can be configured PRE EQ by removing LK9 and fitting LK10.

**STEREO INPUT CHANNELS** The following options can be fitted by adding or removing the relevant solder links.

- o +48V phantom power is not available as standard. To connect it, fit link LK4.
- o REV and AUX can be configured, in pairs, PRE FADER by removing LK1 and fitting LK2.
- o FB can be configured POST FADER by removing LK6 and fitting LK5. The PRE FADER (standard) source is normally POST EQ. It can be configured PRE EQ by removing LK7 and fitting LK8.

**TROUBLE SHOOTING**

- o If there is no sound, check AMP LEVEL control is up and console is not in Standby mode.
- o If the meters do not appear to work properly ensure the METER/PHONES SELECT switch in the correct position and no LISTEN buttons are down.
- o Send/returns & inserts are "break" jacks, these will stop the channel or output working if the connected equipment is not turned on or correctly adjusted.
- o If you use ¼" jacks for speakers (700 series only) check they are connected to the speaker outputs not the amplifier inserts.
- o If a footswitch does not operate check FOOTSWITCH TYPE has been set up correctly. See FOOTSWITCH or Press the F/S button and then the HELP button.

**HELPFUL HINTS**

- o If any channels are routed to the GROUP, make sure the GROUP fader is raised.
- o If the Graphic has no effect make sure it is routed correctly.
- o Raising a channel fader will also increase the signal sent to the effects. Check the reverb PEAK LED.
- o If only one speaker is working make sure the L-R/SPLIT switch has not been pressed.
- o Expect to set channel GAIN controls at about 30dB (2 o'clock) for balanced microphones, then adjust as necessary.
- o Check any suspect Send/Returns or Inserts with a Bypass jack (See Connector Wiring).
- o If the level of the RECORD connectors is too low to achieve a good recording it may be necessary to raise the Left/Right faders and turn the AMP LEVEL control down.
- o Stereo signals must be connected to the unit via two separate jack connectors. Connecting a stereo jack and signal to a line input will not reproduce stereo and will often sound "thin" or not work at all.

**GLOSSARY OF TECHNICAL TERMS**

<b>A.C. SUPPLY</b>	Local electrical supply
<b>ASSIGN</b>	To switch or route a signal to a specific signal path.
<b>ATTENUATE</b>	To reduce or make quieter.
<b>AUX/AUXILIARY</b>	means of sending a signal to external equipment, generally without affecting the main mix.
<b>BALANCE</b>	The relative levels of signals. Also the left/right position in a stereo mix.
<b>BALANCED</b>	Balanced circuitry is widely used in audio equipment. It is used as it cancels outside interference in the connecting cables resulting in a cleaner signal
<b>BANDWIDTH</b>	Audio bandwidth is the range of frequencies that can pass through a piece of equipment.
<b>BIN or BASS BIN</b>	A speaker cabinet designed to reproduce low frequencies.
<b>BUSS</b>	A common conductor that carries a signal, or number of signals, through a mixing console.
<b>CHANGEOVER</b>	A type of footswitch normally with a latching switch.
<b>COLD</b>	The negative phase of a signal. The other is HOT (positive).
<b>COMPRESSOR</b>	An electronic device used to stop the level of a sound from increasing above a set threshold point. A compressor can be used to keep signal levels from overloading the input of a piece of equipment.
<b>CLIPPING</b>	Distortion caused by a signal exceeding the maximum level that an input can accommodate.
<b>D. I. Direct Injection.</b>	Often a small "D. I. box" is used to send a signal directly from a guitar or bass into the console without first putting it through an amplifier and speaker and capturing the sound with a microphone.
<b>DECIBEL (dB)</b>	A logarithmic ratio used to represent voltage or power gain. The reference to which the ratio is made is usually stated. Also used as a measure of audible loudness. 0dB is the threshold of human hearing. Measurements made in dBA take account of the ear's differing sensitivity to different frequencies particularly at low volume levels.
<b>DELAY</b>	A delay or DDL (Digital Delay Line) is an electronic effects processor which samples a short sound and replays it back a short time later to give an echo effect. Delays are also used in very large live venues to ensure that sound from different speaker arrive at the listeners ears at the same time.
<b>DETENT</b>	A soft "click" in the travel of a control usually indicating the centre point.
<b>EFFECTS SENDS</b>	Any outputs from a channel or console that can be connected to external equipment for extra sound processing. Usually effects sends are post fade.
<b>ECHO</b>	The effect of sound reflecting off hard surfaces, often reproduced artificially. See DELAY
<b>EFFECTS</b>	Any device that affects a sound. From a simple foot pedal to professional studio effects processor.
<b>EQ (EQUALISATION)</b>	Tone controls
<b>FADER</b>	Volume control, often a linear or slider type volume control.
<b>FEEDBACK</b>	The squealing sound produced when a mic picks up it's own amplified sound from a loudspeaker.
<b>F.O.H.</b>	Front of House. The speaker system which is used to project the sound from the stage to the audience. Also the position, in front of the stage, where the main mixing console is situated.
<b>FLAT (EQ)</b>	When the signal has not been adjusted using the equaliser (EQ) controls.
<b>FOLDBACK</b>	On-stage monitor system. Theoretically sound which is sent from the main mixing position back to the stage so the performers can hear it. Often with a large sound system an entirely separate foldback (or monitor) system with a dedicated console is located on one side of the stage.
<b>GRAPHIC</b>	Graphic equaliser. An equaliser that uses rows of sliders. Each of the sliders will adjust one part of the frequency spectrum giving a visual display of which areas have been cut or boosted.
<b>GROUND</b>	Earth
<b>GROUP</b>	A collection of related signals all routed to one (or two) faders for easy overall control. An example might be to route all the drum signals to one group so that the level of the whole kit can be adjusted without changing the balance of the sound between them.
<b>HERTZ (Hz)</b>	A measurement of frequency. 1Hz = 1 cycle per second.
<b>HEADROOM</b>	The amount of level (above the nominal operating level) that an input can manage before distorting.
<b>HIGH (or TOP)</b>	The treble or high frequency content of a sound or the speakers used to reproduce it.
<b>HOT</b>	See COLD
<b>INSERT</b>	A TRS jack that is a send and a return. These allow individual signals to be processed externally and then returned to the console. Inserts are generally used for dynamics treatments such as compressors and noise gates as the whole of the signal is processed. Inserts are fitted to the main outputs of the 700/1200, for overall processing, before the signal is sent to the internal amplifiers.
<b>IMPEDANCE</b>	Similar to resistance, except it measures the effect of any inductance or capacitance in the circuit.
<b>KILOHERTZ (kHz)</b>	A measurement of frequency. 1Hz = 1 cycle per second. 1000Hz = 1kHz.
<b>LEVEL</b>	The size of a signal, at any given point, in an audio system.
<b>LISTEN</b>	A button that allows the operator to monitor signals within the console.
<b>MIC LEVEL</b>	The very small output level of a microphone, generally around 5 to 10 millivolts (mV), a millivolt is 1/1000 of a Volt. When used close up in live situations however, the voltage produced by a microphone, even a low impedance type may be as much as a Volt or more.
<b>MOMENTARY</b>	A type of footswitch with a non-latching switch.
<b>LINE LEVEL</b>	The output of most powered equipment. Typical semi pro equipment is -10dBV. Pro equipment level is usually +4dBu and often balanced. Can be anything from 100mV and 4V (-15 to +15dBu).
<b>MIDI</b>	Musical Instrument Digital Interface. An industry standard which allows suitably equipped instruments and equipment to communicate with each other.

<b>MIC PREAMP</b>	A “pre-amplifier” that increases the mic voltage up to the internal operating level of the console.
<b>MID</b>	The middle part of the audible frequency range or the speakers that are used to reproduce it.
<b>MONO</b>	Short for monaural. Single channel sound reproduction
<b>MONITOR</b>	The ability to hear signals within a console or the speakers used by the performers to hear on-stage.
<b>NOISE</b>	Any sound you didn't want.
<b>NOISE GATE</b>	A device which shuts off the channel if the signal and drops below a pre-set level.
<b>OHM</b>	A unit of electrical resistance. 1000 ohms = 1Kohm (or 1000 = 1k )
<b>PAN</b>	Sets the Left to Right balance of a sound in a stereo mix. Derived from the film industry term where a camera would follow the action from one side of the picture (or panorama) to the other.
<b>PFL</b>	Pre Fade Listen. A function which allows the operator to monitor (usually on headphones and on meters) a signal even when the channel output fader is down at it's minimum volume position.
<b>PHANTOM POWER</b>	48V supply applied to Pins 1 & 2 of a 3pin XLR connector to power condenser type microphones.
<b>PHONES</b>	Headphones
<b>POST FADE</b>	A signal taken after (post) the fader. Usually used for effects sends.
<b>PRE FADE</b>	A signal taken before (pre) the fader. Usually used for monitor sends.
<b>PHONO (RCA J ACK)</b>	An unbalanced two pole connector used for hi-fi or other line level equipment.
<b>REGEN (Regeneration)</b>	The control used to adjust the amount of artificial echo that continues after a sound has finished.
<b>RESISTANCE</b>	A measure of the ratio of voltage and current. Resistance = Voltage/Current.
<b>RETURN</b>	The connectors or controls used to bring an externally processed signal back into the console.
<b>REVERB Reverberation</b>	A series of very closely spaced echoes which ring on after the original sound has finished. Usually reproduced by electronic devices and probably the most widely used effect in modern music.
<b>SEND</b>	The connectors or controls used to send a signal out of the mixing console.
<b>SEND/RETURN</b>	See INSERT.
<b>SEQUENCER</b>	Usually a MIDI based device which controls electronic equipment by sending sequences of digital information, normally to play sounds on external sound modules.
<b>SIGNAL TO NOISE</b>	The ratio between the level of a signal and the background noise that accompanies it.
<b>SPEAKON™</b>	A quality connector designed for use with high power amplifiers and loudspeakers.
<b>SUB GROUP</b>	A single fader used to control a group of signals (a “sub-mix”) without affecting their relative levels.
<b>STEREO</b>	Two track sound where the two signals are sent to separate left and right amp/speaker systems.
<b>SWEEP EQ</b>	Allows the frequency of the cut and boost control to be adjusted over a wide range.
<b>TRS Tip Ring Sleeve</b>	¼” 3 pole (“stereo”) jack plug. Used for balanced line signals, inserts, send/returns and headphones.
<b>TS Tip, Sleeve</b>	¼” 2 pole (“mono”) jack plug. Used for unbalanced signals.
<b>UNBALANCED</b>	Two wire connection using one signal and one screen conductor.
<b>WEDGE</b>	A angled speaker designed to project the sound up towards the performers ears.
<b>WET</b>	A signal that has been processed using an effects processor.
<b>XLR</b>	Usually a 3 pin connector used for balanced mics. Also used for line signals and speaker outputs.

### **MIDI IMPLEMENTATION**

<b>MESSAGE</b>	<b>FORMAT</b>	<b>ACTIVE</b>	<b>FUNCTION</b>
START	FAH	When MIDI channel is not 'OFF' and when START/STOP is 'ON'	Un-mute the REVERB Module
CONTINUE	FBH	When MIDI channel is not 'OFF' and when START/STOP is 'ON'	Un-mute the REVERB Module
STOP	FCH	When MIDI channel is not 'OFF' and when START/STOP is 'ON'	Mute the REVERB Module
PROGRAM CHANGE	CnH,ppH	When MIDI channel is not 'OFF' and when a program is set to receive the relevant Program Change Number	Recall a Program from non-volatile memory
<hr/>			
<i>n</i>	= MIDI Channel 0H - FH ( channel 1-16)		
<i>pp</i>	= Program Number 00H - 7FH (0 - 127)		

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

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

The requirement for Electromagnetic compatibility (or EMC for short) stems from the European Directive 89/336/EEC which requires that equipment should not generate interference that would be likely to cause other equipment to malfunction, and should also have an adequate level of immunity from interference itself. Similar regulations covering interference generated by computers have existed in the United States for over a decade, known as the FCC Rules (part 15 - subpart J - computing devices). The concepts are similar, although the U.S. rules do not cover immunity.

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

As part of the requirements of the Directive we are obliged to explain the effects that may be observed.

**Immunity** If this equipment is operated in environments with unusually high levels of emissions from other equipment, its performance may be degraded. Due to the large number of variables possible in the usage of this equipment and its control settings; it is impossible to define the exact degradation that may occur in every possible situation.

For your guidance these are the effects of the tests in what we consider to be typical operating situations.

Susceptibility to 'fast transients' on the a.c. power and signal connections and to electrostatic discharges :

- Results in small clicks or pops ; operation otherwise unaffected.

Since these events are usually infrequently encountered the resulting clicks should not give cause for concern. High levels of mains transients may be caused by defective equipment. This may be determined by switching them off and on. Typical causes of transients on the mains are products containing thermostats such as heating controllers and refrigerators. Excessive clicks from such products may indicate a faulty or worn out thermostats. We would suggest replacement of any such defective part. If such remedial action is still unsuccessful then it may be possible for a competent electrician to add a contact suppressor.

If however you have an electricity supply which has a high and regular level of transients that appear to be unexplainable, we suggest that you contact your electricity supply authority. We know of instances where interference to domestic supplies has (for example) been caused by defective street lighting. Finally if all else fails you may wish to add an external filter which may be obtained from electrical retailers. Susceptibility to radio frequency fields (3V/m) : Result depends on products and test frequency.

- **Power amplifiers and powered mixers** - no audible degradation observed.

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

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

Check the quality of the ground connection to the product.

Determine the source of the interference by switching off and on other electrical and electronic products in the vicinity.      Move any interfering product to a more distant location.

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

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

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

**Emissions** In practice most audio equipment is incapable of generating harmful interference unless it is misused or a fault exists. However products containing microprocessors or other digital systems such as DSP reverb modules operate at radio frequencies and may 'leak' some of this energy into the environment.

This product has been tested for compliance with established standards. However as with immunity this does not mean that this product will not cause interference with other equipment under all circumstances (especially broadcast receivers). Similar guidelines to those for immunity apply for the minimisation of interference. Additionally if you believe that the product is causing interference to radio or television reception, which can be determined by turning the equipment off and on, you may be able to correct the interference by one or more of the following measures.

- Relocate or reorient the receiver's aerial.      - Increase separation between equipment and receiver.
- Connect receiver to a different A.C. mains outlet.      - Consult your dealer or an experienced radio/TV technician.

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

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

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

Avoid unnecessarily long runs of cable when interconnecting equipment.

Use balanced connections wherever possible.

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

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

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



**TECHNICAL SPECIFICATION**

MIXER SECTION			Max gain to		INPUT IMPEDANCE	
GAIN	MIN	MAX	L-R output		Mic	2k
Mono Mic	+10dB	+60dB	+75dB		Line	20k
Mono Line	-10dB	+40dB	+55dB		Ch. Insert	5k
Stereo Mic	+10dB	+50dB	+65dB		Stereo Line	50k
Stereo Line	-10dB	+20dB	+35dB		Aux Line	15k
Aux Input	-	+14dB	+19dB		Tape	10k
Tape Input	-	+14dB	+19dB			
CMRR - Mic @ 1kHz			81dB		MAXIMUM OUTPUT LEVELS	
					L/R Line outputs	+22dBu
					Foldback output	+22dBu
					Aux output	+22dBu
EQUALISATION					OUTPUT IMPEDANCE	
Mic (all +/- 15dB. Peak response)					Left/Right	< 30
H.F.			12kHz		Foldback	< 30
M.F. (Q=0.8)			350Hz to 6kHz		Aux	< 30
L.F.			60Hz (peak)		Tape	730
Stereo Line (all +/- 15dB)					AMPLIFIER SECTION	
H.F.			12kHz		OUTPUT POWER (per channel)	
M.F. (Q=0.5)			1.6kHz		Vision 700 series into 4 load	350 watts
L.F.			45Hz		Vision 700 series into 8 load	210 watts
Graphic (all +/- 12dB)					Horizon 1200 series into 4 load	600 watts
50Hz, 150Hz, 330Hz, 1kHz, 2.5kHz, 5kHz, 10kHz					Horizon 1200 series into 8 load	350 watts
NOISE					DISTORTION	
Mic E.I.N			-129dBu		Vision 700 series - 1kHz into 4 ohms	0.008%
E.I.N through mixer			-127dBu		Horizon 1200 series - 1kHz into 4 ohms	0.015%
L-R faders @ 0dB			-78dBu		AMPLIFIER INSERTS	
1 channel @ 40dB gain			-77dBu		Maximum Send level	+16dBu
DISTORTION					Send Impedance	< 30
Mic to L-R output @ 40dB gain			0.006%		Maximum Return level	+22dBu
FREQUENCY RESPONSE (+/-0.5dB)					Return Input Impedance	10k
Mic to L-R output			20Hz to 20kHz		A.C. POWER REQUIREMENTS	
CROSSTALK @ 1kHz					VOLTAGE RANGE	
Channel fader cutoff			> 80dB		230V model	220-240 Volts 50/60Hz
Standby Mute			> 80dB		115V model	105-120 Volts 50/60Hz
PEAK LED					AC POWER CONSUMPTION	
Illuminates 5dB prior to clipping. Pre & post fade.					Vision 700 series	4.4A Max @230V
REVERB					Vision 700 series	8.8A Max @115V
16 bit (32 bit internal) digital stereo					Horizon 1200 series	7.6A Max @230V
MAXIMUM INPUT LEVELS					Horizon 1200 series	15A Max @115V
Mic			+11dBu		AC FUSES	
Line			+31dBu		700 series 230V model	T6.3A (5x20mm 250V)
Stereo Line			+33dBu		700 series 115V model	10A (1 1/4" 250V)
Aux Line			+22dBu		1200 series 230V model	T10A (5x20mm 250V)
Tape			+18dBu		1200 series 115V model	16A (1 1/4" 250V)
DIMENSIONS mm (inches)			WIDTH	HEIGHT	DEPTH	WEIGHT kg (lbs)
Vision 708			512 (20.15)	170 (6.7)	425 (16.7)	18 (39.6)
Vision 712			629 (24.75)	170 (6.7)	425 (16.7)	20 (44.0)
Vision 716			744 (29.28)	170 (6.7)	425 (16.7)	22 (48.4)
Horizon 1208			512 (20.15)	170 (6.7)	425 (16.7)	21 (46.2)
Horizon 1212			629 (24.75)	170 (6.7)	425 (16.7)	23 (50.6)
Horizon 1216			744 (29.28)	170 (6.7)	425 (16.7)	25 (55.0)
Vision 708 and 1208 occupy 10 Units when racked						

The manufacturer reserves the right to change features and specifications without notice.

**SERVICE INFORMATION**

Studiomaster products are built and tested to the highest standard and should give years of trouble free service. In the unlikely event of a serious problem, DO NOT attempt to rectify it yourself. Service work should be undertaken by a qualified and experienced service engineer. Please follow this procedure in the event of a technical fault.

- 1) Contact the dealer who supplied the equipment and give details of the fault. Your dealer may be able to rectify the problem immediately or give you advice about how to get your equipment repaired.
- 2) If your dealer recommends that you send the equipment directly to Studiomaster Service, then ensure that you pack the equipment in the original packaging to protect the equipment from physical damage. Studiomaster cannot be held responsible for damage resulting from the equipment being packaged incorrectly. Be sure to label the equipment clearly with your own name and address and a description of the fault.

This equipment contains no user serviceable parts. Always consult your dealer or contact Studiomaster directly if a problem arises.