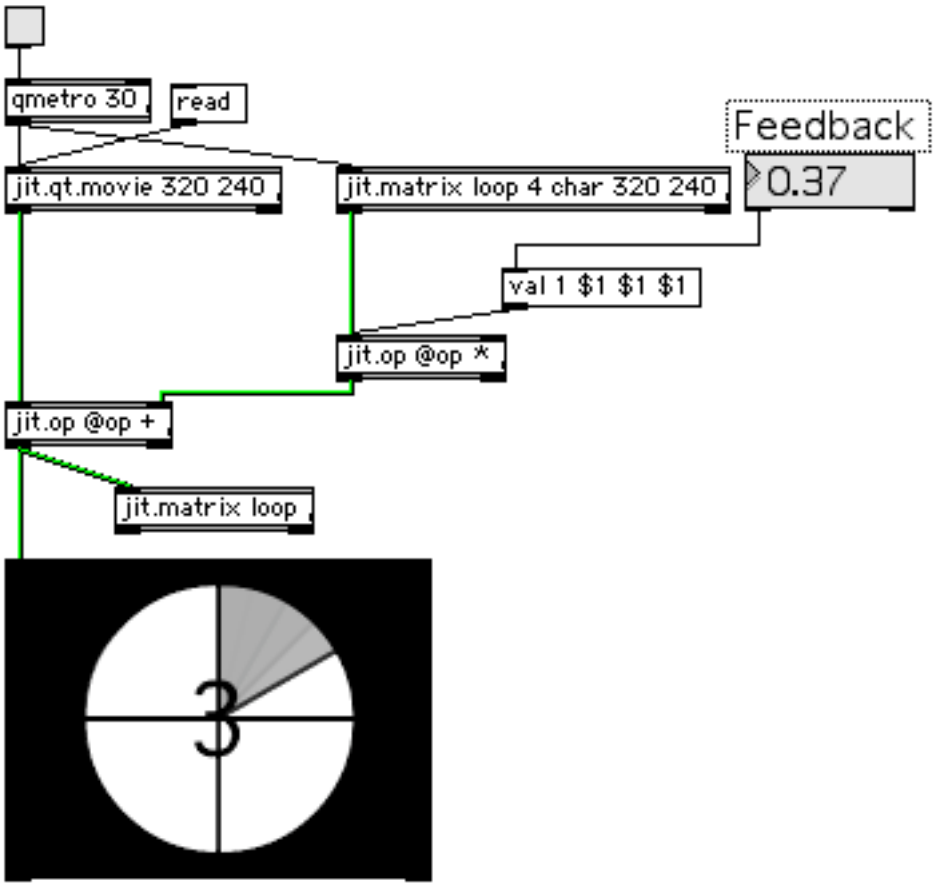
The ol' feedback trick.

Video feedback was probably the first special effect. I remember seeing it on local TV in the 50's. (Usually a mistake, or an April fool's joke.) It's responsible for the opening credits in Dr. Who, the wormhole effects of Star Trek, the textures of iTunes.

To make feed back in jitter, all you need is a named matrix and a way of mixing two images.



You can see that the matrix called loop appears two places in this patch. The object by the jit.qt.movie has no video input connected, but does have a source of bangs. Video is inserted into the loop by the matrix object. The same video comes out of the top matrix object 1 frame later. This is combined with the original video through a simple jit.op adder. The amount added is controlled by a jit.op multiplier. The main effect of simple feedback is to give the screen a memory. Note that the pointer is echoed a couple of times. The gray shade of the circle is lightened, and as the feedback is increased becomes totally white.

Processed Feedback

Here's another example. In figure 2 a subpatcher randomly draws a group of ovals in jit.lcd on each frame with randomly changing colors. The feedback through the loop matrix simply makes the colors brighter as the succeeding frames are added together. The background of the jit.lcd is set to black so a simple addition can be used to mix the images. You can use jit.lumakey or jit.chromakey to mix the images, but jit.op gives fastest performance.

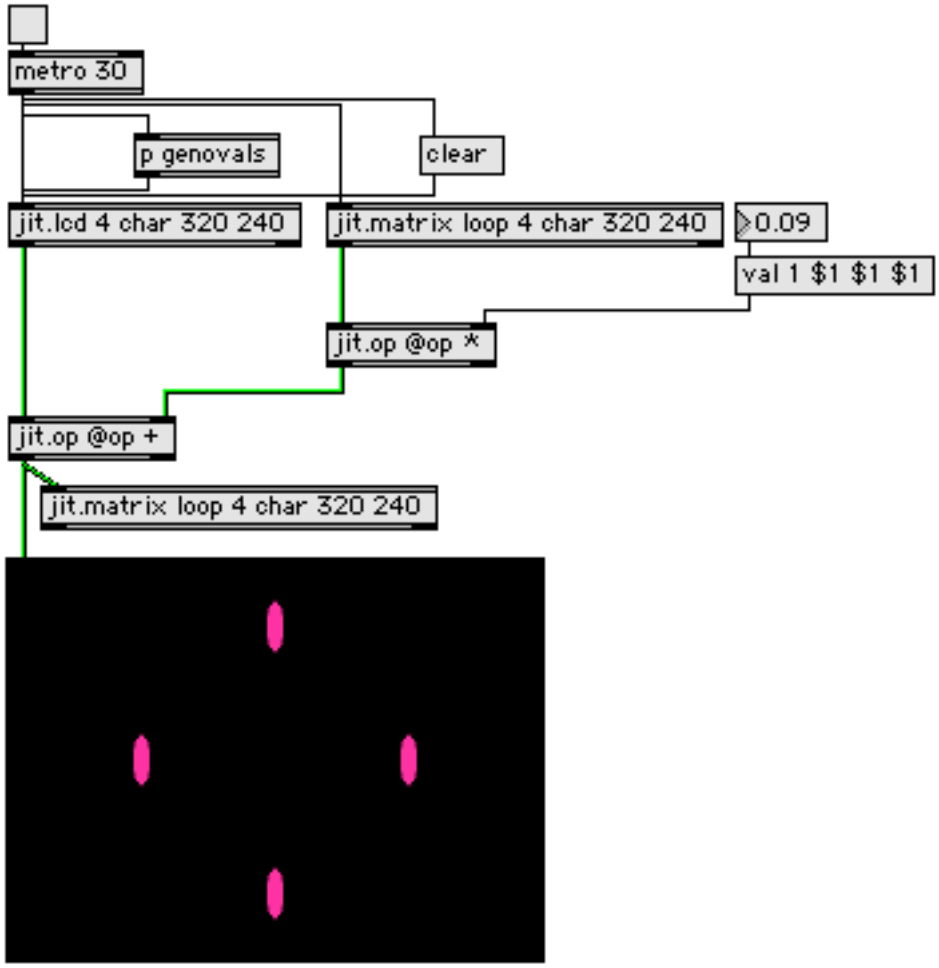


Figure 2.

In figure 3 a jit.rota is added to the loop path. The anchor attributes of jot.rota have been set to the center of the screen. This is equivalent to aiming a camera at a TV screen and turning it on its side. The feedback image is rotated a bit each time through, so objects are progressively twisted and move radially about the center.

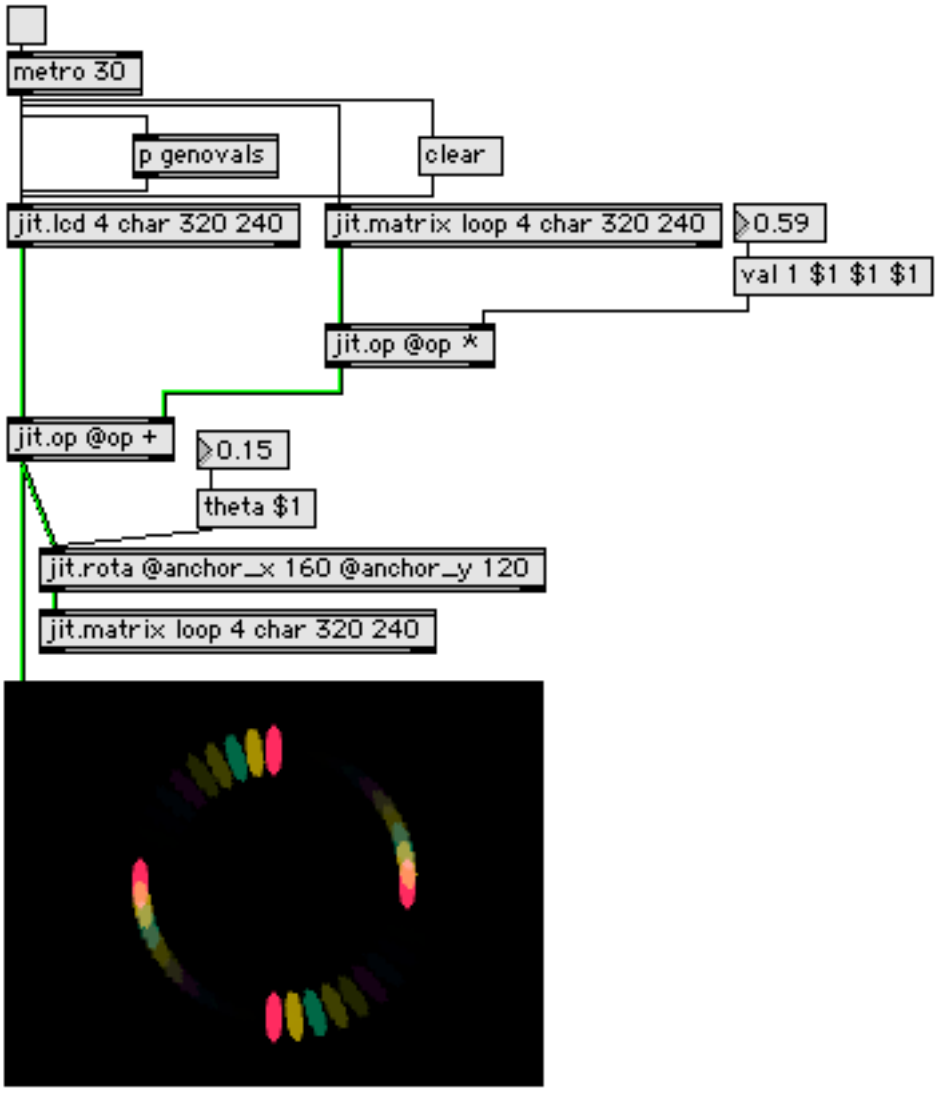


Figure 3.
As feedback is increased, the trail of fading objects gets longer and there is an impression of motion.

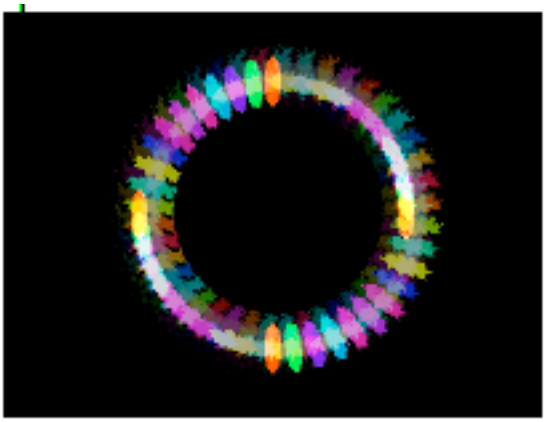


Figure 4.

White areas will appear wherever the color sums exceed 255 255 255. If the angle of rotation is changed, the motion stabilizes at angles that are exact subdivisions of the circle.

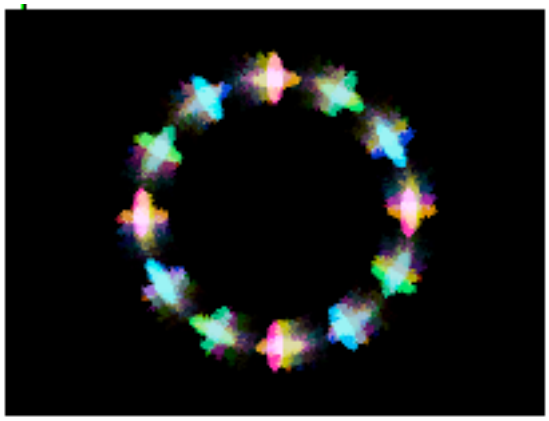


Figure 5.
In figure 5, the rotation is approximately one quarter circle. Multiple overlays create new shapes.

Jit.rota is also capable of zooming the image. Zoom_x and zoom_y can be set independently, but in figure 6A they are both set to 0.84 and in 6B they are set to 1.1 (zoom value of 1.0 does not change the image.)

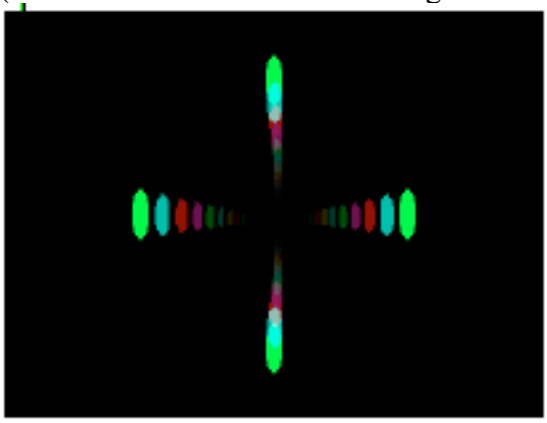


Figure 6A

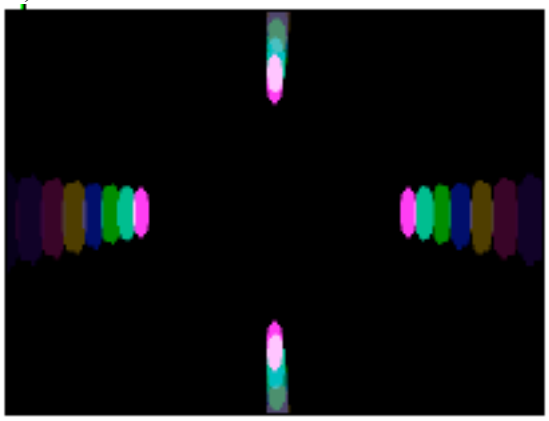


Figure 6B.

Combining zoom and rotation produces falling in and rushing out effects as shown in figure 7.

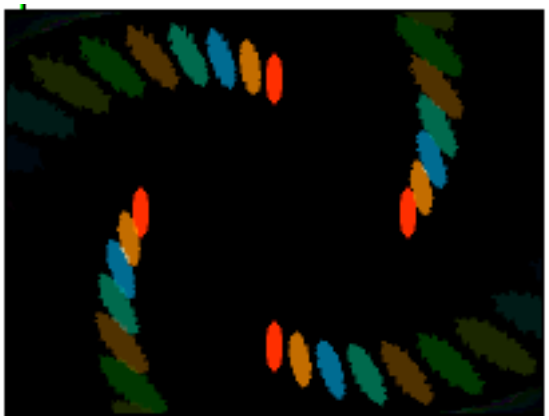


Figure 7A

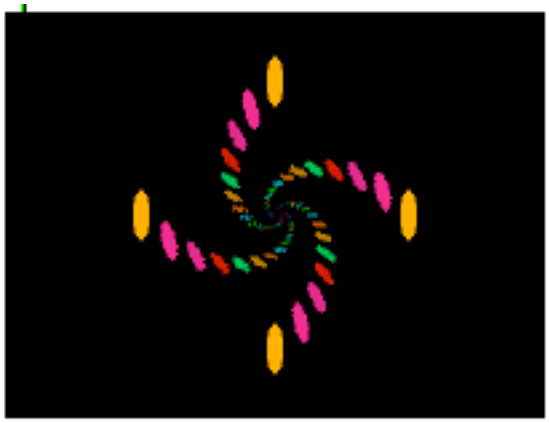


Figure 7B.

Zooming and rotation can produce some artifacts. In particular, tiny or extreme values of rotation and sudden changes in zoom can fracture and distort the image:

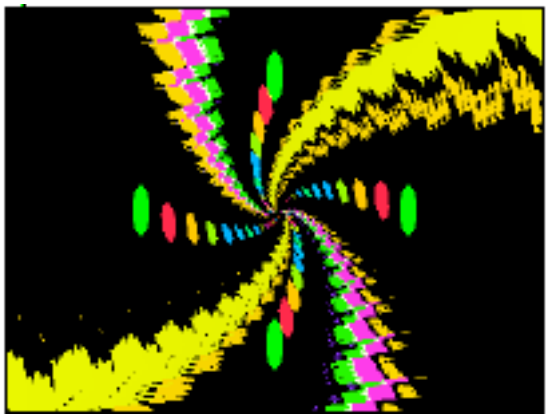


Figure 8A

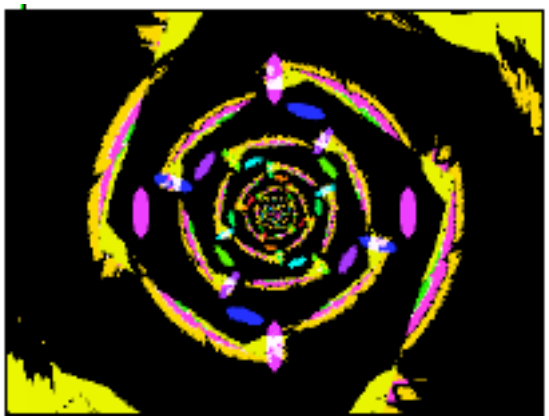
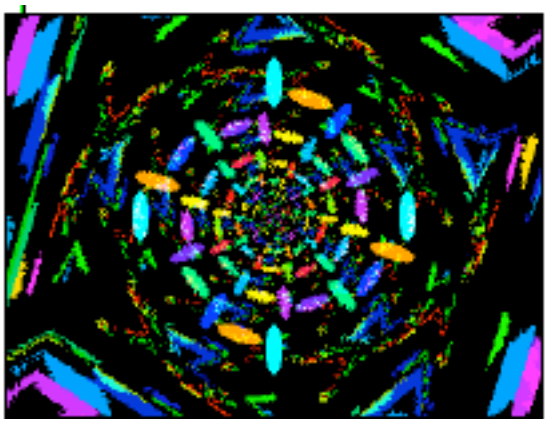
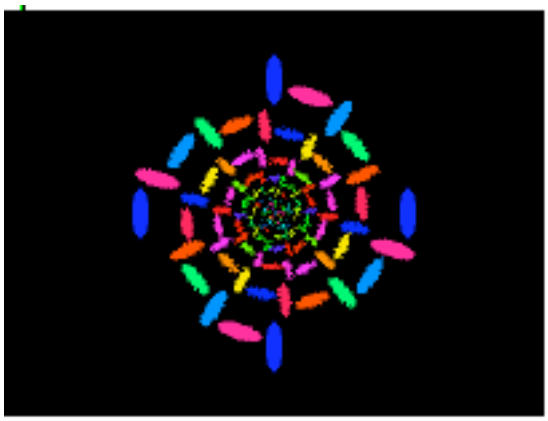


Figure 8B

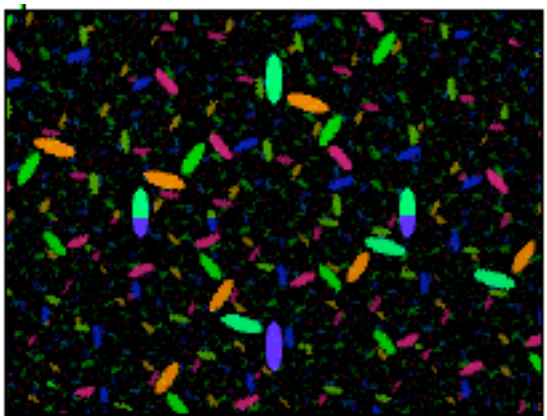
The left and right ends of the image require special treatment in rotation. Since the image is wider than it is high there is nothing to put out there on a 45 degree rotation. The boundmode attribute to jit.rota gives you a choice of five options: ignore the space and leave it as it is (default); clear it (turns it black), wrap (copy the image over), clip (which copies the last valid pixel out to the edge) and fold (a reflection of the image). Figure 9 shows what happens when the image is zoomed out to fill the corners, then quickly zoomed in.



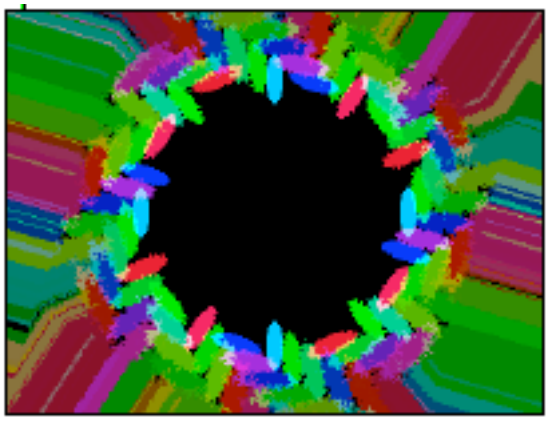
9A Ignore ends



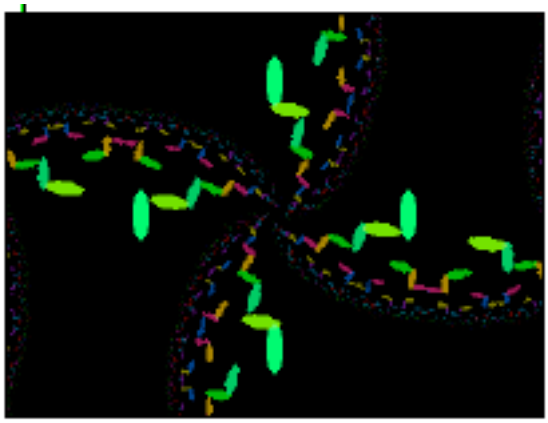
9B Clear ends



9C Wrap image



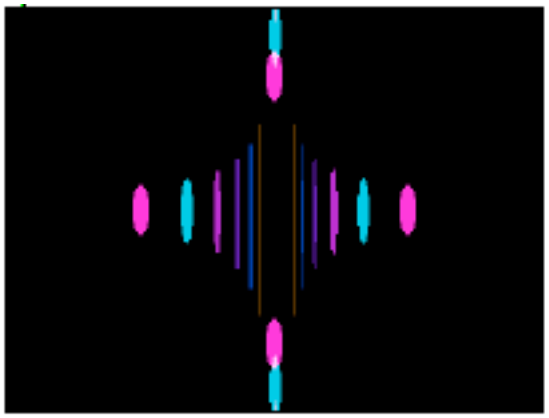
9D Clip image



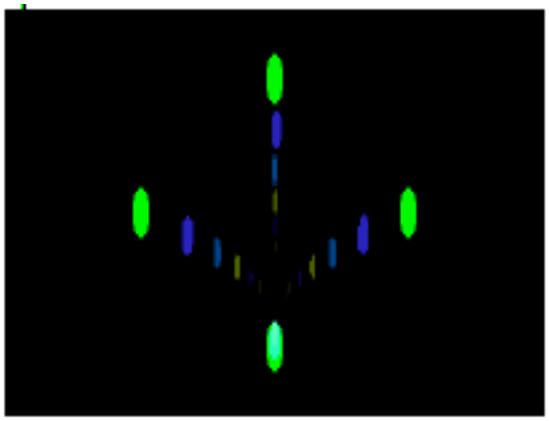
9E fold image.

Of course, once any wrapping or folding occurs, the pixels are recycled through the feedback, giving chaotic results.

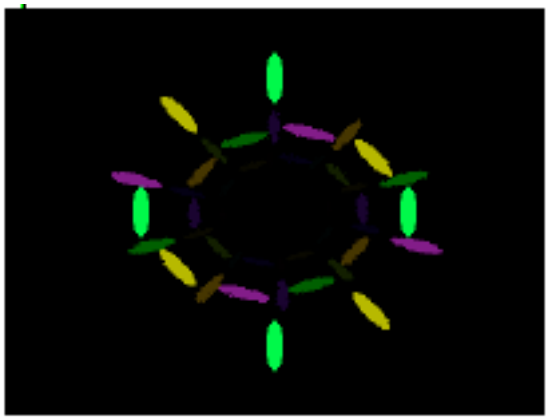
Rota has an offset feature, which is like aiming a camera at different parts of the screen. Rota also has many tricks that were never possible with cameras and monitors. For instance, x and y zoom are independent, and a series of processes vary with theta which make some interesting modulations possible. Figure 10 shows a few of these effects.



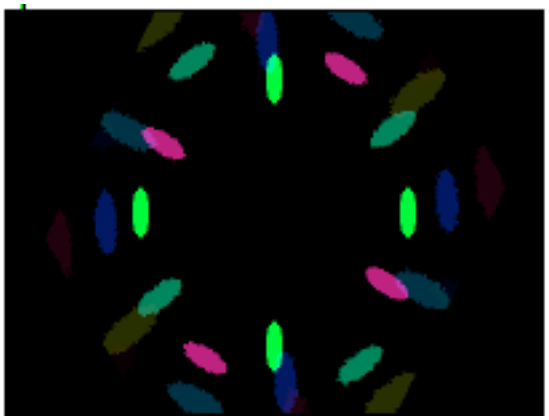
10A Asymmetrical zoom



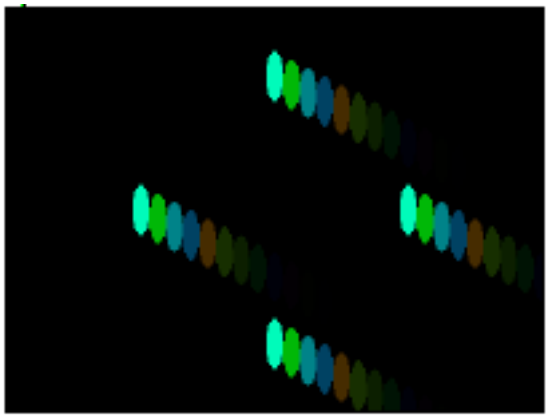
10B Asymmetrical scale with y offset



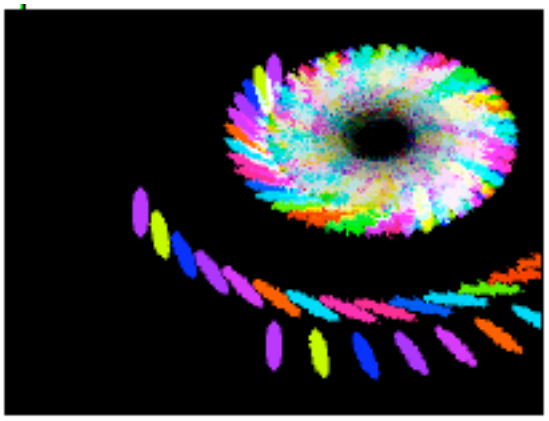
10C Theta dependent scaling theta =0.49



10D Theta dependent scaling theta = 1.11

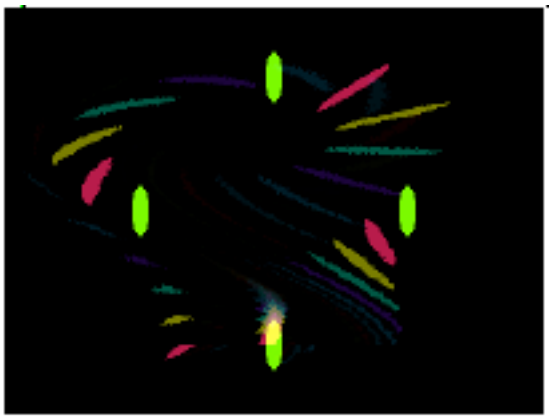


10E Offset

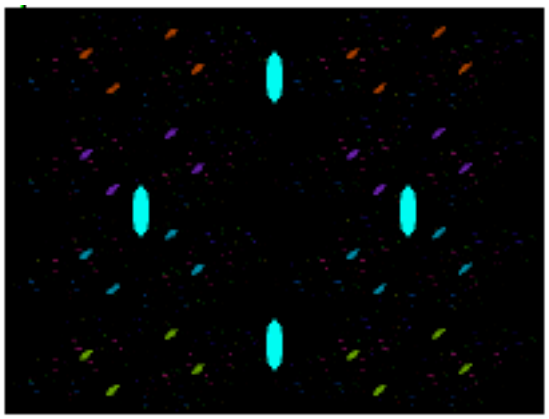


10F Offset and rotation

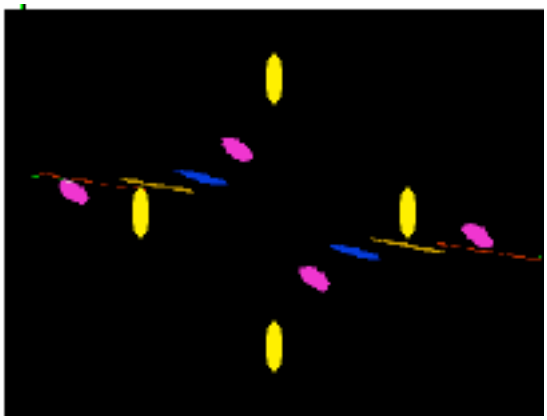
If the processing power is available other objects can be added to the feed back path:



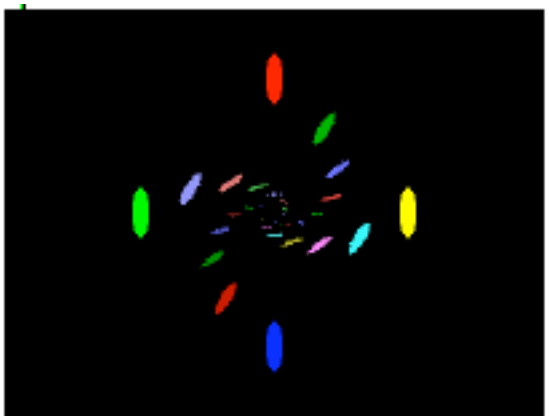
11A jit.scanoffset



11B jit.scanwrap



11C jit.transpose



11D jit.hue (colors fixed at R G B Y)

Video feedback can be a cliché, but there are plenty of unexplored variations and dynamic feedback with modulation of the control parameters is virtually unexplored territory. It remains one of the most flexible and powerful processes available.