William E. Hearn

April 12, 1986

Woody and Steina Vasulka
P.O. Box 100
Santa Fe, N.M., 87501

Dear Steina;

Enclosed is the notice I am sending out to Videolab owners. I am sure that it will solve the problem with Eve Muir's instrument.

I would like to help you with any of your requirements. I understand your wish for individual stand-alone modules. (Keyers, for instance). If you want, I could make some custom modules of any type for you. I have learned a few things since I designed the Videolab. Right now (today), I can offer you the following:

1. I have a Series 2 Videolab like Eve's which I can offer you for $4900. It will have the additional feature of voltage control on the pattern generator oscillators (the only other one with this feature belongs to Ernie Gussella). For an additional $900.00 you can have a copy of a new module which I developed after I did some live performances, a Pattern Source Mixer and Controller. It gives precision control over patterns and allows modulation of patterns with sound (these are not "cheap"- I thought I'd just mention them).

2. I have a used Series 1 Videolab of the most recent type, with a new input board (locks to anything, even 4th generation 1/2 inch stuff). This has the Colorizer that you like and comes with (surprise!) a User's Manual which is free of errors; also with full schematics. With the latest modifications it will pass color nicely. I will reluctantly part with it for $1950 (suuuch a deeeal) Keep this offer to yourself, please. I am not offering it to anyone else.

It was nice to talk you. Etra's back in town. God knows what he's up to. Thanks so much for the agreeing to send the letter about Videolabs. Say hello to Voody and Eve and let's be in touch soon.

LOVE, BILL HEARN

2940 Martin Luther King jr. Way, Berkeley, California 94703. (415) 848-6121

CURRICULUM VITAE

William E. Hearn

Staff Scientist Engineer, Level III
Electronics Engineering Department
Lawrence Berkeley Laboratory University of California
DOE Q no. CA-56409

Education

B.S.E.E, U. C. Berkeley, 1966
A. A., Electronics Technology, CCSF, 1959
R.P.E.E., State of California, License no. E012246

Professional Experience

Summary: Employed as Electronics Engineer at LBL in Accelerator and Fusion Research Division since 1973. Most recent assignment was as Project Electronics Engineer of EBIT, a successful joint LBL/LLL project and IR100 award winner.

As an Electronic Circuit Design Engineer, has made significant contributions to the success of numerous LBL projects.

Strong skills in many areas of Digital and Analog Circuit Design, Computer Interfaces, Control Systems, Optoelectronics, Video, Telemetry, Fast A to D/D to A Converters, Precision Analog Signal Processing, and High Voltage Power Supplies. A specialist in the use of all types of Integrated Circuits in electronic hardware. Has designed several succesful Integrated Circuits. Has significant software design skills.

Major LBL work:

EBIT (Electron Beam Ion Trap) (1986-1988)

As Project Electronics Engineer, responsible for design of all electronics for this accelerator. Designs included Precision Programmable HV power supplies, Magnet and Filament Power supplies, Fiber Optic Telemetry, and many different types of floating instrumentation. Because of the unusual requirements of this project, the bulk of the system electronics had to be specially designed and built. This was a joint LBL-LLNL project. ~~A more complete description of EBIT work is included as Appendix "A" of this C.V~~.

TANDEM (8 MV Computerized Van Der Graff) (1986-1987)

Simultaneously with working on EBIT at LLNL, was Project Electronics Engineer for the Tandem Project at that Laboratory. Designed the Computer control system for this fully rebuilt and automated type FN Accelerator using Hewlett-Packard 300 computers

Since 1991 I have been involved in the Design and development
of [illegible]

as controllers. Produced initial software used for tests of the Source Electronics. Designed all CAMAC Fiber Optic Telemetry for control and monitoring of Ion Sources. Designed and tested the Precision Feedback Stabilization Electronics for the 8 Million Volt Power Supply and the associated Computer Interface. This project was completed and is operated by E division. LLNL.

Magnetic Fusion Experiment (1981-1985)

As an Electronic Engineer in the MFE group, was responsible for the design and development of precision instrumentation for testing of Ion Sources for Fusion Development. Designed the high speed Digital and Analog Fiber Optic Telemetry used in all MFE test stands and for the testing of LBL Ion sources for TFTR. This Analog Telemetry utilizes high speed serial digital encoding to achieve improved performance and exceptional stablilty

Developed Computerized Real Time Diagnostic System for ion source Test Stand no. 2. utilizing Hewlett-Packard 9845B Computer. Wrote complete user-friendly software, including custom graphics, for rapid digitizing and display of system parameters. Developed other software during this time using H.P. 200 series and H.P. 85 computers equipped with GPIO and GPIB busses

Designed Linear Screen Modulator unit for 150kw Pulsed RF power supply used in Test Stand 2. System used solid state drive electronics optically coupled to Eimac 4CW2000 water cooled tetrodes.

Real Time Systems (1981)

As Electronics Engineer for RTSG, developed ultra-accurate Computer Programmable Bipolar V/f converter for Magnetic Measurements Group at LBL. The performance of this unit still surpasses commercially available V/f's and it has proved essential to the work of the Magnetic Measurements group. LBL has built many of these for other laboratories A Patent for this circuit was issued to W. Hearn and D. Rondeau in 1985.

Heavy Ion Linear Accelerator (SuperHilac) (1973-1980)

As Electronic Engineer at Hilac, was responsible for much of the instrumentation and the control system of the accelerator. Designed and developed highly noise resistant I/O circuitry for Modcomp control computer. Designed Magnet Power Supplies, Beam line diagnostics, and related testing equipment. Designed Vector Display displaying simultaneously the amplitude and phase of the ten 70 mhz power RF sources used in the accelerator.

Designed the Control System for the 800kv second injector This major effort utilized automatic tuning of the RF power stage and HV stabilization using a Generating Voltmeter and multiple feedback loops. Designed all SuperHILAC Fiber Optic Telemetry.

Professional Activities

Member, I.E.E.E.

Member, A.E.S.

Awards and Honors

Winner of Electronic Design Magazine National Award for Best Circuit Design Idea of 1976

Patents Issued

U.S. Patent no. 4518887, "Precision Input Stage for Precision Voltmeter" (Hearn, Rondeau, 1985)

U.S. Patent no. [ ], "Touch Controlled Fader", (Lampen and Hearn, 1974)

U.S. Patent no. 3627912, "Visual Display of Complex Color Sound Wave Signals" (Hearn, 1970)

Publications

Hearn, W.E. "Wideband Analog Fiber Optic Telemetry using Digital Techniques", IEEE Transactions on Nuclear Science, 1984

Hearn, W.E., Green, M.I., Nelson, D.L., and Rondeau, D.J., "A Precision Bipolar V/f Converter", IEEE Transactions on Nuclear Science, 1982

Hearn, W.E., "Complete Phase Lock Loop from part of Quad Ex-Or Gate", Electronic Design Magazine, April 1, 1975

Hearn, W.E., "Applications of the SE 531 Fast Slewing Operational Amplifier", Signetics Application Note, June, 1974

Hearn, W.E., "Applications for Fast Slewing Op Amps", Electronic Products Magazine, June 21, 1971

Hearn, W.E., "Fast Slewing Monolithic Operational Amplifier", IEEE Solid State Circuits Journal, Feb, 1971

Seymour, R., and Hearn, W.E., "Frequency Compensation of the 516 (Revised)", Signetics Application Memo, September, 1969

Hearn, W.E., "Frequency Compensation of the 5709", Signetics Application Memo, September, 1969

Hearn, W.E., "A Simple Linear Integrated Circuit Curve Tracer", Signetics Application Memo, September, 1969

Hearn, Bill

Pre-LBL employment:

Cinemix Corporation (Berkeley) (1972-1973)

As Vice President, designed and produced experimental computer-controlled film special effects instruments for commercial applications.

The Exploratorium (SanFrancisco) (1971-1973)

As Head Technical Curator of the Exploratorium, and working under the direction of Dr. Frank Oppenheimer, designed and produced exhibits illustrating scientific principles and exploring the ways in which human beings perceive the world. Was responsible for developing most exhibits in the first years of this institution.

Raytheon Corporation (Mt. View, Ca) (1971-1972)

While a Senior Circuit Development Engineer, assisted staff in the development of linear integrated circuits. Designed a Successful Dual Tracking Voltage Regulator IC.

Signetics Corporation (Sunnyvale, Ca) (1968-1971)

As Applications Engineer, worked with clients throughout the U.S. on applications of both Linear and Digital Integrated Circuits. As Circuit Development Engineer, Designed several successful IC's which are still commercially available today. Designed the 531 Fast Slewing Operational Amplifier and the 7520 series of high speed (15 nanosecond) sense amplifiers (which were the genesis of the NE527-529 high speed comparators and their copy, the National Semiconductor LM360- still the fastest comparator available).

GMR (Berkeley) (a subsidiary of Bausch and Lomb) (1966-1968)

As Electronics Engineer, adapted the optoelectronic precision measuring system produced by this firm to the then newly-developed integrated circuit, technology. Developed improvements to the basic system electronics which allowed the system to achieve submicron precision when measuring over one meter distances.

Nuclear Research Instruments (Berkeley) (1962-1966)

As Electronic technician, Draftsman, and, finally, Project Electronics Engineer, participated in the production of Measuring Projectors and Measuring Microscopes. These instruments were used in Nuclear Research and in the analysis of Aerial Photographs.

Bill Hearn

I was a curator at the Exploratorium and I had designed a really large console that made complex color lissajous patterns: multiple locked oscillators and pseudo-three dimensional shapes. I always thought they were quite beautiful. They had been used in a couple of different applications but I made a large console that would generate great families of them.

I got the idea from somebody else in New York who had done it long before me. I saw what he had done. I improved the deflection amplifiers to give a really good response and I developed a system of color modulation which I have a patent on. It painted color on the surface according to the convolution of the surface.

The monochromatic versions were beautiful, very lacy and sharp. They had a very sharp trace on the electromagnetic CRT. And if you can deflect the beam, which is very difficult, you can get beautiful patterns from voice or recorded music.

For color the basic trick is that the color is a function of the velocity of the trace as it moves on the screen. As the trace moves, the color stretches toward the red end of the spectrum. You know what the spectrum looks like. It starts at red and goes through orange, yellow, green, blue and then violet. I assigned colors according to the actual velocity of the trace on the screen. I had circuits which could measure the velocity and change the color of the dot as it was moving. In doing that it made the contours of the image stand out in a really interesting way.

It's been many years since I've done a thing on it because it was such a dead end. I found that it was quite interesting and beautiful but it had no commercial application. People in special effects, film or advertising all have very tried and true techniques that they stick to. They don't want anybody coming in and disturbing their nice game.

I paid for all of it myself up to the point where I got some exposure and a very wonderful man named Al Leavitt here in San Francisco, who later turned out to be a kind of pain in the ass, saw it. He loved it and he said we should exploit this. I said fine and he made a contract with me through negotiations with my attorney. We formed the Color Communications Corporation. Al put in $30,000 and I put in my patent and then he died. I never would have been able to do what I did if Al had lived. That's the funny part of it. He died of a heart attack at the beginning of the project and the money was in the bank and I went ahead and built this thing.

Through EAT I met a number of budding electronic music composers. I helped them build music synthesizers and when I developed the Vidium, they found that it was a really sympathetic way of producing images directly from their signals to get a visual synthesis of what they were doing sonically. Don Buchla came by for a few meetings and I think David Tudor was very interested in it.

Don Buchla was the strongest influence I ever had in terms of the way he did things. If you look at this you'll see that it's very similar to his synthesizers in the philosophy of what it does: control voltages, logic voltages, signal voltages and unshielded banana jacks, so that you can stack them which makes the flow much simpler. I think technically you can say that this machine could have been designed by Don Buchla.

I had never been interested in television until around the time when I met you. The people at Video Free America in Berkeley asked me to make a colorizer for them: Arthur Ginsberg, Skip Sweeney and Alan Shulman. They showed me that they had a colorizer but when they opened it up all the parts fell out. It was a little thing in a gray box about this big and it cost $800. It had two knobs on it and made a smeary color. I said, "we can do better than that." At that point I evolved the concept of the zone colorizer to cut the gray scale into segments.

What I really lust after is to make machines that are so clear to a creative person and gives them so many possibilities that they can use them. It just gives me a terrific thrill when I see someone like Ernie Gusella in New York who's doing truly creative work with the Videolab.

EAB VIDEO
2940 Grove Street, Berkeley
California 94703
(415) 848-6121

EAB 601/ADWAR CK-3 Encoded Chroma Keyer

The 601/CK-3 Encoded Chroma Keyer is a very high performance, highly versatile, moderate cost unit. It offers more features than other Keyers, and includes a built-in vertical-interval switcher for previewing. The 601/CK-3 is used very effectively in both upstream and downstream applications.

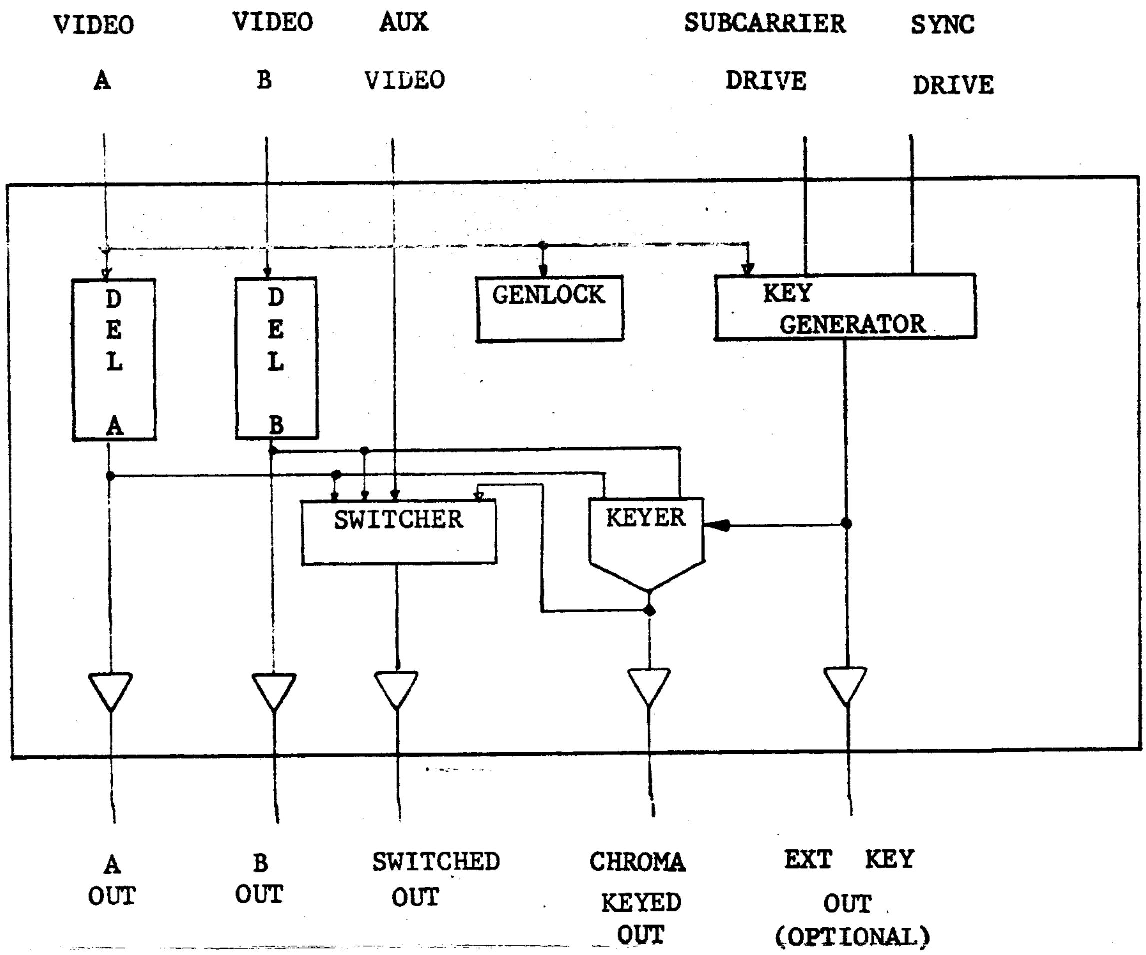
FEATURES

- Zero Color Shift
- Dual Delay Lines
- Four Outputs: A, B, KEY, and Switched
- Three Inputs: A, B, and Auxilliary
- Dual Comb Filters for highest resolution
- Variable Highlight Key Inhibit
- Joystick Keying based on Vectorscope pattern
- Independent Left and Right Key edge position controls
- External Drive and Genlock

All features are standard. Delay lines are highest quality discrete lumped type and are designed so that the 601/CK-3 will pass a Tektronix 146 color bar signal with negligible distortion.

DESCRIPTION:

BLOCK DIAGRAM



The EAB 601 / Adwar CK-3 Chroma Keyer is versatile and easy to use. It has three video inputs and four video outputs. It will either genlock or accept external drive signals. It has no color shift. A vertical interval switcher is built in for convenience. The AUX input is useful for certain non-critical switching applications. An optional External Key output is offered for use with a downstream switcher, where required (Option A).

EAB VIDEO
2940 Grove Street, Berkeley
California 94703
(415) 848-6121

SPECIFICATIONS: EAB 601 / ADWAR CK-3 Encoded Chroma Keyer

Video Inputs	NTSC Encoded Composite/Non-composite
Video Outputs	NTSC Encoded Composite/Non-composite
External Key Output (Option A)	Monochrome Non-composite
Drive Inputs	Composite Sync and Subcarrier
Video Input Levels	1 Volt at 75 ohms
Video Output Levels	1 Volt at 75 ohms ± 2.5%
Ext. Key Output Level (Option A)	0.7 Volt at 75 ohms
Sync Drive Level	-3.5 Volt at 75 ohms, timed to input
Subcarrier Level	1 Volt min. at 75 ohms, timed to input
Video Output Level Matching	± 0.5 db
Video Flatness	+ 0.0, -0.2 db to 5 mhz
Video Delay	2 s. c. cycles (559 ns)
Video Delay Matching	± 3 n. sec. (all outputs)
Keying Range	Hue: 360°
Key Position Adjustment	± 50 n. sec., left and right edges
Connectors	BNC
Operating Temperature Range	0° C. to +55° C.
Input Power	105 - 130 Volts AC, 20 Watts

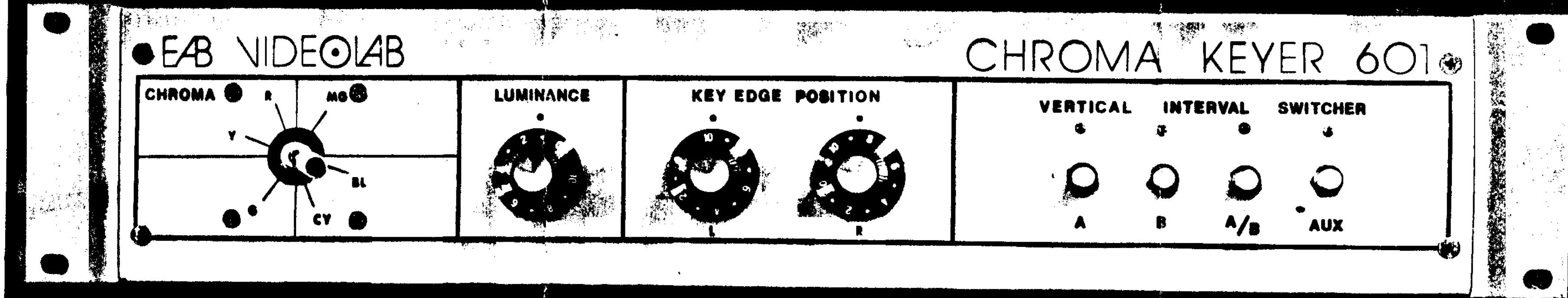
PRICES

601 Chroma Keyer	$2,500.00
Option A (Ext Key)	$ 125.00

DISTRIBUTOR

Adwar Video, 100 Fifth Avenue, N. Y. 10011

EAB
2940 Grove Street, Berkeley
California 94703
(415) 848-6121



FIRST PASS

VIDIUM

4/20/92 Jeff Schier

The Vidium "MK II" was a hybrid analog synthesizer, which acted as a "hyper Lissajous pattern generator". As recounted by Larry Shaw ... The basic Lissajous pattern, name after the French Physicist Jules A. Lissajous consist of a circle formed by driving an X, Y display (or oscilloscope set to XY mode) with two sine waves. With the X axis "in-phase" and the Y axis "out-of-phase" a shape is seen on the display. If the phase shift is 90 degrees a circle is formed, 45 degrees an ellipse, and 0 degrees a diagonal line. By driving each axis with its' own oscillator, with a precise phase shifting and modulation signals, elaborate shapes could be formed. These were expansions on the classic circle and figure eight pattern to form harmonically pinched doughnuts, and vector textures of slowly changing form. Programmable waveforms of sinewaves shifting to triangle waves, then square were applied to form sinuous curves and boundaries.

A modified color television was used for the X, Y display with the deflection yoke replaced with a new yoke driven from audio amplifiers. The audio amp was in turn driven from the main analog waveform generator rack. Color was added by wiring to the color "hue control", forming a voltage controlled phase shifter, wrapping in phase 540 degrees of the normal 360 degree hue space. Color saturation and brightness were set by the TV's front panel controls. A special analog velocity/position detector calculated : the square root of (X squared plus Y squared) deflection signals that fed the color hue shifter. A threshold detector blanked the beam, if the X and Y settled to zero (a dot in the center of the screen). The hue shifter allowed drawing of textural surfaces in smoothly changing colors. The hue shift tracked the shapes automatically.

The main control box consist of two 3 feet by 3 feet racks mounted side by side. The left side contained the "voltage sequencer" outputs with 60 multi-turn knobs, while the right side contained the control and signal processing modules.

The main control of the synthesizer was from an analog voltage sequencer. The "sequenced voltage source" has six controllable "steps", each gating on 10 voltages, the voltages set by ten-turn potentiometers located on the left half of the rack. This six by ten matrix of voltages were interconnected by "Pomona Stacking Banana Plug cords", to other modules located on the right half of the rack. Commonly the sequencer was wired in tandem, the first module triggered the second module, etc.till the sixth sequencer step was triggered. An oscillator at the front end could start up the chain of events. Each "step" had its own time delay (a monostable multivibrator), and a light bulb to indicate it had triggered. Text labels of OSC START , SEQ OUT - a level mimicking the state of the sequence, and EOS (end of sequence) to wire to the next module.

Control voltages were available on colored banana jacks with RED representing analog outputs, BLUE for analog inputs, BlACK for digital inputs (bi-level signals : on or off), and WHITE for digital outputs. The output signals had a "Wired-Or" property, allowing wiring multiple outputs together, with the lower voltage being the victor. Analog voltages could also be "bare-collector" wired, the lower voltage winning out if tied together.

The "pattern generator side was built to form the basic sinewave and phase shifted sinewaves. The modules consisted of oscillator frequency sources, and processing modules. Multiple oscillators were present, including a voltage controlled function generator. The allowed voltage control of frequency and phase as well as a sync input. The output generated a collection of waveforms : triangle, square, sawtooth and sine. A digital version of a "trigger out" and a waveform triggered indicator "logic out" are available on separate jacks. A more elaborate version was proposed to allow a voltage control of waveform shape, the input voltage would shift the output waveform from sine through triangle to square.

Another signal source was an envelope generator. A trigger pulse "ENV START" started a pulse output, and "ENV STOP" turned off the pulse. The rise/fall time of this pulse was voltage controlled, and digital outputs indicated the envelope had triggered. The envelope pulse would later be combined with the main oscillators to smoothly qualify the underlying waveform.

Closely tied to the idea of Lissajous pattern generation is the need for controlled phase shift of the sine wave signal. A modified filter circuit with an operating frequency around 1KHZ was constructed, with inverting and non-inverting inputs. The control input progressively shifted the phase of the input signals in response to the control voltage.

For processing of waveforms a Voltage Controlled DC coupled Amplifier is present acting as a two quadrant multiplier, with a summing input stage. The amplifier summed multiple inputs together, while the voltage control input, attenuated the summed result and sent them to output. The control could come from the envelope generator, the sequencer voltage or the oscillator waveform. Output = (In_1 + In_2) * Control

A precision Four quadrant multiplier with two sets of inputs, an A and B with a inverting and non-inverting polarities were used to modulate the oscillator waveforms. Output = (IN_A1 - In_A2) * (In_B1 - In_B2) This four quadrants allowed both attenuation and inverting of input waveforms.

The combination of the Voltage controlled summing AMPs, ith the Four quadrant multipliers, and phase shifters allowed multiple scillators, envelopes and knob controlled voltages to be combined nto curious patterns of X and Y signals. The hue shifts were closely linked to the pattern drawn by the X and Y waveforms, forming the unique interlocked VIDIUM Lissajous surfaces.

ELECTRONIC ASSOCIATES OF BERKELEY
1624 HARMON ST, BERKELEY, CALIF. 94703
(415) 654-1796

EAB VIDEOLAB-I

The EAB Videolab I is a video system composed of a matrix switcher, genlock, key/matte/wipe generator, and four level colorizer. The system utilizes voltage control for extreme operational flexibility.

VIDEOLAB -I SYSTEM ELEMENTS

1. Matrix switcher/genlock
   - 6 inputs, 6 outputs, completely DC restored
   - provides sync and power for 3 Sony portapack cameras by means of genlock
   - 36 light emitting diodes on front panel provide readout of channel selection
   - channel selecting manually or by voltage control with front panel patching
2. Key/Matte generator
   - utilizes function generators locked to horizontal and vertical scan rates
   - utilizes patching of control signals between comparators and logic elements.
   - allows for a virtually unlimited variety of keys, mattes and wipes by means of internal or external modulation of control signals.
   - provides switching logic levels for 6x6 matrix
3. Colorizer
   - Divides gray scale into four bands
   - provides for control of Hue, Saturation, Gray, and video level within each band
   - video images can be keyed into any band

- all functions operated both by controls on front panel and by voltage control
- soft key mode.

EAB VIDEOLAB modules are professional quality and are supplied in rack mount cabinets. The price of the VIDEOLAB I is $2950. Terms required are 1/3 down and net on delivery and the delivery time is 60 days from receipt of order unless otherwise arranged.

For information about our products call EAB:

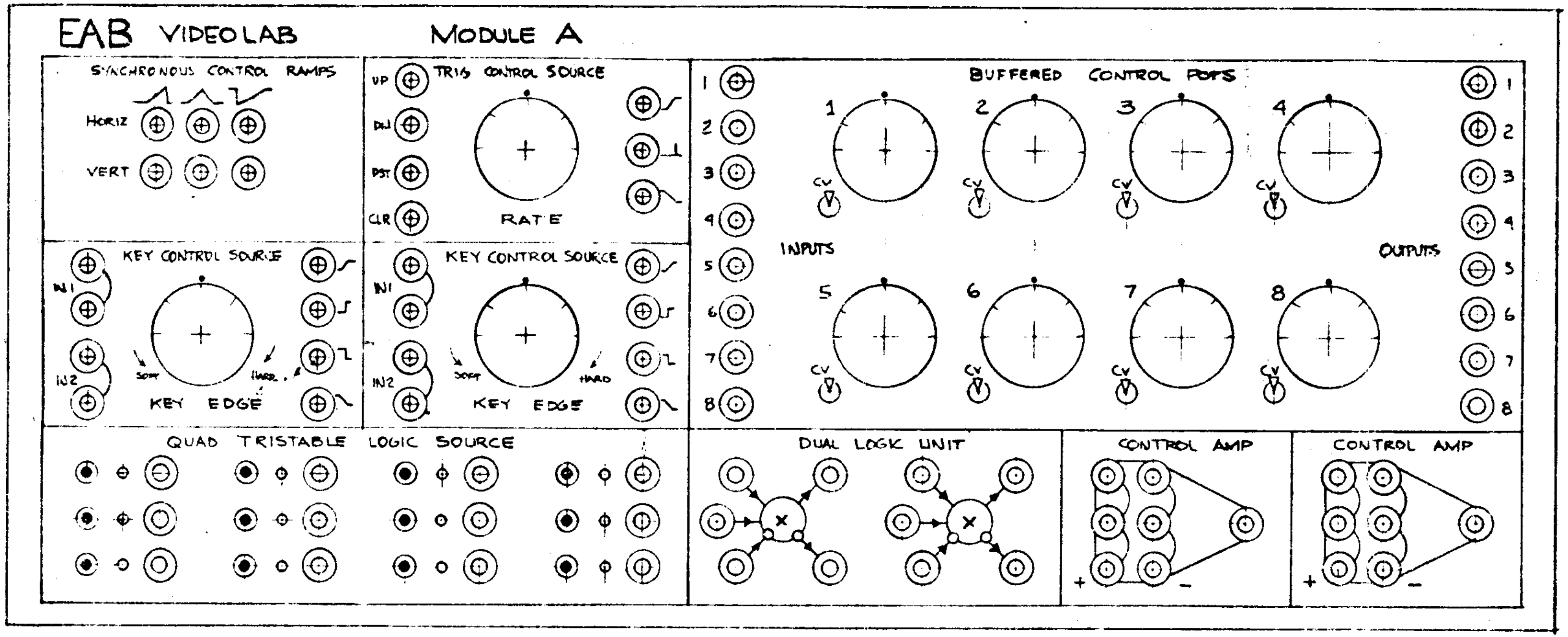
1624 Harmon St.

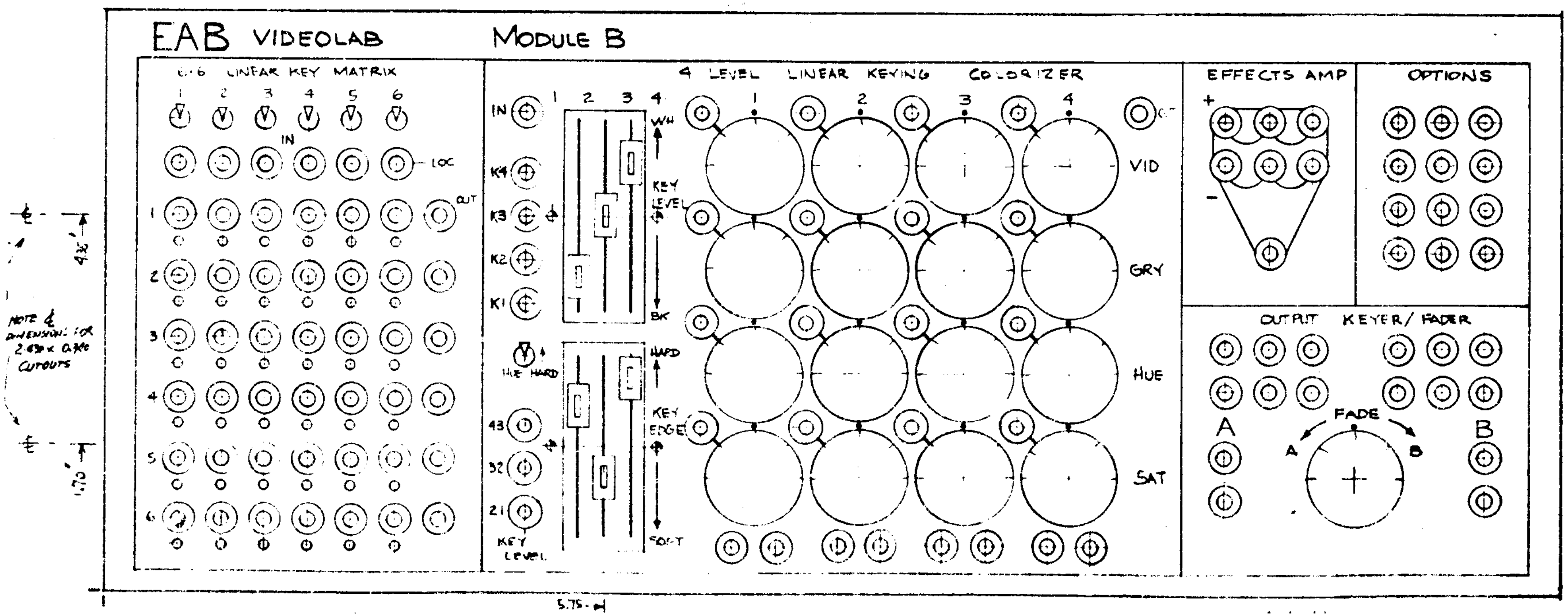
Berkeley, CA 94703

(415) 654-1796

VIDEOLAB PANEL

EAB Berkeley Camp
Bill Hearn 9-14-75
Rev 9-23-75





SYMBOLS

KNOBS, POTS 3/8" HOLE — KNOBS, POTS 1 1/8

BANANA JACK 5/16 HOLE, 3/8 O.D.

PUSH BUTTON C&K 8121 OR S.M. 1/4 DIA HOLE

MINIATURE TOGGLE 1/4 DIA HOLE

LIGHT EMITTING DIODE, 1/8 DIA HOLE

3/32 DIA FOR CLEARANCE OF #2-56 SCREW

NOTES

1. ALL JACKS COLOR CODED AS TO FUNCTION

VIDEOLAB INSTALLATION

The EAB Videolab is usually installed by EAB personnel. If difficulties arise in the installation of your unit, call EAB in Berkeley, Ca. at 415-848-6121. EAB requests that our customers not make unauthorized adjustments to the internal circuitry of Videolabs, as it voids the warranty.

GENERAL INFORMATION

POWER CONNECTONS:

The EAB Videolab consumes 250 Watts Maximum at input power voltages of 110v-130v a.c.,50-60 Herz. It is the customer's responsibility to provide for Mains stabilizing within these limits.

The Videolab is powered by eight regulated power supplies. These supplies are located in the A module. The Power connection to the B module is made by means of the multi-pin cable connecting the two modules.

SIGNAL CONNECTIONS:

All external connections to the Videolab must be made to the rear panel. The Videolab accepts up to six standard video signals at inputs 1-6, and outputs three composite outputs at the connectors marked "1","2", and "MAIN". If the videolab is to be used in the genlock mode, the video input to channel 1 must contain the sync and burst components.

On some models, RGB outputs are provided on the rear panel from the colorizer section. These outputs are 1-volt, 75 ohm non-composite, without burst.

Signal Connections to the front panels of the modules are to be made only to other Videolab modules and only with the EAB patchcords provided. A description of patching techniques is found in the EAB Videolab Users Manual provided with each unit.

SYNC AND TIMING CONNECTIONS:

External Sync and Subcarrier inputs are available on the rear panel of the unit and are automatically activated when driven. If these inputs are utilized, the sync and burst components of all six input signals is ignored. A 360 degree phase shift control is provided for subcarrier phasing.

SYNC AND TIMING CONNECTIONS (CONT.);

Six genlock drive outputs are provided for the convenience of The Videolab user. These are; "HD" (horiz. drive), "CS" (comp. sync), "VD" (vert. drive), "CB" (composite blanking), "SC" (subcarrier drive), and "BF" (burst flag). All are standard levels.

INITIAL TEST

If desired, the user may verify operation of his Videolab. Although the flexibliity of the Videolab permits many modes of operation, the following simple steps will allow the user to verify its basic operation:

1) Connect a suitable composite or non composite video signal to channel 1 on the rear panel.

2) Connect external sync and subcarrier drive signals.

3) Connect a Color monitor to the "Main" output.

4) Refer to the Videolab User's Manual. A number of simple effects may be done with a single channel.

Apr 12, 1986

TO ALL VIDEOLAB SERIES 2 OWNERS:

IMPORTANT NOTICE!

Some EAB Videolab series 2 A/B Modules have power supplies that may lose regulation under certain conditions of ambient temperature and AC line voltage. The symptom is the appearance of horizontal bands in the picture and unstable operation. Repair of this condition is very simple, and we reccomend that all <u>all</u> owners of Series 2 videolabs have this simple "fix" done. EAB will do it for you at no charge, or you may have it done by a qualified technician. <u>Please be careful and follow the procedure: a mistake can result in damage to the instrument.</u>

<u>PROCEDURE:</u>

1.Disconnect all A.C. power by unplugging the "A" module. Disconnect the "B" module and set it aside. You will work on the "A" Module only.

2. Remove the "A" Module top and remove the five screws holding the "A" Module back panel in place. Gently allow the "A" Module back panel to pivot back on its lower edge so that it is laying on the bench.

3. At the lower left of the rear panel is the power transformer. on the left hand side of the power transformer (the primary side), the terminals are marked with the numbers 1 through 7. Remove (unsolder) all wires from these terminals, including any jumpers. <u>Do not disturb the secondary connections, 8 through 11.</u>

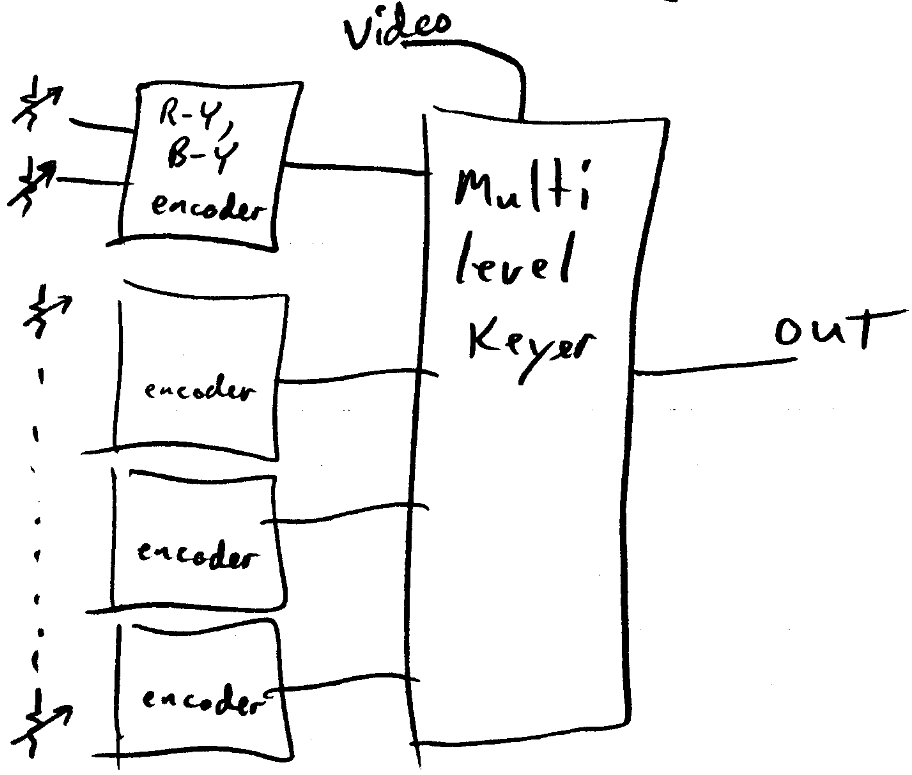
4. You will now have two free wires coming from the rear panel. One wire comes directly from the A.C. cord, and the other comes from the fuse. <u>Solder these two free wires to terminals 1 and 2 of the transformer primary.</u>

5. To double-check your work, you can measure the unregulated D.C. Voltage at the transformer secondary before reassembling the module. To do this, first locate the small terminal strip directly to the left of the horizontal slot cut in the back panel. Plug the "A" module into the A.C. Line (do <u>not</u> reconnect the "B" module. Using a DC voltmeter, measure the upper terminal on this terminal strip with respect to the rear panel (ground). This reading should lie between +18 and +21 volts. Unplug the module. If your readings were not correct, call the number listed below before going any further.

6. Reassemble the "A" Module. The entire Videolab is now ready for use. If you wish further assistance, please call:

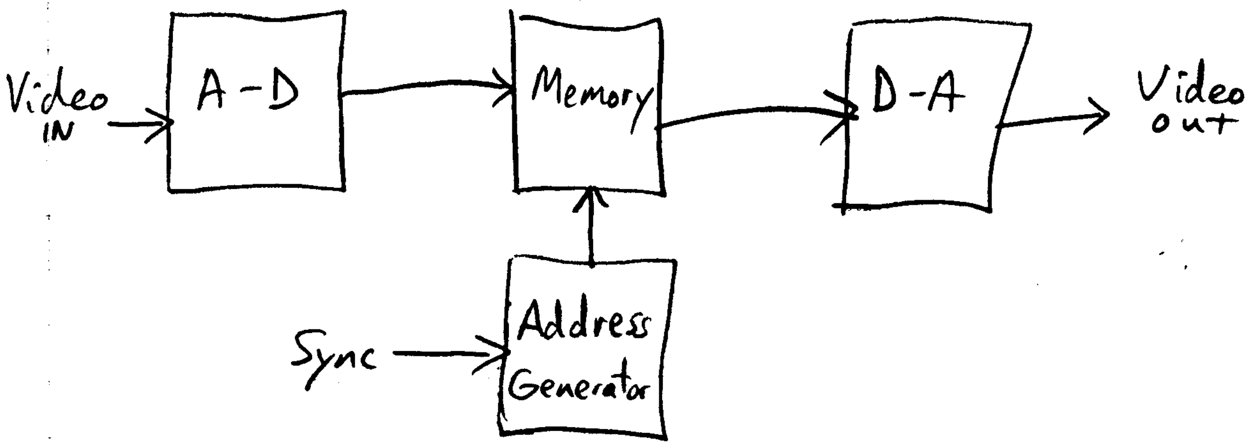
E A B VIDEO
William Hearn, R.P.E.E.
415-848-6121
2940 M.L. King, jr. Way, Berkeley,Ca 94703.

E.A.B. (Hearn) (late 1970's version)



(by David Jones)

64x64 buffer



~~This frame buffer is a simple device that can freeze a video image and display it. It is an early digital video [illegible] that converts the video image into a system~~

(by David Jones)

ELECTRONIC ASSOCIATES OF BERKELEY
ELECTRONIC DESIGN AND DEVELOPMENT

2940 GROVE ST., BERKELEY, CALIF. 94703 415 848-6121

HOW TO USE THE 601 KEYER

1. INPUT CONNECTIONS

A. Connect the main camera to input "A". If this signal is composite video and genlock operation is desired, the "EXT DRIVE" switches are set "up".

B. Connect the background video to the "B" input. This image will appear in the "keyed in" areas of the main image.

C. An auxilliary image from another source which is vertically synchronized may be connected to the "AUX" input. This image may be switched by means of the front panel switcher controls. This input is not used in studio applications and is offered as an accessory feature.

D. External sync and subcarrier signals may be connected. If your Keyer does not have the "EXT SC PHASE TRIM" option, then an external phase shifter will be required.

2. OUTPUT CONNECTIONS

A. The "A", "B", "A/B", and "SWITCHED" outputs may all be connected to the inputs of a master switcher, or to a video synthesizer such as the EAB Module E.

B. The 601 may act as its own switcher. The "SWITCHED" output offers a choice of both original images, the "keyed" image, and a fourth (auxilliary) image.

HOW TO USE THE 601 KEYER (cont.)

3. IMAGE QUALITY

It is vitally important for acceptable keying that the 601 receive a good quality image at the "A" input. The 601 incorporates advanced circuitry, including both horizontal and vertical comb filtering, and will give good results on a variety of sources.

A. Many video sources produce video with chroma far below NTSC levels. Off-air and tape sources often suffer from this defect.

B. All 601 Chroma Keyers are set up using a standard NTSC color source (Tektronix 146). The minimum level of chroma for good quality keying is set to be 30% of the burst amplitude, or about 12 IRE units.

C. Blue backgrounds will often not produce the minimum amount of signal for chroma keying unless the material is carefully chosen. Pale blue backgrounds, for example, are extremely inefficient. A well lit, strongly saturated background gives best results. Use of a waveform monitor or EAB 800 Vectorscope is suggested.

D. The 601 may be readjusted to key at lower than standard levels, although the key quality may suffer. Contact EAB for details.

HOW TO USE THE 601 KEYER (cont.)

4. <u>OPERATION OF CHROMA KEYER CONTROLS</u>

A. Start with
   1. Chroma Joystick set at center
   2. Luminance control counter-clockwise
   3. Key edge position controls set at "5"
   4. Monitor observing A/B output.

B. Using the joystick, locate the correct angle and minimum displacement of the joystick to produce the required key.

C. Advance the luminance control to inhibit highlight keying.

D. Adjust key edge position to give best left and right key edges.

E. Readjust controls as necessary.

601 Encoded Chroma Keyer

I.O. and Controls

EXT. SYNC INPUTS
OPTIONAL:

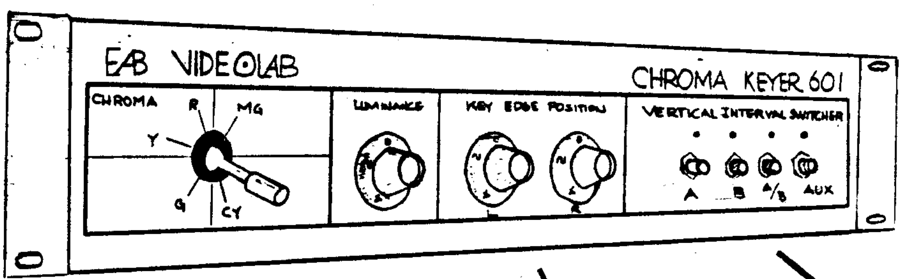
EXTERNAL SUBCARRIER DRIVE INPUT
ACCEPTS EXTERNAL 3.58mhz

EXTERNAL SYNC DRIVE INPUT
ACCEPTS COMPOSITE SYNC DRIVE

NORM / EXT. DRIVE SWITCHES

VIDEO INPUTS
A: FOREGROUND
B: BACKGROUND
AUX: TAPE OR OTHER
ALL 75 OHM TERMINATED

VIDEO OUTPUTS
A: FOREGROUND (DELAYED)
B: BACKGROUND (DELAYED)
A/B: KEYED VIDEO (DELAYED)
SWITCHED: A, B, A/B, AUX.
ALL 75 OHM.



CHROMA JOYSTICK
SETS COLOR
OF CHROMA KEY

MATCHES STANDARD
N T S C VECTORSCOPE

LUMINANCE LOCKOUT
SETS PERMISSIBLE RANGE
OF BRIGHTNESS FOR
CHROMA KEY

KEY POSITION
INDEPENDENTLY ADJUSTS
LEFT AND RIGHT EDGES
OF CHROMA KEY.

VERTICAL INTERVAL SWITCHER
SELECTS BETWEEN A, B, AUX,
AND KEYED VIDEO. VIDEO
APPEARS ON SWITCHED OUTPUT.

THE VASULKAS, INC.
100 ROUTE 6
SANTA FE, NEW MEXICO 87501
TEL. (505) 471-7181/FAX. (505) 473-0614

March 31, 1992

Steve Anderson
1801 East Cotati
Sonoma State University
Rohnert Park, CA 94928

Bill Hearn
2940 Martin Luther King Way
Berkeley, CA 94703

Dear Steven Anderson and Bill Hearn,

We want to thank you for considering our request to borrow the VIDIUM for the exhibition that we are curating for the ARS ELECTRONICA Festival in Linz, Austria. I am sending a copy of a letter that confirms the Austrians' intention to return the instruments after the exhibition. We are writing to both of you concerning this loan. Based upon recent telephone conversations it is our understanding that the VIDIUM is the property of Bill Hearn that has been on extended loan to Sonoma State University.

Woody is planning a trip to the Bay Area Monday, April 13 and Tuesday, April 14 regarding the documentation, restoration and preparation of the instrument for exhibition. David Muller of the University of Iowa is the technician working on this project. David will be preparing all of the equipment for the exhibition and be on site in Germany for the installation and during the exhibition, as will the Vasulkas. The Vasulkas and David Muller will oversee all handling of the equipment. Although we cannot offer you a fee for the installation we can offer Woody and David's expertise and services, as well as inclusion in this international festival, with a full color catalogue.

In addition to highly skilled technical restoration, we are offering very personal shipping attention. As I mentioned, Woody's nephew, Pavel Skryja, will meet Woody in San Francisco with a truck, and drive the instrument to Iowa City. We hope our proposed dates will not be inconvenient for you. The Austrians are picking up all the instruments and additional equipment in Iowa City on May 4th.

However, in addition to confirming the loan, I also need basic information for our insurance and packing plans - approximate size, weight and an insurance value. For your convenience, I have enclosed a packing sheet of the preliminary information I was given by telephone and have included suggested Insurance Replacement Values. Please review and correct - if necessary - then return to us by mail or fax. As I have indicated above, ARS ELECTRONICA has promised to return the VIDIUM soon after the end of the exhibition.

Please note that I need two different Insurance Replacement Values. For shipment within the U.S., and for the shipment to Austria after David Muller has completely reviewed the instrument, and restored it. As a certified appraiser with the American Society of Appraiser, in Fine Arts, it is my opinion that for shipment to Austria VADIUM should be valued at a higher rate based upon the following characteristics - full restoration, inclusion in a highly regarded international festival, and documentation in the museum exhibition catalogue.

Please be assured that from our date of pick-up until May 4, VIDIUM will be insured on the Vasulkas, Inc. policy, Charter Insurance - when we receive an apposite amount from you.

Also enclosed is a more narrative description of the exhibition that we completed recently, to give you a little clearer idea of the exhibition.

We look forward to hearing from you.

Regards,

MaLin Wilson
Coordinator

SONOMA STATE UNIVERSITY
Department of Physics and Astronomy
707 664-2119

1801 East Cotati Avenue
Rohnert Park, California 94928

4/8/92

The Vasulkas Inc.
100 Route 6
Santa Fe, NM 87501

received
April 14 92

Mr. MaLin Wilson,

Thank you for the letter describing the terms of the loan of the VIDIUM for the ARS ELECTRONICA exhibition. I have somewhat different dimensions than the ones given by Mr. Hearn for the VIDIUM;

Height	Width	Depth	Weight
21"	72"	10" (18" with attached base board)	est. #80

The IRV / IRV* values are somewhat "in the eye of the beholder". As an appraiser, you are the expert in this regard.

The unit is functioning, at least the four or five channels that I have used. Some technical knowledge is required. I would pay attention to the grounding and polarity and so on when adapting the power transformer. The unit is attached to a plywood base that is noted in the depth dimension. This base could function as a stand if it were painted and had legs attached to it. It is presently sitting on a lab bench. Please see enclosed photograph.

I have taken the liberty of including the Laser Affiliates' 10 year catalog. We are a group of laser performance artists that have produced visual art performances and holography exhibitions in the Bay Area for some time. We also have a videotape compiled of performance segments that captures more of the kinetic nature of these events. If you are interested, I can send a copy. In the development of theseevents I have made devices very similar to the VIDIUM for generating laser graphics. We also have a computer generated animation system not depicted in the catalog.

I will look forward to meeting Pavel and Woody on March 28. I am excited that other people will be able to enjoy this unique instrument.

Steve Anderson

Steve Anderson
Equipment Tech. III
Sonoma State U., Physics & Astronomy Dept.

Chips and Technologies, Inc.

FACSIMILE TRANSMITTAL

FROM

THE MEDIA GROUP

GRAPHICS, MULTIMEDIA, ACCELERATORS

DATE: 5/29/92

TO: STEINA + WOODY

COMPANY: VASULKA

SUBJECT: HEARNE VIDIUM

FAX: 505-473-0614

FROM: JEFF SCHIER

CC:

TOTAL NUMBER OF PAGES (INCLUDING COVER SHEET):

COMMENTS:

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