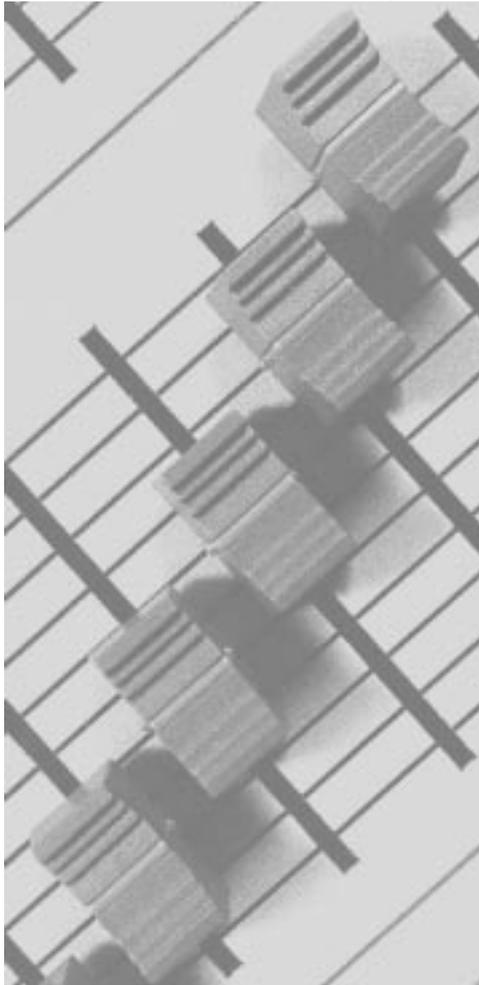


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INFORMATION

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Lightmaster XLS

Manual

zero 88
A touch of Brilliance

Lightmaster XLS Manual

Issue Four - April 1998
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Zero 88 Lighting Ltd. reserves the right to make changes to the equipment described in this manual without prior notice.

This equipment is designed for professional stage lighting control and is unsuitable for any other purpose. It should be used by, or under the supervision of an appropriately qualified or trained person only

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Warning

If a portable or temporary three phase mains supply is used to power this desk:

We recommend that the desk mains plug is removed before connecting or disconnecting the supply.

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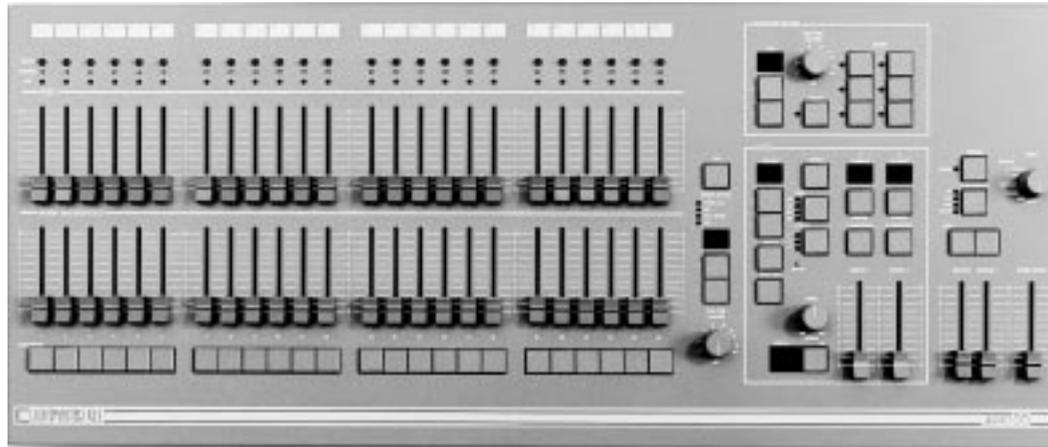
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This Manual

This manual describes the operation and programming of a Lightmaster XLS. It begins with simple two preset operation, and progresses in easy stages to running complete, complex shows. Each section begins with a basic description of controls and functions, followed by a step by step, diagrammatic guide, provided to give the first time user a "hands-on" approach. Notes are included in each explanatory section to provide more detailed information on some of the desk's features, together with Hints giving suggestions as to possible applications.

The Desk

The Lightmaster XLS is two separate 24 channel lighting desks in one box. This provides 24 channels of fully featured traditional lighting control and 24 channels of auxiliary control, for equipment such as colour changers.

The main 24 channels are associated with 24 sub masters, 216 memories, fade times, 9 effects, 2 effects sub masters, with analogue and DMX outputs.

The 24 auxiliary channels are programmed into 9 pages of 6 memories (only one can be accessed at a time), fade times and DMX outputs.

The desk has seven distinct sections: Master controls, Presets, a Memory section, an Effects section, the Auxiliary / Colour Control, the Midi function and the Super User function including Memory Card. These sections can be used to control the output channels in a variety of ways.

- The Master controls provide overall control of the entire desk.
- The Presets offer manual control of individual channels.
- The Memory section allows storage and retrieval of lighting scenes, using the B preset as memory masters.
- The Effects section allows storage and retrieval of chase and audio effects.
- The Auxiliary / Colour Control section allows storage and retrieval of 54 memories.
- The Midi function allows the desk to operate with midi equipment.
- The Super User functions allow protected access to functions that affect the overall desk operation including Memory Card saving and loading.

DMX 512

Each Lightmaster XLS has a USITT DMX 512 output as standard. Under Super User control, it will output DMX signals to the 1990 or pre 1990 standards. There are two built in soft patches both allowing up to 96 / 512 dimmer channels to be addressed. loop timing at 512 is 128 channels per 40 ms

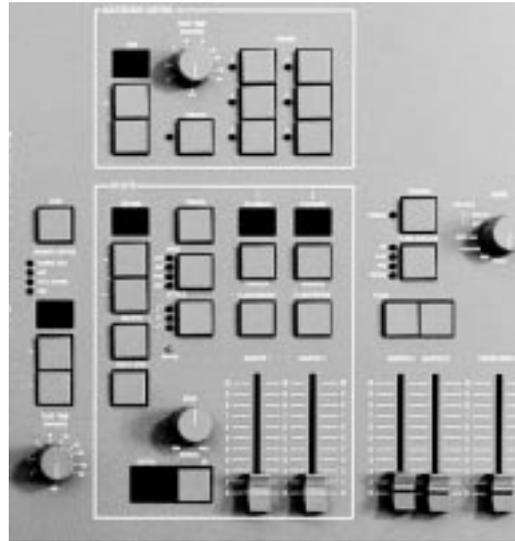
MIDI

The Lightmaster XLS uses MIDI in four ways:

- As a means of linking two or more Lightmaster XLS desks for memory transfer or for Master/Slave operation
- To allow a relatively simple electronic keyboard to control individual channels and memories
- To allow more complex instruments such as sequencers to control scene changes, even to the extent of making such changes into a sophisticated chase
- To allow connection of a foot switch to remotely operate the Effects Go button.

The Memory Card

A Zero 88 Memory Card will store all the memories and set-up of a Lightmaster XLS.



These controls set the general operating conditions for the entire desk. The Master functions determine the mode of operation, the functions of the buttons throughout the desk, and the maximum output level for any channel.

Master Controls

ON/OFF SWITCH:

Supplies power to the desk (Back panel).

MODE SWITCH:

A rotary switch which selects Preset, Run, Program, Patch DMX, MIDI Set-up Out, or MIDI Set-up In / Slave modes of operation.

GRAND MASTER:

Sets maximum level for all outputs.

FLASH FUNCTION:

Determines the function of flash buttons (see notes).

MASTER A / B

Sets maximum level for Preset A, Preset B / Memory Masters.

NOTES

* Flash Functions:

Off: Flash Buttons do not function

Flash: Pressing a Flash Button will cause the channel, memory or effect to be mixed in to the current outputs.

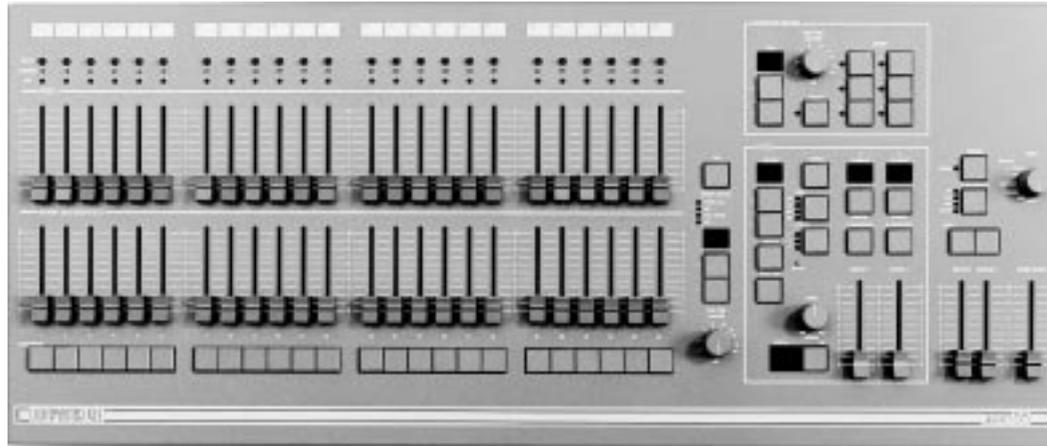
Solo: Pressing a flash button will cause the channel, memory or effect to be output with all other outputs suppressed.

Preview (Run and Program Only): Pressing a flash button will display the contents of that memory on the preview leds without affecting the output of the desk.

* Mode Switch

When switching from Run Mode to Preset Mode there is a small delay, before going into Preset Mode. So if you switch into Presets Mode by accident you can go back into Run Mode and not need to set up Pages and Patterns etc. Switching from Presets to Run after the delay resets the Effects and Memory Page to 1.

Presets Mode Operation



In Presets Mode all effect and memory functions are disabled, offering a completely manual system.

A scene can be set up on Preset A or B using the individual channel faders. The Master A / B faders can then be used to manually crossfade between scenes while still under the control of the Grand Master.

The green channel lights always show the actual output of each channel (i.e. the signal sent to the dimmers, and hence to the lanterns).

Presets Controls

PRESET A & MEMORY MASTERS/PRESET B:
There are two sets of faders controlling individual channels known as Presets (or Scenes); these are referred to as Preset A and Memory Masters/Preset B.

MASTER A/B:
Sets the maximum level of Preset A/B.

MASTER A/B FLASH:
Flashes Preset A/B to the level of the Grand Master. If the outputs are fading between presets then the fade will be overridden by the flash temporarily.

FLASH / PREVIEW:
Whilst pressed, individual channels or memories are flashed. If Flash Function is set to flash.

OUTPUT LIGHTS:
Brightness indicates current channel output.

FADE TIME :
Sets the time for a scene to fade in or out when changed by Master A or B .

NOTES

- * **Master Fader Levels**
For each channel the level of the output is determined by the channel fader, and the Master A (or B) fader, and the Grand Master. i.e. with all three, set to 50%, the total effect is $0.5 \times 0.5 \times 0.5$, so that the channel will be output at 12.5%
- * **Dipless Crossfade**
All crossfades between Master A and Master B are dipless.
- * **Master A/B Faders**
*With Master A/B faders up, the levels on the Presets A/B will be output from the desk directly. This applies whatever the position of the Mode Switch.
B Master may be inverted in Super User. (see page 20)*
- * **References to Preset B / Memory Masters**
Faders are referred to in this manual as Preset B faders when being used in Preset Mode and Memory Masters at all other times.
- * **MIDI**
The desk will respond to MIDI input signals in Preset mode. Ensure that any MIDI cable is unplugged until the operation of MIDI on this desk is fully understood (See page 24.)

Turning on the Desk

- 1 Switch on the desk using the mains switch on the back panel
- 2 Set the Grand Master full on (UP).
- 3 Set Master A and Master B faders to zero (DOWN).

Setting Up Presets

- 1 Set ALL faders at zero, Fade Time to OFF, set Grand Master to full.
- 2 Turn the Mode switch to select Preset
- 3 Set up one scene by setting the required levels for each channel on the Preset A faders, and a different scene on Preset B.

Dipless Fading Between Scenes

- 1 Slowly fade up Master A. The green Output lights correspond to the desk output.
- 2 To manually fade in the next scene, simultaneously push Master B up to full, Master A down to off. You have direct control over the speed of the scene change.

Timed Dipless Fading Between Scenes

- 1 Set Fade Time to 5 seconds.
- 2 Quickly fade up Master A; note that the scene only reaches maximum output level after 5 seconds.
- 3 To crossfade to the next scene, simultaneously push Master B up to full, Master A down to off. The speed of the scene change is set by the Fade Time. (The Master B fader may be inverted, see notes.)
- 4 Experiment with different Fade Times.

Flashing a Channel

- 1 Press Flash Function to select Flash.
- 2 Press one or more individual channel Flash buttons. The channels selected have been added into the scene at the level set by the Grand Master.

Soloing to a Channel

- 1 Change the Flash Function to Solo.
- 2 Press one or more individual channel Flash buttons. This time the channels selected have come on to the level set by the Grand Master, with all other outputs killed.
- 3 Release the Flash button to return the desk to its previous state.

Flash/Solo for whole Presets

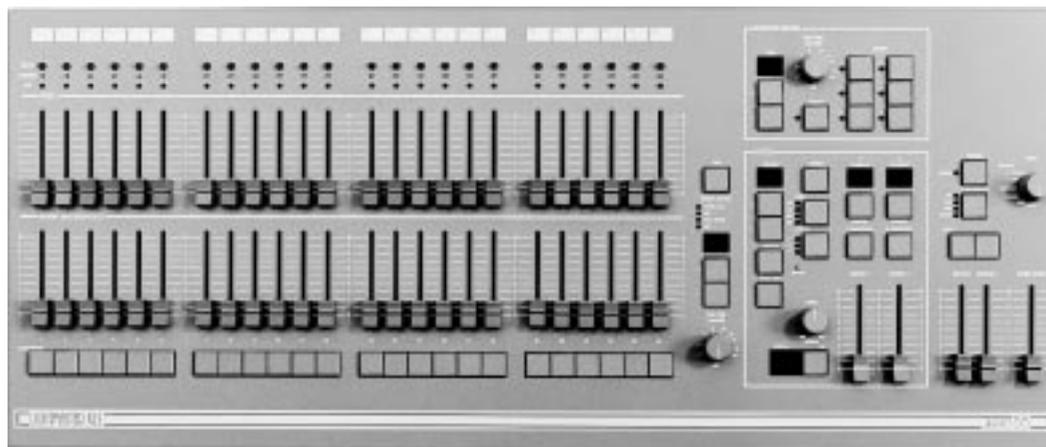
- 1 Press Flash Function to select Flash.
- 2 Set Master A down to off and push Master B up to full.
- 3 Press the Master A Flash button to see the effect of flashing a complete preset/scene.
- 4 Change the Flash Function to Solo.
- 5 Press and HOLD the Master A Flash button. This time the complete preset/scene has come on to the level set by the Grand Master, with all other outputs suppressed.
- 6 Release the Flash button to return the desk to its previous state.

Solo also operates on Memory Masters and the Effects Memories.

HINTS

- * **Grand Master Fader**
This is usually set to full on during normal desk operation.
- * **Solo**
The action of solo can be particularly useful for creating a sudden dramatic change, such as lightning flash or explosion effect.
- * **Auxiliary outputs**
The actions of the Grand Master and Solo do not effect the Auxiliary outputs.
- * **Preset A Level**
Press the Level button and select a channel by using the channel Flash / Preview button. The memory Page Display shows the Preset A level (independent of the Master Levels).
- * **Invert Master B**
If using both presets you can invert the Master B preset in Super User. See page 20.

Programming the Memory



The memories in the Lightmaster XLS are arranged in 9 pages, each of 24 memories. The B Preset Faders become 24 Memory Masters In Run and Program Mode. This provides an easy way of recording up to 216 scenes which would otherwise have to be set up manually on the Presets. Any scene may be previewed (indicated on the Preview lights), before it is output.

Programming

In Program Mode, the Program light is on, the scene to be recorded is set up on the desk outputs. The faders of Preset A are usually used, but the action of programming records all outputs at that time. Whether from Memory Master, Presets or Effects Master, but not Auxiliary Memories. Any number of channels at any level may be assigned to each memory. To program, select the Memory Page using the +/- buttons, then press the appropriate Memory. Flash/Preview button to select the memory you wish to program. Observe the appropriate program light flashing also. The continuously lit channel preview lights show what is in the

memory now. Press the Program button to record the new scene. Channel information in a memory, is shown on the Preview lights each time the memory is selected.

Programming Controls

PAGE + / - :
Selects Memory Page to be programmed.

PROGRAM:
Records levels currently output to memory.

PRESET A:
Sets individual channel levels for programming

FLASH / PREVIEW BUTTONS:
Select one of the 24 memories on each Page to be programmed.

MEMORY CONTROL:
The four lights above show whether the numeric display is showing the Memory Page, the DMX Channel, MIDI information or Preset A fader level.

NOTES

- * **Ch' in Page display**
This indicates "Channels". 'Ch' is a preprogrammed memory with Channel 1 permanently assigned to Memory Master 1, Channel 2 to Memory Master 2 and so on. These memories can be used to replicate two preset operation or to easily provide the facility of fading, flashing or soloing a single channel. If page 'Ch' is previewed, the display changes to 'PC'. Programmable Memory Pages are numbered 1 to 9. There is more about 'Ch' on page 9.
- * **Error Messages**
These are listed on page 33.
- * **Memory Master Faders**
Used for outputting a previously memorised scene.
- * **Recording of Output**
When the Program button is pressed, the state of the outputs is recorded. If one or more Memory Masters are outputting a memory with outputs from Preset A, the complete resultant scene is recorded.
- * **Preview lights**
come on for each channel recorded over 5%.
- * **Preset A level Match**
The display is not effected by Master A or Grand Master control. Available in Presets, Run and Program Mode only. see page 11.

Setting up the Desk for Programming

- 1 Set ALL faders at zero, set Grand Master to full.
- 2 Turn the Mode switch to Program. Program light will come on.
- 3 Push the Master A fader to full.
- 4 Check memory Page is showing '1'.

Programming a Memory

- 1 Select the memory Page required using the page '+' and '-' controls.
- 2 Press the Flash/Preview button to select the memory (1-24) that you wish to program. The Preview lights will show any previously programmed scene; the Preview light of the memory selected will flash slowly and the Page display will change from 1 (for example) to P1, a reminder that the page selected is being previewed.
- 3 Set up a scene on the Outputs using Preset A, other Memory Masters or a static Step from an Effect Pattern.
- 4 Briefly press the Program button to record the output levels in to memory. The new memory is immediately displayed on the yellow Preview leds, to verify that this information has been recorded.
- 5 Repeat steps 1 to 4 to program additional memories.

Clearing a Memory

- 1 Select a memory to be programmed or program a new memory as described above.
- 2 Set the Grand Master down to zero.
- 3 Briefly press Program to clear the memory by storing a scene with all levels at 0. Any preview lights that were on go off.

Blind Programming

This is possible using the Level Match feature described on page 11.

Editing (Using Level Match in Program)

- 1 Set up and record a scene in memory. Leave the desk in Program.
- 2 Move all faders to 0, leave Grand Master at 10.
- 3 Press the memory Flash/Preview button of the memory you want to edit and hold it down until the Preview lights flash to preview the scene that was recorded.

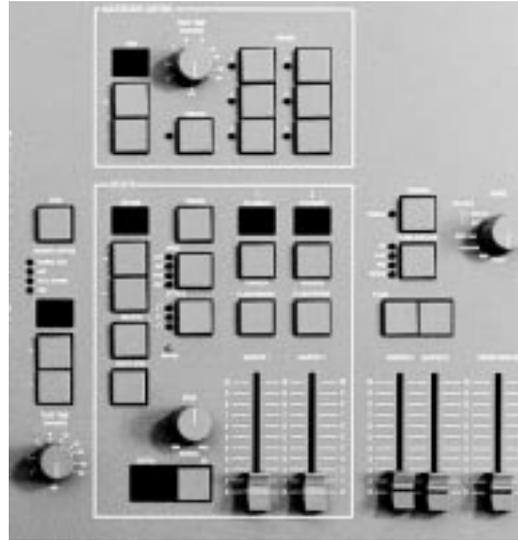
The channel Preview lights will flash quickly on any channels where the channel level on Preset A needs to be decreased to match the programmed level. The channel Preview lights will flash slowly on any channel where the channel level on Preset A needs to be increased to match the programmed level. To see the level on the output leds / dimmers move the Master A to full.

- 4 To edit any channels, adjust the appropriate Preset A channel fader until the associated channel Preview light is on continuously. **Be careful! When the Preset A fader level is at the recorded level, the fader 'catches' the level and then has LIVE control.**
- 5 Now move the fader to the required level. The preview light is still on continuously, this shows the fader and memory are at the same level. The memory has now been edited - simply cancel Level Match by pressing the Flash/Preview button once.

HINTS

- * **Programming Appears Not To Work**
Check that the Grand Master and Master A are up to full, since with Master A at zero, a blank memory will be programmed. Simply fade up the Grand Master or Master A and reprogram the memory.
- * **The scene recorded is not the scene that was wanted.**
Check that none of the Memory Masters or the Effects Master were up whilst you were programming. If any of these masters were on, this will be shown on the Output Lights and the memory that will be recorded will be the mixture of levels set by Preset A and levels set by the Memory Masters that were up. This is an essential feature of the desk.
- * **Reprogramming a Memory**
If the memory chosen is not empty (shown by the preview lights coming on), pressing the Program button will overwrite any previous information with the current settings of Preset A; the old memory will be lost.
- * **Changing the Memory Selected**
To change the memory that you have selected within a Page, simply press another memory Flash/Preview button. To remove the memory preview information from the Preview lights in Run, press the Flash/Preview button of the memory once again.
- * **'PC' in the Page Display**
When 'PC' is shown (Preview Ch), this means that 'Ch' was showing in the Page display when the memory was selected. Pressing the Flash button again will return the display to '1' or using the Page +/- buttons will move to the correct Page required.
- * **Flash Function**
In Program Mode the Flash Function is disabled.
- * **Page CH:**
Is a preprogrammed memory page where Memory Master 1 is programmed with Channel 1 and Memory Master 2s is programmed with Channel 2 etc.

Manual Memory Operation



Using Memories

In both Run and Program, memories are assigned to the twenty four Memory Master faders giving direct manual control over the memory output levels.

In Run, the Memory Flash/Preview button will Flash or Solo complete memories. Memories may be automatically faded in and out at speeds determined by the Fade Time control. Fades are dipless. Times can vary from instantaneous (Off), up to a maximum of three minutes.

In Program, the Flash/Solo functions are disabled; the preset B Flash/Preview buttons are used for selecting individual memories.

Level Match

When in Run or Program Mode, the levels of a scene in memory may be recreated on Preset A. This makes editing of scenes previously recorded very easy. This also works for Effects and Auxiliary Memories.

Page Overlay

When a memory is being used by either pressing a Flash/Preview button or by fading a Memory Master up, the output will not alter if the Memory Page is changed. This feature is called Page Overlay.

The operation of this feature is shown by the slow flashing of the appropriate Preview light. This indicates that the scene being output is not the scene associated with the current page.

When Memory Masters are in Page Overlay or Level Match and a Memory Master, Effect or Aux Memory is previewed, then the preview lights show the preview data, not the Page Overlay or Level Match data. The outputs do not change. Turning the preview off restores the data.

In Run Mode changing pages while previewing a Memory Master turns off the preview.

Manual Master Controls

PAGE + / - :
Selects Next Memory.
Pressing both together selects '1'

MANUAL MASTER/PRESET B:
These faders set the maximum channel level for each memory

FLASH:
Run only. Flashes/Solos the appropriate memory (dependent on Flash Function)

PREVIEW :
Memory contents are displayed on the Preview lights

Notes

- * **Errors**
Error messages are listed on page 33.
- * **Level Match**
The position of Master A does not matter when recreating a scene in Level Match, but make sure it is at the required level when re-recording!
- * **Page Overlay / Masters**
Masters have no effect on Page Overlay facility.

Outputting a Memory

- 1 Select the required Page.
- 2 Ensure that Master B is at the required level.
- 3 Either fade up the Memory Master fader, or press a Flash/Preview button (Run mode only).

Previewing a Memory

- 1 Ensure that the Flash Function is set to Preview, then select the Page required.
- 2 Press the required memory Flash button once. The Preview lights will show all channels that are 'On' by more than 5%. One Preview light will flash slowly to indicate which memory is being previewed.

Using Level Match in Run

- 1 Set up and record a scene in memory.
- 2 Switch desk to Run and move all faders to 0; leave Grand Master at 10.
- 3 Press Flash Function to select Preview.
- 4 Press the Memory Flash / Preview button once, the preview lights will come on to indicate those channels recorded. One Preview light will flash slowly to indicate which memory is being previewed. Press and hold the same Flash/ Preview button. All the preview lights will come on, some will flash and others on continuously. If the preview light for a channel is on and **is not flashing**, the Preset A fader is at the level recorded into memory. If the preview light is flashing slowly the Preset A fader is below the level set in memory. If the preview light is flashing quickly the Preset A fader is above the level set in memory.

- 5 Adjust the Preset A faders so that all channels preview lights are on continuously. The scene in memory is now recreated on Preset A. To cancel Level Match press the Flash/Preview button once.

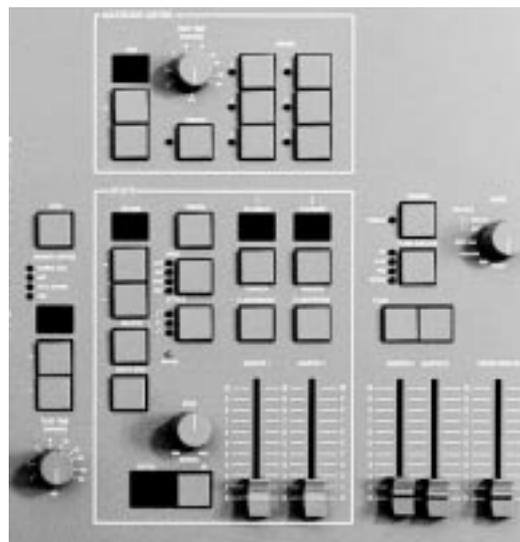
Using Page Overlay

- 1 Set memory Page to 1 and program Memory Master 1 with a scene.
- 2 Set memory Page to 2 and program Memory Masters 1 and 2 with different scenes.
- 3 Set the Mode to Run and Memory Page to 1; ensure Master B is at the required level.
- 4 Fade Memory Master 1 to full.
- 5 Set Memory Page to 2. Note that Preview light 1 comes on and flashes slowly and the outputs do not change.
- 6 Fade Memory Master 2 to full. The outputs of Memory 1 Page 1 and Memory 2 Page 2 are mixed on a highest wins basis.
- 7 Fade Memory Master 1 to 0 and then up to full again. *The Preview Light goes off and Memory 1 Page 2 and Memory 2 Page 2 are now mixed.*

Hints

- * **Overwriting a Memory**
Recording a new memory on to a Memory Master will overwrite the old memory.
- * **Page Overlay with Fade Times**
If the Fade Time is on, page change will not happen until the output is at zero. To illustrate this, try the Page Overlay example with a Fade Time of 5 seconds. At step 6, fade Memory Master 1 to 0 and wait for the outputs to reach 0 before fading the Master to full again. Note that the Preview light stops flashing when the page has changed.
- * **Blind Programming**
Using the Level Match feature in Program with the Preset A Master at 0 allows creation and editing of scenes 'Blind'. When editing scenes, obtain a Level Match of the channel(s) concerned, then simply edit as required. Scenes may be similarly created from scratch.
- * **Preset A Level.**
Press the memory control button until the Preset A level light comes on. The Memory Page Display now shows a read out of the position of any selected A Preset fader. Selection is by the Flash /preview buttons. The Memory Master can be at zero.

Effects Section Programming



The effects section can hold nine sequential memories, each having up to 99 steps (subject to a combined total of 250 steps), and one audio effect. Each sequential effect may be run manually (with or without a Fade Time) using the Go button and/or automatically by the four drives available. The drives are: Bass, Varispeed, Auto chase and Beat. In Run mode the Speed and Attack of the sequence may be varied as required. The audio effect consists of four programmable scenes, the intensity of each scene being modulated by a sound frequency band filtered from the Audio input.

Effects Programming

An effect is a set of up to 99 level memories, each of which is called a step. Thus any number of channels, at any level, may be recorded as one step. Steps are usually programmed using Preset A .

The effects section has 3 parts, Programming module and two playback modules. In Program Mode, playback 2 does not function and playback 1 is locked "Live" to the Program module.

Audio Effect Programming

The audio effect is a set of four audio memories. There are two types of audio effect available: Sound to Light or Ripple sound.

For Sound to Light, the overall output level of each audio memory in the set is modulated according to the sound level in four harmonic bands (Bass, Low Mid, High Mid, Treble).

For Ripple sound, as the sound level increases, the level of audio memory A1 is increased to 100% first, followed by A2 being increased to 100% until at maximum sound level A4 is at 100%. This effect is very complex and spectacular. It is worth trying with channels 1 to 6 at 100% on A1, 7 to 12 on A2 and so on. Any number of channels at any level may be recorded into any audio memory. The audio memories are usually programmed using the A Preset or may be copied from the Memory Masters.

Programming controls

SEQUENCE +/- :

Selects patterns. Blank , Audio, OneNine. Pressing + and - together selects pattern one.

PRESET A:

Sets individual channel levels for programming.

PROGRAM:

Records all Output levels at once as an effects memory.

ADD STEP:

Advances step number or audio memory number for programming.

DELETE STEP:

Deletes displayed step number from sequence.

SO:

Steps through a stopped effect sequence; in Program, cycles through the audio memory to be programmed.

PREVIEW:

Enables previewing and programming of the effects.

FLASH / PREVIEW

In Program Mode they have no effect.

In Run Mode shows on the preview lights those steps running in the associated Effects Master and which Drive, Attack modifiers are being used.

Programming a Sequential Effect

- 1 Turn the Mode switch to Program, the Program light will turn on, all faders down to 0, Grand Master to full.
- 2 Press Effects Preview to enable chaser programming. Pattern No. display and the Program light will flash slowly, to indicate it is being previewed. Playback 1 Display shows L for Live. (See NOTES).
- 3 Select the Pattern to be programmed using the Effect +/- buttons. Press and hold the Delete Step button to clear any existing steps. The Step No display will show '—'. If the button is pressed an extra time, the display will show 'Er' for a brief period, then '—'.
- 4 Set Preset Master A to full and set up the first scene of the sequence on Preset A.
- 5 Press Program to record the step. The channel preview lights will come on to show those channels recorded into the step.
- 6 Press Add Step to add the next step, then Repeat steps 4, 5 and 6 until the sequence is complete.
Do NOT press Add Step after the last step.
- 7 Leave Program Mode or go back to step 3 to Program another Pattern.

Editing a Step in a Sequential Effect

- 1 Turn the Mode switch to Program. The Step No is reset to 1. Use the Effects +/- to select the effect to be edited.
- 2 Press the Go button to find the step that you wish to edit.
- 3 Select Level Match by pressing and holding the Effects Preview button (see pages 8/9 for details on Level Match). Effect Playback 1 becomes Live (See NOTE).

- 4 Fade the required individual Preset A fader(s) up until the associated preview light on each channel has stopped flashing, then, under live control, set the new level(s).
- 5 Press the Effects Preview button once to exit Level Match.

Adding a Step to an existing Sequence

- 1 Set the Mode switch to Program. Ensure that all faders except for Grand Master are at 0.
- 2 Press the Effects Preview button once to select the effect.
- 3 Select the Pattern number required and press the Go button to select the Step No that is before the step to be inserted.
- 4 Set up the scene on the outputs to be recorded.
- 5 Press Add Step to add a blank step after the step that was being displayed.
- 6 Press Program.
- 7 Turn the Mode switch to Run, the effect will be Live in the Playback 1 Display. Fade the Effects Master 1 to 10 and Master A to 0 to view the resulting sequence.
- 8 Leave Program Mode or select an other Pattern for editing.

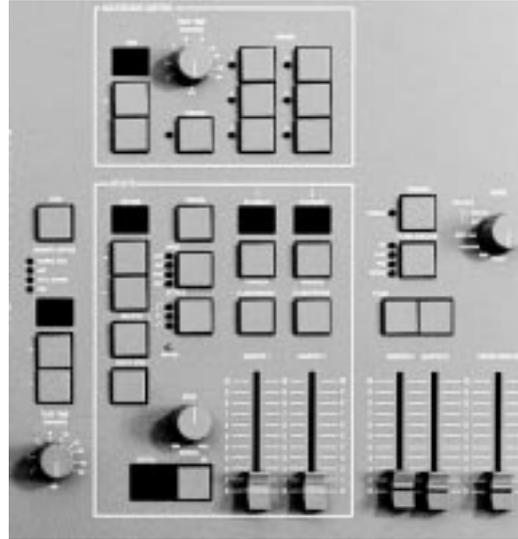
Deleting a Step in a Sequence or deleting an entire Sequence

- 1 Turn Mode switch to Program.
- 2 Fade the Effects Master to 0. Press the Effects Preview once to select the memory.
- 3 Select the sequence to be edited using the Sequence +/- buttons and the Step Number using the Go button.
- 4 Press Delete Step once to remove the step number that is displayed. Press and hold to delete the entire sequence.

Note

- * *Live*
When Transfer is pressed and held the Playback Display shows "L" for live. Any further changes to the modifiers are directly transferred to the outputs.

Audio Effects Programming



Programming the Audio Effect

- 1 Set the Mode switch to Program and ensure that all faders are at 0 except for Grand Master which should be at full.
- 2 Select the sequence called 'A' using the Sequence +/- buttons. The Step number display will show 'A1'. See note.
- 3 Press the Effects Preview to select the Effects memory. Playback 1 becomes Live.
- 4 Set up the scene required for the first audio memory on the outputs. Press Program to record the scene and note that the Preview lights come on as the memory is programmed.
- 5 Press Add Step (or Go) to select Audio memory 2. Set the scene required on the outputs and press Program again.
- 6 Repeat for Audio memories A3 and A4.
- 7 Leave Program Mode.

Editing a Step in an Audio Effect

- 1 Set the Mode switch to Program, select 'A' in the Pattern Display, fade Master A to Full.
- 2 Press the Effects Preview button to observe the output of the A1 audio memory on the preview display.
- 3 Press the Add Step or Go button to select the audio memory you wish to edit.
- 4 Select Level Match by pressing and holding the Effects Preview button.
- 5 Fade the required individual Preset A fader(s) up until the associated preview light on each channel has stopped flashing, then, under live control, set the new level(s).
- 6 Press the Effects Preview button once to exit Level Match.
- 7 To repeat for other audio memories, repeat steps 3 to 6.

Clearing an Audio Memory

- 1 Turn Mode switch to Program all faders to 0.
- 2 Press the Effects Preview once to select the memory.
- 3 Select the audio memory using the Sequence +/- button and the Step Number using the Go button.
- 4 Press Program once to program zero levels into the audio memory selected.
- 5 Repeat steps 3 and 4 for any other audio memories that need clearing.

Effect Operating Controls

SEQUENCE + / - :

Selects one of the sequences or Audio Effects. In Run, both pressed selects the first programmed sequence.

EFFECT DRIVE:

For Sequential Effect, selects auto, varispeed, bass or Beat drive.

For an Audio Effect, selects 'Sound to Light' or 'Ripple sound' type Drive.

ATTACK :

Determines type of crossfade between steps of a chase or the type of Audio Effect.

SPEED:

Sets the speed of the chase sequence or the rate of attack of an Audio Effect.

EFFECTS MASTER 1 and 2:

Sets maximum output level for Effects.

PREVIEW :

Displays effect on preview leds.

GO:

Outputs next step of stopped chase sequence.

FLASH/Preview:

Flashes/Solos and previews the effect running on Effect Master 1 or 2.

NOTES

* Auto / Varispeed / Bass Chase/Beat

Auto chase requires no sound input, with chase speed determined directly by the speed control.

Varispeed speeds up and slows the chase according to the tempo of the music on the audio input, with the speed control used to set a basic speed.

Bass chase will step through the pattern on a bass beat giving a Sound to Light effect.

Beat Allows you to input the rhythm the effect will follow.

* Attack

Three types of crossfade are available:



Switch on / switch off



Switch on / fade off



Fade on / fade off

Switch on / fade off is particularly useful for PAR cans.

* Pattern Display shows only sequences that have been programmed.

When turning the Mode switch from Program or Presets to Run, only Effects that have been programmed will be shown on the Pattern display.

If say 2, 5 and 7 are programmed, '2' will be displayed and only 2,5,7 or A may be selected.

Pressing + and - together takes you to Pattern 1, in Run Mode to the first pattern that has been programmed.

* Audio filters.

A1: Bass

A2: Lower middle

A3: Upper middle

A4: Treble

Previewing Sequential Effects

- 1 Turn the Mode switch to Presets, Speed to off, all faders down, Grand Master to full.
- 2 Wait until the Flash Function light comes back on. (See NOTES page 5).
- 3 Set Mode to Run.
- 4 Select an Effect Pattern using + and -, only those programmed will be available.
- 5 Set Flash Function to Preview. Press Effects Preview.
- 6 Preview lights will show step one of the effect.
- 7 Pressing the Go button will step through the effect.
- 8 Adjust the Speed control from off to Autorun the effect. (unless in Bass drive see NOTES).
- 9 Adjust the Drive and Attack to suit.(see notes) The Effect is now running on Previews only.

Running Sequential Effects (with Fade Time)

- 1 To send an effect to the outputs set it up as above then press Playback 1 or 2 Transfer button.
- 2 The Playback Display displays the same number as the Pattern Display.
- 3 Set the Fade Time to 5 Seconds.(or to off for no fade time)
- 4 Move the appropriate Effects Master to full quickly, to see the effect fade up and run on the outputs.
The Preview lights will follow the Green output lights.

The Output is running in the Playback, with a copied set of modifiers(Pattern, Drive, etc) and the Previews are running in the Pattern Display.

- 5 Change the Speed. The Playback continues at the set speed, The Previews change with the Speed control.
- 6 Now change the Pattern number and all the Modifiers and Transfer a different effect to the

Effects Operation

other Playback. Both effects are now running independently.

Note.

By pressing and holding a Playback Transfer the playback Display displays "L", this means live. Any changes to the modifiers, Pattern Number etc are directly transferred to the playback and thus the outputs. Pressing the Transfer again removes the "L".

Previewing and Outputting an Audio Effect

- 1 Turn the Mode switch to Run. and press Flash Function to select Preview.
- 2 Ensure a suitable audio feed is connected and on.
- 3 Select the Audio Effect using the Sequence +/- buttons and the drive by pressing the Drive button.
- 4 Press the Preview button once to observe the outputs on the Preview lights.
- 5 Fade the Effects Master up to output the effect.

Adjusting the Speed control will vary the slope of attack on the Audio Effect.

Using a Memory to program a step in a Sequence

- 1 Turn the Mode switch to Run, set all faders to 0, set the Grand Master to full.
- 2 Press the Flash Function to select Preview.
- 3 Using the Memory Page +/- buttons, select the Page required and press the Preview button of the memory on that page to preview it if required. Set Master B to the level required and the Memory Master to the level required.
- 4 Press the Effects Flash/Preview button.
- 5 Press the Effects Sequence +/- buttons to select the sequence required and the Go button to select the step to be programmed.

- 6 Turn the Mode switch to Program, press Effects Flash/Preview once to select the Effects section and observe the Program light flashing.
- 7 Press Program to transfer the memory that was set up on the Output lights into the step selected within the effects sequence.
- 8 Repeat for transferring further scenes.

Running a Pattern with Beat drive.

The drive option Beat, allows the operator to directly input the speed that a pattern is running at with out using the speed pot. Patterns 1 to 9 only.

- 1 Set the Mode switch to Run.
- 2 Select the required pattern, using the + / - buttons.
- 3 Press the Drive button until the Beat light comes on.
- 4 The Rhythn light will also come on.
- 5 Select Flash Function preview. Press Effects Preview.
- 6 Press the Go button, wait 1 second, press the Go button again. The Pattern will now run with 1 second steps on the preview lights. Press the Go button again twice with a 2 second gap. The pattern is now running with a 2 second gap.
- 7 Press Transfer and fade up the Effects Master to see the chase on the outputs.

If used live this option is an easy way to make a chase synchronise with a music track, e.g. a regular drum beat.

NOTES

- * **The letters 'ER' or 'NF' are displayed**
When Delete Step is pressed and the step number is '—', the letters 'ER' (error) are displayed; if 'NF' is shown (No Frames), there are no sequence steps available as the memory is full.

- * **Effects Speed, Drive and Attack**

While an effect is running and the Playback Display shows L the Pattern Display, Speed, Drive and Attack may be modified 'live' as required. Only One Effect Playback can be Live at a time.

Once either Transfer Button is pressed, 'live' control is lost. These controls are then used to set up the next effect.

- * **Copying Memories to Sequence Steps**

They may be copied from a memory or combination of memories by setting the memory Master(s) to the required level(s) and recording the resultant scene onto the step.

HINTS

- * **Using a sequential effect as a set of 99 theatre style memories.**

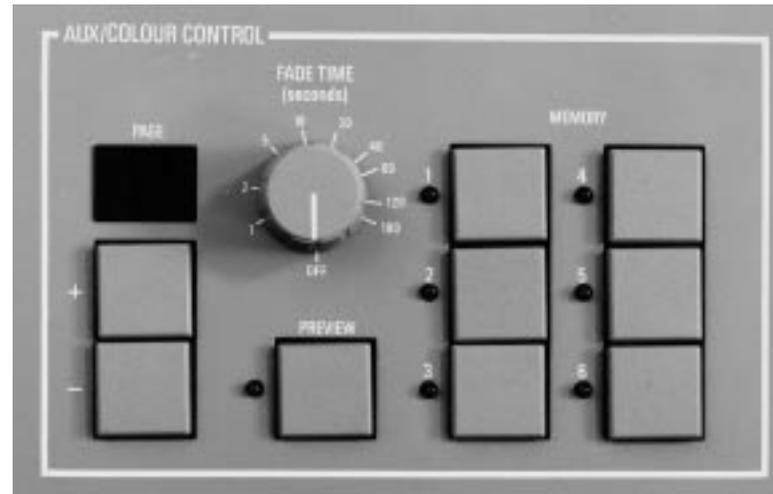
Run mode. The Pattern may be simply used as a set of theatre memories by setting the Speed knob to manual (OFF) and the Fade Time knob to the required crossfade time between memories. Press and hold the Transfer button for either of the Effects Masters. Set the Attack to the lower setting, \wedge . Pressing the Go button will now crossfade between steps within a sequence memory at the fade time set by the Fade Time control. Complex memories may be easily set up using the standard Memory Masters and then simply transferred to the Effect memories.

- * **Midi foot switch.**

The Go button may be remoted via midi. It will only accept a step rate of 1 per second. See page 22.

- * **Transferring sequence steps to a Memory Master**

Scenes may be transferred from an effects step to a Memory Master by setting the Effects Speed switch to manual, selecting the appropriate step, setting the Effects Master to full and Masters A and B to 0. The scene is displayed on the Output lights and may be recorded onto a Memory Master in the normal way.



Auxiliary / Colour Control

The 24 channel Auxiliary control section has nine pages with six memories per page and is independent from the rest of the desk, apart from in programme mode.

The Memories may be Previewed and (if required) a cross fade time set for fading between memories. Crossfades are dipless. The output from the Aux Memory is via the DMX 512 signal. The 24 channels can be soft patched in DMX. (see page 21). In Presets or Run Mode the output is not effected by other operations in the rest of the desk and in Program Mode is only effected while programming the Auxiliary Control section. This allows you to edit a dimmer channel / memory while still outputting a colour memory.

The outputs from this section of the desk work on a latest takes precedence basis.

Auxiliary controls

PAGE +/-:

Selects page to be used.

MEMORY 1,2,3,4,5,6:

Selects Memory number.

FADE TIME:

Selects dipless cross Fade time between memories (0 to 180 seconds).

PREVIEW:

Selects the Auxiliary Colour Control section, for Previewing or Programming.

PRESET A:

Is used in Program Mode to program Auxiliary memories.

Notes

* Auxiliary outputs

The output from the Auxiliary Control is independent from the rest of the desk except when Previewed in Program Mode, in DMX set-up Mode (soft patch) or in Midi Mode.

* Auxiliary Memories

Only one Auxiliary Memory can be output at a time.

* Flashing.

The Page Display and Memory Light flashing while in Preview Mode, indicates the Memory being Previewed.

* Crossfading.

While a crossfade is in progress the Light on the Memory fading in will flash until the fade is complete.

* Changing Pages.

If pages are changed the output does not change, until another memory is selected. If the current memory is not on the current Page, as shown in the Page Display, none of the memory lights will be on.

* Auxiliary Memory Preview.

Auxiliary Memories are Previewed on the red lights under the Channel Preview lights.

Aux Memories can not be previewed in Presets Mode.

* Page +/-

Pressing both together selects Page 1.

Programming Auxiliary Control Memories.

Programming the Auxiliary Control.

Programming the Memory is very Quick and is done From the Preset A faders. The level of the Grand Master and Master A fader have no effect.

Channel 1 Preset fader controls the first Aux Channel no matter where it is soft patched to (see page 21).

Programming for colour memories is best done after having done at least the first plot of the dimmer Memories, as the dimmer channels will need to be on to see the colours.

Programming is best done by building up scenes.

Programming the Auxiliary Memories.

- 1 Set all faders down, Mode switch to Program. The Program light comes on.
- 2 Using the +/- Page buttons select the required page.
- 3 Using the Memory buttons Select the memory required.
NOTE That Memory will now be on the DMX signal.
- 4 Press Auxiliary control Preview button. (The Program and Memory light and Page Display now flash.) The 24 Preset A faders now have LIVE control over the Auxiliary channels on the DMX signal.
NOTE The Grand master and Master A have no effect.
- 5 Adjust the Preset A faders to the required output.
- 6 Press the Program button. The scene is now recorded. The red Aux Preview lights will come on for any channel recorded above 5%.
- 7 Select another Memory. The DMX output does not change, as it is still LIVE from the faders. The Auxiliary Preview lights show what channels are used in the currently selected memory.
- 8 Repeat section 5 to 8 as required to program other memories.

Programming Auxiliary Memories as Colour Memories

This is the same as above except that to be able to successfully program a colour changer you need the attached luminaire on. The Lightmaster XLS Makes this very simple.

- 1 All faders down, Grandmaster and Master B up to full, Program Mode.
- 2 Select Memory page CH.
If any other page is selected ,previously programmed scenes can be accessed rather than Channel Memories.
- 3 Using Preset B turn on the channels / memories of those colour changers you want to program.
- 4 Select the Auxiliary Memory to be programmed.
- 5 Preview the Auxiliary Control.
- 6 Set the colour changers to the required colour by moving the Preset A faders.
- 7 Press the Program button to record the Auxiliary Memory.
- 8 Repeat from step 3 to program other Memories.

Edit Auxiliary Memories In Program Mode

- 1 All faders down, in to Program mode.
- 2 Set up Luminaire outputs as required. Select Auxiliary Page / Memory.
- 3 Press Auxiliary Control Preview.
Control of the DMX signal is now live on the A Preset faders.
- 4 Press and Hold the Preview or Memory button. The DMX control is now from the memory and the Auxiliary Preview leds are in Level Match.(see page 7 for Level Match.)
- 5 Carefully move the A Preset faders until the Flashing Preview lights stop flashing.
Caution: Once the Auxiliary Preview light has stopped flashing the fader has LIVE control over the DMX output and the contents of the

Memory (you don't have to push the Program button to record the new scene).

- 6 Adjust the channels as required. DO NOT press the Program button as this will record all the fader positions not just those that have moved.
- 7 When the channels have been edited select another Auxiliary memory to edit another memory , from step 4.
- 8 To exit either Preview a different section of the desk or leave program Mode.

NOTE

* Other Outputs.

Other outputs will still run while programming the Auxiliary memories as described in the individual sections.

Outputting an Auxiliary Memory.

Operates in Run or Presets Mode.

- 1 Select Auxiliary Page required.
- 2 Press Memory Button (light comes on next to it).
- 3 The Memory Programmed goes straight out on the DMX signal.
- 4 Select another Memory, the light for the previous memory goes out and the new one comes on), its outputs go directly on to the DMX signal.

Auxiliary Memory from another Page.

- 1 With Page 1 Memory 1 Selected and outputting.
- 2 Select Page 2 all Memory lights go off, to show no memory from this Page is selected, but DMX output does not change.
- 3 Select a memory from Page 2, its Light comes on and the DMX output is changed.

Dipless crossfades between Memories.

- 1 Select Page 1 Memory 1.
- 2 Set the Auxiliary Control Fade time to the desired speed (0 to 180 Seconds).
- 3 Select a new page if required.
- 4 Select the new Memory.
- 5 The old memory fades out and the new one fades in at the selected speed. While fading the light on the new Memory flashes slowly until the fade is complete. Adjusting the Fade time during fading will cause the fade time to change.

Recreating Auxiliary Memories with Level Match.

- 1 All faders down, Go into Run Mode.
- 2 Select the Auxiliary Page and Memory that needs to be edited.
- 3 Set the Dimmer Memory Masters as required.
- 4 Set the Flash Function to Preview.
- 5 Press the Auxiliary Control Preview, The red Auxiliary Preview lights come on for those channels recorded above 5%.
- 6 Press and hold down Aux Control Preview or the Memory button. The Auxiliary Preview lights will go into Level Match (see page 7 for a description of Level Match).
- 7 Ensure Master A is down, move each Preset A fader until the associated Auxiliary preview does not flash. The A Preset is now the same as was recorded into the Memory.
- 8 Go into Program Mode. The A Preset faders now have live control over the DMX signal.
- 9 Adjust any channel as required.
- 10 Press Program to record the new scene.
- 11 Go to step 1 to edit another Memory.

Previewing an Auxiliary Memory, while outputting another Memory.

- 1 Program Page 1 Memory 1 and Page 2 Memory 2
- 2 Output Page 1 Memory 1 in Run Mode. Select flash Function, Preview.
- 3 Press Auxiliary Control Preview, Page 1 Memory 1 will be previewed. The Memory light flashes slowly to show it is being previewed.
- 4 Press the Page + button to select Page 2.
- 5 Memory 1 light now flashes slowly.
- 6 Press Memory 2 button, its light now flashes slowly to show it is being Previewed. The red Auxiliary Preview lights come on for any channel recorded above 5%. The output is still from Page 1, Memory 1.
- 7 pressing Preview or Flash Function turns the Preview function off.

Super User Operation

Introduction

The Lightmaster XLS desk has a range of options which are accessed in Super User mode. Whilst in Super User, Presets A and B work normally; Memory, Sequence and Midi functions are disabled.

The principal options are:

- Memory Card Storage
- Set individual channels for Strobe operation
- Set individual channels for Full Level operation
- Setting 1990 DMX / original DMX
- Setting DMX for 96 or 512 channels
- Inverting Master B fader
- Clearing all the memories
- Resetting DMX, Midi and channel settings

To access Super User:

- 1 Turn Mode switch to Preset.
- 2 Press and hold down the Memory Page + and - buttons together, then turn the Mode switch to Run; release both buttons. The Memory Page display shows SU; the Step No display shows the software version number.

To exit Super User:

Turn Mode switch back to Preset.

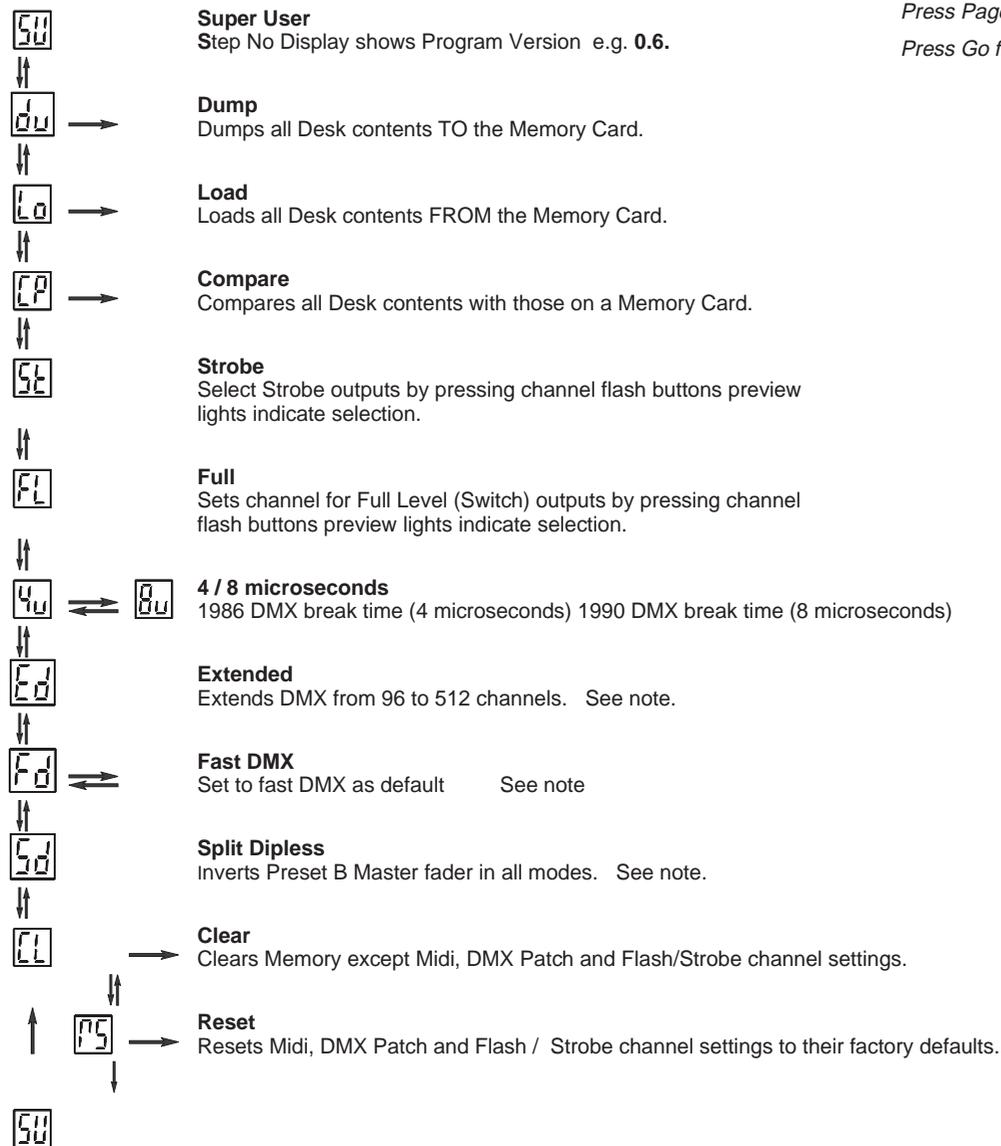
Memory Card Storage

The Zero 88 Memory Card may be inserted at any time in the slot at the back of the desk in the middle.

The Card will store all the memories of a Lightmaster XLS. It should NOT be left in the desk when the desk is switched off as there is a risk that the battery in the card will run down more quickly.

The same card is used for the Sirius 24, Sirius 48 and Lightmaster XL but the information stored is NOT interchangeable.

Super User Operation Diagram



Notes

Press Page + for ↓ or Page - for ↑
Press Go for → or ⇌

* Memory Card Operations:

A second or so after the Go button is pressed, the Page display flashes slowly and the letters 'GO' in the Step No display go out until the operation is complete. If no Memory Card is present, the Step No display flashes 'IC' (Insert Card) until a card is inserted or the Go button is pressed again.

Using Compare (CP)

If the Card contents are not the same as the desk contents, 'NO' with two flashing dots will be displayed in the Step No display. Press Go to continue.

* Strobe and Full Level Outputs

Channels default to proportional output. To set an individual channel for Strobe outputs, press the required channel Flash button to turn on that channel's Preview light. Any channels already set up for strobe operation will have their Preview lights on.

The same procedure is used for setting Full Level outputs (Full Level outputs are On / Off only).

* Extended DMX.(512 channels)

Step display shows the 100's, the 10's and 1's are shown in the memory display. 512 channels will be transmitted at turn on, mode changes, patch changes and page changes. At least 96 channels will always be transmitted. If more than 96 channels are patched the DMX sends up to last channels patched. NB 128 ch transmitted per 40ms. 512 ch takes 160ms.

* Fast DMX

The Default is set to . DMX is sent at its maximum possible rate. With DMX set to  gaps are inserted between each DMX channel data byte. This slows down the DMX transmission enabling some receivers to operate correctly.

* Clearing Memories

There is a second or so delay before CL and RS are started. It is not possible to clear the channel memories and the MIDI, DMX Patch, Full Level and Strobe settings at the same time. Two operations, CL and RS must be performed. Each is totally independent of the other.

* Split Dipless

The Preset B master will only invert if the Grand Master is at zero.

Programming DMX Patch

The 24 Dimmer output channels and 24 Auxillary output channels of the desk can be patched to up to 96 or 512 DMX channels. See Super User options Page 18. The desk contains two separate soft patches.

The default state is that desk dimmer channels 1 to 24 are patched to DMX channels 1 to 24, and Auxillary channels are patched 25 to 48. The Default for Patch two is dimmer ch 1, Aux ch 1, dimmer ch 2, Aux ch 2, etc. These defaults are reloaded by the Super User Reset operation.

DMX always transmits at least 96 channels. If more than 96 channels are patched, Then DMX is transmitted up to the last patched channel. DMX is sent out at 128 channels per 40 mS.

To select a soft patch:

- 1 Set Mode Switch to Patch DMX.
- 2 The Memory Control, DMX Channel light comes on.
- 3 Memory Control Display shows the current patch. 'P1' or 'P2'.
- 4 To change Soft Patch, Press the Go button.
- 5 The Memory Control Display will show the current soft patch.
- 6 Change Mode switch out of Patch DMX.

The desk is patch has now changed.

To examine the patching:

- 1 Set Mode switch to Patch DMX
- 2 The Memory Control, DMX Channel light comes on, the display shows the current DMX patch. Pressing Program Memory + / - moves through the channel numbers. The preview lights shows the desk channel that drives that DMX channel, yellow for dimmer channels and red for Auxillary memory channels. If there is no desk channel driving the DMX channel, the display has a '.' in it.

Press the Memory Page + / - buttons to examine the channels patched to the other DMX outputs.

To re-patch the DMX channels:

- 1 Set Mode switch to Patch DMX.
- 2 Select the DMX Patch by using the Go button. Select the DMX output Channel by using the Memory Page + / - buttons.
- 3 Use the channel Flash/Preview buttons to select the desk channel required. The channel Preview light will come on yellow for dimmer channels, press it again for red for Auxillary channels..
- 4 To cancel the desk output to a DMX channel, press the channel Flash/Preview button until Preview lights go off. The Memory Control Display will now have a '.' in it.

When a Super User Clear Memories (CL) is performed, the DMX patches are NOT reset. When a desk Reset (RS) is performed, the DMX patches are reset to their respective defaults and patch one selected.

* Extended DMX.(512 channels)

Step display shows the 100's, the 10's and 1's are shown in the memory display. 512 channels will be transmitted at turn on, mode changes, patch changes and page changes. At least 96 channels will always be transmitted. If more than 96 channels are patched the DMX sends up to last channels patched. NB 128 ch transmitted per 40ms. 512 ch takes 160ms.

Transferring Memories

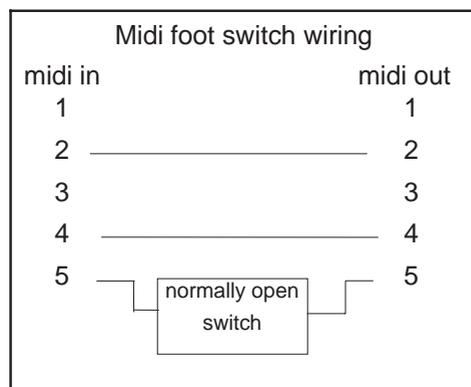
To remote the Go button to a foot switch.

Note. Do not use with other MIDI equipment.

- 1 Wire the switch as shown below
- 2 Plug into MIDI in and out sockets.
- 3 In MIDI out mode set foot switch to on. See page 27.
- 4 The foot switch will now remotely operate the GO button. It will not accept button pushes as fast as the GO button. The maximum rate is about 1 per second.

note

This feature is useful when using the Effects Section as a 99 step memory. see page 14. Foot switch not available from Zero 88



Memory Transfer between two Lightmaster XLS desks

This is possible in two directions:

- 1 Sending data to a secondary desk, or
- 2 Requesting that memories are sent by the secondary desk to the main desk

Note that the desks are referred to as 'main' and 'secondary' purely for convenience, they do not have to be set up or programmed specially.

To send memories to another Desk

- 1 Set Mode to MIDI Setup OUT on the main desk. Ensure that the secondary desk is NOT in MIDI Setup In/Slave mode.
- 2 Connect a MIDI cable from main desk MIDI OUT connector to the secondary desk MIDI IN connector.
- 3 Press Memory + button on the main desk to select Dump 'du'
- 4 Press the Go button on the main desk for a couple of seconds.
The Memory Page display ('du') will flash slowly as transfer takes place.
All existing memories and set up information in the secondary desk are completely overwritten. Pressing the GO button a second time stops the transfer.

Note

If a Dump is stopped prematurely the slave desk may not be correctly setup.

- 5 Before using the slave desk it is best to turn it off and on again. The desk will then check that its memory is all valid. (see memory problems page 33)

Requesting memories from the secondary desk (or another Midi device)

- 1 Set Mode to MIDI Setup OUT on both desks. Note that the Memory Page display shows Ch
- 2 Connect one MIDI cable from the main desk MIDI OUT to the secondary desk MIDI IN connector
- 3 Connect a second MIDI cable from the main desk MIDI IN connector to the secondary desk MIDI OUT connector
- 4 Press Memory + button on the main desk to select 'du', then once again to select load 'Lo'
- 5 Press the main desk Go button for a couple of seconds.
The secondary desk Memory Page display ('du') will flash slowly as transfer takes place
All existing memories and set up information in the main desk are completely overwritten.
- 6 Before using the desk it is best to turn it off and on again. The desk will then check that its memory is all valid. (see memory problems page 33)

Linking Desks to operate as Master/Slave

- 1 Decide which of the desks is to be the Master. There may be more than one Slave. The limit is set by the MIDI specification and local operation conditions.
 - 2 Ensure that all desks are programmed to use the same MIDI channel.
On the Master desk, set the Mode switch to MIDI Setup Out; the Memory display shows 'Ch' and the Step display shows the MIDI transmission channel No.; Change if required. On each Slave desk, set the Mode switch to MIDI Setup In / Slave; press Page + once, the Memory display shows 'Ch' and the Step display shows the MIDI reception channel No.; ensure it is the same as the Master desk transmit channel.
 - 3 Set Mode to Presets or Run on the Master desk and to MIDI Setup In / Slave on the Slave desk(s).
 - 4 Connect a MIDI cable from MASTER OUT on the Master desk to MIDI IN on the first Slave desk. Continue with a cable from the Slave MIDI OUT to the next Slave MIDI IN and so on as required.
In MIDI Setup In / Slave mode ONLY, the Out signal is a repeat of the In signal, duplicating the MIDI Thru function.
- Note
If any desk has been connected to another MIDI instrument (not a Lightmaster XLS), Linking may not work. Turn all desks off and then on again to reset them if this is the case.

Notes - Linking Desks

- * **Linking**
Linking an XLS to an XLS or a XL only works in Presets or Run Mode. The Master desks remotely operates the second desk, which becomes a dumb slave, the Mode Switch, +, - and the Go button still operate for desk setup.
- * **Linking an XLS to an other XLS.**
*In Preset Mode
The linked desk becomes a 48 channel manual + 48 channel Auxiliary memory desk.
In Run Mode
The linked desk becomes a 48 channel + 48 channel Auxiliary memory desk with 24 Memory Masters.
This means that in Run Mode on the Slave desk the Memory Masters and their Flash buttons do not work (24 Memory Masters Only), but Preset A still operates.*
- * **Linking an XLS to an XL.**
*In Preset Mode
The linked desk becomes a 36 channel manual + 24 channel Auxiliary memory desk.
In Run Mode
The linked desk becomes a 36 channel + 24 channel Auxiliary memory desk with 24 Memory Masters.
The XL is limited to its original Specification, E.G. 1 Effects Master and no Auxiliary control.*
- * **Number of Linked Desks**
*The number of desks that may be linked is not defined. The exact number will depend on cable lengths and electrical environment.
Special devices are available from other suppliers to increase the number of linked instruments.
In MIDI Setup in / Slave Mode set "op" to "24" if the Slave desk in an XLS. If the slave is an XL then set to "12".
It is not possible to slave an XLS from an XL.*
- * **Soloing**
In Presets mode, soloing a channel only affects the outputs of the desk on which the Solo button is pressed.
- * **Audio**
All audio is connected to the Master only. The Master will control the Slave(s) as required.
- * **DMX Output**
Each desk will need to be attached to a separate DMX receiver.

* Sequences

These are driven from the Master effects section. For sequences to work properly. they must be programmed very carefully.

Desks do not link in Program mode, so each desk must be programmed separately.

For example:

Setting up a 48 channel chase on two desks:

Program steps 1 to 24 as usual on the Master, followed by steps 25 to 48 as blank steps.

On the Slave, steps 1 to 24 must be blank, steps 25 to 48 to be programmed as required.

Note that if a sequence (No 4 for example) on the Master is programmed, but on the Slave is unprogrammed, there will be no output on the Slave. Similarly, if sequence 4 is programmed on the Slave but not on the Master, this sequence cannot be accessed by the Master

Notes - General

- * **Transfer of Memories from the main desk:**
*The secondary desk does not have to be specially set up to have memories transferred to it.
If the secondary desk is in MIDI Setup In/Slave mode, its memories cannot be overwritten in error.*
- * **Loading memories from a programmable MIDI device (e.g. a computer):**
*If there is a programmable MIDI device connected rather than a Zero 88 lighting desk, the result of this Load request will depend on what the device is programmed to do on receipt of a Zero 88 System Exclusive code of 00 20 0F: it will probably be ignored.
All data is dumped using system exclusive messages only; if your sequencer can store system exclusive messages and replay them it may be used to store and load data to and from a Lightmaster XLS.*

What is MIDI ?

Simple MIDI

Turn on your Lightmaster XLS, plug in a MIDI cable from a keyboard to the MIDI 'IN' socket, ensure that the Mode switch is set to Presets. Any note played on the keyboard will turn a channel on. Yes it's that easy!

If this doesn't work, someone has been experimenting with MIDI on the desk, go into Super User and perform a desk Reset. See Page 20.

To use MIDI to link desks for Master / Slave operation or for transferring desk memories, see page 22.

The introduction to MIDI below will help if you need or want to know the technical details.

Introduction to MIDI

MIDI (Musical Instrument Digital Interface) was originally designed as a means of communication between electronic musical instruments. Some of the concepts involved are important to understand before starting to program the desk to respond in a particular way to MIDI commands.

Communication

MIDI is a means of communication between musical instruments. Most MIDI devices have three MIDI connectors known as 'ports' - 'IN', 'THRU', and 'OUT'; Some have 'IN' and 'OUT' only. Data is only sent out from the out port and only received on the in port.

Transmit and Receive Channels

MIDI has separate Transmit and Receive channels each numbered 1 to 16.

By setting receive to a particular channel, only the signals that are wanted will be received.

Alternatively, Receive may be set to respond to all channels so that any MIDI information transmitted will be received, this may be good or bad .

The Transmit channel must be set to a specific channel (1 to 16).

For two MIDI instruments to communicate with

each other in a system with many other instruments connected, they must be set up to use Transmit and Receive channels that are not used by other instruments.

Note Numbers

The MIDI standard assigns 'Note Numbers' to musical notes. Middle C is number 60. C on the octave below is 48 and so on. Associated 'note on' data is sent when a key is pressed, the action caused by the 'note on' will continue until 'note off' data is received when the key is released.

Voices (Program Changes)

Most MIDI musical instruments have 'voices' such as Piano, Harpsichord and so on. Changing these clearly changes the type of sound that is played. When a voice is changed, a signal called a Program Change is sent on the Transmit channel assigned to the instrument. Any device which has been set up to receive data on this channel will respond to the Program Change. Program Changes values can not be greater than 127.

Bank Select.

Is very much like Program Change except that it is used to access numbers greater than 127, which is the limit for Program Change.

Velocity Sensing

Some keyboards have this function. It enables the musician to control the loudness of the music by playing notes and chords delicately for soft music or hard for loud music. The MIDI signal that is transmitted by such instruments includes a Velocity in the range 1 to 127.

If the instrument does not have Velocity sensing, the Velocity is fixed by the manufacturer, often at 63 rather than 127 so that the music that is being played is not too loud.

Summary

MIDI instruments send a stream of signals from their 'OUT' port. The signals sent principally consist of Note On messages, to turn Note on, and Note offs, to turn a note off. A Note on consists of a Note On command followed by a variable number of pairs of Note Numbers and Velocities.

There may be the occasional Program Change signal if the voice is changed.

MIDI Transmitted

MIDI is transmitted continuously except in Program and MIDI Setup In / Slave modes.

MIDI and the Lightmaster XLS

The Lightmaster XLS is designed principally to receive MIDI information, mainly note on, note off and program Changes. It only transmits information that is of use to another XLS or a computer.

The Lightmaster XLS uses note numbers to select Faders / Auxiliary Memories to be turned on and off.

Velocity Sensing is used to set the level of the faders.

Only a group of 24 channels / memories can be accessed at one time, but the start of the group can be moved from page 0, channel 1 to any page any channel. Selection of the 1st in a group is achieved by use of the Program Change command.

Some of the ways the Lightmaster XLS uses MIDI to achieve clever effects such as foot switch and desk linking may not be compatible with other MIDI equipment.

The Lightmaster XLS uses MIDI in four ways:

- 1 A foot switch can be connected to remote the Go button.
- 2 As a means of linking two or more Lightmaster XLS desks for memory transfer or for Master/Slave operation
- 3 To allow a relatively simple electronic keyboard to control individual channels and memories
- 4 To allow more complex instruments such as sequencers to control scene changes, even to the extent of making such changes into a sophisticated chase

Memories in MIDI, terminology

When the Lightmaster XLS is controlled remotely via another MIDI machine, be it a keyboard, synthesiser or sequencer, then access is allowed to memories previously programmed into the XLS. No access is allowed to Effects, though effects can be achieved.

In normal lighting desk terminology it is easy to talk about Preset A, B, Channels, Memories and Pages, But when Midi is added in on top it becomes confusing.

To try to overcome this confusion (and to make the Manual easier to write) we will use 'Preset C'. Preset C does not physically exist.

Preset C is like the other Presets on the Desk, 24 faders wide and has pages 0 to 9. Which gives 240 memories. Page 0 like page 'CH' on Preset B is always programmed to fader 1 to output ch 1, fader 2 to output ch 2 etc. The rest of the pages in Preset C are copies of Pages 1 to 9 on the B Preset.

So if the information in preset C is the same as Preset B why do we need to use it? It's a good question. The Answer is , because while the desk is being used Manually various things can also happen via MIDI control. So explaining what is happening and why would be very difficult.

The other concept we need for talking about MIDI is Memory Numbers.

in Preset C Page 0 Fader 1 is Memory Number 1
 Preset C Page 0 Fader 2 is Memory Number 2
 Preset C Page 0 Fader 24 is Memory Number 24
 Preset C Page 1 Fader 1 is Memory Number 25
 Preset C Page 1 Fader 2 is Memory Number 26
 Preset C Page 9 Fader 24 is Memory Number 240
 and all in-between.

There is a table of page / fader to Memory numbers to make recalling memories easier, Please photo copy it if required.

Any of the 240 memories can be accessed by its Memory Number. How this is done depends on which Mode the desk is in at the time.

MIDI in different XLS modes

The Lightmaster XLS responds to MIDI data in different ways in different ways, depending on where the Mode Switch is.

In Presets Mode:

The desk acts as a normal two preset desk with Auxiliary memories, with some basic MIDI controls.

Receiving Note on / Note off requests turns Preset C Page 0 faders on and off. A Program Change (voices) request will output a single memory number, until another Program Change is received or those channels are turned off by subsequent Note On / Off requests. If other Program Changes are received then the new memory replaces the old in a latest takes precedents basis.

In Run Mode, Program Mode and Patch DMX Mode.

The desk runs as normal in that mode with the above basic Midi control.

Midi Setup out Mode.

Is used to set the channel number that MIDI is transmitted on and for talking to other Lightmaster XL's or XLS's. The basic MIDI controls still operate.

MIDI Setup in / slave Mode

The desk acts as a basic 2 preset desk with Auxiliary control and Superior MIDI controls. Note Number, Program change and Bank Change combinations allow access to up to 24 of any of the 240 memories numbers at any level at any time.

Recording Channel Outputs.

One of the easiest ways of automating a lighting show is to record the state of all the XLS output channels on to a sequencer along with the music.

- 1 Setup the XLS to drive luminaires and colour changers as normal.
- 2 Record memories, effects and Auxillary memories that would normally be needed for the show.
- 3 Connect the MIDI out on the XLS to the MIDI in on the sequencer.
- 4 Set the XLS to MIDI setup out Mode. Set the Memory Display to. Press the Go button until the Step display shows the channel number that the sequencer wants to record on. Use the Memory + / - buttons to select  Press the Go button until the Step display shows "op", this enables all output channel data down the MIDI port. Now record the set up on to a memory card, just in case.
- 5 Set the Mode Switch to Run Mode. The XLS will now continually send the state of each output channel to midi, no matter how that output channel was turned on.
- 6 Set the XLS to give the required output at the start of the performance.
- 7 Start the sequencer recording. (See Note)

Using MIDI

- 8 Light the performance as usual, timing the lighting changes to the music on the other MIDI channels. It is not necessary to follow the actors, dancers etc as they should also follow the music.
- 9 At the end of the performance stop the recording. Set the Mode Switch to MIDI setup in and check that **[M]** is set to the same channel as the sequencer. Connect the MIDI out of the sequencer to the MIDI in of the XLS. Disconnect the XLS MIDI out.
- 10 Replay the MIDI as recorded by the sequencer. The XLS will replay the performance as originally played
- 11 While the MIDI is controlling the desk, the normal front panel controls work. Do not change the Mode switch.
- 12 Some sequencers give the ability to edit the recording, so that output changes can be made to happen exactly on the musical note.
- 13 Once perfected the performance can be repeated, time after time. There is no need to keep the Memory card dump of the XLS or the memories programmed into the XLS unless you play along with the MIDI playback or you need to re-record the Performance.

NOTE

Depending on the sequencer software being used, whether MIDI musical instruments are being recorded at the same time or using pre-recorded MIDI music tracks, it may be necessary to record all MIDI channels at once or record on the MIDI lighting channel while playing the rest. Ability and methods of editing and modifying the recording will differ between sequencers.

NOTE

It is possible to record on a sequencer the data sent between Linked desks. Replaying this data will also replay the show. However you will need to keep the desks programmed. It will not normally be possible to edit the recording in the sequencer.

Response to MIDI Received

Keyboards have 12 notes per octave therefore the 24 preset C faders can be controlled by two octaves.

For basic MIDI controls:

If **[M]** is set to '—'. With a keyboard of more than two octaves the note numbers sent by the extra octaves are mapped onto the XLS in corresponding positions. If the XLS note number **[M]** is set to 60 then middle C will drive fader one of page one preset C and channel one will come on. The first note on a 4 octave keyboard usually sends note number 36, 6 octave sends 24 and 8 octave sends 12. Set **[M]** so that the first note on your key board drives the first XLS output channel.

With Shift and Colour Note Number set to '—' and note number set to any thing but '—' the C Preset Page 0 will be controlled by the two octaves, from the note number, up. Any other note numbers will have no effect, unless a second XLS has been set-up to be controlled from the other octaves.

Colour note number **[C]** defines which note number drives Auxiliary Memory 1. If **[M]** and **[C]** are both set to 1 then Channel and Auxiliary memory 1 will both be driven. The crossfade speed for the Aux Memories is set by the Fade Time control on the front panel.

The XLS has 54 Auxiliary memories, so to control all of them a 4.5 octave keyboard is needed. To control the 24 channels and the 54 Auxiliary memories a 6.5 octave keyboard is needed.

If shift is set to 'up or 'dn' then playing only the white notes will drive successive preset C faders or Auxiliary memories. The Black notes will drive the same fader or Aux memory as the next or previous white note respectively. That is 3.5 octaves for presets and 8 octaves for Auxiliary memories.

MIDI may be used to turn whole memories on by using the MIDI Program Change command. Sending a Program Change of 25 (voice select 25 on some key boards) will cause Preset C, page 1, fader 1, Memory Number 25 (see table 3 page 31) to be on the channel outputs. All channels will be updated, this is called "Latest Takes Precedence".

The channels set by Memory Number 25 will stay on, until one of two things happen:

1: A different Program Change is received. The new Memory Number will take Precedence. Program Change 00 turns all channels off.

2: If the individual channels are turned on by note numbers the channel will go off when the note goes off. Each channel turned on by the memory number will need to be turned off individually.

When the output scene has been set by a Program change then any individual note numbers received will add channels in on a highest wins basis.

If your key board has velocity sensitive keys the harder the key is pressed the brighter the channel output, the softer the dimmer the outputs will be.

When a Program Change causes a Memory Number to output, It is output to the level recorded into the memory.

If driven from a sequencer, it is easy to create effects and sequences by simply sending the appropriate Program Change to select Memory Numbers required.

MIDI Setup-In / Slave Mode

- SL** **Slave** Step No. Display shows 'NO' if no MIDI data has been received since the desk was last turned on. If a MIDI signal is connected, 'Li' shows; if 'AC' is shown MIDI data was being received, but is now disconnected. The desk works as a simple two preset desk, non split dipless with fade times and Auxiliary memories.
- ↕
- Ch** **Channel** Sets MIDI Receiving Channel No.(1-16, —, NO) in Step No. display. NO turns MIDI off. Default is all channels('—').
- ↕
- NO** **Note number** Sets MIDI Note Number that triggers desk channel 1, shown in Step No display. Numbers selectable are: 1 to 9, A0 to A9 (used for 100 to 109), b0 to b9 (used for 110 to 119, be careful not to confuse **b0** (60) with **b0** (b0)) , C0 to C7 (used for 20 to 127) and '—'. When set to '—', the first note of the first octave drives desk channel 1, the first note of the third octave drives channel 1 also and so on. The default is '—'.
- ↕
- Sh** **Shift** sets note numbers sent by White notes to drive consecutive XLS channels. Black notes drive the next white note up or the previous white note. The step number display shows '—', 'up' or 'dn' for the three different settings. Default is '—'.
- ↕
- br** **Brilliance** Sets a 'padding value' - used for non velocity sensing keyboards to ensure that the maximum desk output may be programmed to be full brightness. The value set is shown in Step No. display, range 1 to 63, *default '—' (0)*.
- ↕
- AF** **Auto fade** Sets the value of Auto fade Delay in the range '—', 1, 2, 4, 8, 16, 32 and 64, *default '8'*. (See Note)
- ↕
- PC** **Program Change** - If 'ON' allows a remote MIDI instrument to change the block of memories that are being addressed by Note Numbers. If 'NO', stops remote changes. *Defaults to 'NO'*. when the memory page display shows 'SL' and a program change is sent to the Lightmaster XLS the new program change number is shown in the step number display.
- ↕
- Pd** **Program Default** - Allows the block of memories that are being addressed by a Note Numbers to be changed at the desk. Once the desk has received ANY Program Change command from a MIDI instrument, with PC set to 'ON', Program Default will be completely ignored until the desk is switched off and back on again, or a program change of "00", even if 'PC' is reset to 'NO'. The range shown in the Step No display is from 1 to C0 (As 'No' above). *Defaults to '1'*.
- ↕
- Co** **Colour note number** Sets the first note number that will control auxiliary memories. **Co** set to '—' will disable auxiliary memories. Speed of cross fading is set by the front panel control. Program change and default have no effect on auxiliary memories. Normal memories may overlap. So to control all from one keyboard will require a key board with 5 octaves. The default is 'no' (for off)
- ↕
- PA** **Preset A** This provides a back up scene from Preset A when MIDI data stops (midi slave in mode). To allow for pauses in midi data a time of between 0.1 and 9.9 seconds can be set. When no midi has been received for the time set then the Preset A is faded in. When midi restarts the preset fades away. Fade times are controlled by the fade pot. The maximum level is set by the Master A fader, this is over riden when midi is being recieved. If set to 'on' control is from the Master A fader directly
- ↕
- RS** **Reset** Determines if the MIDI reset comand will be acted upon. options 'on' or 'no'. The default is 'no'.
- ↕
- SL**
- (Press Page + for ↓ or Page - for ↑ Press Go or Add Step for → Press Delete Step for ←)

MIDI Setup - Out Mode

- Ch** **Channel** Sets MIDI Transmitting Channel No - shown in the Step No display. Range is 1 to 16, *Default is channel 16*.
- ↕
- Du** **Dump** Sends all desk memories to a secondary desk or MIDI device. Uses Zero 88 System Exclusive)
- ↕
- Lo** **Load** Sends request for memory data from secondary desk (uses Zero 88 System Exclusive)
- ↕
- To** **To** Sets linking option for linking to xl, xls, or send channel data, or no data at all.
- ↕
- UP** **Update** sets the time taken between sending full sets of MIDI data for "busy" MIDI networks.
- ↕
- FS** **Foot switch** midi foot switch. Default set to 'no' set to 'on' to remote the Go button to a midi footswitch.
- ↕
- Ch**

Notes: MIDI Setup - Out

- * **Lo Function**
When a Slave desk is not connected, the Lo function appears not to work. There is no error message; "Lo" will flash to indicate a load action has occurred.

Notes: MIDI Setup - In / Slave

- * **Auto fade Delay**
Keyboards can obviously be played very fast, faster than a lamp can respond (especially if percussive instruments are being played). If this happens, try experimenting with different values of Auto fade delay times which add a fade time after a Note Off message is received. 1 = a slow decay, 64 = a fast decay.

MIDI setup

Note Numbers to Preset C fader chart.

	Preset C Fader Numbers.																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
note number of first key. 	Note number																							
e.g. 36	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
e.g.60	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Use this line to enter the note numbers used on your system																								

Table 1

Auxillary Memory

Auxillary Memory numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Colour Note Number  = ____																											
Auxillary Memory numbers	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Colour Note Number																											

Table 2

NOTE

To find the Note Number of a key pressed:
 Select MIDI Setup in or Out Mode;
 Press and hold the Program button. The Page display will show "—". Press one Key on the keyboard, the note number received by the XLS will be shown in the Page display.

Advanced MIDI In MIDI setup / In Mode.

In previous MIDI control the C Preset only has access to page 0. In MIDI setup / In Mode the C Preset has access to all 240 Memory numbers. Preset C are Sub Masters in MIDI Setuo in / Slave Mode.

They can be accessed from a range of products from a cheap keyboard up to the top of the range sequencer.

Memories from a keyboard.

Program the desk as normal.

Set the Mode Switch to MIDI setup in.

Set the XLS Program Default **[Pd]** to 25 and the first note on the key board will drive Memory Number 25. See the table 3 on page 31. The following 23 notes will drive the following 23 Memory numbers. Set the Program Default to 33 and the first note on the keyboard will drive Memory Number 33 and the following 23 notes on the keyboard will drive the following 23 Memory Numbers. This is like changing pages on the desk except that the block of 24 memories on Preset C can start from any Memory Number.

Set Program Change **[PC]** to "NO" to stop the Program Default being changed by remote MIDI equipment.

Try setting Program Change to 25 press and hold the first note on the keyboard. Change Program Change to 33 Press and hold note two. Note one has memory Number 25 on it and Note two has Memory Number 34. Outputs are updated on a highest takes precedence basis. A MIDI version of Page overlay operates. Up to 24 keys can be operated like this, if you have enough fingers, it is a bit easier on a sequencer.

Access to the Auxillary memory is as ever from the Colour Note Number upwards on latest takes precedence basis.

The rest of the XLS operates as a simple 24 channel 2 preset desk with Auxillary memory.

Control from a sequencer in MIDI setup in Mode.

To run a performance where synchronisation between the lighting and music is required a sequencer must be used.

The memories within the XLS are programmed as normal. Then with the help of the tables 3 and 4 on page 31 annotate the script / musical score so that it shows which Memory Number is required at what point in time. Program the sequencer with the Music. Then program in to the sequencer the Memory Numbers and fader levels to call up the light outputs. The desk memories need to be kept. The sequencer can request the XLS to output any 24 of the 240 Memory Numbers at any one time and one Auxillary memory. It is possible to drive more than one XLS at a time either on the same MIDI channel or on a different MIDI channel.

What to send to an XLS.

Up to 24 Memory Numbers can be output from the XLS at a time plus one Auxiliary Memory.

To select which Memory Number is output use tables 3 and 4 on page 31. The technique used will differ slightly if the Memory Number is over 127. As Program Changes are limited to 127.

From turn on, in MIDI setup / in Mode, with Program Change set to "on", Program Default set to "1", Channel set up the same on XLS and Sequencer and the appropriate cables plugged in. This text will refer to Faders but Note Number will have to be sent, as per Table 1 page 28.

As set up now driving Preset C fader 1 will drive Memory Number 1 and fader 2 will drive Memory Number 2 up to fader and Memory number 24. If a Program Change of 25 is sent to the XLS then fader 1 drives Memory Number 25 and fader 2 will drive 26 as shown on Chart 3. If Program Change 40 is sent then Fader one now drives Memory Number 40, and fader 2 Memory Number 41.

If fader one is now held on so the Memory Number 40 continues to be output and a Program Change 50 is sent Fader 2 will now drive Memory Number 51 while fader 1 is still driving 40. Releasing fader 1 and then replaying it will cause Memory Number 50 to be output. This is all done in Bank select 0.

As shown in table 4 on page 31 access can be gained to Memory Numbers above 127 by using an extra parameter, Bank select.

In table 4 not all numbers are shown.

By sending Bank Select(BS), Program Change(PC) and Note Number(NN) (Preset C fader numbers) Any of the 240 memories can be accessed. With a maximum of 24 at a time. There will always be more than one combination of BS,PC,NN to select any one memory Number. By careful choice and planning of Memory Numbers, will reduce the amount of BS and PC data having to be sent.

Table 4.

Pick a Memory Number. Locate it within a range of Memory Numbers. The left hand column will display the Bank Select needed, Down will show the Program change needed, and up to find the fader number, Table 1 if completed, will shown the note number to sent. When more than one memory is output at a time they are mixed on a highest wins basis.

Example.

To output Memory Number 50 followed by Memory Number 145, then remove Memory Number 50. Memory Number 146 on, All off.

Send BS 1, PC 25, Fader 2 on, BS 5, Fader 1 on, Fader 2 off, Fader 2 on, Fader 1 off, Fader 2 off.

Advanced MIDI Programming

Program Changes.

By sending Program Changes other than 1, 25, 49, 73, 97, 121 then the Program Change sent "loads" that memory Number into Preset C fader 1 and the following 23 Memory Numbers into the following 23 Faders. A Program Change of 33 gives fader 1 to Memory Number 33, Faders 2 to Memory Number 34Fader 24 to Memory Number 56.

Auxiliary Memories.

Auxiliary Memories are accessed on a latest takes precedence basis by sending the the correct note Number. The first note Number to have any effect is the one in MIDI setup / in, Colour Note Number. The note number set drives the first Auxiliary Memory, and the following 53 drive the following 53 Auxiliary Memories as recorded in Table 2 Page 28. If the Note Numbers for Auxiliary Memories and Preset C overlap then both will be driven.

Fader levels.

Along with Note Numbers a Key velocity can be sent. This is used to set the faders position. So to fade a memory in it must be sent several times in succession at different Velocities. There is a padding value set-able via MIDI Setup/In Mode to set outputs to full brightness for equipment with out the means to set velocities.

Connect a MIDI cable from the keyboard MIDI OUT port to the desk MIDI IN port. Check the keyboard MIDI Transmit channel (by referring to the handbook if necessary) and set the desk Receive channel to be the same.

Set up the desk to respond to external Program Change commands.

Set the Mode switch to MIDI Setup In / Slave. The Page display shows 'SL'

Press Page + until 'PC' shows in the Page display.

Check that the Step No display shows 'ON'. If not Press 'Go' so that it now shows 'ON'.

Check the Program Default setting.

Program Default sets the address of the first memory that is addressed by the first key of the octave before any Program Change command has been sent by the keyboard. The procedure below selects memory 1.

Set the Mode switch to MIDI Setup In / Slave. The Page display shows 'SL'

Press Page + until 'Pd' shows in the Page display.

Check that the Step No display shows '1'. If not Press 'Go' until it shows '1'. Alternatively press Add Step and Delete Step together.

Program Change Notes

Not all keyboards send the same Program Change numbers as they appear on the Keyboard voice list; check your manual.

If  is set to 'on' then Preset A will be available for use, otherwise Preset A will normally be turned off and if no MIDI data is received for more than the time set then the scene on Preset A will be faded in, to the level set by the A master, over 5the time set by the Fade Time pot on the front panel. The next Midi data received will cause the preset to fade to off.

NOTES

- * *Loading memories from a programmable MIDI device (e.g. a computer):*

If there is a programmable MIDI device connected rather than a Zero 88 lighting desk, the result of this Load request will depend on what the device is programmed to do on receipt of a Zero 88 System Exclusive code of 00 20 0F: it will probably be ignored.

All data is dumped using system exclusive messages only; if your sequencer can store system exclusive messages and replay them it may be used to store and load data to and from a Lightmaster XLS.

- * *No MIDI 'THRU' Port*

The Lightmaster XLS has 'IN' and 'OUT' only.

In MIDI Setup In / Slave Mode only, the MIDI 'OUT' signals are the same as the 'IN' signals thus duplicating the MIDI 'THRU' function.

WARNING

It is possible to set up a chain of desks in MIDI Setup In / Slave mode, all connected to a single keyboard or other MIDI instrument. If the mode switch of any desk is switched out of MIDI Setup In / Slave mode, all further desks that are controlled via that desk may not operate properly.

The preferred method of driving multiple desks from one keyboard is to use a MIDI 'Thru' box (not available from Zero 88).

- * *MIDI Transmitted*

In Preset and Run modes, the XLS continually transmits Midi data on the Out port. Any (or all) other XLS desks connected to this port which are in MIDI Setup In / Slave mode will react to this information.

No data is sent when a desk is in Program mode.

If a Master is in Program and a Slave is connected and in MIDI Setup In / Slave, the Slave will show 'SL' in the Page display and 'AC' (Active sensing lost) in the Step No. display.

Memory Number 1 to 127 to Faders and Pages.

	Preset C Fader Number.																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24							
Bank Select 0																															
Page 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24							
Page 1	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48							
Page 2	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72							
Page 3	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96							
Page 4	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120							
Page 5	121	122	123	124	125	126	127	Memory Numbers																							

Table 3

Memory Number 1 to 240 to Bank Select, Program Change and Fader.

Preset C fader Number	1	2	to	23	24	1	2	to	23	24	1	to	24																	
Bank Select 0	1	2	to	23	24	25	26	to	47	48	49	to	72	73	to	96	97	to	120	121	to	144								
Bank Select 1	1	2	to	23	24	49	50	to	71	72	73	to	96	97	to	120	121	to	144	145	to	168								
Bank Select 2	1	2	to	23	24	73	74	to	95	96	97	to	120	121	to	144	145	to	168	169	to	192								
Bank Select 3	1	2	to	23	24	97	98	to	119	120	121	to	144	145	to	168	169	to	192	193	to	216								
Bank Select 4	1	2	to	23	24	121	122	to	143	144	145	to	168	169	to	192	193	to	216	217	to	240								
Bank Select 5	1	2	to	23	24	145	146	to	167	168	169	to	192	193	to	216	217	to	240											
Bank Select 6	1	2	to	23	24	169	170	to	191	192	193	to	216	217	to	240														
Bank Select 7	1	2	to	23	24	193	194	to	215	216	217	to	240																	
Program Change					1					25					49					73					97					121

Table 4

In Presets or Run Mode to output Memory Number 50 send Program Change 50.(numbers greater that 127 can not be sent)

In MIDI Setup In Mode to output Memory Number 50, send Bank select 0, Program Change 49, Preset C fader 2 or send Bank select 1, Program Change 25, Preset C fader 2 . To get the same result.

Midi Implementation Chart

MIDI Implementation Chart.

Version : 6201

Date: FEB 1993

Function	Transmitted	Received	Remarks
Basic Channel	<input type="radio"/> 1-16	<input type="radio"/> 1-16	1
DefaultChannel	<input type="radio"/> 1-16	<input type="radio"/> 1-16	2
Mode	Mode 3	Mode 1/3	3
Default Messages	X	X	
Altered	X	X	
Note Number	X	<input type="radio"/> 0-127	4
True Voice	X	<input type="radio"/> 0-127	
Velocity	X	<input type="radio"/> 0-127	
Note ON	X	<input type="radio"/> 0-127	
Note OFF	X	<input type="radio"/> 0-127	
After Key's	X	<input type="radio"/> 0-127	
Touch Ch's	X	<input type="radio"/> 0-127	
Pitch Bender	X	X	
Control Change	<input type="radio"/>	<input type="radio"/> 7 Volume	5
Prog Change	X	<input type="radio"/> 0-120	
True #	X	<input type="radio"/> 0-120	
System Exclusive	<input type="radio"/>	<input type="radio"/>	6
System : Song pos	X	X	
: Song Sel	X	X	
Common : Tune	X	X	
System : Clock	X	X	
Real Time : Commands	X	X	
Aux : Local ON/OFF	<input type="radio"/>	<input type="radio"/>	7
Messages : All Notes Off	X	<input type="radio"/>	
: Active Sense	<input type="radio"/>	<input type="radio"/>	
: Reset	X	<input type="radio"/>	8
Notes			9

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO

Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO

O : YES X : NO

NOTES:

Transmitted channel number
The transmitted channel number is selectable by the user; this is set to 16 following a Super User Reset.

Receiver channel number
The receiver channel number is selected by the user; the channel number is ignored when the receiver is operating in Mode 1.

Receiver mode
The receiver may either operate in:
Mode 1; All channels of Midi data accepted: This is set following a Super User Reset.
Mode 3; Only a single channel of Midi data accepted

Transmitted Note On
Note On data is sent in Preset and Run mode in a format only understandable by a desk running in MIDI In / Slave mode

Controller Change 7
The level of all channels can be controlled by use of non-registered parameter numbering.

System Exclusive
System Exclusive messages transmitted and received use the Zero 88 ID of 00H 20H 0FH.

Local ON/OFF
Local Off is used to switch a desk into Slave mode.

Reset
Upon receipt of a Midi Reset message, and  set to 'on' in MIDI setup in Mode, the Lightmaster XLS will reset itself to a state as if power had just been applied; this simulates a turn-on reset.

Turn On Messages:
Transmit Enquiry Identity Reply
When power is first applied to the desk, or following the receipt of a Midi Reset message the Non-Real time System Exclusive 'Inquiry Message - Identity reply' message will be transmitted.
Transmit System Exclusive Cue Message
When power is first applied to the desk or following the receipt of a Midi Reset message a Zero 88 System Exclusive Cue message will be transmitted.

Memory Problems

The memory Page displays may show one of the following messages if a memory error is detected when the desk is turned on.

Mode switch in any position.



Super User set up options have been corrupted



The output Strobe / Full Level channel memory has been corrupted



The DMX patch memory has been corrupted



Lost Pattern - The sequence memories have been corrupted



The Midi lighting control data has been corrupted

All these problems are likely to be transitory. They may require a Super User Clear Memory and/or Reset operation and some reprogramming. Always keep a copy of important shows on a Memory Card.

Hardware Problems

The Lightmaster XLS will display 'CR' (crash) in the Page display if the hardware is not operating correctly. There are two types of crashes: those that will allow some desk operations to proceed despite the fault and those that prevent the desk working completely.

Faults that allow desk operations to continue:

— Display —
Page Step No.



Chaser frame memory recovery failed (Faulty Eprom)



Analogue input ICs not reading 0 volt line correctly



Analogue input ICs not reading 'Vref' correctly

Faults that prevent the desk working completely:



Eprom checksum not correct (Faulty Eprom)



RAM testing has failed (Faulty RAM)



Mode switch in faulty position



Unaccepted system exclusive message received in MIDI.

When a hardware problem is detected the desk will stop but the outputs will stay at their previous levels.

To continue after a hardware problem is detected, press the Page +, Page - or Go buttons.

If the problem persists the desk will again be halted until the hardware is repaired.

Memory Card Errors



Insert Card



Battery Low



Not Formatted



Not a Lightmaster XLS Card



No Data Saved



Corrupt Card



Protected



Not Verified



Card Error



Card Error



Card Send Error



Card Receive Error



Card Addressing Error

Error Messages

Midi Error Messages

With the Mode switch in MIDI Setup In / Slave mode the following errors are reported.

The Memory Page Display shows  and the Step No. Display shows the following Status messages.

 No MIDI Data has been received.

 Active Sensing
MIDI data was received but has now stopped. Check if the cable is unplugged or open circuit.

 MIDI data received but no MIDI status byte detected.

 Midi Lighting Data (Non Slave) seen.

 Two Digit Number - indicates that a Midi Program Change has been received.

System Exclusive

Status message shown in the Page Display.

 Either a System Exclusive Command has been received and not accepted
Or an attempt to dump data to the desk has been received and not accepted.

MIDI received errors

Status message shown in the Page Display.

 Format error; overrun.

 Framing error.

 Midi buffer full

 Unaccepted System Exclusive

These errors will only appear if MIDI data is corrupt or the XLS is turned on in the middle of data being sent to it.

MIDI reset.

Status message shown in the Page Display.

 MIDI reset seen.

Standard Outputs

Analogue Output	0 to + 10 volts
Digital Output	USITT DMX 512 to 1990 or 1986 spec (user selectable).
MIDI	Full implementation of MIDI/MMA spec 1.0.

Mains Input

Power Supply	200 to 260 Vac 50 Hz (Internally selectable), 30W
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Audio

Input	Stereo; greater than 30mV, Maximum 100V, input impedance 22kΩ
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Physical Details

Operating Environment	+5 to +40°C (non condensing)
Net Weight	10kg
Size	825 x 330 x 105mm (32.5 x 13.5 x 4 inches)

WARNING - Mains Supplies:

If the Lightmaster XLS's memory is frequently being corrupted, it is probably due to a "dirty" mains supply. Zero 88 have designed a Mains Conditioning Unit (Part No 00-140-00), which can be installed to solve this problem and also prevent high voltage spikes on the mains supply causing damage.

Options and Accessories

00-669-00	Flight Case for Lightmaster XLS
00-292-00	32kb Memory Card This uses a BR2325 battery which is easily available from Radio Shack/Tandy as their Cat No 23-168
00-293-00	Gooseneck Light
00-140-00	Mains Conditioning Unit (MCU) This prevents very noisy mains supplies from corrupting the Lightmaster XLS memories. Limited mains conditioning is built into the desk as standard

MIDI foot switch
Not available from Zero 88.
See page 22 for wiring details

Complementary Products

Alpha Pack
Freestanding, wall or stand mounting 3 channel x 6 Amp dimmer packs.

Betapack
Rack/Wall mounting dimmer pack with 6 channels x 10A

Betapack Plus
Rack/Wall mounting dimmer pack with 6 channels x 10A and Local Control

Betapack DMX 512 input kit
Converts Betapacks to DMX and analogue, requires one per Betapack

Rackmaster 260
6 channel x 10A high density dimmer pack

Rackmaster 490
6 channel x 16A high density dimmer pack with sockets and Circuit Breakers

Rackmaster 490 DMX 512 input kit
Converts Rackmaster 490 to DMX and analogue, requires one per Rackmaster

Demux 48
A 48 channel demultiplexor which will convert DMX data to 0 to +5, +10, or +15v analogue signals. A negative output kit is also available.



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