Video Sequencer, (aka. Field Flip/Flop Switcher,with digital control), 1972
Multikeyer (Analog with digital control), 1973
GEORGE BROWN

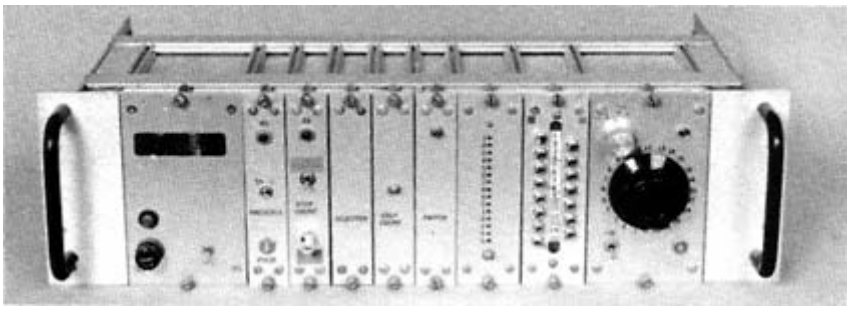
GEORGE MUST HAVE DEEPLY understood numbers. When Steina wondered about New York running out of phone numbers, given the fact, that numbers with 0 or 1 as a second digit were reserved for long distance, he calculated the total number available in his head. We looked at him in disbelief — "oh that's easy, it's just a formula."

I think he was a Vietnam veteran. He did not talk about it but he just did not talk much about anything. He thought he was of Hungarian extraction and the story that still stays with me is when he once "borrowed" a gasoline truck and drove it from New Jersey to New Hampshire. It was found parked in front of his girlfriend's house and that's how he learned some electronics: in jail.

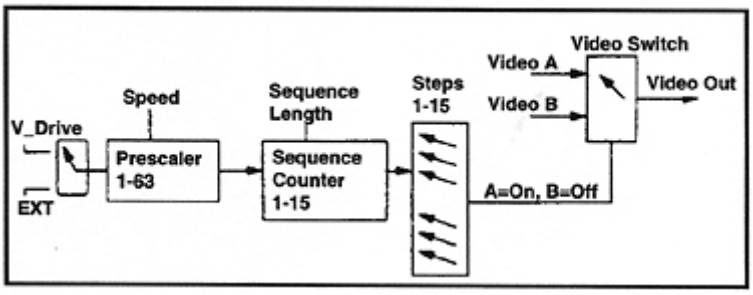
The Video sequencer was inspired by binocular experiments and by our friendship with Alfons Schilling. We played a lot with the "Pulfrich Effect" using video. We even had a show on it in The Kitchen. We wanted an instrument to encode left/right eye into a sequence of video frames recordable to tape for later decoding. We never got further than that in our stereo-video experiments, but I still use it as an electronic shutter when photographing the screen.

George's instruments put us right into the middle of media experimentation. To us they felt very sophisticated and, just as with digital tools and the computer, we never reached the bottom of the trunk. To me a good tool generates its own secrets at a much greater rate than it discloses them.

W.V.



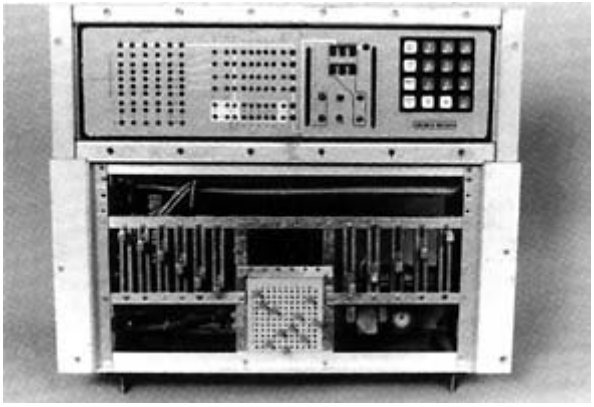
Field Flip/Flop Switcher, 1972. Collection of the Vasulkas.



VIDEO SEQUENCER

The George Brown Field/Frame Video Sequencer is a programmable digitally controlled switch between two video sources in a field or frame rate. Intended originally for the binocular investigation by the Vasulkas, this "clean switching" is performed in the vertical blanking interval, and its duration, order and length are set through a front panel knob and a collection of toggle switches. 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 "X or "B" video source. The sequence length can be reduced to less than 15 steps if desired, by a length register loaded with the control knob. Fast switching of frame rate sequences are easily programmed by flickng the toggle switches and viewing the output.



Multikeyer, 1973. Collection of the Vasulkas.

MULTI-LEVEL KEYER

The George Brown Multi-level keyer is an elegant instance of a digital sequencer controlling an analog video 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, sorts them into multiple image planes, and routes them 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 by hand 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/ keyer's priorities, a step duration, and a "next state." 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 though 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 stepped by a clock 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" ordered from back to front. When self-keying with multiple cameras, the brightness of the image determines where to insert the keyed picture in front or back of the 5 image planes. A sixth input acts as a background and is always the furthest in back of the "image stack." This stacking and sequencing of image priority and its keying makes for an image layering not easily attained in conventional video mixers and without resorting to multi-generation tape loops.

J.S.