

# Abstracts of Papers From Other Journals

Abstracts of papers appearing in other journals are, from time to time, published in the SMPTE Journal. The abstracts are chosen for their importance and possible value to researchers as well as for their timely interest.

**Ten Billion Bits on a Disk**, Kees Bulhuis, Marino G. Carasso, Jaques P. J. Heemskerk, Peter J. Klivits, Wilhelm J. Kleuters and Pieter Zalm, *IEEE Spectrum*, 16: 26-33, Aug. 1979.

A compact optical disk system being developed by Philips — an offshoot of optical videodisk technology — uses high power Al-GaAs laser diodes. The recorder resembles strongly in concept consumer optical videodisk and audiodisk players. It gives random access times both in recording and in reading, similar to those obtained with present magnetic disks. Information capacities of over  $10^{10}$  bits per 30-cm disk have been achieved with a mean access time of 70 ms and recording bit rates of 10 Mb/s. Raw bit error rates between  $10^{-5}$  and  $10^{-6}$  have been measured.

As both the laser technology and the sen-

sitivity of recording materials are improved, laser diode recording will also become reliable for high bit-rate recording. The current modulation of laser diodes can go up to hundreds of megahertz. The light intensity, however, will become high in short laser pulses and may limit the bit rate. Erasable recording materials are feasible, but the signal-to-noise ratio is still somewhat low, and the archival quality has yet to be proven.

**Predictors for Intraframe Encoding of PAL Picture Signals**, H. Gharavi and R. Steele, *IEE Proc.*, 127: 205-211, No. 3, June 1980.

A predictor based on three previous pels along a scan line is examined for DPCM encoding of composite PAL signals. The predictor coefficients are described in terms of the ratio of sampling frequency  $f_s$  to color subcarrier  $f_{sc}$ . Predictions based on pels on the second and previous lines are derived for the case of  $f_s/f_{sc} + 2.5$ . Simple 2-dimensional predictors are then formed and used in the DPCM encoding of a PAL color bar signal.

**Color-Sensing Device Based on a Novel Principle**, Homer B. Tilton, *Optical Eng.*, 18: 429-431, No. 4, July/Aug. 1979.

The design of present-day color sensing devices, such as color television cameras, is generally based on Young's 1801 trichromatic theory as quantified in the CIE system of color mixture. But the actual makeup of the human color vision mechanism remains unknown to this day. There exists significant evidence that neural hue signals originate from direct rod-cone interaction. This paper describes a simple optoelectronic device which models a possible neural mechanism for generating such retinal hue signals. This device produces a pulse train simulating the neural hue signals. The frequency of the pulse train varies with changes in stimulus wavelength in a manner similar to the way retinal hue signals are believed to vary. Thus these signals represent primitive hue information extracted from the stimulus.

**Gas-Discharge Panels for Color TV Display**, *NHK Technical Monograph*, 3-47, No. 28, Mar. 1979.

With the realization of flat panel displays for a high definition wide screen television system as the final objective, research has been conducted on possible display panels using gas discharge and systems receiving color television pictures. Several methods are available for the display of color images using gas discharge. A display system has been studied in which three primary color phosphors are excited by UV radiations generated in the discharge space. This paper first de-

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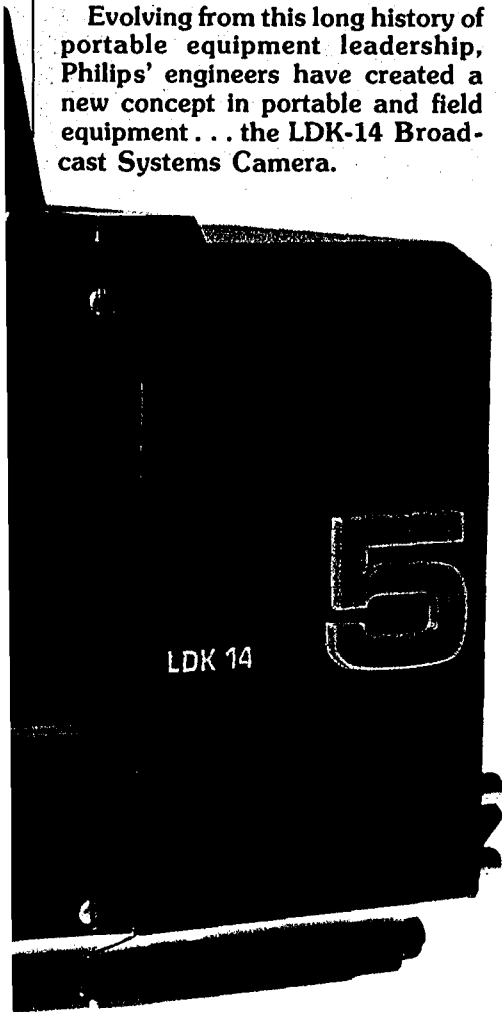
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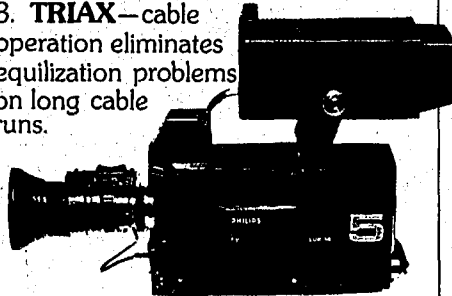


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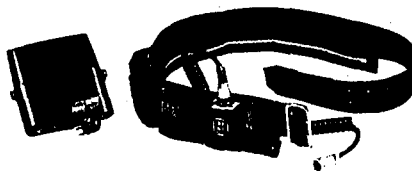
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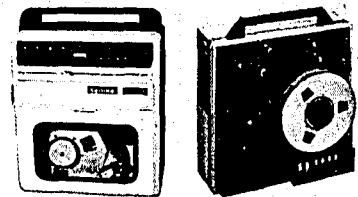


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scribes the main results obtained from the basic studies of the problems relevant to UV radiation gases, phosphors, gas discharge cells, and driving methods which are important elements in the composition of the display system. As the filling gas for the discharge cell, an He-Xe mixture was found the most suitable; helium was used as the primary gas and was mixed with a suitable amount of xenon allowing a VUV radiation with a 147 nm wavelength to be utilized. New red, green, and blue phosphors are developed and achieve a high quantum efficiency for the VUV radiation from xenon. They have excellent hue and saturation. Some new structure of the gas discharge cell and the panel driving methods for the picture display system are also developed. Two new experimental gas discharge panels were fabricated based on these basic studies and are used to demonstrate a color television display. One panel is a planar positive column (PPC) type 10-in panel and is believed to be the first one based on this principle. The other panel is a thin center sheet (TC) type 16-in panel with an improved Burroughs-type structure and 2-lines-at-a-time driving scheme. It is an extremely large flat panel color television display. Both panels give excellent picture displays in color television picture receiving experiments.

**Resolution of Saturated Color Television Picture — Color MTF of Vision and Improvement of the NTSC Signal, Haruo Sakata, J. Inst. TV Engrs. of Japan, 34: 147-152, No. 2, 1980.**

The modulation transfer function (MTF) of blue receptor in the retina was found to have a narrower bandwidth than red and green receptors. However, blue light of a color CRT excites not only blue cones but also red and green cones because blue light has a wide spectrum range. Thus the MTF characteristics of vision for each of the three primary colors on a CRT become equal, and the resolution in highly saturated color pictures on the NTSC television system becomes worse. This paper presents a new method that adds high frequency components of a color difference signal to a luminance signal in order to correct the resolution. It was applied to the NTSC color television system and its effectiveness was confirmed.

**Automatic Inspection Method for Black Matrix Screens of Color Picture Tubes, Mamoru Nonaka, Hisatake Yokouchi, Chiaki Shimbo, Noriaki Honma, Katsumi Takami and Tadashi Fukino, J. Inst. TV Engrs. of Japan, 34: 141-146, No. 2, 1980.**

A method is described for automatic inspection of black matrix screens of color picture tubes with in-line mask construction because the dimensions of these matrix screens are closely connected with the white uniformity of the tubes. A converged laser beam scans the inner surface of the picture tube panel using a scanning mirror located at the center of the panel curvature. The beam illuminates a photomultiplier through a diffuser set at the back of the panel. The widths of the matrix openings and black guard bands are obtained by measuring the corresponding scanning times in the waveforms of the photomultiplier outputs. The measurements on 14-in panels are reproducible with a standard deviation of 1  $\mu$ m in about five seconds per panel with the prototype apparatus.

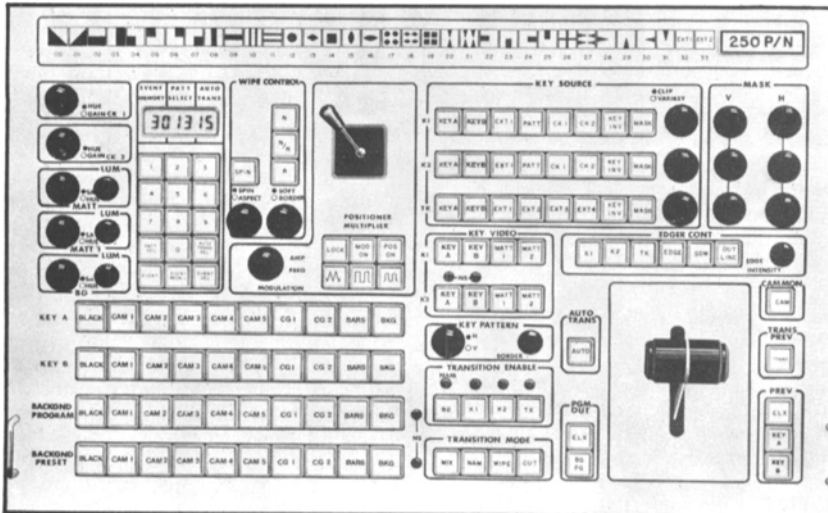
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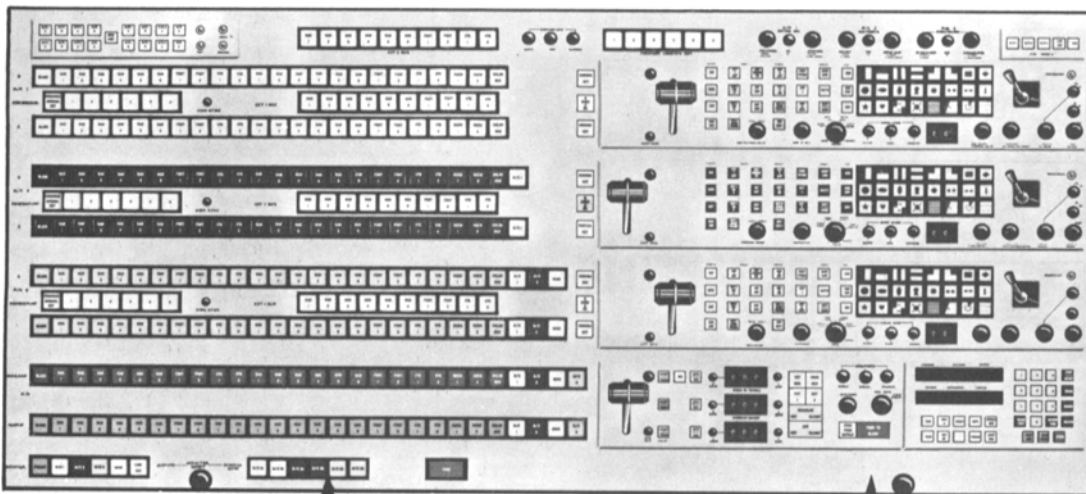


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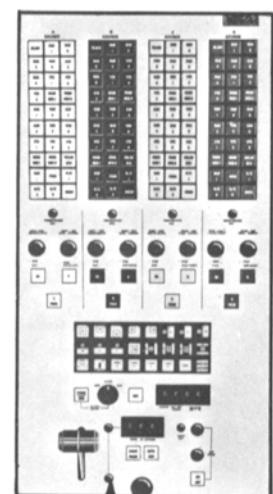
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**Display of Component Profiles from Microprocessor-Based Recognition Systems Using a Teletext-Encoded Display**, Alan Pugh and Clive Loughlin, *Radio and Electronic Engineer*, 49: 236-240, May 1979.

Teletext as a communication medium has aroused considerable interest among those appreciating the virtues of television display and the power of universal interactive information handling. This paper outlines a powerful use of teletext which has, hitherto, been ignored. The shape of component profiles when encoded into Teletext graphics characters offers profound advantages in applications of visual sensory feedback for component orientation prior to automatic handling.

**The Automatic Subtitling of Television Programmes**, Dennis Packham, *BKSTS Journal*, 62: 142-144, Apr. 1980.

The continued growth of worldwide television program distribution is increasing the need for subtitling into the local language. In many countries using languages spoken by a relatively small population, subtitling of programs can be as much as 50% of the country's total program output. This paper describes an automatic television subtitling system designed to provide facilities suitable for a high output of subtitled programs. The importance of maintaining a high aesthetic standard has been recognized in the provision of a video character generator of exceptionally high graphic quality. Automatic synchronization to telecine of VTR is provided by cueing data stored with the subtitles on magnetic floppy disk. Each disk can record up to 2463 substi-

tes, each of up to three rows of text totalling approximately 110 proportionately spaced characters. Editing facilities allow subtitles to be recalled from the disk, amended if necessary, and re-recorded. Subtitles may be deleted or additional ones inserted and, if the program is later edited, the system allows for all cues following the edit to be automatically retimed. The use of current microprocessor technology provides for a compact control system which, being software-oriented means that changes can be made to the system's operational facilities without needing to resort to hardware modifications.

**Preservation of Developed Color Images on Electrophotographic Materials** (in Russian), A. L. Kartuzhanskii et al., *Zh. Nauchn. i Prikl. Fotogr. i Kinematogr.*, 25: 51-53, No. 1, 1980.

Because of the expanding applications of color electrophotographic materials it has become necessary to investigate the preservation of developed color images when they are acted upon in various ways during the storage period. Certain experiments are described and results are presented.

**Optical Fibre Communication in U.S.A.**, C. K. Kao, *Proceedings of the IREE Australia*, 40: 54-56, No. 3, June 1979.

While activities in research and development continue in all fiber optics related technologies, a look at the installed optical systems and other applications reveals the market forces which are driving optical fiber system development in the U.S.A. Activities

are increasing rapidly as the technology approaches maturity. Optical fiber components are showing a downward price trend while quality, range, and durability are being extended. Although none of the components are in full scale production they are being readied for manufacturing.

**Optical Fiber System Developments in the U.K.**, I. A. Ravenscroft, *Proceedings of the IREE Australia*, 40: 57-62, No. 3, June 1979.

Optical fiber system developments have now moved out of the initial speculative stages into the period of feasibility demonstration exercises through which practical data have been collected in preparation for the operational phase. At the present time firm plans are underway for the development of 8 and 140 Mbit/s digital systems for junction and trunk applications, the former utilizing double crucible fibers together with high performance stripe configuration light emitting diodes and low noise PIN-FET receivers. At higher bit rates there is greater confidence in obtaining the required reliability from lasers. Fibers with their low attenuation are showing prospect for repeater spacings greater than 10 km at the GaAs wavelength of 850 nm and up to 50 km at the longer wavelengths produced by GaInAsP devices. Thus applications are wide ranging and although initial attention has been given in the UK to the immediate requirements of multicarrier transmission paths of the inland network, optical fiber systems have the potential for operating in the local network as well as in submarine cable systems.



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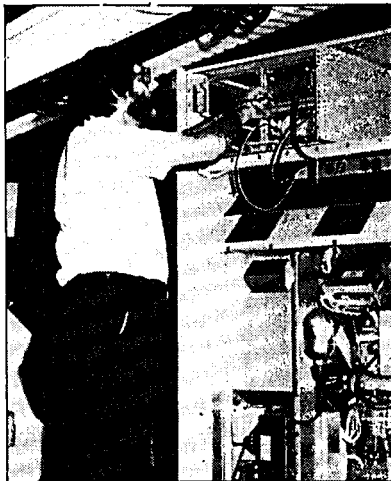
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