BILL ETRA & STEVE RUTT

Rutt/Etra Scan Processor (Analog), 1973

I ALWAYS WONDERED how it must have felt to be one of Bill's cats. They had grown to enormous proportions taking over the house, making any guest a pitiful addition to their kingdom.

I fantasized that the cats, having no other reference to the proportions of the world had looked up to Bill to settle their sizes. They were many and they were big, real big.

The instrument called Rutt/Etra, named after their inventors, was a very influential one. Etra, with his art affiliations, had placed the instrument much closer to the hands of individual artists for the right price. Almost everybody I respect in video has used it at least once. Its power was in the transformation of the traditional film frame into an object with lost boundaries, to float in an undefined space of lost identity: No longer the window to "the" reality, no longer the truth.

I CANNOT TELL YOU MUCH about Steve. We met almost always in a formal situation. But his factory was a special case, something we all wanted to have exist, something where the artist would participate directly in tool-making and which would facilitate the cultural continuity of invention we know and treasure in photography, film, and video.

But we knew his crew pretty well. Sid Washer in particular. We met him well before he worked for Rutt. He invented a TV set modulated by a guitar, very live and interactive. Like many others, he had insisted that Paik caught a glimpse of it and the cat was out of the bag. —W.V.

"I WAS AT THE TV LAB for a while, so I built a Nam June-type machine. The one Barbara Buckner used. It was from looking at the picture and from looking at the TV Lab's machine. I built it with the 11" trinitron which was a slightly better monitor, and a bigger yoke and different amplifiers, but there was no schematic.

Steve knew electronics. He had not finished college but had been brought up with electronics. I said I wanted help doing this and Steve said he wanted money and eventually I convinced NET to give him the right amount: $3,500, which is what they paid for the first Rutt/Etra. Steve and I added about $10,000 of our own money which we borrowed from our families and built the first machine. It cost us $13,000 and they got it for $3,500.

It would probably not have happened had access been available to a Dolphin computer. I'd seen Ed Emshwiller's stuff, the one before Scapemates. The people twisting in space.

I knew almost nothing when I started. I knew you had to sum the waveforms. That was obvious from the oscillators. I knew you had to attenuate them, which is multiplication. Steve knew about diodes, resistance networks, etc.

The first machine we built was really deflection on a regular oscilloscope, in fact I have the oscilloscope downstairs. We used huge pots, to actually change the deflection voltages on the yoke, to zoom and rotate. I thought it was going to cost under $5,000 and be sold to artists and schools. I still don't like the broadcast companies particularly.

It got too expensive, among other things. The price went up because we tried to sell it to broadcast engineers who couldn't use it anyway. They didn't have the initiative to use that sort of complex equipment.

We got to be pioneers which is great and glorious, if it continues. Of course, if it ends that's something different. If video had only a small part in it, then we all get washed out. But for a while we got to be pioneers." —Bill Etra

Above: Bill Etra and Steina Vasulka atThe Kitchen, 1972.
Left: Steve Rutt.
Below: Rutt/Etra Model RE-4 Scan Processor.

"WHAT WE DID over the years was raise the price and improve the quality. We mostly raised the price but we never made money on it. It's the old story: if you're building it for five dollars and selling it for four, you can make it up in volume. So we decided we had to raise our prices. We doubled the price and nobody could afford it any more. We pushed the price way up and that was the end of the creative market for the thing.

One of the things that hasn't changed is the modules, which has become sort of a joke for one thing because this waveform generator never worked right. I shouldn't say it never worked right, it never did all the things we knew it could do. In the early modules it was sort of OK because it was this early state and nothing worked right back in those days. We used to have a standard procedure that if something didn't work right, that was the way it was supposed to be. But we never changed the modules at all. The only thing we ever did was put power supplies on the modules so that you could line them up and plug them into the machine. We then found out that the power supplies were the weakest link

and they used to blow out all the time.

We did two things differently than the Nam June machine. One thing was that the Nam June machine was built out of surplus parts, whatever happened to be available he snuck in. We started from scratch and built it so it was a little more refined and all plugged together. The other thing is we DC coupled everything which had been AC coupled. That was the main thing. Without that you couldn't get positional movement, you could only get waveform distortion. You couldn't actually take something and slowly flip it upside down.

Most of the modules we used were things that had been analog computer concepts such as multipliers, summing amplifiers, dividers, log functions. I was just sort of listening to what people wanted and building it and Bill was one of the people that I was listening to a lot. In the early stages somebody wanted this and somebody wanted that and we built modules. The books that we built from were mostly the Motorola book and a little bit of the National book. I had this big Motorola book from which we discovered the multipliers that we used. You'd look up an op amp and it would have eighteen different circuits on how to use it, none of which worked, of course. Half the stuff in the book was always screwed up. You'd built it and then de-bug it.

I'm certainly not an artist, under any stretch of the imagination. I create with the thing because I know how it works electronically and I'm able to create stuff that I've passed off as art. Some of it for considerable amounts of money considering what it was. But I wouldn't call myself a creative artist. And a lot of the stuff that has been created with this, that people call art, I'd also put into the same category as the stuff I do as a technician. I don't think somebody walking over to his TV set and turning the horizontal hold off and photographing the screen constitutes art but neither does a pile of cement blocks at the Metropolitan Museum of Art constitute art. I have a pile of cement blocks in the back which I'm considering also selling for $10,000 but nobody wants to buy them yet. I also have a pile of plasterboard which I'm going to put out as soon as the cement blocks are sold. By the modern standard I'm an artist. By other standards I'm sure I'm not, including my own." —Steve Rutt

RUTT/ETRA SCAN PROCESSOR

The Rutt/Etra Scan Processor is a real-time system which electronically alters the deflection signals that generate the television raster.

Developed in the early 1970's in New York by Steve Rutt and Bill Etra, this analog scan processor loosely resembled the Scanimate, but was simplified in operation and offered at a lower cost. Steve Rutt manufactured the unit, while Bill Etra refined the scan processor concept, placing an emphasis on external voltage control of the processing modules. Its principle of operation is to intercept the sweep signals of a black and white video monitor and modulate these signals with analog control voltages. The voltage control directly modifies the sweep waveforms and is more predictable than other magnetic versions such as gluing or winding additional yokes onto the necks of black and white monitors. Images are 're-scanned' by a video camera facing the modulated display monitor for combination with other video signals and final recording to video tape.

The Rutt/Etra is housed in three rack mount cabinets. One unit holds a small black and white display monitor with high power deflection yokes and a video amp. Another box contains the analog sweep processing chain, and a third box houses the control voltage generators with various oscillator/function generators, a sequenced ramp generator, and a summing amp to combine the signals before routing to the sweep processing box.

The raster is manipulated by control voltages feeding two processing chains, one on the horizontal axis (H), and one for the vertical (V). Each chain contains four-quadrant multipliers and summing

amplifiers placed between the H and V ramp generators, and their corresponding deflection yokes. A cross coupling "rotation slot" is available to insert an analog "2 by 2" rotation matrix but remains empty in most units. Dual multipliers driven by a common control voltage adjust the "zoom" of both the sweep axes. The video signal runs through a two quadrant multiplier followed by a summing amp for intensity and brightness control. Each sweep chain has a two channel switch in front of its processing module control inputs, splitting the raster into two independently adjustable rasters. Multiple 15 turn knobs are present on the front panel of the modules to adjust size, position, zoom and intensity. Due to cost, the knob's position is unmarked. This position is discovered through twirling of the knob fully to one side then back to find it's current control setting.

The control voltages are driven either from static voltage sources or from function generators locked to: sync signals or themselves ('freerunning'). AM and FM control allow cascading these control signals.

The need for intensity compensation, to correct for brightness changes due to the speed of the beam, is problematic in small rasters that can "burn" phosphor holes in the display tube. Resolution loss due to the rescan process, and difficulty in attaining repeatable raster movement using analog control generators, are some of the shortcomings of the analog scan processor.

The raster's size, position and intensity can each be modulated through voltage control signals. These control signals fulfill a commercial function: to generate swooping titles and sliding graphics. A more esoteric use is demonstrated in the "Vasulka Effect" the input video brightness connects to the vertical position control. This causes the brighter parts of the video to "pull" the raster lines upward. When combined with other synthetic waveforms, the raster forms a three dimensional contour map where video brightness determines elevation. The generation of video objects built from the underlying raster structure is evident in video tapes created by the Vasulkas.

Scan processing starts out as an orderly progression of swept image lines. The electronic control of the size, position and brightness, contorts the electronic envelope of the picture. This modulation of the scanning beam forms moving surfaces, objects and shapes built upon the underlying scanned raster structure. —J.S.