

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.

Digital Optical Data Storage and Retrieval, B. R. Reddersen and L. M. Ralston, *Opt. Eng.*, 19: 199-204, No. 2, Mar./Apr. 1980.

Because of the growing number of digital data sources — from satellites such as the Lansat series to the increasing use of all digital information distribution networks in the publishing industries — there has been a corresponding explosion in the need to store that data permanently at very high densities such that it can be retrieved conveniently and quickly. In parallel with these developments, the capability of high density optical data storage and retrieval techniques such as holography and optical spot recording to meet these needs has improved as well. Offering data transfer rates of up to 100 Mbit/s (spot recording) to over Gbit/s (holographic) and information storage densities in excess of 100 Mbit/in², these technologies have now made it possible to configure complete systems for a

wide range of mass storage requirements. The basic technologies and building blocks required for such systems, the general criteria for converting a mass memory specification to an optical storage system based on it, and examples of both holographic and direct spot systems are described. The present status of the Wideband Holographic Recorder System with data transfer rates of over 1Gbit/s and the Mastar 10¹⁵ bit archival mass memory with information storage densities of over 100 Mbit/in² are also reviewed.

Optical Fibre Communications in Telecom Australia, G. P. Kidd, R. J. Morgan, and P. V. H. Sabine, *Proceedings of the IREE Australia*, 40: 63-70, No. 3, June 1979.

Within Telecom Australia, research on optical fibers has been directed towards the characterization of fibers, development of measurement techniques, investigation of materials for and fabrication of light sources, and on system optimization studies with a view to defining the most technically and economically satisfactory fiber systems for use in the Australian network. As part of this program contracts have been placed with Aus-

tralian industry and universities to investigate specific aspects of fiber manufacture and theory. In October 1978 Telecom Australia installed its first optical fiber cable for experimental and practical assessment, and a further installation in a working environment is now being planned.

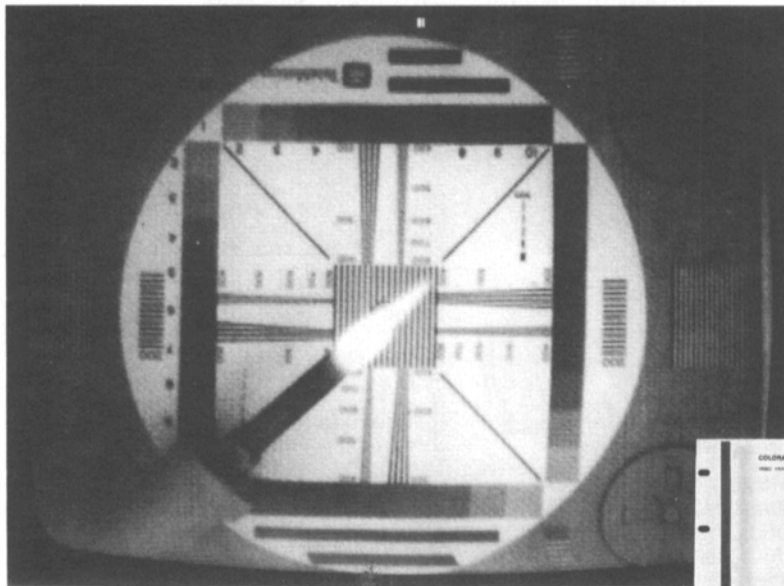
Digital Transmission of Video and Audio Signals Over an Optical Fibre System, N. H. C. Gilchrist, *Radio and Electronic Engineer*, 49: 629-636, Dec. 1979.

During 1977 the BBC Research Department was invited to participate in field trials of an experimental optical fiber digital transmission system installed between the Post Office telephone exchanges at Hitchin and Stevenage. BBC equipment was specially adapted for these trials to provide multiplexed digital video and audio signals at 140 Mbit/s and to decode these signals after transmission. High quality audio and video signals were sent between Hitchin and Stevenage, a total distance of some 18 km for the return path over a period of one month during which time a number of tests were conducted. Brief descriptions of the equipment and tests are contained in this paper. No serious difficulties arose in the trials.

PCM Program Transmission and Communication Network for the Norwegian Broadcasting Corporation, Richard Anderson and Knut Ronning, *J. Audio Eng. Soc.*, 28: 225-236, Apr. 1980.

A countrywide radio link system is under installation. The system will carry television and sound programs to transmitters together

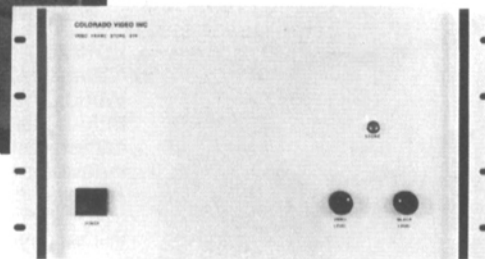
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photo : Collection Cinémathèque Française

Buster Keaton in Sherlock Junior, 1924

And they don't fade away either

There has been a rather ominous rumour circulating these last few months... The color is said to deteriorate in old films. If this were true, it would indeed be disquieting to ponder upon the progressive disappearance of the cornerstones of our cinematographic world.

Film has traditionally been used to record historic moments; and many feature films have become historic in their own right. Kept at suitable temperature and hygrometry, **the original negative (5247) or master (5243) can be used again and again to make prints, up to a hundred years after processing.** Release prints (5383) made for theater distribution, by very nature short lived, are not to be confused with the original film, which maintains a wealth of information.

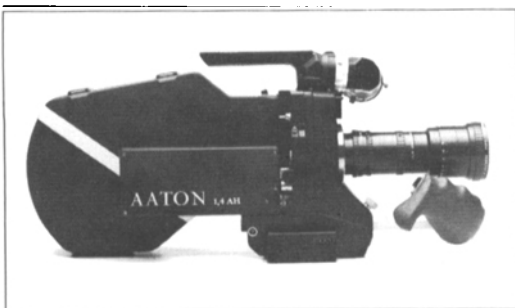
With the evolution of video technology today, the importance of recording **high quality originals on film** is paramount : the images taken in last year's video camera won't be on a par with the definition of next year's broadcast equipment.

The essential characteristics of 16 and 35 mm film have not changed in the last fifty years. With good conservation, **films made at the beginning of the century can be exploited today** on existing projectors, for example, or via telecine for TV broadcast. The point is that the information contained in the film medium *can* be utilized to its full potential so long after original exposure. Can video boast of such stability?

Until such time as video technology settles down, having attained the recording quality it is striving for today, **film is the only means of obtaining time-resistant originals**. Historic events of the 1980's *must* be recorded on film : only film can supply the high definition that future video transmission will need. Twenty, thirty years from now, these films will be sold as high quality originals for transfer to video disks, etc. There won't in all likelihood be VTRs capable of reading tapes made to today's scanning standards. Even video tape itself will change : magnetic tape will be left aside for metalized polyester tape.

Because the role of film is more and more to supply raw material to future video technology, it is vital to have **the best in film equipment**. The **Aaton 16 mm camera**, chosen systematically for blow-up to 35 mm in Sweden is now being adopted by discerning Americans for the same purposes. A comfortable, yet highly sophisticated camera : easy to handle and reliable.

Old pictures don't die; today's won't if they're made on film.



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with program circuits and communication between the Broadcasting Center and regional studios. Sound program distribution is relayed over five time-multiplexed PCM channels above the television picture (SOV). Sound program exchange circuits, local transmitter feed circuits, and communication are relayed as an 8448 kbit/s time-multiplexed PCM signal in the baseband of an ordinary 960-channel telephone link, giving in total 15 music channels and 30 telephone channels. System and equipment are described. Future extensions and switching facilities are discussed.

Sound Multiplexed Television Broadcasting, *ABU Technical Review*, 65: 15-20, Nov. 1979.

Various techniques for the transmission of sound-multiplexed signals within the existing television channels have been studied by Nippon Hoso Kyokai (NHK) since 1963. As a result of these studies an FM-FM multiplexing system was developed, and in early 1979 sound-multiplexed television test broadcasts were conducted in Tokyo and Osaka. This paper outlines the complete system for the FM-FM multiplexed experimental broadcasts which have been introduced in Japan as a new service.

Noise Temperature Estimation From Efficiency Factors of a Cassegrain Antenna, Takeyuki Ojima, *J. Radio Research Laboratories, Japan*, 26: 83-99, July/Nov. 1979.

This paper presents a computational method of estimating noise temperature of a

Cassegrain antenna using aperture efficiency factors of radio frequency radiation characteristics. Antenna noise temperature is expressed by the sum of the five largest components corresponding to spill-over energy from the subreflector, scattered energy due to blockage by the subreflector and its support structures, dispersed energy by surface roughness of the main reflector, and energy carried by the main lobe and its vicinity. These noise components are closely connected with efficiency factors of RF radiation characteristics of the antenna. In this calculation of antenna noise temperature, mean brightness temperature within some solid angle is adopted on the assumption that scattered or dispersed energy is uniform across the solid angle. With this method, estimated noise temperature of the 26-m Cassegrain antenna at Kashima Test Station is in good agreement with the measured value at 4 GHz. This method may be applied to any Cassegrain antenna at any elevation angle.

Replication of Very High Density Video Disk Master Recordings Via Contact Printing, Dennis G. Howe, Harold T. Thomas, and Joseph J. Wrobel, *Phot. Sci. and Eng.*, 23: 370-374, No. 6, Nov./Dec. 1979.

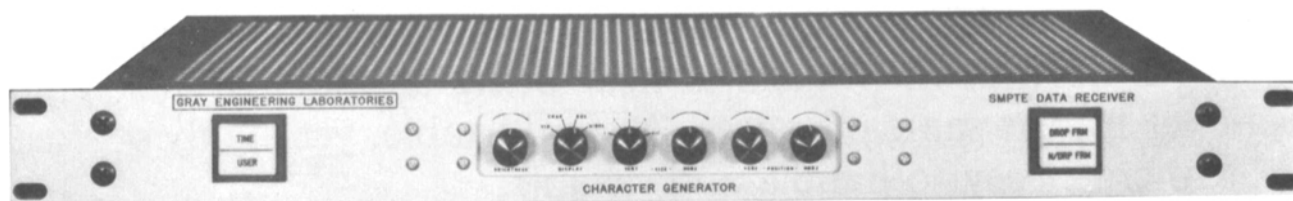
We have fabricated replica videodisks that contain full bandwidth color TV signals recorded in precisely the same fashion as on conventional pressed replica disks. Recorded track widths are $\leq 1 \mu\text{m}$, there is one 525-line TV frame per 360° track and recovered flat field video SNR is ≈ 40 dB (unweighted).

These disks are made by contact printing replication of laser machined thin film master disks. Details of the contact printing process that (i) allows high fidelity reproduction of the micron-sized apertures which constitute the recorded information and that (ii) has a surprising tolerance of imperfect contact between the master and replica disks over their 12-in diameters are given. The relationship between the variability of replicated aperture geometry and SNR of signals recovered from the replica is discussed.

Videodisc Battle Coming for Market That May Top \$3 Billion by 1985, *High Technology*, 1: 31-39, June 1980.

A number of videodisk systems are nearing the marketing stage after more than ten years of development. The two basic system types are the optical-laser videodisk system and the capacitance-stylus videodisk system. These systems and some modifications of them are briefly described. The different formats are incompatible and this incompatibility is reminiscent of the development of incompatible audio formats. Just as audio disks and tapes have found their own niche in the marketplace, it is thought that different videodisk (and videotape) formats will co-exist. Companies involved in videodisk development are mentioned and discussed; topics touched upon include their development programs, equipment, marketing forecasts and plans, agreements they have entered into, and programming they plan to make available.

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