

VIDGEO.TXT

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GEORGE BROWN - MULTI-LEVEL KEYER

4/21/92 Jeff Schier

An example of elaborate digital control of an analog video keyer is the George Brown Multi-level keyer. It consists of a programmable digital sequencer wired to an analog processing rack, where a digital "key priority encoder" combines with multiple analog keyer/mixers. An expansive matrix of red light emitting diodes (LEDs), seven segment displays and a keypad, are used to interface with the digital sequencer. The analog keyer/mixer gates and prioritizes the six video sources, sorting them into multiple image planes, which are routed to a single output connector. This multi-level keyer was built for the Vasulkas in the early 1970's. Construction of the digital sequencer is on a large "perf-board", with TTL logic, wired point-to-point, then painted black to hold down the connections. A computer interface was appended in 1977 to allow remote storing, loading and control of the program sequences.

The sequencer is a 16 step state machine, with each state controlling: the video source, the mixer/keyers priorities, a step duration, and a "next state" to generate the order to "step the sequence". The timebase to advance the sequencer is handled by a pre-scaling counter, set to either fields, frames, tenths of seconds, or seconds.

Programming the sequence is through a front panel telephone keypad, switches, an LED cursor, and two seven segment displays. A cursor points to each parameter of a sequence step: the video priority, the key priority, the step duration, and the "next step" of the sequence. The parameters are stored in a 16 step by 40 bit digital memory and are updated through pressing a "write" push-button. The front panel displays information about the current step of the sequence, and advances as the sequence progresses. Once programmed the sequence is run, timed to external vertical drive pulses, to count the elapsed fields. The analog video mix levels, key levels and output black levels are set by linear slider pots on the video processing rack.

A unique aspect of the keyer is its ability to set the priority or layering of the image. Given four camera sources, any one of the luminance components can be routed to position an image "in front". The priority encoding sets up "image planes" from back to front. When self keying from multiple cameras, the brightness of the image decides how far in front or back of the 5 image planes to insert the keyed picture. A sixth input for background is always the furthest back of the "image stack". This stacking and sequencing of image priority and key, makes for an image layering not easily attained in conventional video mixers, without using multi-generation tape loops. The clean "vertical interval" switching, frame counting, and programmable layering makes this a unique image combining tool.

GEORGE BROWN VIDEO SEQUENCER

4/25/92 Jeff Schier

The George Brown Video Sequencer allowed a precise digitally controlled switching between two video sources. The switching is cleanly performed in the vertical blanking interval, and its duration, order and length are set though a front panel knob and a collection of toggle switches. The switcher was constructed for the Vasulkas and is self contained in a rack mounted enclosure. The switching timebase can be counted down from video vertical pulses, or triggered externally from audio or other sources.

A pre-scaler counter times the stepping speed of the sequence from an external sync source, or a front panel manual pushbutton switch. The counter speed from 1-63 counts, is loaded into a register from the front panel knob. The output of the pre-scaler drives a 15 step sequence counter. The output of the sequence counter drives a set of 15 vertically oriented lamps indicating the step position in the sequence. Adjacent to the lamps are a set of 15 switches, their position selecting either the "A" or "B" video source. The sequence length can be reduced to less than 15 steps, if desired with a length register loaded with the control knob. Fast switching of frame rate sequences are easily programmed by flicking the toggle switches and viewing the output.

George Brown Video Sequencer



