

Abstracts of Papers From Other Journals

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

Subject areas for the Abstracts in this issue of the *Journal* are shown below:

General
Motion Pictures
Optics
Medical Imaging
Satellites
Photographic Theory and Materials
Television

GENERAL

Trends in Picturephone (in Italian), S. Martinelli and G. Tamburelli, *Electronica E Telecomunicazioni*, pp. 255-262, No. 6, 1977.

The potential applications and development of the picturephone and in particular the possibility of increasing the number of its services and of reducing the costs are examined. A DSTI (Digital Speech Television Interpolation) device allowing the simultaneous use of digital pcm lines for both telephone and video signals is described. Finally, SIT Siemens and CSELT studies and achievements in the field of terminals, lines and exchanges for the picturephone are described.

MOTION PICTURES

The Stereoptiplier: 3-D Movies Without Glasses Photographed With a Standard Movie Camera, Robert B. Collender, *Information Display*, 4 pages, Sept. 1978.

A 3-D motion-picture concept not requiring glasses is described. The system provides satisfactory 3-D motion pictures for screen sizes up to about 3×4 ft. For screen sizes larger than this, the apparatus required is too big and cumbersome for practical use. For smaller screen sizes, however, the system provides comfortable, unaided 3-D viewing in high resolution with image quality equal to flat projection systems.

OPTICS

Extending the Content and Expanding the Usefulness of the Simple Gaussian Lens Equations — Part 2. Derivation and Application of Gaussian Design Relationships That Are Inherent in the Primitive Relay Optical System, L. T. Sachtleben, *RCA Review*, 39: 340-379, No. 2, June 1978.

A primitive relay optical system comprises a fixed, coaxially mounted pair of separated lenses. It functions to produce finite images of two fixed objects that are spaced apart at finite distances along the system axis

and to do so in a manner that conserves the light. In its most general form, the primitive system is called the "basic relay" system. The Gaussian relationships are developed for this form. Other relationships are easily obtained for the more specialized forms of the primitive system. One such form that has a special interest is infinite in focal length and is called the "afocal relay" system. In order to illustrate application of the relay theory, it is used to design an increase in the length of a short, handheld type telescope to more than 30 ft by the efficient use of relaying stages. Lens locations, lens focal lengths, and diameters of all objects and images are determined on the basis of the simple or first-order lens equations developed in the earlier Part 1 and in this paper.

MEDICAL IMAGING

A Digital Video Image Processor for Real-Time X-Ray Subtraction Imaging, R. A. Kruger, C. A. Mistretta, J. Lancaster, T. L. Houk, M. Goodsitt, C. G. Shaw and S. J. Riederer, *Opt. Eng.*, 17: 652-657, No. 6, Nov./Dec. 1978.

A digital video image processor (VIP) has been constructed and is presently being tested and used in a variety of preclinical medical imaging situations. Details of its design are discussed. The VIP can digitize, store and process images from a conventional radiographic television fluoroscopy system. From these images a variety of subtraction images can be formed and displayed in real time at video rates. These subtraction images include K-edge images, time dependent subtraction images, tomographic, and K-edge tomographic images. Examples of *in vivo* K-edge and time-dependent subtraction images are presented.

PHOTOGRAPHIC THEORY AND MATERIALS

Densitometry on Multi-Emulsion Imagery, Frank L. Scarpaga, *Photog. Eng. and Remote Sensing*, 44: 1279-1292, Oct. 1978.

Basic concepts of color densitometry and film calibration procedures are reviewed with special emphasis on the specific application to the remote sensing investigator. The differences between, and the instrumentation to measure, the spectral, broadband, specular, diffuse, integral and analytical densities are discussed. An explanation of equivalent neutral density and methods of determining this type of density are presented. Methodologies of using analytical densities for the remote sensing community are detailed. The use of analytical densities in the construction of characteristic curves is discussed. Comments are made on reasons for the use of analytical densities in the analysis of film imagery and

on proper application of the exposure values derived from the characteristic curves.

SATELLITES

A 14-GHz 2-kW Klystron for Earth Stations of Satellite Broadcasting Systems, Shigemoto Murata, Michikiyo Takahashi, Kaizo Yamamoto and Yoji Morishita, *The Monitor: Proceedings of the Institution of Radio and Electronic Engineers, Australia*, pp. 6-10, June 1978.

A 14-GHz 2-kW klystron has been developed as the transmitting tube for earth stations of a satellite broadcasting system. To make the transmitter as compact as possible, the klystron was chosen after a trade-off study between the klystron and the TWT. The klystron has five cavities with high-efficiency tuning and employs permanent magnet focusing with samarium-cobalt and forced air cooling for the body and collector. The klystron is operated with a beam voltage of 9.8 kV and a beam current of 0.78 A and can deliver saturated output power of 2.5 kW minimum at any 50-MHz band in the 14.0- to 14.5-GHz range. The power gain at 2 kW is 42 dB minimum.

TELEVISION

Interfacing Intraframe Differential Pulse Code Modulation (d.p.c.m.) With Conditional Replenishment Coding for Viewphone Signals, R. C. Nicol, *The Radio and Electronic Engineer*, 48: 277-284, June 1978.

Conditional replenishment is a coding technique that is particularly efficient at exploiting the large frame-to-frame redundancies that exist in visual telephone or conferencing signals. However, such techniques are necessarily complex and their cost of implementation may, in the case of lightly loaded routes, outweigh the saving in transmission capacity. It is therefore possible on such routes that cheaper, less efficient techniques such as d.c.p.m. will be used, thereby creating an interface between links employing different methods of source coding. The compatibility problems that exist at this interface are discussed, and an experimental system is described that accepts a d.c.p.m. signal at 8 Mbit/s and uses a novel interfacing technique to take advantage of frame-to-frame correlation and the statistical distribution of the samples within the moving areas for transmission at 2 Mbit/s.

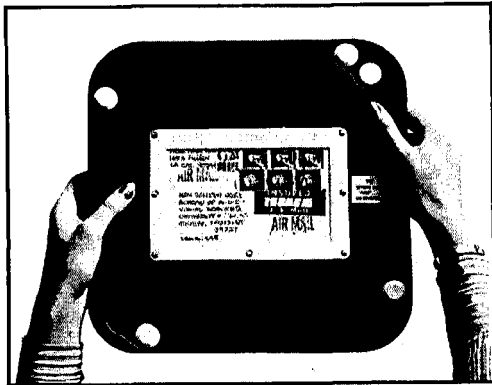
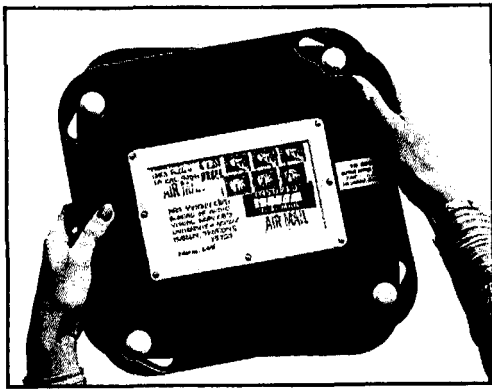
Correction of Primary Chromaticities of Display Tubes by Matrixing of Gamma-Corrected RGB Signals, S. J. Lent and R. Storey, *E.B.U. Review*, 168: 66-75, Apr. 1978.

For optimum color fidelity, signal origination equipment should produce signals matching a given set of display primaries. These are the CCIR recommended primaries adopted for 625-line color television. The use of display primaries with incorrect chromaticities gives rise to color errors that can be unacceptable. Linear color-separation signals are not normally available in a picture monitor, so simple matrix correction cannot theoretically be used. Matrixing of gamma-corrected signals can however provide a compromise solution. The color errors incurred by matrixing are discussed, and two methods of deriving a suitable matrix are described.

The new fast lock case: It locks at all four corners with one push-turn movement.



Until now, your shipping people have *left the case lids loose* after checking returned prints. Why? To save time and fingernails. Their fingernails. Your time.



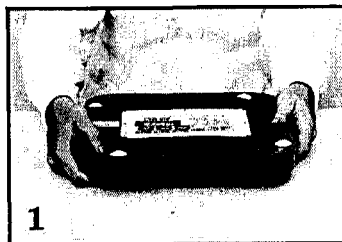
This case isn't just easy to close. You can also see that it's closed.

Mail

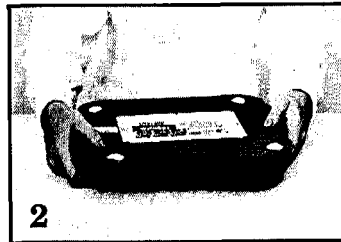
Some old-style cases have *four* catches to be turned — and the catches look about the same open or closed. So customers sometimes return prints through the mail with the lids unlocked!

Stiff

Even when they *do* lock them — "I dread having to twist all those stiff little plastic locks and then pry off those lids," says Sandy Morehouse of Motivational Media in Hollywood.



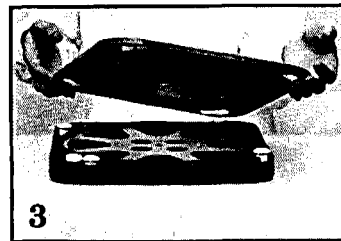
1



2

How to open it:

1. Press down the lock button marked PUSH.
2. Turn the lid until the other four buttons are at the big end of their slots.
3. Lift off. Turned, the lid sticks out $\frac{5}{8}$ inch, so it's easy to grab. (Incidentally, any corner of the lid fits any corner of the case.)



3

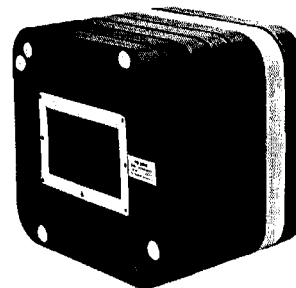
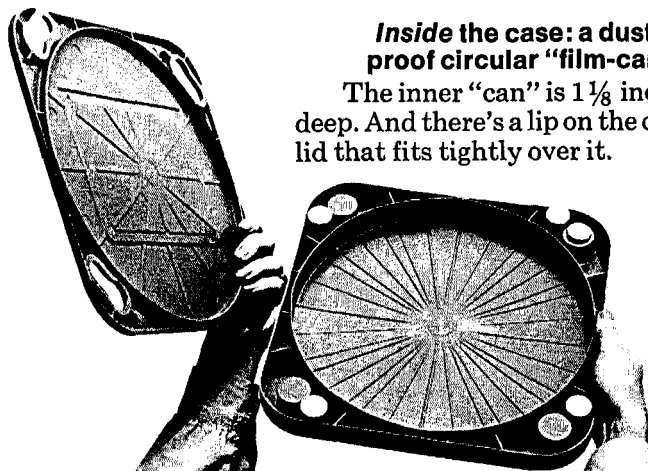


4

No broken fingernails

Inside the case: a dust proof circular "film-can."

The inner "can" is $1\frac{1}{8}$ inches deep. And there's a lip on the case lid that fits tightly over it.



Cases are square, so you can stack them upright, like books.

These are also *storage* cases. Prints filed on edge are much easier to get at, obviously.

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FILM SHIPPING AND STORAGE CASES

The Role and Scope of Digital Signal Processing in Communication Systems, R. Benjamin, *The Radio and Electronic Engineer*, 48: 266-270, June 1978.

Trends in relative costs encourage sophisticated signal processing in order to make fuller use of the capacity of communications channels. This implies features of subtlety, adaptation, transformation and manipulation which are most expediently handled digitally. The variety, diversity and pervasive nature of these techniques in modern communication nets are illustrated, and their impact on overall system design is discussed. Three specific techniques are included for illustrative purposes: (1) the design of multi-valued discrete signals in the phase/amplitude plane; (2) the adaptation of Fourier analysis to equally-spaced narrow frequency lines; and (3) the compensation of tape recorders for both steady and transient differences in tape speed between recording and replay.

The B.R.T.'s Computer-Controlled Television Continuity Suite, W. De Boeck, *E.B.U. Review*, 1968: 76-85, Apr. 1978.

The R.T.B./B.R.T. television production center in Brussels contains two complex and sophisticated computer-controlled television continuity suites. The two suites are identical. One is used for the Belgian Dutch-language service provided by the Belgische Radio en Televisie (B.R.T.), and the other for the French-language service of the Radiodiffusion-Télévision Belge (R.T.B). This article deals specifically with the B.R.T. installation which was brought into operation 1 October 1974, but it may be assumed that the R.T.B. presentation suite operates in a similar manner. In the suites the operations are carried out by a computer-assisted real-time system which was designed and built by the Thomson-C.S.F. company to specifications drawn up with the assistance of R.T.B./B.R.T. engineers. The computer itself is an XDS type 10020 which was built under license in France by the Compagnie Internationale pour l'Informatique.

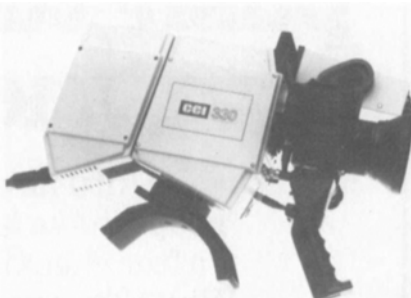
Airborne Television Transmission, M. W. Harman and J. Middleton, *BBC Eng. No. 109*: 26-37, Apr. 1978.

Certain countries with favorable climates have already obtained satisfactory results using high-flying aircraft and captive balloons to provide a rapid solution to their television coverage problems. In general, these techniques have been considered or applied in situations with no existing ground station network or where unused parts of the radio spectrum are available for broadcasting. While the United Kingdom has no immediate plans to re-engineer the VHF television broadcasting bands, at present used for 405-line black-and-white transmissions, it is worth considering various methods, conventional or otherwise, that might be used to rearrange the channeling for 625-line color. Some of the propagation effects of transmitting from high-altitude aeriels have been investigated, and the results obtained are submitted as a contribution to Band III service area prediction under such conditions.

Approximate cost comparisons are made between different methods of transmission based on both capital and revenue expenditure.

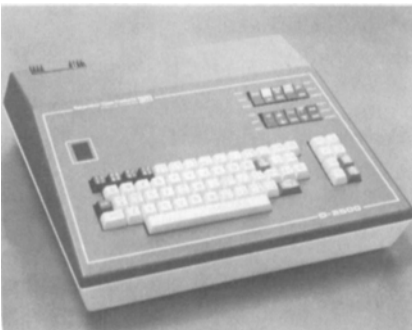
New Products & Developments

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 manufacturer's statements, and publication of these items does not constitute endorsement of the products or services.



A digitally controlled broadcast color television camera system, the CEI-330, has been announced by Commercial Electronics Inc., 880 Maude Ave., Mountain View, CA 94043. The 330 extends cable range between camera head and electronics unit to 2400 ft, reportedly without compromising color control or signal-to-noise ratio. Two components, a camera head addition and an auxiliary power supply plus one board, change the earlier CEI 310 field production camera system to the 330 remote configuration. The 3-lb camera head addition provides viewfinder control switches and micro-cable connectors. Buffer amplifiers add timing and test signals while offering matched impedance for TV81 cables.

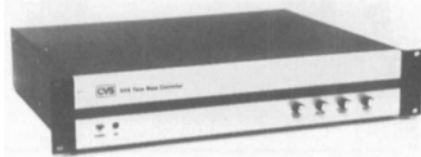
The CEI micro-cable carries three (RGB) video signals, viewfinder video and camera head control, on-off switches for beam, tally and test, IC and program sound (for headset), two spare analog channels, and one spare on-off control. Modular configuration makes possible either field or studio use. CEI camera systems are priced from \$24,000; remote systems from \$54,000. Existing 310 systems can be upgraded to 330 for about \$12,000.



A television character generator, the Datavision/3M D-2500, was announced by 3M Company, P.O. Box 33600, St. Paul, MN 55133. The device features a broadcast quality video mixer, three-speed vertical roll and horizontal crawl, two character sizes, automatic centering, word flash, character edging, and an internal

random access memory. Three type fonts are available in upper and lower case — video gothic, piper roman, and helvetica semibold.

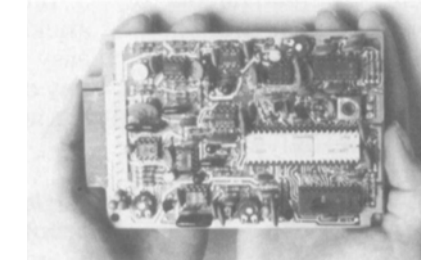
The D-2500 will generate full-size characters, 28 scan lines in height, having a resolution equal to 1120 video elements. The smaller size characters have a height of 20 scan lines. Large and small characters can be intermixed on the same line. The D-2500 provides internal four-page memory with random access to 40 lines of titles; if needed, an unlimited memory capacity using cartridge storage can be added. The price of the character generator, including one type font, is \$5495.



An analog time base corrector, Model CVS 506, was announced by Consolidated Video Systems, 1255 E. Arques Ave., Sunnyvale, CA 94086. Designed for nonbroadcast heterodyne VTR formats, including ¾-in U-Matic, Beta, and VHS, the CVS 506 eliminates skew, jitter, flagging, and other picture distortions.

In operation, the CVS 506 removes multiline errors using a one horizontal line floating correction window that tracks the VTR. A special circuit automatically adjusts tracking rate to tape condition. Other features include a built-in process amplifier and automatic color/monochrome selection.

The CVS 506 is 3½ in (89 mm) high, 19 in (484 mm) wide, and weighs 4.5 kg. Power requirements are 117 V + 10% or 235 V + 10%. The price is \$3900.



An LSI microprocessor-based OEM pitch shift module, Lexicon Model 20, was announced by Lexicon, Inc., 60 Turner St., Waltham, MA 02154. It is designed to produce off-speed audio intelligibility in tape, disk, and film editors, previewers, and sound reproducers over a range from ½ to 2½ times normal sound speed. Use of a digital intelligent splicing technique allows the module to provide speech time compression and expansion with noise-free splicing.

With a continuously adjustable ×20 – ×0.4 pitch shift range, the Lexicon Model 20 offers a 100–5000-Hz, +0/–3-dB frequency response;