

**MOONWALK SERVICE**



## **DOCUMENTAZIONE**

### **Moonwalk Service**

**c/o Claudio Giulio Prencipe**

Noleggio Audio e Luci | Installazioni per Eventi  
via Camogli 11/3 - Rivoli frazione Cascine Vica, 10098 (TO)

+39/3477822465

[moonwalkservice@gmail.com](mailto:moonwalkservice@gmail.com)

[www.noleggio-audio-luci.it](http://www.noleggio-audio-luci.it) | [www.moonwalkgroup.com](http://www.moonwalkgroup.com)

NB: tutti i diritti appartengono ai rispettivi proprietari;  
la presente documentazione viene resa disponibile presso il sito  
[www.noleggio-audio-luci.it](http://www.noleggio-audio-luci.it) e [www.moonwalkgroup.com](http://www.moonwalkgroup.com) per  
scopi puramente informativi. Vi invitiamo a visitare i siti  
dei produttori per consultare le ultime edizioni disponibili.



MULTIGATE

***OPERATION MANUAL***

---

# CONTENTS

Page

1.	INTRODUCTION	1
2.	INSTALLING THE MULTI GATE	2
2.1.	Mounting	2
2.2.	Mains Connection	2
2.3.	Audio Connection	2
2.4.	Midi Connection	3
3.	GETTING STARTED	4
4.	MULTI GATE DESCRIPTION	5
5.	FRONT PANEL CONTROLS	6
6.	SWITCHING ON THE MULTI GATE	7
6.1.	Restoring the Power Off Configuration	7
6.2.	Basic Level Default Values	8
6.3.	ROM Error	8
6.4.	Battery Backup - data retention life	8
7.	PLAY MODE OPERATION	9
7.1.	Liquid Crystal Display	9
7.2.	Channel Status LED's	9
7.3.	Edit Wheels	10
7.4.	Memory Scan and Memory Access	11
7.4.1.	Memory and ADVANCED level	11
7.4.2.	Memory and BASIC level	11
7.4.3.	Memory Load	12
7.4.4.	Accidental Memory Load	12
7.4.5.	Loading Memories and Mute Patches with Programme Change	12
7.5.	BYPASS	13
7.6.	SOFT KEY	13
7.7.	RECEIVE key	13
7.7.1.	Key Operation	14
8.	EDIT MENU LISTINGS	15
8.1.	Editing With the Multi Gate	16
9.	SYSTEM EDIT MENUS	17
9.1.	Clock/Pan Trigger	17
9.1.1.	Internal Clock Mode	17
9.1.2.	Midi Clock Mode	18
9.1.3.	Problems with Very Fast Clock Times	19
9.2.	Memory Load Mutes	19
9.3.	Memory Name	19
9.4.	SOFT KEY	20
9.5.	Midi Control	21
9.5.1.	Midi Mute and Gate Messages	21
9.5.2.	Midi and Mutes	22

9.5.3.	Midi and Gates.	22
9.5.4.	Midi with Triggers or Gates.	22
9.5.5.	Midi Channel	23
9.5.6.	Midi Note Numbers	23
9.5.7.	Channel 1 Mute Note	23
9.5.8.	Initialise Trigger/Gate Notes	23
9.5.9.	Midi Switches	24
9.6.	Programme Change Table	24
9.6.1.	Initialise Table to Memories	25
9.6.2.	Initialise Table to Mute Patches	25
9.7.	Mute Patch Table	26
9.8.	Using Mute Patches	26
9.9.	Display Options	26
9.10.	Data Wheels (Copy/Rel)	27
9.11.	Advanced/Basic Level	27
9.11.1.	Basic Level	27
9.11.2.	Basic Default	27
9.11.3.	Advanced Level	28
9.11.4.	Advanced Lock	28
9.12.	Memory Enable	28
9.13.		
10.	CHANNEL EDIT MENUS	30
10.1.	What's in a channel?	30
10.2.	Channel Mode	31
10.2.1.	Mute	31
10.2.2.	Gate	31
10.2.3.	Duck	32
10.2.4.	Clock I/II	32
10.2.5.	Tremolo	32
10.3.	Attack	32
10.4.	Decay	33
10.5.	Hold Time	33
10.6.	Hold Mode	33
10.7.	Trigger Hold	34
10.8.	Range	34
10.9.	Threshold	35
10.10.	Keysource	35
10.10.1.	Stereo Triggering	35
10.11.	Channel Note	36
10.12.	Transmit Trigger Off	36
10.13.	Basic Level Default Values	37
11.	SAVE	38
11.1.	Saving an Edit Setup	38
11.2.	Accidental Save & Restore	38
12.	COPY	40
13.	NOTES ON THE USE OF MIDI	41
13.1.	Midi Loops	41
13.2.	Thru Chains	41
13.3.	Programmable Gates	41
13.4.	Midi Delays and Buffering	42
13.5.	Direct Control of VCA's	42

14.	FREQUENCY CONSCIOUS KEYING	43
15.	SYSTEM EXCLUSIVE	44
15.1.	System Exclusive Messages	44
15.2.	Midi Channel Interrogate & System Exclusive Switch	45
15.3.	Parameter Change and Parameter Request	45
15.3.1.	Channel Parameters	46
15.3.1.1.	Attack/Decay Time Lookup Table	47
15.3.1.2.	Threshold Values	47
15.3.2.	System Parameters	47
15.3.2.1.	Midi Parameters	47
15.3.2.2.	Programme Change Table	48
15.3.2.3.	Mute Patch Table	48
15.3.2.4.	Miscellaneous	48
15.3.2.5.	Clock/Pan Trigger	49
15.3.2.5.	Edit NAME	49
15.4.	Dump Data and Dump Request	49
15.4.1.	Dump Request Messages	49
15.4.2.	Dump Request Number Formats	49
15.4.3.	Dump Data Messages	50
15.4.4.	Description of Dump Data format numbers	50
15.4.4.1.	Single Memories and Edit Buffer	51
15.4.4.2.	Dump Memory Bank A or B or C or Factory Presets	51
15.4.4.3.	Dump Programme Change Table	51
15.4.4.4.	Dump Mute Patch Table	52
15.4.4.5.	Dump System Setup Data	52
16.	MIDI IMPLEMENTATION CHART	53
17.	MULTI GATE SPECIFICATIONS	54

---

# 1. INTRODUCTION

The MULTI GATE is a complete 16 channel audio noise gate in a 1U rackmount case which has been designed to complement any audio system in a live or studio environment.

The primary function of the MULTI GATE is to provide 16 channels of audio gating whilst providing Midi trigger information as to the action of the gates which can be recorded on a sequencer and played back through the MULTI GATE. The MULTI GATE can also be used as a 16 channel Automated Mute Processor as well as providing Panning and Tremolo effects.

Whilst transparently removing any noise from recorded material or a mix, the MULTI GATE is very easy to use - even remotely from a computer or another MULTI GATE. The front panel consists of 16 channel control keys, 6 mode keys and 4 Edit Wheels (one with Range/Hold select) which are used for the Threshold, Attack, Decay, Range and Hold time as in a conventional noise gate. These can control any channel simply by pushing the appropriate channel control key. Additionally, a Liquid Crystal Display gives the current status of all 16 channels while each channel has its own multi-colour indicator to indicate the action of the channel.

Editing the MULTI GATE is just as easy. Using conventional MENU/PARAMETER and DATA keys OR using the Edit Wheels which can also be used to spin through the MULTI GATE edit menus/parameters and data.

Version 3.60 of the MULTI GATE software now supports a number of new features which dramatically enhance its performance in areas such as triggering and expanded operation. For example, the transmission of midi triggers can now be masked to prevent the accidental triggering of other equipment as well as just the trigger off, so that percussion devices requiring simple start triggers may be used more efficiently. Expanded operation now allows a true 48 channel gating system to be employed where each MULTI GATE can be setup as a Group of 16 gates/ mutes, allowing fully independent access to each of the 48 channels under system exclusive. An advanced mode lock is also incorporated which means that the MULTI GATE will always power on in exactly the same condition it was switched off, without having to 'restore' the power off setup.

---

## 2. INSTALLING THE MULTI GATE

### 2.1. Mounting

The MULTI GATE can be installed into any 19" rack or left as a stand alone unit depending on your preferences. When mounting in a rack, please observe that racking systems do not usually cater for any form of mounting to support the rear of equipment so that the only support is the front panel. Due to the stresses incurred on mounting 1U rackmount devices, it is a good idea to mount any devices with 2 or 3U panels at the bottom of the rack working up to the 1U devices at the top. In this way, the stronger 2 or 3U devices provide the necessary rear support in a rack. The MULTI GATE will operate between normal temperatures of 0 to 35 °C. In racking situations, do make sure that the rack is well ventilated as some pieces of equipment can generate a great deal of heat.

### 2.2. Mains Connection

The MULTI GATE can operate on either 110 or 240 volts 50/60 Hz mains supply. Mains connection is via a standard EURO type connector cable, supplied with the MULTI GATE. It is important to observe the correct operating voltage as the MULTI GATE will NOT work and possibly suffer fatal damage if set to the incorrect voltage. The voltage can be selected via a small drawer directly under the mains inlet. This drawer has the current voltage selection at the top left hand corner and can be changed by pulling it out and rotating it. You will also notice that this drawer also contains the mains fuse as well as a spare.

### 2.3. Audio Connection

The audio connections for the 16 channels of the MULTI GATE are via Stereo Jack sockets where the "ring" connection is the GATE input and the "tip" is the GATE output. The simplest method of connection to your mixing desk is via the INSERT points which often use a Stereo Jack connection so that a simple stereo jack to jack lead can be used. However, be careful to observe the correct polarity of the connection on the desk; it is usual to have the tip connection as the line output source so that the output doesn't get temporarily connected to the output of the device being connected while the jack plug is being inserted into the socket. The Ring will always be the line source, therefore, in general, the connection will most usually be Tip to Ring and Ring to Tip.

If you intend to use the MULTI GATE In Line with other pieces of equipment, you will probably require a stereo jack to 2 mono jacks lead - the number of connection possibilities is limitless - Bantam, Jack, Phono, XLR, etc., etc.

Please note that the signal drop through the MULTI GATE is in the order of 0.4dB. This will not usually be of any concern although it may be worth bearing in mind if the MULTI GATE is removed from the system from time to time.

Once the MULTI GATE has been installed, it is not necessary to turn it off: as with most electronic equipment, it usually has a longer life if left running continuously as in the simple case of the light bulb.

## 2.4. Midi Connection

The MULTI GATE uses the standard Midi Connections - IN, OUT and THRU. The THRU connection is simply a buffered copy of the MIDI IN data while the MIDI OUT data represents data generated in the MULTI GATE. It is also possible to echo the MIDI IN data to the MIDI OUT socket whilst also combining it with the Midi data generated in the MULTI GATE (see section on Midi Echo in Midi Switches).



---

### 3. GETTING STARTED

Once you have installed the MULTI GATE and you are eagerly awaiting the opportunity to mixdown your multitracks with a Noise Gate on every channel, switch on the MULTI GATE. You will notice the power-up display reads "Basic Level" after 5 seconds or so. The MULTI GATE has 2 levels of operation, Basic and Advanced level. Basic level is effectively a cut down version of the MULTI GATE whereby some of the more complex features are not available. When switching on the MULTI GATE in Basic Level, you are presented with 16 Audio Noise gates which are ready to use. To get the feel of the MULTI GATE, make sure all your signals are routed correctly and switch on your tape machine. The first thing you will notice are the green channel LED indicators going on when an audio signal is present, these indicate when the gate is open, allowing the audio signal to pass through. To CONTROL a CHANNEL, push the appropriate Channel Control Key (the 16 keys to the right hand side of the front panel) to assign the 4 Edit Wheels to that channel. You will notice that the LCD will temporarily display the channel that you have selected by a '\*' in the appropriate position on the top line, and the channel number on the bottom line.

Lets start by adjusting the THRESHOLD - this sets the audio level which is sufficient to trigger the gate and open the channel to allow the audio signal to pass through. As soon as you move the THRESHOLD control, you'll notice that the display shows the current value of the threshold as well as the channel that it is concerned with - the top line of the display has a '\*' under the appropriate channel number 1-16. When the THRESHOLD control is moved a bit more, the value of the Threshold will the start changing. Turning the THRESHOLD clockwise will increase it (anti-clockwise=decrease) until the gate will close and you won't hear anything. At this point the threshold level is too high for the audio signal to trigger the gate and open it. If the Threshold Edit Wheel is not moved for 4 seconds, the display 'times out' and reverts back to displaying the status for all 16 channels.

If you move the ATTACK wheel, the display will indicate the current attack time. This represents the rate at which the gate opens when triggered. For example, a Bass Drum would require a fast attack time so that the initial 'click' wouldn't be missed. Usually, most signals will require a fast attack time so that no signal is lost but it may be desirable for some signals such as 'strings' to have a slower attack, for example 20ms or so.

The DECAY wheel controls the rate at which the gate closes when the signal becomes less than the threshold. Normally a setting of about 70ms is adequate. If the decay time is too fast, a click can often be heard as the gate closes, this is because the gate is suddenly switching off in the 'noisy' part of the signal.

The RANGE and HOLD are both adjusted with the same wheel. A switch selects whether the wheel is set to RANGE or HOLD. The HOLD controls the minimum time that the gate can be open for once it has been triggered. The hold time can be used to prevent effects such as 'chatter' which is the effect caused by the gate opening and closing rapidly if for example the audio signal is hovering around the threshold level.

The RANGE controls the amount that the gate closes. If for example the range is set to 80dB, then no signal will pass through the gate when closed. If 20dB, there will be a substantial reduction in signal level while the gate is closed.

In essence, the MULTI GATE consists of 16 VCA and Audio Trigger channels where each channel can be configured to operate in a number of ways. The primary application is as an audio gating device but the channels may also be configured to operate as MIDI MUTES, PANNERS or TREMOLO's. Any GATE/DUCK channel can be keyed by any of the 16 channels which allows a powerful method of linked multi-channel keying. In addition, All GATES/DUCKS and TRIGGERS can transmit Midi Information as well as operate under the control of Midi. A CLOCK controller can be used to act as a trigger source for any channel (configured as a CLOCK/PAN) which can run by itself by setting the Clock Rate, and Balance(Duty cycle), OR run under the control of the MIDI CLOCK. Here, the Midi Clock divide ratio can be set up along with a Cycle Offset value, Duration and Start/Stop so that any channels operating as CLOCK/PAN can for example synchronise to a Drum Machine. Here, particular beats could be removed or emphasised though effects units. Operating the MULTI GATE is very straight forward- select which channel you wish to adjust with the Channel Control Keys, and adjust the desired parameter with the Edit Wheels as a conventional Gate would be adjusted. Editing is also very simple. The MULTI GATE gives you the choice between the conventional MENU/PARAMETER/DATA keys approach and also a very fast option whereby the 4 Edit Wheels are each assigned to MENU/PARAMETER/DATA & YES/NO which can reduce editing and setup time by half. The MULTI GATE contains 16 factory presets which are intended to get you started, and 96 user memories where each contains a complete 16 channel/Clock/Softkey setup. User Memories are divided into 3 Banks of 32 (A01-32,B01-32,C01-32) and are all accessible via the Memory Scan Wheel as well as the 16 channel keys which are always assigned to memories A01-A16 for quick recall of your most used settings. Memories are also available under Midi Programme change. When the MULTI GATE is being used as an Automated Mute Processor (i.e., all channels are configured as Mutes), the MULTI GATE contains 128 mute patches.

---

## 5. FRONT PANEL CONTROLS

The front panel is divided into 4 sections:

Edit Wheels

Display (16 characters by 2 rows)

Channel control keys (used for MENU/PARAMETER/DATA/YES/NO/COPY/SAVE in Edit)

Operation Mode Keys: Play, System Edit, Channel Edit, Bypass/Undo, Softkey, Receive

---

## 6. SWITCHING ON THE MULTI GATE

When you initially switch on the MULTI GATE, you will observe a power up display sequence which starts with the MULTI GATE title which includes the designers name , Guy Martin and the software version number. This is then followed by a simplified status readout of four important settings that will be in existence once the unit is running. These are the Operating Level (Basic, Basic Default, Advanced Level and Advanced Lock), the Midi Channel (1 to 16), System Exclusive (On or Off) and the Channel Grouping (1 to 16, 17 to 32 or 33 to 48). These four parameters will let you instantly know if the MULTI GATE is configured into your equipment correctly, without having to grub around in the System Edit menu to find out.

The MULTI GATE has been designed to power up as 16 conventional noise gates so that the operator/engineer will have a standard reference point from which to start from. This default configuration is the same as that used in factory preset memory P01 "16 Basic Gates", and is also the same as that used when the system is initialised from the system edit menu in Basic Level Default. For more information, see the section below - "Basic Level Default Values".

It is possible to override the powerup default so that the MULTI GATE switches on in exactly the same condition that it was when switched off. see next section.

### 6.1. Restoring the Power Off Configuration

In many instances, it would be preferable for the MULTI GATE to switch on in the same condition that it was switched off in. There are three ways that this can be done:

1) If the PLAY key is held down at the time the MULTI GATE is switched on, it will restore in exactly the same state that it was turned off in. This included not only the Channel edit setup, but also all the System setup parameters as well as the old operating level.

2) Once the MULTI GATE has been turned on, initialising to 16 Basic Gates, the Power-Off configuring can be restored in the same way that the old edit restore can be done, see section on Accidental Memory Load. Making sure you are already in Play mode (Play LED lit continuously), press the PLAY key followed by the UNDO key; the display will read:

UNDO to restore  
from power-off:

If you wish to restore, then press the UNDO key and a full system restore will take place.

3) The most straight forward way of restoring the power off state is by leaving the MULTI GATE in Advanced Lock mode. This automatically maintains the power off setup when the MULTI GATE is switched on eliminating the need to have to hold down any keys etc. in order to restore the power off state.

For more information on Advanced/Basic level operation, see section 9.11 - Advanced/Basic Level.

## 6.2. Basic Level Default Values

### Channel Parameters

All 16 channels of the MULTI GATE are configured as 16 Audio Gates (it uses Factory Preset 1), where-

Attack time	=	30 $\mu$ s
Decay time	=	110ms
Hold Mode	=	Hold at Trigger Off
Hold time	=	50ms
Range	=	80dB
Threshold	=	-45dB
Keysource	=	Own Channel
Trigger Hold Time	=	10ms
Channel Note	=	C3 (successive from chan 1)

### System Parameters

Soft Key	=	Gates Open
Midi with Triggers mode		
Midi is on Trigger Transmit		
Midi Channel	=	1
Channel 1 Mute Note	=	C0
Mute Transmit/Receive	=	ON
Memory	=	ON
All Notes Off	=	ON
Midi Reset	=	OFF
Echo Midi	=	OFF
System Exclusive	=	OFF

## 6.3. ROM Error

After the MULTI GATE has performed its power up sequence, it carries out a simple test to check that the eprom chip containing the software is in 100% working order. If it is found that there is in fact an error, the display will read "ROM ERROR", whereupon the MULTI GATE will not function any further so as to safe guard the memory contents. A system crash could easily destroy these. It should be noted that it is VERY RARE that an eprom can fault, and corrupt its data, where the only natural cause might be an intense cosmic ray. If your MULTI GATE does display ROM ERROR, it may be worth checking to see that it is firmly seated in its socket. If this does not cure the problem, then a replacement eprom may be obtained from LA Audio. The new ROM will also contain the most recent software release.

## 6.4. Battery Backup - data retention life

The MULTI GATE's memory has full battery backup so as to retain all data when the unit is switched off. The battery itself is rechargeable and should never need replacing. This has the benefit that the battery will always be fully charged as long as the unit is used at least once a year. However, if the unit is not switched on for a year or more, the battery voltage may drop sufficiently (as it has to maintain power to the memory) for the memory to start losing its contents. This does NOT mean that the unit will not function but the data in the user memories may be damaged. If the battery does become discharged, the unit should be switched on for about 5 hours for the battery to become fully charged again. The memories will also need to be re-created, either from scratch, or by dumping from another Multi Gate or library package. After this, the MULTI GATE will function perfectly.

---

## 7. PLAY MODE OPERATION

Play mode is indicated when the PLAY LED is lit continuously.

### 7.1. Liquid Crystal Display

In play mode, the display indicates the status of all 16 channels. The top row of characters indicates the channel configuration:

M or m	=	Mute
G or g	=	Gate
D or d	=	Duck
C or c	=	Clock/Pan
T or t	=	Tremolo

The uppercase letters indicate whether the channel is being used as a keysource where the audio input signal on that channel is used to trigger a Gate or Duck channel.

The characters on the LCD are organised as 2 rows of 16 characters where each channel uses two vertical characters to display its status and the horizontal character position relates to the channel 1-16.

The second character row of the LCD is used to indicate the corresponding channel trigger source (depending on the nature of its configuration): If the channel is configured as a Gate or a Duck, it will require a keysource, which is indicated 1 to 16. Additionally, if a channel is using a stereo trigger (where it uses an adjacent pair of channels), an "s" is displayed. When Gate/Duck channels are being bypassed (i.e. the audio signal is allowed to pass straight through without any Gating action), a 'b' is displayed. If the channel is configured as a Mute, a '-' is displayed as it doesn't require any trigger. If the channel is configured as a Clock/Pan controller, the clock phase is indicated I or II. Phase I will be on while II is off and vice versa. If the channel is configured as Tremolo, '-' is displayed as it doesn't require any trigger.

When the Threshold/Attack/Decay/Range/Hold/Clock Rate/Clock Offset and Clock Balance are being adjusted with the Edit Wheels, the display shows the value of the parameter when the Wheel is first moved. When the Wheel movement is continued, the parameter is then incrementally changed to its new value. In order to maintain readability, the currently displayed parameter value is held on display for about 4 seconds after the Wheel has stopped moving unless another parameter wheel is adjusted. After the 4 second timeout, the display resorts back to displaying the 16 Channel status.

While a parameter is being changed, the top row shows the channel that is being adjusted by a '\*' under the appropriate channel number indicated above.

### 7.2. Channel Status LED's

Each channel has its own status LED which indicates whether the channel is open or closed while the LED indicators are multi-coloured to aid visible recognition of the current channel state. When a channel is configured as a Gate or Duck, the LED indicates GREEN when the channel is open (off when the channel is closed) and RED for either Mute, Clock/Pan or Tremolo. In addition, when a Pre-Mute Patch is being setup, the LED indicators flash ORANGE so as to contrast with a Mute that is currently on (indicated in RED).

Sometimes the status leds cannot respond to a channel opening and closing in a very short period of time. This is because the leds are multiplexed at a frequency of about 50Hz with 25% duty cycle. Therefore if a channel opens for less than 15ms in between the period that its led is not being driven by the multiplexer, then the led will not illuminate. This will not normally be a problem and the status leds will faithfully respond to the channels opening and closing. Probably the worst case for this is in Tremolo mode in which the channel can be made to open and close at a rate of 10ms. If you set the Attack and Decay to about 20ms, you should find that the led will appear to be flashing at about the right rate. If you now decrease the attack and decay and hence speed up the tremolo rate, the led will begin to behave erratically as the tremolo rate approaches the led multiplexer rate. It should be emphasised however that this display effect should not normally be any problem as it is an extreme worst case situation, also it has NO detrimental effects what so ever on the actual audio channel operation and performance.

### 7.3. Edit Wheels

The EDIT Wheels are used to control the gates in a conventional way and to allow the MULTI GATE to have an analogue feel to it. When using the MULTI GATE as 16 conventional gates, the 4 Edit Wheels are used to control the THRESHOLD, ATTACK, DECAY, RANGE and HOLD where the RANGE and HOLD are combined on the one Wheel and is selected by the toggle switch to be either RANGE or HOLD. To use the Wheels to control a channel, simply select the channel you wish to use by pushing the appropriate channel control key 1-16. You will notice that the LCD displays the current selection as the channel number on the bottom line, and on the top line a "\*" is displayed under the appropriate channel. The channel can now be controlled in a conventional manner. It is possible to simultaneously control several channels at once by assigning the Wheels to several channels thus providing for example a stereo link. This is simply achieved by pushing down the appropriate channel control keys together or holding down one of the keys while pushing the others to be selected. It is possible here to control all 16 channels simultaneously although it is probably not a very practical application. When more than 1 channel is selected in this way, instead of displaying the single channel selected on the LCD bottom line, the MULTI GATE displays either Data Wheel = Copy OR Data Wheel = Rel. When Copy is displayed, the edited data is copied to all selected channels from the lowest numbered channel selected. For example, if channels 3,5,7 and 9 are selected, when a parameter is edited (i.e., THRESHOLD,ATTACK,DECAY,HOLD,RANGE), the value of channel 3 will be adjusted and copied to channels 5,7 and 9. When Rel is displayed (short for Relative), all data is adjusted independently. For example, if channels 4,12 and 15 are selected, and the RANGE is adjusted, then if initially 4=56dB, 12=30dB and 15=45dB and the range is adjusted by +10dB then 4=66dB, 12=40dB and 15=55dB. The COPY or RELATIVE option can be found in the SYSTEM EDIT menu. Note that when operating the MULTI GATE in BASIC level, this function is always set to COPY, and it is not accessible in the edit menu.

The edit wheels are used to adjust the main parameters of the channel they are assigned to. For ease and speed of operation, when a wheel is first moved, the current appropriate value is displayed on the LCD along with the channel that it represents. The Edit Wheel has to be moved about 1/8 of a turn before the parameter starts to be adjusted. If the Edit Wheel is not moved for 4 seconds, the LCD times out and reverts to displaying the channel status unless another Edit Wheel is moved whereby the appropriate value is first displayed before being adjusted.

If the channel is a Mute, then there are no parameters to be adjusted as the attack and decay times are fixed at 20ms. (however, the attack and decay of the muting action are editable in the respective channel edit menu). If the channel is a Gate or Duck, the edit wheels are used to adjust the THRESHOLD, ATTACK, DECAY, RANGE and HOLD. RANGE and HOLD are both controlled by a single controller where the toggle switch is used to select either RANGE or HOLD. When the switch is first moved (like the edit wheels), the display displays the current value of the Range or Hold. If a channel is itself not being used as a keysource, then in effect the threshold will not be required as the threshold is only used to set the trigger threshold. Therefore the THRESHOLD will have no effect in

this instance.

If the channel is a Clock/Pan, the ATTACK/DECAY and RANGE wheels still have the same functions while the THRESHOLD controller can now be used to control either the CLOCK OFFSET or the CLOCK RATE, and the HOLD controller now controls the Clock BALANCE or DUTY CYCLE. The CLOCK OFFSET is controlled when the Clock itself is controlled by the external MIDI CLOCK; the OFFSET has the effect of shifting the start of the CLOCK cycle over its entire cycle duration. The CLOCK RATE is used when the CLOCK is set to internal mode where a simple CLOCK RATE or speed can be set up.

If the channel is a TREMOLO, only the ATTACK/DECAY and RANGE are used. The TREMOLO configuration simply allows the channel to ramp up and down continuously where the ramp speeds are determined by the ATTACK and DECAY times while the RANGE sets the lower signal level limit.

Note that all these PLAY mode parameters are also available in EDIT mode. The RANGE/HOLD wheel is also used to access all memories.

## 7.4. Memory Scan and Memory Access

The MULTI GATE contains 16 factory presets which are intended to get you started, while there are also 96 user memories organised in 3 banks of 32 memories - A,B,C. Each memory contains a full 16 channel setup plus the SOFTKEY mode, the CLOCK/PAN TRIGGER setup as well as the MIDI transmit/receive enables for the GATES/DUCKS. (see respective sections for more details).

All of the 96 User Memories or 16 factory presets are accessible via the front panel of the MULTI GATE (or by Midi Programme change) by either using the MEMORY SCAN wheel or the 16 channels keys which are assigned to memories A01-A16. The latter enable you to keep your most used memories in A01-A16 so that you can call them up instantly without having to scan through all the memories with the MEMORY SCAN wheel. The MULTI GATE allows you to view or find a memory before it is actually loaded by displaying the memory number, NAME and the status of the 16 channels. This feature means that you can reliably load the memory you want without having to first try the one which you thought it might have been.

### 7.4.1. Memory and ADVANCED level

All memories are accessible in ADVANCED level operation. Whenever a memory is loaded, the MULTI GATE also transmits a Programme Change number which is accessed from the Programme Change Table. Likewise, whenever the MULTI GATE receives a Programme Change Message, the memory relating to the Programme Change number is looked up in the Programme Change table. See Programme Change Table under EDIT for more details.

### 7.4.2. Memory and BASIC level

The use of the Memory can be enabled or disabled in the SYSTEM EDIT menu although whenever the MULTI GATE is initialised to BASIC level operation or it is switched on in BASIC level, the Memory function is always enabled.

In BASIC level operation, the channel configurations, Clock/Pan and Tremolo are not available, therefore if you try to load a memory containing either of these in BASIC level, then the LCD will display



"Advanced Memory", and you will not be able to load it.

When a memory is loaded, the MULTI GATE also transmits a Programme Change message where the programme change number is not looked up in the programme change table but is directly related to the memory number. Also if the MULTI GATE receives a Programme Change message in BASIC level, it will use the Programme Change number to directly access the memory.

Programme Change Numbers	Memory Number	
0 to 31	A01 to A32	user
32 to 63	B01 to B32	user
64 to 95	C01 to C32	user
96 to 111	P01 to P16	preset
112 to 127	P01 to P16	preset

### 7.4.3. Memory Load

To LOAD a MEMORY, first make sure you are in PLAY mode - the PLAY LED is on continuously. By pressing the PLAY key, you will notice that the PLAY LED is flashing which indicates that you are in MEMORY VIEW mode. In the LCD display, you will now see the current memory number, NAME and Channel status

GGGGGGGGGGGGGGGGGG  
P01 Basic Gates

You can now scan or view through all the memories until you find the one you wish to load, or select A01-A16 with the channel keys. When the LCD displays the memory you wish to load, press the PLAY key to actually load up the memory. Note that if while in MEMORY VIEW mode (Play LED flashing), any of the other 3 Edit wheels are moved, then the view mode is cancelled returning the MULTI GATE to normal PLAY mode. Normal PLAY mode is also resumed if no new memories are selected for view within 8 seconds

### 7.4.4. Accidental Memory Load

A feature of the MULTI GATE allows you to restore the last edit that you were creating if a memory was accidentally loaded over it before saving your edit. This can be accomplished by pressing PLAY, then the UNDO key. Here, you will notice that the LCD reads: "Press UNDO key to restore old edit". By pressing the UNDO key, the last edit you were working on will now be restored ready for you to use, so that you can use, continue editing or save to one of the 96 User memories. If you don't wish to UNDO anything, simple press PLAY to get you back into normal PLAY mode.

### 7.4.5. Loading Memories and Mute Patches with Programme Change

As mentioned previously, Memories and Mute Patches can also be loaded by sending the MULTI GATE Programme Change messages. If the MULTI GATE is operating in Basic Level, the Programme Change numbers relate directly to the memory number and any memories that are only available at Advanced Level (i.e., they incorporate Clocked channels or Tremolos) cannot be loaded. If the MULTI GATE is operating in Advanced Level, Programme Change numbers are used to lookup a corresponding

Memory or Mute Patch from the Programme Change Table.

When a Memory is loaded via Programme Change, the display shows Memory Bank, Number and Name on the bottom line, as well as the Channel Configurations on the top line for about 8 seconds. If the Programme Change number corresponds to a Mute Patch, only channels already configured as Mutes will respond to the appropriate mute states in the loaded patch, and all other channels will simply ignore new mutes. When a mute patch is loaded via Programme Change, the display will show the received Programme number and corresponding Mute Patch number for about 8 seconds.

## 7.5. BYPASS

If this key is not required to UNDO anything, then it is used in conjunction with the channel control keys to BYPASS the gates. By pushing the appropriate channel keys while the BYPASS key is held down, channels can be bypassed (indicated by a "b" where the keysource is normally displayed and the channel gate LED being lit). While still holding down the BYPASS key, pushing the same channel key will switch off the BYPASS. All BYPASSES are cleared if the SOFT KEY is assigned to either GATES OPEN or CLOSED, and it is pushed down. BYPASSES are also cleared when a COPY or Memory load is done. Individual BYPASSES are also cleared if the respective channel edit parameter menu is entered so that the action of editing can be monitored by the action of the channel.

When any of the Gate/Duck channels are BYPASSED, Gate open/close messages are not transmitted if the Gates are operating from Midi. If, however, the Triggers are operating on midi, trigger On/Off messages are always transmitted regardless of whether a channel is BYPASSED or not, and providing that the channel(s) concerned are not operating as programmable gates.

Note that the BYPASS function does not work with Mute, Clocks or Tremolos.

## 7.6. SOFT KEY

The SOFT KEY is used as a global channel controller and can be assigned to do a number of useful functions which are primarily intended for Mute control. For more information, see the SOFT KEY section under EDIT.

## 7.7. RECEIVE key

The RECEIVE key is used to switch Gates/Triggers to receive midi OR transmit midi so that a sequence of Gates/Triggers can be recorded and then played back through the MULTI GATE, providing programmable gates. Individual channels can be enabled or disabled for midi reception and transmission to add to the flexibility of the system. This can be used to switch just a few channels to receive while the others are all transmitting (that is, if they are enabled to), whereby you may wish to reserve a few channels for normal gates while the others are all programmable gates. There are an infinite number of combinations in the use of the triggers and it is your application that will dictate what you wish to use. A Green led indicates when the key is set to receive midi.

## 7.7.1. Key Operation

The Receive key operates in two ways:

- 1) When it is simply pressed and released, it will toggle the receive on and off, as indicated by the led.
- 2) If the key is held down, the display will show you which channels are enabled to transmit or receive depending if the MULTI GATE is currently set to receive or transmit as indicated by the led. When using this 'view' facility, transmit/receive status will not be toggled. You can individually change the enables/disables by keeping the RECEIVE key depressed while using the channel keys to toggle the appropriate enables. An enabled channel is indicated by a "\*" in the appropriate channel position on the LCD display.

When the green indicator is Off, all Gates/Triggers will be transmitting midi Note On/Off information. Gates or Triggers are selected in the MIDI Edit Menu, and instructs the MULTI GATE to transmit/receive midi Note On/Off from either the Audio Trigger response or from the Gate/Duck action using user specified Note Numbers for each channel. When the Midi indicator is green, Gates OR Triggers can now switch over to operate on received midi Note On/Off information. The switching action of the RECEIVE key occurs when the key is released and the display shows what the RECEIVE key function will (when the key is released) while the RECEIVE key is held down.

If Midi is assigned with Gates, and the RECEIVE key is set to receive, then the GATE/DUCK channels will Open when they receive a Note On message with the correct Note Number, and will Close when they receive a Note Off message with the correct Note Number. This therefore acts as a global receive switch for all Gate/Duck channels.

If Midi is assigned with Triggers, the MULTI GATE offers the most versatile option as the Triggers can still be used to key any channel while individual Triggers can be enabled or disabled to receive midi Trigger information. Any Triggers that are not enabled to receive, operate under normal audio triggering and transmit midi information if transmit triggers is enabled.

To select channels for receive, push the appropriate channel keys while the RECEIVE key is held down. You will see a "\*" under the appropriate channel numbers which indicates if the channel is enabled. Pushing the channel key repeatedly, toggles the channel enable.

## 8. EDIT MENU LISTINGS

SYSTEM EDIT MENUS		PARAMETERS
CLOCK/PAN TRIGGER		Internal Mode      Midi Clock Mode Internal Rate      Clock scale Internal Balance    Synchronise Clock Offset Clock Balance
MEMORY LOAD MUTES	B	16 channels of initialised mute states
EDIT SETUP NAME	B	12 characters, e.g. "Basic Gates "
SOFT KEY mode	B	Off, All mutes on, All mutes on + restore, All mutes on while Soft key is down, All mutes off, All mutes off + restore, All mutes off while Soft key is down, Mute patch A - B toggle, Call Pre-Mute All Gates/Ducks open, All Gates/Ducks closed.
MIDI CONTROL	B	Midi with Gates/Trigs, Midi Channel, Channel 1 mute note, Initialise Trigger/Gate notes, Transmit Mutes, Receive Mutes, Transmit Programme Change, Receive Programme Change, All Notes Off, Midi Reset, Echo Midi, System Exclusive, Dump single memory, Dump memory bank, Dump Programme change table, Dump Mute patch table, Dump System setup, Dump Everything, Request single memory dump, Request Bank dump, Request Programme change table dump, Request Mute Patch Table dump, Request System setup dump, Request Dump Everything.
PROGRAMME CHANGE TABLE		Assign any memory or mute patch to each Programme Change number.
EDIT MUTE PATCH TABLE		28 full 16 channel mute patches.
DISPLAY OPTIONS		Display mode for Note Numbers. Display mode for numerical data.
DATA WHEEL MODE		Copy or Relative
OPERATING LEVEL	B	ADVANCED or BASIC
USE MEMORY enable	B	On or Off.

B - Available menus in Basic Level Operation, all others only available in Advanced Level.

## 8.1. Editing With the MULTI GATE

The MULTI GATE has been designed to be fast to edit and give you options to your preferred method of editing. Conventionally, editing is done by moving round a main Edit menu by using Menu Increment and Decrement keys. Once you have found a main menu you would like to enter, a YES key is pressed to select that menu whereupon Parameter Increment Decrement keys are used to move around the various parameters while editing the parameter data with Data Increment, Decrement Keys or Yes/No keys. Although it doesn't take very long to get used to this editing technique, it is however a bit cumbersome and user unfriendly. Steps have been taken in the MULTI GATE to try and create a more user friendly approach to the technique of editing. To fall in line with convention, it does provide MENU dec/inc, PARAMETER dec/inc, DATA dec/inc and Yes/No keys where the PARAMETER keys are arranged as 2 pairs of keys. There are 2 PARAMETER Increment keys (one above the other) and 2 Decrement keys (one above the other) to facilitate quicker access to them from the MENU and DATA keys. Additionally, to select an edit menu from the main menu, the conventional YES key can be used as well as pressing a PARAMETER key. The MAJOR advantage of the system employed by the MULTI GATE is that ALL of the key functions (except SAVE and COPY) are replicated on the 4 Edit Wheels. Going from left to right, the MULTI GATE has a MENU Wheel, PARAMETER Wheel, DATA Wheel and YES/NO Wheel. Moving any Wheel clockwise represents Increment, and anti-clockwise represents Decrement. Note that for the YES/NO wheel, moving it clockwise represents YES, and anti-clockwise represents NO. The use of the 4 Edit Wheels in this way can be highly preferable to the Keyed system where the Wheels are much easier and faster to use resulting in a much less time spent over editing.

One additional feature of the MULTI GATE is that when in Edit mode, you can still turn mute channels On or Off with the appropriate channel keys by holding down the SOFT KEY while switching the mute. The only 2 situations where this is not possible is when you are setting up the Memory Load Mutes, and the Mute Patches.

If System Exclusive is switched on, any parameters that are edited are also transmitted as System Exclusive messages to allow, for example, a front panel controller to keep up to date with the current MULTI GATE setup. Additionally, if the same parameter that is currently displayed in the edit window is transmitted to the MULTI GATE, the new parameter value will be displayed.

---

## 9. SYSTEM EDIT MENUS

To get into SYSTEM EDIT, press the EDIT SYS key and the MULTI GATE immediately jumps into the last SYSTEM EDIT menu that was selected with the MENU keys but NOT the MENU Wheel. This feature is to allow quick access to a preferred SYSTEM EDIT menu if you find the MENU Wheel more convenient to use. In this case, the MENU keys can be used to select your preferred or most used SYSTEM Menu so that whenever you push the EDIT SYSTEM key, that menu is entered. Note that the default Menu is the Midi Control menu which allows you to setup the various Midi operating parameters. When in SYSTEM EDIT, using the MENU keys allows you to scroll round the various SYSTEM MENU selections while using the MENU Wheel allows you to scroll round the entire MULTI GATE menus. When you have found a Menu that you would like to enter (some you don't need to enter), simply press YES (or use YES Wheel), OR use the PARAMETER Wheel/Keys to enter the Menu. To get out of a Menu selection and back into the main menu, use the MENU Wheel/Keys and the main menu selection is returned.

### 9.1. Clock/Pan Trigger

This function is not available when using the MULTI GATE in BASIC level, neither is it possible to configure channels to be controlled by the CLOCK/PAN TRIGGER. The CLOCK/PAN TRIGGER provides the global clock controller to channels configured as CLOCKS. It can be setup to work in 2 modes, under the control of Midi Clock or by its own internal clock. It generates two trigger signals which are out of phase with each other, (i.e.- when one is on, the other is off and vice versa), which are used to trigger any channels assigned to them. For example, you may wish to use channels 7 and 8 as a stereo pan pair. In which case, you would configure channel 7 as Clock I and channel 8 as Clock II so that when channel 7 was going on, channel 8 would be going off, creating a stereo panning effect. In addition, you can then setup the 'depth' and 'activity' of the panning effect by adjusting the RANGE, ATTACK and DECAY for the 2 channels. The CLOCK/PAN TRIGGER can be used to create effects other than panning such as synchronised Tremolo, Stereo Imaging and Beat Enhancement. As an example of the latter, an audio signal could be taken from a Drum Machine along with the Midi Clock signal into the MULTI GATE Midi In socket. The CLOCK can be setup to be controlled by the Midi Clock as well as being synchronised to Midi Start, Stop and Continue messages. By setting up the Midi Clock divide ratio (where, by convention there are 24 Midi Clocks per Beat, so you might set up the divide ratio to be 96 in which case the CLOCK/PAN TRIGGER would generate one complete cycle every 4 beats,  $96 \div 24 = 4$ ) along with the Cycle Offset (which allows the trigger point to be moved along the cycle time), and Balance (which controls ratio between the trigger on time and off time), you can 'pick out' particular beats in a bar to be gated into other effects such as reverb or pitch shift.

#### 9.1.1. Internal Clock Mode

To set the CLOCK/PAN TRIGGER to Internal mode, use the MENU Wheel/Keys to find the CLOCK/PAN TRIGGER menu and select or jump into it by either pushing YES or PARAMETER Wheel/Key which will then indicate the current Mode. DATA Up sets it to Midi Clock mode, and DATA Down sets it to Internal mode. When the CLOCK/PAN TRIGGER is operating on Internal mode, it simply provides channel triggers at a regular fixed rate of between 40ms and 10.24 seconds. You can also control the Clock BALANCE. This is the ratio between the time the clock trigger is Off to the time it is On. For example if the Clock Rate was set to 2 seconds, and the BALANCE was set to 50%, then the trigger would be on for 1 second and Off for 1 second. If the BALANCE was set to 25%, the trigger would be On for 0.5 seconds and Off for 1.5 seconds.

To adjust the Internal Clock Rate in Edit mode, Rate can be controlled from the CLOCK/PAN TRIGGER edit Menu by selecting the Clock Rate with the PARAMETER Wheel/Keys and then adjusting the Clock Rate with the DATA Wheel/Keys.

To adjust the Internal Clock Rate in Play mode:

It is also possible to adjust the Clock Rate in Play mode - If the Edit Wheels are assigned to a channel which is used as a CLOCK, and the CLOCK/PAN TRIGGER is operating in internal mode, the THRESHOLD wheel will adjust the Clock Rate. Note that where the top line of the LCD is normally used to display the channel being controlled, adjusting the Clock Rate doesn't display any channel because the CLOCK/PAN TRIGGER is a global trigger source.

To adjust the Balance in Edit mode:

Once in the CLOCK/PAN TRIGGER menu, select the BALANCE with the PARAMETER Wheel /Keys, and adjust the BALANCE with the DATA Wheel/Keys. To adjust the Balance in Play mode - If the Edit Wheels are assigned to a channel which is configured as a CLOCK, adjusting the HOLD Wheel (front panel switch needs to be set to HOLD), will now adjust the BALANCE.

## 9.1.2. Midi Clock Mode

When the CLOCK/PAN TRIGGER is operating in Midi Clock mode, the TRIGGER rate is determined by the incoming Midi Clock from, for example, a Drum Machine. This mode exists to allow you to synchronise Panning effects and such like with a device generating a Midi Clock. Normally, such devices generate the Midi Clock signal continuously, i.e., it is still running even if 'STOP' has been pressed. The CLOCK/PAN TRIGGER can if desired be synchronised to the Midi Stop, Start and Continue messages so that the TRIGGER output is always synchronised to your rhythm pattern and such like. Note that when a Midi Stop message is received in this mode, the TRIGGER also stops, Midi Start will re-start the TRIGGER output in synchronisation and Midi Continue will allow the TRIGGER output to continue. Therefore the TRIGGER timing will always follow the Stop, Start and Continue messages. Note that if the Midi Clock tempo is altered after Start or Continue has been pressed (i.e. the drum pattern for example is running), the Clock Offset and Balance will automatically re-adjust to the new Tempos. The Clock Scale is used to derive a TRIGGER from the incoming Midi Clock signal by specifying how many Midi Clock pulses are used per trigger cycle. If for example the Clock Scale is set to 48, a complete trigger cycle will be generated every 48 Midi Clocks. For example, if the tempo is 60 beats per minute (=1 beat every second) and the CLOCK SCALE is set to 48, then (due to the Midi convention where there are 24 Midi clocks per beat) the TRIGGER rate will be 2 seconds. ( $48/24=2$ ). In Midi Clock mode, the CLOCK OFFSET can be used to 'shift' the TRIGGER point along the period of the trigger cycle so that the TRIGGER can be made to occur, say three quarters the way through the cycle. This is particularly useful when using the synchronise option as it enables you to trigger at precisely the correct time in the cycle while the BALANCE allows you to set the duration of the TRIGGER as a percentage of the whole cycle time. For Example:- With Synchronise ON. If you wish to gate the 3rd beat of a 4/4 drum pattern, set the Clock Scale to 96 ( $24 \text{ Midi Clocks} * 4 \text{ beats}=96$ ), set the Clock Offset to 50% (0% would be the start of beat 1, 25% - start of beat 2, 50% - start of beat 3, 75% - start of beat 4, 100% - start of 1st beat of the next bar !), and set the BALANCE to 25% (25% means that the trigger will have a duration of 1/4 cycle = 1 beat in this case). Provided a channel is configured as a CLOCK I, the channel will then allow just the 3rd beat to pass through which could be effected in some way.

To Edit the Parameters in Midi Clock mode, first make sure that the mode is set to Midi Clock, then as before, use the PARAMETER Wheel/Keys to select the parameter you wish to edit, and edit the data with the DATA Wheel/Keys. When the MULTIGATE is in PLAY mode, both the CLOCK OFFSET and BALANCE can be controlled by the Edit Wheels. If a channel is assigned to the Edit Wheels which is configured as a CLOCK, where the CLOCK/PAN TRIGGER is operating in Midi Clock mode, the THRESHOLD wheel is used to adjust the CLOCK OFFSET, and the HOLD wheel (switch set to hold) is used to adjust the BALANCE.

## Internal Mode

Clock Rate (40ms-10.24sec)  
Balance (duty cycle 0% - 50%)

## Midi Clock Mode

Clock Scale (set Midi clock divide 1-250)  
Synchronise with Start/Stop (yes/No)  
Clock Cycle Offset (-99%-0%--+99%)  
Balance (duty cycle 0% - 99%)

The CLOCK/PAN TRIGGER setup is saved in memory during a SAVE which can be with a full edit setup or saved independently to any of the 96 user memories. (see the SAVE section). When a memory is loaded, the CLOCK/PAN TRIGGER setup is also loaded.

### 9.1.3. Problems with Very Fast Clock Times

If you are using very fast clock times whereby the channel LEDs should be flashing very rapidly (same for Tremolo), they can sometimes give a false 'flashing rate'. Despite of this, however, the VCA will be doing what it should be doing, i.e. quickly switching the audio signal on and off. The reason for this phenomena is due to the fact that the LED's are driven by a multiplexer running at about 50Hz, therefore if an LED is made to cycle on and off at a rate greater than this, it will give a false flashing rate due to intermodulation effects.

### 9.2. Initialise Memory Mutes

The Memory Load Mutes allow the mute states to be initialised when first loading up a new memory provided that the memory being loaded includes a channel(s) configured as mutes. In the patch, mutes that will be initialised to ON are indicated by a '\*' under the appropriate channel number (printed above the LCD on the front panel). There are 3 ways to set up the desired mute patch - 1) By holding down the SOFT KEY and pushing the appropriate channel key has the effect of toggling the 'mute' On or Off. 2/3) Use the PARAMETER Wheel/Keys to move the cursor to the appropriate channel position, and the YES/NO Wheel/Keys to turn the 'mute' On or Off. The Mute patch setup can then be saved along with the rest of your edit setup OR saved independently to any of the 96 user memories when you use the SAVE command. (see SAVE)

The mutes can also be setup under system exclusive where they are defined as a channel parameter. The data byte = 0 for mute off and 1 for On. As a result, the sysex message must be of the correct channel group in order to setup the mute state of the appropriate channel.

### 9.3. Memory Name

The NAME menu allows you to give your newly created edit a NAME with no more than 12 characters. There are 128 characters (letters & symbols) available for you to create your edit name which can then be saved in one of the 96 user memories along with your edit OR independently to any memory. (see SAVE). To setup your desired name, use the MENU Wheel/Keys to get to the Edit Name window. Once there, the PARAMETER Wheel/Keys can be used for cursor move to individually select each character position in the name, and the DATA Wheel/Keys are used to change the character. To help speed things up a little, character selection goes round a continuous loop so that you don't necessarily have to go from one end of the character set to the other to find the character you want. The BLANK character can be found at the end of the lower case alphabet just after a couple of horizontal arrows, and just before some !"ú\$%^& symbols and numbers.



## 9.4. SOFT KEY

The SOFT KEY can be used as a global controller for either channels configured as GATES/DUCKS or MUTES and is assigned a specific function in the SYSTEM EDIT MENU. Although it is primarily intended for use with MUTES where it can for example be used to 'kill' all Mutes, it can also be used with GATE/DUCK channels to either temporarily OPEN or CLOSE all channels in instances where you may wish to check all source material with a quick 'bypass' while the SOFT KEY is held down. The SOFT KEY can only have one function assigned to it at any one time, while the SOFT KEY function is also stored in one of the memories along with the 16 channels and Clock controller information. When loading a memory, the SOFT KEY function will also be loaded so it won't be necessary to set your desired SOFT KEY function every time you load a new memory (that is, unless you wish to). When operating the MULTI GATE in BASIC level, only the functions marked with 'B' in the following list of functions are available:-

Function	Description
B Off	The SOFT KEY is inactive.
B All Mutes On	When the SOFT KEY is pushed, all channels configured as Mutes are Turned On. i.e., the Mute is active and NO audio signal can pass through the channel(s).
All Mutes On+R	This mode is very similar to the above, but if the SOFT KEY is pushed a second time (provided no other Mute channel keys were pushed to toggle a Mute), then the previous mute states are restored.
All Mutes On-Down	This mode enables all Mutes to be temporarily turned ON while the SOFT KEY is held down. As soon as the SOFT KEY is released, the Mutes revert back to their original state before the SOFT KEY was pushed down.
B All Mutes Off	When the SOFT KEY is pushed, all Mutes are turned OFF, i.e., the audio signal is allowed to pass through the channel.
All Mutes Off+R	This mode is very similar to the above, but if the SOFT KEY is pushed a second time (provided no Mute channels were Muted or De-Muted), then the previous mute states are restored
All Mutes Off-Down	While the SOFT KEY is held down, all Mutes are turned OFF. When the SOFT KEY is released, the previous mute states are restored.
B Patch Toggle	This mode allows the SOFT KEY to toggle between 2 Mute Patches (not to be confused with the Mute Patch Table). When the SOFT KEY is first pushed, the current Mute states are exchanged with the previous Mute states. If any Mutes are now toggled, creating a new mute patch and the SOFT KEY is pushed again, then the new Mute patch is exchanged with the previous one.
B Call Pre-Mute	This mode allows a Mute Patch to be setup before Calling it up to actually Mute or De-Mute the channels. In this mode, when any of the Mute Keys are pressed, the Mute Status LED's will flash Orange to indicate if the channel(s) will be muted when the patch is called up. If a channel is not flashing, then the Mute will be Off when called up. Note that these Pre-Mutes can be toggled On or Off by repeatedly pushing the appropriate channel key(s). Once a Mute Patch has been setup, it can then be called up by pushing the SOFT KEY. If you decide that you don't want the Mute Patch you are setting up, and wish to clear it, then press the UNDO key and any Mutes you may have been setting up will be cleared.
B Gates Open	This mode and the next are designed purely as a global quick-test for any channels that are configured as GATES or DUCKS. While the SOFT KEY is held down, All GATE/DUCK channels will be fully opened to allow you to instantly check all source material. As soon as

Gates Closed

the SOFT KEY is released, the channels revert back to their correct state depending on whether the Key is On or Off.

While the SOFT KEY is held down, All GATE/DUCK channels will be FULLY CLOSED and No source material will be heard. As soon as the SOFT KEY is released, the GATES/DUCKS will revert back to their correct state depending on whether their key was On or Off.

To Edit the SOFT KEY function, use the MENU Wheel/Keys to move to the SOFT KEY menu window, and use the DATA Wheel/Keys to select the SOFT KEY mode.

Whenever any of the mutes are toggled with the Soft Key, Midi Note On/Off messages are transmitted. However, there are four exceptions to this when the messages are NOT transmitted:- Mutes On/Off while Softkey is down and Gates Open/Closed while Softkey is down. The four exceptions are due to the fact that they are used for quick temporary tests where it is not necessary to transmit Note On/Off messages.

## 9.5. Midi Control

The MULTI GATE has been designed to be flexible and simple to use under Midi control. All parameters within the MULTI GATE are accessible via Midi System Exclusive along with the Gating and Muting action of which both use Midi Note On/Off messages to communicate with equipment plugged into the MULTI GATE. Although the MULTI GATE is primarily designed as a 'stand alone' device, this also means that it can be installed into a rack, plugged in, switched on and never be physically touched again whereby complete control of the MULTI GATE can be handed over to such systems as "Steinberg Cubase". Alternatively one MULTI GATE can 'slaved' to another where anything that the main MULTI GATE is doing can be replicated by the slave MULTI GATE via System Exclusive, Programme Change and Midi Note On/Off.

### 9.5.1. Midi Mute and Gate Messages

The way in which the MULTI GATE receives and transmits MUTE, GATE and TRIGGER information is by the use of Midi Note On/Off messages. In a Note On/Off message, a Note Number is also included which specifies which Note number is to be turned On or Off. For example, on a Midi keyboard, when a middle C is played, a Note On message is transmitted with note number 60 (60=middle C); when the key is released, a Note Off message is transmitted with note number 60. The way in which the MULTI GATE uses these messages is by assigning each channel with its own Midi Note Number so that if for example channel 7 was configured as a Gate, and assigned with Midi note number 78, then when the gate opened, it would also transmit a Note On message with note number 78, and when the gate closed, it would transmit a Note Off message with note number 78. Using this system of note numbers, the MULTI GATE can make the most efficient use Midi Note numbers where a single MULTI GATE would only use 16 of the 128 available note numbers all on only 1 Midi channel. This therefore means that you could use up to 8 MIDI GATES providing 128 channels of GATING or MUTING on just 1 Midi channel (16 x 8 =128), leaving the other 15 Midi channels for the rest of your system.

## 9.5.2. Midi and Mutes

When a channel is configured as a mute, Midi is transmitted when the Mute is turned On or Off, while a mute can be turned On or Off when the MULTI GATE receives a Note On/Off message. Note that a Note On message will turn the mute On and a Note Off message will turn the mute Off (allow the audio signal to pass through the channel). To simplify the use of Midi note numbers for mute channels, a global note number is assigned to channel 1 (whether it is configured as a mute or not). This Note Number then defines the note numbers that the other 15 channels will use as they are all sequential from channel 1. For example, if you decide to set channel 1 to operate on C0 (Midi note number 24), then channel 2 will use note 25, channel 3 will use note 26, ..... to channel 16 which would use note 39.

## 9.5.3. Midi and Gates.

The MULTI GATE has been designed so that all Gating action is transmitted via Midi to allow Gates to be recorded by a sequencer or used to control a slave MULTI GATE. The MULTI GATE can also use Midi Note On/Off information to trigger the gates instead of using the Audio signals. There are 2 main parameters that need to be setup in order to use Gates with Midi to full effect.

The first of these is to be found in the Midi Edit Menu -

## 9.5.4. Midi with Triggers or Gates.

This mode selection is a global setting which allows all receiving and transmitting of Midi Note On/Off information to be assigned to either the Gating action OR the Trigger action. If the mode is set to Midi with Triggers, then only the Triggers (which are used to key the Gates) can operate with Midi Note On/Off information. Normally, whenever a Trigger goes On or Off, it also transmits Note On/Off information using the Note Number that is assigned to the particular Trigger/Gate channel while the velocity value is always fixed at 64 (Note On/Off velocity is not used by the MULTI GATE). As mentioned previously, this information can be recorded with a sequencer to create a trigger sequence which can be later played back through the MULTI GATE when the triggers are set to Midi Receive. When triggers are set to Midi receive, they can be used in just the same way as they are when triggering with audio signals and keying any Gate/Duck channel. Using the MULTI GATE in Midi Trigger mode gives you the greatest flexibility in Gate processing because it simply deals with the 'raw' trigger information which is directly generated by the audio signals; this can then be used to key any channel as well as re-configuring the channel parameters so that the Gating action can be later adjusted when playing back a Trigger sequence through the MULTI GATE.

The second mode is Midi with Gates which is less versatile than the previous mode because it simply assigns the Midi Note On/Off information to the Gating action. i.e., when the Gate opens, a Note On message is transmitted, and when the Gate closes, a Note Off message is transmitted. When the MIDI switch is switched to Midi transmit (LED is Off), all Gates and Ducks operate normally any can be keyed by any channel, while Midi Note On/Off information is transmitted from the Gates/Ducks (i.e., when they open and close). If the MIDI switch is set to receive, ALL Gate/Duck channels are now directly opened or closed with Note On/Off messages. (i.e. a Note On message will Open the channel while a Note Off message will close the channel. Note that no hold time is implemented, so it in fact operates a bit like a mute upside-down).

## 9.5.5. Midi Channel

The MULTI GATE requires the use of only a single Midi channel for all of its communication. This Midi channel can be set to any channel from 1 to 16 to allow the MULTI GATE to be installed comfortably into your Midi setup. When operating the MULTI GATE at ADVANCED level, the Midi channel is always memorised, and doesn't need to be re-changed on power up. However, when operating at BASIC level, the Midi Channel always defaults to Channel 1 whenever initialised or powered up at BASIC level.

## 9.5.6. Midi Note Numbers

All Note Numbers used by the MULTI GATE are user definable so you can fit it into your Midi system in the most convenient way. Normally, you would reserve one Midi channel for use with the MULTI GATE and it is possible, due to the note definability, to use up to 8 MIDI GATES on a single Midi channel. If each of the 16 MULTI GATE channels was assigned a specific note, then all 128 available Midi notes could be used, providing possibly 128 channels of Audio Gating.

## 9.5.7. Channel 1 Mute Note

The Channel 1 Mute Note Number defines the Note Numbers that all 16 channels will use. With Mutes, all Note numbers are successive in that by defining channel 1's note, channel 2 will be a note higher, channel 3 will be 2 notes higher, and so on up to channel 16 which will be 15 notes higher than channel 1's note. The Channel 1 Note Number can be set to any note from C-2 to D7 or Midi note 0 to 110. Sometimes it is preferable to use decimal values rather than actual Notes; the MULTI GATE offers 3 ways of displaying Notes - Note, Decimal and Hexadecimal (see Display Options). To setup the Channel 1 Mute Note number, simply locate it in the Midi Parameters menu and adjust the Note Number.

## 9.5.8. Initialise Trigger/Gate Notes

All Gate/Trigger Notes are individually definable within the individual channel edit menus so that you can if you wish setup a note configuration to meet your specific requirements. For example, you may wish to use the audio triggers to trigger a drum machine where each voice requires a specific note number. An example of this is memory P11 "RX21 Trigger". However, this would not normally be required, and a more straight forward approach can be adopted by specifying a base note to channel 1 and subsequent channel note numbers increment on this. The MULTI GATE allows this to be done with ease in the Midi Edit Menu whereby a base note is setup and the initialisation is then activated. When System Exclusive is switched on, the new note numbers are also transmitted in the form of individual channel parameter change messages. This allows a host computer (if used) to keep up to date with the various parameters inside the MULTI GATE.

To initialise all Gate/Trigger Note numbers, find the "Init Gate/Trig Notes ?" menu in the Midi Parameter Menu. The "?" prompts you to press the YES key. The display will now read "Trig/Gate 1 Note = <note>", where the note represents the base note for channel 1. This note can now be adjusted with the DATA Wheel /Keys. When you are satisfied with the base note, press the YES key to initialise all the 16 channel notes. The display will read "Initialise Done" when this operation is complete.

## 9.5.9. Midi Switches

The MULTI GATE includes a range of switches which allow specific functions to be ON or OFF. For Example, if you wish the MULTI GATE to receive Programme Change, but not transmit it, then you would set - Transmit Prog:No, & Receive Prog:Yes. To enable or disable these, use the YES/DATA INC Wheel/Key to enable, and the NO/DATA DEC Wheel/Key to disable. The available switches are as follows:-

- Transmit Mutes
- Receive Mutes
- Transmit Programme Change
- Receive Programme Change
- All Notes Off
- Midi Reset
- Echo Midi
- System Exclusive

When All Notes Off is enabled, receiving this message will turn off any Mutes. When Midi Reset is enabled, receiving this message will RESET the MULTI GATE to its power on sequence. If Reset is on, and a reset message is received, the MULTI GATE waits for its midi buffers to empty before resetting itself. This safety measure ensures that no data will be lost or corrupted in the midi chain before the occurrence of the reset message. In addition to this, if Echo is On, it also allows the Reset message to be echoed to the output before the MULTI GATE resets itself.

If Midi Echo is enabled, all Midi received at the MIDI IN port is echoed to the MIDI OUT port along with any Midi that the MULTI GATE generates itself. If System Exclusive is On, all System Exclusive Parameter Change/Request and Data Dump/Request can be used. (see the section on System Exclusive). Midi On Gates - Allows Midi Note on/off to be transmit from either the Gates or the Triggers Midi Channel- sets the global Midi channel 1-16 Ch1 Mute Note- sets the Midi note number for mute channel 1 where 2-16 become serialised from Channel 1 note number. e.g.- 60,61,62,63,64 etc. Init Trig Notes - Allows all trigger/gate notes to be serialised from channel 1 Midi Enables- Transmit Mutes:Receive Mutes:Transmit Programme change:Receive Programme change:All Notes Off:Reset:Echo Midi in to Output. System Exclusive- If enabled, Midi dumps and dump requests can be performed:- Dump Requests are- Single Memory:Bank:Programme change table: Mute Patch Table:System setup:Everything. Additionally if Exclusive is ON, All parameters are individually received and transmitted when edited from the Front Panel.

## 9.6. Programme Change Table

The Programme Change Table is used to assign Memories or Mute Patches to Programme Change Numbers. It can be thought of as a table to divert particular Programme Change Numbers to particular Memories and Mute Patches. When the MULTI GATE receives a Programme Change message, it uses the programme change number, to look-up in a table of memory and patch numbers, its associated Memory/Patch number, which the MULTI GATE then loads. When a memory is loaded in the MULTI GATE, it looks up in the Programme Change Table the associated Programme Change Number and transmits it as a Programme Change message.

While the Programme Change Table allows you to individually assign any Memory or Mute Patch to a Programme Number, it also allows you to initialise the whole table to either the 112 Memories OR the 128 Mute Patches. Although the MULTI GATE memories will be used most, being able to quickly setup the table to the Mute Patches has the advantage of allowing you to use the MULTI GATE as a 16 channel Automated Mute Processor (all channels have to be configured as Mutes) where all 16 mutes can be setup with a single Programme Change message.

When using the MULTI GATE in conjunction with a host computer, it is important that the host is always kept up to date with the parameters and configurations so as to prevent data contention or corruption. For this reason, when the Programme Change Table is initialised to Memories or Mutes, the Programme Change Table Dump is also transmitted, providing System Exclusive is switched On.

### 9.6.1. Initialise Table to Memories

When you first enter the Programme Change Table menu from the main menu, the display reads "Init to Memories?". Pressing YES here will initialise the entire table to the MULTI GATE memories plus 16 mute patches at the end of the table:-

Prog No	Memory/Patch
1 to 32	user memory A01 to 32
33 to 64	user memory B01 to 32
65 to 96	user memory C01 to 32
97 to 112	factory preset P01 to 16
113 to 128	Mute Patch 1 to 16

### 9.6.2. Initialise Table to Mute Patches

If you wish to initialise the table to the 128 Mute Patches, the next parameter after "Init to Memories?" is "Init to Patches?". Pressing YES will then initialise the Programme Change Table to the 128 Mute Patches.

If you don't wish to initialise the table, but wish to assign a Memory or Mute Patch to a Programme Number, then use the PARAMETER Wheels/Keys to select the Programme Number, and the DATA Wheel/Keys to select the Memory/Patch for that Number. Memory/Patch selection allows you to select ANY of the User Memories, Factory Presets or Mute Patches for each Programme Number. If a particular Memory/Patch is already assigned to a Programme Number and you try to assign the same Memory/Patch to different Programme Number, the MULTI GATE issues a WARNING display along with the Programme Number that is duplicated. However, the MULTI GATE does still allow duplicated numbers so that it can call up the same Memory/Patch with 2 different Programme Change Numbers. When a Memory is loaded, the MULTI GATE uses the first Programme Number it finds when searching the Table.

When operating the MULTI GATE at BASIC level, the Programme Change facility is not available, and the Programme Numbers directly relate to the Memory Numbers in the order:-

Prog No	Memory/Patch
1 to 32	user memory A01 to 32
33 to 64	user memory B01 to 32
65 to 96	user memory C01 to 32
97 to 112	factory preset P01 to 16
113 to 128	factory preset 1 to 16

## 9.7. Mute Patch Table

The MULTI GATE contains 128 user definable Mute Patches which can be loaded via Programme Change messages and the Programme Change Table. The use of the Mute Patches greatly speeds up the Midi transmission time because only a single Programme change message needs to be sent in order to setup a complete 16 channel mute patch. The alternative is to send 16 individual Mute On/Off (Note On/Off) messages to setup the patch, which will take up to 16ms to transmit!

When setting up a Mute Patch in the table, the channel mutes themselves (if any) aren't affected so it is purely a setup facility, and not an active control over the current mute states. To setup a Mute Patch, first enter SYSTEM EDIT, you will find the Mute Patch edit window after the Programme Change Table menu. The Mute Patch window editor is accessed directly when stepping through the main menus. The bottom line of the display indicates the current mute patch selection while the top line of the display indicates which mutes in the selected patch are On or Off. e.g.:- `*** * **** ** ****` where `**` = mute on. To select one of the 128 mute patches, use the DATA Wheel/Keys. There are 2 ways of setting up the patch (i.e. mutes on or off) :- 1) Using the PARAMETER Wheel/Keys to move the cursor `_` along the display to the appropriate channel position, then use the YES/NO Wheel/Keys to turn the selected mute On or Off. 2) Using the channel control keys directly by holding down the SOFT KEY and pushing the appropriate channel key to turn the mute On or Off. When editing a mute patch, it doesn't need to be saved because the patch editing operation directly sets up the patch.

## 9.8. Using Mute Patches

As mentioned earlier, any of the 128 Mute Patches can be accessed by Programme Change to enable a quick loading of a mute patch. Although a Mute Patch contains all 16 channels of mute states, when loading a mute patch under Programme Change, only channels that are configured as mutes will respond to the new patch and any other channel configurations will simply ignore the patch. For example, if the MULTI GATE is setup as 16 Basic Gates (memory P01), and you try to load a particular mute patch, none of the channels will respond due to the fact that none of them are configured as mutes. Therefore in order to make use of the mute patches, you must have 1 or more of the channels configured as mutes.

To Load a Mute Patch, you first need to have one or more mute patch numbers assigned to the Programme Change numbers you wish to use. Then by simply sending the appropriate Programme Change number, the mute patch will be loaded into the current mutes. For example, if the MULTI GATE is setup as 16 Mutes and Programme Change Number 34 is assigned to Mute Patch 78, and you send the MULTI GATE a Programme Change message whose number is 34, then mute patch 78 will be loaded into the 16 Mutes.

## 9.9. Display Options

The Display Options allows you to view data in several ways depending on your preference. Note That this feature is not available if operating the MULTI GATE at BASIC LEVEL (data is displayed in decimal, and notes are displayed as Notes). In many instances when dealing with MIDI, you may find that certain values are given in Hexadecimal or Midi note numbers may be specified as decimal numbers rather than Notes. The MULTI GATE allows you to view data in different formats so that it is easier to setup parameters with reference to other pieces of equipment. The Display Options menu offers 2 data type parameters:

- 1) Data display: can be Decimal or Hexadecimal.
- 2) Note display: can be Decimal, Hexadecimal or Note (e.g. C#3).

Use the PARAMETER Wheel/Keys to select either 'Data' or 'Note', and DATA Wheel/ Keys to select the

display format. Note that when operating the MULTI GATE at BASIC level, this menu is not available, and the 'data' is displayed as decimal values while 'notes' are displayed as real Midi notes.

## 9.10. Data Wheels (Copy/Rel)

When in PLAY mode, the Edit Wheels are assigned to 2 or more channels, the MULTI GATE can adjust the values in 2 ways which is selectable in the single-window SYSTEM EDIT menu. When set to 'COPY', the adjusted value is copied from the lowest assigned channel to all the other assigned channels. This therefore allows for direct controlled linking of 2 or more channels where for example a stereo pair might be implemented. When set to 'REL', all the assigned channels are adjusted independently so that their values are adjusted RELatively. Note that when operating the MULTI GATE at BASIC level, this function defaults to COPY.

## 9.11. Advanced/Basic Level

The MULTI GATE has two levels of operation, Advanced and Basic, where Basic level allows you to use the MULTI GATE in a more straight forward way; here many of the more complex features are masked out to simplify operation. Basic Level is mainly aimed at first time users to enable them to get used to using it with ease as well as coming to terms with the idea of 16 Gates in a single 1U case as compared to the more conventional Dual Gate devices where all parameter controls are available at the front panel. When operating the MULTI GATE in Advanced level, all functions are made available such as Programme Change Table, Hold Mode, Trigger Hold, Transmit Trigger Off enable, Clock/Pan trigger and the Tremolo configurations.

The operating level is broken down into 4 modes to satisfy any preferences as to its use: Basic Level, Basic Default, Advanced Level and Advanced Lock, and are setup from the system edit menu. i.e., use the Menu Wheel/keys to select the Operating Level display, and the Data Wheel/Keys to select the desired level. The currently selected level is displayed without a "?". To invoke the new level, press the "YES" key.

### 9.11.1. Basic Level

Invoking this simply switches the MULTI GATE over to Basic Level operation without altering any of the parameters or settings that would otherwise be used in Advanced level. However any of the advanced only parameters or settings are not now available.

### 9.11.2. Basic Default

When the YES key is used to select this, entire MULTI GATE is defaulted to 16 Basic Gates by use of factory preset P01. This also includes other parameters such as the Midi Channel; see section 6.2 - Basic Level Default Values for all the default values. Additionally, the MULTI GATE resets to PLAY mode. Note that when defaulting the system, the current MULTI GATE setup is saved so that you can restore the original setup. This is done in PLAY mode: Push the PLAY key followed by two presses of the UNDO key, and the restore will be done. The main advantage of using the MULTI GATE in this mode is that you will always know what to expect when you power the unit up at the beginning of a session; particularly if it is somebody else's MULTI GATE which is setup differently from yours. There are three important factors to remember when defaulting the Multi Gate: 1) System exclusive is turned Off, 2) the Midi Channel defaults to channel 1, 3) The Channel group is NOT changed.



### 9.11.3. Advanced Level

This allows every function and parameter in the MULTI GATE to be accessible.

### 9.11.4. Advanced Lock

When the MULTI GATE is switched on, it will always power up in Basic Default UNLESS Advanced Lock is used. As the name describes, the Advanced Level operating mode will be locked so that the MULTI GATE will be in exactly the same state when it is switched on, as it was when switched off. When you have become familiar with the MULTI GATE, you will probably prefer to leave it in Advanced Lock to save you from having to setup the system to your liking every time the unit is switched on.

For more information on the operating level, see section 6 - Switching On The MULTI GATE.

## 9.12. Memory Enable

This feature allows you to disable the use of the memory feature so that memories can't be loaded. In some situations, you may find that you don't need the memory facility whereupon it can be disabled. Note that when enabling or disabling the memory facility, the Programme Change Transmit and Receive are also enabled or disabled to save you from having to set these up as well.

If system exclusive is On, turning memory enable on or off will cause the appropriate sysex message to be transmitted as well as the Programme Change transmit and receive enable messages.

## 9.13. Channel Group

As has been previously mentioned, up to 8 Multi Gates may be used on a single midi channel, providing 128 channels of Muting/Gating, each responding to individual note numbers. This is probably an extreme case, and it would be more usual to have 48 channels, which are commonly supported on larger desks. The Channel Grouping facility allows 3 Multi-Gates to be combined on the same midi channel, thus providing 48 Gate/Mute channels so that each channel on your desk can have its own Gate/Mute. By configuring each of the 3 Multi-Gates to be in a separate group, a Host computer can individually control any channel by system exclusive where the group is specified in the system exclusive message. In this way, all 3 Multi-Gates can operate on the same midi channel so as to make economic use of midi channels.

The group is selected in the System Edit Menu, where the MULTI GATE channels can be configured in 3 groups, each comprising of 16 channels:

- Group 1 = channels 1 to 16,
- Group 2 = channels 17 to 32,
- Group 3 = channels 33 to 48.

In addition, the correct channels are displayed on the LCD in the edit modes. However, the keysource display in PLAY mode still has to display 1 to 16 because it is not possible to program the LCD with more than 8 custom characters. This obviously also applies to the front panel screen.

For example, if the MULTI GATE is configured to group 2 (channels 17 to 32), then in channel edit mode, when the keysource for say channel 20 is set to be keyed from channel 19, the PLAY mode display will indicate that channel 4 (which corresponds to channel 20) is keyed by channel 3

(corresponding to channel 3).

To ensure that the MULTI GATE doesn't accidentally get re-grouped, especially in situations where several of them are employed, the Channel Group can only be set from the front panel of the MULTI GATE, and not by system exclusive. Neither does it default when operating in Basic Level, or powering up in Basic Default.

---

## 10. CHANNEL EDIT MENUS

The Parameter listings for all 16 channels are the same. However some parameters are not available depending on the channel configuration.

### PARAMETER

Channel Mode	Mute	Gate	Duck	Clock I	Clock II	Tremolo
Attack	O	O	O	O	O	O
Decay	O	O	O	O	O	O
Hold Mode	X	O	O	X	X	X
Hold Time	X	O	O	X	X	X
Range	X	O	O	O	O	O
Threshold	T	T	T	T	T	T
Keysource	X	O	O	X	X	X
Trigger Hold	T	T	T	T	T	T
Note Number	X	O	O	X	X	X

O = Available      X = Not used      T = Only available if channel is used as a keysource

Channel edit menus can be entered in several ways:

1) By pushing the EDIT CHANNEL key, the PLAY LED flashes slowly and the LCD prompts for you to select a channel to edit. A channel is then selected by pushing the appropriate channel key, and the edit menu is entered. Note that if the MULTI GATE is operating in BASIC level, the menu is always entered at the channel mode while in ADVANCED level, it is entered at the last channel parameter that was selected in Edit. This is to enable a quick comparison between channel's parameter data by simply pressing EDIT CHANNEL and the Channel key to view the data.

2) If already in a channel edit menu, and the Menu Keys are pushed, the Channel select menus can be looped round until you find the one you are looking for. Then by using either the PARAMETER Wheel/keys OR the YES Wheel/Key, the Channel edit menu can be entered. Jumping back to the main Channel select menu can be done by using the MENU Wheel/Keys.

Note that when using the MENU Keys, the Channel select menus are consecutively selected and looped round (1,2,3...-16-1,2,3...-16 etc.), while using the MENU Wheel, the entire Channel and System menus are looped round. To get back into PLAY mode at any stage in EDIT, simply press PLAY.

### 10.1. What's in a channel?

Each channel in the MULTI GATE basically comprises of two sections, with a third section to 'glue' them together. The First of these is the Trigger section. This is used to generate the Triggers which can be derived from either the audio input or the midi input. Commonly, the audio inputs will be used whereby when the signal level trips over the Threshold, a trigger will be generated. If the trigger section is switched to respond to midi, a note on message will generate a trigger, where each trigger is set to respond to a specific note number. The trigger section can also be used to generate a midi trigger which comprises of a note on and a note off message, using the specified note number. A Trigger Hold time can also be set, which sets the minimum time that the trigger can remain on once the threshold is tripped. This is of particular use in the generation of midi triggers where it is possible for the midi line to become overloaded with a lot of unnecessary information. The solution is to increase the trigger hold time.

The second section is the channels main functional block which is used to control the attenuation of the audio signal. This section can be configured as a Mute, Gate/Duck (controlled by the Trigger section), Clocked VCA or Panner, and a Tremolo. Associated with this section is the ATTACK, DECAY, RANGE, HOLD, and KEYSOURCE, where the latter two parameters are related to the Gate and Duck configurations.

The KEYSOURCE is of major importance as it acts as the 'glue' block between the 16 Triggers and the 16 channel control blocks. This is used to route the triggers to the appropriate channels as well as combine trigger pairs for Stereo operation. A major feature of the MULTI GATE is its ability to control any channel from any trigger, thus allowing a versatile method of cross-keying and creative signal processing.

## 10.2. Channel Mode

This Parameter defines the function of the channel of which there are 6 possible selections: Mute, Gate, Duck, Clock I, Clock II, Tremolo. Note that if the MULTI GATE is operating at BASIC level, CLOCK I/II and Tremolo are not available.

When a new channel mode is selected (as described below), parameters such as the Attack and Decay are defaulted to a value within the parameter range for the channel mode. For example, setting a channel to a Mute automatically defaults the Attack and Decay to 20ms, as it would be undesirable for a mute to switch any faster than this. This response is also reflected in the transmission of the system exclusive mode message. i.e., provided sysex is On, when a new channel mode is selected, it is transmitted in sysex along with the messages for the other defaulted (or changed) parameters. In this way, a host computer can keep up to date with the Multi Gates internal parameter settings.

### 10.2.1. Mute

A Mute is used to turn the audio signal On or Off by pushing the appropriate channel key (in PLAY mode). Mutes provide a number of useful functions, for example when doing a mix-down from a multi track tape machine, you might have some undesirable material on a couple of tracks somewhere on the tape, so to save you from having to turn down the fader, all you need to do is Mute the channel. Muting becomes a much more powerful tool when whole sequences of Mutes are recorded on a sequencer which is synchronised to the tape machine. All Mutes on the MULTI GATE can operate completely under the control of Midi - Mute on uses Note On, and Mute Off uses Note Off messages. Mutes can also be controlled globally - see section on SOFT KEY.

Setting a channel to a Mute also defaults the Attack and Decay times to 20ms which tend to be the best average times for clean silent muting. The Attack and Decay times can't be adjusted by the Edit Wheels in PLAY mode but if you wish to change them to something more suitable for your requirements, this can be done in the channel edit parameters.

### 10.2.2. Gate

When a channel is configured as a Gate, it can be used as a conventional noise Gate where the gate is keyed by the incoming signal. In this mode, when the signal is greater than the THRESHOLD, the Gate will open at a rate set by the ATTACK time and will allow the signal to pass through the gate un-attenuated. When the signal level falls below the THRESHOLD and the HOLD time has expired, the Gate will close at a rate set by the DECAY time. When the Gate is closed, the level of attenuation can be set by the RANGE control. The MULTI GATE allows any channel to key any other channel by selecting a

keysource 1 to 16 for each channel so that such setups as stereo linking can be easily implemented. In addition, Gates also operate under Midi control so that the MULTI GATE can be setup as a 16 channel programmable gate.

### 10.2.3. Duck

A Duck operates in the opposite way to a Gate. When the Signal rises above the THRESHOLD, the channel closes at a rate set by the ATTACK to the RANGE level. When the signal falls below the THRESHOLD and the HOLD time has expired, the channel opens at a rate set by the DECAY time until the channel is fully open.

### 10.2.4. Clock I/II

Each channel can be controlled by either phase I or II of the CLOCK/PAN TRIGGER which generates a regular clock. Phase I or II is used by configuring the channel to either Clock I or Clock II where phase I is On, phase II is off and vice-versa. This configuration can be used to implement a number of useful effects such as PANNING which would require the use of a pair of channels where one would be setup for Clock I and the other setup to Clock II. By setting the Clock Rate and Balance (duty cycle) the Pan rate is setup, and by setting the ATTACK, DECAY and RANGE for the two channels, the 'SHAPE' of the panning can be setup. Note that the Clock I/II configurations are only available at ADVANCED level.

### 10.2.5. Tremolo

When a channel is configured as a Tremolo, the channel opens and closes continuously at a rate determined by the ATTACK time, DECAY time and RANGE. In a traditional tremolo, the amplitude of the signal is varied evenly where the only control over the 'shape' is the depth and rate. The MULTI GATE system is setup in a different way:- Setting the ATTACK time gives the attack rate of the channel opening, the DECAY sets the speed at which the channel closes, and the minimum level or 'depth' is set with the RANGE. Changing any of these 3 parameters will change the overall Tremolo Rate because the 'ramping' is continuous, and governed by the 3 parameters. To get an even type of Tremolo, you might set the Attack and Decay to 200ms, and the Range to 40dB. If you wanted to adjust the 'shape' of the Tremolo and make the signal level rise more slowly, you would increase the Attack to, say, 400ms. Note that the Tremolo feature is only available in ADVANCED level.

## 10.3. Attack

The ATTACK is used to set the rate at which the channel turns On or Off when it is Triggered-

Mute	Sets the rate at which the channel closes (Mute ON)
Gate	Sets the rate at which the channel opens once triggered.
Duck	Sets the rate at which the channel closes when triggered.
Clock I/II	Sets the rate at which the channel Opens when triggered by clock
Tremolo	Sets the rate at which the channel Opens (and the tremolo rate)

The range of the Attack time (with maximum Range) is variable between 0.1 milliseconds to 11 seconds. Note that for Tremolo, the minimum time is 10ms.

## 10.4. Decay

The DECAY is used to set the rate at which the channel turns On or Off

Mute	Sets the rate at which the channel Opens (Mute OFF)
Gate	Sets the rate at which the channel Closes when key is Off
Duck	Sets the rate at which the channel Opens when the key is OFF
Clock I/II	Sets the rate at which the channel Closes
Tremolo	Sets the rate at which the channel Closes (and the tremolo rate)

The range of the Decay time (with maximum Range) is variable between 1.9 milliseconds to 11 seconds. Note that for Tremolo, the minimum time is 10ms.

## 10.5. Hold Time

Hold Time is simply a timing feature which allows you to set the minimum time that the Gate can be open for once triggered. The hold facility is used for a number of reasons, for example, to eliminate such problems as 'chatter' (an effect occurring when the gate opens and closes rapidly due to the indeterminacy caused by the threshold being at the same level as the signal itself), or to delay the gate closing after the signal has fallen below the threshold. The latter is particularly important when treating signals with a long decay whereby it would be necessary to extend the time that the gate turned off so that no signal would be lost. A typical example of this is in Gating a vocal track, where the voice has such a wide dynamic range that the vocal sound can easily fall below the Threshold level for a short period of time. Therefore, the Hold time needs to be increased sufficiently so that the gate remains open for a certain duration after the signal has fallen below the threshold. In this way, the possible gaps in the vocal sound are removed resulting in the desired transparent effect of gating.

## 10.6. Hold Mode

The MULTI GATE is equipped with 3 Hold Modes which allow the Hold time to function in different ways.

### 1) Hold at Trigger ON.

As soon as a trigger occurs, the hold time sets the minimum time that the gate can be open for. Therefore if the trigger is only 3ms long while the Hold time is 10ms, then the Gate will stay open for the full 10ms and not close after 3ms. If the trigger is 100ms long, then the gate will close as soon as the trigger ends because the minimum hold time requirement is fulfilled.

### 2) Hold at Ramp End.

This mode can be very useful for implementing a type of Hold Off timer. The way it works is by initiating the Hold time when the trigger On ramp or Attack time has been completed. Once the gate has been turned fully On, the minimum Hold time is now in operation as in mode 1. There are a number of uses for this mode, for example it can be used to remove short signals such as clicks, which would normally be strong enough to trigger the gate and initiate the minimum hold timer. However, by setting the Attack time to be relatively long (longer than a click 20ms), then the trigger ramp would still be rising by the time the trigger had ended, and hence the gate would be immediately closed.

### 3) Hold at Trigger Off.

This mode is the most straight forward of the 3, and is implemented in Basic level. It is quite simply used to set the minimum time that the gate can be on for once the trigger has ended. Therefore if a new trigger occurs while the gate is still on, the gate will remain on. The only time that the gate will close is when the period between triggers is greater than the Hold time, allowing the Hold to time out and close the gate.

## 10.7. Trigger Hold

This feature is only available in Advanced level. It is similar to the Hold Time in mode 3 (Hold at Trigger Off) except that it directly controls the Hold time for the Trigger itself rather than the Gate. Due to the extensive key sourcing capabilities of the MULTI GATE, the Triggers and Gates are generally treated as 2 separate blocks where the TRIGGER simply generates a Key signal for any of the 16 channels to use, as well as transmit Midi Trigger information. To prevent the Midi lines becoming clogged up with 16 possible channels of rapid Trigger On/ Off messages, the Trigger Hold time is included so that clogging can never occur even in the most demanding situations. When the MULTI GATE is operating in Basic level, the Trigger Hold is always fixed at 10ms which is sufficient to prevent clogging of the Midi lines. Although the Trigger Hold time isn't available on the front panel in PLAY mode, it can be used as a 'local' Hold time for any channels that are keyed by a particular trigger as well as the individual Gate Holds themselves. When a trigger is responding to Midi information rather than Audio information, the Trigger Hold is still in operation to allow a local Hold facility.

## 10.8. Range

The RANGE is used to set the maximum amount of attenuation applied to the input signal when the channel is closed. Note that when a channel is configured as a mute, the Range is not used, and the channel is either fully open or fully closed (after it has 'ramped' on or off). The Range indicated on the display is between 0dB and 80dB, but it must be pointed out that these values aren't accurate values and are purely to give a rough indication as to the extent of the attenuation. However, the amount of Range that you set by ear will be repeatable.

The RANGE may be used to perform a number of useful functions with Gates and Ducks. Here are a few examples :-

In Gate mode, you can use the Range to attenuate the input signal when the key is Off so that it is completely removed leaving total silence. This is quite a common use for gates and allows the total elimination of any unwanted noises providing they are below the THRESHOLD. In situations where a drum kit is being recorded, overspill between say the bass drum and the snare can often be a problem, so the Bass drum can be gated where the THRESHOLD is set so that the Snare isn't strong enough to trigger the gate while the Bass drum is cleanly gated through. Often when gating a vocal track, it can be difficult to set the THRESHOLD due to the dynamic range of the voice, so a compromise can be met where a relatively long DECAY and HOLD time are set to receive 'chatter' while the RANGE is increased so that some of the quieter dynamics that are not loud enough to trigger the gate are still present albeit attenuated. The RANGE control can be particularly important when dealing with Ducking. If the RANGE is set to maximum (80dB), then the audio signal can be completely eliminated when it is greater than the threshold (this can sound rather ugly!).

Possibly one of the most notable uses of ducking is in a DJ voice-over, where when the DJ starts talking, the music level is reduced until the talking ends whereupon the music level is restored. A typical setup on the MULTI GATE to do this would be to use 3 channels, e.g. channels 1,2 and 3, where channels 1 and 2 would have the stereo music signal passing through and each channel would be configured as a Duck with about 100ms ATTACK, DECAY and HOLD, the RANGE might be set to 20dB and the keysource for the 2 channels would be channel 3. Channel 3 would be used for the Voice signal so as to generate the necessary key to trigger channels 1 and 2. By setting the Threshold of channel 3 to trigger when the talking started, the music would be ducked.

A final example of the use of RANGE with Ducking is in the re-shaping of percussive sounds. A good example of this is in the reshaping of a snare drum that has already had some reverberation added. Using a single channel configured as a Duck and keyed by itself, a snare drum can be made to sound more expansive or longer by setting a RANGE of just a few dB's, a fast ATTACK and a few 10's of

milliseconds DECAY. When the snare drum is hit, the channel will immediately close to the RANGE level until the reverb level is too low whereupon the channel begins to open at a rate set by the DECAY. This type of effect is similar to compression or limiting.

## 10.9. Threshold

The THRESHOLD sets the level at which a trigger is generated when the incoming audio signal exceeds the THRESHOLD so as to control a channel for either Gating or Ducking. The THRESHOLD can be set between -54dB to +15dB. In most Gating applications, a Gate will be used to simply remove any signal (i.e. noise and overspill), when it gets too low. Therefore, it is normal to set the THRESHOLD as low as possible without any undesirable triggering from general noise so that the unwanted noise is removed.

## 10.10. Keysource

Any channel configured as a Gate or Duck can be keyed by any of the 16 channels in the MULTI GATE regardless of whether or not the KEY SOURCE channels (the channels providing the key) are themselves Gates or Ducks. As well as providing patching of the keysources to any Gate/Duck channel, the MULTI GATE channels can be configured as a more conventional Stereo Pair whereby 2 adjacent channels can be triggered by both their audio triggers. In this way, accurate stereo tracking is achieved. When the MULTI GATE is in PLAY mode, the channel keysource is displayed on the second line of the LCD display, underneath the channel mode character. The keysource 1 to 16 is displayed while an "s" indicates that a channel is operating under stereo trigger control.

As an example of how to set up the keysource for channel 1 so that it is being triggered by channel 5. First, (presuming it is in PLAY mode), Press EDIT CHANNEL key, then select channel 1 - this will get you straight into the channel 1 parameter edit menu. Using the PARAMETER Wheel/Keys, step through the various Parameters until you come across "Key source=Ch 1". Then use the DATA Wheel/Keys to select Channel 5 as your new keysource and you've done it. Now get back into PLAY mode, and you'll see under the Channel 1 status display that channel 1 is keyed by channel 5.

### 10.10.1. Stereo Triggering

The MULTI GATE allows true stereo triggering whereby the triggers from two adjacent channels are combined, and used to trigger a stereo pair of channels. In order to achieve maximum flexibility, each channel can be specified as to whether it is to be keyed by a stereo trigger or not. In this way, a true stereo gate can be implemented by choosing a pair of channels, e.g.: 1 and 2, and setting both their keysources to be "s" (stereo). Both channels will then be keyed by the combined triggers. Alternatively, an application might require that a single Gate channel needs to be keyed by a trigger pair, in which case the channel keysource needs to be set to "s". In this case, the adjacent channel's trigger is used while its audio function could be either a 'dummy' function or used as a mono Gate etc. for the audio on that channel. When stereo channels are configured, the MULTI GATE still allows independent control of the Thresholds, Attack, Decay, Hold and Range, but you can 'GANG' the channels controls together in PLAY mode by pushing both channel keys together. This effectively assigns the Control Wheels to both channels simultaneously.

For STEREO triggers, the keysource needs to be set to "s". This is found after the 1 to 16 keysource selection in the channel edit menu. It is important to remember that channel triggers are paired up when stereo mode is used. These pairings are fixed within the MULTI GATE : 1,2 ; 3,4 ; 5,6 ; 7,8 ; 9,10 ; 11,12 ; 13,14 ; 15,16.



For example, if channel 7 is using a stereo keysource, then it will use both trigger outputs from channels 7 and 8. If channel 8 is using a stereo keysource, it would use trigger outputs from channels 7 and 8 (Not 8 and 9). Therefore by setting both channels to stereo, they will both be triggered by the combined inputs, resulting in true stereo operation.

There are many ways in which you can use this key sourcing facility; the most extreme example might be where all channels are keyed by channel 1, this can be seen in Factory Preset P10 "1KeyAllGates". An example of true Stereo gates can be found in Factory preset P02 "Stereo Gates". Other examples are given throughout this manual.

## 10.11. Channel Note

The Channel Note applies to channels configured as Gates or Ducks. Each channel of the MULTI GATE can have its own specific Midi Note number which is used when receiving or transmitting Midi Note On/Off messages. If the MULTI GATE is setup for Midi Note On/Off to operational on the Triggers, then the triggers will use their channel's note number while if Midi is operational on Gates/Ducks, the Gate/Duck action will transmit receive Note On/Off using the channel's Note Number. Normally, no special requirements will be necessary with the individual channel Note Numbers provided that two or more channels don't use the same Note Number, so that they may be configured to be successive numbers. This can be achieved in 2 ways:- Firstly by setting up each Note for each channel using the channel parameter edit menus, and secondly by using the 'Initialise Trigger/Gate Notes' menu parameter which can be found in the 'Midi Parameters Menu' - see section. The channel Notes may be set to any value from 0 to 127 (C-2 to C#7) and can be set individually by selecting the desired Channel Parameter Edit Menu (push EDIT CHANNEL then select channel), then using the PARAMETER Wheel/Keys until you find "Note Number = ". Then use the EDIT Wheel/Keys to select the Note you wish to use for that channel. If you select a note that is already being used by another channel, the display temporarily issues a WARNING message with the other channel using the same Note.

One example for the use of individually defining particular notes is in the case where you can use the MULTI GATE to act as a Drum to Midi Trigger device where microphones are used to bug individual drums, and the Midi triggers generated by the MULTI GATE could be used to trigger voices of a drum machine! An example of this can be found in the Factory Presets P11 "RX21 Trigger" where the first 9 channels are assigned with the appropriate note numbers to trigger the voices of the Yamaha Drum machine - give it a try.

## 10.12. Transmit Trigger Off

This feature which is included from software version 3.60 allows the transmission of the Trigger Off (Midi note off) to be enabled or disabled. It is specific to each of the 16 channels and only available in Advanced level operation. Note that in Basic level, it is not available, and the trigger offs are always transmitted providing a channel isn't set to receiving midi.

This feature can be used in applications where a simple midi trigger is required such as in drum triggers, or sample triggers, where the effective note length can now be determined by the sample length. The MULTI GATE has a maximum hold time of 1275 milliseconds which may be sufficient for most applications, especially those involving programmable gates. This could also include applications where the MULTI GATE is being used to trigger samples to 'beef' up drum sounds and alike. However, you might find that the maximum hold time is not sufficiently long for certain sample lengths, in which case, Transmit Trigger Off's could be disabled so that the MULTI GATE transmits a single Trigger On message. This feature is only available when Midi is assigned to Triggers rather than Gates or Ducks. When midi is assigned to Gates, the Receive key globally controls all 16 channels, setting them to

receive OR transmit midi, where the transmitted midi is from the action of the VCA's opening and closing rather than the triggers. It is worth remembering that the triggers switch on and off much faster than the gates because the gate action is largely dependent on the HOLD time. When a trigger goes on, it will key the gate, and initiate it's hold timer. This could mean that the Gate remains open for a relatively long time while the trigger itself is switching on and off many times. Therefore, although using midi on gates will probably make more efficient use of midi (due to less information being transmitted), there aren't the benefits of using midi on triggers. It should also be remembered that midi on triggers permits the re- patching of keysources on playback, or to a slave MULTI GATE.

## 10.13. Basic Level Default Values

### Channel Parameters

All 16 channels of the MULTI GATE are configured as 16 Audio Gates (it uses Factory Preset 1), where-

Attack time	=	30 $\mu$ s
Decay time	=	110ms
Hold Mode	=	Hold at Trigger Off
Hold time	=	50ms
Range	=	80dB
Threshold	=	-45dB
Keysource	=	Own Channel
Trigger Hold Time	=	10ms
Channel Note	=	C3 (successive from chan 1)

All channels are enabled to receive midi when the RECIEVE key is ON, and are enabled to transmit midi when the RECIEVE key is Off.

### System Parameters

Soft Key	=	Gates Open
Midi with Triggers mode		
Midi is on Trigger Transmit		
Midi Channel	=	1
Channel 1 Mute Note	=	C0
Mute Transmit/Receive	=	ON
Memory	=	ON
All Notes Off	=	ON
Midi Reset	=	OFF
Echo Midi	=	OFF
System Exclusive	=	OFF

---

## 11. SAVE

The SAVE facility allows you to save the current loaded or edited setup to any of the 96 user memories. SAVING can only be done whilst in Edit mode (PLAY LED is OFF) due to the fact that the 16 channel keys are 'double function' keys depending on whether the MULTI GATE is in PLAY or EDIT mode. An important feature of the SAVE facility is that it enables you to save not just an entire edit setup, but also part of an edit setup, i.e. any single channel, MEMORY LOAD MUTES, edit NAME and the CLOCK/PAN TRIGGER setup can be saved separately to any memory. Additionally, if after saving your setup to a memory, you suddenly realised that you just wrote over a memory that you meant to keep, then you can UN-SAVE the last memory and restore its original contents. Finally, a Memory write protect feature is also available whereby when entering SAVE, the MULTI GATE will indicate if the memory is protected; this can be simply be turned off by pressing the NO key, then SAVE to get back into SAVE. Note that whenever the MULTI GATE is turned ON, the memory becomes Protected.

### 11.1. Saving an Edit Setup.

When you are happy with the Edit setup you have created, and are now ready to SAVE it, first make sure that the MULTI GATE is in EDIT mode (anywhere in EDIT will do). Press the SAVE key - this enters you into the MULTI GATE SAVE options. If the SAVE function hasn't been used since the MULTI GATE was turned ON, the LCD will say "Memory Protect ON". This is just as a precaution as it is important not to write over any memories you wish to keep. To switch the memory protect OFF, either use NO or DATA DEC, whereupon the LCD reads "Mem' Protect Off". Press SAVE again to get you back to the SAVE options. The SAVE options window uses the LCD top line to display the type of SAVE you require, and the LCD bottom line selects the Memory you wish to SAVE to. The PARAMETER Wheel/Keys are used to place the "?" on the respective line you wish to setup, and the DATA Wheels/Keys are used to select the SAVE type and Memory. Note that when entering SAVE, the SAVE type always defaults to FULL - SETUP while the Memory is set to the last user memory loaded OR memory A01 if the last memory loaded was a factory preset. To select a SAVE type other than a FULL SETUP, place the "?" on the top line with the PARAMETER DEC Wheel/Key, and use the DATA Wheel/Keys to Select:-

- Any single channel 1-16
- Memory Name
- Memory Load Mutes
- Clock/Pan Trigger setup
- Full Setup (includes all of the above as well as Midi with Gates/Triggers setup,  
MIDI key Transmit/Receive state, Receive Midi Trigger Enables, and the Soft Key selection).

To select the Memory to save to, place the "?" on the LCD bottom line with the PARAMETER INC Wheel/Key and use the DATA Wheel/Keys to select any user memory A01-32,B01-32,C01-32. Once you have made your choice, Press SAVE, and the SAVE is now complete.

### 11.2. Accidental Save & Restore.

The MULTI GATE has a number of safety precautions built into it, one of them being the ability to UN-SAVE a memory. If after saving your setup to a memory, you suddenly realised that you had written over a Memory you wanted to keep, then all is not lost because the MULTI GATE allows you to restore the last memory you saved to. First, get into the SAVE options window, by pressing SAVE in EDIT mode. Then, press the UNDO key. The LCD will now display:- "UNDO to restore-" on the top line, and the old Memory Number and Name that you wish to restore, on the bottom Line. By pressing the UNDO key,

the restore will be done, restoring the old memory contents. In addition, the memory contents before the restore are now loaded into the Edit buffer for re-editing and saving somewhere else, while the current EDIT buffer is backed up. Re-saving can now be done as mentioned above if you require. To restore the EDIT buffer before the UN-SAVE was done, get into PLAY mode by pushing the PLAY key, then push the PLAY key once more followed by the UNDO key to get into the Restore Old Edit function as described in the section on Accidental Memory Load. By pressing the UNDO key, your original EDIT will now be restored.

---

## 12. COPY

The COPY function Key allows you to COPY the parameters of one channel to any other channel or all 16 channels. Like the SAVE function, a COPY can only be done when in EDIT mode (it doesn't matter where) due to the double-function of the channel keys. Use of the COPY feature can greatly speed up editing time because it means that you don't have to setup all the same parameters for certain channels if they are to be the same. Additionally, COPY allows you to COPY either all channel parameters, just trigger parameters or just Mute/Gate parameters. The latter two are only available in ADVANCED level. Also in ADVANCED level, when copying, you can specify whether or not you wish to copy the Keysource so that a stereo pair can be quickly created. Please note that the ONLY parameter that is not copied for obvious reasons is the Note Number. To COPY a channel, first make sure you are in EDIT, then press COPY. The COPY window will display the channel that you will be copying on the top line of the display (using the last channel number selected in Edit), and the COPY destination on the bottom line. "?" is used at the end of the respective 'line' that you wish to setup and can be changed by using the PARAMETER Wheel/ Keys; the window will change (in ADVANCED level) to display parameters to be copied and whether or not you wish to copy the keysource). To change the selection use the DATA Wheel/Keys. Once you have setup what you wish to copy and to what channel, press COPY and it will be done.

For example, say you wish to copy all the channel 3 parameters including it's keysource to channel 9, then get into Edit mode and press COPY. Using the PARAMETER Wheel/Keys, place the "?" at the end of the top line where it says "Copy Channel" and select channel 3 with the DATA Wheel/Keys. Then place the "?" at the end of the bottom line which says "To ..... ", and use the DATA Wheel/Keys to select channel 9. Next ensure that the parameters you wish to copy are All Parameters by pushing the PARAMETER INC key and select "All Parameters" with the DATA Wheel/Keys if not already selected. Finally you need to specify that you wish to copy the keysource as well, so press PARAMETER INC and the bottom line will now display "Key=Chan Yes/No". Press NO to insure that the keysource is not copied across from the channel being duplicated. Now everything is setup, press COPY, and the copy will be done, and you are returned back to where you left off in the EDIT menu. Although this sounds long winded, it is in fact very quick and easy to use.

When using the MULTI GATE in conjunction with a host computer, it is important that the host is always kept up to date with the parameters and configurations so as to prevent data contention or corruption. For this reason, when the copy is actually performed, the MULTI GATE also transmits the system exclusive Edit Buffer dump, that is providing system exclusive is switched On.

---

## 13. NOTES ON THE USE OF MIDI

### 13.1. Midi Loops

Midi loops can easily occur in any Midi network and should be avoided at all times. They occur when, after plugging in various pieces of Midi equipment, a complete loop is formed. For example, if you have say a Sampler whose Midi Thru is connected to the Midi In of a Tone Generator, whose Midi Through is connected to the Midi In of a MULTI GATE whose Midi Thru is, etc., etc., whose Midi Thru is connected to the Midi In of the Sampler you started with, then a complete Midi loop will be formed. This will have disastrous results because as soon as a Midi message is sent, it will echo round and round the system causing it to quite possibly 'crash'. So beware ! the Midi gremlins are waiting. Although this appears to be a rather grim tale, the MULTI GATE does seem to cope quite well in such situations; it's main indication that something is wrong will be if the LCD throws up an invalid character. However, in spite of this, the MULTI GATE will NOT crash.

### 13.2. Thru Chains

Problems with Midi reception can often occur if you link up a number of Midi devices using the Midi Ins and the Midi Thru's due to the fact that the data coming out of a Midi Thru socket is a simple buffered output of data from the Midi In socket. Therefore as you move further down the chain, timing errors begin to occur between successive bits due to optocoupler slew rates and responses. By the time you have got more than 3 links down the chain, the errors can be severe enough to prevent the Midi Receive hardware from operating correctly. It is therefore advisable to use the Midi Out socket if you can (your Midi device must echo the Midi in to the Midi out for this to work) because the Midi Out data clock rate will always be accurately timed up.

### 13.3. Programmable Gates

A major feature of the MULTI GATE is its ability to transmit and receive Midi information when Triggers occur or Gates/Ducks open and close. This can be put to great use when combining the MULTI GATE with a sequencer because it will enable you to record a complete sequence of Gating events as well as play them back through the MULTI GATE where you might have re-voiced some of the channels but used the Gating events from the original signals. There is one major point worth bearing in mind, - Midi delay. It takes about 1ms to transmit and receive a Midi Note On/Off message (or 640 microseconds if you are using Running Status), therefore when you come to play back the Gate or Trigger events through the MULTI GATE, they will be about 2 milliseconds late!. This therefore means that you will have to advance the Gate sequence by about 1ms in order for it to be correctly synchronised - don't forget that all other Midi equipment will also be running 1ms late because they too need to receive their respective Midi messages.

To use the MULTI GATE as a Programmable Gating device, first you need to record your sequence of Gating events. This is probably best done by recording the Triggers as it gives you the most options when playing back due to keysourceing and speed; make sure that Midi is assigned to Triggers - see Midi Control edit menu. Setup your sequencer, tape machine, gates and what ever else you might be using, make sure that the MIDI LED is off (indicating trigger transmit mode), and start the Recording sequence. When complete, and you are ready to play back the sequence through the MULTI GATE

along with the audio signals, set the MIDI key to receive (Green indicator is On), and Play back your sequence. Note that individual channels in the MULTI GATE can be enabled or disabled for Midi receive by holding down the MIDI key while selecting the appropriate channels: a "\*" = enabled to receive when MIDI indicator is on. Once you have a recorded gating sequence, you can move gate event times around with the sequencer editor to create new effects with the original (or new) signals, or use the events to trigger other Midi controlled devices such as samplers or effects units.

## 13.4. Midi Delays and Buffering

One of the problems which has already been outlined above, concerning the advancement of sending a midi Note On/Off message in order to compensate for the time it takes to actually transmit a message. It should also be borne in mind that there is also the distinct probability that the midi line will be carrying many more messages than just the Note On/Off messages. This is of major importance when considering midi delays: every message that is transmitted will need to be processed by the device(s) receiving them, and a midi line can only carry one message at a time. Therefore if a string of assorted messages was transmitted directly before a pertinent Note On/Off message, then the preceding messages would have to be dealt with before the Note On/Off message, meaning that a delay would result. This effect is very noticeable when using pitch bend controllers from instruments where a virtually continuous stream of pitch bend data is being transmitted which can 'clog' up the midi line, resulting in midi glitches, etc.

## 13.5. Direct Control of VCA's

By now you have probably realised that the MULTI GATE could be used as 16 VCA's for use in automated fader control, by sending SYSEX "Range" messages where the channel is either configured as a Mute, or a Gate with the Threshold at a maximum (see section on System Exclusive Parameter Change). However, this is not recommended due to the fact that the Range-Attenuation of the VCA's is not linear albeit repeatable. The VCA's in the MULTI GATE were designed specifically for use in Muting/Gating applications where one of the most important characteristics is quite, high speed operation, and not necessarily Range-Attenuation linearity. This is not to say that you shouldn't take advantage of this feature, it might well be that nonlinearity is not of a crucial nature in your specific application.

Version 3.60 of the MULTI GATE software allows a second method of directly controlling the VCAs. One problem that could be encountered using the Range method of control, is that you may have the channel coupled to an audio trigger, and although the maximum threshold will be OK for most signals, any high level signals may trip the threshold and trigger the channel. This is obviously very undesirable. An alternative method of sysex control is now available which is free from the aforementioned problem. The channel to be controlled has to be configured as a Mute whereupon there is much less likelihood of a midi note on/off message doing the damage than an audio trigger. The sysex message is a Channel Parameter change message on parameter number 12. See section 15.3.1 Channel Parameters.

Frequency Conscious keying is used when you want to selectively Gate signals depending on their frequency content so that spurious signals will not trigger the gate. An example of this can often be found when miking up a drum kit where, say the microphones on the snare drum were picking up enough signal from the Hi-Hats, sufficient to open the Snare gate. A solution to this problem is to use a filter on the Key trigger whereby the top end is rolled off so that the signals from the Hi-Hat which are causing the Trigger and consequently opening the gate, are removed. This type of application can easily be implemented on the MULTI GATE by using 2 channels: If the Snare signal is routed through 2 channels of your mixing desk and each goes through a channel of the MULTI GATE, then by using one channel to key the other, along with using the EQ section on your desk to filter the signal being used for the keysource, a frequency conscious system can be easily implemented. The only limitation on such a setup is that you need 2 channels to do 1 channel of gating where to implement frequency conscious keying for all channels, would limit the MULTI GATE to any 8 channel device. It might be possible to get away with using just a single channel on your desk provided that you can take a signal before and after the channel EQ section, and return the signal from the MULTI GATE before the channel routing and fader network.

Frequency conscious keying can also be implemented in stereo applications, but it will be necessary to use a spare pair of channels and a submix output on your desk. This application would require that you use for example, channels 1 and 2 for your actual stereo gate pair where they are both keyed by channel 3. The audio input for channel 3 would come from your desk, where it would be equalised mix of the 2 channels. The equalising could be independently done for each channel albeit this would require two extra channels for the two equalisation sections followed by a sub mix to an auxiliary output to be input to channel 3. A more efficient use of channels could be achieved by first mixing the master channels (stereo channels) to an auxiliary, and then input that to a reserved channel. The reserved channel can be used as the equalisation section to implement the frequency conscious element of the keying.



---

## 15. SYSTEM EXCLUSIVE

The MULTI GATE includes a fully blown System Exclusive implementation where every parameter is accessible for Editing or Requesting, as well as being transmitted in real-time whenever a parameter is edited from the front panel of the MULTI GATE. The two advantages of this are that it is possible to easily implement a MULTI GATE slave setup whereby one can directly control another, for example, in a 16 channel stereo setup where One MULTI GATE deals with the Left Hand signals while the other MULTI GATE deals with the Right Hand signals. Probably the most important aspect of the MULTI GATE's System Exclusive facility is in the integration with a host computer running as a "Front Panel" for the MULTI GATE. In such a configuration, the Host computer can emulate a MULTI GATE control panel where any parameters that are changed on the Host, are transmitted to the MULTI GATE and dealt with as if they were edited from the MULTI GATE front panel itself. Conversely, if any parameters are edited from the front panel of the MULTI GATE (such as the Threshold, Channel Mode, Keysource, etc.) then the new respective parameter data is simultaneously sent to the Host so that the Host ALWAYS knows exactly how the MULTI GATE is setup. A range of Dumps and Dump Requests are also available for quick downloading of parts or all of the MULTI GATE setup and memories. This can effectively allow for a vast extension to the MULTI GATE memory by using the memory storage system of the Host computer. Using the MIDI GATEs System Exclusive communication with a Host computer, it is possible to install the MULTI GATE into your system and never touch it again, as total control can now be handed over to the Host computer.

### 15.1. System Exclusive Messages

All messages used by the MULTI GATE are headed by 4 Midi bytes:-

F0h	Start system exclusive
00 20 0Eh	LA Audio identification number
16h	MULTI GATE identification number
tmh	System exclusive type (t), and Device Number (m)

The Device Number uses the MIDI GATEs current working Midi channel.

The System exclusive types are given below:-

t	type
0	Dump Data
1	Parameter Change
2	Dump Request
3	Parameter Request
4	reserved
5	reserved
6	reserved
7	Midi Channel Interrogate

## 15.2. Midi Channel Interrogate & System Exclusive Switch

This feature has been included to interrogate what channel the MULTI GATE is operating on. When using this message, the MULTI GATE will respond by sending its current Midi channel regardless of what channel number you use to send the interrogate message and regardless of whether System Exclusive is actually On inside the MULTI GATE. The main purpose of this is so that you don't have to actually use the front panel of the MULTI GATE to find out what channel it is set to. This feature therefore allows the MULTI GATE to be used as a truly Remote device. Additionally, while system exclusive cannot be enabled or disabled with an exclusive parameter change message, it can be done using a controller change message. The MULTI GATE uses controller number 46h to do this, where a data value of 0 turns System Exclusive OFF, and data 1 turns Exclusive ON. Note that any other data value has no effect.

As an example for using this facility, say that you have a MULTI GATE plugged into your Host and you wish to control it from a front panel editor on the Host but the MULTI GATE is not conveniently accessible for its front panel, then first transmit the interrogate message < F0 00 20 0E 16 70 F7 > whereupon the MULTI GATE will respond by sending its Midi Channel in the form of a Parameter Change Message (see Sysex section) < F0 00 20 0E 16 11 01 01 0m F7 > where the value <0m> represents the Midi Channel or Device Number. Now you have the Midi channel, you need to ensure that System Exclusive is switched On in the MULTI GATE, so transmit the Control Change Message with your interrogated Midi channel < Bm 46 01 >, and system exclusive is now ON and ready to use.

Switch On Exclusive	<Bm 46 01>
Switch Off Exclusive	<Bm 46 00>
Interrogate Channel	<F0 00 20 0E 16 70 F7>

## 15.3. Parameter Change and Parameter Request

These two types are very similar in structure where the only difference between the two are that they have a different header type (t), and the Request messages don't include any data bytes after the group and parameter numbers.

Parameter change messages consist of 1 to 3 data bytes depending on the type of parameter. For Example, an 8 bit data byte would be split into 2 Midi bytes where bit 7 of the data byte would be sent as bit 0 of the second (ms) Midi byte. For 16 bit data, this is split into 3 Midi bytes where :-

b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0

shift to -

data byte 3	data byte 2	data byte 1
0 0 0 0 0 0 b15 b14	0 b13 b12 b11 b10 b9 b8 b7	0 b6 b5 b4 b3 b2 b1 b0

The general form that Parameter Change messages take are -

F0h	Start exclusive
00 20 0Eh	LA Audio ID
16h	MULTI GATE ID
0001mmmm	Parameter Change & Midi Channel (device number)
Ohhhhhgg	hhhhh = parameter group, gg =group type
Offffff	parameter number
Oddddddd	1st data byte

0ddddddd	2nd data byte}
0ddddddd	3rd data byte} If required
F7h	End of Exclusive

Note that for the group type gg, 00 = channel parameter, 01 = system parameter If the group type is a channel parameter, then hhhhh = the channel number 0-15.

All the following messages use one Midi byte unless otherwise stated.

## 15.3.1. Channel Parameters

hhhhh is used to specify the channel number of the MULTI GATE, 1-16 (0-15) and gg is used to specify one of the three possible groups to which the Multi Gate may be configured (see section 9.13 "CHANNEL GROUP").

Channel Group 1	(channels 1 to 16)	gg=00
Channel Group 2	(channels 17 to 32)	gg=10
Channel Group 3	(channels 33 to 48)	gg=11

Note that gg=01 is used for system parameters; see section 15.3.2. This may seem rather odd, but the original version of the software didn't support the channel grouping facility, and the new version 3.60 takes advantage of the two spare sysex group numbers 10b and 11b to implement the 3 Channel Groups.

(hhhhh = channel number 0 - 15 (channel 1-16), gg = 00)

Parameter Number	Description
0	Channel Mode. 0 = Mute, 1 = Gate, 2 = Duck, 3 = Clock I, 4 = Clock II, 5 = Tremolo
1	Attack Time (0 - 110) see table below
2	Decay Time (0 - 110) see table below
3	Hold Mode 0 = Hold at trig On, 1 = Hold at ramp end 2 = Hold at Trig Off
4	Hold Time. 2 bytes (0 - 254) Hold Time = 5*data ms
5	Key Source (0 - 15) Channel 1 - 16
6	Threshold. see look-up table
7	Trigger Hold Time. 2 bytes (0 - 200) . Time = 5*data ms
8	Range (0 - 80) where 0 = 80dB, 80 = 0dB
9	Memory Load Mute 0 = Mute Off, 1 = Mute On
10	Enable Trigger to receive Midi, 1 = On 0 = Off
11	Channel Note Number (0 - 127)
12	Direct VCA control (0-127). This is only operable when the channel is configured as a mute.
13	Enable Trigger to transmit midi. 1 = enable, 0 = disable
14	Enable the transmission of midi trigger Off. 1 = enable, 0 = disable

### 15.3.1.1. Attack/Decay Time Lookup Table (in milliseconds)

Value	Time (milliseconds)
0 - 9	0.03, 0.07, 0.1, 0.5, 1.0, 1.4, 1.8, 2.2, 2.6, 3.0
10 - 19	3.3, 3.6, 4.0, 4.3, 4.6, 5.0, 5.3, 5.6, 6.0, 6.3
20 - 29	6.6, 7.0, 7.3, 7.6, 8.0, 8.3, 8.6, 9.0, 9.3, 9.6
30 - 39	10, 11, 12, 13, 14, 15, 16, 17, 18, 19
40 - 49	20, 22, 24, 26, 28, 30, 35, 40, 45, 50
50 - 59	55, 60, 65, 70, 75, 80, 85, 90, 95, 100
60 - 69	110, 120, 130, 140, 150, 160, 170, 180, 190, 200
70 - 79	210, 220, 230, 240, 250, 260, 270, 280, 290, 300
80 - 89	324, 344, 367, 393, 408, 424, 441, 460, 480, 500
90 - 99	525, 551, 580, 613, 649, 689, 735, 789, 848, 919
100-107	1000, 1100, 1200, 1400, 1600, 1800, 2200, 2700
108-110	3700, 5500, 11000

### 15.3.1.2. Threshold Values

Value	Threshold
0 - 44	-54dB to -10dB in 1 dB steps
45 - 94	-9.5dB to +15dB in 0.5dB steps

### 15.3.2. System Parameters (gg = 01)

hhhhh	description
0	Midi Parameters
1	Programme Change Table
2	Mute Patch Table
3	Miscellaneous
4	Clock/Pan Trigger
5	Edit Name

#### 15.3.2.1. Midi Parameters (hhhhhgg = 0000001)

ffffff	
0	Midi with Gates or Trigs. (Trigs=0 Gates=1)
1	Global Midi channel (0 - 15) Channel = 1 to 16
2	Mute Channel 1 Note Number (0 - 110)
3	Enable Transmit Mutes (1=enabled)
4	Enable Receive Mutes (1=enabled)
5	Enable Transmit Programme Change (1=enabled)
6	Enable Receive Programme Change (1=enabled)
7	Enable All Notes Off (1=enabled mutes only)
8	Enable receive system reset (1=enabled)
9	Enable Midi echo (1=enabled)
10	MIDI key -- 0 = Transmit Gates/Trigs 1 = Receive Gates/Trigs

### 15.3.2.2. Programme Change Table (hhhhhgg = 0000101)

The Programme Change Table can be used to assign any of the 96 user memories, 16 factory presets, or 128 mute patches to a Programme Change Number. fffffff represents the programme change number (0 - 127) while the 2 byte data represents the memory/patch assigned to the programme change number.

The first Midi data byte represents the Memory/Patch number:

- 0 - 31 = memory bank A
- 32 - 63 = memory bank B
- 64 - 95 = memory bank C
- 96 - 111 = factory presets

OR

- 0 - 127 = Mute Patch 1-128

The second Midi data byte = 0 if memory, and 1 if Mute Patch.

### 15.3.2.3. Mute Patch Table (hhhhhgg = 0001001)

Mute patches are sent as a 16 bit word where each bit position corresponds to a channel. i.e., If b0=1, channel 1 mute will be ON, If b12=0, channel 11 mute will be OFF. Hence, 3 Midi data bytes are required for the 16 bits. fffffff = patch number (0 - 127) - patch 1 to 128

### 15.3.2.4. Miscellaneous (hhhhhgg = 0001101)

All the miscellaneous data bytes are single Midi data bytes.

ffffff

- |   |   |
|---|---|
| 0 | Operating Level (0 = BASIC level, 1 = ADVANCED level)         |
| 1 | Memory Write Protect. ( 0 = Protect Off )                     |
| 2 | Memory Enable (0=disable, 1=enabled (front panel selectable)) |
| 3 | Data Wheels Copy/Relative (0=Relative, 1=Copy)                |
| 4 | Soft Key mode:  |
|   | 0 Off   |
|   | 1 All Mutes On  |
|   | 2 All Mutes On + Restore                                      |
|   | 3 All Mutes On while Key down                                 |
|   | 4 All Mutes Off   |
|   | 5 All Mutes Off + Restore                                     |
|   | 6 All Mutes Off while key down                                |
|   | 7 Mute Patch A-B toggle                                       |
|   | 8 Call Pre-Mute   |
|   | 9 All Gates Open while Key Down                               |
|   | 10 All Gates Closed while Key Down                            |
| 5 | reserved  |
| 6 | Note display mode 0=Decimal, 1=Hexadecimal, 2=Note (e.g. G 3) |
| 7 | Data display mode 0=Decimal, 1=Hexadecimal                    |

### 15.3.2.5. Clock/Pan Trigger (hhhhhg = 0010001)

All Midi data bytes are sent as 1 byte with the exception of the Internal Clock rate and Midi Clock Scale which requires a value from 0 to 255, i.e. 2 Midi data bytes

ffffff	
0	Clock/Pan mode. 0 = Internal 1 = Midi Clock
1	Internal Clock rate.(0-255) where 0=0.04s. increments of 0.04s.
2	Internal Balance or duty cycle ( 0 - 50 ) %
3	Midi Clock Scale (1 - 250) -- Midi clock divide ratio
4	Synchronise to Start/Stop/Continue. 1 = enabled
5	Cycle Offset (0 - 99) %
6	Balance (duty cycle (0 - 99) %

Note that the Cycle Offset is 0, +1...+99% = -, -99....1%

### 15.3.2.5. Edit NAME (hhhhhg = 0010101)

The edit NAME is made up of 12 characters where the character position is represented by fffffff (having a value of 0 to 11). The Character value uses the standard ascii character set (0 to 127).

## 15.4. Dump Data and Dump Request.

Like the Parameter Change/Request headers, the DUMP DATA/REQUEST messages have a similar format. i.e. the header message and format numbers are the same for the Dump and the Request. The differences being in that system exclusive type byte is different, and the Dump Request message has No data bytes or checksum associated with it.

### 15.4.1. Dump Request Messages

The message type for a dump request is as follows:-

F0h	Start System Exclusive
00 20 0Eh	LA Audio Identifier
16h	MULTI GATE identifier
0010mmmm	Dump Request & Midi Channel (Device Number)
Offffff	Dump Request type/format
F7h	End of Exclusive

### 15.4.2. Dump Request Number Formats

ffffff	description
0 - 31	single memory A01 to A32
32 - 63	single memory B01 to B32
64 - 95	single memory C01 to C32
96	edit buffer
97	16 memories - factory presets

98	32 memories - Bank A
99	32 memories - Bank B
100	32 memories - Bank C
101	Programme Change Table
102	Mute Patch Table
103	System setup
104	Dump Everything. Note, the response to this includes 97,98,99,100,101,102,103

### 15.4.3. Dump Data Messages

The message type for Dump DATA is as follows:-

F0h	Start System Exclusive
00 20 0Eh	LA Audio Identifier
16h	MULTI GATE identifier
0000mmmm	Dump Data & Midi Channel (Device Number)
0ffffff	Dump Data type/format
0ddddddd	data bytes -- sent in packets of 8 Midi bytes
0ccccccc	Checksum - 7 lsb's of sum of all data bytes
F7h	End of Exclusive

### 15.4.4. Description of Dump Data format numbers:-

ffffff	description
0-31	single memory A01 to A32
32-63	single memory B01 to B32
64-95	single memory C01 to C32
96	edit buffer
97	16 memories - factory presets
98	32 memories - Bank A
99	32 memories - Bank B
100	32 memories - Bank C
101	Programme Change Table
102	Mute Patch Table
103	System setup

All Dump Data is compressed into packets of 8 Midi bytes representing 7 8bit data bytes. For each packet, the first Midi byte is made up from the bit 7's of the 7 data bytes such that bit 0 of the first Midi byte = bit 7 of the first data byte, and bit 6 of the first Midi byte = bit 7 of the 7th data byte.

The organisation of the data for the various dump formats is as follows :-

### 15.4.4.1. Single Memories and Edit Buffer (uses 170 bytes)

For channels 1 to 16 (9 bytes each)

byte 1	Channel mode b0,1,2 hold mode b4,5. b3=Tx Trig Enable
byte 2	Hold time (*5ms)
byte 3	Attack time (see attack/decay table above)
byte 4	Decay time (see attack/decay table above)
byte 5	Threshold (see details above). b7=Tx Trig Off Enable.
byte 6	Key source 0 to 15 (channels 1 to 16)
byte 7	Trigger hold time (*5ms)
byte 8	Range (0 to 80, where 0 = 80dB)
byte 9	Channel note number (0 - 127)
the above 9 bytes repeated for 16 channels - 144 bytes so far	
byte 145-156	Name (12 characters)
byte 157,158	Receive trigger enables (b0 to 15 correspond to chans 1-16)
byte 159	MIDI key (1= enable Midi trigger receive)
byte 160	Midi with Gates/Triggers (0=triggers, 1=gates)
byte 161,162	Memory Load Mute patch (b0 to 15 correspond to chan 1-16)
byte 163	Clock/Pan trigger mode (0 = Internal, 1=Midi clock)
byte 164	Internal clock rate
byte 165	Midi Clock mode scale
byte 166	Midi Clock mode cycle offset
byte 167	Midi Clock mode Balance (duty cycle) 0 - 99%
byte 168	Internal clock Balance 0 - 50%
byte 169	Soft key mode
byte 170	Not Used

### 15.4.4.2. Dump Memory Bank A or B or C or Factory Presets

The data structure is the same as for dumping a single memory except that 32 memories are strung together. If dumping the Factory Presets, there are only 16 memories as opposed to 32 for the User Memories.

### 15.4.4.3. Dump Programme Change Table

The Dump data array consists of 128 bytes where the data byte count represents the programme change number, and the value of the data byte represents the Memory/Patch assigned to the Prog change number:

DATA VALUE	DESCRIPTION
0 - 31	Memories A01 to 32
32 - 63	Memories B01 to 32
64 - 95	Memories C01 to 32
96 - 111	Factory preset 01 to 16
128 - 255	Mute Patches (128 off)



## 15.4.4.4. Dump Mute Patch Table

The Mute patch table consists of 128 words where each 16 bit word relates to each mute patch. B0 to 15 = Channel 1 to 16 respectively, and a bit set represents a Mute ON, reset =Mute OFF. The word count = the patch position in the table.

## 15.4.4.5. Dump System Setup Data

Note that some of these are also duplicated in the memories. i.e., clock setup, receive trigger enables, Midi with Gates/Trigs, Receive/transmit Midi On/Off, Softkey, Memory Load Mute Patch.

byte 1	Global Midi channel (0 - 15)
byte 2	Mute channel 1 note number (0 - 110)
byte 3	Transmit mutes enable (1=enable)
byte 4	Receive mutes enable (1=enable)
byte 5	Transmit Programme Change enable (1=enable)
byte 6	Receive Programme Change enable (1=enable)
byte 7	Receive All Notes Off enable (1=enable)
byte 8	Receive system Reset enable (1=enable)
byte 9	Echo Midi enable (1=enable)
byte 10	Note display mode
byte 11	Data display mode
byte 12	Memory enable (1=enable)
byte 13	Data Wheel mode (copy/relative)
byte 14,15	Data Wheel to channel assigns (b 0-15 = chan 1-16, 1=enabled)
byte 16	Operating mode (0=Basic, 1=Advanced)
byte 17	Memory Protect enable (0 = protect off)
byte 18,19	Receive Midi trigger enables (1=enabled)
byte 20	MIDI key (1=Midi receive enabled)
byte 21	Midi with Gates/Triggers (0=Trigs, 1=Gates)
byte 22,23	Memory Load Mute patch
byte 24	Clock/Pan Trigger mode. (0=internal, 1=Midi clock)
byte 25	Internal rate
byte 26	Midi clock scale
byte 27	Midi clock cycle offset
byte 28	Midi clock balance
byte 29	Internal clock balance
byte 30	Softkey mode

# 16. MIDI IMPLEMENTATION CHART

## MULTI GATE - 16 Channel Audio Gate Processor

Function		Transmitted	Recognised	Remarks
BASIC CHANNEL	Default	1	1	Basic Level Memorised
	Changed	1-16	1-16	
MODE	Default Messages Altered		Mode 3	
NOTE NUMBER	True Voice	0-127	0-127	Used for Mute, Gates and Triggers
VELOCITY	Note On	64	0	0=Note off
	Note Off	64	X	
TOUCH	Key's	X	X	
	Chan's	X	X	
PITCH BENDER		X	X	
CONTROL CHANGE		X	0	Switch Sysex On/Off Controller No. 46h 0 = Off/1 = On
PROGRAM CHANGE	True#	0-127	0-127	Programme Change Table
SYSTEM EXCLUSIVE		0	0	
SYSTEM COMMON	Song Pos	X	X	
	Song Sel	X	X	
	Tune	X	X	
SYSTEM REAL TIME	Clock Messages	X X	0 Start, Stop, Cont.	Used as Clock/Pan controller
AUX	Local On/Off	X	X	Kill mutes
	All Notes Off	X	0	
	Active sense	X	X	
	Reset	X	0	
Mode 1: OMNI ON, POLY		Mode 2: OMNI ON, MONO		O: Yes
Mode 3: OMNI OFF, POLY		Mode 4: OMNI OFF, MONO		X: No

---

## 17. MULTI GATE SPECIFICATIONS

SIGNAL INPUT LEVEL	up to +22dBm unbalanced
INPUT IMPEDANCE	10Kohms
SIGNAL OUTPUT LEVEL	up to +21.5dBm unbalanced the output is down from the input by 0.7dB
THD	0.04% at 1kHz 0dBm
NOISE	-100dB unweighed at ZERO
ATTENUATION	-93dB unweighed at MAX ATTENUATION
BANDWIDTH	10Hz - 60KHz +/-1dB
RAMP BREAKTHROUGH	91dB
CHANNEL CROSSTALK	-100dB @ 1KHz
MAXIMUM ATTENUATION	103dB
MUTE PROTECTION	All channels are muted on power up sequence
THRESHOLD	-54dB - +15dB
ATTACK	30µs to 11s
DECAY	0.1ms to 11s
HOLD	5ms to 1275ms
RANGE	0dB to 80dB attenuation
KEY SOURCE	Any channel 1-16 or Midi key
FUNCTION	Each channel- Mute, Gate, Duck, Clocked Pan, Tremolo
REAR PANEL	Mains input (with voltage selector and fuse) Midi In, Midi Out, Midi Through
FRONT PANEL	16 stereo jacks - Body=Earth, Ring=Input, Tip=Output Power On/Off, Threshold wheel, Attack wheel, Decay wheel Range/Hold wheel, Range/Hold select switch, 16 * 2 Liquid crystal display (backlight), 16 * Channel control /assign keys & Bi-colour channel status LED's, Play key & LED, Edit Channel key, Edit System key, Bypass/Undo key, Soft Key, Midi key (switches gates to Midi receive when LED is on)
POWER	110v / 240v selectable by rotating fuse drawer on mains inlet. (current selection on top left of drawer.) 15 Watts power consumption. Fuse - 200mA slow-blow for 240V operation 400mA slow-blow for 110V operation
WEIGHT	4 Kg
DIMENSIONS	483mm (width), 44mm (height), 252mm (depth)
ENVIRONMENT	Operating temperature 0 °C to 35 °C Storage temperature -10 °C to 60 °C Humidity 90% without condensation

MULTI GATE Manual - Rev. 4.0. - 06/93

*The L A Audio Multi Gate is manufactured under license in the U.K. by:*  
SCV Electronics, 3A 6-24 Southgate Road, London N1 3JJ, England  
Telephone: +44 (0)71-923 1892 Facsimile: +44 (0)71-241 3644