MEMO_MINUTES

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Effects in grandMA2

On the following pages we are going to explore what can be done with effects. We will step by step introduce the most common effect functions.

Effect Theory

Before we start to actually program we should have a brief look into the theory behind the effects.
Effects run in a cycle. The 'Form' dictates how an attribute moves from the 'Low Value' to the 'High Value '.

The bottom part of the 'Form' is the 'Low Value '. The top part is the 'High Value '. The figure on the left illustrates the transition between the two values for the frequently used 'Form' sine curve.
In cues and in the programmer, the speed of an effect is controlled by the 'Speed Layer' and the 'Speed Group Layer'. The 'Speed Layer' follows the speed readout defined in the user profile.
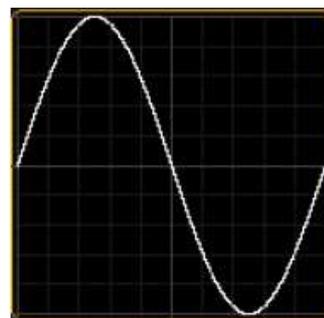
An effect inside the effect pool has a 'speed per effect line' editable by using the effect editor.
If an effect line has a speed of 60 BPM the time to complete one cycle is one second. If the 'speed per effect line' is set to 30 BMP the cycle needs two seconds to run thru.
Another column within the effect editor is called 'speed group'. It is possible to assign one out of sixteen available speed groups to a particular effect line. When the cell (row: effect line / Column: speed group) has no entry the 'speed per effect line' will be directly applied. As the 'speed per effect line' influences the way the 'speed group' is applied life is in most cases easier when it is set to 60 BPM (before assigning a 'speed group').
Note: The displayed unit of the effect speed (Hz, BPM or Sec) can be defined here: Setup/User/Settings/Speed Mode.

Sometimes it is required to have a single or group of fixtures start to act from different points in the cycle. A phase shift needs to be applied – the parameter to control this is called 'Phase'.
The phase shift is defined using a value between 0 and 360. When you think of the cycle as a circle then the values are the number of degrees around that circle.
What one normally does is to create a line in the effect. This line refers to a single attribute (could be 'Dimmer', 'Pan', 'CM1', etc.). Next step is to define the form that will be used. Define the speed, the 'Low Value ' and ' High Value '.
This is basically all what is needed to create an effect.
Applying different phase values can effects make more appealing and interesting.
Some forms can also use parameters like 'Width', 'Attack' and 'Decay'.
'Width' controls how much the form should occupy the cycle. A 'Width' of 100% makes the form take up all the cycle. If the 'Width' is only 50% then the form only occupies the first half of the cycle.
'Attack' And 'Decay' is used to "fade" values in forms that doesn't normally fade (Random, PWM (Pulse Width Modulator) and Chase).

We separated effect values and values – What does it mean?

Before gMA2 Version 2.3 storing effect values always stored a value combined with the effect value.
With the Software Version 2.3 we divorced values and effect values. Values and effect values are activated separately and can be stored to different cues. When using the store filter you are able to even store values, timings or effects only while the other would stay active in the programmer.
The following comparison between values and effect values shows you the typical things you can do with values and the corresponding for effect values.

Values	Effect Values
• can be stored in the referring Preset Pool	• can be stored in the Effect Pool
• can be directly set in the programmer	• can be set directly in the programmer or set by an effect template
• can be set by using a preset and will be updated in the cues, if the preset has been changed	• can be set by using a selective effect and will be updated in cues, if the selective effect has been changed
• are using the cue timing	• are using the cue timing
• individual fade overwrites cue fade	• individual effect fade overwrites cue fade
• individual effect delay overwrites cue delay	• individual effect delay overwrites cue delay
• can be stored, edited and updated in cues	• can be stored, edited and updated in cues
• are tracking through the cue-list until they are set to another value or released	• are tracking through the cue-list until they are set to another effect value, stomped or released
• can be edited in the tracking sheet	• can be edited in the tracking sheet

Difference between Effect Playbacks (effects with assigned executors) and effects in programmer and cues

Effects running as pool playbacks or directly assigned to executors will not be stomped by a cue.
Absolute effects will execute "OffOnOverwritten" for sequences if possible but sequences will not execute "OffOnOverwritten" for effects. Effect playbacks can only be stopped by switching them off.
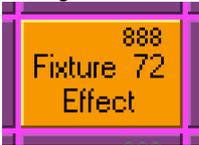
Comparison between gMA1 and gMA2 effects

Terminology: Difference between effects and modulators
The grandMA series 1 had effects and modulators; effects were only running in the effect pool. When using effects in a sequence, there was only a link to the effect stored in the cue. If the effect was topped, it created modulator values in the programmer, which could be stored in cues, followed the tracking of the cue-list, and could be modified per channel. Modulator values could also be adjusted directly in the programmer and stored in cues afterwards, but modulators could not be stored in any pool.

The grandMA2 effects are more related to the grandMA series 1 modulators than to the grandMA series 1 effects. grandMA2 effects can be built or modified in the programmer and stored in the effect pool or directly into a cue. Alternatively effects can be built in the effect pool using the effect editor.

Overview about the different types of grandMA series 1 effects and their grandMA2 references.

grandMA series 1	grandMA2
"red" effects 882 Effect	These effects are called Effect Templates in grandMA2
"red" effects running in the pool	Effect Template values are brought into programmer and can be modified in the programmer or live edited with the effect editor
"orange" effects 888 Fixture 72 Effect	These are not needed any more as the effect values of the effect templates are stored into the cues and can be edited directly in the tracking sheet or by editing the cue or using the update function.
"pink" effects 884 Effect	Selective Effects
"pink" effects running out of the pool 886 Effect	"Pool Playbacks" offer the same functionality. Selective effects can be started in the pool by hitting the go hard key and the effect pool icon afterwards. For faster access an effect pool view can be switched to pool playback and direct action mode. In this mode every pool button press will execute a "TOGGLE" at this effect[1] 34 A S / CMY congo yellow / AS 34 CMY cong 45.0 BPM 0.0 s
"pink" effects assigned to executor	Selective effects can still be assigned directly to executors and work the same way as they do in grandMA series 1.
Effects with base value	These effects are called absolute effects in grandMA2
Effect without base value	These effects are called relative effects in grandMA2

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[1] Hint: When using existing show files saved with Software versions between V2.3 and V2.5.x.x it is necessary to open once the assign menu of a poolplay effect and select "TOGGLE" and "Save default"

How to create an effect in grandMA2

There are two ways to create an effect[2]

Creating an effect in the effect pool:
Select Fixtures / Channels, press the "Edit" button in the effect pool to open the Effect Editor.

"Add" will open the „select Effect attribute" menu.
Now the effect can be started via selection in the effect pool.

All following entries in the Effect Editor will be directly executed on the fixtures currently selected.

To adjust the details of these explained functions the encoder in the "Edit Effect Encoderbar" will open the corresponding option menus by pushing it.

In the column "QTY", the amount of selected fixtures is displayed.

Note:
- If the amount is >0 this effect is a "Selective Effect"
- If it is 0 this effect is a temporary effect (Effect Template).

Selective effects are working similar to presets. When storing these effects in cues, only the link (effect pool number / effect ID) will be stored in a cue. This means that afterwards changing the effect will directly have impact to the corresponding cues – (…as they are only calling this effect from the pool).
When storing Effect Templates all effect values for each parameter are stored in the cue. This means afterward changing parameter of this effect does have NO impact on the behavior in the cue.

In the column "Attribute", the attribute can be changed

In the column "Mode", there can be chosen how the effect will be executed:
- "Abs" (absolute) means, that the attribute values which are active before starting the effect will be ignored and overwritten with the values stored in this effect.

- "Rel" (relative) means that the attribute values which are active before starting the effect will be used as base value.

Note:
Because of the fact that the effect values are added to the base value, it normally makes sense to have an effect value range from negative to positive e.g.. –30° to +30°.

In the column "Form", all forms of the form pool are displayed (when editing)
When a multidimensional form has been chosen, a popup to select the sub form will come up.
If more than one effect lines are selected simultaneously the sub form order is done automatically equivalent to the effect line selection.

In the column "Speed" can be entered how fast the effect shall run.

The column "Speedgroup" provides the possibility to assign a special master speed .

The column "Dir" (direction of the effect execution) allows selection between direction types: forward, backward, forward bounce and backward bounce

The columns "Center" and "Size" contain the base Value and the size (amplitude) of the effect.
The way the base value and the size is displayed can be selected with the button "Val. Readout".

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[2] Predefined effects can be found at Setup/Show/Import Export/Import/Effects and can be imported into the effect pool by opening the file "predefined.xml"

It toggles between "Low/High Value", "Center/Size" and "Auto". The setting "Auto" follows the mode of the first effect line: Like "Low/High value" comes in use for effects in absolute mode while "Center/Size" for effects in relative mode.

When editing an absolute effect one can also see the available presets in these columns.
In this way it is possible to create very fast e.g. a pan/tilt effect between different stage positions.
Note:
For an effect without selected fixtures (Ttemplate Effect) only global and universal presets are displayed.

With the entered value the column "Phase" the starting time of all fixtures in an effect row can be shifted.

'0'	all fixtures are executing this effect in parallel
'0.0 thru 360.0'	the starting time within a cycle will be divided through the number of fixtures. The start point of the effect for each fixture will be one after the other in order to the result of the division.
'0.0 thru -360.0'	the effect will be started reverse – the distribution is the same as described above.

Note:
Mathematically correct a sinus function for example will be executed from left to right per fixture. Nevertheless the resulting pattern on stage will appear like a moving pattern from right to left when setting the phase is set to "0 thru 360". Changing the phase to "0 thru -360" will change the pattern direction to from left to right. (Same as grandMA series 1)

The value in column "Width" adjusts the time the „High Value" remains active.
(e.g. for the form PWM (Pulse Width Modulation))

In the columns "Attack" and "Decay" a "in fade time" and a "out fade time" for a form can be entered. These columns are only available for the forms "Random", "PWM", and Chase.

With the column "Groups" can be configured how the selected fixtures work together according to the phase subdivision "0 thru 360" or "0 thru -360".
Is the entry "None" the phase will be divided by the number of fixtures otherwise by the number of groups.

The value in the column "Blocks" configures how many of the side by side selected fixtures run with the same effect.

The value in the column "Wings" defines how many of the selected fixtures – in the opposite selection order – execute the effect with the same phase.
 "Delete" deletes the selected effect lines

"Take Selection" enters the current selected fixtures into the selected effect lines

If no fixture is selected the way the effect is applied changes:
The effect turns into a Template Effect (similar to the red effects in grandMA series 1)
Note:
If a 0 is entered in the row "QTY" the marker in the effect pool changes from "S" (selective)
to "T" (template)

"Show Selection" selects the fixtures attached to the effect.

"Take MAtricks" takes the MAtricks settings from the programmer into the selected effect lines.

"Shuffle Selection" shuffles the selection of the fixtures of the selected effect lines. This button is available for selective effects only.

"Remove individuals" removes all in the selected effect line stored individual effect values.
You get individual values when you afterwards store own effect values for single fixtures in an effect. These cells have a pink background.

"Edit Effect Line" opens a graphical effect line Editor.

On the right side single effect lines can be chosen or combined to work on the effect lines.

"Align" switches the input of the entries of "Low", "High" and "Width".
Only one value from – to values or the selection of presets. (Selective presets are only displayed with absolute effects)

Note 1:
Is e.g. the "Low Value" set to a fan (Align) the values will only be spread on the low value of the selected fixtures

Note 2:
All buttons in the bottom area of the „ graphical effect line editor" will only be executed for the selected effect lines.

Create an effect in the programmer:

When effects are created via the encoder bar (as described below), all entries are taken as active effect value (storable) directly into the programmer and at the same time given out on stage.

These values can directly be stored in a cue or in the effect pool for further use.

Open a fixture/channel sheet and select some devices.
Select the preset type in the encoderbar and press "Effect layer 1 of 3" (to select the effect form)

For the following example we will take the preset type "Color" with the Feature "Color mix".

With the button between "Color mix" and "Value layer" can be adjusted whether the encoders are only active for one attribute (single link) or for all 3 Colors simultaneously (Link Feature)
(for this example we take "Link Feature")
Select an effect form with the encoder and the effect start immediately
Pressing the encoder (or the button above the encoder) will open an option menu (calculator) to select a form.
The effect mode is displayed in the fixture sheet of the effect form with an "R" (relative) or an "A" (absolute) in front of the effect form by pressing "Speed" this layer will be controlled by an encoder.

When selecting "Low" or "High" values between the effect will be executed can be entered via the encoder. When the encoder has the function "Low" or "High" presets from the preset pools can be used directly

Pressing "Effect Layer 2 of 3" switches to the 2nd assignment of the encoder bar.

The starting time of all fixtures in an effect can be adjusted with "Phase".

Pressing the encoder (or the button above the encoder) will open an option menu (calculator) to select fanning functions:
- Choosing "0 thru 360" the start time will be devided by the number of fixtures – that means the effects will be executed on after the other
- Choosing "0 thru 360" the effect starts reverse

Note:
This is necessary, as a sinus function, for example, will be executed mathematically correct from left to right per fixture. Nevertheless the resulting pattern on stage will look like a moving pattern from right to left, if the Phase is set to "0 thru 360". Changing the phase to "0 thru -360" will change the pattern direction to from left to right.
(Same as grandMA Series 1)

„Width" e.g. with the form PWM (pulse width modulation) defines how long the "high Value" is active.

"Fade" or "Delay" takes individual effect fadetimes (fade-in times) or individual effect delay times active into the programmer.
Note:
These values are only stored in cues – not in the effect pool.
If no individual effect times are stored in the cue, the cue timings are used instead.

If no individual effect times are stored in the cue, but individual times for values, the effect parameter will take these values.

Pressing "Effect Layer 3 of 3" switches to the 3nd assignment of the encoderbar.

"Attack" or "Decay" can be used to adjust a "in-fade time" or an "out-fade time" for a form.
These columns are only available for random,PWM and chase.

"ID" is used to changeover the fixture sheet to see from which effect pool an effect has been started.

Pressing "Speedgroup" allows to browse thru and select from the special master speed using an encoder.

If an effect layer is selected you will see in the encoder bar the button "Special Dialog".

When opening this dialogue you can see most adjustment in a graphical form.
In addition with "Sync Effects" all in the programmer active effects are started in sync (this can be done with the combination „MA" + „Effect" as well).
With "Absolute" / "Relative" the mode of the effect forms can be changed.

Concerning speed control for Effects in Cues

The speed of an effect in a cue can be controlled by either the executer speed, the executer rate, executer speed master or the executer rate master. Inside the assign menu there is an option "Link Effect to Rate" to select whether the rate fader affects only cue transition times or additionally the effect speed. If attributes stored in a cue have an entry in their particular speed group layer (a speed master) this entry overrides all other ways of influencing the effect speed.