
ABSTRACTS OF PAPERS FROM OTHER JOURNALS

Time Base Correctors and Frame Synchronizer, Leonid Strashun, *International Broadcast Engineer*, 4-27, Summer, 1983.

In recent years time base correctors and frame synchronizers have become increasingly available and more sophisticated. They were originally conceived as "black boxes" designed (a) to compensate for errors that are introduced onto the video signals when these signals are stored on magnetic tape (time base correctors), and (b) to correlate video signals originated from distant nonrelated sources (frame synchronizers). The marriage of television and computer techniques has produced present-day time base correctors and frame synchronizers and made them into every-day production tools with an almost unlimited potential.

Telecines and Color Correctors, Dennis Moralee, *International Broadcast Engineer*, 5-9, July, 1983.

Although it can be argued that more and more television program makers are switching to video as the preferred original "shooting medium," film not only remains a vitally important ingredient in TV broadcasting, but continues to offer some positive advantages. Not least of these is the flexibility and sophistication of current generation telecine machines with computer-controlled scene-by-scene color correction for post-production. Additionally, so much broadcast material, including cinema features, is on film that the future of broadcast-oriented telecine is assured for many years to come.

Electronic Still-Picture Camera Using Magnetic Bubble Memory, Kazunori Ohnishi, Keinosuke Murakami, and Kataro Wakui, *ABU Technical Review*, 31-36, March, 1983.

The characteristics of solid-state image sensors have been rapidly improved in the past several years, which has nearly satisfied the requirements for home TV cameras. These TV cameras have been designed to operate in combination with home VTRs. Their utilization has only been applied to ordinary TV cameras; however, the application of solid-state image sensors to electronic still-picture cameras, in which images are recorded by electronic means, has recently been noticed. NHK Laboratories displayed experimental equipment in June, 1981. The equipment used a frame transfer CCD as an image pickup device and a magnetic bubble memory as a recording device for digital recording.

This paper outlines the experimental equipment for an electronic still-picture

camera developed by NHK, and describes a means of electronically controlling the time of integration which corresponds to the time of exposure in film cameras. Camera characteristics and variations of picture quality during the time of integration are described.

3-D Television Without Glasses on Standard Bandwidth, Robert B. Collendar, *Optics in Entertainment*, 27-37, January, 1983.

This system for stereoscopic television uses relative camera-to-scene translating motion and does not require optical aids at the observer's eyes. It presents a horizontal parallax (hologram-like) 3-D full-motion scene to a wide audience, and has no dead zones or pseudo 3-D zones over the entire horizontal viewing field. It operates on standard telecast signals requiring no changes to the television studio equipment or the home television antenna. The only change required at the receiving end is a special television projector.

The system is compatible with pre-recorded standard color television signals. The CRT is eliminated by substituting an array of solid-state CCD liquid crystal light valves which can receive television fields in parallel from memory and which are arrayed in an arc for scanning purposes. The array contains a scrolled sequence of successive television frames which serve as the basis for the 3-D horizontal viewing parallax.

These light valves reflect polarized light with the degree of polarization made a function of scene brightness. The array is optically scanned and the sequence rapidly projected onto a cylindrical concave semi-specular screen that returns all of the light to a rapidly translating vertical "aerial" exit slit of light through which the audience views the reconstructed 3-D scene.

Silicon Liquid Crystal Light Valves: Status and Issues, U. Efron, P. O. Braatz, M. J. Little, R. N. Schwartz, and J. Grinberg, *Optical Engineering*, 682-686, November/December, 1983.

The structure, operation, and performance of the silicon-based liquid crystal light valves — the photoactivated, CCD addressed, and visible-to-IR converter — are described. The performance limitations of the readout structure, in particular those affecting resolution, sensitivity, contrast ratio, and speed are discussed.

A High-Transmission Focus Mask for Color Picture Tubes, E. F. Hocking, S. Bloom, and D. J. Tamutus, *RCA Review*, 44:371, September 1983.

The performance of a dipole-quadrupole focus mask has been demonstrated in a functioning color picture tube. The tube is an experimental type, and many problems need to be solved before such a focus tube can be commercially manufactured. The mask insulator used will not withstand the thermal processing of conventional tube preparation. More suitable insulators might be, for example, glass or polyimide which have both thermal stability and high breakdown voltages.

Furthermore, the 10-in. demonstration tube employed a flat focus mask and a flat screen; this avoided the problems associated with forming the mask to a spherical or cylindrical shape and the problems of preparing a compatible phosphor screen. Although mask forming presents no conceptual difficulties, screen preparation will require methods other than the conventional lighthouseing.

The dipole-quadrupole focus mask has been shown to provide a highly transmitting color-selection structure requiring only moderate voltage biases and possessing good structural integrity. These masks have transmissions on the order of 50% compared to the 18 to 22% of typical shadow masks.

The bias voltage necessary to achieve color purity extrapolates linearly to about 625 V for a 25-kV color tube. The presence of the horizontal webs of the aperture plates provides a sturdiness not present in the older focus masks using only long vertical wires, and this sturdiness allows the present construction to be extendable to any size tube.

Hybrid Intraframe Transform Coding of Image Data, R. J. Clarke, *IEE Proceedings*, 131:2, February 1984.

To reduce the computational requirement which two-dimensional transform coding imposes, it is common to combine the one-dimensional form of the process with simple previous-element predictive coding with an assumed fixed value of predictor coefficient for all coefficients.

The underlying assumptions of this approach are examined both theoretically and with reference to experimental data obtained from two widely different real images. It is shown that it is highly inefficient to apply the prediction process to all of the transform coefficients, because not only is the error sequence variance frequently greater than that of the original coefficient sequence, but also considerable residual correlation exists in the signal to be quantized and coded, thus undermining the basis upon which such a data-compression technique rests.

Some Factors Affecting the Performance of Airline Entertainment Headsets, Samuel Gilman, *J. Audio Eng. Soc.*, 31:914, December 1983.

Results of tests of several airline entertainment system headsets on a manikin have shown response features for the

headset and insert earpieces (tips) that can substantially affect both a passenger's comfort and perception of sound quality. In addition, the ability of the tips to attenuate cabin noise can influence both the intelligibility of speech on sound tracks and the extent to which the sound pressure level necessary for an acceptable signal-to-noise ratio may exceed a safe upper limit. Effects of design differences are described and suggestions are made for improving performance and listener acceptance.

The Aeroplane as a Camera, Roger E. Read, *J. Photographic Science*, 31:212, September/October 1983.

Present-day methods of aerial photography are little different from those of the early 1950's. The aerial camera is installed in available aircraft as a totally separate system, the adaptation more often designed with economy rather than efficiency in mind. The Ultra Light Survey Aircraft Concept describes an integral aircraft/camera system in which a single crew member operates a fully automated survey system.

Deformation Measurements of Power Dams with Aerial Photogrammetry, A. J. Brandenberge, S. K. Ghosh, and M. Bougouss, *Photogrammetric Eng. and Remote Sensing*, 49:1561, November 1983.

The use of aerial photogrammetry, due to its operational and economic advan-

tages, offers much toward periodic control surveys to determine deformations in power dams. An increased use of aerial photogrammetry for such deformation measurements can be foreseen.

The paper deals with the development of a digital method for measuring differential movements in three dimensions of a power dam. This method emphasizes the use of a digital model datum rather than ground control by way of using the initial model for absolute orientation of subsequent models and using spatial "entities" (a set of points describing the whole or part of a feature which can be interpreted or recognized on the stereo-model) for studying the differential movements. Data analyses with statistical control are discussed. The results are analyzed and some ideas are presented for further refinement of the developed working system.

Multiple-Cavity Lasers for Holography, James D. Trolinger, *Optical Engineering*, 23:043, January/February 1984.

The use of multiple-cavity lasers in holography and photography is described. By splitting up a ruby laser cavity and using part of the crystal for different cavities, a number of interesting possibilities result. Eight basically different configurations are discussed to show how the normally oversized crystal in commercially available lasers can be used to advantage. These result in lasers that become ideal

sources for some applications, such as ultra-high repetition rate, stereo holography, multiple reference wave, simultaneous front and back lighting, multiple framing, and other techniques.

Modulation Transfer Function from the Variance of Cyclic Bar Images, Ronald T. Droege and Mark S. Rzeszutarski, *Optical Engineering*, 23:068, January/February 1984.

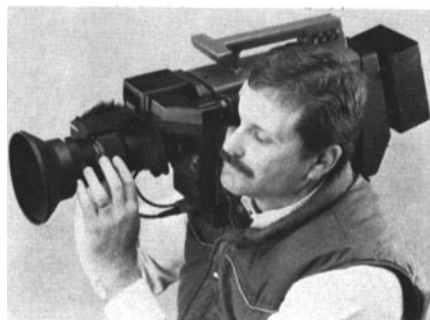
The variance of a bar pattern image can be used to measure the modulation transfer function (MTF) of an imaging system. This method is often simpler and more practical than conventional methods. The theoretical basis of the method is derived and verification is provided by computer simulations. The computer simulations also are used to evaluate the accuracy of approximate formulas. The MTF of a computed tomographic (CT) scanner is measured to illustrate the technique.

Incoherent Optic Image Correlator, Demetri Psaltis, *Optical Engineering*, 23:012, January/February 1984.

A real-time optical image correlator is described. An acousto-optic device and an array of light-emitting diodes are the electronic-to-optical transducers for the input and reference images, respectively, in this architecture. The two-dimensional correlation is formed by temporal integration on a two-dimensional CCD detector.

NEW PRODUCTS

Further information about these items can be obtained from the addresses given. As in the case of technical papers, the Society is not responsible for manufacturers' statements, and publication of these items does not constitute endorsement of the products or services.



CCD-1 portable color camera, RCA

The CCD-1, a portable solid-state color camera using three charge-coupled devices in place of camera tubes, was recently announced by RCA. Developed and manufactured by RCA's New Products Div., Lancaster, Pa., the chips used in the camera measure 0.325x0.415 in. Each

chip contains 403 horizontal picture elements (pixels) and 512 effective vertical pixels.

The RCA chip is designed on the frame transfer method because of its potential for high sensitivity and low output capacity. The frame transfer structure has an image area at the top and a storage area with output register at the bottom. The bottom area is shielded from light. The image is focused on the upper area, and the resulting charges are transferred, once per field, to the storage area at the bottom.

The CCD camera produces sharper pictures, said to have the look of film. Main advantages of the new camera are its ability to see detail in rapidly moving objects, and its ability to perform over a wide range of lighting conditions, thus making it especially suitable for news gathering and sports coverage. Other advantages over tube cameras are ruggedness, long life, and superior reliability.

The Calaway Automatic Video Replacement System (AVRS), for use in film-to-tape transfers, has been announced by Du

Art Video, division of Du Art Film Laboratories, Inc., 245 W. 55th St., New York, NY 10019. The AVRS permits insertion of re-recorded scenes or new scenes of the same length in an existing transfer without editing. It also eliminates the need for second generation masters and allows frame-accurate reel changes. Du Art can now control the telecine process using one or two recording VTRs. Even with reel changes, scenes can be inserted in a transfer master with frame-to-frame accuracy, and the need for a separate editing suite is eliminated.

A new film format for 35mm motion pictures called Iscovision™, was announced by Glenn Berggren, vice-president, Optical Radiation Corp., 1300 Optical Dr., Azusa, CA 91702. The new format was developed in cooperation with the Isco-Optics firm of West Germany. It is a full-frame 35mm wide-screen format with a hybrid anamorphic system of lenses. Iscovision has all the advantages of other wide-screen systems while providing more light, better image detail, and picture