

MooreMega One Update IBC2003

MM1 MultiVector

The most obvious changes concern the MultiVector Processor MM1.

ISOLATION CONTROLS

Hue /Saturation and Luminance Isolation has been completely re-worked to make them more similar in operation to Mega2.

Each parameter now has the BLEND control as found on M2 which adjusts the edge rate of the isolation key.

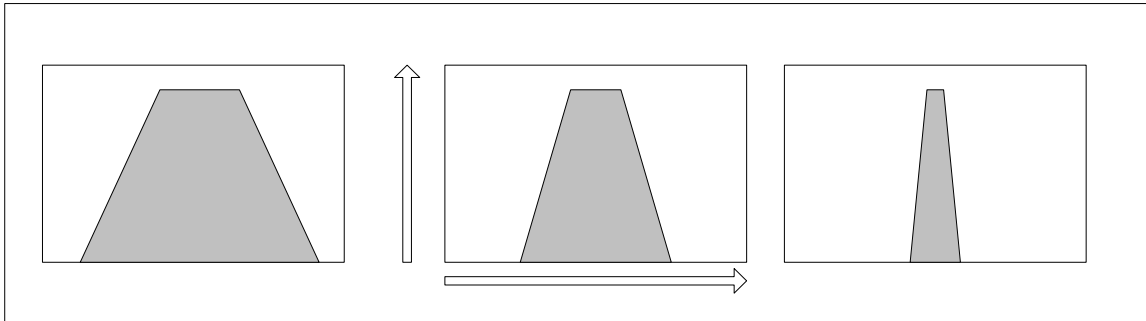


Fig 1.

Originally the keys generated by the isolation controls had soft edges but the amount of softness was fixed. See the fig1 which shows the original response of Hue Isolation.

As the Vector is widened to select more hue range the softness was scaled by the same amount.

In the new version a separate control 'BLEND' is added which controls the rate of the softening. Now the range of Hue selected [WIDTH] and also the range over which the edge of the selected area is softened [BLEND] may be individually adjusted. This creates a much smoother and more natural appearance. [See Fig 2]

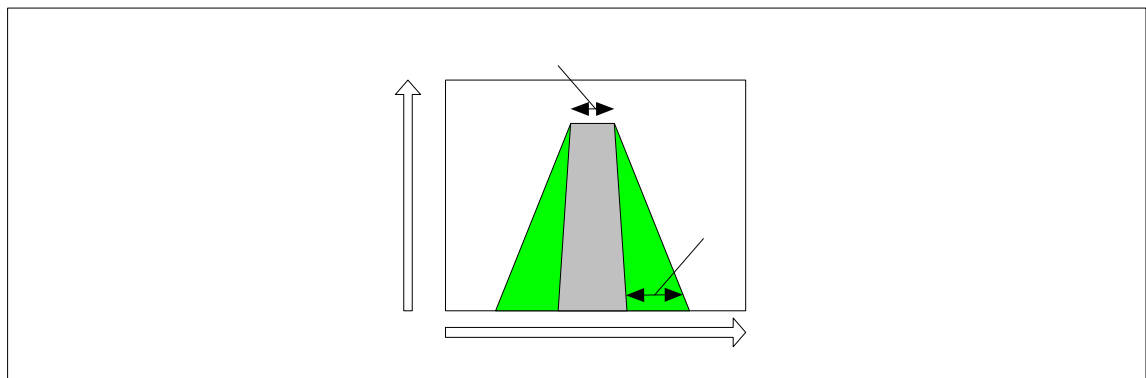


Fig 2.

A similar function has been added to both the Saturation Isolator and the Luminance Isolator. [Fig 3]

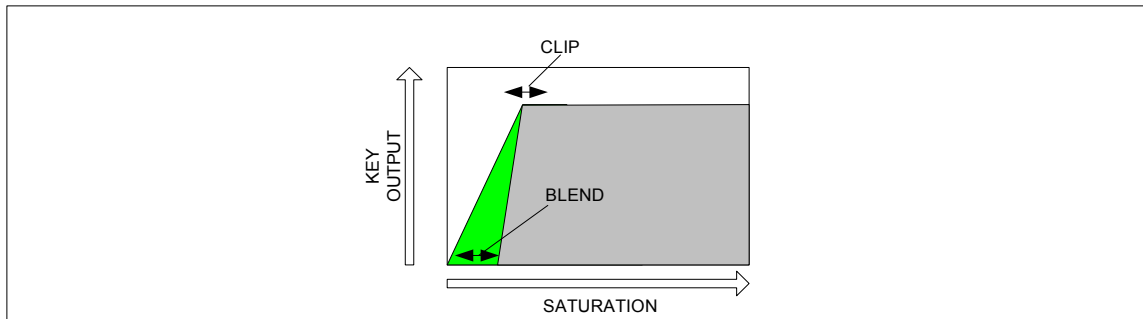


Fig 3.

On the New Evolution Control Panel the new function has been added to the third of the group of three control wheels to correspond to the layout for Mega2.

Note that in reality all the key signals use S-curve profiles to further improve the edge appearance. These have been omitted from the diagrams as I haven't worked out how to draw them yet !

NEW SHAPES

The two shape generators on the MultiVector Processor MM1 have also been completely re-defined.

The original Circle and Diamond shapes remain however in addition there is a new SQUARE shape. More importantly the way in which shapes may be softened has been changed.

In the original version the SOFT control produced a soft edge which moved inwards from the outside of the shape. This meant that in use the shape often had to be resized several times to achieve the required amount of soft area.

On the new version SOFT works from the center out which is far more convenient.

Start with a small shape directly over the area of interest then use the SOFT control to widen it out and soften the edge. The range has been increase quite considerably over the original and so the result is much nicer.

CHANNEL COUNT

The original version of MultiVector MM1 had 12 channels.

Now in order to make room for the additional features the number has been reduced down to ten. We are confident however that the 10 remaining channels are much more powerful than before.

As with the original Channels 1 thru 6 have HUE + SAT + LUMINANCE isolation with a HI-down LO-up switch on the Luminance Isolator.
Channels 7 -10 have HUE and SATURATION controls only.

MM1 VIGNETTE

NEW SHAPES

The Shape generator has been updated as per MultiVector Processor described above. A further enhancement for the Vignette layer is an Edge focus switch. This adjust the profile of the shapes soft edge. '1' is the original Setting '2' provides a more pronounced edge.

NEW CHANNEL ORDERING

The operation of the third Vignette channel has changed [this is the one accessed using the BLUE channel selector].

Rather than having it's own shape channel Three now operates as the Compliment of the other two channels. This means that the colour correction for this layer will operate only OUTSIDE of the areas defined by Channel One [R] and Two [G].

This may sound complicated but in use it is actually very easy.....

A very quick way to make a Vignette is to define a circular shape in the center of the screen using Channel One. Make This shape nice and soft using the new SOFT control. Having done this now Channel One [R] will adjust the colour correction inside the shape and Channel Three [B] will adjust the colour correction outside.

As before Vignette Channel Four [Y] is a background colour correction which operates transparently behind all selected shapes.

Note that Channel Three now has full R/G/B Lift/Gamma/Gain Controls and Y/C Masters. In the original version channel Three only provided Master Lift/Gamma/Gain.

A further enhancement provides a switch to allow channel three to operate either outside of Channel One [Red] only, outside of Channel Two [G] only, or outside of both [default].

MM1 PRIMARY

The Only real change here has been to incorporate the new style shape generator as per the Multivector and Vignette Layers.

COLOUR CUBE – 3D INTERPOLATOR.

This is a new feature for the MM1 card.

It is intended mainly as a means of calibration to allow the output of the Pixi/MegaDEF to be altered to suit a different colour space to that of the HDTV monitor that the colourist might use for his grading session.

MM1 has always provided a set of one dimensional Look Up Tables on both input and output of the system. These can be used either to linearise Log colour space in which case a LIN-LOG conversion table is imported in the form of an ASCII file. Alternatively the LUT's are available to be used creatively using MegaGamma Controls.

If you play with the MegaGamma GUI you will find that in effect there are three look up tables one for Red one for Green and One for Blue. The output of these look up tables can be any function of the input so for example it is easy to apply a Log curve or perhaps an S-Curve for a more 'filmic' look.

What is not possible however is to mix some of the red channel into the output of blue or green. This might very well be necessary when the output of the Pixi is going directly to a film recorder such as the Arri Laser where some cross colour mixing is required to compensate for the different response of the various layers within the film stock.

Another example is when the output is to be applied to a DLP projector which has a different colour response to an HDTV monitor.

A Lookup table approach can be used for cross colour correction.

In our 1D table we provide one entry for each possible level of RGB. If these are for example 12bit signals then each look up table is [4k] 4096 x 12bits and of course there are three giving a total size of 12K x 12bits.

To make this work in three dimensions we need to provide a lookup for every possible combination of Red and Green and Blue this would be $4096 \times 4096 \times 4096 = 68719476736$ x 36 bits. This works out to be 294912 MegaBytes of Computer Memory or nearly 300 GigaBytes !!!

In order to make this task more practical we instead divide the entire colour space up into $16 \times 16 \times 16$ cubes. This set of cubes can be described using 4913 data points of 36 bits each which is much more manageable.

Any colours which do not fall exactly on the boundary of the $16 \times 16 \times 16$ cubes [which is most of them] can then be calculated by first working out into which of the cubes that point will be placed and then using an interpolator to calculate in between.

Within Pixi the colour cubes are enabled by using an ASCII file into which the 4913 boundary points have been stored. These files appear within the Pogle VAULT and can be loaded simply by clicking on them.

Once enabled in this way the interpolator can be switched on and off within the SCC control panel. [3D_CUBE button].

Pandora provide a tool as part of the FIX software package which can be used to design cubes. For example it is possible to create a colour look using a software tool such as Adobe Photoshop. The result is then analysed using FIX and a cube constructed to emulate the appearance exactly within the PiXi.

More importantly we have published the specification of the ASCII file and other manufactures such as Arri and Kodak can provide pre-built cube files closely matched to the characteristics of certain film stocks and processing techniques.