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## How to write a Fixture Template file for the maXim.

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## **Introduction**

The maXim lighting control desk with PaTPaD is capable of controlling a wide variety of lighting fixtures.

Each different brand and model of lighting fixture uses a different configuration of DMX channels to control the various attributes of that fixture. One DMX channel might be used to control the INTENSITY attribute, another for the PAN attribute and others for attributes such as TILT, GOBO, COLOUR etc.

To make a fixture function correctly, the maXim needs to know the DMX channel(s) and function(s) of every attribute of that fixture. It also needs to know the specific levels to be output on those channels to get the desired result from the fixture. The maXim gets this information from a computer file called a "Fixture Template".

Every different *type* of Fixture that you control from the **PaTPaD** requires its own Template. For example, if you were using 5 Trackspots and 10 Stagescans in a show you would need one Trackspot template and one Stagescan template.

Fixture Templates for most popular models of Fixtures are available from the LSC website, however you can write your own templates or customise existing templates using the instructions in this document.

A fixture template is a simple text file that can be created on virtually any word processor. We recommend using a freeware program called "Crimson Editor". LSC have created a custom version of Crimson Editor that colour codes various areas of the template making it easier to read and we have extended the editor to recognise legal words for a maXim template file, provide shortcuts for common entries and to check the file to ensure that the template will be accepted by the maXim even BEFORE you load it into your maXim.

Details on how to install, setup and use our custom version of Crimson Editor on your computer are at the end of this document.

Templates are loaded into the maXim via the disk drive and stored in the maXim's library which can hold up to 128 different fixture templates. When a template is required, it is loaded from the library into the patch.

## **Fixture Attributes**

Fixture manufacturers publish a data sheet for every model and version of fixture that they manufacture, specifying how many DMX channels the fixture uses, which attribute of the fixture each channel controls and what specific DMX values on these channels do. This information is typically provided when you purchase a new fixture but it can often be obtained from the fixture manufacturer's web site.



Lets look at the information provided for a “High End Systems” “Trackspot”.

DMX channel	Function	Attribute	Value
1	Pan	Pan Position	0 - 255
2	Tilt	Tilt Position	0 - 255
3	Colour Wheel	Open / Colour 1	0
		Colour 2	32
		Colour 3	54
		Colour 4	79
		Colour 5	110
		Colour 6	138
		Colour 7	160
		Colour 8	200
		Colour 9	210
		Colour 10	240
4	Gobo Wheel	Open / Gobo 1	0
		Gobo 2	32
		Gobo 3	54
		Gobo 4	79
		Gobo 5	110
		Gobo 6	138
		Gobo 7	160
		Gobo 8	200
		Gobo 9	210
		Gobo 10	240
5	Shutter	Closed	0
		Open	26
		Strobe 1	51
		Strobe 2	77
		Strobe 3	102
		Strobe 4	128
		Strobe 5	153
		Strobe 6	179
		Strobe 7	204
		Closed	230
Open	242		
6	Dimmer	Closed – Open	0 - 255
7	Mspeed	Slowest – Fastest	0 - 255

If we look at DMX channel 1, we can see that it controls the Pan Position function and if the value is varied between 0 and 255, the fixture will pan from side to side. If the level is set to 128, the pan will be in the mid position.

Looking further down the chart, if DMX channel 4 has its value set to 32, gobo 2 will be selected and if DMX channel 6 is set to 255, the dimmer will be fully open.

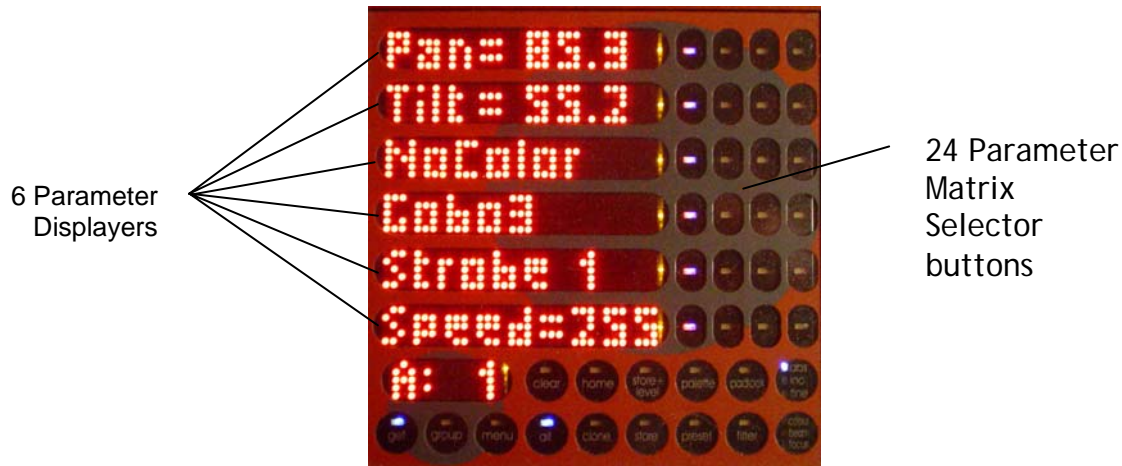
Hence, by setting the various DMX channels to particular values, the attributes of the fixture can be controlled.

For the maXim to be able to control the fixture, we need to format the above information into something that the maXim can understand. The file we create to do this is the fixture template.



## Parameter Displays

The PaTPaD uses its *parameter displays* to control the various attributes of a fixture.



The PaTPaD has:

- 6 Parameter Displays (equivalent to 6 control wheels)
- 24 Parameter Matrix Selector buttons, 4 per parameter displayer.

The four Parameter Matrix buttons beside each Parameter Displayer allows you to select one of four possible parameters that can be controlled by that Parameter Displayer.

The template tells the maXim which parameters are available for each *parameter displayer* and also which attribute(s) of the fixture that will be controlled by the selected parameter.

Notice that these PaTPaD displayers are called “**parameter**” displayers and not “**attribute**” displayers.

In many cases a parameter displayer directly controls the fixture’s attribute of the same name, so why not simply call them “attribute displayers”?

The reason is that a **single** PaTPaD **parameter** displayer can not only control a **single attribute**. It can also be defined in the template to control **multiple attributes** at the same time. Controlling multiple attributes provides much simpler and quicker control of complex tasks. More about this later.

## Parameter Control Methods

The *parameter displayers* can be defined in the template to operate in different ways. They can be:

- Mouseable (variable).
- Step between pre-defined values called *wheel stops*.
- A wheel stop can have a limited variable area within that stop.

Lets look at how we control the PAN attribute of the Trackspot.

Pan is an attribute that you need to control in a smooth and continuously variable way. In the template, a PaTPaD *parameter displayer* is assigned to vary the pan attribute and is defined as M (Mouseable). When you slide your finger across this pan *parameter displayer*, the fixture pan attribute varies and the beam smoothly pans across the stage. The way that this control method is actually defined in the template is described in the next section.

Now lets look at the colour wheel attribute.

Unlike the Pan parameter which is mouseable over its entire range, the colour wheel has 10 distinct positions and needs to step from one colour value to another. In the template, the colour parameter is defined with 10 “wheel stops”. The specific DMX values for each colour and the names that will be displayed on the parameter displays are defined for each wheel stop. To change colours you tap either end of the colour parameter display.

The Trackspot also has a 10 position gobo wheel. In the template, another parameter display is assigned to the gobo wheel and defined with 10 wheel stops. Just like the colour parameter, the DMX value at each wheel stop is defined to exactly position the wheel for the required gobo. To change gobos you tap either end of the gobo parameter display. The names that have been defined in the template for each wheel stop, for example, star, dots, circle etc, will appear on the PaTPaD as each gobo is selected.

Some fixtures might require a parameter that can be moused (smoothly varied) between certain values as well as having some defined wheel stops.

For example, the colour parameter for the Trackspot is defined with 10 wheel stops, one for each position of the colour wheel. You could define another wheel stop that is mouseable and specify the range over which it can be moused. This would allow you to position the colour wheel at any position such as mid way between two colours (providing the fixture is internally configured to allow this).

Recapping, a parameter display can be defined in a template to control one or more attributes and to work in different ways.

- The value of a parameter might be mouseable (variable) (e.g. Pan).
- It might jump between pre-defined fixed values called *wheel stops* (e.g. Gobo 1, Gobo 2 etc).
- There might be a mouseable range within a wheel stop (e.g. gobo spin speed).

## **Template Structure**

A fixture template is a simple text file that can be created or edited in any text editor program. It can be broken down into four basic parts.

- Comments.
- Title section.
- Attributes section
- Parameters section.

**Comments** can appear anywhere in a template and are for user information only. They are ignored by the maXim.

The **Title** section is used to distinguish this fixture from all other fixtures. It includes the manufacturer name and the fixture model. In addition, there is a version number so that we can keep track of different versions of the same template.

The **Attribute** section describes which DMX channel controls which attribute of the fixture. As part of this section we also include a home value for each attribute. A home value is the value that each attribute will go to when the fixture is first loaded or when the PaTPaD is used send a fixture to its “home” setting.

The **Parameter** section defines which display controls which attribute(s), how the display will operate (mouseable, wheel stops or mouseable wheel stops), what will be



seen on the PaTPaD displays (and video) and the DMX values to be output to the fixtures attributes. The parameter section is the most complex part of the template.

Every template starts with the word **fixture** and ends with the word **end**.

This is so the maXim knows where its information starts and where its information ends. The maXim processes information one line at a time and ignores any white space or comments. It recognises “keywords” and uses them as instructions to process the information that follows them. These keywords are reserved and must not be altered, nor can they be used elsewhere in the template.

Let’s look at the maXim template for the Trackspot and then take each of these sections in turn.

The colours used in this template are the ones used in our customised version of the text editing program, Crimson Editor.

- Blue - for keywords (reserved keywords used as instructions for the maXim)
- Mauve - for any text that will be displayed.
- Black - all other legal text.

You will also notice that keywords are indented. The use of indents and colours are only to make the template easier to read and to edit. The indents and colours are ignored by the maXim.



```

//////////////////////////////////// High End TRACKSPOT
// LSC Lighting Systems
// maXim fixture Template
// High End Systems Trackspot
// Author G. Pritchard
// Updated by S. Richards December 04, 2003

```

Comments

```

fixture
  manufacturer = "HIGHEND"
  name = "Trackspot"
  version = 1.00

```

Title  
Section

```

attribute
  name = "PAN"
  channel = 1
  homeVal = 128

```

```

attribute
  name = "TILT"
  channel = 2
  homeVal = 128

```

```

attribute
  name = "COLOUR"
  channel = 3
  homeVal = 0

```

Attribute  
Section

```

attribute
  name = "GOBO"
  channel = 4
  homeVal = 0

```

```

attribute
  name = "SHUTTER"
  channel = 5
  homeVal = 255

```

```

attribute
  name = "INTENSITY"
  channel = 6

```

```

attribute
  name = "SPEED"
  channel = 7
  homeVal = 255

```

```

////////////////////////////////////

```

Comments

```

parameter
  name = "-PAN-"
  displayerNum = 1
  type = F
  attribList = 1
  stop = (M 0:255),D,0,170,"Pan="

```

```

parameter
  name = "-TILT-"
  displayerNum = 2
  type = F
  attribList =
  stop = (M 0:255),D,0,110,"Ti@"

```

Parameter  
Section



```
parameter
  name = "-COLOUR-"
  displayerNum = 3
  type = C
  attribList = 3
  stop = ( 0: 0),N, "Open"
  stop = ( 32: 32),N, "Color 2"
  stop = ( 54: 54),N, "Color 3"
  stop = ( 79: 79),N, "Color 4"
  stop = ( 110:110),N, "Color 5"
  stop = ( 138:138),N, "Color 6"
  stop = ( 160:160),N, "Color 7"
  stop = ( 200:200),N, "Color 8"
  stop = ( 210:210),N, "Color 9"
  stop = ( 240:240),N, "Color 10"
```

```
parameter
  name = "-GOBO-"
  displayerNum = 4
  type = B
  attribList = 4
  stop = ( 0: 0),N, "Open"
  stop = ( 32: 32),N, "Gobo 2"
  stop = ( 54: 54),N, "Gobo 3"
  stop = ( 79: 79),N, "Gobo 4"
  stop = ( 110:110),N, "Gobo 5"
  stop = ( 138:138),N, "Gobo 6"
  stop = ( 160:160),N, "Gobo 7"
  stop = ( 200:200),N, "Gobo 8"
  stop = ( 210:210),N, "Gobo 9"
  stop = ( 240:240),N, "Gobo 10"
```

```
parameter
  name = "-SHUTTER-"
  displayerNum = 5
  type = B
  attribList = 5
  stop = ( 0: 0),N, "Closed"
  stop = ( 26: 26),N, "Open"
  stop = ( 51: 51),N, "Strobe 1"
  stop = ( 77: 77),N, "Strobe 2"
  stop = ( 102:102),N, "Strobe 3"
  stop = ( 128:128),N, "Strobe 4"
  stop = ( 153:153),N, "Strobe 5"
  stop = ( 179:179),N, "Strobe 6"
  stop = ( 204:204),N, "Strobe 7"
```

```
parameter
  name = "-MSPEED-"
  displayerNum = 6
  type = F
  attribList = 7
  stop = (M 0:255),B, "Speed="
```

end

Parameter  
Section





Lets break down the template and examine each part.

## 1. Template Comments

```
//////////////////////////////////// High End TRACKSPOT
// LSC Lighting Systems
// maXim fixture Template
// High End Systems Trackspot
// Author G. Pritchard
// Updated by S. Richards December 04, 2003
```

Comment lines always begin with at least two forward slashes, //. You can use more than two slashes if you wish to make a comment easier to find.

These parts of the template file are ignored by the maXim. They only provide reference information to assist you in tracking the history of a template, providing explanatory notes and other background information.

Comments might include;

- Make and model of fixture.
- Software version of fixture.
- Mode of fixture.
- Option settings of fixture.
- Author of template.
- Date of template.
- Revision information.
- Explanatory notes.
- Start of next section.

Comments can occur anywhere in the template. A line of forward slashes is often used to separate the various sections of the template and make it easier to read when editing. Forward slashes must not be used in any text entries.

## 2. Title Section.

The first line of the template is the keyword “fixture” signifying the start of information for the PaTPaD. The word “fixture” must be the first *keyword* in the template. This is followed by the title section.

```
Fixture
  manufacturer = "HIGHEND"
  name = "Trackspot"
  version = 1.00
```

Templates are organised in the maXim’s fixture library by “manufacturer” and “name”. This part of the template file tells the maXim which manufacturer this fixture is to be listed under in the library and also the model name to be displayed. It also lists the version number of the template. These three pieces of information are used as the unique identifier for this template and are checked when loading a template into the maXim to determine if it already exists in the library. A template with a different file name but with the same information in the title section will be deemed by the maXim to be the same template. In this example, the template will be stored in the fixture library in the “HIGHEND” section under the name “Trackspot”.

A maximum of 9 characters can be displayed on the PaTPaD. Longer names can be used for the manufacturer and will shown in full on the video screen.



**Hint:** If you were creating custom templates for your own exclusive use, you could use your own name as the manufacturer and therefore all of your custom templates would be held in the same location (your name) in the fixture library.

**Note:** The **order** of keywords in the Title Section should be:

```
manufacturer =  
name =  
version =
```

### 3. Attributes Section

The Attribute section starts with the keyword “attribute” to tell the maXim that attribute information follows.

```
attribute  
  name = "PAN"  
  channel = 1  
  homeVal = 128
```

Next is the keyword “**name**”. This defines the text that will be seen on the video screen “V1 Channel View”. The name to be shown is entered inside the quotes. A maximum of 7 characters can be displayed.

Following this is the keyword “**channel**” which defines the fixtures DMX channel number of this attribute.

This is followed by the attributes home value. In this case it is 128 (midrange).

This attribute is followed by the other 6 attributes of the Trackspot. Each attribute always begins with the word “attribute”.

```
attribute  
  name = "TILT"  
  channel = 2  
  homeVal = 128
```

```
attribute  
  name = "COLOUR"  
  channel = 3  
  homeVal = 0
```

```
attribute  
  name = "GOBO"  
  channel = 4  
  homeVal = 0
```

```
attribute  
  name = "SHUTTER"  
  channel = 5  
  homeVal = 255
```

```
attribute  
  name = "INTENSITY"  
  channel = 6
```

```
attribute  
  name = "SPEED"  
  channel = 7  
  homeVal = 255
```



Notice that the “home value” for COLOUR and GOBO are “0”, which will set them to their first (open) positions. Motor speed home value is set to fastest.

When the maXim finds an attribute with the name “INTENSITY”, (case sensitive) it controls that attribute from a yellow fader (as selected in the patch) and not from the PaTPaD. It therefore does not need a home value.

Comparing the attribute section of the template to the information list provided by the manufacturer you can see that there is a direct 1 to 1 relationship.

Template Information	Manufacturer Information	
	DMX channel	Function
<pre>attribute   name = "PAN"   channel = 1   homeVal = 128</pre>	1	Pan
<pre>attribute   name = "TILT"   channel = 2   homeVal = 128</pre>	2	Tilt
<pre>attribute   name = "COLOUR"   channel = 3   homeVal = 0</pre>	3	Colour Wheel
<pre>attribute   name = "GOBO"   channel = 4   homeVal = 0</pre>	4	Gobo Wheel
<pre>attribute   name = "SHUTTER"   channel = 5   homeVal = 255</pre>	5	Shutter
<pre>attribute   name = "INTENSITY"   channel = 6</pre>	6	Dimmer
<pre>attribute   name = "SPEED"   channel = 7   homeVal = 255</pre>	7	Mspeed

Notes:

- The order of keywords in the Attribute Section should be:  

```
name =
channel =
homeVal =
```
- All fixture attributes must be defined in the template before any of the parameters can be defined.



## 4. Parameters Section

The parameter section follows the attribute section. Each parameter in this section represents one displayer on the maXim's PaTPaD and specifies which attribute(s) of the fixture the defined displayer controls and how it controls them.

Let's dissect the first parameter.

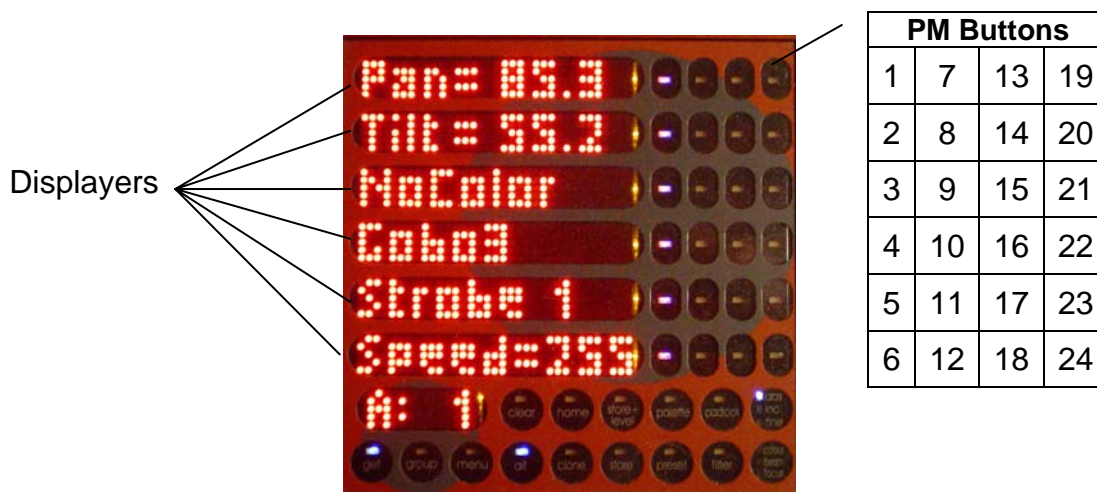
```
parameter
  name = "-PAN-"
  displayerNum = 1
  type = F
  attribList = 1
  stop = (M 0:255),D,0,170,"Pan="
```

It begins with the reserved keyword "**parameter**". This tells the maXim that the following information is about a parameter.

Following this is the keyword "**name**". Each parameter displayer on the PaTPaD has three display modes. It can show the name, value or time of its parameter. This keyword defines the text that will be seen when the displayer is in name mode. By an adopted convention we always enter parameter **-NAMES-** in capital letters and place dashes at the beginning and end. Therefore if a displayer is showing **-TEXT-** in capitals with dashes at each end, it must be in name mode.

A maximum of 9 characters can be displayed including the dashes.

The next keyword, "**displayerNum**", determines which parameter displayer on the PaTPaD will be used to control this parameter. There are 6 displayers on the PaTPaD and each one can control up to 4 parameters as selected by the 4 Parameter Matrix (PM) buttons beside them. Parameter Matrix (PM) buttons are numbered vertically from 1 in the top left hand corner to 24 in the bottom right hand corner. Therefore the top displayer can be used to control parameter numbers 1, 7, 13 or 19. The next displayer can be used to control parameters 2, 8, 14 or 20. The third displayer can be used to control parameters 3, 9, 15 or 21, etc, etc.



In this example, the PAN for the Trackspot is controlled by top displayer when PM button 1 is pressed.

Thus valid characters for “displayerNum =” are: 1 to 24.

The next keyword “**type**” describes whether this parameter is deemed to be controlling a **Focus**, **Colour** or **Beam** attribute and the letter **F**, **C** or **B** designates this accordingly. The type (F,C or B) specified here will determine if this parameter is selected when the PaTPaD’s **filters** are used to select “focus”, “colour” or “beam” parameters. The default “move” and “delay” times are also organised by “focus”, “colour” or “beam” and consequently defining the parameter type determines the default times that will be used.

“Type” also determines the colour of this parameter on the video screen and the colour of the LED in the PM button when this parameter is *not* currently selected.

- **Red** indicates a **colour** parameter is available.
- **Dark Blue** indicates a **beam** parameter is available.
- **Green** indicates a **focus** parameter is available.
- **Not Lit** indicates an *unused PM button*.

The currently selected PM button for each displayer lights **White**.

In this example, the pan parameter is correctly defined as a B (beam) parameter.

**Note:** “Focus” refers to the position of the beam on the stage, that is, *where* it is focused, not whether it is in sharp or soft focus. Sharp or soft is a “beam” shaping parameter.

When writing a template, there is one other option available for **type** and this is the letter **N**. This signifies to the maXim that it is **Not** to store the values of this parameter at any time. This is used for parameters such as “fixture reset”, “lamp strike” or “lamp douse”. These type of functions should only be performed manually from the PaTPaD. They should not be performed when a scene or chase is played back. Therefore, if a parameter is defined as type “N”, it is Not included in any scene, chase, preset or palette that is stored or recorded.

Thus valid characters for “type =” are: F, C, B or N (Focus, Colour, Beam or No store).

The next keyword “**attribList**” specifies the list of attributes (as defined in the attribute section) that this parameter controls. It is possible for one parameter to control more than one attribute of a fixture and it is also possible for one attribute to be controlled by more than one parameter displayer. Multiple attribute/parameter control is described in the advanced section.

The attribute(s) to be controlled are listed after the equals sign and separated by commas. For example, in the Trackspot where the pan parameter controls a single pan attribute and the pan attribute channel number is 1, the line reads:

```
attribList = 1
```

or, for a more complex example in a different fixture where the parameter might control 3 different colour filter attributes the line might read;

```
attribList = 3,4,5
```

Thus valid entries for “attribList =” are the channel numbers of any of the defined attributes.



The next keyword is “**stop**”. As mentioned earlier, a parameter displayer can control a parameter in 3 ways.

1. The value of a parameter might be mouseable (variable) (e.g. Pan).
2. It might jump between pre-defined values called *wheel stops* (e.g. Gobo 1, Gobo 2 etc).
3. There might be variable areas within wheel stops (e.g. gobo spin speed).

The keyword “**stop**” defines how the displayer will control this parameter, the range of control and also how the current value or text is displayed.

The entry for the PAN parameter in the Trackspot template is:

```
stop = (M 0:255),D,0,170,"Pan="
```

Following the = sign, there are several entries, each separated by a comma.

Inside the brackets are the mode and range of the wheel stop. The “M” defines that this wheel stop is **Mouseable**. The values separated by the colon (:) are the minimum and maximum values between which you can “mouse”. In this case the mouseable range will be from 0 to 255, which is the full range of the PAN.

To make templates easier to read and edit, the minimum and maximum values should always be entered as 3 characters wide. That is, if the value is less than 100, use spaces to make up the 3 characters. When a parameter has multiple wheel stops (see below), this ensures that all of the wheel stop values line up in easy to read columns. In the above example, there are two spaces before the zero of the minimum value.

Next follows a comma, then the letter “D” which tells the maXim to display the pan position in **Degrees**. Other display options are available and are listed in the advanced section.

When the “Degrees” option is selected, it must be followed by the minimum and maximum values of the degrees to be displayed, all separated by commas.

In this case the display will range from 0 to 170 degrees. When the DMX is at 0 you will see 0 degrees on the displayer and when the DMX is at 255 you will see 170 degrees. If the DMX level is at 50% you will see 85.3.

The degrees are displayed to 1 decimal place, so keep this in mind when designing templates because the parameter “text” (see below) and value (degrees) must stay within the 9 character limit.

The final part of the “stop =” line is the “text” to be displayed beside the current value. Everything inside the quotation marks will be displayed.

In this case, the text is “Pan=”, so if the pan was in mid position, the displayer would read;

Pan= 85.3

Degrees are the only values that are displayed with a decimal point. When the operator sees a display on the PaTPaD with a decimal place, it tells them that the value is an “angle” in degrees rather than a “level”.

Now lets look at the next parameter.

parameter

```
name = "-TILT-"
displayerNum = 2
type = F
attribList = 2
stop = (M 0:255),D,0,110,"Ti@"
```



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Once again it begins with the reserved keyword “**parameter**”.  
Then the keywords follow in order.....

```
name = "-TILT-"
```

The text “-TILT-“ will be shown on the displayer when in name mode.

```
displayerNum = 2
```

Displayer number 2 will control this parameter.

```
type = F
```

Once again, this is a F (Focus) parameter.

```
attribList = 2
```

Attribute number 2 (tilt) will be controlled by this displayer.

```
stop = (M 0:255),D,0,110,"Ti@="
```

The “M” again means that this wheel stop is **Mouseable**. The mouseable range will be from 0 to 255, which is the full range of the Tilt.

The “D” tells the maXim to display in the tilt position in degrees. The tilt range of a Trackspot is from 0 to 110 degrees so the range to be displayed is different from the pan parameter.

The text to be displayed beside the value is; “Ti@=”. The @ symbol is recognised by the maXim and displayed as the special character “It”. This special character “It” requires less space on a displayer than the individual letters l and t and so it allows more characters to be shown. When the letters Ti are followed by @, the result on the PaTPaD is the word “Tilt” in a compact form. A list of other special characters is in the Advanced Template section. In this case, the text is “Ti@=”, so if the tilt was in mid position, the displayer would read;

Tilt= 55.2

Now let’s look at the next parameter, the colour wheel.

```
parameter
```

```
name = "-COLOUR-"  
displayerNum = 3  
type = C  
attribList = 3  
stop = ( 0: 0),N,"Open"  
stop = ( 32: 32),N,"Color 2"  
stop = ( 54: 54),N,"Color 3"  
stop = ( 79: 79),N,"Color 4"  
stop = ( 110:110),N,"Color 5"  
stop = ( 138:138),N,"Color 6"  
stop = ( 160:160),N,"Color 7"  
stop = ( 200:200),N,"Color 8"  
stop = ( 210:210),N,"Color 9"  
stop = ( 240:240),N,"Color 10"
```

Once again it begins with the keyword “**parameter**”, and the next three lines are very similar to the previous parameters.

The name to be displayed is –COLOUR-

Displayer number 3 will be used to control this parameter.

The type of parameter is a C (Colour).

Attribute number 3 (Colour) will be controlled by this displayer.



The “stop” information is quite different from the pan and tilt parameters. Where pan and tilt had the letter M (mouseable), there is now a space. When there is a space before the values, the wheel stop has a fixed value. It is NOT mouseable. There are however, 10 wheel stops. To change the value you tap either end of the displayer to step through the wheel stops.

As before, each stop has a minimum and maximum value separated by a colon and has spaces in place of leading zero's. When a wheel stop has the same values for its minimum and maximum, this is the value to be output on that wheel stop. If the values are different, the mid point between the two will be calculated by the PaTPaD. The reason for having a minimum and maximum value and not just a single absolute value are explained in the advanced section.

The letter N signifies that No value is to be displayed on the parameter displayer (only the text).

Next is the text to be displayed (everything inside the quotation marks). In the first stop the text is "Open", so if this wheel stop is selected, the displayer would read;

Open

If the right end of the displayer is tapped, it will step to the next wheel stop. You can see from the template that the DMX output level for this attribute will change to 32 and the displayer will read;

Color 2

Further taps on the right end of the displayer will step through the wheel stops. Tapping the left end changes in the opposite direction.

Now lets look at the remaining parts of the template.

The Gobo and Shutter parameters are very similar to the Colour parameter and need very little explanation. The Gobo attribute is assigned to displayer numbers 4. It is a **B** (Beam) type parameter and will be controlled by displayer number 4. It has several non mouseable wheel stops that do not display (**N**) their value, showing only their “text” for each wheel stop.

parameter

```
name = "-GOBO-"
displayerNum = 4
type = B
attribList = 4
stop = ( 0: 0),N, "Open"
stop = ( 32: 32),N, "Gobo 2"
stop = ( 54: 54),N, "Gobo 3"
stop = ( 79: 79),N, "Gobo 4"
stop = ( 110:110),N, "Gobo 5"
stop = ( 138:138),N, "Gobo 6"
stop = ( 160:160),N, "Gobo 7"
stop = ( 200:200),N, "Gobo 8"
stop = ( 210:210),N, "Gobo 9"
stop = ( 240:240),N, "Gobo 10"
```

You could customise a template and replace the generic names “Gobo 1”, “Colour 4”, etc with descriptive names such as “Circle”, “Stars” or “Yellow” that match the actual gobos or colours fitted to your fixtures.





The Shutter attribute is assigned to displayer numbers **5**. It is a **B** (Beam) type parameter and will be controlled by displayer number **5**. It has several non mouseable wheel stops that do not display (**N**) their value, showing only their “text” for each wheel stop.

```
parameter
  name = "-SHUTTER-"
  displayerNum = 5
  type = B
  attribList = 5
  stop = ( 0: 0),N, "Closed"
  stop = ( 26: 26),N, "Open"
  stop = ( 51: 51),N, "Strobe 1"
  stop = ( 77: 77),N, "Strobe 2"
  stop = ( 102:102),N, "Strobe 3"
  stop = ( 128:128),N, "Strobe 4"
  stop = ( 153:153),N, "Strobe 5"
  stop = ( 179:179),N, "Strobe 6"
  stop = ( 204:204),N, "Strobe 7"
```

The next parameter is motor speed. The parameter name is “-MSPEED-” and is controlled by displayer number 6. It is a F (Focus) parameter. Attribute number 7 (SPEED) will be controlled by this displayer. It has one wheel stop that is mouseable over the full range from 0 to 255.

The number “2” tells the maXim to display the motor speed as a percentage of the mouseable range using only **2** digits, 00, 01, 02, ..... 99, FL.

The text to be displayed is “Speed=” followed by the current value as a 2 digit percentage.

Therefore if the motor speed was at its mid point of 128, the displayer would read;  
Speed=50

```
parameter
  name = "-MSPEED-"
  displayerNum = 6
  type = F
  attribList = 7
  stop = (M 0:255),2, "Speed="
```

At the conclusion of all of the parameters, the template ends with the word;  
end

## Advanced Template Techniques

### Value Display Formats

The value that is displayed on a parameter displayer can be shown in several formats. You determine what is displayed by entering the required character in the wheel stop.

Character in wheel stop	Displayed value
D	Angle in Degrees, over the mouseable range. Min and Max angles must also be defined. e.g. D,0,180, Negative values are accepted. Angle displayed to 1 decimal place.
N	No Value displayed
1	1 digit as a % of the range, 0.1.2.....8.9.F.
2	2 digits as a % of the range, 00.01.02.... 99.FL



Pan and tilt should always be displayed in degrees. Displaying the position in degrees is particularly useful with fixtures that can pan through 540 degrees as you can see at a glance whether the unit is past the 360 degree mark. You can also use it for Zoom angles, gobo indexing, in fact anything where there is a linear relationship between the min and max values.

Negative numbers can be used when defining the range of angles to be displayed.

For example;

```
stop = (M 0:255),D,-85,85,"Pan="
```

In this case the displayer will read negative when pan is to the left, 0.0 (Zero) when pan is in the mid position and positive numbers to the right.

Some manufacturers do not specify the pan and tilt ranges of their fixtures in degrees. In this case you can either estimate the ranges or display the range as type 2, a percentage from 00..to ..FL.

There are three other display formats that were used in earlier maXim templates. LSC does not recommend the use of these formats although, as a legacy, they are still accepted by the maXim .

Character in wheel stop	Displayed value
W	(Word) 0.....65535. Only for High Resolution Parameters
B	(Byte) 0.....255.
3	3 digits as a % of range, 000-100

## Mouseable and Fixed Wheel Stops

The mouseable wheel stops described in the previous section were defined to allow the attribute to be varied over its entire range (0 to 255). However you can limit the mouseable area by defining the relevant minimum and maximum values in the wheel stop.

The following example of a Gobo rotate parameter has 3 wheel stops:

- The first stop is not mouseable (because there is a space before the min:max values) and the displayer will read "Stop".
- The second stop makes the gobo rotate in the anti-clockwise direction and the speed is mouseable (M) over the range 132 to 255. The displayer will read "Spd<: ##", where ## is a percentage of the moused value.
- The third stop makes the gobo rotate in the clockwise direction and the speed is mouseable over the range 8 to 131. The displayer will read "Spd>: ##", where ## is a percentage of the moused value.

```
parameter
    name = "-ROTATE-"
    displayerNum = 5
    type = B
    attribList = 4
    stop = ( 0: 7),N,"Stop"
    stop = (M132:255),2,"Spd<:"
    stop = (M 8:131),2,"Spd>:"
```



When a parameter has more than one wheel stop, the text in any *mouseable* wheel stops must end with a colon (:). This is shown in the two mouseable wheel stops above.

- Therefore, when the text on a displayer is followed by a colon, it tells you that the wheel stop is mouseable and that other wheel stops are available.

When a parameter has only one wheel stop and it is mouseable, the text must end with an equals (=) sign.

For example; `stop = (M 0:255),D,0,170,"Pan="`

- Therefore, when the text on a displayer is followed by an = sign, it tells you that the wheel stop is mouseable and that no other wheel stops exist.

You can also define a mouseable wheel stop whose range includes the values of the fixed wheel stops. In this example, there are 6 non-mouseable wheel stops to select gobos. The seventh wheel stop is mouseable over the entire range allowing you to freely position the gobo wheel, even part way between gobos (if the fixture allows this).

```
parameter
    name = "-GOBO-"
    displayerNum = 4
    type = B
    attribList = 3
    stop = ( 0: 42),N,"Open"
    stop = ( 43: 85),N,"Swirl"
    stop = ( 86:127),N,"DotBar"
    stop = ( 128:170),N,"Orbits"
    stop = ( 171:213),N,"Star"
    stop = ( 214:255),N,"Circle"

    stop = (M 0:255),2,"Gobo:"
```

The mouseable wheel stop is separated from the other wheel stops by a blank line to make the template easier to read. The blank line is ignored by the maXim.

## Wheel Stop Min and Max Values

When a non-mouseable wheel stop is selected, if the minimum and maximum values are the same, then that is the actual value that will be output for that stop. For example;

```
stop = ( 0: 0),N,"Open"
stop = ( 32: 32),N,"Color 2"
stop = ( 54: 54),N,"Color 3"
```

The levels for the 3 stops are 0, 32 and 54 respectively.

Instead of a specifying a single value for a particular attribute, some manufacturers specify a **range of values**.

For example,

Manufacturers Information

Colour Wheel	DMX Value
Open	0-20
Colour 2	21-40
Colour 3	41-60
Colour 4	61-80

To write a template for this fixture you could calculate the mid point for each stop and enter that value as both the min and max values for each stop. For example;



```

stop = ( 10: 10),N, "Open"
stop = ( 30: 30),N, "Colour2"
stop = ( 50: 50),N, "Colour3"
stop = ( 70: 70),N, "Colour4"

```

This template would work, but there is a small problem.

On a maXim, you can not only control the level of an attribute using a parameter displayer, you can also directly vary an attribute level using the Edit Wheel. It is therefore possible to set an attribute to a level that is not within the range defined in any of the wheel stops.

If, for example, the Edit Wheel was used to set the colour attribute to a level of 5, the fixture would move its colour wheel to the open position as this it within its specified range of 0-20. However, the colour wheel displayer would not recognise this position because a level of 5 is not defined in any of its wheel stops. The defined text for a wheel stop is only shown on the displayer when the DMX level is within the range of that wheel stop. If the current DMX level is not within the defined range, the displayer will show "???".

Therefore, when a manufacturer specifies a range of values for a particular attribute, those min and max values should be defined in the template. The maXim will automatically calculate the **mid range** value and send this to the attribute.

In this example, the wheel stops should be defined as follows;

```

stop = ( 0: 20),N, "Open"
stop = ( 21: 40),N, "Color 2"
stop = ( 41: 60),N, "Color 3"
stop = ( 61: 80),N, "Color 4"

```

The maXim would output levels of 10, 30, 50 and 70 for the respective wheel stops.

Now, if the colour attribute is set to any value within the range of a colour, the maXim will recognise the value and display the correct name.

## High Resolution Attributes

In some brands and models of fixtures, some attributes (such as pan and tilt) use two DMX channels to provide much finer control of position. One DMX channel provides the course control and another DMX channel provides the fine control.

Using one DMX channel provides a resolution of 0 to 255.

Using two DMX channels provides a resolution of 0 to 65535.

In this example of a MAC 500, the relevant section of the manufactures information is.....

### MAC 500 DMX

DMX Channel	Value	Function
11	0 127 255	<b>Pan Coarse (MSB)</b> Max Left Neutral Max Right
12	0 127 255	<b>Pan Fine (LSB)</b> Max Left Neutral Max Right
13	0 127 255	<b>Tilt Coarse (MSB)</b> Max Up Neutral Max Down
14	0 127 255	<b>Tilt Fine (LSB)</b> Max Up Neutral Max Down

MSB = Most Significant Byte

LSB= Least Significant Byte



In a fixture that uses a single DMX channel;

- The keyword **channel =** is used to define its DMX channel.

In a fixture that uses two DMX channels;

- The key word **channel =** is used to define the coarse control (MSB) DMX channel.
- The key word **fineChan =** is used to define the fine control (LSB) DMX channel.

In the **attribute section** of the template, the PAN attribute is defined with both the course (**channel =**) and fine (**fineChan =**) channels.

Fixture

```
manufacturer = "MARTIN"  
name = "Mac500.2"  
version = 1.0
```

Attribute

```
name = "PAN"  
channel = 11  
fineChan = 12  
homeVal = 32768
```

Attribute

```
name = "TILT"  
channel = 13  
fineChan = 14  
homeVal = 32768
```

The pan and tilt attributes can now be controlled by a single parameter displays.  
The home value is defined to the mid point between 0 and 65,535, that is 32,768.

In the **parameter section**, the parameters are defined in the usual manner with the exceptions that only the "channel =" attribute is listed (the displayer automatically controls both the course and fine channel attributes) and the maximum value for the pan and the tilt wheel stops is now 65,535 instead of 255 as in a single DMX channel.

Parameter

```
name = "-PAN-"  
displayerNum = 1  
type = F  
attribList = 11  
stop = (M 0:65535),D,0,170, "Pan="
```

Parameter

```
name = "-TILT-"  
displayerNum = 2  
type = F  
attribList = 13  
stop = (M 0:65535),D,0,110, "Ti@="
```

## Multiple Attribute Control from a Single Parameter Displayer

It is possible to control multiple attributes from a single parameter displayer.

A typical application of this feature is to control fixtures that use separate colour mixing filters to control their colour output. One attribute controls the Cyan filter, another attribute controls Magenta and a third attribute controls the Yellow filter.



For example, a typical template might define the following parameter displayers;

```
parameter
  name= "-CYAN-"
  displayerNum = 4
  type = C
  attribList = 3
  stop = (M 0:255),2,"Cyan="

parameter
  name= "-MAGENTA-"
  displayerNum = 5
  type = C
  attribList = 4
  stop = (M 0:255),2,"Mgnta="

parameter
  name= "-YELLOW-"
  displayerNum = 6
  type = C
  attribList = 5
  stop = (M 0:255),2,"Yellow="
```

Each colour filter is varied to subtract its particular colour from white light. To change the fixture to a specific colour you need to individually set the values on all three colour attributes. If you want to match a specific colour this can be a slow process.

“Multiple Attribute Control” from a single displayer greatly simplifies the selection of specific colours by using a single parameter displayer to select wheel stops that simultaneously vary all three colour attributes. Each wheel stop defines the specific values for all attribute and the colour **name** that will be displayed on the parameter displayer.

For example, the 3 colour attributes are defined in the usual manner;

```
attribute
  name = "CYAN"
  channel = 3
  homeVal = 0

attribute
  name = "MAGENTA"
  channel = 4
  homeVal = 0

attribute
  name = "YELLOW"
  channel = 5
  homeVal = 0
```

Then the parameter is defined. The “attribList =” line contains all three colour attribute channels separated by commas. Therefore, the cyan (3), magenta (4) and yellow (5) attributes will all be controlled by this parameter named “-COLOURS-”.

```
parameter
  name = "-COLOURS-"
  displayerNum = 3
  type = C
  attribList = 3,4,5
```



Now the wheel stops are defined.

```
stop = ( 000:000, 022:022, 255:255),N,"101 Yel"  
stop = ( 053:053, 255:255, 255:255),N,"106 Red"  
stop = ( 255:255, 179:179, 053:053),N,"132 MdBlu"  
stop = ( 173:173, 046:046, 006:006),N,"117 StBlu"
```

Notice that each stop contains three sets of min:max values separated by commas.

Lets examine the first wheel stop.

The first set of min:max ( 000:000,) is the value for the first attribute listed in "attribList =", attribute 3, the cyan filter.

The second set of min:max (022:022) is the value for the magenta filter.

The third set (255:255) is for the Yellow filter.

Setting the filters to these values gives no cyan, a little magenta and full yellow.

The wheel stop name to be shown on the parameter displayer is "101 Yel" because these settings will match the output of this fixture to the gel colour "101 Yellow".

The next stop sets the attributes to values of 053, 255 and 255 respectively and displays the text "106 Red". Setting the filters to these values gives some cyan, full magenta and full yellow, resulting in a mid red.

The next stop sets the 3 filters to match the colour "132 Medium Blue" and the next stop matches "117 Steel Blue".

The min:max values for the 3 filters in each wheel stop were initially determined by adjusting the 3 individual colour filter displayers until the colour output of the fixture **matched** the colour from a reference fixture. The filter values on the displayers were then noted and entered in the wheel stops when creating the new template containing the multiple attribute control.

In this example only four stops are shown but you could create as many stops as you need for the colours that you want to match.

## No Intensity Channel

Colour scrollers, colour mixers and some fixtures do not have an intensity channel. They are usually attached to a light source that is controlled by a separate DMX channel (separate dimmer).

In this case, the intensity attribute in the template is defined as channel 0.

```
attribute  
    name = "INTENSITY"  
    channel = 0
```

The maXim recognises the channel number "0" so when you are patching this type of fixture the display tells you that the "Fixture needs a HTP (dimmer) channel". You press [OK] then select the DMX address of the separate dimmer, then press [OK].



## Intensity (HTP/LTP) Splitting

Some manufacturers choose to use a single DMX channel to control multiple functions of a fixture. This is easily accommodated in the template by defining separate wheel stops for each function.

However, if one of the functions is the INTENSITY channel, then the intensity attribute needs to be separated from the other functions. This is because when the maXim sees the keyword "INTENSITY", it automatically assigns control of this DMX slot to the yellow FADER that was selected for this fixture when it was patched. The fader uses HTP (Highest Takes Precedence) control for this attribute. (See "Patch" in the PaTPaD operational manual for details on HTP/LTP).

Typically, a fixture that splits its intensity channel will use a part of its 256 level range for intensity (say 0 to 128) and another part of its range (say 129-255) for the other functions such as shutter/strobe speed. If the fixtures fader has total control of this attribute level, operation can be difficult because when you fade up the intensity, if the fader is raised above half way, the fixture begins to strobe. Also, the shutter function cannot be controlled from the PaTPaD, nor can it be played back in an LTP (latest takes precedence) fashion.

To overcome this problem the intensity attribute is split in the template to separate the Intensity (HTP) from the other (LTP) functions.

In the template, the keywords `maxVal` and `minVal`, are used to tell the maXim the range of DMX levels that control INTENSITY. All values outside these ranges are removed from the yellow fader to allow them to be controlled from the PaTPAD.

For example;

```
attribute
  name = "INTENSITY"
  channel = 1
  minval = 0
  maxval = 128
  homeVal = 0
```

The fader now has a range from 0 to 128.

When a fixture is loaded onto the PaTPaD it will go to its home value. A normal intensity attribute does not have a home value because it is only controlled from a fader. When an intensity attribute is split, it requires a home value of "0" to ensure that the PaTPaD has no influence over the attribute when the fixture is "homed".

In the parameter section of this example there are three wheel stops.

```
parameter
  name = "-SHUTTER-"
  displayerNum = 5
  type = B
  attribList = 1
  stop = ( 0: 0),N,"UseFader "
  stop = (R 1:128),N,"UseFader "
  stop = (M129:255),1,"Shutter:"
```

The home value (0) is recognised by the first wheel stop, so the displayer will read "UseFader", indicating that this parameter is under fader control. When this wheel stop is selected, the fader can be used to vary the level from 0 to 128 (zero to maximum intensity). The second wheel stop is R (Read only) (see below) and therefore cannot be manually selected by the displayer. It "reads" the value of the attribute and if it is within the range defined in this wheel stop it displays the text "UseFader". Therefore, if the attribute is set to a level anywhere within the range of this wheel stop the displayer still reads "UseFader".





If the third wheel stop is selected (by tapping the end of the displayer) the value will now be mouseable within the range 129 to 255. The displayer can now be moused to vary the shutter speed over the range 1 to F. The displayer will read;

Shutter: #

To give control back to the fader, tap the end of the displayer to select the first stop, "UseFader".

## Read Only Wheel Stops

A wheel stop can be mouseable (M), non mouseable (space) or Read Only (R).

An example of a read only stop was used in the previous section.

```
stop = (R 0:128),N,"UseFader"
```

A "R" (Read only) wheel stop means that you cannot select wheel stop to set these defined levels of this attribute. However, if the level of the attribute is set from somewhere else, then this displayer will read the value and display the text if the value is within the min:max values defined in the R wheel stop.

The level for the attribute could be coming from either another displayer, from direct edit wheel control of the attribute or from a fader if the attribute is in intensity split mode as described above.

A simple use for a read only stop is where several different values have the same effect on an attribute.

For example:

Value	Function
0	open
90 to 110	open
110 to 254	strobe
255	open

We could only define 2 wheel stops to cover all functions.

```
stop = ( 0: 0),N,"Open"  
stop = (M111:254),2,"Strobe:"
```

However, if the attribute was set to a level between 90 and 110 or to a level of 255 the shutter would be open but the displayer would read ??? because it does not recognise these values.

We could define 4 wheel stops for the these values.

```
stop = ( 0: 0),N,"Open"  
stop = ( 90:110),N,"Open"  
stop = (M111:254),2,"Strobe:"  
stop = ( 255:255),N,"Open"
```

The displayer would now read correctly, however, changing from wheel stop 1 to 2 or from 4 to 1 would not change anything as they are all "Open" stops and it would appear confusing to the operator.

The solution is to define R "read only" wheel stops.

```
stop = ( 0: 0),N,"Open"  
stop = (R 90:110),N,"Open"  
stop = (M111:254),2,"Strobe:"  
stop = (R255:255),N,"Open"
```



The first wheel stop (open) is a non mouseable stop, stops 2 and 4 are read only and wheel stop 3 is mouseable over the strobe range. Only the first and third wheel stops can be selected on the displayer. However, if other means are used to set the attribute to any of the values defined in the “read only” stops, then the maXim will “read” these values and display the word “Open”. In this way the displayer always shows the correct settings of the fixture.

## Advanced Read Only Wheelstops

Read Only wheel stops allow us to easily perform some very complex functions with the PaTPAD.

Some fixtures use the values on one DMX channel to change the current function or mode of another DMX channel. Read Only wheel stops allow a displayer to only show certain wheel stops, dependent upon the function or mode that has been selected by another displayer.

In the following example of the High End “Catalyst” fixture, attribute 11, “-EFFECTS-”, is used to select 5 different modes for attribute 12.

When attribute 11 is set to “Gobo Efx”, varying attribute 12 controls Gobo effects.

When attribute 11 is set to “Wobble Efx”, varying attribute 12 controls Wobble effects.

When attribute 11 is set to “Tile Efx”, varying attribute 12 controls Tile effects.

When attribute 11 is set to “Invert Efx”, varying attribute 12 controls Invert effects.

When attribute 11 is set to “KeyStn Efx”, varying attribute 12 controls Keystone effects.

Therefore the same value on attribute 12 will have a different effect depending upon the mode set by attribute 11.

Displayer number 4 is assigned to attribute 11.

```
Parameter
  name = "-EFFECTS-"
  displayerNum = 4
  type = B
  attribList = 11
  stop = ( 0: 4),N, "Gobo Efx"
  stop = ( 5: 9),N, "WobbleEfx"
  stop = ( 10: 19),N, "Tile Efx"
  stop = ( 20: 29),N, "InvertEfx"
  stop = ( 30: 39),N, "KeyStnEfx"
```

Changing wheel stops on displayer 4 alters the values of attribute 11.

Displayer number 5 is assigned to attributes 12 **and** 11.

```
Parameter
  name = "-VIS FX1-"
  displayerNum = 5
  type = B
  attribList = 12,11
  stop = ( 0: 0,R 0: 4),N, "ClrOnBlk"
```

For simplicity, only the first wheel stop is shown in here. The entire parameter is on the next page. The first min:max values ( 0: 0) are for attribute 12 and the second min:max values (R 0: 4) are for attribute 11 and are defined as R (read only). When the maXim processes the wheel stops for displayer 5, it starts with the first wheel stop. If the “read only” value for attribute 11 does not match the current value of attribute 11, then this wheel stop is not displayed. If it does match the current value, then this wheel stop is available.



Therefore, the `-EFFECTS-` parameter must be on the "Gobo EFX" wheel stop to make the `-VIS FX1-` "ClrOnBlk" wheel stop available.

Now looking at the entire parameter, if displayer 4 had been used to set attribute 11 to its first wheel stop,

```
stop = ( 0: 4),N,"Gobo EFX"
```

only the first nine wheel stops are available on displayer 5.

Parameter

```
name = "-VIS FX1-"
displayerNum = 5
type = B
attribList = 12,11
stop = ( 0: 0,R 0: 4),N,"ClrOnBlk"
stop = ( 2: 2,R 0: 4),N,"BlkOnWht"
stop = ( 3: 3,R 0: 4),N,"Trnsprnt"
stop = ( 4: 4,R 0: 4),N,"BlkOnTrns"
stop = ( 5: 5,R 0: 4),N,"TrnsOnWht"
stop = ( 6: 6,R 0: 4),N,"EdgeOutLn"
stop = ( 7: 7,R 0: 4),N,"Trans 50"
stop = ( 8: 8,R 0: 4),N,"Trans 75"
stop = (R 9:255,R 0: 4),N,"Reserved"
stop = ( 0: 0,R 5: 9),N,"NoWobleX"
stop = (M 1:255,R 5: 9),2,"WoblX:"
stop = ( 0: 32,R 10: 19),N,"SingleX"
stop = ( 33: 64,R 10: 19),N,"TwoOnX"
stop = ( 65: 96,R 10: 19),N,"ThreeOnX"
stop = ( 97:128,R 10: 19),N,"FourOnX"
stop = ( 129:160,R 10: 19),N,"FiveOnX"
stop = ( 161:192,R 10: 19),N,"SixOnX"
stop = ( 193:224,R 10: 19),N,"SevenOnX"
stop = ( 225:255,R 10: 19),N,"EightOnX"
stop = ( 0: 0,R 20: 29),N,"NoInvert"
stop = (M 1: 29,R 20: 29),2,"Invert:"
stop = (R 29:255,R 20: 29),N,"Reserved"
stop = (R 0:255,R 30: 39),N,"Keystone"
```

If displayer 4 is now changed to:

```
stop = ( 5: 9),N,"WobbleEFX"
```

only stops 10 and 11 will be available on displayer 5.

If displayer 4 is changed to:

```
stop = ( 10: 19),N,"Tile EFX"
```

only stops 12 to 19 will be available on displayer 5.

Etc, etc.

This greatly simplifies the operation of fixtures with different modes because the available choices on the displayers change **automatically** when a different mode is selected by a different displayer.

This "Read-Only" function is (we believe) UNIQUE, no other console, even those costing ten times more, offer this amazing feature.



## Template Rules

Fixture templates must be created using the following rules.

### General Syntax

Template File	Rules
// Text	Comments..... Ignored by maXim.
Spaces and tabs	Ignored by maXim.
The <b>order</b> of keywords at the beginning of the file should be: fixture manufacturer = "TEXT" name = "Text" version = NUM	Use CAPITALS for manufacturer name. Fixture model name. Version number of template file.
The <b>order</b> of keywords in the attribute section should be: attribute name = "TEXT" channel = NUM fineChan = NUM homeVal = NUM	Start of next attribute. <b>Attribute name</b> shown on video. Max 7 chars. The (MSB) DMX channel NUMber of this attribute. The (LSB) DMX channel NUMber of this attribute. Value to be output when "Homed". The attribute "fineChan =" is only used for high resolution attributes (that use 2 DMX channels). If the fixtures attribute is not "high resolution" then this line must be omitted.
The following <b>Attribute names</b> are reserved. They are CASE SENSITIVE. <ul style="list-style-type: none"> <li>• INTENSITY...The attribute with INTENSITY as its name will have its control assigned to a yellow fader as selected in the patch. It will operate on a HTP (Highest Takes Precedence) basis.</li> <li>• PAN.... The attribute with PAN as its name will have its delay times used by any other parameters whose delay time flags have been set to be, "As-Pan".</li> <li>• TILT, IRIS and SHUTTER are reserved for future enhancements.</li> </ul> Attribute names can have a maximum of 7 characters.	
All attributes must be defined before any parameters can be defined.	
The <b>order</b> of keywords in the parameter section should be: parameter name = "-TEXT-" displayerNum = NUM type = C, B, F or N attribList = NUM,,,NUM stop = (MMin:Max),( Min:Max),Mode, "Text="	Start of next parameter. Use -CAPS- with hyphens for name. PM button to use, 1-24. C(Colour), B(Beam), F(Focus), or N(No store). Attribute channel number,(s). Order of Min:Max relate to order of attribList NUM. Character in brackets prior to Min:Max defines stop as either: Space = non-mouseable (fixed value). M = Mouseable. R = Read Only Only one set of Min:Max values can be Mouseable for a given stop.  "Mode" character defines what is displayed: N = No Value displayed. 1 = One digit as a % of range 0.....9.F. 2 = Two digits as a % of range 00....99,FL. D = Degrees. Must be followed by min:max values to display over the range. e.g. D( 0:180). Neg values accepted. When a stop is non-mouseable or read only, it must be defined as Mode N.



## Formatting Rules

1. Parameters should be assigned to displayers in the following order:

- PAN .....Displayer 1
- TILT .....Displayer 2
- COLOUR(s).....Displayer 3, (4 etc).
- GOBO(s).....Next displayer(s) after Colour(s)
- FOCUS.....Next displayer after Gobo(s)
- ZOOM.....Next displayer after Focus
- PRISM.....Next displayer after Zoom
- IRIS.....Next displayer after Prism
- SHUTTER.....Next displayer after Iris
- Any Other parameters....next available displayer
- Lamp control parameters should be located on displayer 24.
- Speed parameters should be located on displayer 23 unless there is more than one Lamp Control. For example if there are 2 lamp controls then these would be located on 23 and 24 and the speed would be located on 22.

2. Parameters should be listed in the template according to the order of their displayer numbers. This assists you (and others) in finding a particular parameter when editing.

3. A Parameter that controls colour should have stops ordered in the following manner:

- White
- Colours
- Half Colours (If applicable)
- Wheel Spins
- Mouseable Colour Wheel Index (If applicable)

4. A Parameter that controls gobos should have stops ordered in the following manner:

- No Gobo
- Gobos
- Half Gobos (If applicable)
- Wheel Spins
- Mouseable Gobo Wheel Index (If applicable)

5. A Parameter that controls a shutter should have stops ordered as:

- UseFader (if applicable)
- Closed
- Open
- Strobe
- Pulse
- Random
- Other

6. Wheel stop Text should always start with a capital letter. The rest of the text should be lower case however the use of a capital letter or two for clarity is acceptable



7. When a parameter has more than one wheel stop, the text in any mouseable wheel stops must end with a colon (:).

- Therefore, when the text on a displayer is followed by a colon, it tells you that the wheel stop is mouseable and that other wheel stops are available.

When a parameter has only one wheel stop and it is mouseable, the text must end with an equals (=) sign.

- Therefore, when the text on a displayer is followed by an = sign, it tells you that the wheel stop is mouseable and that no other wheel stops exist.

8. Where a wheel stop will cause an attribute of the fixture to rotate, the “<” character should be used to indicate counter clockwise rotation and the “>” character used to indicate clockwise rotation.

e.g.: For a Colour Wheel Clockwise Spin, the wheel stop text should be: “CWhl>.”

9. The word “Open” should be avoided in a wheel stop as it does not convey any information as to the type of parameter that is open. Instead use terminology such as:

No Gobo

No Filter

No Prism

White (for the colour Parameter)

10. Where an attribute has an OFF and an ON state, the OFF state wheel stop should be before the ON state wheel stop where ever possible. This would apply to things like shutters and lamp control. This means that the user can assume that if the lamp is currently ON (home position) then hitting the left end of the displayer will turn the lamp off.

For example: `stop = ( 0: 19),N,"Lamp Off"`

`stop = ( 241:255),N,"Lamp On"`

11. Where several ranges of DMX values on an attribute result in the same thing, then only one active wheel stop should be used. Read Only (R) wheel stops should be used for the values not defined in the active wheel stop. This means that the displayer will always read the correct setting of the attribute, but the displayer is not cluttered by unnecessary wheel stops.

12. Home values for Zoom and Focus parameters should set to 50%.

13. The following special characters can be used for text entry in a template. They are used to make fine adjustments to the width of the text on the PaTPaD displays.

Special Character	Displayed on PaTPaD
!	Space, one pixel wide
Space	Space, two pixels wide
#	Space, three pixels wide
\$	Space, four pixels wide
@	It (as used in the word Tilt, but uses less space than the separate characters l and t)

14. The following reserved characters are not be used for any text entry;

~, &, ^, |, /, \ and \*.



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15. Values should always be entered in decimal format (0 to 255).

Some manufacturers provide their fixture data in hexadecimal format. LSC does not recommend the use of hexadecimal format although as a legacy, it is still accepted by the maXim .

When Hexadecimal values are used they are always prefixed by the characters 0x followed by the value in the range from 00 to FF.

For example, 0xFF

## Standard Terms

In an effort to keep templates consistent, LSC have developed a list of “standard terms” to be used when writing templates. It is not essential to use these, however their use reduces the amount of memory used by a show, will allow more templates to be put into the library and will speed up operation of the maXim.

These are the preferred names to be used in the “title” section of a template;

MANUFACTURERS				
ABSTRACT	CLAY PAKY	COEF	COEMAR	DTS
FAL	FUTURELIGHT	FX RANGE	GENERIC	GENI
GENIUS	GLP	GRIVEN	HIGH END	JBLIGHTING
MARTIN	MOVITEC	PEARL	RADLITE	ROBE
SAGITTER	SGM	STUDIODUE	TECHNILUX	ULTRALITE
VARILITE	WYBRON			

These are the preferred names to be used in the “attributes” section of a template;

ATTRIBUTES				
PAN	TILT	COLOUR	COLOUR 1	COLOUR 2
CYAN	MAGENTA	YELLOW	GOBO	GOBO 1
GOBO 2	GOBO ROT	INTENSITY	SHUTTER	IRIS
ZOOM	FOCUS	PRISM	MSPEED	SHAPE
ZAPMODE	STROBE	FROST	CONTROL	PTSPEED
FXSPEED	SPEED	SHAPER1	SHAPER2	

These are the preferred names to be used in the “Parameters” section of a template;

PARAMETERS				
-PAN-	-TILT-	-COLOUR-	-COLOUR1-	-COLOUR2-
-CYAN-	-MAGNTA-	-YELLOW-	-GOBO-	-GOBO<>-
-GOBO 1-	-GOBO 2-	-GOBOROT-	-SHUTTER-	-IRIS-
-ZOOM-	-FOCUS-	-PRISM-	-CONTROL-	-MSPEED-
-SHAPER-	-ZAPMODE-	-STROBE-	-FROST-	-CNTRL-
-PTSPEED-	-FXSPEED-	-CTC-	-PRISM<>-	-ROTGOGO-
-SPEED-	-LEECOL-	-GB1 IDX-	-GB1 ROT-	-GB2 IDX-
-GB2 ROT-	-SHAPER1-	-SHAPER2-		



These are the preferred names to be used for “wheel stops” in the “Parameters” section of a template;

<b>WHEELSTOPS</b>				
Pan=				
Ti@=				
Colour 1	No Gobo	G1 Shk:	Dot	Focus=
Colour 2	Gobo 1	G2 Shk:	Dots	Focus:
Colour 3	Gobo 2	G3 Shk:	Cone	SoftFocus
Colour 4	Gobo 3	G4 Shk:	Spirals	No Prism
Colour 5	Gobo 4	G5 Shk:	Spokes	Prism
Colour 6	Gobo 5	G6 Shk:	Squares	Prism 1
Colour 7	Gobo 6	G7 Shk:	Star	Prism 2
Colour 8	Gobo 7	G8 Shk:	Stars	Prism 3
Colour 9	Gobo 8	G9 Shk:	Line	Prsm>:
Colour 10	Gobo 9	G10 Shk:	Laser	Prsm<:
Colour 11	Gobo 10	G11 Shk:	TieDie	Macro 1
Colour 12	Gobo 11	G12 Shk:	Glass 1	Macro 2
Col1>:	Gobo 12	GWhl>:	Glass 2	Macro 3
Col1<:	No Gobo1	GWhl<:	Glass 3	Macro 4
Col1:	Gobo 1.1	Gobo>:	Ripples	Macro 5
Col2>:	Gobo 1.2	Gobo<:		Macro 6
Col2<:	Gobo 1.3	G1Whl>:		Macro 7
Col2:	Gobo 1.4	Gobo1:	Shtr Clsd	Macro 8
ColWhl:	Gobo 1.5	G1Fine:	Shtr Open	
Cwhl>:	Gobo 1.6	Gobo1>:	Strobe:	No Effect
Cwhl<:	Gobo 1.7	Gobo1<:	Pulse1:	Effect 1
Cyan=	Gobo 1.8	Gb1Idx=	Pulse2:	Effect 2
Cyan:	Gobo 1.9	G2Whl>:	Rand:	Effect 3
Mgnta=	No Gobo2	Gobo2:	MoveBlk	Effect 4
Mgnta:	Gobo 2.1	G2Fine:	PulseO:	Effect 5
Yellow=	Gobo 2.2	Gobo2>:	PulseC:	FxIdx:
Yellow:	Gobo 2.3	Gobo2<:	Rnd Fast	Fx>:
Colour:	Gobo 2.4	Gb2Idx=	Rnd Med	Fx<:
Ctc=	Gobo 2.5		Rnd Slow	Lamp Off
C1Whl<:	Gobo 2.6		No Iris	Lamp On
C1Whl>:	Gobo 2.7	RndStrbF	Iris Min	PT Reset
C1Whl:	Gobo 2.8	RndStrbM	Iris Max	Fx Reset
C2Whl<:	Gobo 2.9	RndStrbS	Iris:	Mot Reset
C2Whl>:	Gb1.1:	RndPulsOF	Iris=	All Reset
C2Whl:	Gb1.2:	RndPulsOS	Pulse:	Reset
White	Gb1.3:	RndPulsCF	Flash:	Fast
SteelBlue	Gb1.4:	RndPulsCS	FxBlack	Ultrafast
Amber	Gb1.5:		SCUT Off	Vector:
Violet	Gb1.6:	G2.1shk:	SCUT On	Track:
Blue	Gb1.7:	G2.2shk:	Shapr1:	NormTrack
Pink	Gb1.1<:	G2.3shk:	Shapr2:	SlowTrack
Red	Gb1.1>:	G2.4shk:	NoShaper1	FastTrack
Yellow	Gb1.2<:	G2.5shk:	NoShaper2	Tracking
Green	Gb1.2>:	G2.6shk:	FxSpd:	
UV	Gb1.3<:	G2.7shk:		
	Gb1.3>:	G2.8shk:		
	Gb1.4<:	G2.9shk:		
	Gb1.4>:			
	Gb1.5<:			
	Gb1.5>:			





## **Crimson Editor**

When writing or editing templates, LSC uses a freeware editor that makes working with templates much easier. This program is called "Crimson Editor" and it is freeware. It uses line numbering and colour coding which greatly simplifies the writing and editing of templates.

LSC have extended the Crimson Editor with a "maXim Template Updater" to recognise legal words for a maXim template file. The maXim Template Updater also provides shortcuts for common entries and a checker (parser) to test that the template will be accepted by the maXim.

To download "Crimson Editor" and the "maXim Template Updater" go to the LSC web site then click on "Help Centre" / "Discussion Forums". Click on the "Templates" forum and there you will find the links to download the programs.

To set-up and configure Crimson editor do the following:

1. Install crimson editor by double clicking on the downloaded file.
2. Install the maXim Template updater by double clicking on the downloaded file.
3. Run Crimson Editor from the start menu.
4. To associate maXim template files with .FXT fixtures, from the Crimson Editor toolbar, select TOOLS, PREFERENCES

In the Categories Window click on File - Association

In the window to the left of the Associate button, clear the current entry (it probably says .323) then type ".FXT" (without the quotes).

In the Description Box, clear the current entry then type "maXim Template" without the quotes.

Push the Associate button.

Click OK to close this window.

The editor is now configured.

Loading a maXim template into this editor will show maXim *key words* in *blue*, words included in *quotes* in *pink*, *comments* in *green* and characters thought to be *errors* in *red*.

If you are starting a new template, the following key stroke combinations will assist you in quickly entering the basic formatting.

Alt+1 - Adds the basic elements required by all templates.

Alt+2 - Adds the basics for an Attribute

Alt+3 - Adds the basics for a Parameter

Alt+4 - Adds the basics for a Wheel Stop

Alt+5 - Adds the basics for a double Wheel Stop.

Note: If you are starting a new template, save the contents (even if it is still blank) to a file with a .FXT extension, otherwise everything will be in red (errors) until you do so.

## **Checking Templates.**

When your template is at a point that you think it is ready, press Cntl+P and the file will be checked and any errors or warnings printed in the window at the bottom. The checker only works correctly with Windows XP or 2000. If you are using Windows 95, 98 or ME, the checker will report that there are errors, even when there are none.

