Sapphire 2000
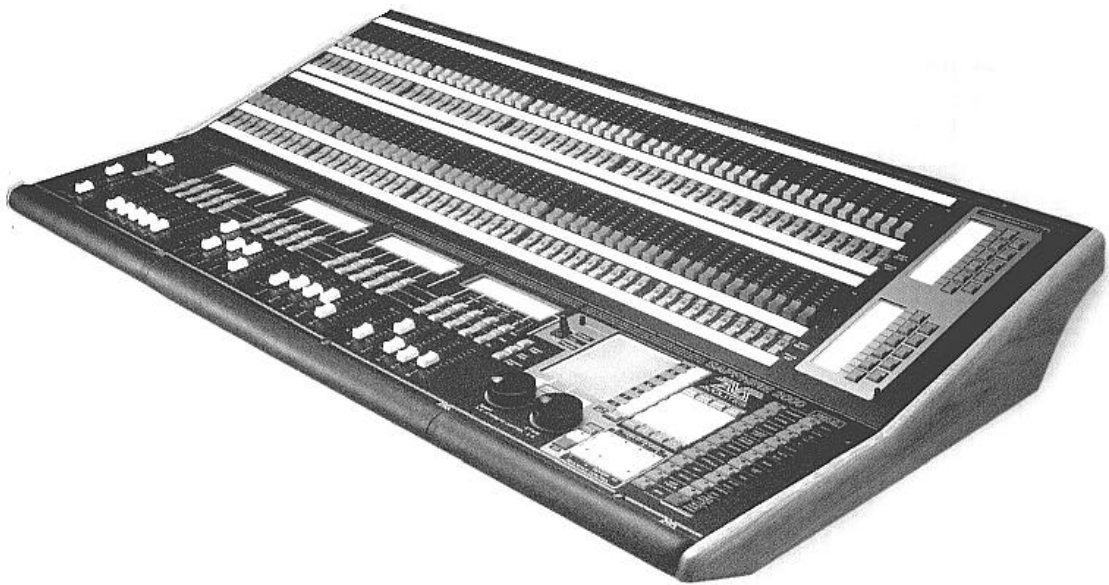
Operator's Manual

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*Before contacting Avolites for service enquiry please ensure that you have the product serial number and the Software version. The serial number can be found on the back of the desk and the software version can be found by turning the key to "System" and pressing Softkey B, "Software ID".

The latest version of this manual (in Microsoft Word 97) and Sapphire Software can be downloaded by modem from the Internet.

The small print :

No Liability for Consequential Damages

Avolites has a policy of continuous product and documentation improvement. As such the detail within this manual may not match the operation of the Sapphire 2000.

In no event shall Avolites be liable for any direct, indirect, special, incidental, or consequential damages or loss whatsoever (including, without limitation, damages for loss of profits, business interruption, or other pecuniary loss) arising out of the use or inability to use the Sapphire 2000 even if Avolites Ltd. has been advised of the possibility of such damages. Because some jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitation may not apply to you.

Reprint and revision history:

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TUTORIAL CONTENTS

REFERENCE MANUAL CONTENTS

Pages in the Tutorial section have numbers below 100. Pages in the Reference manual have numbers above 100.

I N T R O D U C T I O N

1.   Welcome to the Sapphire 2000

This manual is designed to help you get the most out of your Sapphire 2000 console. We have divided it into two sections.

- This first section is a tutorial which gives you a step by step guide of how to carry out the most common functions of the Sapphire 2000. This section is printed on coloured paper. If you are new to the console, working through this part will give you a good introduction.

- The second section is a reference manual which tells you everything there is to know about the Sapphire 2000.

To help you move between the two sections, we have made the chapter numbering the same, so if you are using the tutorial and you want more information, just look for the same chapter number in the reference manual.

At the back of the reference manual there is a Glossary, explaining some of the technical terms used in the manual, and an Index which can be used to find what you need in either section of the manual.

This manual does not apply to the original Sapphire console; however, to make reading easier, we will refer to the "Sapphire 2000" simply as the "Sapphire".

1.1   Setting up the Sapphire 2000

Before you can use the Sapphire, you need to make a few connections to it. Ensure the power is off while making these connections.

Important: Firstly check the voltage selector on the back of the console (next to the power sockets) to make sure it matches your mains power. You can set it to 230V or 120V.

If you plug in the power with the switch set wrongly, you will probably blow up the power supply. This would be a bad thing to do a few hours before a show.

Once the voltage selector is correctly set, connect the mains inlet to an AC power supply.

Note: If your mains is in any way suspect, a power conditioner is a good idea. A noisy or unreliable mains supply could possibly crash the console.

If you are using the optional VGA display, power it from the mains outlet on the rear of the console. Connect the VGA data lead to the VGA output on the back of the console. You don't have to use the VGA display but it does show some additional information that is not shown on the console displays.

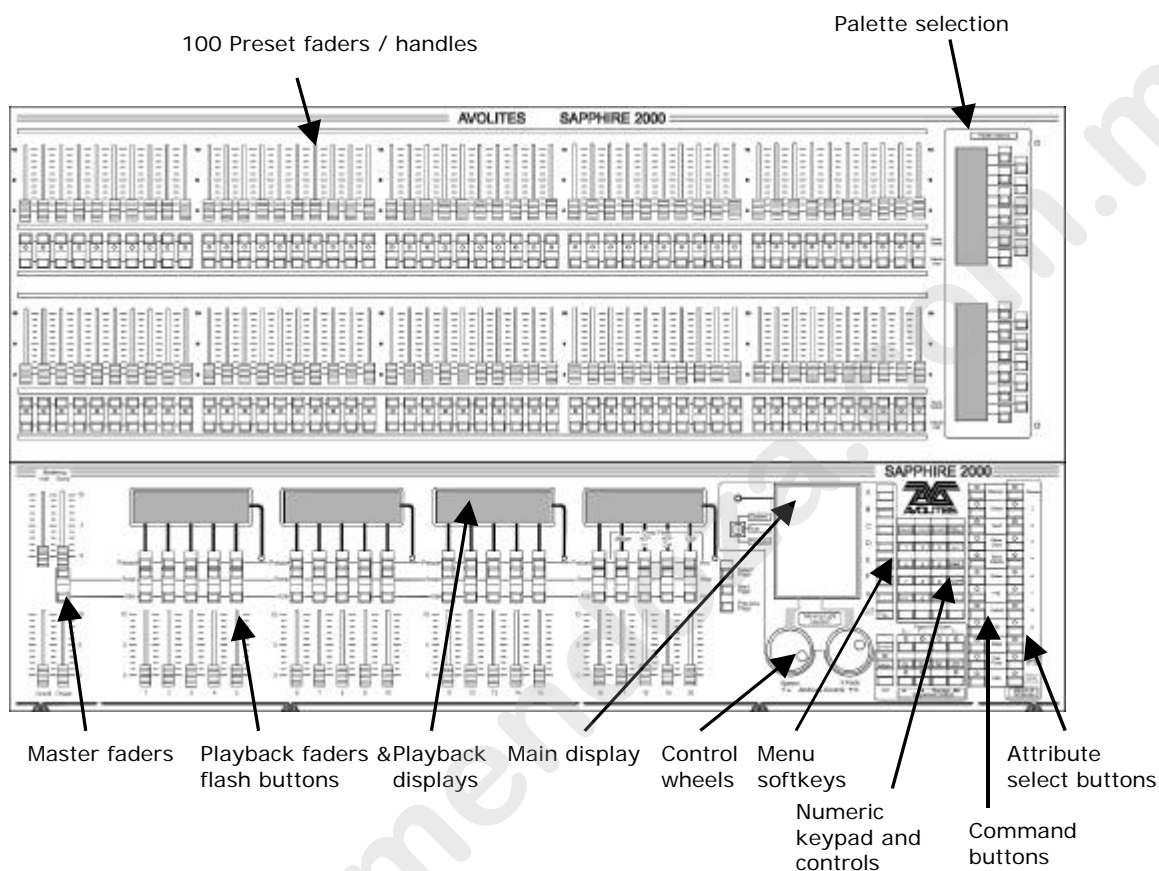Connect the DMX output(s) to your lighting fixtures or dimmers. The Sapphire has four DMX output sockets. Chapter 1 in the reference manual has more details on DMX connections.

Plug in the two desk lights to the sockets on the back edge of the console. If you have a QWERTY keyboard, plug it into its socket.

Turn on the power. The console displays and VGA display (if you are using one) should come alive.

1.2 Finding your way about on the Sapphire 2000

The Sapphire might initially appear to have an alarming number of sliders and buttons on it, but don't be scared of it. The main controls are:

100 Preset faders / handles

Palette selection

Master faders   Playback faders & flash buttons   Playback displays   Main display   Control wheels   Menu softkeys   Numeric keypad and controls   Command buttons   Attribute select buttons

- The **Preset Faders** are used to control individual dimmer channels and fixture intensities. The 2 buttons below the faders are used to select and flash fixtures. Each fader and buttons is called a "Handle".

- The **Palette selection** area is used to recall colours, positions and other settings you have programmed. The displays show you what each button will do. Shapes are also selected here.

- The **Master faders** control the overall output of the various parts of the console. You will normally have these set at Full.

- The **Playback faders** and flash buttons are used to play back memories you have programmed, when you are running a show. At the right hand end of the playback faders are the Page Select buttons.

- The **Playback displays** show the names you have set for the playbacks, so you can see at a glance what each playback will do.

- The **Main display** is the nerve centre of the console and shows you what is going on. The display can show various screens of information.

- The **Control wheels** are used to set control values on the fixtures.

- The **Menu softkeys** (labelled A – G) are used to select control options. The display next to the buttons shows what each one will do.

The options for each key change depending on what the console is doing.

- The **Numeric keypad** and other control buttons are used to enter values and change controls on the console. The fixture page buttons are also here, which select 4 pages for the Preset Faders.

- The **Command buttons** are used to carry out functions such as storing memories, copying, saving to disk, etc. These buttons have lights on to indicate when they are active.

- The **Attribute select buttons** are used to select which attributes of a fixture (e.g. colour, gobo, pan, focus) are going to be controlled using the Control wheels. The buttons have lights on to show you which attributes are active. The bottom (red) button allows you to reduce the intensity of a fixture if it loses position during a show.

The **VGA display** shows more information than the on-board displays. It is useful when setting up the console and programming shows. When entering text or numbers, what you are typing is shown only on the VGA display. Often you will not need it when you are running a show.

Function output values   Current type of fixture being displayed   Today's date and time

Menu options (select these using the A-G menu softkeys)

Current chase information   Function of left wheel   Function of right wheel

The main part of the display shows the output of the console for one of the types of fixture you are using. The left-right arrow keys change the type of fixture shown on the display, allowing you to view the intensity channel outputs, and any fixture patched on the desk. If you have more than 10 fixtures of one type, the up-down arrow keys let you step through them.

When the fixtures are "selected" for manual control, the number at the top of the column is dark blue. When you have changed one of the functions, it turns light blue. The "a b" at the left side of the screen shows which functions are currently assigned to the control wheels.

1.3   What next?

The rest of this part of the manual is a tutorial. If you have never used an Avolites console before, by working through the rest of the tutorial section you should be able to get the Sapphire up and running, and be well on the way to programming and running a show with it.

The tutorial is organised in the order you'll need to do things to get the console set up and working, so try to work through it in sequence.

If you are a seasoned Avolites user, you'll find the Sapphire works much like its brothers, just with a few extra features. You might find the tutorials useful, and if there is anything specific you need to know, just look in the appropriate part of the Reference Manual. The Reference section is in the same order as the Tutorial section, to make it easier to move between the two.

If you are new to intelligent lighting, or even new to lighting altogether, you might like to read chapter **11**, "Introduction to intelligent lighting". This explains the concepts behind digital control of lighting and will help you to understand what we are going on about in the rest of the manual. There is also a Glossary at the end of the Reference Manual which explains some of the obscure lighting words we have used in the manual.

If you are used to the Avolites Pearl 2000 console, read chapter 12, "The Sapphire 2000 for Pearl experts", which gives you a quick rundown on the differences between the two consoles.

CHAPTER TWO

2. Patching

In this chapter: how to set up the Sapphire to control dimmers and fixtures.

- clearing the Sapphire
- patching dimmers
- patching moving light fixtures
- setting addresses on the fixtures
- backing up the Sapphire to disk

So, you have your fixtures and dimmers all connected up with DMX cables and the Sapphire connected to the end of it. (If you have a big rig, you might find it easier to learn the basics using a few dimmers and a few moving lights, and leave the rest of it till you're an expert).

First you need to allocate each fixture or dimmer to a preset fader on the Sapphire, so that you can tell it which of the fixtures or dimmers you want to control at any time.

The fader and the buttons below it (the picture shows some) are called the **handle** for the dimmer or fixture, because you use it to take control of the fixture. The fader will control the intensity of the dimmer or fixture, the "Swop" button is used when programming to select the dimmer or fixture. In Run mode the Add and Swop buttons function as flash buttons.
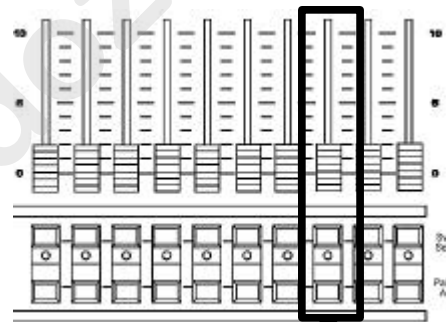
a "handle"

You also need to tell the Sapphire what type of fixture is allocated to each handle. When you have entered this information, the Sapphire can tell you what addresses to set on your fixtures and dimmers to match the settings it is using.

This setup process is called **Patching**.

You can patch up to 400 fixtures and dimmer channels on the Sapphire. There are 4 "pages" of 100 handles, selected using the "Pages of Fixtures" buttons below the numeric keypad.
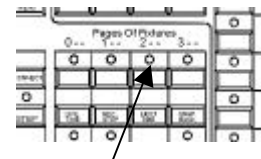
Fixture page buttons

The Sapphire controls dimmers and fixtures slightly differently, so we will look at each in turn. But first…

2.1 Clearing the Sapphire - Wipeall

Unless the Sapphire is brand new, it's a good idea to clear the memory before you start a new setup. This ensures that you won't get confused by any peculiar settings left by the previous user.

2.1.1 Clearing the Sapphire

➔ Turn the key to "System"

➔ *Select option A "Service"*
➔ *Select option F "Wipeall".*
➔ *Press F again to confirm. The memory will be wiped.*

The Sapphire is now pristine and new, and ready for you to start patching. You will need to be in Program mode to do any patching, so turn the key to Program.

2.2 Patching dimmers

Each dimmer channel you want to use has to be allocated to one of the handles. Then, when you want to control the dimmer channel, you fade up the slider, or press the Add button.

2.2.1 Patching dimmer channels

➔ *Press Patch (one of the blue "command" buttons).*
➔ *Press Softkey A, "Dimmer"*
➔ *The Sapphire will start at DMX address 001 (shown on the top line of the display). You can change this by typing in the new address on the numeric keypad.*
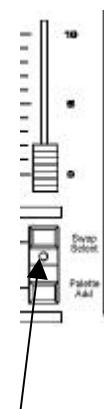➔ *Press the blue preset "Swop" button below preset fader number 1. The fader and add/swop buttons will become the "handle" used to control that dimmer channel.*
➔ *The Sapphire will update the DMX address to the next free channel, so you can just press another button to patch the next dimmer.*
➔ *Press Exit when you have finished patching.*

Swop button

You can now control the dimmer channel on handle 1 using the fader (the buttons do not operate as flash buttons in Program mode, only in Run mode).

If you have lots of dimmers to patch, there are some quicker ways. If you just want to patch 10 dimmers in sequence on to handles 21-30, you can do it this way:

2.2.2 Patching a range of dimmers to buttons

➔ *Enter Dimmer Patch mode*
➔ *Enter the DMX channel you want the range to start at, if it's different to the one the Sapphire is displaying*
➔ *Hold down the Swop button of the first handle to be patched (handle 21)*
➔ *Press the last Swop button (handle 30)*
➔ *Release both buttons*
➔ *Each handle will be patched in order to a dimmer channel.*
➔ *Press Exit when you have finished patching.*

You can also patch more than one dimmer channel on the same handle.

This can be useful when you have several lights on different dimmer channels, but you always want to control them together. For example, if you have lit an area with several spots and you just want to use one handle to control all the lights on that area, this is a good way to do that.

2.2.3   Patching several dimmers to the same button

➔   *Enter Dimmer Patch mode*

➔   *Using the numeric keypad, enter the DMX address of the first dimmer channel to be patched*

➔   *Press the Swop button for the handle you want to use (this patches the first dimmer)*

➔   *Using the numeric keypad, enter the DMX address of the next dimmer channel to be patched (the Sapphire will have automatically increased the address by 1)*

➔   *Press the Swop button again*

➔   *Press Exit when you have finished patching*

You can repeat this procedure to patch as many dimmers as you like on to one handle.

While you are in Patch mode, the VGA display shows a diagram to tell you which channels you have patched so far and which are free.

2.3   Patching moving light fixtures

Moving light fixtures are controlled slightly differently to dimmers; a dimmer only has one controllable attribute, intensity. But a moving light fixture can have many attributes, such as pan, tilt, colour, gobo etc. When you patch a fixture, you will see on the VGA display that it occupies a block of DMX channels rather than just one. However, the principle is still the same.

The Sapphire has personality files for most lighting fixtures in the known universe, and these are stored internally in the console. If you want to use a personality not available in the console, you can load it from a personality disk.

Note: To use the internal personality files, make sure there is no disk in the disk drive.

2.3.1   Patching a fixture

➔   *Make sure there is no disk in the disk drive*

➔   *Press Patch*

➔   *Press Softkey B, "Choose a fixture"*

➔   *The display will show "Please select an instrument" on the top line.*

➔   *A list of known fixtures will appear next to the softkeys after a pause.*

➔   *Use Softkeys F and G to go up and down the list and find the correct fixture, then press the Softkey next to the fixture to select it.*

➔   *The Sapphire will load the fixture information (this may take a few seconds). The display shows information about the fixture.*

→ *The Sapphire will ask "Automatically create preset focuses?".*

→ *Press Softkey A for Yes. (This is explained later)*

→ *The Sapphire will offer you the first free DMX address (on the top line of the display). You can change this using the numeric keypad if you want your first fixture at a different address.*

→ *Press the Swop button on handle 1 to patch the fixture you have selected to handle 1.*

→ *The display will show the block of channels occupied by the fixture.*

→ *Patch more fixtures, or press Exit when you have finished.*

You can continue to patch this type of fixture at the next free DMX address by pressing the next Swop button you want to use. You can also patch a range of fixtures by holding down the first button in the range and pressing the last button, as with dimmers.

If you want to patch a different type of fixtures, you can change the type of fixture to be patched very easily.

2.3.2 To change the fixture type

→ *Press softkey A ("Select another fixture")*

→ *Choose the fixture type from the list on the softkeys*

→ *Patch as before*

Note: The "preset focuses" you can load contain a selection of position, colour and gobo settings. You can call back settings from the palette select buttons when programming rather than having to set up your own, allowing you to select, for example, "Yellow" or "Blue" instead of setting up the value using the wheels. You can't load the automatic palettes later (though you can define your own).

The Sapphire has four physical DMX output lines, identified as A, B, C, D. You can patch onto any of the four lines using Softkey E, "Select a DMX line". However, to keep it simple, stick to line A while you are learning.

2.4 Addressing your fixtures to match the Sapphire

Once you have told the Sapphire where to allocate all your dimmers and fixtures, you need to go round the actual lights and set the DMX address to match the Sapphire.

The Sapphire can tell you the DMX address it is using for each fixture, and in some cases can show you how to set the dip switches on the fixture. It's usually easiest to write down the addresses for all the fixtures, then go and set them.

2.4.1 Displaying the DMX address for fixtures

→ *Press the View button (next to the numeric keys)*

→ *Press Softkey D, "Fixture Patch"*

→ *The display will show a list of the handles to which you have patched fixtures or dimmers, with the DMX line and address (e.g. A24 is address 24 on DMX line A).*

➔ *The top handle on the list has an arrow next to it. In the lower part of the screen, more information is shown for this fixture.*

➔ *Use the Arrow keys to move the arrow up and down the list, and show information for the other fixtures in the list.*

➔ *You can also press View then select Softkey C, "DMX Patch" to display a list of DMX channels and which fixture is patched at that address.*

2.5 Changing what you have done

If you need to change the patching you have done, you can re-patch a fixture to a different DMX address. You can also patch a fixture onto a different handle, and delete a fixture from a handle, but this loses any programming for the fixture. How to change the patching is described in the reference manual.

2.6 Completing the patch

When you have patched all your dimmers and fixtures, press the Exit button on the numeric keypad to go back to normal mode. You have now completed the setting up of the lighting system, and it's time to get to work on programming a show. But there's one important thing to do first...

2.7 Backing up the Sapphire to disk

The Sapphire has a built in disk drive which allows you to save everything you have done. You should get into the habit of saving your show regularly to guard against that unexpected moment when the worst happens.

It only takes a minute or so to save the contents of the Sapphire to disk. You can then reload it if you mess up the show by accidentally changing something, or if some helpful person steals the Sapphire you can load your show into a replacement console.

2.7.1 *Backing up the Sapphire to disk*

➔ *Press the Disk button in the bottom right hand corner of the Sapphire*

➔ *Insert a blank formatted 1.44M disk into the disk drive (anything on the disk will be wiped).*

➔ *Select softkey B, "Save show to disk".*

➔ *The Sapphire will ask for a filename for the show. Type this on the QWERTY keyboard then press Enter.*

➔ *The Sapphire will save your current show onto the disk. The display will tell you when the Sapphire has finished.*

➔ *If you need to reload the show, use softkey A, "Load show from disk".*

CHAPTER THREE

3. Controlling dimmers and fixtures

In this chapter: how to control dimmers and fixtures manually.

- controlling fixtures and dimmers
- changing attributes
- using and creating palettes
- using and creating groups
- viewing the console output

Having patched all the dimmers and fixtures you want to use, you are ready to start operating them. This chapter explains how you do this.

To manually control fixtures and dimmers, you need to be in Program mode, so ensure the key is set to Program. There's also a special Run mode which lets you "take over" fixtures, which is described later.

3.1 Controlling dimmer channels

Controlling dimmer channels is simple – you just push up the fader of the handle where the dimmer is patched. Dimmers work just like a normal "preset" lighting desk on the Sapphire. If you want to turn on lots of dimmer channels at the same time, you can also "select" the dimmers and use the Dimmer attribute button and control wheels as described below.

3.2 Controlling fixtures

Controlling fixtures is nearly as simple, except there are a few more functions to control than just intensity.

The first thing you have to do is to "select" the fixtures that you want to control. The Sapphire then knows that any changes you make are only to be sent to these fixtures. You can select fixtures individually, or several at once.

3.2.1 Selecting fixtures or dimmers

➔ *Press the Swop buttons for the fixtures you want to control.*

➔ *The Swop button LEDs will light for the fixtures which are selected. They are shown in dark blue on the VGA display.*

➔ *If you select a fixture you don't want, press its Swop button again to deselect it.*

➔ *You can use the "Locate Fixture" function (Press the ML Menu button then Softkey A) to position the selected fixtures at a "home" position with the light on, so you can see where they are. Dimmer channels are set to 50%.*

➔ *You can select a range of fixtures by holding down the Swop button for the first fixture in the range, then pressing the Swop button for the last fixture.*

You can change the fixture page, if you need to, by pressing one of the other Fixture Page buttons.

3.3   Changing attributes of fixtures

Having selected the fixtures you want to control, you then need to select the attributes (pan, tilt, colour etc.) of that fixture that you want to change.

The attributes are selected using the buttons on the lower right corner of the Sapphire. The attributes you can control will vary depending on the type of fixture you are using. For dimmer channels, you can only change the "Dimmer" attribute (intensity). For scans, you can control the pan, tilt, colour, gobo and other functions.

Attribute select buttons

3.3.1   Controlling pan and tilt of a fixture

➜ *Select some fixtures using the Swop buttons*

➜ *Use the Locate Fixture function (press ML Menu then Softkey A) to position the fixtures at a central position with the lamp on (you don't have to do this, but it helps you see what's happening)*

➜ *Press the Pan/Tilt attribute button*

➜ *Control the tilt using the left hand wheel and the pan using the right hand wheel. You should see the selected fixtures move.*

➜ *The display area just above the wheels shows you which attribute is being controlled by each wheel.*
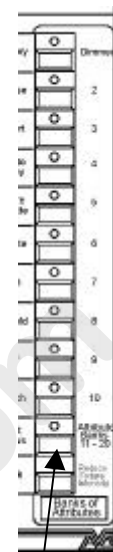
Note: If you need more accurate control of the position (and the fixture you are controlling has 16-bit movement) you can set Pan/Tilt to Fine (16-bit) mode by pressing the Pan/Tilt attribute button again. The light flashes to show you that it is in Fine mode.

Any other attribute of the fixtures you selected can be controlled by pressing the appropriate button and turning the wheels. The display will show which functions the left and right wheels are going to control. If the display doesn't show a function when you select an attribute button, that function is not available on the fixtures you selected.

You can use the Dimmer attribute to control the intensity channel of the fixture, or you can use the fader of the handle. The effect is the same.

Note: Once you have changed any attributes, all the fixtures will be automatically deselected the next time you press a fixture select button.

3.4   Using palettes

When you are controlling attributes which are continuously variable such as pan, tilt, and colour, it can speed things up if you can instantly call back a position such as centre stage, or a particular colour like red, blue etc.

If you've got different types of fixtures, to get the same colour on each fixture might mean setting different values for each type of fixture.

The Sapphire has pages of preset values, called "palettes", which you can use to store attribute settings which you use a lot. These are instantly accessible using the buttons and displays on the top right hand side of the console.

The Sapphire loads 10 pre-programmed positions, 10 colours and 10 gobos each on a separate page when you patch a fixture (unless you tell it not to).

This means that if for example you want all your fixtures to go Red, you just have to select "Red" from the colour page of the palette. The Sapphire knows the values to send to each fixture to get red light out of it.

3.4.1   Using palettes

➔ *Select the fixtures you want to control by pressing the Swop buttons*

➔ *Select the page of palettes you want to use by pressing one of the Palette select buttons*

➔ *The Palette displays will show you the contents of the page.*

➔ *Press one of the Palette select buttons to use one of the palette values. The value will be set to all the fixtures which are selected.*

➔ *To go back to the list of pages, press the bottom button (showing "Pages").*
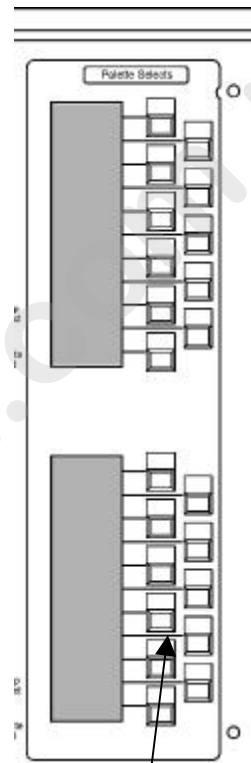
Palette select buttons & displays

You can also store your own palette values of positions, colours and so on that you use regularly. The reference manual gives more information on how to do this.

When you use a palette value, the Sapphire remembers the palette entry you used rather than the actual values you used. This can be very handy when you are touring a show, if you use palette entries to program the show. When the venue is a different shape, you only need to redefine a few standard palette positions rather than having to reprogram the whole show. All the memories which used the palette positions will then use the new positions.

Note: The Sapphire may sometimes call palettes "focuses" or "preset focuses". This is the term used for a palette on other Avolites consoles. The meaning is the same.

3.5   Using groups

The Sapphire allows you to put fixtures or dimmer channels into groups. This can speed up the process of selecting fixtures or dimmers. If you have several different types of fixture, for example, you can make a group for each type of fixture. You can then select all the fixtures just by typing the group number. If you are using the graphics tablet you just press one button.

3.5.1   Making a group

➔ *Select the fixtures or dimmer channels you want to put into the*

group

➔ *Press the ML Menu button, then softkey D, "Record Group".*

➔ *Type the group number 1-200 on the numeric keypad and press Enter.*

Once you have created a group, you can then quickly select all the fixtures in the group by entering the group number.

3.5.2   Selecting a group of fixtures

➔ *Type the group number on the keypad*

➔ *Press softkey A, "Recall Group".*

➔ *The fixtures in the group are selected.*

If you are using the graphics tablet, you can save and recall groups with one touch of the pen. This is described in more detail in the Graphics Tablet chapter.

3.6   Viewing the output

The display shows you the output level of all the channels which are turned on, but only channels 1-50 fit on the display. To show channels 51-100, press the Fixture Page button again (the light on it flashes).

You can select which attributes you are looking at by pressing one of the attribute buttons.

CHAPTER FOUR

4.   Using shapes

In this chapter: how to use the shape generator

- selecting a shape
- positioning
- setting size and speed
- coarse and fine spread
- also Fan mode

The Sapphire, in common with other Avolites consoles, has a shape generator. This allows you to quickly create exciting light shows using lots of movement and changes, with the minimum of programming.

There are a large number of pre-programmed shapes available, which can be used on the position, colour, gobo, dimmer, or iris of a fixture. You can control the size, speed and positioning of the shape, and how the shape is allocated across a range of fixtures.

To understand how shapes work and how they can be spread across multiple fixtures, it's best to set up at least four fixtures next to each other. Once you have mastered the basics, you can try some more interesting arrangements.

4.1   How shapes work

A shape is a pre-programmed movement sequence which usually repeats over and over again. Typical shapes are circles, spirals, squares, etc. There are also random shapes, which do not repeat.

When you apply a shape, it works on the current settings of the fixture. So if you apply a circle to the pan and tilt attributes of a fixture, the centre of the circle will be at the current pan and tilt position. You can change the size of the circle, and the speed of the circle. By moving the pan and tilt position of the fixture, you can move the whole shape around the stage.

Shapes can be applied to other attributes of a fixture, not just pan and tilt. You can use them to create colour changes, gobo changes, iris changes and a variety of other attributes. Each shape is designed to modify one particular attribute.

4.2   Selecting a shape

Selecting a shape is very similar to selecting a value from a palette. When you choose a shape, it will be applied to all selected fixtures.

4.2.1   Selecting a shape

➔ *Select the fixtures you want to apply the shape to by pressing the Swop buttons*

➔ *Use Locate Fixtures (Press ML Menu then Softkey A) to turn on the fixtures and move them to a central position*

> ➔ *Select the page of shapes you want to use by pressing one of the Palette select buttons on the bottom display. The palette display will change to show the contents of the page of shapes you selected.*
> ➔ *Press one of the palette select buttons to select a shape. The shape will be applied to all selected fixtures.*

The shape will start based on the current setting of the attribute.

4.3 Changing the size and speed of a shape

It is easy to change the size and speed of a shape after it has first been selected.

4.3.1 Changing the size and speed of a shape

> ➔ *Enter the Shape Generator menu by pressing Softkey G.*
> ➔ *Press Softkey D, "Set wheels A=Size B=Speed"*
> ➔ *Control the size of the shape using the left hand wheel*
> ➔ *Control the speed of the shape using the right hand wheel*
> ➔ *The size and speed is shown above the wheels on the display.*

The minimum size is zero. Obviously, you won't see the shape, and the fixture will resume its previous settings. The minimum speed is Stop. Again, you will not see the shape, though it will offset the positioning of the fixture.

4.4 Changing the positioning of a shape

A shape is based on the current settings of the fixture. For a pan/tilt shape, this means that the movements will be centred around the current position of the fixture.

4.4.1 Changing the positioning of a shape

> ➔ *Select the fixtures you want to change*
> ➔ *Set the wheels to Size/Speed and reduce the shape size to 0 (it's difficult to see the position when everything is moving)*
> ➔ *Press the Pan/Tilt attribute button*
> ➔ *Set the position using the wheels.*
> ➔ *Set the wheels back to Size/Speed and change the size of the shape back to where you want it.*

For a colour shape, the colour changes will be centred round the current colour of the fixture, so you would select the Colour attribute and change that.

4.5 How a shape works across multiple fixtures

Shapes get more interesting (and look more impressive) when you apply them to multiple fixtures. The Sapphire lets you set how a shape is spread across several fixtures.

In the case of a circle, this can vary from all fixtures moving identically (a spread of None), fixtures working in pairs (a spread of 1) through to all fixtures being distributed evenly through the shape, so the first fixture is just starting the shape as the last one finishes (an Even spread). This is the same as the number of fixtures, so if you have 4 fixtures doing the shape, a spread of 4 would be the same as an Even spread.

You can also set the Fine Spread value, which introduces a slight offset into the timing of the shape across each fixture.

4.5.1 Changing the spread of a shape

➔ *In the Shape Generator menu, press Softkey C, "Set wheels to Spread"*

➔ *Set the coarse spread using the right hand wheel. The minimum is Even (the shape spread evenly across the fixtures), then Zero (all the same), then 1, 2, etc.*

➔ *Set the fine spread using the left hand wheel.*

To start with, you will find it easier to keep the Fine Spread set to zero, and work with the Coarse Spread setting, or everything will get confusing.

Note: The order in which you select the fixtures determines how the shapes are applied; the "first" fixture is the one you select first and the "last" fixture is the one you select last.

4.6 Fan mode

Fan mode is not really anything to do with shapes, but we have put it in this chapter because it works in a similar way.

Fan mode automatically spreads out a selected range of fixtures to produce a fan of light beams. The first and last fixtures of the range are affected most, and the central fixtures are affected least. The amount of fan can be set using the wheels.

Note: As with shapes, the order in which you select the fixtures sets how the fan effect works. The fixtures you select first and last will be the ones which change most.

The fan effect, while normally used on pan or tilt attributes, can be applied to any attribute.

4.6.1 Fanning out a range of fixtures

➔ *Select the range of fixtures you want to fan*

➔ *Select the attribute to fan (pan, tilt, colour etc)*

➔ *Press the Fan button*

➔ *Set the amount of fan using the wheels*

➔ *The display shows which attribute is being controlled by each wheel*

You will be able to see the effect of fan mode best if you have a row of at least 4 fixtures. If you have an odd number of fixtures, the central fixture will not move in fan mode.

Remember to turn off Fan mode when you have finished, or you will get

confused when the controls don't do what you expect.

CHAPTER FIVE

5. Recording and playing back memories

In this chapter: how to record memories into the playback faders

- explanation of HTP and LTP channels
- how the Sapphire works when programming
- recording and playing back memories
- playback pages
- flash button modes
- naming memories
- setting fade times for memories
- copying and clearing memories
- the include function
- editing memories
- record by fixture or by channel

So, you now know how to control your dimmers and fixtures, and how to use the shape generator. This chapter tells you how to record the wonderful effects you have created so that you can recall them at the touch of a button. The Sapphire has 20 playback faders across the bottom of the desk, into which you can record your effects. There are 100 pages of faders, allowing you to save 2000 playbacks in all!

Before we get onto the details of recording memories, there are a couple of general things about how the Sapphire works. The first thing to understand is what happens when you play back more than one memory at a time, and the operation of HTP and LTP channels. It's important to understand this before going on.

5.1 What are HTP and LTP channels?

The Sapphire treats channels which control intensity differently from other moving light control channels. If two or more memories are turned on together, or if you fade out a memory, the Sapphire needs to know how to output the levels from the memories.

Dimmer or intensity channels work on the principle of "highest takes precedence" (HTP). This means that if the same HTP channel is turned on in several memories, the highest level will be output. When you fade a memory, the HTP channels fade out.

Moving light channels work on the principle of "latest takes precedence" (LTP). This means that the latest change takes over from any other values, so the most recent memory to be turned on is the one which is output. When you fade in a memory, LTP channels do not fade, but come on at their full values, and stay there until another value is set. This is important, because when you fade a memory you normally just want the intensity to fade, you don't want the fixtures moving and changing colour.

The fixture personality file tells the Sapphire which channels of a fixture are HTP and which are LTP. Normally, only dimmer attributes are HTP, and everything else is LTP.

5.2   How the Sapphire works when programming

When you start setting dimmers and moving fixtures, the Sapphire remembers what you have changed. Fixtures and dimmers you have changed are stored in "the programmer" which is a special area of memory. When you record a memory, only the settings in the programmer (i.e. the things you have changed) are stored in the memory.

When you press Clear, all fixtures are cleared from the programmer. You should get into the habit of pressing Clear before you start to program a memory, or you can end up recording fixtures you don't want. You also need to press Clear when you finish programming, because any functions in the programmer will override playbacks.

Channels in the programmer are shown by an "m" (modified) on the console Channel Output display, and are shown in light blue on the VGA display.

Note: Turning on a memory does not place the values from the memory in the programmer (the Include function lets you do this, see page 24). The Locate Fixture function does not place any values in the programmer either.

5.3   Recording a memory

So now that is all out in the open, let's record a memory. The Sapphire has 100 pages of 20 memories, which are controlled using the 20 faders across the bottom of the console.

5.3.1   Recording a memory

➔   *Press Clear to clear the programmer. This ensures that you are starting with a clean slate.*

➔   *Set up a nice effect using the fixtures and dimmers. You can include shapes in a memory if you want. Remember! Only the fixtures/dimmers you have changed will be recorded in the memory.*

➔   *Press Memory.*

➔   *Press the Swop button of the playback fader you want to use.*

Memory button

➔   *The display above the fader will change to show that you have saved a memory there.*

➔   *Press Clear to clear the programmer.*

5.4   Playing back a memory

Playing back a memory is very simple. Just raise the fader. (Make sure there are no values in the programmer by pressing the Clear button, because anything in the programmer will override the playback).

5.4.1   Playing back a memory

➔   *Raise the playback fader.*

➔   *To stop the memory, lower the fader.*

All the HTP (intensity) channels in the memory will fade up with the fader. The LTP (movement) channels will be set as soon as the fader leaves the zero position.

You can preload the LTP channels beforehand by pressing the Preload button for the playback. This can be useful if you want to position the fixtures in blackout and have them ready to turn on, rather than seeing them snap into position if you put the fader up quickly.

5.5 Changing playback pages

You can change pages to select another 20 memories simply by pressing one of the playback page up or down buttons. You can also enter the page number by pressing "Select Page" then typing the number, then pressing Enter.

If any playbacks are turned on when you change page, they remain turned on. The display above the playback flashes and shows you the name of the memory which is turned on. The new memory for that playback on the new page is displayed above the old one.

If you want to use the same playback fader on a new page, you need to lower it to zero to turn off the first playback, then raise it again to turn on the new playback on the new page.
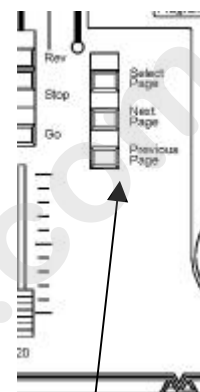
Playback
page buttons

5.6 Flash button modes

The playback faders each have two flash buttons, an "add" and a "swop". The flash buttons only operate when the key is set to "Run" mode. Pressing the "Add" button will turn on the playback in addition to any other playbacks which are running. Pressing the "swop" button will temporarily turn off all other playbacks and just run that one.

There are separate "Add" and "Swop" masters to control the overall level of the Add and Swop buttons.

5.7 Naming a memory

The Sapphire allows you to name all the memories. This can be very helpful when you are trying to remember where you put that amazing effect you created yesterday.

The name of each memory is shown on the display above the playback fader, so you can see at a glance what is stored in each fader.

5.7.1 Labelling a memory

➔ *At the main menu press softkey D, "Input Legend".*

➔ *Press the Swop button of the playback you want to label.*

➔ *Enter the label using the external QWERTY keyboard. The VGA display shows you what you are typing.*

➔ *Press Enter to save the label.*

➔ *You can label another memory by pressing another Swop button, or finish by pressing Exit.*

You can also label the playback pages by pressing the Select Page button, and the palette pages and select buttons by pressing the button next to the display you want to set.

> Note: If you don't have a QWERTY keyboard connected, you can enter letters using the Swop and Add buttons on Preset Faders 1-26. The Swop buttons enter capitals and the Add buttons enter lower case letters.
>
> If you don't have a VGA display, you can still enter names but you can't see what you have typed until you press Enter. You also need to remember to press Exit when you have finished, to get out of Input Legend mode.

5.8 Setting fade times for a memory

You can set a fade in and fade out time independently for every memory. The fades only affect HTP (intensity) channels, and are set using softkey C for fade in and D for fade out. There is also a separate LTP timer which allows you to set movement times, set using softkey E.

5.8.1 Setting fade times for a memory

➔ *Press softkey C, "Edit Times".*

➔ *Press the Swop button of the playback you want to set times for*

➔ *The display shows you the times you can set.*

➔ *Press softkey C to set Fade In time, or Softkey D to set Fade Out time.*

➔ *Use the numeric keypad to enter the new time. Press Enter to save it.*

➔ *Press Enter when you have finished. If you press Exit, the changes you have made will not be stored.*

There are some other timing functions available as well, which you don't need to worry about at the moment. They are described in the reference manual.

5.9 Copying a memory

Copying a memory is very fast and simple.

5.9.1 Copying a memory

➔ *Hold down the Add button of the memory you want to copy.*

➔ *Press the Swop button of the playback you want to store it in*

➔ *You can change the playback page while you are holding down the Add button, if you want to copy a memory to a different page.*

The new memory will be a linked copy of the old one. If you change a memory which is linked, all the other memories linked to it will change too.

You can create a completely separate copy of the memory using the "Photocopy" function. Just press the Photocopy button (one of the blue command buttons) before you start the copy. If you have named the memory, the name will not be copied, indicating that it is a "new" memory.

5.10 Clearing a memory

If you want to clear a memory so you can store something else in it:

5.10.1   Clearing a memory

➔ *Press Delete (one of the blue command buttons)*

➔ *Press the Swop button of the playback you want to delete*

➔ *Press the Swop button again to confirm the delete.*

If the memory is linked to other memories, the others will not be affected.

5.11 The Include function

Sometimes it's useful to be able to re-use some aspects of a memory you have already created in another memory. If you've created a really nice combination of colours, for example, you might want to use it again in another memory with different gobos and positions.

Normally when you play back a memory, the information is not loaded into the programmer, so you can't use it to make another memory. The Include function lets you load selected parts of a memory into the programmer. You can then use these parts in a new memory.

The Include function loads selected attributes of selected fixtures into the programmer. So, for example, if you have a memory which contains position, colour and gobo information for 8 fixtures, you can use the Include function to load only the colour information for 4 of the fixtures into the programmer. You could then "include" position information from another memory into the programmer, and build up a new memory using information from several existing memories.

5.11.1   Using Include

➔ *Press the Include button.*

➔ *Select the fixtures from which you want to take settings. If you don't select any fixtures, all fixtures will be used.*

➔ *Select the Attributes you want to include. The Dimmer attribute will include all other attributes (the lights on the buttons show which attributes will be loaded).*

➔ *Press the Swop button for the memory you want to include.*

➔ *The selected attributes of the selected fixtures will be loaded into the programmer.*

You can Include an entire memory by ensuring no fixtures are selected and selecting the Dimmer attribute.

If the memory you are including contains shapes, the shapes and all the fixtures they are applied to will be loaded, whether they are selected or not.

Include is also useful when you are programming chases, which is described in the next section.

5.12 Editing memories

You can edit any part of a memory you have already saved simply by

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making the changes and saving the new information on top of the memory.

5.12.1   Editing a memory

➔ *Press Clear to empty the programmer.*

➔ *Turn on the memory you want to edit, so you can see what you are doing.*

➔ *Select the fixtures you want to change, and make the changes.*

➔ *Press Memory.*

➔ *Press the playback swop button for the memory you are editing to save the changes.*

The changes you have made are saved into the memory. None of the other information in the memory is affected.

If you need to remove fixtures or individual attributes of fixtures from the memory, you can use the "Off" function to do this. The "Off" function is described in the reference manual.

5.13 "Record by fixture" and "record by channel" modes

Normally the Sapphire records all the attributes of any fixture you change. However, the Sapphire also has a more selective mode of operation. You can choose the mode by holding down the Avo button and pressing Softkey C. The display shows the current setting of the option.

- **Record by fixture**: This is the normal mode of the Sapphire. It means that when you record a memory, all attributes of every fixture that you have changed are recorded in the memory. So if you change only the position of a fixture, the colour, gobo, intensity and all other attributes of that fixture are recorded as well. This is useful because you know that when you recall the memory, it will look exactly as it did when you saved it. However, it can be slightly inflexible if you want to combine memories.

- **Record by channel**: This means that only attributes you have changed are recorded in the memory. So if you change the position of a fixture, only the position is recorded. When you recall the memory, the colour, gobo etc will remain as they were last set. This means you can use a memory to change the position of some fixtures while leaving the colour set from a previous memory, allowing more variety when you are running a show. It is a powerful feature but you can easily get yourself into trouble with it, so you need to be sure which attributes you need to record and which you want to "show through".

5.14 Using shapes in memories

As you would expect, any shapes you have set up will be saved as part of the memory. If you are using Record by Channel mode, there are some interesting possibilities.

If you have changed the position of the fixture, then the new position will be stored in the programmer. When you recall the memory, the fixture

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will start the shape at the position you set in the memory.

If you have not changed the position of a fixture, when you recall the memory the shape will run at whatever the current position of the fixture is. This allows you to make a "shape only" memory which overlays shapes on the current positioning of the fixtures.

CHAPTER SIX

6. Recording and playing back chases

In this chapter: how to record chases

- explanation of chases
- programming a chase
- running a chase
- setting speed and crossfade
- stacks and sequence control
- editing a chase
- sound activation of chases

As well as being used for recalling static memories, the playback faders on the Sapphire can also be used for recalling chases.

6.1 What is a chase?

A chase is simply a sequence of static positions. Each position is known as a "step". It is normally used to flash lights in a sequence without you having to keep pressing buttons, or to move fixtures around. Chases can run automatically, or by pressing a "Go" button. If you are using the Sapphire for theatrical lighting, you can use a chase to store cues for a show. The Sapphire also has a dedicated theatrical lighting mode which has a section of its own at the end of this chapter.

Don't get shapes confused with chases. A shape simply moves one attribute of the fixture around in a pattern. A chase allows you to define the attributes of the fixture in a step-by-step controlled manner.

However, you will find that using shapes saves you a lot of work, and you won't have to program as many chases as you would on a conventional lighting desk.

6.2 Programming a chase

To program a chase, you have to set up the lighting for each step of the chase. You can either set all the fixtures and dimmers manually for each step, or you can use Include to load in the information from memories you have already recorded.

Note: You can't use shapes in a chase.

6.2.1 Programming a chase

➔ *Press the Chase button.*

➔ *Press the Swop button of the playback where you want to store the chase.*

➔ *Set up the lighting for the first step, either manually or by using "Include" on existing memories.*

➔ *The display shows the step number*

➔ *Press the playback Swop button or the Enter button to record the step. The information from the programmer is stored as Step 1 of the chase.*

➔ *Press Clear, set up the lighting for the second step, then*
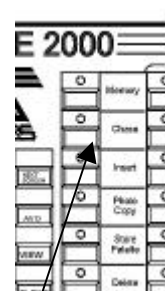
Chase button

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press Swop or Enter again to save step 2.

➔ *When you have saved as many steps as you want, press Exit or Softkey G to finish.*

6.3 Running a chase

Running a chase is just like turning on a memory. Just raise the fader and the chase will start to run.

The HTP (intensity) channels in the chase will be controlled by the position of the fader. The other channels (LTP) will be set as soon as the fader moves above zero. You can pre-position the LTP channels to the first step by pressing the Preload button of the playback.

The chase normally starts at step 1, and runs forward. You can pause the chase and change the direction of the chase using the Sequence control buttons to the right of the wheels.

There are lots of options you can set which let you do fancy things with chases, such as Random, One-shot, special timing, and manual step mode. The details are in the reference manual.
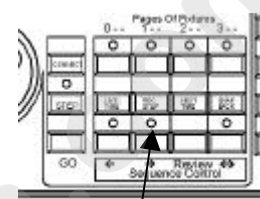
Sequence control buttons

6.4 Setting speed and crossfade

When you run a chase, the wheels are assigned to control the Speed and Crossfade of the chase (crossfade is the "slope" between steps, from instant switching to continuous fading).

You can save a speed with the chase, so that every time you play it back, it runs at the same speed.

6.4.1 Saving chase speed

➔ *Turn on the chase you want, and set the speed to the setting you want.*

➔ *Press softkey A "Chase Menu".*

➔ *Press softkey A again (this time it's "Save Speed")*

➔ *The display will show "Saved".*

You can also save the current direction of the chase by pressing softkey B.

If you are running several chases, the wheels are assigned to the most recently selected chase. You can "connect" the wheels to one of the other chases by pressing the Connect button to the right of the wheels, then the playback Swop button for the chase you want to connect to.

6.5 Stacks and sequence control

The most common use of a chase is as an automatic continuous sequence. However, the Sapphire lets you step chases manually using the Go button, which allows you to use them for theatrical lighting cues or "One shot" chases. When you use a chase like this, it is sometimes

known as a "Stack".

The Sapphire has a dedicated theatrical lighting mode which is described in detail in the next chapter.

6.5.1   Creating a stack
➔ *Save each cue state as a step in a chase.*
➔ *Press Softkey C, "Edit Times"*
➔ *Press the playback Swop button for the chase*
➔ *Press Softkey G to set LINKS = OFF for the whole chase*
➔ *Press Enter to save the setting.*
➔ *Raise the playback fader to activate the chase.*
➔ *Press the Go button to run each cue.*

You can set the fade in and fade out times independently for each cue using the Live Time button.

6.5.2   Setting cue times on a stack
➔ *Start the chase by raising the fader.*
➔ *Press the Live Time button to set the times for the current cue.*
➔ *Use softkeys A-G to set the times you want*
➔ *Press Enter to save the settings or Exit to abandon them.*
➔ *Press the Go button to go on to the next cue.*

You can also set a text label for each cue. The Sapphire will show you the label for the current cue and the next one coming up. The reference manual tells you more details about this.

6.6   Editing a chase using Unfold

The Sapphire has a powerful chase editing system. The Unfold button places each step of a chase on one of the playback faders, allowing you to examine and edit each step individually as if it was a normal memory.

If your chase has more than 15 steps, you can swap to the next 15 steps using softkey F, or the previous 15 steps using softkey E.

6.6.1   Editing a chase using Unfold
➔ *Press the Unfold button*
➔ *Press the playback Swop button of the chase to be edited*
➔ *The first 15 steps of the chase are loaded into playback faders 1-15*
➔ *Raise a playback fader to view the contents of the step*
➔ *The softkeys show a list of options which can be used for the step*
➔ *To edit the contents of the step, make the changes then use softkey A*
➔ *To change the times of the step, use softkey B.*
➔ *Press the Unfold button again to finish.*

While the chase is unfolded you can press Softkey G, "Set Legends" to set a label for each step.

You can also edit chase steps while you are running the chase, without using unfold. The "Rec Step" button allows you to record the current programmer settings directly into the current step of the chase. This is described in more detail in the reference manual.

6.7   Sound activation of chases

The Sapphire can use bass, mid or treble frequencies from its audio input to trigger chases. Playback 1 is triggered from low frequencies (bass), playback 2 from mid and playback 3 from high frequencies (treble).

Sound mode only works with the key turned to Run.

6.7.1   Sound activating chases

➔   *Turn the key to Run mode.*

➔   *Press softkey E, "Enable Sound to light"*

➔   *Chases stored in playbacks 1,2,3 will step in time to the sound signal*

➔   *The Speed wheel controls the maximum speed of the chase*

➔   *Press softkey F, "Disable sound to light" to turn off sound activation.*

Also while in Run mode you can set the chase speed manually by tapping Softkey G in time with the music.

CHAPTER SEVEN

7. Theatre mode

In this chapter: the Sapphire's theatre mode

- Setting theatre mode
- Theatre controls
- Plotting a cue
- Naming a cue
- Setting fade times for a cue
- Jumping to a cue
- Running the show

Theatre mode is a new addition to Avolites consoles. It makes the Sapphire behave like a standard theatrical console, allowing you to program your whole show as a sequence of cues, and play it back just by pressing the Go button. Playback faders 17-20 become dedicated cue masters. The rest of the console continues to operate as normal, so you can run the main cues from the theatre mode, and spot effects from the other playback faders.

7.1 Setting theatre mode

In program mode, select Softkey B "Theatre stack programming", then press Enter.

The display above playbacks 17-20 changes to show the theatre control display.

Note: When theatre mode is enabled, you can't access playbacks 17-20 on any page; if you intend to use Theatre mode it is advisable not to program these playbacks. Any programs are kept and when you turn off Theatre mode you will be able to access them again.

You can get out of the Theatre menu by pressing Softkey G, "Quit". The Exit button does not operate in this mode.

To turn off theatre mode completely, turn the key to System, press Softkey C "User Settings" then Softkey D "Theatre Mode" so that the display shows "Theatre Mode=OFF".

Theatre mode programming is not deleted when theatre mode is turned off.

7.2 Theatre controls

Fader 17 is the Master fader, controlling the overall intensity of all lights.

The Go button next to the wheels makes a cue start.

If you stop a fade part-way by pressing the Stop button, or one of the stop buttons above the faders, then Fader 18 controls the Fade In of the next step, fader 19 controls the Fade Out of the previous step, and fader 20 controls the LTP (movement) fade timer.

The buttons above 18, 19 and 20 are Reverse, Stop and Go buttons for each of these functions.

7.3 Plotting a cue

You can set up the levels for a cue either by using the preset faders to set the levels you want, or by typing in the channel number and the level.

7.3.1 Entering dimmer levels

➔ *Press Channel (at the top of the numeric keys)*

➔ *On the numeric keypad, enter the fader number of the dimmer channel (not the DMX address of the channel)*

➔ *Press softkey G, "At %"*

➔ *Enter the value to be set as 0 – 9, or Softkey G for Full. You can enter a decimal point and another number if you want more accurate level control.*

➔ *The channel you entered will be set to the level you entered.*

➔ *Press the Channel button again to go back to the normal menu*

The softkeys offer you a few more options such as up by 5%, down by 5%, blackout.

Note: You can't get out of Channel mode by pressing Exit. The only way back to the normal menu is to press Channel again.

You can also set multiple channels to the same level using softkey F, "through" button. Enter first channel, "through", last channel, "at %", level.

7.3.2 Entering multiple dimmer levels

➔ *Press Channel*

➔ *On the numeric keypad, enter the first dimmer channel number of the range*

➔ *Press Softkey F, "Through"*

➔ *Enter the last dimmer channel number of the range*

➔ *Press Softkey G, "At %"*

➔ *Enter the value to be set as 0 – 9, or.Softkey G for Full.*

➔ *The channels you entered will all be set to the level you entered.*

When you have set all the levels as you want them, type the cue number, then press Softkey D, "Record". You then need to press Softkey B, "Record Stage" to record all the intensity channels that are currently turned on, plus anything in the programmer, or Softkey D to record just the contents of the programmer (i.e. what you have manually changed). The cue will be saved.

7.4 Naming a cue

Type the step number to be named, then press Softkey E, "Set Legend". Enter the legend on the QWERTY keyboard. While you are typing, the input is shown on the VGA display.

The name of the live cue and the next cue is displayed above the theatre faders.

7.5   Setting fade times for a cue

You can set fade in, fade out and "wait" times for each cue. Press Softkey C, "Set Times" to show the options. This will set the times for the current step. You can also press the Live Time button to set times for the current step, and the Next Time button to set times for the next step. See page 23 for details of times.

7.6   Jumping to a cue

You can change the cue being edited by typing the cue number then pressing Enter. If you want to output this cue, press Softkey F, "Cut to Live" (fade times are ignored).

7.7   Running the show

If you have just been editing, you may need to type 1 then Softkey F to set the console to cue 1.

The display above the Theatre faders shows the current cue, the next cue (with names if you have set them), and the wait and fade times for fade in, fade out and LTP. "WFG" means "Waiting for Go", in other words the cue will start when you press the Go button.

For automatic cues, you can simply press the Go button next to the wheels. The console will carry out the fade with the times you programmed.

If you want to manually control a fade, you can use the in, out and LTP faders or Go/Stop buttons to operate the cue. The display shows the percentage of fade left to go. The display shows "Stopped". When Fade In, Fade Out and LTP all show "Stopped", the console moves on to the next cue.

8. The graphics tablet

In this chapter: using the graphics tablet with the Sapphire

- Using the tablet
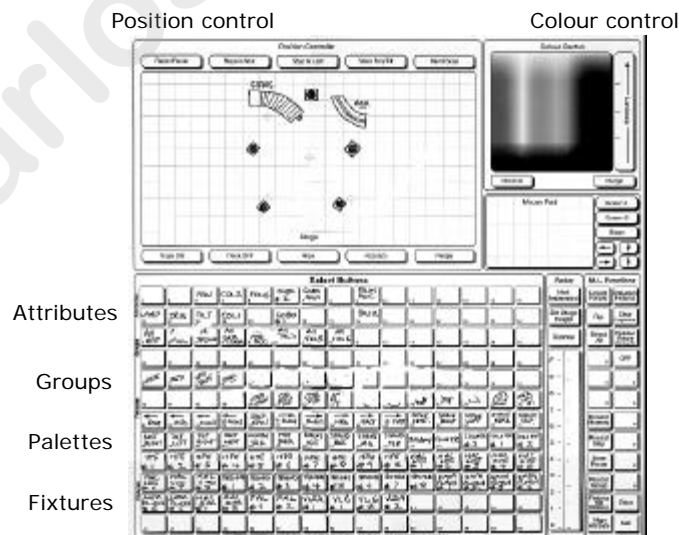- Functions available on the tablet

The graphics tablet is fitted in a cunningly concealed drawer at the left hand side of the Sapphire. It allows you to use a pen to select fixtures, groups, colours, and position the fixtures by simply drawing with the pen. You will be amazed how much easier your programming and show operating becomes when you use the graphics tablet.

8.1 Using the tablet

To use the tablet, you simply press the pen onto it. The button on the side of the pen doesn't do anything. A quick press is like pushing a button on the Sapphire. You can also draw on the tablet by keeping the pen pressed down while moving it. This is used to move fixtures or change attributes.

The Sapphire will behave as if you are pressing buttons on it in the normal way, so the LEDs and the displays will change as you use the tablet. Many of the functions of the Sapphire are quicker and easier using the tablet. Sometimes you might find it easier to do part of the function on the tablet and part on the console. The end result is the same.

The tablet has a paper overlay on it. You can write your fixture names, group names, attributes, palette entries and even draw your stage layout on the overlay so that you know what's what. Spare overlays are available from Avolites.

Position control   Colour control

Attributes

Groups

Palettes

Fixtures

8.2 Functions available on the tablet

To select a fixture or a group, just press the pen onto the fixture button or the group button. The first 60 fixtures are available on the tablet. Only the first 30 groups are available on the tablet. The Swop button LEDs on

the handles will light up to show you which fixtures are selected, as if you had pressed the actual console buttons.

You can control the position of the fixture by drawing on the Stage area of the tablet.

You can "train" the Sapphire so that it knows how all the lights are set up. Then when you point at the stage area of the tablet, all the lights will point at the same place on the stage. This is called "Tracking mode". The Reference manual tells you how to do this and how to use tracking mode.

If you press on the Nudge button, when you draw on the tablet the fixture will move relative to its current position. This can be useful if you want to slightly reposition a fixture. Press on the Absolute button to turn off this mode.

You can control the intensity of the selected fixtures by drawing on the Dimmer area.

If the fixture can do colour mixing, you can set the colour by drawing in the colour mix area of the tablet.

You can recall the first 60 palette entries by pressing the pen on the Focuses buttons.

You can change individual attributes of selected fixtures by pressing the pen on to the attribute button, then (without lifting the pen) drawing up and down on the tablet. The attribute lights on the console will come on to show you which attribute is selected.

On the right hand side of the tablet, some of the programmer functions are available, such as Clear and Locate Fixtures. You can also record groups and memories using the tablet exactly as if you were pressing buttons on the console. The details are in the reference manual.

The "Fixtures or Mimics" button allows you to set whether the LEDs in the Swop buttons show you which fixtures are selected, or the intensity of the channel.

C H A P T E R   N I N E

9. Running your show

In this chapter: running your show with the Sapphire 2000

- Showtime
- Run modes
- Master faders
- Channel mimics
- Manual control during a show

9.1 It's showtime...

When you have finished programming (or not) and it's showtime, the most important thing is to back up the show to disk (see end of section 2 on page 9 for instructions). Having done that, turn the key to Run. This means you can't accidentally change your programming when you get into a button-pressing frenzy.

9.2 Run modes

When you are running a show, there are two modes available to you, normal Run mode, which just allows you to play back memories, and Takeover run mode, which allows you to play back memories and also take manual control of fixtures. The mode also affects how the Swop and Add buttons on the console operate.

You can select the mode by pressing Softkey A, "Toggle mode". The mode is shown on the top line of the display.

- **What's not affected**: The playback faders work the same in either mode. The Preset Faders work as handles to control the intensity of the device they are patched to.

- **Normal Run mode**: the Add and Swop buttons on the handles and playbacks work as flash buttons. The "Add" button adds the function into anything else which is on. The "Swop" button turns on the function, but turns off everything else while the button is held down. The programmer is cleared and you can't manually control any LTP channels.

- **Takeover run mode**: the Swop buttons on the handles allow you to select dimmers or fixtures for manual control. This lets you add to or change your programming in real time during the show. The faders still control the intensity of the dimmers and fixtures. The Add and Swop buttons on the playbacks are disabled.

9.3 Master faders

In the bottom left hand corner of the console are the Master Faders. These allow overall intensity control of the whole console.

- The Add and Swop masters control the intensity of the Add and Swop buttons on the playbacks.

- The Preset Master controls the overall intensity of any channels turned on in the Preset faders.

- The Grand Master controls the intensity of all output from the console.

If you are in Program mode, the contents of the programmer are not affected by the Grand Master.

9.4 Channel mimics

If you are in normal Run mode, the LEDs on each handle mimic the intensity of the fixture or dimmer controlled by that handle (i.e. they are lit if it is turned on).

If you are in Takeover Run mode (or Program mode), you can choose between "Mimic" mode or "Fixture" mode, where the LEDs show you which fixtures are selected for manual control.

You select the mode by holding down the Avo button and pressing Softkey A. The button shows "Preset LEDs = Fixtures" (or mimics) depending on the mode. You can also change this mode using the Graphics Tablet.

9.5 Manual control during a show

If you have not had as much programming time as you would have liked, you might need to make up some additional effects during the show. You can create instant variations by recalling palette values to modify your existing programs.

You need to be in Takeover Run mode to do any of this.

9.5.1 Using palettes over time in Run mode

➔ *Select some fixtures which are already in use on stage*

➔ *Press "2" on the numeric keypad*

➔ *Press Softkey B, "Recall Focus"*

➔ *Recall a different colour from the Colour palette*

➔ *The selected fixtures will change to the new colour over a time of 2 seconds.*

You can also change the position of fixtures; the easiest way to do this is to use "Nudge" on the graphics tablet. This allows you to sweep selected fixtures around their programmed position by drawing with the pen, so you can alter the height of a chase or shape in real time.

CHAPTER TEN

10. Advanced features

Hopefully, by working through this tutorial manual, you now know how to set up the Sapphire, control fixtures with it, save memories and chases and use them in a show.

We have tried to stick to the basics, but the Sapphire can do many more things than we have told you so far. The reference manual expands on all the information in the previous chapters. There's also some subjects we have not touched on yet, and these are described in the reference manual. Just so you know, they are:

- User Preferences - Some console options you can change

- Setting the real time clock

- Disk functions

- Tracking - You can train the Sapphire so it knows how the fixtures are positioned relative to the stage. You can then point all the fixtures at one part of the stage by clicking on the graphics tablet. Training is described in Chapter 3.10 of the reference manual and use of the graphics tablet in tracking mode is described in Chapter 8.

- MIDI - The Sapphire has a very comprehensive MIDI control system

- Script files - You can tell the Sapphire how to run a show from a list of instructions which you can enter or record in real time. This is described in chapter 9 of the reference manual.

- Changing the operating system - From time to time Avolites release a new version of operating software, which you can load into the Sapphire

- Personality files - if the Sapphire doesn't have a personality file for your fixture you can write your own. These are described in chapter 11 of the reference manual.

- Devious hardware tricks for wiping the console

CHAPTER ELEVEN

11. Introduction to intelligent lighting

This section is for those who have not used intelligent lighting much before, who are put off by dip switches, lights that move unexpectedly and strange digital control systems that fly down microphone cables.

11.1 Ordinary lighting

Standard lighting consists of a variety of light bulbs connected to dimmers. The lights may be anything from par cans to theatrical lanterns, and the dimmer controls the intensity of the light. A typical controller for standard lighting has a set of sliders, and each slider controls the intensity of one dimmer using a low-voltage control signal of 0 to 10 volts. The standard way to link the sliders to the dimmers is by using a multicore cable with one core for each dimmer channel.

11.2 So what is intelligent lighting?

Intelligent lighting usually contains more functions than just intensity; a typical intelligent light, often called a "fixture", can also change colour, project different patterns (called "gobos") and direct the light beam in any direction using a movable mirror or by motorised control of the light unit itself. The fixtures are called "intelligent" because they contain a small computer which controls the movement of the internal motors in response to the control signals. Most fixtures can also listen to music and produce their own light show, sometimes synchronising themselves with other intelligent fixtures. However they are actually not all that intelligent and usually need a user to make them do something interesting.

11.3 How do you control it?

Each function of an intelligent fixture requires its own control signal, so the user can select the colour, position, gobo etc. You can use 0 to 10 volt control signals on some fixtures, but the cable carrying the control signals again has to be a multicore with one core for each function, so each fixture might need 8 or more cores in the control cable. Some of the more complicated fixtures use 20 channels.

When several fixtures are used, the number of cores needed in the control cable soon becomes large. The cable also has to split at each fixture. It all gets a bit complicated.

11.4 The DMX control system

Fortunately, there is an easy to use system for controlling intelligent lighting and dimmers. It is called DMX-512, which stands for Digital MultipleX, and it sends up to 512 control signals down a 2-core screened cable. The cable can be simply daisy-chained from each fixture to the next. Microphone-style XLR connectors are usually used, sometimes 3-pin and sometimes 5-pin.

The DMX system sends out the level for channel 1, followed by the level for channel 2, then 3, then 4 and so on, all the way up to a maximum of 512 (though not all DMX systems send out all the channels). It then goes back to channel 1 again. All the units connected to the DMX receive all the channels, and you tell them which channels to respond to by setting

the "base channel" or "DMX address" on each unit. The computer inside the fixture waits for the correct channels to come up, then reads in the levels for those channels.

Dimmers can also understand DMX; some dimmers can read it directly, others use a demultiplexer or "demux" to convert the DMX into the normal 0 to 10 volt analogue signals they are used to.

11.5 Moving light control desks

Sliders are ideal for controlling dimmers. More complicated dimmer control desks have memories to record the level of all the dimmers, so you can recall a setting without having to set all the sliders again during a show.

However, once you start controlling lights that move and change colour, sliders become less ideal, because it is the movement rather than the end level which is important. Dedicated moving light desks such as the Sapphire include many helpful functions which makes the programming of intelligent lighting much easier, such as palettes of pre-programmed colours and positions, and a shape generator to create movements.

11.6 A few cautions about using DMX

DMX is a robust system which normally works very well, but sometimes it can be problematic. Here are a few tips for making DMX work well.

- DMX cabling should be twisted-pair data cable. Microphone cable is not recommended because it doesn't transmit the signal as well. You will probably get away with it, but equally you might have problems.

- Always connect a terminator plug on the last fixture. This has a 120 ohm resistor across the DMX line and prevents data interference on the line. It might work without but…

- Don't split the DMX cable. Loop it from one unit to the next. If you have to split it, use a proper active splitter unit.

- Don't try to run more than 16 fixtures from one DMX line unless the fixtures are buffered. Either use several DMX lines (the Sapphire has four) or use a DMX repeater unit. Again, you will probably get away with using more if you have to, but the DMX signal will be weaker than it should be.

- Don't run your DMX lines near high voltage cables or neon. They may pick up interference which will stop the system working, or worse, blow up the receiver electronics in the fixtures (this really does happen).

CHAPTER TWELVE

12. The Sapphire 2000 for Pearl experts

If you are used to using the Avolites Pearl 2000 console, this section gives you a quick rundown of the differences between the Pearl 2000 you know and love and the Sapphire 2000. There are not that many differences.

12.1 The handles

Whereas the Pearl only allows you to use the bottom bank of preset faders as handles (giving you 30 in total), the Sapphire allows you to use all 100 faders as handles. Each fader has its own Swop button for selection purposes.

12.2 The palette section

You will have noticed the direct access palette (preset focus) buttons on the top right hand corner of the Sapphire. These allow you to select palette pages and palette entries very quickly. The display next to the buttons shows the contents of the palette. There are 10 pages of 20 palette entries, and 10 pages of 20 shapes. The palettes on the top screen are numbers 1-10 and on the bottom screen are 101-110, for the first page.

You can also use the Add buttons on the preset faders in the time-honoured Pearl fashion, if you prefer, but the bottom 10 entries in each page can only be selected using the palette buttons or numeric entry.

On the Sapphire, focuses and preset focuses are normally (but not always) referred to as palettes.

12.3 The playbacks

The Roller is no more, the playbacks now have a display above each slider which tells you what's in it. You set the playback names by pressing Set Legend (Softkey E), then the Swop key of the playback, then typing the name on the external QWERTY keyboard (you can also use the 1-26 Add and Swop buttons as letters). The roller itself is replaced by Page Select buttons.

If you change pages with playbacks active, the top part of the display shows you the name of the active playback, while the bottom part shows you the name of the new playback.

The page select buttons consist of a Next Page, a Previous Page and a Select Page button. The Select Page button allows you to enter the page number on the keypad.

There is a new "Preload" button for each playback which allows you to pre-position the LTP channels in the playback before you raise the fader (if you have set LTP fade times they will still apply).

There is an entirely new "Theatre mode" which provides a dedicated Theatre Stack. It uses playback faders 17-20. While enabled, the rest of the console can be used as normal, except Chase Autoconnect is disabled.

12.4 The programmer

When you are saving memories, both LTP and HTP channels will only be saved if they are in the programmer. (On the Pearl, HTP channels were saved as seen whether or not they were in the programmer.) You can use the Record Stage function to record the active HTP output channels as well as the programmer contents.

12.5 Record by fixture / by channel

The Sapphire only works in Record by Fixture mode when saving a new memory, or adding a fixture not currently used in an existing memory. If editing channels on a fixture already recorded in a memory, then only the changed channels are recorded.

12.6 Stage View

The main VGA output has been changed to show the output of the console in a more useful way. The display shows the output channels for each type of fixture patched on the console. You can choose which type of fixture to view using the left-right arrow keys. If you have more than ten fixtures of one type, the up-down arrow keys allow you to scroll through them. You can also select Intensity, which shows you the output of all the HTP (intensity) channels.

Sapphire 2000

Reference Manual

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CHAPTER ONE

1.   Setting up the console

This chapter contains: Connecting mains power; connecting DMX lines; connecting MIDI devices; connecting audio; the disk drive; other back panel connections and controls; desk modes.

1.1   Connecting mains power

Important! Before connecting the mains power to the Sapphire you must ensure the voltage selector switch next to the mains socket is set to match your mains supply. It can be set to 120V or 220V.

If you connect mains power with the switch set incorrectly, you will probably blow up the power supply unit. If this happens you will need to shamefacedly return the console to Avolites for repair.

1.2   Connecting DMX lines

The Sapphire can output DMX down 4 separate lines. When you patch a dimmer or fixture you can tell the Sapphire which DMX line it is on. The lines are identified by the letters A,B,C,D. Normally A comes out of output 1, B comes from 2, C from 3, and D from 4, but just to add to the fun you can swap this round if you want (see Patching, section 2).

The 4 DMX outputs come out of the 5 pin XLR sockets on the back of the console. They are wired like this:

DMX line	Pin numbers	Socket
1 (normally A)	2=Data - 3=Data +	1
2 (normally B)	2=Data - 3=Data +	2
3 (normally C)	2=Data - 3=Data +	3
4 (normally D)	2=Data - 3=Data +	4

1.3   Connecting MIDI devices

The Sapphire has the usual MIDI IN and OUT connections. It can read MIDI information and use it to trigger a show, and it can output MIDI information in response to user actions on the controls. This means you can record a show straight into a MIDI sequencer by operating the show yourself using the buttons and sliders. The MIDI operation of the console is described in section 10 on page 161.

1.4   Connecting audio

The Sapphire has a left and right audio input socket, which are used for sound to light functions.

There is an internal link on the PCB to set the overall sensitivity of the audio inputs. It is located near the audio connectors and is labelled "Preset Gain Links". It can be set to 0dB, 20dB or 40dB by bridging one of

the pairs of jumpers. The link should normally be set to 0dB for a line level input, and 20 or 40dB for a microphone level input.

1.5 The disk drive

The Sapphire has a 1.44M floppy disk drive which is used to load and save shows, personality files and system software. The standard PC disk format is used, so you can transfer data to and from your PC. You can use the smaller 720K disks, but large shows may not fit!

You should get into the habit of backing up your show to disk regularly to guard against that moment when something goes wrong. It doesn't take long.

1>   *Press the Disk button in the bottom right hand corner of the Sapphire*

2>   *Insert a blank formatted 1.44M disk into the disk drive.*

3>   *Press softkey B, "Save show to disk". Enter a name on the QWERTY keyboard. The Sapphire will save the show.*

4>   *To reload the show, use softkey A, "Load show from disk".*

Other disk drive functions are available when you have pressed the Disk button. The disk drive functions are described in section 10 on page 161.

1.6 Other back panel connections and controls

Also on the back panel are the following:

The QWERTY socket is for connecting a standard PC keyboard. This is used for entering legends to name memories, chases and palettes. You should connect the keyboard *before* you turn the power on.

The VDU socket is for connecting a VGA display. Any standard VGA display will be OK. You do not have to connect the VGA display as most information is shown on the console's on-board displays, but some extra displays are available on the VGA display which are useful when programming or operating a complex show.

The Desk Lamp sockets on the top edge of the console are for the gooseneck lights.

The Reset button on the back right hand corner of the console allows you to restart the Sapphire if something funny happens to it. The Sapphire will come back to the same place it was in when you pressed Reset, but all playbacks will be turned off. The memory is not affected.

1.7 Operating modes

The Sapphire has a key-operated switch next to the main display which allows you to select the operating mode of the console.

When running a show, you normally select Run mode. You can run playbacks and (in Takeover run mode) manually control fixtures (see page 153). You cannot change any programming. This is the best mode if others are operating the console and you want to make sure they can't mess up your programming. Just take the key with you!!

When programming, you need to be in Program mode, which you access by turning the key to Program. *This manual assumes you are in program mode.*

System mode allows you to clear the console using softkey F, "Wipeall", and to access AVO mode. This allows you to do anything to the console, including Wipeall, various diagnostics and loading a new operating system. There are more details about AVO mode in Section 10 on page 163.

1.8   The front panel controls

If you need a quick guide to what all the controls do on the front panel (and boy, are there a lot of them) there is a quick rundown in section 1.2 on page 2 of the Tutorial guide.

CHAPTER TWO

2. Patching

This chapter contains: Fixture handles; patching dimmers; patching moving light fixtures; checking the patching; changing the DMX address; moving a fixture to a different handle; deleting a patched fixture; patching options.

Patching is the process where you tell the Sapphire

- What type of lighting units you have connected to it

- What DMX addresses they are operating at

- Which DMX output line each unit is connected to (there are 4)

- Which "handles" (control sliders) you want to use to access them

You can either patch the DMX channels on your console to match your lighting rig, or set up the console first and then set the lighting rig to match.

The Sapphire must be in Program mode before you can patch.

2.1 Fixture handles

Handles (Preset faders)

The Sapphire can control up to 400 intelligent fixtures or dimmer channels. To do this it has 4 pages of 100 control "handles". The handles are located in 2 rows of 50 along the top of the console. Each handle consists of a slider, used to set the intensity of the fixture or dimmer patched to the handle, a "Swop" flash button which is used in program mode to select the fixture, and an "Add" flash button.

The fixture page buttons are located just to the right of the wheels. Fixtures 1-100 are on page 0--, Fixtures 101-200 on page 1--, 201-300 on page 2—and 301-400 on page 3--. You can change the fixture page at any time.

The Sapphire also allows you to allocate fixtures and dimmers to Groups, which can be useful if you usually select the same set of fixtures together. Groups are described in the next chapter.
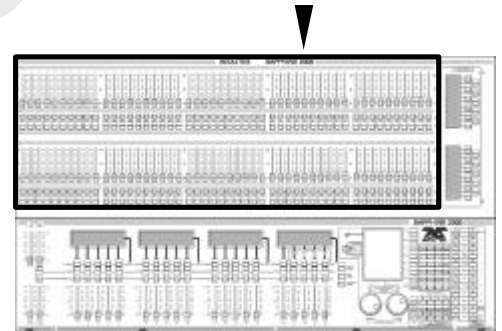
2.2 Patching dimmers

Each dimmer channel is allocated to one handle. If you want to link dimmers together, you can allocate several to the same handle.

1> Press Patch, then Softkey A "Dimmer"

2> On the top line of the display, the Sapphire shows the DMX address it is going to patch at. You can change this using the numeric keypad. You can also use softkey C "Select a DMX line" to patch onto one of the other 3 DMX output lines.

3> To patch a single dimmer, press a handle Swop button. To patch a range of dimmers, hold down the Swop button for the first dimmer in the range, then press the last Swop button in the range. The range of dimmers will be patched to sequential DMX

addresses.

4> To patch another dimmer to the same handle, enter the new DMX channel and press the Swop button again

5> Repeat from step 2 for other dimmers.

- The VGA display will show the channels which have been patched. You can patch multiple dimmers onto the same handle by simply pressing the Swop button again when you get to the DMX address for the appropriate dimmer.

- When in Dimmer Patch mode you can set options for dimmer channels which you are going to patch. You can set the "Full on" level to less than 100% using option A, and select a different dimmer response curve using option B. To use the "User curve" setting you need to load in a user curve, see page 161. These settings affect all dimmer channels you patch afterwards, until you change the settings again. Channels you have already patched are not affected.

2.3   Patching moving light fixtures

Moving light fixtures are more complicated to patch than dimmers because they have more attributes to control, such as pan, tilt, colour etc., where a dimmer channel just has intensity. When you patch a fixture, you will see on the display that it occupies a block of DMX channels rather than just one.

The Sapphire uses a "personality" system to control fixtures. There is a personality file in the Sapphire for each fixture, which tells it what attributes are available and how to control them. In the unlikely event that there isn't a personality for the fixture you are using, you can either create one yourself (see chapter 11) or contact Avolites, who will be able to create one for you.

Note: The Sapphire holds all the personalities in an internal "cache" file. If the console memory gets wiped you might need to reload the file, how to do it is described on page 160. You can also use a Personality Disk in the disk drive.

If you are using the internal personality cache, ensure there is no disk in the disk drive.

1> Press Patch, then Softkey B, "Choose a Fixture".

2> The Sapphire will read the personality files, then display "Please select an instrument". A list of known fixtures will appear next to the softkeys after a pause.

3> Use Softkey F (next) and Softkey G (Back) to go up and down the list and find the correct fixture, then press the softkey next to the fixture to select it.

4> The Sapphire loads the fixture information. The display shows details of the fixture.

5> The Sapphire will ask "Automatically create focuses?". Press Softkey A for Yes. This loads a standard set of positions, colours and gobos into the Palette pages which can be useful when programming. If you say No now, you can't load them later.

6> On the display, the Sapphire shows the DMX address it is going to patch at. You can change this using the numeric keypad. You can also use softkey C "Select a DMX line" to patch onto one of the other 3 DMX output lines.

7> Press an unused handle Swop button to patch the fixture. The display will show the block of channels occupied by the fixture. If you want to use a different fixture page, select the new page first.

8> Repeat from Step 7 to patch more of this type of fixture.

9> Press softkey A ("Select another fixture") and repeat from Step 3 to patch a different type of fixture.

- You can patch a range of fixtures by holding down the first and last Swop buttons of the range, the same as for dimmers.

- You cannot patch more than one fixture onto a handle. If the handle is already used, the patch will fail. Use a different handle or delete the fixture already on the handle if you don't want it any more.

- Some fixtures can only be patched at certain DMX addresses. This is usually described in the fixture instruction manual. If this information is included in the fixture personality, the Sapphire will allow you to patch the fixture at an illegal address, and will offer the next valid address instead.

- If you are patching a fixture which uses a separate dimmer channel such as a VL5™, you can patch the dimmer channel onto the same handle as the moving light part of the fixture, so you can control it all together.

2.4 Checking the patching

Having set the Sapphire, you need to ensure that your lighting rig is set up to match the Sapphire by going round your rig to set the DMX addresses.

You can display the DMX settings on the Sapphire like this.

1> Press the View button next to the numeric keys

2> Press Softkey D, "Fixture Patch"

3> The display shows a list of the handles to which you have patched fixtures or dimmers, with the DMX line and address (e.g. A24 is address 24 on DMX line A).

4> The top handle on the list has an arrow next to it. The lower part of the display shows more information for this handle, including dip switch settings if the fixture personality includes this information.

5> Use the up-down cursor arrows to change the selected fixture. The left-right cursor arrows will show you another page of handles.

6> Repeat from Step 4 to view other fixtures.

- Press View, then Softkey C "DMX patch" to display a list of all DMX channels, what they are allocated to and the current output. The cursor arrows scroll through the list.

- Press View then a handle Swop button to display the settings for the fixture patched to that handle.

- You do not need to be in patch mode to view this information, you can do it at any time.

2.5   Changing the DMX address of a fixture

You can re-patch a fixture to a different DMX address or a different DMX output line. All programming is kept.

1>   Press Patch (if you're not already in Patch mode).

2>   Press Softkey E "Repatch Fixtures".

3>   Use the numeric keypad to enter the new DMX address of the fixture. If you want to change the DMX output line, press Softkey E "Select a DMX line" and choose a new output line by pressing A B C or D.

4>   Press the handle swop button for the fixture to patch that fixture at the new address.

5>   Press Enter to confirm the change.

6>   Repeat from step 3 if you want to change other fixtures.

- If the new DMX address was already used by another handle, the fixture or dimmer on that handle will be "parked". All programming for the handle is preserved, but you need to patch it to a new DMX address using the above procedure before you can use it again. If you view the fixture patch as described above, the display will show "park".

2.6   Moving a fixture to a different handle

You can move a dimmer or fixture from one handle to another simply by entering the DMX channel to match the address of the fixture, then patching it again onto another handle. However, *all programming is lost* for that dimmer channel or fixture.

2.7   Deleting a patched fixture

You can delete a fixture or dimmer from a handle if you patched it accidentally or if you change your rig and want to use the handle for something else.

1>   Press Patch (if you're not already in Patch mode).

2>   Press Delete (the light will flash).

3>   Press the Swop button of the handle you want to delete.

4>   Press Enter to confirm.

You can delete individual DMX channels from a handle by typing the channel number instead of pressing a Swop button. This is useful for deleting dimmer channels from handles which have multiple channels patched to them. Be careful not to delete individual channels out of fixtures using this function.

2.8   Patching options

The Sapphire allows several options to be set for each fixture or dimmer when it is being patched. The Patch Options menu is accessed by pressing Softkey F "Patch Utilities" while you are in patch mode. Set the options before you start programming, because memories will play back differently when the options are on.

The options are:

A: Invert - Allows you to invert an attribute of a fixture, so when you set

zero the output will be full. You cannot invert some attributes.

1>	*Select the fixtures you want to invert*
2>	*Select the attribute you want to invert by pressing the Attribute Select button (some can't be changed)*
3>	*Press Softkey E or F to invert the attributes shown (the softkey shows the current setting as NORMAL or INVERTED)*
4>	*Repeat from 2 if you want to invert more attributes, or 1 if you want to change other fixtures.*

B: Set/Reset Instant mode - When the Sapphire fades LTP (movement) channels between two memories, the LTP values normally change smoothly. You can set Instant mode to make the channel snap instantly to the new value.

1>	*Select the fixtures you want to change*
2>	*Select the attribute you want to change (some can't be changed)*
3>	*Press Softkey E or F to change the attributes shown (the display shows INSTANT or FADE)*
4>	*Repeat from 2 if you want to change more attributes, or 1 if you want to change other fixtures.*

C: Swap pan and tilt - If you have some fixtures mounted sideways, it can be useful to swap the pan and tilt channels over.

1>	*Press the Pan/Tilt attribute button so you can see the setting*
2>	*Press the Swop buttons of the fixtures you want to change*
3>	*Repeat from 2 to change other fixtures.*

D: Set DMX lines - The Sapphire has 4 DMX output lines, this option lets you set which connectors they come out of. You can output the same DMX line from more than one connector if you want to.

The console shows the current settings of the DMX outputs on the VGA display. You need the VGA display connected to set this option, as the settings are not shown on the on-board display. Use the cursor arrows to select the output you want to change. Press Softkeys A-D to select the DMX line you want to come out of this output.

You can also use this option to set the highest DMX channel to transmit. This will speed up the DMX refresh rate if you are not using all 512 channels. (This option can also be set from the User Preference menu).

E: Find fixture - This option lets you find "lost" fixtures (if you have set the DMX address and forgotten what it was, or a fixture has gone off on its own). You need the VGA display connected to use this option as the settings are not shown on the on-board display.

1>	*Using the cursor arrows, select the type of fixture & press enter*
2>	*Spin wheel A until the fixture responds (open white beam, central position)*
3>	*You can change the DMX output line using the A B C D softkeys or directly enter a channel by pressing softkey G*
4>	*Read the DMX address from the VGA display.*
5>	*Press Exit when you have finished.*

CHAPTER THREE

3. Controlling dimmers and fixtures

This chapter contains: Selecting fixtures and dimmers for control; changing attributes of the selected fixtures; using groups; selecting fixtures one at a time; the align and flip buttons; killing off a fixture; using palettes; entering levels as numbers; the ML menu and tracking; viewing the output.

When you are programming a show, and sometimes when you are running a show, you need to manually control the fixtures and dimmers to set the intensity, position, colour, etc. To do this you first select the fixtures you want to change, then you set the attributes of those fixtures.

3.1 Selecting fixtures and dimmers for control

To select the fixtures or dimmer channels that you want to control, you use the handle Swop buttons. You can select fixtures or dimmers individually, or several at once.

You can control dimmer channels and fixture intensity directly from the fader control of the handle, or select the channels as described below and use the Dimmer attribute.

1> Press the handle Swop buttons for the fixtures you want. The LED in the Swop button comes on for selected fixtures (they are also shown in dark blue on the VGA display)

2> To select a range of fixtures, hold down the Swop button for the first fixture then press the Swop button for the last fixture.

Here are some other things to know:

- Press ML Menu then Softkey A, "Locate Fixture" to position the selected fixtures in open white at a central position (dimmer channels go to 50%). These values are not loaded into the programmer - you can't save them unless you modify them.

- You can deselect a fixture by pressing the fixture select button again.

- Once you have changed any attribute, pressing a handle Swop button will deselect all fixtures and start the selection process again.

- You can select fixtures on another page by pressing one of the "Pages of Fixtures" buttons.

3.2 Changing attributes of the selected fixtures

"Attributes" are the functions of the fixture, like pan, tilt, colour, dimmer, etc. You select which attributes you want to modify using the buttons on the right edge of the console and set values using the wheels at the bottom of the Sapphire. The attributes available depend on the fixture type. Dimmer channels only have a dimmer attribute. The Sapphire can control up to 40 attributes per fixture.

Attribute select buttons
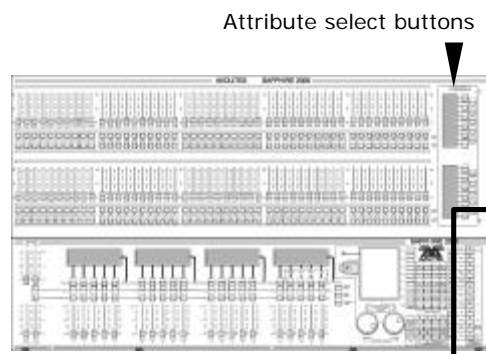
Each attribute button controls two attributes, one on the left wheel and one on the right wheel.

> *1>* *Press the button for the attribute to be changed*
> *2>* *Turn the wheels to set the attribute. The display above the wheels shows which attributes are being controlled.*
> *3>* *Repeat from 1 to change other attributes of the selected fixtures.*

Some other things to know about attributes:

- The Attribute buttons let you select the first 20 attributes. Another 20 attributes are available by pressing the "Attribute Banks 11-20" button, to cater for the weird and wonderful DMX fixtures of the future. The light on the button stays on when you are using the top 20 attributes.

- If the display does not show the attribute when you press the button, that attribute is not available on the selected fixtures.

- You can directly control the dimmer function of the fixture (or dimmer!) using the fader of the handle.

- Fixtures which don't have a Dimmer function usually use the Gobo function to black out the fixture. Gobo channels are defined as HTP channels in this case.

- You can control pan and tilt in "fine" (16-bit) mode by pressing the Pan/Tilt button twice (the LED will flash). Any fixtures capable of 16-bit movement will now be controlled more accurately.

3.3 Using groups

You can create groups of fixtures or dimmer channels, to make selecting them faster. You can, for example, make a group for each type of fixture, or group by left / right stage, etc. You can then select all the fixtures in the group just by typing the group number and pressing Softkey A.

> *1>* *Select the fixtures/dimmers you want in the group (the order in which you select them will also be stored in the group)*
> *2>* *Press ML Menu, then softkey D, "Record Group"*
> *3>* *Type the group number you want to store it as, and press Enter*
> *4>* *Repeat from 1 to store other groups*

Other useful things to know about groups:

- Once you have created a group, you can then quickly select all the fixtures/dimmers in the group simply by typing the group number, then pressing Softkey A. All other fixtures and dimmers are deselected.

- The order in which you select the fixtures takes effect when you use the last fixture – next fixture functions described in the next section, and when you use Shapes and Fan mode.

3.4 Selecting fixtures one at a time

If you have selected a range of fixtures, or a group, the Sapphire has functions to step through the selected fixtures one at a time. This can make it easier to program a range of fixtures because you don't have to select each one manually.

This mode uses the "Sequence Control" buttons which are normally used for controlling chases.

> *1> Put the Sapphire into Fixture Select mode by holding down the AVO button and pressing Softkey B until the option shows "Fixture Control Enabled"*

Sequence control buttons

> *2> Select a range of fixtures or a group*
>
> *3> The ← (Reverse) and → (Forward) buttons will select the fixtures in the range one at a time*
>
> *4> The ←→ (Bounce) button will highlight the output of the selected fixture so you can see it on stage (the button LED is lit when in Highlight mode)*
>
> *5> The Review button reselects the whole range of fixtures.*
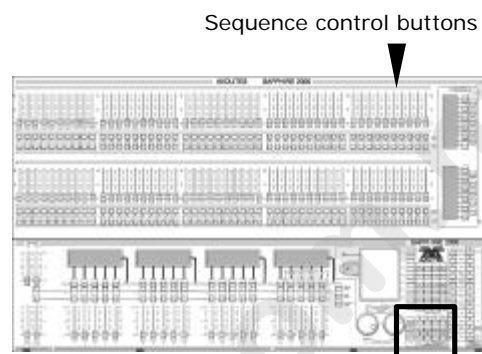
- The Sequence Control buttons stay in this mode until you change them back by holding AVO and pressing Softkey B again. This means you cannot use them for controlling chase direction. However Softkeys E, F, G in the Chase Parameters menu give you the functions of the chase direction buttons.

3.5   The Align and Flip functions

The **Align** function allows you to set the same level on a particular attribute for a range of fixtures. This can be useful if you want to set a row of scans to have the same tilt position, or if you want to set a colour from one fixture onto other fixtures.

> *1> Press an attribute button to select the attribute you want to align.*
>
> *2> Select the fixture to use as the reference*
>
> *3> Select the other fixtures you want to align to the first one*
>
> *4> Press ML Menu, then Softkey C, "Align <attribute name>".*
>
> *5> The attributes will be aligned on all the selected fixtures.*

- You can align all attributes of the fixtures using Softkey B, "Align Fixtures" (it doesn't matter which attribute is selected).

- If you use a group to select the fixtures, the one you selected first when you recorded the group will be the reference fixture.

- If Tracking mode is on (see page 123), aligning the Pan/Tilt attribute will cause all the fixtures to point at the same place on the stage rather than copying the actual Pan/Tilt values.

The **Flip** function is used with moving head fixtures. This type of fixture has two possible pan and tilt positions for each point on stage, and the Flip button alternates between them. This allows you more freedom to make movements without hitting the pan stop.

> *1> Select the fixtures to flip.*
>
> *2> Press ML Menu twice (option A should be Flip)*
>
> *3> Press softkey A, "Flip".*

- On moving head fixtures capable of more than 360 degree rotation

such as the Martin MAC range, the Flip function will give a distorted result.

- The other functions on the ML menu are described at the end of the chapter.

3.6 "Killing off" a fixture or dimmer

Sometimes during a show you might want to "kill" a fixture or dimmer from the stage output. This may happen if a camera is having problems with a light shining straight into it, if a lamp blows and you want to keep the rig symmetrical or if a fixture loses position.

The "Reduce fixture intensity" button allows you to temporarily dim or turn off any fixture or dimmer. Programming is not affected and you can later restore it to normal operation. You can do this in program mode or run mode.

1> Press "Reduce Fixture Intensity" (in the lower right corner).

2> Put the fader for the fixture/dimmer channel to be reduced up to full (if it was already full, take it to zero then up to full).

3> Reduce the fader to the intensity level you want.

4> Repeat from 2 to reduce other fixtures.

5> Press Reduce Fixture Intensity to finish.

- To restore the fixture, do the above but leave the fader at full. The fixture will stay "reduced" until you restore it.

- Make sure you turn off Reduce Fixture Intensity when you have finished, otherwise you will end up reducing intensities when you don't want to, and wondering why none of your fixtures are coming on.

- To cancel all reductions, press the Reduce Fixture Intensity button and put all faders to full, then press the button again to end.

- If the Swop buttons are in "mimic" mode (see page 153), they will show the programmed output of the channel, not the reduced output.
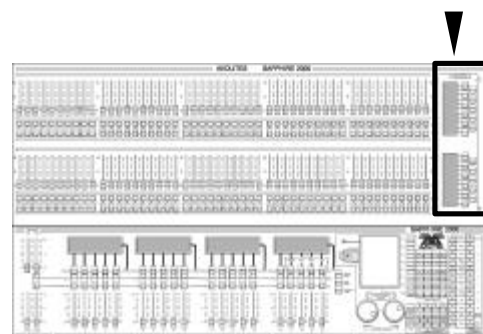
3.7 Using palettes

When programming a show you will find that you frequently use certain positions, colours, etc. Like an artist's palette, the Sapphire lets you store these settings so you can recall them at the touch of a button. There are 10 pages of 20 palette entries. You can name the palette values so that you know what you're getting, and the Sapphire displays them on its built-in palette control area.

Palette select buttons

Also, when you patch a fixture, the Sapphire loads 10 preset positions, 10 colours and 10 gobos into the palette for that fixture. The colours are the same for all fixtures, so you know that if you select "Red" you are going to get red on everything, even though the Sapphire is sending out different values to the different types of fixture.

Palette values stored as a reference

The most important thing about palettes is that when you use a palette

value in a memory, the Sapphire stores a reference to the palette, rather than the actual value. This means that if you program your memories using palettes, you can easily change all the positions just by reprogramming a few palette entries rather than having to reprogram all the memories. This is handy if you are touring a show and have to cope with different stages or truss heights every show.

Shared and individual palettes

Palette entries can be shared or individual.

- Shared: If you only have one fixture selected when recording the palette entry, then you can use that palette entry for all fixtures of the same type. So you could save a value for "Red" on the first of your Wackylites™, and then use that value for any of your other Wackylites. This is a shared palette, useful for values which are the same for all the fixtures of one type, such as colour, gobo, prism etc. The pre-programmed palettes are all shared.

- Individual: If you select more than one fixture when recording the palette entry, then the entry is unique for each fixture. So when you save an entry with pan/tilt positions for your 4 central Wackylites, those positions will only ever apply to those fixtures. You can later add values for other fixtures; fixtures which have no values saved will not change when the palette is recalled. This is an individual palette, useful for values which vary for each fixture, like pan, tilt and focus.

Which attributes are stored in palettes

A palette entry can store any or all attributes of a fixture, so you could store colour and gobo in the same palette entry. Only the attributes you have changed will be recorded. You can also "mask out" some of the attributes, when saving the palette entry.

To save all the changed attributes, select the Dimmer attribute when saving the palette. All the attribute lights will come on to show you that they are all going to be used. To save one individual attribute, press one of the other attribute buttons (the Colour attribute also selects the Yellow / Magenta / Cyan colour mix attributes). You can save other attributes later if you need to.

This is how you save a palette value:

1> *Press Clear to clear the programmer.*

2> *Select the fixtures for which you want to store palette values. Select one fixture only to record a shared palette entry.*

3> *Set the attributes you want in the palette entry. You can store any or all attributes of a fixture in each palette entry. Only attributes you have changed will be recorded.*

4> *Press the attribute button for the attributes you want to store (the dimmer button will store all attributes). The buttons light up to show you which attributes are going to be recorded.*

5> *Press Store Palette, (press the palette page you want to use if the pages are displayed), then press one of the palette select buttons to store the palette entry under that button.*

6> *Name the palette entry by pressing Softkey D, "Set Legend", then the palette select button, then enter the name using the external Qwerty keyboard.*

To recall a palette value, this is what you do:

1> *Select the fixtures to be changed. Shared palettes can be set to any fixture of the same type. Individual palettes will set individual values to each fixture.*

2> *Select the attributes you want to recall from the palette. The Dimmer attribute will recall everything (the LEDs on the buttons show you which attributes are active)*

3> *You can apply the palette values instantly, or fade to them by typing a time on the keypad then pressing softkey B, "Recall Focus", before selecting the palette entry*

4> *Press the palette page you want if the pages are displayed, then press the select button for the palette entry you want (the palette display shows the contents of the page). The selected attributes of the fixtures will be set to the palette values.*

Other useful things to know about palettes:

- The Sapphire sometimes calls palettes "Focuses". This term is used on other Avolites consoles. The meaning is the same.

- You can edit a palette entry by recalling it, making the changes you want, then saving the new information back on top of the existing palette entry. Anything you haven't changed will not be affected, values you have changed or added will be amended. You can also use the Edit Focus button, which automatically selects the fixtures used in the palette.

- You can delete a palette entry by pressing Delete, then the select button for the palette entry to be removed

- You can change the way the attributes are grouped when saving or recalling palette entries by selecting the attribute button to change, then pressing the Menu button below the Palette button, then option A "Focus mask". The buttons will light to show which attributes are saved when that button is selected. You can press the buttons to include or exclude attributes. Press Exit twice to finish. If you do change these settings for any reason you should change them back when you have finished, or major confusion will result.

- You can recall selected attributes out of a palette entry using the Focus button. Press Focus, then select the attributes you want to recall, then enter the palette number.

- Palette numbering: The 10 pages of palettes on the top screen are numbered 1-10 (on page 1), 11 to 20 (on page 2) and so on. The 10 pages on the bottom screen are numbered 101-110 (on page 1), 111-120 (on page 2) and so on. You will only need to know the number of the palette if you recall it using the Focus button or another numerical method rather than just pressing the Palette select button.

3.8   Entering intensity levels as numbers

You can set levels using the numeric keypad as you would on a theatrical lighting desk. If you are used to doing this, it can be faster when plotting

dimmer levels for a scene than using the select buttons and the wheels.

1>   Press the Channel button

2>   Type the dimmer or fixture handle number (not the DMX channel) on the keypad.

3>   Press Softkey G, "At %".

4>   Press 0 - 9 for the intensity, or Softkey G again for 100%

5>   Press the decimal point key and another digit for more accurate control

6>   Press Channel again to get back to normal (the Exit button does not operate in this mode)

Other things you can do by numeric entry:

- The softkey options are D:set to 100%, E:up by 5%, F:down by 5%.

- You can set multiple dimmers to the same level using softkey F, "Through". Enter first dimmer number, "through", last dimmer, "At %", level.

- Softkey B, "Select new fixture type" lets you tell the desk the type of fixture you are working with. It uses this when you select fixtures. Normally it is set to "desk channel" and will select fixtures starting from handle 1. If you set it to dimmer, it will only select dimmers, starting at the first dimmer patched, so selecting 1 "through" 10 would select the first 10 dimmers, wherever they are patched. You can set the option to any fixture type you have patched on the console.

- If you have more than one dimmer/fixture selected, Softkey C, "Odd or Even", allows you to select the odd and even numbered channels. Softkey B selects Even channels and C selects Odd channels. Softkey A selects all channels again after you have used this option.

- Softkey E, "Select Group" allows you to recall a group by entering the group number.

3.9   Controlling fixtures by entering values

You can also directly enter values for fixture attributes. This can be useful for programming palette values from a fixture data sheet.

1>   Select the fixtures to be set by pressing the Swop buttons

2>   Select the attribute to be set using the Attribute buttons

3>   Type the value to set.

4>   Press Softkey E or F to set the A/B wheel attribute (displayed next to the softkey).

5>   Press Softkey G, "Set input to 0-255 / %" to change the entry mode between 0-10 and 0-255.

- You can change the attributes to be set by pressing another Attribute button, but then you will need to enter the value again.

- You can also recall groups of fixtures or dimmers (type group number, then press softkey A, "Recall Group").

- You can recall palette entries (type palette entry number, then press softkey B, "Recall Focus")

3.10 The ML menu and Tracking

The "ML menu" (Moving Light menu) button allows access to some handy features for moving lights.

If you press the ML Menu button again you will get a second set of options

Option A "Locate Fixture" positions selected fixtures at central position, with light coming out of them. The settings are not placed in the programmer, so you need to change the values if you want to save them. The "locate fixture" settings for each type of fixture are defined in the personality file.

Option B "Align Fixtures" is described in section 3.5 on page 117.

Option E "Define the stage" lets you teach the Sapphire how your lights are set up.

The Sapphire can learn the layout of the stage and lights rig you are using. This enables it to calculate where it needs to point each light so that they all hit the same place on the stage. This is called Tracking mode and it is a very powerful feature of the Sapphire.

You need to mark a square on the stage, ideally the sides of the square need to be half the depth of the stage but as long as it's square and you can point all the fixtures at the corners, the size is not that important.

1>   Select all the fixtures you want to use for Tracking.

2>   Point all the fixtures so they light someone standing at the back left hand corner of the square (don't light a circle on the floor, or your lights will be pointing at peoples' feet all the time).

3>   Select option A "Top left". This stores the positions.

4>   Point them all so they light someone standing at the back right hand corner, then select option B "Top right".

5>   Repeat for the front corners of the stage using options C and D to store the positions.

6>   Press Enter to complete the process.

7>   The Sapphire will go away and do lots of calculations. The message bar on the VGA display shows the progress. This can take several minutes.

- You can recall a position you have already set, if you want to edit it, using option F "Recall" then A B C or D to recall one of the positions.

- You need to make sure you are lighting a person rather than making a spot on the stage, because otherwise the beams will cross over at the wrong place. If you can't find a handy spare person, use a plastic cup or a light coloured item of clothing over the end of a mic stand at head height.

- If you are using moving head fixtures, you need to ensure the pan stop is on the side away from the stage, or the fixtures will not be able to track over the whole stage area. You also need to keep the Tilt value less than 50%, or the heads may "flip" when you track into some areas.

Option F allows you to turn Tracking mode off or on. You can also do this from the graphics tablet (see page 149). When tracking mode is on, the pan and tilt controls set the position on the stage rather than absolute DMX values. Tracking mode is easiest to use from the Graphics Tablet,

but if you really want to you can do it from the wheels.

Option G is used to run "macros" which are used to strike lamps or reset fixtures, etc. These features often require a sequence of levels to be sent on different control channels, which the Sapphire can do automatically if the macro is defined in the personality file for the fixture.

The display will show a list of available macros for the fixtures which are currently selected. If no macros are available for those fixtures, the option will not do anything. The Personality File section on page 165 contains details.

On the second page of the ML menu... (press ML Menu again)

Option A "Flip" is described in section 3.5 on page 117.

Option B "Calculator" displays a screen on the VGA monitor allowing you to convert numbers from decimal to hex or to binary. This is useful for working out dip switch settings. If you are not using a VGA monitor, this option will apparently do nothing, but you will need to press Exit to get the console back to normal mode.

Option C "Remove from programmer" allows you to remove from the programmer fixtures which are selected. This can be useful if you have changed a fixture you didn't want to include in a memory – just select the fixture, then use this option.

Option G "Load into programmer" loads the values of selected fixtures into the programmer. This can be useful if you are in "Record by Channel" mode but want to record all the fixture settings. If Palette values have been used to set the fixture, the absolute values are stored rather than a reference to the palette entry.

3.11 Viewing the console output

The on-board display shows you the output level of all the channels which are turned on, but only channels 1-50 fit on the display. To show channels 51-100, press the Fixture Page button again (the light on it flashes).

You can select which attributes you are looking at by pressing one of the attribute buttons.

The channels shown refer to the console channels (handle numbers), not the DMX channel. So if you have a fixture patched on handle 10, you can view the intensity of the fixture by pressing "Dimmer" and looking at the output for channel 10, or the pan-tilt settings by pressing "Pan Tilt" and looking at the output.

The VGA display shows a similar "stage view" screen, but shows all the attributes for each type of fixture that is patched. You can select the fixture type you are viewing using the left-right cursor arrows. The VGA display shows the current type above the menu options. If you have more than 10 of one type of fixture, the up-down cursor arrows let you page through them.

You can also select "Intensity", which shows the output intensity of each fixture or dimmer.

An example display is shown on page 3 of the tutorial manual.

CHAPTER FOUR

4. Using shapes

This chapter contains: Selecting a shape; changing the size and speed of a shape; spreading a shape across multiple fixtures; editing shapes which are running; fan mode.

The Sapphire, in common with other Avolites consoles, has a shape generator. This allows you to quickly create exciting light shows using lots of movement and changes, with the minimum of programming.

A shape is simply a sequence of values which can be applied to any attribute of a fixture. A "circle" shape, for example, applied to the pan and tilt attributes, would cause the fixture to move its beam around in a circular pattern. You can set the centre point of the circle, the size of the circle and the speed of the circle movement.

You could apply circle values to the colour mix attributes of a fixture and create some interesting ever-changing colours. In addition to circles there are a large number of other shapes available in the Sapphire. The shapes are defined for a particular attribute and the VGA display tells you which attribute they control.

When you use a shape with more than one fixture, you can choose to either apply the shape identically to all the fixtures, or offset them so that the shape runs along the fixtures creating "wave" or "ballyhoo" type effects. This is called the *spread* of the shape.

4.1 Selecting a shape

Selecting a shape is very similar to selecting a value from a palette. When you choose a shape, it will be applied to all selected fixtures.

> *1> Select the fixtures the shape is to be applied to.*
>
> *2> Press one of the Shape Page selects on the bottom Palette screen.*
>
> *3> Press a select button to apply a shape to the fixtures. The Palette screens describe the shape for each button.*

- Position shapes are always based on the current position of the fixture. Other types of shape are based on the current setting of the attribute if they are described as "User" or "Usr", otherwise they are based on a fixed value.

- If the shape description says "Even" or "Parallel", this describes the Spread of the shape. You can always change this later.

- You can change the base value of a "user" or position shape (e.g. the centre of a circle) by changing the attributes using the wheels in the usual way. You can reduce the Size to zero (see next section) to help you see what the base value actually is.

- You can run more than one shape at a time by repeating the above procedure. You can run several shapes on one fixture, but only if they work on different attributes (e.g. you can have a pan/tilt shape and a colour shape, but not two pan/tilt shapes.)

- Press Softkey G, "Shape Generator", then Softkey B, "Edit a shape"

to show what shapes are running.

- If you apply the same shape to two different groups of fixtures, the shape will appear twice on the shape list. You can edit the two shapes separately to give different directions, speeds etc (see later)

- You can remove shapes from fixtures which are selected by pressing Softkey G "Shape Generator", then softkey E "Remove shapes from selected fixtures".

- Each shape is designed to work on a particular attribute; the list on the palette display shows you which attribute. Obviously if the fixtures don't have the attribute, you can't use that shape on those fixtures.

4.2 Changing the size and speed of a shape

It is easy to change the size and speed of a shape after it has first been selected.

> *1>* *Press Softkey G, "Shape Generator" (if you are not already in the shape generator menu).*
>
> *2>* *Press Softkey D, "Set wheels to Size/Speed"*
>
> *3>* *The left hand wheel controls the Size. The right hand wheel controls the Speed. The display shows the values.*

Other things to know about size and speed of shapes:

- If you have more than one shape running, the controls operate on the most recent one. You can edit the parameters of any shape that's running using the Edit Shape function, see later in the chapter.

- The minimum size is zero. This will "hide" the shape, and the fixture will resume its previous settings. The shape is, however, still active.

- The minimum speed is Stop. This will freeze the shape and will offset the positioning of the fixture.

4.3 Spreading a shape across multiple fixtures

To get the maximum impact from a shape, apply it to several fixtures. The Sapphire has some powerful "Spread" functions which determine how the shape is spread out across the fixtures.

This can vary from all fixtures moving identically (Coarse spread = NONE), fixtures working in pairs (Coarse spread = 1) through to all fixtures being distributed evenly through the shape, so the first fixture is just starting the shape as the last one finishes (Coarse spread = Even).

The "Fine" spread value introduces a smaller offset into the timing of the shape across each fixture.

> *1>* *In Shape Generator menu, press softkey C, "Set wheels to Spread".*
>
> *2>* *The left hand wheel controls the Fine Spread. The right hand wheel controls the Coarse spread.*
>
> *3>* *Keep the Fine Spread at zero while you adjust the Coarse spread to the desired value, or the output can get confusing.*

- The order in which you selected the fixtures before assigning the shape determines how the shapes are applied; the "first" fixture is the

one you select first and the "last" fixture is the one you select last.

- If you select the fixtures using a group, the order in which you selected the fixtures when recording the group is used.

4.4 Editing shapes which are running

The Shape Generator menu allows you to edit shapes which are running. Press Softkey G "Shape Generator" on the main menu.

Any changes you make to a shape will affect all fixtures which are running that shape. If you applied the same shape several times to different fixtures, you can change each copy of the shape independently.

The softkey options are:

A: Playback a shape - This is an alternative way to select a shape using the menu softkeys rather than the palette select buttons. If you are used to the Pearl 2000 console, you might find this method of selecting shapes to be more familiar.

B: Edit a shape - This option lets you select which shape is the "Active shape" (the one you can control the speed, size and spread of with the wheels). You can't edit shapes which are being played back from a memory using this option, only shapes in the programmer.

1>   Next to the softkeys is a list of shapes you can edit.

2>   Press a softkey to make the shape active. Active shapes are highlighted. You can make more than one shape active.

3>   Press Enter when you have finished

4>   The speed, size and spread controls will now affect all the shapes you have set to be active.

Options C and D are described above.

E: Remove shapes for selected fixtures - This option is the only way to turn off shapes for an individual fixture. Select the fixtures you want to remove shapes from, then select this option. All shapes will be removed from the selected fixtures.

F: Change direction - The direction of the Active shape(s) will be reversed.

G: Playback parameters - This option lets you set parameters for a shape stored in a playback / memory. When a memory fades in, you can determine whether the shape should start at full size and speed instantly, or whether the shape speed and/or size should fade in as well. If the memory mode is set to 0, the settings are ignored.

1>   Press the swop button of the playback you want to set the parameters for

2>   The Sapphire displays the current options.

3>   Softkey A sets the Size to Static or Timed

4>   Softkey B sets the Speed to Static or Timed

5>   Softkey C sets the Shape Merge option on or off (if you run two playbacks applying shapes to the same fixtures, this option allows you to merge the shapes or override previous shapes with

---

the latest one)

6> Softkey D sets the current memory mode of the playback. This is described in the next chapter.

4.5 Fan mode

Fan mode is nothing to do with shapes, but the effect is similar to a static shape.

Fan mode automatically spreads out the values on a selected range of fixtures. If used on pan and tilt, the result is spreading out "rays" of light beams. The first and last fixtures of the range are affected most, and the central fixtures are affected least. The amount of fan can be set using the wheels.

As with shapes, the order in which you select the fixtures sets how the fan effect works. The fixtures you select first and last will be the ones which change most. If you use a group to select the fixtures, the order is that in which the fixtures in the group were selected when it was created.

The fan effect, while normally used on pan or tilt attributes, can be applied to any attribute.

1> Select the fixtures you want to fan

2> Select the attribute to fan (pan/tilt, colour etc)

3> Press Fan

4> Set the amount of fan using the wheels

5> The display shows which attribute is being controlled by each wheel

Fan mode needs to be used on at least 4 fixtures to give good effects. If you have an odd number of fixtures, the central fixture will not move in fan mode.

Press the Fan button again to leave Fan mode. Any effects you have set will remain.

It's fairly easy to accidentally leave Fan mode turned on and be very confused about why the wheels aren't working properly, so turn it off as soon as you have completed the effect.

CHAPTER FIVE

5. Recording and playing back memories

This chapter contains: HTP and LTP channels; how the Sapphire works when programming; recording a memory; playing back a memory; changing playback pages; setting fade times for a memory; copying and deleting memories; the include function; editing memories; the "off" button; blind mode; recording the stage using snapshots; using shapes in memories.

The Sapphire has many functions for producing a complex light show, and the most fundamental part is a Memory, in which you can store a "look" you have created using your lights.

The Sapphire has 2000 playbacks, in 100 pages of 20, which can be used to store memories or chases (sequences of "looks"). Chases are covered in the next chapter. The playbacks are controlled using the sliders and flash buttons across the near edge of the console. The displays above the faders show the name of each playback.

Playback faders

The memory functions on the Sapphire are very powerful; the first part of this section explains the basics of how the Sapphire uses memories.
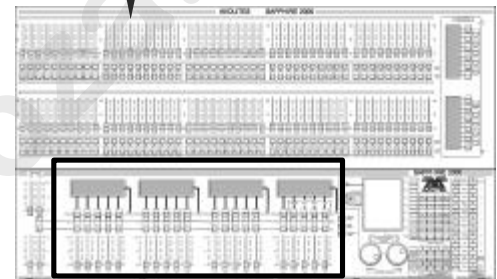
5.1 HTP and LTP channels

The Sapphire can treat control channels in two ways:

- Dimmer or intensity channels work on the principle of "highest takes precedence" (HTP). If an HTP channel is turned on in several memories, the highest level will be output. When you fade a memory, the HTP channels fade out with it.

- Moving light channels work on the principle of "latest takes precedence" (LTP). The latest change takes over from any other values, so the most recent memory to be turned on is the one which is output. When you fade a memory, LTP channels do not normally fade (you can make them if you want). They set their full values when the memory starts to fade in, and stay there until another value is set. (You can set the value this happens at using the User Preference menu).

The fixture personality file tells the Sapphire which channels of a fixture are HTP and which are LTP. Normally, only dimmer attributes are HTP, and everything else is LTP. If a fixture does not have an intensity control channel, the Gobo channel is defined as HTP to make sure the fixture blacks out when a memory is turned off.

5.2 How the Sapphire works when programming

The Sapphire has a special internal memory called the "Programmer". Whenever you change a channel of a fixture, the changes are stored in the Programmer. When you record a memory, the contents of the programmer are stored in the memory. Nothing else from the console

output is stored.

> Note: On the Sapphire, unlike other Avolites consoles, both LTP and HTP channels work through the programmer. HTP channels are not saved unless they are in the programmer. (The "Record Stage" function, where available, records the active HTP channels and the programmer).

The Sapphire has two programming modes, "Record by Fixture" (the normal mode) and "Record by Channel". The mode is selected by holding the AVO button and pressing Softkey C. The differences are:

- Record by Fixture - When you change any attribute of a fixture, all the other attributes are placed in the Programmer as well. You will get exactly the result you expected when you recall the memory, but you can't combine memories containing the same fixtures, because the new memory will just override the old one.

- Record by Channel - Only the attribute you change is placed in the programmer. This means you can save memories which only contain position information, then recall them with other memories to set colours, gobos etc. This is much more flexible but requires more programming initially, because you need several memories to get a result. It also lays you open to problems if you don't keep track of what you are doing.

When you press **Clear**, all fixtures are cleared from the programmer. You should get into the habit of pressing Clear before you start to program a memory, or you can end up recording fixtures you don't want. You also need to press Clear when you finish programming, because any functions in the programmer will override playbacks.

Attributes which are in the programmer are shown with a "m" (modified) on the on-board output display, and with a light blue (cyan) background on the VGA display.

Turning on a memory does *not* place the values from the memory in the programmer (but the Include function lets you do this, see page 133). The Locate Fixture function does not place any values in the programmer either.

5.3   Recording a memory

The Sapphire has 100 pages of 20 memories (the page select buttons are at the right hand end of the playbacks).

1>   Press Clear to clear the programmer. This ensures that you are starting with a clean slate.

2>   Set up the stage effect using the fixtures. You can include shapes in a memory. Remember that only the fixtures you have changed will be included in the memory.

3>   Press Memory.

4>   Press the Swop button of a playback to record it. (Select a new page first if you want to use a different page).

5>   Press Clear to clear the programmer. Repeat from 2 to program more memories

Other useful things to know about recording memories:

- You can label the memory to help you remember what's in it. The

label is shown on the display above the playback fader. Press Softkey E, "Set Legends", then the playback Swop button, then enter a name using an external Qwerty keyboard. The text is shown on the VGA display. Press Enter to store it, then Exit to finish.

- You can also label the current playback page this way, by pressing the "Select Page" button instead of the playback Swop.

- If you forgot to bring your Qwerty keyboard, you can use the Swop buttons of Presets 1-26 for capital A-Z, and the Add buttons for lower case a-z.

- If you don't have a VGA display, you can't see what you are typing. When you press Enter, the legend will appear on the on-board display. You need to remember to press Exit to get the console back to normal mode.

5.4 Playing back a memory

To play back a memory, raise the fader. (Make sure there are no values in the programmer by pressing the Clear button, because anything in the programmer will override the playback).

- You can turn on more than one memory at once.

- If you are using a fader, all the HTP (intensity) channels in the memory will fade up with the fader. The LTP (movement) channels will be set as soon as the fader leaves the zero position. You can set the point at which this occurs on the User Preference menu. (If you have changed the memory to be Mode 1 or 2, the LTP channels fade as well).

- The Add and Swop flash buttons only operate in Normal Run mode.

- In Run mode you can preset the LTP channels before raising the fader by pressing the Preload button. This is useful if you want to avoid the fixture "swinging" into position when you turn the playback on.

5.5 Changing playback pages

You can change pages to select another 20 memories simply by pressing Next Page or Previous Page on the playback page buttons. You can also enter a page number by pressing Select Page, then typing the page number on the keypad, then press Enter.

Playback page buttons

- Playbacks which are turned on when you change page remain active. The display above the fader shows you the name of the active memory in the top row, and the name of the memory from the new page in the bottom row.

- If you want to turn on a playback which is already on from a previous page, lower the fader to zero then raise it again. The memory from the previous page will turn off and the memory from the new page will turn on.

- You can label the playback pages by pressing softkey E, "Set Legends", then the Select Page button, then entering a label using the Qwerty keyboard. The labels are shown across the top of the Playback
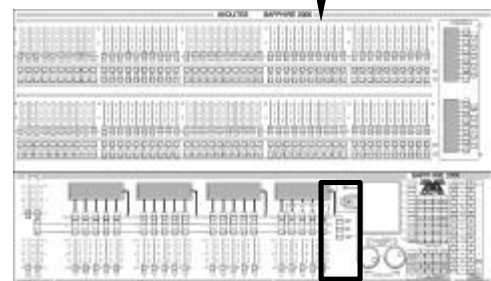
displays.

5.6　Setting fade times for a memory

You can set a fade in and fade out time independently for every memory. The fades only affect HTP (intensity) channels. There is a separate LTP timer which allows you to set movement times. LTP channels which are set to "instant" (see page 112) ignore LTP fade times.

1>　Press Softkey C, "Edit Times".

2>　Press the Swop button of the playback you want to set times for

3>　Press Softkey C to set the fade in time, Softkey D to set the fade out time, or Softkey E to set the LTP fade time (Options A, B, and F have no effect on memories and are only used on chases)

4>　Type the new time using the numeric keypad and press Enter to save it.

5>　Softkey G sets the memory mode of the chase to 0, 1 or 2 (described below).

6>　Press Enter to save the changes. If you press Exit, any times you have set will be abandoned.

The times you enter are also affected by the memory mode:

- Mode 0 - No timing information.

- Mode 1 - Channels fade as set by the HTP and LTP fade times (except Instant LTP channels). If you enter times for a Mode 0 memory, it will automatically change to Mode 1.

- Mode 2 - HTP channels fade as set by the HTP times. LTP channels are controlled by the fader position (except Instant channels). Set the LTP fade time to 0 to use this mode.

- If the memory includes shapes, and you have set the shape size or speed to "timed", then the shape will change with the LTP channels. The changes will be timed for a Mode 1 memory and controlled by the fader position for a Mode 2 memory. This allows you to create a shape which gets bigger or faster as you push up the fader.

5.7　Copying a memory

Copying a memory is very simple on the Sapphire. You can either create a linked copy (if you change a linked memory, all others linked to it will change too) or a "photocopy", which is a completely new and independent copy of the memory.

To create a linked copy:

1>　Hold down the Add button of the playback you want to copy.

2>　If you want to copy to a different page, use the page buttons to set the new page.

3>　Press the Swop button of the playback where you want to store the copy. Release both buttons.

- To create a Photocopy, press the blue Photocopy button before pressing the playback Add button

- If you have named the memory you copied, the linked memory will

have the same name. A photocopy will have a new name.

5.8 Deleting a memory

To delete a memory:

1> *Press the Delete button.*

2> *Press the Swop button of the memory you want to delete.*

3> *Press the Swop button again to confirm the delete.*

- If the deleted memory is linked to others, the linked memories are not affected.

5.9 The Include function

The Include function lets you load selected parts of a memory back into the programmer. (Normally, only manual changes to fixtures are put in the programmer). You can then use this to make a new memory. This is useful if you want to make a memory which is similar to one you already have.

When you use Include, you specify which attributes of which fixtures you want to load into the programmer. So, for example, if you have a memory which contains position, colour and gobo information for 8 fixtures, you can use the include function to load only the colour information for 4 of the fixtures into the programmer. You could then "Include" position information from another memory into the programmer, and build up a new memory using information from several existing memories.

1> *Select the fixtures from which you want to take settings.*

2> *Press Include.*

3> *Select the Attributes you want to include. The Dimmer attribute includes all other attributes (the buttons light up to show which attributes will be included)*

4> *Press the playback Swop button for the memory you want to include. Press Enter. The selected attributes of the selected fixtures will be loaded into the programmer.*

5> *Repeat from 2 to include other attributes from the same fixtures, or repeat from 1 to include other fixtures.*

- If you want to put the whole memory into the programmer, ensure no fixtures are selected, then press Include, then the Playback Swop button for the memory to include. Everything will be placed in the programmer.

- If the memory contains shapes, all the shapes and all the fixtures they are applied to will be loaded into the programmer, even if the fixtures and attributes are not selected. The shapes can then be edited, see page 127.

- If you really want to, you can edit the way the Attributes are grouped (e.g. the colour function always selects the Yellow / Magenta / Cyan functions too). This is called the "Focus Mask". See Attribute Groups for palettes on page 120.

5.10 Editing memories

You can edit any part of a memory you have already saved simply by making the changes and saving the new information on top of the memory.

1>   Press Clear to empty the programmer.

2>   Turn on the memory you want to edit, so you can see what you are doing.

3>   Select the fixtures you want to change, and make the changes.

4>   Press Memory.

5>   Press the Swop button for the memory you are editing to save the changes. Unchanged information is not affected.

- If the memory contains shapes, and you have selected some new shapes, the original shapes in the memory will be deleted (after a warning). To get round this you need to use Include on the original memory to load the shapes into the programmer. Ensure that the playback fader for the memory is at zero (i.e. the shape is not active) when Including the memory.

5.11 The "Off" button

The "Off" button allows you to remove an attribute which has been stored in a memory, so that it is as if you never recorded it.

For example, suppose you recorded a memory which had scans at a certain position, with the colour set to green. If you later decide that you don't want a colour recorded at all in the memory, so that the previous colour setting of the scans will be used, you use the Off function to turn off the colour in the memory. You can also use the Off function to remove complete fixtures from a memory.

Using the Off button is not the same as recording an attribute at zero. It is like not recording the attribute at all.

1>   Turn on the memory you want to edit, so you can see what you are doing.

2>   Select the fixtures you want to change.

3>   Press the OFF button to display the Off menu.

4>   To switch off all attributes of the selected fixtures, press Softkey A (this will remove the fixtures from the programmer).

5>   To switch off selected attributes, press the appropriate attribute button, then use Softkey B and C to set each attribute to Off (the screen shows which attribute will be turned off for each button)

6>   Repeat from 3 to turn off other attributes, or from 2 to turn off other fixtures.

7>   Press Memory.

8>   Press the Swop button for the memory you are editing to save the changes. Unchanged information is not affected.

- Attributes which are Off are shown on the screen. The stage output will not change until you save the memory.

- Attributes or fixtures set to "Off" can be turned back on again by selecting them in the usual way and changing them using the wheels.

- You can also use this function to turn off fixtures or attributes in a

palette entry. Use the procedure above, but instead of editing and recording a memory, edit and record a palette entry instead. See page 120 for how to do this.

5.12 Recording in Blind mode

The Sapphire has a useful function called "Blind mode", which allows you to program memories without altering the output of the console. The contents of the Programmer are saved on entering Blind mode, and restored when you leave Blind mode. Any playbacks turned on continue as normal, and you can make any changes you like without affecting the output.

This is useful if for some reason you need to edit a memory in the middle of a show without upsetting the current lighting state. Obviously, as you can't see the changes you are making, you will need to have a good idea of what values to set.

1> *Press Softkey F, "Press for Blind Mode".*

2> *If you don't want to use the contents of the programmer, press Clear.*

3> *Make changes to your fixtures as usual. Use the screen or the Graphics Tablet to help you set the right positions, colours etc.*

4> *Save your changes as usual.*

5> *To go back to normal, press Softkey F, "Press for Live Mode". The previous contents of the programmer will be restored (the contents of the programmer from Blind mode will be lost).*

• If you have edited a playback which is already turned on, you will need to turn it off then on again to load the new version.

5.13 Recording the stage using Snapshots

The Snapshot function allows you to instantly record the current output of the console for later use. This can be useful if you suddenly create an amazing effect on stage, but it's a mixture of things you have changed and things left over from the last memory.

When you take a Snapshot, any fixture which is lit up (has its dimmer channel on), and any active dimmer channels are stored. You can later retrieve the snapshots and copy them into memories.

The Sapphire can store up to 50 snapshots. They are listed by time and date, so if you write down the time when you store one, you will be able to identify them later.

1> *At the main menu press Softkey D "Snapshot Menu". The VGA display shows "(x/50)" to tell you how many of the 50 snapshots are used.*

2> *Press Softkey C "Take a snapshot of the stage" to record the output to a snapshot.*

3> *Press Softkey A "Load a snapshot" to load a previous snapshot into the programmer. The VGA display shows a list of stored snapshots. Use the cursor keys or type the number of the one you want on the numeric keypad, then press Enter. You can then save the snapshot to a memory as usual.*

4> *Press Softkey B "Delete a snapshot" to delete a snapshot from the list. The VGA display shows a list of snapshots, select the one*

> *you want as for the Load option above.*

- You need to ensure that the Sapphire's internal clock is set correctly if you are using Snapshots, or you will not be able to identify the snapshots afterwards. See page 160 for how to set the clock.

5.14 Using shapes in memories

As you would expect, any shapes you have set up will be saved as part of the memory.

If the base value of the shape is not in the programmer (e.g. the central pan/tilt position, for a circle), and the shape is a "User" type, then the memory will contain a "relative" shape. When you recall the memory, the shape will start based on the current position of the fixture. This allows you to create lots of different effects by layering a few different memories - one for the shape, one for the base position.

You can either use "Record by channel" mode, and not set the position, or use the "Off" function to achieve this effect.

CHAPTER SIX

6. Recording and playing back chases

This chapter contains: Programming a chase; running a chase; setting speed, crossfade and direction; manually controlling the chase steps; setting step times and unlinking; editing a chase using unfold; editing a chase which is running; copying chases; sound activation of chases; chase options.

As well as being used to store static memories, the playback buttons on the Sapphire can also be used to store chases (sequences of static memories).

6.1 Programming a chase

To program a chase, you have to set up the lighting for each step of the chase, then save it. The contents of the programmer are recorded as a step.

You can either set all the fixtures and dimmers manually for each step, or you can use Include to load in the information from memories you have already recorded.

1> Press the Chase button.

2> Press the Swop button of the playback where you want to store the chase.

3> Set up the lighting for the first step, either manually or by using "Include" on existing memories.

4> Press the Swop button of the playback or Enter to store the programmer contents as Step 1 of the chase.

5> Press Clear, then repeat from step 3.

6> Press Chase to finish when you have stored all the steps you want.

- You can't record shapes in a chase. Any shapes which are active will be ignored.

- You can set a label for the chase by pressing Softkey E, "Set Legends", as with memories.

- There is no limit to the number of steps in a chase provided there is enough free memory in the Sapphire.

6.2 Running a chase

To run a chase, raise the fader of the playback. (You can also use the Add/Swop buttons if you are in Normal Run mode). The chase will start to run.

- The HTP (intensity) channels in the chase will be controlled by the fader. The other channels (LTP) will be set as soon as the fader moves above zero according to the LTP fade times programmed in the chase. You can set the point at which the LTP channels activate from the User Preference menu.

- The bottom part of the display shows the progress of the chase. The Wait and Fade times are represented by black bars.

- Press View then "5" to show details of the chase steps on the screen.

There are many options you can set to determine the way the chase runs and these are described in the rest of this chapter.

6.3 Setting speed, crossfade and direction

When you run a chase, the wheels are assigned to control the Speed and Crossfade of the chase. The wheels are automatically "connected" to the most recent chase.

You can save a speed with the chase, so that every time you play it back, it runs at the same speed.

> *1> Press Softkey A, "Chase Parameters".*
>
> *2> Set the speed you want using the left hand wheel.*
>
> *3> Press Softkey A "Save Speed".*

- If you are in Run mode, you can also set the chase speed by tapping Softkey G, "Tap twice to set speed" in time with the music.

- You can change the speed display to BPM (beats per minute) rather than seconds, from the User Preferences menu (see page 159).

- If you are doing another operation using the wheels while running a chase (e.g. manually positioning some fixtures), you can make the wheels control speed and crossfade again by pressing the Connect button next to the wheels, then the swop button for the chase.

- You can set the chase back to its programmed speed by pressing Connect, then Softkey A, "Clear temporary speed".

- You can "connect" the wheels to a different chase by pressing the Connect button, then the swop button for the chase you want to connect to.

- You can turn off the "chase autoconnect" option in the User Preference menu if you don't want the wheels to connect to a chase when you start it. You will have to use the Connect button to control the chase if you do this.

The chase direction is controlled by the ← (backwards), → (forwards) and ←→ (Bounce) buttons. These buttons can also be assigned as Fixture control buttons (see page 116). Hold down the Avo button and press Softkey B so the display shows "Chase Control Enabled" to use the buttons to control the chase direction.

- You can save the current direction of the chase so it will always start in that direction; Press softkey A, "Chase Parameters", then softkey B, "Save Direction".

- If you want to keep the buttons in Fixture control mode, you can also set the chase direction by pressing Softkey A, "Chase Parameters", then softkeys E, F and G set the chase direction.

6.4 Manually controlling the chase steps

You can take manual control over the connected chase by pressing the Stop button. If the chase is set to "Links Off", it will do this automatically - see the next section for details on Links.

- Press the Go button to restart playback of the chase

- Press the Stop button to jump to the next step (times and fades are ignored)

- Press the Snap Back button to jump back a step (times and fades are ignored)

- To set the "next" step to be a particular step number, type the step number on the numeric keypad then press Connect.

- Turn the left hand wheel to manually control the HTP fades for this step (this can be disabled using the chase parameters menu).

- Turn the right hand wheel to manually control the LTP fades for this step (this can be disabled using the chase parameters menu).

- You can also use the ← and → buttons to jump backwards and forwards a step.

6.5   Setting step times and unlinking

You can set step times globally for the whole chase and individually for each step. You can also unlink the steps, either for the whole chase or for individual steps, so that the chase pauses and waits for you to press the Go button. This can be useful if you are using the console for theatrical lighting cues.

To set the global times for a chase:

1>   Press Softkey C, "Edit Times", then the playback button for the chase.

2>   Press Softkey A-F to select the time parameter to set (the times are described below).

3>   Type the new time value using the numeric keypad and press Enter

4>   Press Softkey G to set Link on or off for the whole chase. If link is on the chase runs automatically. If off, you run each step manually using the Go button (a chase like this is called a "stack").

5>   Press Enter when you have finished. If you press Exit, any changes you have made will be lost.

The times are:

Wait In - Delay before the fade in starts
Wait Out - Delay before the fade out starts
Fade In - Time to fade in
Fade Out - Time to fade out
LTP Fade - Time for the LTP (movement) channels to fade over
LTP Wait - Delay before the LTP channels start to move

- You can enter minutes as part of the time - press the decimal point twice, a colon (:) will appear. e.g. to enter 20 mins 10.5 seconds, type 20..10.5 (the display will show 20:10.5).

- You can set the fade in and fade out times independently for each step/cue. Chase steps with individual times are called Complex steps, if they use the global settings they are called Simple steps. To set independent times you can either use Unfold (see next section) or Live editing (the section after).

6.6 Editing a chase using Unfold

The Sapphire has a powerful chase editing system. The Unfold button places each step of a chase on one of the playback faders as if each step was a memory, allowing you to turn on and edit each step individually.

1> Press Unfold, then the Swop button of the chase to be edited

2> The first 15 steps of the chase are loaded into playback faders 1-15. The display shows details about the steps.

3> Raise a playback fader to output the contents of that step (fade times will operate as programmed)

4> Various Unfold options are available, the details are below.

5> Press Unfold again to get out of unfold mode.

- To edit the contents of a step: Press Clear to empty the programmer, raise the fader to output the step, make the changes, press softkey A "Record", then the Swop button (1-15) for the step number.

- To change the times for the step, press Softkey B, "Edit Times", then the flash button for the step, then set the times (see previous section)

- To Insert a new step, set up the lights for the new step, press Softkey C, "Insert", then the Swop button where you want to insert the new step. The new step will be allocated to the button you press with a step number half way between the steps either side, and all other steps will be shifted along one. (You cannot use the blue Insert button in Unfold mode).

- To Delete a step, press Softkey D then the Swop button for the step you want to delete. (You cannot use the blue Delete button to do this).

- You can copy a step by holding the Add button of the step to copy, then pressing the Swop button of the step to copy it to.

- You can renumber the chase to whole numbers by pressing Softkey C, "Insert", softkey A, "Renumber", then Enter to confirm.

- If the chase has more than 15 steps, you can swap to the next 15 steps using softkey F, or the previous 10 steps using softkey E.

- While the chase is unfolded you can press Softkey G, "Set Legends", followed by the Swop button for the step to set a label for the step.

6.7 Editing a chase which is running

You can also edit chase steps while you are running the chase, without using Unfold. Make sure the step you are editing is not in the middle of a fade, or you might get unexpected results next time you run the chase.

1> Start the chase by raising the fader. (if Links are On, press the Stop button to pause the chase)

2> Keep pressing the Stop button to step on to the step you want, or type the step number you want, press Connect then Stop.

3> Press Clear to make sure the programmer is empty.

4> Make the changes that you want to the current step.

5> Press Rec. Step, then Enter, to save the changes to the step.

6> Press the Stop button to jump on to the next step or the Snap

Back button to go back.

- You can set individual times for each step using the Live Time button as follows:

  1> Stop the chase on the step you want to set, as above.

  2> Press the Live Time button to set the times for the current step, or the Next Time button for the next step. The Live and Next step numbers are shown on the display.

  3> Use softkeys A-G to set the times you want (see above for description of the times)

  4> Press Enter to save the settings, Exit to abandon them, or the ML Menu button to toggle the step mode between Simple/Complex (Simple = use the global timings).

  5> Press the Stop button to jump to the next step or the Snap Back button to go back one.

- The Review button shows you the step you have just edited, including all the fades. When you press Review, the chase jumps back to the step before the one you are on, then runs the step you have edited to show you the overall result. The chase does not have to be stopped to use Review.

- To insert a new step at the current point in the chase: Set up the lights how you want them for the new step, then press the blue Insert button, then press Enter. (If you want to insert a different step number, type it before pressing Enter). The Set Times menu is displayed. Change the times if you want to, then press Enter to insert the step.

- You can delete a step from the connected chase by pressing the blue Delete button, typing the step number to be deleted, pressing Enter then Softkey A, "Yes".

6.8 Copying chases

You can copy a chase exactly the same as a memory – hold down the Add button of the chase you want to copy, then press the Swop button of the playback you want to copy it to. The copied chase will be linked to the original, and any changes made to either chase will affect both chases.

If you want an unlinked copy, press the Photocopy button before starting the copy.

6.9 Sound activation of chases

The Sapphire can use bass, mid or treble frequencies from its audio input to trigger chases. The chase in Playback 1 is stepped by low frequencies, playback 2 by mid frequencies and playback 3 by high frequencies.

1> Save the chases you want to sound trigger in playbacks 1, 2 or 3.

2> In Run mode, press softkey E, "Enable sound to light".

3> When playbacks 1,2,3 are turned on, chases stored in them will step in time to the sound signal

4> Press softkey F, "Disable sound to light", to turn off sound activation.

- Turn the chase links Off and set fade times to zero to get a true sound to light chase.

- You can make some linked steps and some unlinked steps to give a chase which runs on a few steps for every audio pulse.

- The sensitivity of the audio input can be set using an internal PCB jumper to enable use of a microphone rather than line level audio. See page 105.

6.10 Previewing chase steps

You can preview the output of a chase step on the display. The chase does not have to be connected or running.

1> Press View.

2> Press the Swop button of the chase to view.

3> Choose the attribute to view by pressing one of the Attribute buttons.

4> Use softkeys F and G to step through the chase.

- You can view the live output of a connected chase by pressing View then Connect.

6.11 Chase options

Each chase has options which can be set to affect the way it runs. Press softkey A, "Chase Parameters". If you do not have a chase "connected", some options will not be available. The options you set are individual for each chase.

The options are:

A: Save Speed - saves the current speed of the chase (set using the left hand wheel)

B: Save Direction - save the direction of the chase (set using the direction / bounce buttons or options, see below)

C: Normal / Random - turn on random mode (steps are executed in random order) - press to change the mode. Turn off random mode when editing a chase, or you won't know which step you are going to get next.

D: Stop on final step - makes the chase stop on the final step. If the final step is a blackout, the chase will appear to turn itself off, so you can just press Go whenever you want to make it happen again

E: Chase Left – The same as pressing the ← button, but useful if the direction buttons are set to "Fixture control" mode (see page 116)

F: Chase Right – The same as pressing the → button.

G: Chase Bounce - Allows you to create a bounce chase which runs forward to the last step, then backwards to the first step, and so on. The same as the ←→ button.

More Chase Options can be set by pressing the ML Menu button while in this menu.

A: Fader start options - (press the button to cycle through the options):

Fader will reload chase (every time you turn on the chase it

starts at step 1)

Fader stops, go to start chase (the chase will not run until you have pressed Go after you turn on the chase)

Fader stops/starts chase (every time you turn on the chase it continues from where it left off)

B: Skip times options – Allows you to skip the first wait and/or fade of a chase. You often want to do this so the chase starts as soon as you raise the fader. (Press the button to cycle through options)…

Skip first wait time (The wait time is missed when the chase is first turned on)

Skip first wait and fade time (Both wait and fade times are missed when the chase is first turned on)

Wait and Fade for all steps

C: Manual mode allowed / disallowed – If set to Allowed, lets you manually fade a paused step by turning the left hand wheel for the HTP channels and the right hand wheel for the LTP channels.

D: Speed wheel allowed / disallowed - Lets you change the chase speed using the left hand wheel. You might want to turn this off if you don't want the console operator to be able to change chase speeds at playback time.

CHAPTER SEVEN

7. Theatre mode

This chapter contains: Setting theatre mode; theatre controls; plotting a cue; naming a cue; setting fade times; jumping to a cue; running a theatrical show; advanced options.

Theatre mode is a new addition to Avolites consoles. It allows you to use the Sapphire like a standard theatrical console, where you program your show as a sequence of cues, then run the show just by pressing the Go button at the appropriate moment. Playback faders 17-20 become dedicated cue masters.

7.1 Setting theatre mode

In program mode, press Softkey B "Theatre stack programming". The Sapphire displays the theatre mode startup display. Press Enter to start.

The display above playbacks 17-20 changes to show the theatre control display.

- Press Softkey F, before pressing Enter, to bypass the Theatre Mode startup display in future.

- When theatre mode is enabled, you can't access playbacks 17-20 on any page; if you intend to use Theatre mode it is advisable not to program these playbacks. Any programs are kept and when you turn off Theatre mode you will be able to access them again. Chase Autoconnect mode is also disabled when theatre mode is turned on.

- To get out of the theatre menu, press Softkey G, "Quit". The Exit button is disabled in the theatre menu. This does not turn off theatre mode, but allows you to use the rest of the console.

- To turn off theatre mode completely, turn the key to System, press Softkey C "User Settings" then Softkey D "Theatre Mode" so that the display shows "Theatre Mode=OFF".

- Theatre mode programming is not deleted when theatre mode is turned off.

7.2 Theatre controls

While theatre mode is turned on, Playback faders 17-20 have special functions assigned to them.

Fader 17 is the Master fader, controlling the overall intensity of all lights.

Theatre mode faders

The Go and Stop buttons above the master fader (17) control all three timers and are the same as the Go and Stop buttons next to the wheels. The Reverse button above the master fader snaps all uncompleted fades back to the start.

Fader 18 controls the Fade In of the next step, when it is stopped.

Fader 19 controls the Fade Out of the previous step, when it is stopped.
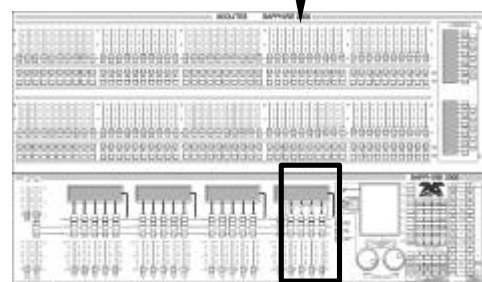
Fader 20 controls the LTP fade timer, when it is stopped.

The buttons above 18, 19 and 20 are Reverse, Stop and Go buttons for each of these functions. The Reverse button snaps back to the start of the fade, but only when the fade has not completed.

7.3 Plotting a cue

Plotting a cue is very similar to saving a memory. You need to be in Program mode to record cues.

1> *If you are not already in "Theatre mode" press Softkey B, "Theatre Stack Programming" at the main menu.*

2> *Press Clear to make sure the programmer is empty.*

3> *Set up the channel levels, either using the preset faders or typing in the levels for each channel (see page 120).*

4> *If the current step number on the display is different to the one you want to use, type the step (cue) number*

5> *Press softkey D, "Record", then softkey B, "Record Stage" to record the programmer contents and all HTP channels that are turned on, or Softkey D, "Record programmer" to just record the contents of the programmer*

6> *Press Clear.*

7> *Repeat from 3 to plot more cues.*

- You can edit a cue you have saved by typing the cue number then pressing Softkey F, "Cut to live". Make the changes you want using the preset faders or by entering new levels, then press Softkey D, "Record", then Softkey D again, "Record programmer". The cue will be updated.

- You can use an existing memory to form a cue by either using Include (see page 133) or, if you only want dimmer levels, just turn the memory on and use the "Record Stage" option.

7.4 Naming a cue

Type the cue number to be named, then press Softkey E, "Set Legend" from the theatre menu. Enter the legend on the QWERTY keyboard. While you are typing, the input is shown on the VGA display.

The name of the live cue and the next cue is displayed above the theatre faders so you can see what's coming next.

7.5 Setting fade times for a cue

You can set fade in, fade out and "wait" times for each cue. Press Softkey C, "Set Times" to show the options. This will set the times for the current step. You can also press the Live Time button to set times for the current step, and the Next Time button to set times for the next step. See page 139 for a description of what the various times are.

7.6 Jumping to a cue

You can change the cue being edited by typing the cue number then pressing Enter. If you want to output this cue, press Softkey F, "Cut to Live" (fade times are ignored).

7.7 Running a theatrical show

If you have just been editing, you may need to type 1 then Softkey F to set the console to cue 1. You should also turn the key to "Run" to make sure you can't accidentally change anything.

The display shows the current cue, the next cue (with names if you have set them), and the wait and fade times for fade in, fade out and LTP. Above each slider is displayed "WFG", meaning "Waiting for Go", in other words the cue will start when you press the Go button.

For automatic cues, you can simply press the Go button next to the wheels. The console will carry out the fade with the times you programmed.

If you want to manually control a fade, you can use the in, out and LTP faders or Go/Stop buttons to operate the cue. The display shows the percentage of fade left to go. When the fade is completed for that fader, the display shows "Stopped". When Fade In, Fade Out and LTP all show "Stopped", the console moves on to the next cue.

The "Reverse" button for the In, Out and HTP faders snaps the fade back to the start, if it has not completed.

Once the display shows "Stopped" you cannot reverse the fade using the fader or the Reverse button.

7.8 Advanced theatre options

Press softkey A, "Advanced" to display the Advanced theatre options menu.

The options are:

A: Renumber – Renumbers all cues to whole numbers.

The other options apply to a cue. You select the cue by typing the cue number and pressing Enter. The display shows the current cue number.

B: Assign a fade up autoload – Assigns a memory or chase which will be automatically loaded and run when the fade-in for the cue starts. This allows you to load a memory or chase with the step by only pressing the Go button.

C: Assign a fade down autoload – Allows you to turn off a memory or chase when the cue starts.

D: Delete autoload – Deletes the autoload memory from the current cue.

- You can only have one autoload (either a fade up or a fade down) for each cue.

- The memory to load can be from any page, but it will be loaded into the same playback number that it is saved in. If this playback is active on the current page, it will be turned off and replaced by the autoload memory.

- If a cue has an autoload memory allocated to it, the name of the memory is shown on the VGA display.

- Fade times for Autoload memories only work to the nearest second.

8.   Using the graphics tablet

This chapter contains: Connecting the graphics tablet; using the tablet; selecting fixtures on the tablet; changing the position of the fixtures; changing colours and other attributes; storing palette entries; other functions.

The graphics tablet is fitted in a drawer on the front left of the Sapphire. It allows you to use a pen to select fixtures, groups, colours, and position the fixtures by simply drawing with the pen. When you use the Sapphire's Tracking mode you can instantly make all your fixtures point at one place on the stage just by pressing on the tablet.

The tablet makes programming and operating a show on the Sapphire much more intuitive. If you don't have a graphics tablet you're missing out!

8.1   Using the tablet

To use the tablet, press the pen onto it (the button on the side of the pen doesn't do anything). A quick press is like pushing a button on the Sapphire. You can also draw on the tablet by keeping the pen pressed down while moving it. This is used to move fixtures or change attributes.

The Sapphire will behave as if you are pressing buttons on it in the normal way, so the LEDs and the display will change as you use the tablet. Many of the functions of the Sapphire are quicker and easier using the tablet. Sometimes you might find it easier to do part of the function on the tablet and part on the console. The end result is the same.

The tablet has a paper overlay on it. You can write your fixture names, group names, attributes, palette entries and even draw your stage layout on the overlay so that you know what's what. Spare overlays are available from Avolites.

8.2   Selecting fixtures on the tablet

Fixture select

To select a fixture or a group, just press the pen onto the fixture button or the group button. The first 60 fixtures which are patched are available on the tablet. Only the first 30 groups are available on the tablet.

You can select multiple fixtures by just pressing on each fixture that you want. Once you change an attribute this selection mode will end; the next time you select a fixture all the other fixtures will be deselected and you can start selecting multiple fixtures again.
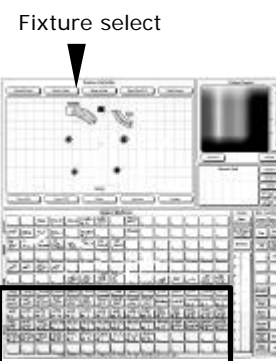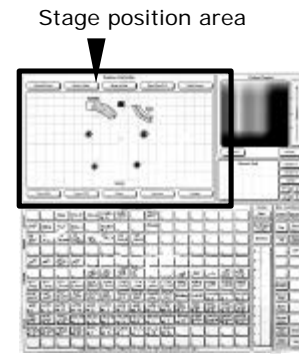
8.3   Changing the position of the fixtures

You can control the position of the selected fixture by drawing on the Stage area of the tablet.

If you press on the Nudge button, when you draw on the tablet the

fixture will move relative to its current position. This can be useful if you want to slightly reposition a fixture or a group of fixtures. Press on the Absolute button to turn off this mode.

Stage position area

If you have trained the Sapphire, which is described on page 122, you can turn on Tracking mode by pressing on the Track ON button. When you point at the stage area of the tablet, all the lights will point at the same place on the stage. If you draw the stage layout on the tablet overlay, you can instantly focus the fixtures on a specific point on the stage just by pointing at the tablet.

8.4 Changing colours and other attributes

If the fixture can do colour mixing, you can set the colour by drawing in the colour control area of the tablet. The Nudge button allows you to change the colour slightly as for positions. The Absolute button lets you set up a new colour. The Luminosity bar sets the brightness of the colour.

You can recall the first 60 palette entries by pressing the pen on the Focuses buttons.

You can change individual attributes of selected fixtures by pressing the pen on to the attribute button, then (without lifting the pen) drawing up and down on the tablet.

Attributes   Colour select

You can also use the fader bar to change attributes, press on the attribute button you want to change then draw up and down on the fader bar.

Press the Dimmer button above the fader bar to allocate it to the dimmer attribute.

There is an Align button and a Flip button which allow instant access to the functions on the console (see page 117).
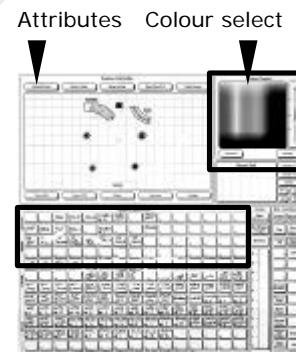
8.5 Storing palette entries (focuses)

You can store palette entries from the graphics tablet. The tablet refers to these as Focuses, which is what they are called on the Pearl and other Avolites consoles.

The buttons above the stage area allow you to edit and save position palettes. Press on Recall Focus, then a focus button to select all the fixtures in that palette entry and set the values. You can move all the fixtures together, or the Step to Next and Step to Last buttons will step through the fixtures one at a time. When you have made the changes, press on Store Pan/Tilt to store the changes back into the same palette entry.

You can also change other attributes in a palette, but to store changes other than pan/tilt you use the Store Focus button on the right hand side of the tablet.

8.6   Other functions

The tablet has a selection of other functions down the right hand side, including Locate Fixture, Flip, Select All, Clear (programmer), Off, Record Memory etc. These have the same functions as pressing the appropriate button on the Sapphire.

You can create a group using the tablet, just select the fixtures you want in the group, press Record Group, then the group button to be used.

The Release Fixture button is similar to clear, but it only removes from the programmer fixtures which are selected.

The DeLatch Fixtures button deselects a fixture but leaves any changes in the programmer.

Other buttons in this area, and the Mouse Pad area above, are for future expansion.

C H A P T E R   N I N E

9.   Running a show and automated playback

This chapter contains: Run modes, channel mimics, master faders, manual control during a show; Script files, using script files in Run mode.

9.1   Run modes

When you finish programming, back up the console to disk before you start the show (see page 161). Then turn the key to Run mode to make sure you can't accidentally change anything.

When you are running a show, there are two modes available to you, normal Run mode, where you can turn on anything you have programmed but can't control anything manually, and Takeover run mode which allows you to take manual control if you want. The mode also affects how the Swop and Add buttons on the console operate.

You can select the mode by pressing Softkey A, "Toggle mode". The mode is shown on the top line of the display.

- **Normal Run mode**: the Add and Swop buttons on the handles and playbacks work as flash buttons. The "Add" button adds the function into anything else which is on. The "Swop" button turns on the function, but turns off everything else while the button is held down. The programmer is cleared and you can't manually control any LTP channels. You can control HTP channels using the preset faders.

- **Takeover run mode**: the Swop buttons on the handles allow you to select dimmers or fixtures for manual control. This lets you add to or change your programming in real time during the show. The Add buttons on the handles recall palette values (but unless you are used to the Pearl, it is easier to use the dedicated Palette buttons). The faders still control the intensity of the dimmers and fixtures. The Add and Swop buttons on the playbacks are disabled.

9.2   Channel mimics

If you are in normal Run mode, the LEDs on each handle mimic the intensity of the fixture or dimmer controlled by that handle (i.e. they are lit if it is turned on).

If you are in Takeover Run mode (or Program mode), you can choose between "Mimic" mode, or "Fixture" mode where the LEDs show you which fixtures are selected for manual control.

You select the mode by holding down the Avo button and pressing Softkey A. The button shows "Preset LEDs = Fixtures" (or mimics) depending on the mode. You can also change this mode using the Graphics Tablet.

9.3   Master faders

In the bottom left hand corner of the console are the Master Faders. These allow overall intensity control of the whole console.

- The Add and Swop masters control the intensity of the Add and Swop buttons on the playbacks. This allows you to flash the playbacks to a

certain level. It also allows you to disable the Add buttons by setting the master at 0. (If you turn the Swop master to 0 you will get a blackout if you press a Swop button).

- The Preset Master controls the overall intensity of any channels turned on in the Preset faders.

- The Grand Master controls the intensity of all output from the console. Normally you would set this at full, and use it if you need to quickly fade out all the lights.

If you are in Program mode, the output of anything in the programmer is not affected by the Grand Master.

9.4 Manual control during a show

If you have not had as much programming time as you would have liked, you might need to make up some additional effects during the show. You can create instant variations by recalling palette values to modify your existing programs. (You need to be in Takeover Run mode.)

You can "fade" to a palette value by selecting the fixtures you want to change, typing the fade time (e.g. "2" for 2 seconds), pressing softkey B, "Recall Focus", then pressing the Palette Select button you want (e.g. Green). The selected fixtures will change to Green over a 2 second period.

You can also change the position of fixtures; the easiest way to do this is to use "Nudge" mode on the graphics tablet. This allows you to sweep selected fixtures around their programmed position by drawing with the pen, so you can alter the height of a chase or shape in real time.

9.5 Creating Script files

Script files are a powerful feature of the Sapphire which allow you to record a show in real time using the playback faders, then play back the show synchronised to an external MIDI time code source, or using the Sapphire's internal clock. This is very useful for repeated light shows such as at exhibitions or in fixed displays.

The script file is simply a list of instructions to the Sapphire which specify actions at certain times. The easiest way to make a script file is to get the Sapphire to record your actions as you do them, but you can also enter commands individually.

To enter script file programming mode, turn the key to "System", then press Softkey D "Script file programming".

The procedure for programming a script file is as follows (the options are listed afterwards):

1>   *Press Softkey A "Select a timer source", then A for MIDI timecode or D for internal timer.*

2>   *Press Softkey B "Create a script file". Start the timecode source if using MIDI.*

3>   *Run the show as you want it by turning playbacks on and off. The Sapphire records your actions (including fade times) as script file commands. You must move faders to maximum for the action to*

be recorded.

4> Press Softkey F "Done" when finished.

5> Reset the script file to the start by pressing the ML Menu button.

6> If you are using the internal timer, reset it to 0 by selecting option A and pressing Enter, then select Softkey E, "Connect Timer". For MIDI timecode, start the timecode again.

7> The script file will replay.

- You can set an option which makes the script file run automatically when the Sapphire is turned on, see option G.

- At any point, pressing the ML Menu button will reset any playbacks which have been turned on by the script file and move the file back to the first step.

- Ensure the master faders are at full when recording Script files otherwise the playback faders will not be recorded.

The options on the Script File Menu are:

A: Select a timer source - Allows you to select the source for the timer on which the script file is based. The possibilities are:

- A - External (MIDI) time code.
- D - Internal timer /TC - uses the internal clock
- E - Stop timer - stops the internal clock
- F - Start timer - restarts the internal clock

You can enter a setting for the internal clock using the numeric keypad - 2 digits each for hours, minutes, seconds, frames - then press Enter. The time you are entering is shown at the bottom of the screen.

To reset the internal timer to 0, just press Enter.

B: Create a script file - This option lets you create a new script file. If there is already a script file, the Sapphire will make sure you want to overwrite it (if not, select No and use option C below to work on another file).

Now, start your music or midi time code source, and perform the show you want to record on the Sapphire by turning playbacks on and off. It will record all playback changes and display them on the screen, with the timing information.

The menu options allow you to select the timer source as above, Reset the timer, Clear masters (which turns off any memories turned on by the script file), and End the recording.

C: Select script file - Lets you select which script file you want to work on. The display shows a list of script files. Type the number of the one you want using the numeric keypad, from 01-99, then press Enter. To start with a new blank file, select any number which is not on the list.

D: Edit script file - Allows you to edit the current file. The display shows the steps in the file (the VGA screen gives a more detailed description of the step contents). Use the cursor keys to select the current step, which is indicated by an arrow. The options (when not in "on-the-fly

editing mode") are:

- A - Delete step (deletes the current step)
- B - Insert before current step (inserts an empty step)
- C - Insert after current step
- D - Assign action - lets you set a new action for the current step
- E - Assign timecode - lets you set a new time for the current step.
- G - Press to enable on the fly editing

You can enter a step number to jump to using the numeric keypad, then press Enter.

Option D "Assign action" allows you to change the action for the current step as follows:

- A - Load (Turn on a playback - press A then the swop button of the playback to turn on)
- B - Ramp Down (Turn off a playback - press B then the playback to turn off),
- C - Record a blackout step
- D - Set ramp time (the fade in or fade out time for the step - input the time on the keypad then press Enter)

Option E "Assign timecode" allows you to change the trigger time for the current step as follows:

- A - Select timer source (same as option A on the main menu)
- B - Assign TC to file start (sets the time code of the first event in the file to the current time code)
- C - Assign TC to group (sets the time code of all events in the group set using option F to the current time code)
- D - Assign TC to step (sets the time code of the step to the current time code)
- F - Toggle group (the current event is added to a group, indicated by a < next to the step number).
- G - Sort by timecode (Re-orders the events in time order)

You can also type in the trigger time for the current step. A flashing cursor on the screen shows you where the input is going. The time you are entering is shown at the top of the screen.

Option F "Press to enable on-the-fly editing" allows you to add new events to the file in real time as it plays back. (You can also add events to the file while it is paused, anything you do will be added at the current timer setting). The options on the menu change to

- A - Select timer source (same as option A on the main menu)
- C - Sort steps by timecode (Re-orders the events in time order)
- D - Play (runs the file from the current time)
- E - Pause (stops running the file)
- F - Start script file from step 1
- G - Disable on-the-fly editing (Turns off this mode)

E: **Connect Timer** - Connects the timer to the script file. This will cause steps to be executed when the event timecode matches the timer. The option changes to Disconnect timer when selected, and option F changes to Synchronise.

F: **Next Step** - Moves on to the next step in the script file. This option changes to Synchronise when the timer is connected to the script file.

G: **Script File parameters** - Lets you set options for how the script file is run. The display shows a list of the script files available, you can select the current file using the cursor arrows. The menu options are:

- A - Toggle Global Autorun (Enables Autorun, any file with Autorun turned on using option C will run when the Sapphire is turned on)
- B - Toggle Loop mode (Changes the Loop setting of the current script file. Loop resets the timer to zero when the file finishes. Only works with the internal timer.)
- C - Toggle the scriptfile autorun (Changes the Autorun setting for the current script file. Global Autorun must also be On).
- D - Set end-time from input (Allows you to set the end-time of the file from the numeric keypad)
- E - Set end-time from script (sets the end-time to the last event in the file).

9.6 Using Script files in Run mode

When the Sapphire is in Run mode, a special set of Script file options are available.

You can run a script file and operate the console manually at the same time.

C: Play Script File – Starts the currently selected Script file (you select it using option D). The script file runs from its current position, so you may need to reset it to step 1, and/or reset the timer or send the correct MIDI timecode.

The option changes to Pause Script file when selected.

D: Script file Functions - Lets you set options for how the script file is run. The menu options are:

- A – Select a timer source (same as option A on the main Script File menu)
- C – Select a script file (same as option C on the main Script File menu)
- D – Start from Step 1. Resets the file to step 1, also resets the internal timer, if you are using it, to the Step 1 time.
- E – Connect timer. Runs the script file. (Same as option E on the main Script File menu)
- F – Next Step. Moves the current step on to the next step. Also moves the internal timer on to the next step time.
- G – Clear Script File Playbacks. Resets all playbacks which have been used by the script file.
- You can also press ML Menu to release the playbacks which have been used.

CHAPTER TEN

10. Advanced features

This chapter contains: The user preference menu; setting the Sapphire's clock & utility functions; disk functions; using MIDI commands with the Sapphire; Service mode; hardware WIPEALL mode.

10.1 The User Preference menu

This menu is obtained by turning the key to System mode and pressing Softkey C, "User Settings". You select the option to change using the cursor up/down buttons, and make the changes using the left/right buttons.

The options are:

← → ← → = **Chase keys** – Allows you to set whether the Sequence Control keys set chase direction or Fixture selection (see page 116). This option can also be set by holding the Avo button and pressing Softkey C.

Fader OFF < x - Sets the level of the fader at which LTP channels turn off when fading out a memory or chase. This has to be at least 2 values below the "on" value. The Sapphire will not let you set an incorrect value.

Fader ON > x - Sets the level of the fader at which LTP channels turn on when fading in a memory or chase.

Normal Run / Take Over - Sets the Run mode of the Sapphire. This option can also be set by pressing Softkey A while in Run mode. See page 153 for details of Run mode.

Rec by Instrument / Rec by channel - Sets the recording mode of the Sapphire. If set to "by Instrument", if any attributes of a fixture are changed, all attributes are recorded. If set to "by channel", only changed attributes are recorded. See page 129 for details of how this works. This option can also be set by holding the Avo button and pressing Softkey B.

TC Check Enabled / Disabled – Turns MIDI timecode checking on or off. If turned on, the Sapphire will sample the incoming timecode, and if it is corrupted will substitute internal timecode until the external timecode is OK again.

Chase Autoconnect ON / OFF - Allows you to turn Chase autoconnect on or off. If on, the controls are automatically connected to the most recently turned on chase. If off, you have to connect the chase manually using the Connect button.

Speed=Seconds / BPM - Allows you to set whether chase speed is displayed in Seconds or Beats Per Minute (tempo).

FRAME + xxx mcs - Sets the DMX idle time (the delay between the end of one packet and the start of the next). This allows you to slow down the DMX refresh rate if you have some equipment that can't keep up. Increasing the delay will degrade the performance of the DMX link so

you should not change this unless you have to.

Midi - SLAVE/MASTER/DISABLED - Sets the MIDI mode of the Sapphire. In Slave mode it receives data, in Master mode it transmits data when you press a key or raise a fader. This provides a simple way of recording a show straight into a sequencer.

Midi channel = xx - Sets the MIDI transmit / receive channel. MIDI channels are actually numbered 1-16, and the Sapphire displays 0-15, so add 1 to the Sapphire display to get the actual channel.

DMX Chans = xxx - Sets the maximum number of DMX channels to transmit. If your rig does not use all 512 channels, you can improve the DMX refresh rate by reducing this number to the maximum of your rig. You can also set this option from the "Set DMX Lines" option in Patch mode.

There are also options on the softkeys, these are:

A: Fixtures or Mimics – The Swop button LEDs can show either the fixture intensity (Mimic) or light up if the fixture is selected (Fixtures). This option can also be set by holding the Avo button and pressing Softkey A

B: Set TC valid range – Allows you to set the MIDI timecode range which will be accepted. Enter the minimum time as prompted on the screen and press softkey A, or the maximum time and press softkey B.

C: Specify Attributes for Bank - Allows you to set which attributes go together (also called the Focus Mask, see page 120 for another way of setting this). Normally the Dimmer attribute includes all the others, and the Colour attribute includes the cyan/magenta/yellow attributes, but you can change this. Select the Attribute to change, then press this option. Select the other attributes you want to include, then press Exit. Beware of changing these settings unless you are sure what you are doing.

D: Theatre mode = Off / On – Allows you to disable the Theatre mode. This is the only way to turn off Theatre Mode. See page 145.

10.2 Setting the Sapphire's clock and Utility functions

The Sapphire has a built-in real time clock. It uses this to record snapshot times and disk backups, so it's important to have the correct time and date set on it.

To set the clock you need to be in System mode, and you need to have a VGA monitor connected.

Press Softkey G, "Utilities", then Softkey A, "Set Clock". The Sapphire displays a window on the VGA monitor in which you can enter the time, date and daylight saving modes (if the clocks get put forward an hour in summer). Press Exit to abandon or Enter to save.

The other options on the Utilities menu are:

C. Configure a MIDI keyboard - This lets you teach the Sapphire which MIDI note turns on each memory. Send the MIDI note for memory 1, then the note for memory 2, and so on. Press Exit to end.

D. Cache personality files - Lets you load the personality files into the

Sapphire, so you don't need to carry a personality disk around with you. You need the special compressed personality file called P2000PER.CMP which is available from the Avolites web site.

E. Load Shape File – Allows you to load a new shape definition file SG.DAT. You may need to do this if Avolites issue an updated shape file.

F. Clear Wrap around channels - If you load a show saved with an earlier version of software, you might get a problem with channels which wrap around from 255 to 0. Running this option will sort them out.

10.3 Disk functions

Press the Disk button to display the disk menu. The options are:

A: Load show from disk - The Sapphire displays the name of the show on the disk. This is shown on the VGA monitor only. Press Enter to load it or Exit to cancel.

B: Save show to disk - Saves the contents of the console to the disk. Type a name for the show, then press Enter.

C: Verify disk – Compares the show on the disk to the contents of the Sapphire.

E: Format options - Allows you to format a disk to 720K or 1.44M, then optionally save a show when the format is complete.

F: Catalogue – Displays (on the VGA monitor) the show file on the disk.

G: Load user curve - Allows you to load a custom dimmer curve. You can specify that a dimmer should use the custom curve when patching it. It is a text file with the following format:

The file must have 256 lines and be named UC.DAT. Each line contains the dimmer output value (in decimal) for that line number. Comments are allowed after 5 spaces. An example is

```
00      output for level 0
05      output for level 1
07      output for level 2
09      output for level 3
...
251     output for level 254
252     output for level 255
```

10.4 Using MIDI commands with the Sapphire

The Sapphire can respond to or output MIDI note information which emulates certain buttons being pressed or faders being moved. The console can also respond to MIDI Timecode, which is used with script files.

If you want to know more about MIDI, a good book to read is *MIDI Systems and Control* by Francis Rumsey; Published by Focal Press, ISBN 0-240-513000-2. There's also a huge amount of information available on the Internet, try searching for "MIDI specification".

The MIDI mode is set on the User Preference menu to be MIDI master (outputs MIDI when you turn on playbacks), MIDI slave (responds to MIDI) or MIDI disabled. The MIDI channel the Sapphire will respond to is

also set on this menu (note that you need to add 1 to the number displayed by the Sapphire to get the actual MIDI channel number).

What a MIDI command looks like

The normal MIDI command is: STATUS BYTE1 BYTE2

Or in binary, `1cccnnnn 0xxxxxxx 0yyyyyyy`

`ccc`	=	the MIDI command (note on, program change etc)
`nnnn`	=	the MIDI channel number (set on the User Preferences menu).

`xxxxxxx` and `yyyyyyy` are the data bytes.

MIDI often works in "running status" mode. If a lot of the same type of command is being sent (lots of note on's etc.) then the status byte can be missed out. The receiver knows that if it doesn't get a status byte, it just has to run with the last one it received.

MIDI commands used by the Sapphire

The Sapphire uses standard MIDI commands. The usual name for these is given in *italics.* All commands are given in hexadecimal notation ($9n), where 'n' is the MIDI channel number. So a note on command for MIDI channel 3 for example would be $92.

Set playback page : *program change* (`$Cn xx`)

Page	1	2	3	4	5	…	98	99	100
xx	$00	$01	$02	$03	$04	…	$61	$62	$63

example   *$Cn $02*   *Console changes to Page 3*

Turn on a playback: *note on* (`$9n pp ll`)

Note number (pp) = playback number, from 0 - 19 (decimal)
Key velocity (ll) = playback level, from 0 - 127 (decimal). 127=Full

example $9n $03 $40   *Playback Fader 4 at 50% level.*

(Note that Playback Fader numbers start at zero, so subtract one from the number on the console to get the MIDI note number).

To Turn Off a playback, send a note on command with velocity=0. The Sapphire does not recognise MIDI note off ($8n) commands.

Stop/run/step a chase etc: *after touch* (`$An pp cc`)

Note number (pp) = playback number, from 0 - 19 (decimal)
Aftertouch value (cc) = control codes:

$00	stop chase
$01	run chase
$02	restart from step 1
$03	fade to next step using programmed fade times
$04	Snap directly to next step

MIDI Time Code

MIDI time code is used to synchronise Script Files with an external

music track.

Quarter-frame message types are fully supported and these follow the standard format, which can be found in most MIDI handbooks. A suitable EBU/LTC Timecode to Midi Timecode converter is manufactured by JC Cooper Electronics whose address is 12500 Beatrice Street, Los Angeles CA 90066 USA, or through Avolites UK.

MIDI Problems

The console supports a full MIDI data rate burst for 2 seconds, after that data may be lost since it cannot be processed.

A MIDI debug Terminal is available which shows you the MIDI commands being received by the Sapphire. To activate this :

Turn the key to System, then Press Softkeys A, D, F. The MIDI terminal window is displayed on the VGA monitor. Turn the key to Run to finish.

10.5 Service mode

Service mode, selected by turning the key to "System" then pressing Softkey A, "Service", lets you make fundamental changes to the console, including changing the operating software.

Do make sure you have plenty of time to complete these operations. Do not attempt to upgrade the operating system or make other fundamental changes just before showtime!

The options are:

A: Run AVOS2 - Starts the low-level operating system. If you have any information in the console, you should save it to disk before running AVOS. You will need to enter a code to discourage anyone who gets here by accident, the code is 68340.

The options are:

A. Start the system - runs the Sapphire operating system
B. Burn a new program - Loads new console operating software. You can get this from the Avolites web site or on a disk from Avolites. The file is called FLASH.PRL. You should execute option 1 after loading a new operating system.
C. Verify - checks if the operating system on the disk matches the one loaded on the Sapphire.
D. Save program - saves the existing operating system to disk
E. AVOS extender - lets you load a new AVOS operating system (RAM.PRL). You must ensure the console is not turned off while you are doing this, because you will need new flash memory chips from Avolites if this happens.
1. Wipeall and start system - Executes a Wipeall (clears everything) then runs the Sapphire operating system

B: Diagnostic Screen – Displays a diagnostic screen which enables you to test the buttons, faders and wheels on the console. Test messages are shown on the other displays. Turn the key back to Run mode to get out of Diagnostic mode.

C: Display Bus Errors – Shows a log of errors on the internal system bus.

D: Tests – Displays another menu allowing you to test various hardware in the system. A MIDI test window is shown on the VGA display to display incoming MIDI commands.

F: Wipeall - Wipes all memories and all options from the console so it is pristine and new.

10.6 Hardware WIPEALL mode

You can do a complete factory reset by fitting a link on the board. You should obviously save any show data that you want to keep. It may also be advisable to have a backup of the system software (AVOS option D) before you do this… just in case.

1> *Disconnect the Sapphire from the mains.*

2> *Undo the half-turn fasteners on the rear edge of the console, and lift the fader section of the console.*

3> *Fit the Wipeall link. This is a jumper located on the main PCB near the large square processor. It's labelled on the PCB legend. A link is provided fitted to one of the pins. Fit the link so it connects the two pins.*

4> *Close the console (don't fasten it), then turn on the power.*

5> *The console will power up in the AVOS menu. Select option A "Start the System". (do not select any other option when the Wipeall link is fitted).*

6> *Turn off the Sapphire, open it and remove the Wipeall link (fit to one of the pins only). If you forget this, the console will do a Wipeall every time you turn it on!*

7> *Close the console and refasten it.*

If you do the above then restart the console without selecting "Start the System", you may not be able to get the console to run. Use the following procedure to start the console.

1> *Turn off the console and open as described above.*

2> *Fit the AVOS link. This is a jumper located on the main PCB near the chip labelled "PASHA". It is in a row of 8 jumpers, the AVOS link is the one nearest the back of the console. A link is provided fitted to one of the pins. Fit the link so it connects the two pins.*

3> *Close the console (don't fasten it), then turn on the power.*

4> *The console will power up in the AVOS menu.*

5> *Select option A, "Start the system". Do not select any other option.*

6> *Turn off the Sapphire, open it and remove the AVOS link (fit to one of the pins only).*

7> *Close the console and refasten it.*

11. The Personality File System

This chapter is designed for those users who wish to know how to write or alter a Personality File.

The Personality File system uses a simple programming language. Whilst we have attempted to create the simplest manual some prior knowledge of writing software is assumed.

If your eyes glaze over at the thought of writing software, read no further and enjoy using your console in the knowledge that at Avolites there are software programmers who actually enjoy writing personality files and if you come across a fixture for which a personality file is required contact us and we will help.

11.1 What is and how do I write or change a Personality file?

The personality file is an ASCII text format file containing information on how the desk should patch each channel of an instrument.

Since the files are in ASCII text format you can easily modify them and create new versions for your own use. When editing files you must ensure your word processor is set to save in plain ASCII text format. If you use Windows Write make sure that when you open the file you select 'no conversion' and when you close the file you save it in the 'text file' format.

Before editing make a backup of the original, in case your edits do not work.

The Sapphire normally stores the personality files in an internal cache so that you don't need to carry a personality disk around. The personality cache is a special compressed file containing all the personalities. You cannot currently add your own definitions to it, so you will have to load your custom personalities from disk in the time-honoured fashion.

11.2 Personality file naming conventions

There are four extensions used by personality files: .PER, .D2, .R96 and .R20.

Sapphire software will read any .PER file and any.R96 file, however when .PER files are read a message will be presented to the user to warn that an old personality file is being used and not every function of the desk will work correctly. Typically this includes tracking, pre-loaded focuses and locate fixture and tablet functions. .D2 files are for the Diamond.

Files with the extension .R20 can only be used with Pearl 2000, Azure 2000 and Sapphire 2000 control desks. These files have additional fields for the enhanced functionality provided within these desks.

11.3 Personality File Keyword Order

Keywords should appear in the following order:-

```
DEVICE ...
TYPE ...
DEVICEADDRESS ...
DAEND ...
MINDMX ...
```

```
MAXDMX ...
DIVBY ...
MIRROR ...
DMX ...
DMX ...
TEXT   ...
END
PFTABLE ...
PFEND
MACRO ...
MEND
```

11.4 The Instrument Name

The **INSTRUMENT NAME** will appear in the following format :-

`DEVICE    XXXXXXXX`

Where **DEVICE** is the keyword to tell the desk that an instrument name follows and `"XXXXXXX"` is the name of the instrument, this name can be 11 characters long and no spaces or tabs are allowed.

This instrument name will appear on a soft button when patching and is used in various view screens when operating the desk.

It is usually easier to make the actual file name similar to the **DEVICE NAME** to make things easier when servicing personality files.

11.5 The Device Type

The **DEVICE TYPE** will appear in the following format :-

`TYPE  1 Y Z`

Where **TYPE** is the keyword used to tell the desk that **DEVICE TYPE** data follows.

`"1"`, which is the first character on the line is no longer used but is required for backward compatibility. This field may be used in future versions and should always be "1".

Field `"Y"` tells the desk the number of ATTRIBUTES (channels) the device uses, and entry `"Z"` gives information on the way the device is to be patched.

Where:-

> M   patches from dmx 512 to 001 (downwards)
> D   patches from dmx 001 to 512 (upwards)
> K   for those devices where the dmx channels used are not in consecutive slots

For example a **TYPE-LINE** can look like:-

`TYPE   1 8 M`

Setting the device to:- 8 channels used patched from 512 downwards and the next line sets a device for 10 channels and patched from 001 to 512

`TYPE   1 10 D`

11.6 Fixture switch settings

This allows the desk to display the exact switch settings required to

configure a fixture for a given DMX address and to ensure it is set in the correct mode.

The display can be configured in virtually any way required. The fixture switch detail MUST be declared before the DMX declaration.

A number of variables are provided for use within this function, these must be in lower case:-

        d = dmx number the instrument is assigned to
        h = handle the instrument will be operated from
        n = the device name, given earlier in the personality file
The keywords associated with the fixture switch settings are:

        DEVICEADDRESS
        DAEND
        MINDMX
        MAXDMX
        DIVBY
The screen space allowed for displaying the fixture information is 10 lines by 21 characters.

The start and end of the fixture switch detail is marked by DEVICEADDRESS and DAEND.

The formula to display this information is restricted to 10 lines by 79 characters.

The three other variables must be defined for the instrument are:-

- MINDMX = lowest DMX number the instrument can be addressed

- MAXDMX = highest DMX address number the instrument

- DIVBY = The difference of two dmx addresses selected by changing the LS bit of the address switch.

For example if the instrument address switch increments the DMX number by 1 then the difference DIVBY will be 1, if, like on the Cyberlight it increments by 20 then DIVBY would be 20.

DIVBY is used to ensure that an instrument can be addressed at the address proposed by the user when patching.

There follows an example for a Cyberlight.

```
;This instrument can only be switched to certain DMX addresses.
; variables used d=dmx number, h=handle, n=devicename;
"Address    %04b %1b001"16-(d/20%16),(d/20)/16
; This is the address display line
; 1. Items in quotes are displayed
; 2. First item here (Address    ) is ascii text
; 3. %04b = 4 bits of binary data, 0 means display leading 0's
; 4. next is a space
; 5. %1b = 1 bit of binary data
; 6. 001 is ascii text again
; 7. Close quotes
; 8. first variable passed is 16-((d/20)%16)
;      (d/20)  : dmx/20 giving fixture number
;      %16     : isolates lower 4 bits
;      16-     : reverses the 4 bits
; 9. Second variable passed is  (d/20)/16
;      (d/20)  : dmx/20 giving the fixture number
;      /16     : isolates the upper 4 bits.
;DEVICEADDRESS
"Handle  %2d"h
"Fixture %11s"n
"DMX     %03d"d
""
```

```
"Dip Switch  1234 5678"
"Personality 0000 0000"
"Address    %b%b%b%b %b001"d/20%2,d/40%2,d/80%2,d/160%2,d/320%2
""
"0=OFF ( Right )"
"1=ON  ( Left  )"
DAEND
MINDMX=1
MAXDMX=481
DIVBY=20
```

The next example is for a Colour Fader, This instrument uses a GROUP and ADDRESS switch

```
; Upto 10 lines of 79 chars are allowed including formulae
; variables used d=dmx number, h=handle, n=devicename;
"Address    %04b %1b001"16-(d/20%16),(d/20)/16
; This is the address display line
; 1. Items in quotes are displayed
; 2. First item here (Address    ) is ascii text
; 3. %04b = 4 bits of binary data, 0 means dislay leading 0's
; 4. next is a space
; 5. %1b = 1 bit of binary data
; 6. 001 is ascii text again
; 7. Close quotes
; 8. first variable passed is 16-((d/20)%16)
;      (d/20)  : dmx/20 giving fixture number
;      %16     : isolates lower 4 bits
;      16-     : reverses the 4 bits
; 9. Second variable passed is  (d/20)/16
;      (d/20)  : dmx/20 giving the fixture number
;      /16     : isolates the upper 4 bits.
;
DEVICEADDRESS
"Handle  %2d"h
"Fixture %11s"n
"DMX     %03d"d
""
"GROUP   %2d"d/12+1
"CHANNEL %2d"d%12
""
""
""
""
DAEND

MINDMX=1
MAXDMX=508
DIVBY=3
```

11.7 Mirror

Mirror is used to define the instrument type - Moving head or Moving mirror and the maximum Pan and Tilt angles through which the instrument can move. These values are required for the 3D tracking system. Typically a **MIRROR** line looks like:-

```
MIRROR  1 170 110
```

Where:-

MIRROR is the keyword

> **1** indicates moving mirror a **2** in this field indicates a moving head instrument.
> **170** is the maximum pan movement.
> **110** is the maximum tilt movement.

11.8 The DMX/Preset Layout

The **DMX/PRESET LAYOUT** will appear in the following format:-

```
DMX
A B C D E F G H I J K L ; comment
A B C D E F G H I J K L; comment
END
```

Where **DMX** is the keyword to tell the desk dmx, preset and fader information follows.

A: sets which Attribute button will be connected to the DMX channel, defined later. The range is 1 to 20 for the desk, but up to 15 for the tablet.

A 0 (zero) in this field indicates it is part of a 16 bit channel defined in the previous line.

B: This tells the desk which wheel is used for that channel, where 1 means left and 61 right.

C: This is the channel type, currently there are 5 different channel types available :-

H	(HTP)	for dimmer
L	(LTP)	for moving lights and scrollers
I	(instant)	LTP channel which does not fade
S	(double byte)	16 bit LTP channel which does not fade
s	(double byte)	16 bit LTP channel

D: This is the relative DMX address of the attribute being defined, starting from 1.

E: This is the maximum output of that attribute in %, where 0 means no output at all and 100% full output. This allows the channel to be limited in level.

F: This sets the curve for that channel, DOM version 2.xx and up supports 4 different curves :-

```
1 =  linear curve
2 =  square
3 =  relay at 50%(128) on
4 =  FD square
```
The curve number is prefixed a single letter which can be:-

```
N = normal
C = complemented curve (ie invert the channel)
```

G: This is the link to the user tables and identifier for PAN and TILT. This will be explained in the **TABLES** section. This entry can run from A to F and 0 (zero) meaning no table entry.

H: This must always be 1 (The checksum facility has been removed).

I: This defines the channel name. This should be in inverted commas and can be up to 11 characters long and it may include spaces. This will be used on screen to identify the channel.

J , K and **L:** define three default levels that can be output. These are

Locate fixture, Highlight and Lowlight.

The range is 0..255 and -1 means no change to the output.

Locate Fixture is used in the moving light menu to turn on a fixture and set channels to a level such that you can see where the instrument is. Generally the settings give 50% pan 50% tilt, white, no gobo, 100% dimmer.

Highlight and Lowlight are used when editing to brighten or otherwise mark one instrument whilst the others are turned into a dim state.

11.9 Text Field

The text field will be displayed when patching the devices.

This text field can hold any text you like, but generally it displays the Attribute Bank layout of the device being patched.

If you are going to want to use the personalities on other Avolites consoles, bear in mind that the Sapphire and the Pearl consoles use an LCD display which is smaller than the VGA display. Limit the text to 20 characters a line if you want the personality to be compatible.

11.10 The Preset Focus (Palette) table

Tables on the Sapphire are for default Palettes which are automatically loaded when an instrument is patched.

Two key lines are required for tables, the definition line and the data line.

The definition line looks like:-

```
PFTABLE  "table name"  A B..
```

Where A is allows the table to be connected to a tablet attribute button.

With the instrument when the pen is clicked on the tablet the table list appears on the VGA screen, moving the pen up or down allows selection of a table entry.

The range for this is -1 meaning table is not attached to a tablet button or 1..30 to define which button the table will be attached to.

Where B is the list of dmx channels values which will be defined within the table.

For example:-

```
PFTABLE "GOBO" 3 4 7
```

The first word is the keyword PFTABLE to indicate that a preset focus table follows.

Next follows the table name. This can be up to 11 characters and can include spaces. It must begin and end with double quotes.

The first number indicates which tablet attribute button the table will be available on.

The final numbers are the actual DMX channel numbers.

The next lines contain the actual focus information and is defined as follows:-

```
"focus name"  palette entry number  channel level(s)
```

When "`focus name`" this is the name given to the focus. This can be up to 11 characters and can include spaces. It must begin and end with double quotes.

When `focus button number` defines which palette entry will be used, numbers 1..200 indicate the entry button number.

Where `channel level(s)` are the actual level output to the instrument. This is must be in hexadecimal notation. If no value is required (the entry is OFF) a -1 (minus one) should be placed in the field.

For example:-

```
"STAR GOBO" 20 0 FF ;
```

The first field is the name of the focus, STAR GOBO.

Next is the focus button number that the focus will be placed on. In this case focus button 20.

Next are the data values.

The last line of the preset focus table must be:-

```
PFEND
```

There can be a number of preset focus tables.

11.11   Macros

Macros allow a defined set of channels to be adjusted rather like running a chase. The principle use for this is to allow instruments to be struck up or reset which sometimes requires a sequence of channels to be turned on and off over a certain time scale.

Whilst a macro is running all other desk functions are locked out. The macro progression is presented on the prompt line of the screen.

There are three key types of data line associated with macros, these are:

```
MACRO "macro name" channel list
"data" data list
"delay" 1 time
MEND
```

- Where "`macro name`" can be up to 11 characters and can include spaces. It must begin and end with double quotes.

- The channel list is the DMX channels for the instrument, to which data will be passed from the `data list`.

- "`data`" that the following data will be passed to the instrument. Note that this MUST be in lower case and enclosed in double quotes.

- `data list` is the data to be passed to the instrument. It must be in hexadecimal notation..

- "`delay`" This optional statement defines that a delay time before running the next step. When used it must be followed by a 1. This field is for future use.

- `Time` is the delay time in units of 0.1 seconds and is in hexadecimal.

   3 seconds would be 2E

Macros must terminate with the statement `MEND`

A typical example macro is:-

MACRO "HOME" 1 18 20 ; send instrument to home position

```
"data"  0 FF 0
"delay" 1 20
"data"  0 0 FF
"delay" 1 20 ; wait about 2.5 seconds
"data"  0 0 40
"delay" 1 40 ; wait about 5 seconds
"data"  0 0 0
MEND
```

11.12   Example Personality File for the High End Cyberlight

Items in BOLD are required, everything else is comments which can be freely changed deleted etc. comments always precede a ;.

```
; "High End Cyberlight mode 1", 20 DMX channels, filename :hecyber1.per
;
; Date       By         Description
; 26-05-94 Salzedo    created
; 10-08-94 Anwar      revised dmx slots
; 07-09-94 J.B.Toby   revised for Pearl use/relocation of channels
; 11-11-94 J.B.Toby   revised to match PerManML
; 22-05-96 S. Anwar   Pan/Tilt channel identification & Resolution inserted
; 04-03-96 S. Anwar   Revised for Sapphire 96
;-------------------------------------------------------------------------------
; The device name, upto 11 characters, no spaces are allowed
DEVICE  CYBER_mode1
;
;-------------------------------------------------------------------------------
; The Type of instrument, 1 & M are required for backward compatibility
; The middle number denotes the number of DMX channels used
TYPE  1  20  M
;
;-------------------------------------------------------------------------------
; Mirror/Head resolution
MIRROR      1       170     108
;           |       |       |
;           |       |       |_____ maximum tilt movement (in degrees)
;           |       |_____ maximum pan movement (in degrees)
;           |_____ 1 means moving mirror, 2 means moving head
;
;-------------------------------------------------------------------------------
; Patching Information. (Upto 10 lines allowed)
; Upto 10 lines of 159 chars are allowed including formulae
; Variables used d=dmx number(1..512), h=handle(1..60), n=devicename (11-char)
; Allowed modifiers
;    +,-,*,/,(,) basic arithmatic
;    % means remainder after divide
;    & means logical AND
;    | means logical OR
;    R means reverse the bits of the curernt result (operates on a byte)
;    ^ means logical Exclusive OR (operates on a byte)
;    > means shift to the right
;    < shift to the left
;    r followed by number means get the value of that parameter
;    d DMX address
;    n Fixture name, a 0 terminated character string
;    h The handle number
DEVICEADDRESS
"Handle  %2d"h
"Fixture %11s"n
"DMX     %03d"d
""
"Dip Switch  1234 5678"
"Personality 0000 0000"
"Address     %b%b%b%b %b001"d/20%2,d/40%2,d/80%2,d/160%2,d/320%2
""
"0=OFF ( Right )"
"1=ON  ( Left  )"
```

```
    DAEND
    ;
    ;--------------------------------------------------------------------------------
    ; Specify DMX limits
    ;
    ; minimum allowed dmx number
    MINDMX=1
    ;
    ; maximum allowed dmx number
    MAXDMX=481
    ;
    ; DMX number must be divisible by this
    DIVBY=20
    ;
    ;--------------------------------------------------------------------------------
    ; DMX channel description
    ;
    ; Column by column description of each DMX channel
    ; 1. The channels bank number (1..12)
    ; 2. The upper faders in the bank (1) or the lower faders in the bank (61)
    ; 3. Channel type (L=LTP, H=HTP, I=Instant LTP, S=16-bit instant LTP,
    ;    s=16-bit Fadeable LTP
    ; 4. DMX offset (1..number of DMX channels)
    ; 5. The output level is proportionally reduced by this level (0..100%)
    ; 6. The curve number (applicable only to HTP channels), usually set to 1
    ; 7. Inverted (I) or Normal (N)
    ; 8. Attribute type (A=Colour Wheel, BCD=Colour Mix, E=Pan, F=Tilt,
    ;                                    0=uncategorised)
    ; 9. Checksum channel (Always 1)
    ;10. Attribute name, must be enclosed in quotes and upto 12 characters allowed
    ;11. The ON value of this channel (0..255)
    ;12. The Highlight level of this channel
    ;13. The Lolight level of this channel
    ;
    DMX
    3  61   S    1  100 1N  E   1   "Pan"          128   -1   -1  ; PAN
    0   0   L    2  100 1N  E   1   "Pan Low"      128   -1   -1  ; PAN Low
    3   1   S    3  100 1N  F   1   "Tilt"         128   -1   -1  ; TILT
    0   0   L    4  100 1N  F   1   "Tilt Low"     128   -1   -1  ; TILT Low
    4   1   I    5  100 1N  0   1   "Colour Wheel"   0    0    0  ; COLOUR WHEEL
    10  1   L    6  100 1N  B   1   "Cyan"         255  255  255  ; CYAN
    10 61   L    7  100 1N  D   1   "Magenta"      255  255    0  ; MAGENTA
    9  61   L    8  100 1N  C   1   "Yellow"       255  255    0  ; YELLOW
    6   1   I    9  100 1N  0   1   "Gobo 1"         0    0    0  ; GOBO 1
    6  61   I   10  100 1N  0   1   "Gobo 2"         0    0    0  ; GOBO 2
    8  61   I   11  100 1N  0   1   "Gobo Speed"     0    0    0  ; GOBO SPEED
    5   1   L   12  100 1N  0   1   "Zoom"           0    0    0  ; ZOOM
    5  61   L   13  100 1N  0   1   "Focus"          0   -1   -1  ; FOCUS
    2   1   I   14  100 1N  0   1   "Iris "        255  255  255  ; IRIS
    9   1   I   15  100 1N  0   1   "Effects"        0    0    0  ; EFFECT WHEEL
    7  61   I   16  100 1N  0   1   "Frost"          0    0    0  ; FROST
    2  61   L   17  100 1N  0   1   "Shutter"      255  255  255  ; SHUTTER
    1   1   H   18  100 1N  0   1   "Dimmer"       255  255  255  ; DIMMER
    8   1   L   19  100 1N  0   1   "Motor Speed"  255  255  255  ; MOTOR SPEED
    11  1   I   20  100 1N  0   1   "Control"        0    0    0  ; Control
    END
    ;
    ;--------------------------------------------------------------------------------
    ; Text to be displayed when the Instrument is selected for Patching
    ;
    TEXT
      Cyberlight Mode 1
    Bank    Faders
      Bottom    Top
    --------------------
     1 Dimmer   --
     2 Iris     Shutter
     3 Tilt     Pan
     4 Colour 1 --
     5 Focus    Zoom
     6 Gobo 1   Gobo 2
     7 Frost    --
     8 M-speed  Gobo spd
     9 Effect   Yellow
    10 Cyan     Magenta
    11 Control  --

    INPUT and/or note DMX
    number.
```

```
      Press a channel grab
      to make patch
      END
      ;
      ;-----------------------------------------------------------------------
      ; Tables

      ; A colour table colour wheel, cyan, magenta, yellow
      PFTABLE "Colour" -1  5   6  7  8
      "Col 1"          1  0   ff ff ff
      "Col 2"          2  0   ff  0  0
      "Col 3"          3  0    0 ff  0
      "Col 4"          4  0    0  0 ff
      "Col 5"          5  0   ff ff  0
      "Col 6"          6  0    0 ff ff
      "Col 7"          7  0   ff  0 ff
      "Col 8"          8  0   97 32 c8
      "Col 9"          9  0   3d a3 bd
      "Col 10"        10  0   eb 5a 17
      PFEND


      ; Gobo
      PFTABLE "Gobos" -1  9 10 11
      "Gobo 1.1"       11  2  0  0
      "Gobo 1.2"       12 af  0  0
      "Gobo 1.3"       13 b9  0  0
      "Gobo 1.4"       14 c3  0  0
      "Gobo 1.5"       15 cc  0  0
      "Gobo 1.6"       16 d7  0  0
      "Gobo 1.7"       17 e1  0  0
      "Gobo 2.1"       18  0 2d  0
      "Gobo 2.2"       19  0 4b  0
      "Gobo 2.3"       20  0 5f  0
      PFEND


      ; Positions
      PFTABLE "Positions" -1 1 3
      "Middle"    21 80  80
      "Left"      22 50  80
      "Right"     23 b0  80
      "Top"       24 80  50
      "Bottom"    25 80  b0
      "TLeft"     26 50  50
      "TRight"    27 b0  b0
      "BLeft"     28 50  b0
      "BRight"    29 b0  50
      PFEND

      MACRO "HOME" 1  18   20
      "data"       0  ff   ff
      "delay"      1  20
      "data"       0   0   ff
      "delay"      1  20
      "data"       0   0   40
      "delay"      1  40
      "data"       0   0    0
      MEND•


      MACRO "SHUTDOWN" 2  18   20
      "data"           0  ff   ff
      "delay"          1  20
      "data"           0   0   ff
      "delay"          1  20
      "data"           0   0   80
      "delay"          1  40
      "data"           0   0    0
      MEND
```

12. Contacts for Fixture Manufacturers

Moving Light Mfr. Contact Numbers			
Country	**Company**	**Contact**	**Telephone Number**
UK	Abstract	John Saunders	+44 (0) 116 278 8078
UK	Andromeda Lighting	David Morrell	+44 (0) 160 868 3673 (fax) 3417
Germany	Amptown	Rolf Garnes	+ 49 40 64 (fax) 0445
Italy UK	Clay Paky Pulsar	Andy Graves	+ 39 35 654 311 +44 (0) 1 223 66798
Italy UK	Coemar Coe-tech	Mr Fausto Kevin Foster	+ 39 376 779 336 +44 (0) 1604 785 878
UK	Fal Lightmasters		+44 (0) 1480 407727
USA	High End Systems Lightfactor	Mick Hannaford	+1 512 836 2242 +44 (0) 181 575 5566
UK	Lampoo Batmink		+44 (0) 1458 833186
UK	M & M	Michael Goldberg Nigel Sadler (Sales)	+44 (0) 171 284 2504
Denmark UK	Martin Professional Martin UK	Ian Kirbie	+44 (0) 1622 755 442
UK	NJD		+44 (0) 115 939 4122
USA	Pan Command		+ 1 408 986 8800
UK	Ryger		+44 (0) 1773 530325
Italy UK	Sagitter JYG	Stefano	+39 35 951 738/777 +44 (0) 1708 530325
UK	SGM JYG		+44 (0) 1708 741613
Italy	Space Cannon	Alexanda Baleski	+ 39 131 772 288 (fax) 292
UK	Starlight	Ray French Martin Lubach	+44 (0) 171 511 4400
UK	Strand Lighting	David Burtenshaw	+44 (0) 181 560 3171
Italy	Studio Due	Franco Bertini	+39 761 352 520
UK	TAS Coe-tech	Kevin Foster	+44 (0) 1604 785878
USA	Vari-Lite Inc	Field Service	+1 214 630 1963
UK	Vari-Lite Europe Ltd	Technical Support	+44 (0) 181 575 6666
UK	Wynne, Wilson Gotelier Ltd (Tunbridge Wells)	Peter Win Wilson	

13. **Glossary of terms**

4D TRACK	The unique Avolites moving light Tracking system available using the Graphics Tablet.
ABSOLUTE	Mode for colours and positions on the Graphics Tablet in which the output of the Fixture corresponds directly with the position of the stylus on the Tablet. See NUDGE.
ADD	Type of flash button which adds the output being flashed into the existing output of the console. See also SWOP.
ADDRESSES	The DMX Channels occupied by individual Fixtures. The first Channel occupied is usually encoded onto the Fixture somehow (often by switches) and called its ADDRESS.
ALIGN	A means of copying Attribute characteristics from the first Fixture selected to other selected Fixtures, resulting in the Fixtures being aligned to each other.
ATTRIBUTE	One Channel of an Intelligent Fixture.
ATTRIBUTE BANK	A set of buttons controlling which Attributes the wheels connect to.
AVOS	The most basic Operating mode in the console. AVOS allows loading of the System Software.
BACKUPS	Copies of a show stored to disk for safety.
BPM	Beats Per Minute.
CHASE	A sequence of one or more pre recorded steps programmed using the CHASE button. It can be replayed automatically if desired. Sometimes known as SEQUENCE, STACK or Linked Cues.
CHASE STEPS	Individual component steps of a Chase. See above
COLOUR CHANGER	A mechanical Fixture for changing the colour of a light source, usually by scrolling through a roll of different coloured gels or by moving special filters into the light beam.
COLOUR MIX	A system of three filters that can each crossfade from white to a colour, or one colour to another. It is a feature of some Intelligent Fixtures, which enables thousands of different colours to be created.
COMPLEX STEP	A Chase Step that has Individual Step Times programmed into it, and hence will not use Global times. See SIMPLE STEP, GLOBAL CHASE TIMES, INDIVIDUAL STEP TIMES.
CONNECTED CHASE	A Chase which has been brought under control of the Wheels and other Chase functions by pressing the CONNECT button.
COPY	A system of replication of Memories and Chases that links all the copies together. A change in any one of the replicas results in the same change to all of

	them. See PHOTOCOPY.
CROSSFADE	Or X FADE. A smooth transition from one state to another.
DEVICE	See FIXTURE.
DMX	DMX512(1990) a specification for communication between control desks and Fixtures, Originally for Dimmers it has been adopted as a control protocol for most Intelligent Fixtures. It can carry 512 different Channels of data.
DMX TRANSMISSION RATE	
	The rate at which DMX data is broadcast from the desk to the Fixtures.
FADE	A smooth transition from one state to another.
FADING CHANNEL	An LTP Channel which CROSSFADES. See INSTANT CHANNELS.
FIXTURE	Any lighting instrument that is patched using a Personality. Generally refers to a moving light or colour changer, not an individual Dimmer channel. Also called Intelligent Fixture, Device, Instrument, Moving Light.
FLIP	A function for use with Moving Head Fixtures. They have two possible Pan and Tilt positions for each point on stage, and FLIP will alternate between them.
FOCUS	What Palettes are called on other Avolites consoles. Occasionally some screen messages may display this term. See PALETTE.
GENERIC	Term used to indicate a Dimmer channel. See also FIXTURE.
GLOBAL CHASE TIMES	
	Fade and Wait times which apply to any Chase Step which does not have Individual Step times programmed into it. These steps are called SIMPLE STEPS. See INDIVIDUAL STEP TIMES, COMPLEX STEP, SIMPLE STEP.
GRAPHICS TABLET	Optional input device for the Sapphire that controls Dimmers and Fixtures by means of clicking a Stylus or a Puck on an electronic slate.
GROUP	A GROUP is a pre-programmed collection of Fixtures that can be selected with a single button press.
HANDLE	The fader and add/swop buttons which are used to control an individual fixture or dimmer channel.
HTP	Highest Takes Precedence, a mechanism for determining the output level of a Channel held in more than one Playback Channel. The Channel outputting the Highest value at any given time will always determine the level of the Channel. Also see LTP.
INCLUDE	A means of transferring the contents of a Memory or

Chase Step into the Programmer.

INDIVIDUAL STEP TIMES

Times programmed into one individual Chase Step from the TIMES menu. These steps are called COMPLEX STEPS. See GLOBAL CHASE TIMES, SIMPLE STEP, COMPLEX STEP.

INSTANT CHANNEL   A channel which does not use fades generated by the console, and moves in discrete jumps from one state to another. See FADING CHANNEL.

INSTANT ACCESS   A function on the Graphics Tablet that does not require the correct Attribute Bank to be selected in order to control an Attribute.

INSTRUMENT   See FIXTURE.

INTELLIGENT FIXTURE

See FIXTURE.

LCD   Refers to the console's on-board displays (stands for Liquid Crystal Display).

LED   Refers to the small red lights within the buttons on the console (stands for Light Emitting Diode).

LINKS   Connections between Chase Steps enabling them to run on from one to another automatically.

LOCATE FIXTURE   A feature of the console that makes it easy to find your selected Fixtures by putting them in Open White with Pan and Tilt at 50%.

LTP   Latest Takes Precedence, a mechanism for passing control of a channel from one Playback Fader to another on the basis that the latest Playback Fader to be moved has control, providing that Playback Fader has moved passed the Trigger point. (See TRIGGER POINT). Also see HTP.

MACROS   Macros allow functions programmed into an Intelligent Fixture by the manufacturer to can be executed by sending a DMX command sequence from the console. They can allow you to reset the Fixture for example. The DMX command sequences are defined within the Personality File.

MEMORY   A single stage look programmed onto a Playback button or fader. It does not have Wait times. Also known as CUE, STATE, SCENE, LOOK.

MEMORY MODE   A playback format programmed into a Memory. There are Memory Modes 0, 1 and 2.

MIDI   Stands for Musical Instrument Digital Interface. It is the established hardware and software specification enabling the exchange of data between digital musical instruments (such as keyboards) and other devices such as computers, sequencers and sound and lighting consoles.

ML MENU   Stands for Moving Light Menu.

NUDGE   Mode for colours and positions on the Graphics

	Tablet in which the output of the Fixture changes relative to the movement of the stylus on the Tablet. See ABSOLUTE.
PALETTE	A term used to describe a referenced pre-defined state for an Attribute that can be recalled whenever required during programming. Each Fixture may be different in the Palette, the entries can be named, and recalled with a single button press.
PARK	This happens to a fixture when its DMX address is taken by another fixture during a later patching session. The fixture must then be repatched.
PERSONALITY FILE	A description of what Attributes a particular Intelligent Fixture has and how the console will patch and use these. It also determines which Attribute Bank will control which Attribute. Avolites Personality Files are in ASCII format and can be edited on any personal computer which can read and save onto MS DOS 1.44 Mb (High Density) 3.5 inch disks.
PERSONALITY DISK	A disk on which Personality Files are stored.
PHOTOCOPY	A method of replicating Memories and Chases that are completely independent of each other. See COPY.
PLAYBACK	Area of the console that can replay recorded Memories or Chases using Playback Faders.
PRESET FADERS	The 100 faders across the top of the console which are used for controlling individual fixtures or dimmer channels.
PRESET FOCUS	What Palettes are called on other Avolites consoles. Occasionally some VGA screen messages may display this term. See PALETTE.
PROGRAM	Desk mode in which programming functions are enabled, but System Software is protected. See RUN, SYSTEM.
PROGRAMMER	The part of the console which contains Channel information which has been changed by the user, prior to recording.
RUN	Desk mode in which all Playback functions are enabled, but all programming functions disabled.
SCRIPT FILES	System that allows Playback to be automated and controlled by Timecode.
SELECTED	A Fixture that is under manual control.
SEQUENCE	See CHASE.
SHAPE	A preprogrammed effect available which is applied to an Attribute. It can then be customised and stored in a Memory.
SHARED PALETTE	A Palette in which information is only stored for one Fixture, but is available to all Fixtures of that type.

SIMPLE STEP	A Chase Step which does not have Individual Step Times programmed into it, and hence will use Global Chase times. See COMPLEX STEP, GLOBAL CHASE TIMES, INDIVIDUAL STEP TIMES.
SOFTKEY	Buttons marked A-F, with different functions which are shown on the VGA display.
STACK	See CHASE.
STAGE REMOTE	Optional input device for the Sapphire allowing control of DMX Channels and recall of Memories and Chase Steps.
SWOP	Type of flash button which turns on the output being flashed and turns off all other output while the button is pressed. Sometimes called "Solo". Also used for selecting fixtures or playbacks when programming. See also ADD.
SYSTEM	Desk mode allowing access to the operating software of the Sapphire.
SYSTEM SOFTWARE	The software which runs the Sapphire.
TC	Abbreviation for Timecode. In the Sapphire, this is always MIDI Timecode.
TRACKING	A mode in which Moving Lights can move around an area all pointing at the same spot.
TRAINING	The process of recording points on a stage so that the console can work out the TRACKING for Moving Lights.
TRIGGER POINT	The level set in the User Settings which determines at which point a Playback Fader triggers the LTP Channels programmed onto it.
UNFOLD	A function that allows Chase Steps to be laid out onto Playback Faders for easy editing.
USER SETTINGS	User definable desk settings. Found in the USER PREFERENCE menu.
WAIT	A period of time that elapses before a Fade happens in a Chase.
WIPEALL	A process which clears all the previous programming out of the desk, but does not touch the System Software.
WHEEL A	This is the left hand wheel. It is used to control the upper Attribute of each Attribute Bank.
WHEEL B	This is the right hand wheel. It is used to control the lower Attribute of each Attribute Bank.

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