

laser. An iodine laser (1.3 μ wavelength) which was developed by the laboratory produces light pulses with a power of 1 TW and a duration of 300 ps. The Quantal YAG laser has numerous applications and is used as part of the data acquisition instrumentation in laser plasma experiments.

The experiments are investigating the characteristics of light absorption in laser produced plasmas. A Hadland Photonics Streak camera is used to record the light pulse duration. The light spectrum is recorded by television cameras from which measurements are obtained of the diffuse and specular reflected light. X-ray pinhole pictures of the plasma ball are taken, the ions are monitored and the x-ray spectrum is measured. In addition, there is the synchronized illumination of the laser plasma by the second and third harmonic light pulses of picosecond duration which per-

mits photography of the expanding laser plasma.

(Further information is available from Dr. Volk at the Max Planck Gesellschaft Zur Förderung Der Wissenschaften E.V., Projektgruppe für Laserforschung, D-8046 Garching bei Munchen.) — *Lincoln L. Endelman*, Vice President for Photoinstrumentation Affairs

References

1. W. G. Hyzer, "Instrumentation Engineering: Some Design Considerations," *Closeup*, Vol 3, No. 1, Polaroid Corp., Cambridge, MA 02139.
2. L. J. Poldervaart, 9th International Congress on High Speed Photography, Denver, Colo., Aug. 1970.
3. W. G. Hyzer, "Photonics: What is It? Where is It Going?" *R/D*, 25: 34-35, June 1974.
4. W. G. Hyzer, "At Last: Photonics Comes Out of the Parentheses," *Photomethods*, May 1977, p. 55.
5. Milton Laikin, "PLZT Ceramic As a High Speed Shutter," *High Speed Optical Techniques, SPIE Proceedings*, 94: 58-61, 1976.

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EDUCATION

The use of audiovisual media in education expanded during 1977, as did programs for the training of young men and women for careers in the field. The protection of an old Copyright Act for communication products came to an end, and that of a new act began. In Washington, D.C., for the first time in the history of the presidency, the White House honored motion pictures (art and industry) with a reception.

Audiovisual Media in Education

Expenditures for audiovisual hardware, software, production, administration and services increased overall by a substantial 7% in 1977, according to *Hope Reports*, for an estimated grand total of \$5,142,000,000, compared with \$4,804,000,000 in 1976. Increases were reported in all of the several categories of expenditures, from which the following selection is taken:

1. Equipment and materials sales, domestic: AV materials sales (prepared films, videotapes, multimedia kits, etc.), \$495,000,000; AV presentation equipment sales (projectors, television sets, audio-cassette tape recorders, etc.), \$518,000,000; production equipment sales (film and television cameras, still cameras, reel-to-reel tape recorders, etc.), \$198,000,000.

2. Exports of both equipment and software, \$175,000,000.

3. Services: contract production (film, video, and slide films), \$537,000,000; AV supplies and services (equipment rental, engineering, film and videotape rentals, replacement parts, repairs, etc.), \$489,000,000; in-house production and use

of AV materials, above and beyond previously listed expenditures: film and video production, \$711,000,000; slide production, \$479,000,000; AV administration costs, \$1,418,000,000; capital expenditures other than AV equipment, \$96 million; instructional television, \$26 million.

Hope Reports estimated the 1977 audiences for audiovisual products as comprising 478,000 business firms, 108,000 schools, 477,000 churches and various clubs, agencies and hospitals. The fastest growing segment of the industry was that of 35mm slides, totaling an estimated \$1 billion. Hope also saw a leveling off of federal government film production and use, as contrasted with an increase in production of state and local government films.

Film and Television Careers

From its modest origins nearly half a century ago, the teaching of film and television in colleges and universities has grown into a major field of study. The extent of such instruction was reported in the latest of a series of biennial surveys conducted by the American Film Institute. Data collected in the 1977 survey show the following:

1074 schools teaching courses in film and/or television.

9216 courses being taught.

307 schools offering degrees in film, and/or television.

4218 members of the faculty teaching courses in film and/or television; 2828 full-time, 1390 part-time.

40,584 students majoring in film and/or television.

200,000 (est.) students taking courses in film and/or television.

Scholarships and Awards

The Society seeks to encourage and enlarge support for scholarships and fellowships in the field of film and television studies. During 1977, the following major grants were made to film and television students at American colleges and universities:

Two scholarships of \$1500 each were given by the Society of Motion Picture and Television Engineers to undergraduate students Henry Farcus of Temple University and John Griffith of the Rochester Institute of Technology. The Society also administered three scholarships for graduate film students given by the Academy of Motion Picture Arts and Sciences: \$2000 awards to Diana Auti of New York University and John Katchmer of Boston University, and an \$1800 award to Michael Barrett of the University of California at Santa Barbara.

The \$500 University Film Association scholarship for film production was awarded to Michael Nankin and David Wechter, undergraduate students at UCLA. A special \$100 prize for film production contributed by Eastman Kodak Co. and administered by UFA was given to graduate student Jan Krawitz of Temple University. A \$500 University Film Foundation scholarship for film studies was awarded to graduate student Barbara G. Klinger of Ohio University.

Copyright Law

A 68-year-old, largely obsolete Copyright Act expired on 31 December 1977, and a new Act began to govern the protection and use of intellectual and artistic

property in the United States on 1 January 1978.

Under the new act, a single system of statutory protection for both published and unpublished copyrightable works replaces the previous system of statutory and common law. The duration of copyright for works published after 1 January 1978 has been extended to the duration of the author's life plus 50 years, while works created for hire will be protected for 75 years from publication or 100 years from creation, whichever is shorter.

The new law adds a provision which specifically recognizes the principle of "fair use" as a limitation on the exclusive rights of copyright owners and indicates the factors to be considered in determining whether particular uses fall within this category. The new law makes provisions for reproduction by libraries and archives, for the compulsory licensing of recording rights in music and for jukebox operation, and for compulsory licensing of certain types of cable television transmissions. Most significantly, it provides for the es-

tablishment of a copyright tribunal which will, among other matters, determine and review certain copyright royalty rates. In September of 1977, President Carter appointed as the first Commissioners of the Copyright Royalty Tribunal, Thomas C. Brennan, Douglas Coulter, Mary Lou Burg, Clarence L. James, Jr., and Frances Garcia.

Both producers and users of mass media products will wish to familiarize themselves with all of the provisions of the new act, the precise interpretation and impact of which will wait upon time, use, and the judgment of the Copyright Tribunal and the courts. In the meantime, intellectual and artistic property copyrighted prior to 1 January 1978 will continue to be protected under provisions of the old act until expiration of such copyrights.

White House Honors the American Film

For the first time in the history of the presidency, a formal White House reception was held to honor the motion-picture art and industry, hosted by President and

Mrs. Carter on 17 November 1977. In addition to the many notables present from the motion-picture industry were several educators and scholars representing organizations active in the field of film and television studies. These included Peter Dart of the University of Kansas (President, University Film Association); Raymond Fielding, Temple University (Trustee, American Film Institute and Vice-President for Educational Affairs, SMPTE); John Kuiper, Director of the Department of Film, George Eastman House Museum and member of the SMPTE Educational Advisory Committee; Timothy Lyons, Temple University (President, Society for Cinema Studies); David Mallery, Director of Studies of the National Association of Independent Schools; Edward Perry, Director of the Film Department, Museum of Modern Art; and Robert Wagner, Ohio State University (Trustee, American Film Institute and member of the SMPTE Educational Advisory Committee). — *Raymond Fielding*, Vice-President for Educational Affairs

EUROPEAN BROADCASTING UNION

Although relatively little progress has been achieved recently in the formerly active fields of transmission coverage and duration within the European Broadcasting Area (see Table I), except in countries such as Turkey where the network is still being constructed, and France, where an obsolescent monochrome network is being duplicated by a modern color one, various minor developments can be reported. One of these is the experimental use of stereophonic sound to accompany television broadcasts which has been introduced by several European broadcasting organizations during the past year. As neither transmitting nor receiving facilities for stereophony are available directly in association with television, it has been necessary to use simultaneous duplication on a stereophonic FM radio network. Both popular and classical music, including opera, have been broadcast successfully in this way, and the technique has also provided a dramatic demonstration of the deficiencies of the sound reproduction quality of many television receivers.

The response from the public has been sufficient to encourage broadcasting organizations to study the two principal technical problems involved: how best to record television programs accompanied by stereophonic sound, and how best to broadcast them. Two EBU Working Parties are engaged on these studies, which will also take into account the possible application of these techniques to the simultaneous transmission of two languages.

Another new technique which has attracted much attention during the past year is broadcast teletext, which is being transmitted experimentally in at least four countries. The lack of mass-produced receiving equipment has prevented a rapid expansion of the audience, but it has also enabled the broadcasters to continue with further development of the two systems now in use, one of which is used for the CEEFAX and ORACLE services in the United Kingdom and the other for AN-TIOPE in France. Compatibility of the broadcast teletext standards and those adopted for interactive domestic digital information services, such as Viewdata in the United Kingdom, is considered to be essential for the successful introduction and operation of both services, which are seen as being complementary from the user's point of view.

So far as color television broadcasting is concerned, the introduction of second program services by both the French- and Dutch-speaking networks in Belgium is worth mentioning. This took place on 26 April 1977 when the VHF transmitters began operating on the familiar B-PAL system instead of the obsolescent monochrome system C. This was the first time that a network had changed its transmission system overnight, and it was preceded by an extensive information campaign to ensure that viewers were ready. Alternative programs are provided only on weekday evenings at present, which explains the relatively small duration of the second program schedules. The introduction of

color, using the SECAM system, by the Libyan broadcasting organization L.J.B. (formerly P.R.B.C.) should also be noted.

As may be seen from Table II, the duration of color television broadcasting in Europe continues to increase, particularly in the case of the smaller countries. In the larger organizations, on the other hand, it has remained virtually unchanged, as the proportion of color in the schedules has already reached nearly 100%. Similarly, the audience equipped for color reception is growing more slowly in the countries where color transmissions began ten years ago than in those where they have been introduced recently, because it is already in the majority in several of the former cases.

There were few major sports events of international interest during the year, and the opportunity was therefore taken to make preparation for the next World Football Championship, which will be held in Argentina in 1978, and for the 1980 Olympic Games, which will be held in Moscow, USSR and Lake Placid, USA. In the field of news, on the other hand, undoubtedly the most memorable coverage was that of the peace negotiations in the Middle East, which involved numerous transmissions via satellite, using provisional ad hoc facilities from Cairo and Jerusalem, at the end of the year.

The statistics for the interchanges of television programs and news items between the television networks and stations participating in Eurovision by terrestrial