ABSTRACT PATTERN GENERATION VIA TELEVISION TECHNIQUES

by

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A number of interesting and aesthetically pleasing patterns may be produced on a television screen in black and white or in color by pointing the lens of a television camera at the monitor screen. With a standard, unmodified, television camera, this would result in an image similar to that produced by two parallel mirrors, with duplication of the image seen to infinity, depending upon the camera angle and proximity.

By introducing certain distortions in the video signal before it is applied to the television monitor, a much wider variety of interesting and pleasing effects may be achieved. The basic operation involved is the translation of the continuous range of grey scale values from the television camera output to a black or white only signal through means of a device such as a high-speed Schmitt trigger. In this instance, the sensitivity of the television camera is very greatly increased to small threshold values of video signal, and when the camera is pointed at the television monitor, a different form of regenerative process can take place when monitor brightness, contrast, and camera sensitivity exceed a certain threshold. In this instance, the high gain of closed-loop operation can cause the reproduced television signal to assume a number of unusual configurations, including slowly changing patterns on the television monitor as influenced by factors which will be discussed later.

The use of two or more Schmitt triggers or slicers set to different amplitude levels may be used to generate more complex patterns and the outputs of such slicers or quantizers can be fed to the inputs of a color television monitor or a color encoder for the reproduction of colored images. The use of color greatly enhances the aesthetic appeal of the reproduced patterns and a block diagram of a typical system, usable with either black and white or color, is shown in Fig. 1.

The generation of patterns is influenced by the following factors:

(1) Camera distance and lens focal length as compared to the diameter of the picture monitor.

(2) Angle of the camera position as related to the monitor screen.

(3) Angular rotation of the camera scanning plane.

(4) Optical and/or electrical focus of the television camera.

(5) Lens aperture and/or video gain of the camera.

(6) Setting of quantizer thresholds.

(7) Introduction of secondary light patterns on the television monitor screen by optical means.

(8) Introduction of secondary video images on the monitor screen through electronic mixing.

(9) Modulation of the feedback path by external signals such as might be derived from an audio source (music, speech, etc.,) as applied to any element in the chain, including brightness modulation of the television monitor screen, changes in gain of the television camera, changes in quantizer threshold levels, etc.

(10) Utilization of vidicon or other camera pickup tubes, having substantial target "lag" characteristics which tend to produce more slowly moving, changing patterns.

(11) Modification of automatic gain control characteristics of the television camera gain to affect pattern change characteristics.

(12) Secondary modulation techniques involving variations in color intensity or hue shift.

The television camera may be used to look at either a color monitor to reproduce color patterns, or may look at a black and white camera, with the outputs of several quantizers being fed into a separate color monitor or color encoder for synthetic color pattern generation. Similarly, the output of a camera looking at a color monitor may be reproduced only in black or white, as desired.

606 VIDEO QUANTIZER

Inv #	REMARKS	S/N	MODEL		DATE
163	W-P AFB	001	21 Chan		1-15-70
162	Hyer	002			1-15-70
574	U of Iowa	003			1-15-70
310	Integrerad, Sweden	004			3-1-70
	IBM	005			3-1-70
268	Telejockey	006	A*		4-2-70
372	U of San Diego	007			4-2-70
255	Rensselaer	008			4-2-70
385	KGM, England	009			4-2-70
270	WFAA - Dallas	010	A*		10-20-70
450	FT. Geo. Meade, MD	011	A		12-14-70
*	Salvaged Richard Taylor	012	-5 Slicer		12-14-70
	??	013			
390	Brown Boveri & Co, Switzerland	014			9-13-71
388	Lockheed Missile + Space	015			9-13-71
459	~~Argonne~~ Univ. of Illinois	016	P		9-17-71
420	LDS Hospital, Salt Lake City	017			9-17-71
422	Hughes	018	C		11-22-71
1240	Johgen Andersen	019			3-10-72
576	Cramer	020			4-24-72
548	Dupont	021	A		4-24-72
711	Marshall Space Flt Ctr	022			4-24-72
711	" " " "	023			4-24-72
493	Datex	024	A		4-24-72
820	KODAK	025	"C"		6-8-72
1158 553	Museum of Science (Boston) Tech Corp	026	A		8-28-72
670	Tech Corp	027	A		1-30-73
761	DIAMOND Power Specialty Corp.	028	A		4-25-73
735	Marshall Space Flt Ctr, NASA	029	STD(16)		6-5-73
863	Raytheon	030	" "		6-26-73
1020	Mem. Analy - John Roach.	031	" "		7-10-73
1130	IBM - Fishkill	032	" "		1-22-74
1099	IBM - Owego. T. ETC	033	"C"		3-26-74
38	Sperry	034	"		"
1456	Colo Cassette - Mexico	035	"		"

SECTION 1

GENERAL DESCRIPTION

1.1 INTRODUCTION

This instruction manual is to be used as a guide to the installation, adjustment, operation, and maintenance of the CVI Model 606C Video Quantizer.

1.2 PURPOSE OF EQUIPMENT

The Model 606C is an instrument designed to process the greyscale characteristics of a monochrome video input signal in order to achieve radical alterations in output linearity or, alternately, to synthesize color signals from different shades of grey.

The unit operates on the input video signal by selecting from 1 to 21 separate narrow "slices" which are adjustable to any amplitude level between black and white. Selection of the thresholds may be on a linear, logarithmic, antilog, or other arbitrary basis. An integral patch panel provides a means of combining the outputs of the 21 quantizers to achieve a wide range of visual effects. The unit also contains a linear video amplifier, the output of which may be mixed with the quantized signals for additional versatility.

1.3 DESCRIPTION OF EQUIPMENT

The Model 606C Video Quantizer mounts in a standard 19" rack, occupies 14" of vertical space, and utilizes completely solid state circuitry. All major circuit elements are mounted on plug-in cards.

Normal operating and setup controls are front panel mounted, and all signal interconnections are located on the rear of the chassis. BNC connectors are used for video and drive inputs.

1.4 SPECIFICATIONS

Size:	14" x 19" x 12"	
Mounting:	Standard 19" rack	
Construction:	Plug-in cards, solid state, silicon	
Power:	117 VAC, 60 Hertz	
Inputs:	Video	1V, 75 ohms
	Ext. Signal	0 to +1V, 75 ohms DC to 15 MHz
	Horiz. DR	4V, 1K ohms
	Blanking	4V, 1K ohms
Outputs:	Video Red	1V, 75 ohms
	Video Green	1V, 75 ohms
	Video Blue	1V, 75 ohms
	Sync	3.5V, 75 ohms
Controls:	AC Power	
	Input Level	
	Bias	
	Analog Level	
	Quant.: Int/Ext/Test	
	Quant. Thresholds: 1 through 21	
	Quant: Output Level: 1 through 21	
	Red Level	
	Green Level	
	Blue Level	
Connectors:	BNC	

Nothing extends easily or without great difficulty

SECTION 1

GENERAL DESCRIPTION

1.1 INTRODUCTION

This instruction book is to be used as a guide to the installation, adjustment, operation, and maintenance of the CVI Model 502 Data Camera.

1.2 PURPOSE OF EQUIPMENT

The Model 502 is intended primarily as a laboratory research instrument for the conversion of visual data into standard or non-standard TV format.

1.3 DESCRIPTION OF EQUIPMENT

The CVI Model 502 Data Camera is a three-piece instrument capable of using a variety of standard 1" pickup tubes. The 502 accommodates standard vidicons of either separate or integral mesh, silicon diode target tubes, lead oxide target tubes, or other devices with appropriate mechanical and electrical characteristics.

The Model 502 is primarily intended for laboratory or industrial inspection usage, and incorporates a number of features not normally found in conventional CCTV equipment. These include:

- Externally controllable sweep circuits which allow for non-conventional scanning patterns or rapid changes in position, angle, or size, when required for pattern matching or similar applications. H and V deflection may be interchanged.
- Externally controllable beam blanking for target integration or pulsed light applications.
- Wide range sweep circuits (DC coupled) and video circuits capable of operating from one frame per second to 1000 frames per second.
- Remote, dynamic, gain control over a 4 to 1 range.
- Plug-in video low pass filters for best signal-to-noise ratio (Note: normal video bandwidth is 10 MHz).
- Remote, continuous, beam current control.
- A series of available options:

1. Video data sampler for A/D conversion for control purposes.

2. Eight video low pass filter frequencies selectable by means of a 3-bit digital code.

3. Preamplifier gain/bandwidth selection by means of an 8-bit digital code.

1.4 SPECIFICATIONS

Size:	Camera Head	4½" x 5" x 11" (w/o lens)
	Camera Control	3½" x 19" x 8"
	Power Supply	3½" x 19" x 9½"
Construction:	Solid state, silicon	
Power:	117 VAC, 25 watts	
Inputs:	Horizontal drive	TTL, positive going
	Vertical drive	TTL, positive going
	Ext. Blanking	TTL, positive going
	H. Deflection	0 to +5 V, 10K ohms
	V. Deflection	0 to +5 V, 10K ohms
	Remote beam	0 to +5 V, 10K ohms
	Remote gain	0 to +5 V, 10K ohms
Outputs:	Video	0 to +1 V, 75 ohms, DC coupled
	Video (option 1)	0 to +4 V, 500 ohms, DC coupled

Controls:

Front Panel
- Gain
- Blanking
- Video Polarity +,-
- Target
- Beam
- Focus
- Horizontal Size
- Horizontal Centering
- Vertical Size
- Vertical Centering
- Scan Centering (option #1)

Rear Panel
- #1 Alignment
- #2 Alignment
- Blanking: Int/Ext
- Sweeps: Int/Ext
- Beam: Int/Ext

Power Supply
- AC On/Off

Connectors: BNC