

Progress Committee Report for 1977

Introduction: My introduction to the Progress Report this year will be somewhat of a change from those of the previous years, but it has been one of the aims of your President, William D. Hedden, and myself, to improve the format of the Progress Report wherever possible, with the hope that these changes will make this report more meaningful to our members. Each of the Affairs Vice-Presidents has spent a great deal of time in preparing this report, and their forecasts on the impact of the new technology which has become available to our industry in the past year will have considerable significance for our members. It is my hope that a Progress Report on the activities of the Society itself will also prove to be beneficial to our members.

The industry trends reported in my Introduction to the 1976 Progress Report continued during 1977 in both the motion-picture and television industries. In the financial areas of both industries, the upward trend noted in the Introduction to the 1976 Progress Report continued, with the overall picture of both industries showing encouraging financial growth.

Technical progress in each of the disciplines that the Society addresses itself to is reported on and evaluated by the five Affairs Vice-Presidents and by our overseas Committee Members who provide an overall view of the year's important accomplishments in their respective countries.

In television, continuing trends included electronic newsgathering and digital signal processing with noteworthy progress being made in these and other areas including 1-in videotape. These and other important advances are discussed in detail by Frank L. Flemming, Vice-President for Television Affairs, whose report begins on page 271 of this issue.

Progress in motion-picture science and technology is reported by Fred J. Scobey, Vice-President For Motion Picture Affairs, in the report which begins on page 279. This report provides insights on computer-controlled camera techniques used for special effects. The report also explains in depth the stereophonic photographic optical sound applications which have been used in recent feature films with overwhelming acceptance by the public. Also noted are new methods employed by motion-picture laboratories to counter rising costs as well as items on pollution abatement and energy conservation.

The report by Daan Zwick, Vice-President for Photo-science Affairs, beginning on page 284, discusses some interesting developments in optics and new films. This includes an explanation of the new instant color motion-picture process, as well as a survey of the photoscience

field given by Zwick in his introduction.

Exciting developments in photoinstrumentation, including new techniques for using data beamed to earth by observation satellites, are reported by Lincoln Endelman, Vice-President for Photoinstrumentation Affairs, beginning on page 285.

The field of Education also showed a noticeably upward trend with dollars spent for audiovisual hardware and software increasing by 7% over expenditures in 1976. The field of Education as it relates to the interests of the Society is examined in depth by Raymond Fielding, Vice-President for Educational Affairs, in his report beginning on page 291.

SMPTE Engineering and Technical Involvements in 1977

Early in 1977, the Society held its Television Conference in San Francisco — the most successful in the Television Conference's 11-year history — on the themes of "Beyond ENG" and "Digital Video." Attendance set a record for registrants and 31 companies exhibited new technology and equipment directly related to the themes of the Conference.

At this Conference, the Society took under consideration requests from two of the U.S. television networks for standardization of the 1-in helical videotape recording system. In response to the industry's concern over the proliferation of 1-in tape systems, the SMPTE directed its efforts toward bringing together interested parties to help develop a common format having the basic parameters essential for broadcast television.

With unprecedented rapid action, the SMPTE Engineering Committees and working groups developed a compromise format acceptable to all major manufacturers and broadcast television networks. Within nine months, a period less than half the usual time in similar situations, the SMPTE Standards Committee approved the proposed draft standards specifying the basic parameters to ensure interchangeability of recorded videotapes. A paper by A. E. Alden in the December 1977 *SMPTE Journal*, "The Development of National Standardization of the One-Inch Helical Videotape Recording Systems," gives the history of the development of these formats. The Type-C-format documents were published in the *SMPTE Journal* of March 1977.

As the television influence in the Society has been recognized and has added to the growth of the Society, the motion-picture industry also progressed very well during 1977 and has also added to the Society's growth. Over fifty more motion-picture features were produced in

1977 than in the previous year and 1977 set a new box office gross; but of equal importance is the ever-increasing number of people going back to the movies. This growth in attendance started in the early 1970s and has steadily increased with close to 90 million admissions recorded for some months in 1977. Feature films set gross records for the industry with some 28 films grossing more than \$10 million each. Included in that group was one feature film that in a single year set a new industry total gross record income for any film ever released. Also, 33 other films grossed more than \$8 million each in 1977.

The motion-picture theater business continued to show major growth in 1977 with over 375 new screen openings in the United States. This new screen openings trend started back in the early 1970s with a decrease in large size theaters and an increase in mini-type theaters, thus increasing the need for new products and for the number of motion-picture prints required for a given release. It is the industry's prediction that this trend will continue. Full-length feature films for television continue to increase, with over 140 films being produced by the motion-picture industry for television.

There was concern last year that the United States tax laws would affect feature production in the United States but this has not proved to be the case, with features for both motion picture and television showing a substantial increase over previous years. In fact, there has been much activity by individual states to establish State Film and Television Advisory Boards with the purpose of bringing professional motion-picture feature production into their area. State governments are playing an active role in cooperating with production companies for their feature production location shooting.

Your Society's Activities in 1977

Success in the Society for 1977 was outstanding from both the administration and engineering aspects. Both conferences, the Television Conference in San Francisco and the 119th National Conference held in Los Angeles, proved to be the most successful ever held. At the National Conference, over 1300 registrants attended the five-day technical sessions where over 110 technical papers were presented. Also, 135 exhibitors occupied 220 exhibit booths to show the latest equipment and technology in the motion-picture and television fields. Over 6000 individuals viewed our exhibit area. Each year, we see the success of our policy of holding one national conference a year, and we know that this conference is becoming more and more important to

The Progress Committee ROBERT M. SMITH, *Chairman*

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England	Canada	M. Rotthaler	Yozo Yasuda
Jack P. Hall	Don V. Kloepfel	Germany	Japan

both the motion-picture and television industries throughout the world.

In 1977, the Membership Committee set a goal for increased Society membership. This goal was for 7700 members, which was reached and exceeded in 1977, thus making this the highest membership in the Society's history. This membership increase reversed a trend and we expect this growth to continue.

The Section activities in the Society, one of the most important services to our members, also showed marked activity in 1977. Our 20 Sections, located throughout the United States, Canada, and Australia, held a total of 176 Section Meetings, an average of nine section meetings a year. There were also two special section conferences held where a one-day technical presentation was given. One was held by the Chicago Section, the other was jointly sponsored by the Toronto/Rochester/Montreal-Ottawa-Quebec Sections and was held in Toronto.

Although the Academy Awards presented in 1978, for developments completed in 1977, are noted in detail in the Report on Motion Pictures, I would like to note here that of the seven awards presented in 1977 (two Class II and five Class III awards), all but two of the awards honored either a sustaining member of the Society or an individual member.

SMPTE members of the ISO PC 36 Committee attended three International Standards Committee meetings which were held in London during the Film 77 Conference. These committees met on the subjects of International Exchange of Materials, Sound and Projectors. The Conference was sponsored by the British Kinematograph Sound and Television

Society. The SMPTE had a large representation at this conference with National Officers and Governors in attendance. Also, many of the technical presentations were presented by SMPTE members.

Your Society has been involved for the past two years in a Voluntary Capital Funds Program, whose purpose was to retire the indebtedness on your Society's building, thus reducing the Society's yearly operational expense. To date, approximately \$40,000 has been raised by this program, and during 1977 this money was applied to the mortgage, thus reducing the outstanding indebtedness by over 25%.

During the year, the Board of Governors decided to make modifications concerning methods of nominations, qualifications, and restrictions on the length of national office held in the Society. This permits as many members as possible to serve in national positions in the administrative and engineering functions of the Society.

Among the 26 staff employees of the Society who are engaged in the Publication, Engineering, Test Material, Membership and other Administration functions of the Society, many have received or shortly will be receiving training on our newly installed in-house computer equipment. In the past, the processing of the membership rolls had been serviced by an outside computer service bureau. This, and other administrative tasks, will be handled by the new computer. One of the first advantages we expect to accomplish with this system will be the rapid correction of our membership mailing list.

The new technical developments and the activities of the Society as reported in this year's Progress Report surely indicate continuous growth in all areas of Society

involvements. There was increasing evidence that the Society engineering commitments to the motion-picture and television industries are being fulfilled and that these two industries have reached a stage of development where each complements the other and both can continue to grow and improve along the lines best suited for their technical requirements. The Chair-

man, on behalf of the Progress Report Committee, expresses the hope that the Committee has achieved its goals in preparing this year's Progress Report and that it may better serve the interests of our members.

Your Chairman would like to extend his personal thanks to each member of this Committee and to the Affairs Vice-Presi-

dents for the long hours spent in preparing their reports. I would also like to thank our sustaining members for their cooperation and, also, the Editorial Staff of the Society, in particular, Rac Hargrave and Tom King for their fine cooperation and advice which is greatly appreciated by your Chairman. — *Robert M. Smith*, Chairman, Progress Committee

TELEVISION

This section of the Progress Report discusses the developments that have reached the point of effective operational service in 1977 and have demonstrated new and improved performances compared to prior equipment. Important trends and some developments now on their way are discussed that may not have reached their full potential during the year; however, they are included because they appear to offer significant advance in some aspect of television broadcasting.

The major areas of progress and development that will have an impact on the future of television broadcasting are professional 1-in videotape equipment and digital television. Electronic newsgathering (ENG) continued its rapid growth and expansion with the introduction of its use overseas. Major technical advances were made in the field of digital signal processing including frame storage, digital video effects (DVE), noise reduction and standards conversion.

New technology of communications included the beginning of satellite distribution systems. Both Public Broadcasting Service (PBS) and national public radio began work on their new systems that will feed programs to member stations via Western Union's Westar satellite. Joining them on the bird will be Mutual Broadcasting System, the first commercial broadcasting network to announce its intentions to forsake terrestrial land lines in favor of satellites.¹

From an economic viewpoint, broadcast economists, sales specialists and Wall Street analysts agree that the broadcasting business in 1977 set new records in sales and undoubtedly in profits as well.^{2,3}

The value of individual television stations skyrocketed and they also enjoyed a 14% rise in revenue. The three commercial networks also posted record gains in revenue and profits.

From an audience standpoint, another record was set on Sunday, 30 January 1977 when 80 million people tuned in to ABC-TV's final two-hour episode of *Roots*.²

Digital Technology

Major advancements in the application of digital television techniques during 1977

have resulted in new developments in digital video effects (DVE), noise reduction, electronic still store, picture processing and digital standards conversion. These developments have opened up a new approach to graphics for television that will have a major impact on production techniques.

The application of digital techniques to audio has also produced new recording techniques with tremendous improvement in technical quality.

Digital Noise Reducer

An important development in 1977 for improvement of picture quality in television was the Thomson-CSF Digital Noise Reducer, model 9000 (Fig. T-1). This unit was first introduced through the SMPTE digital handbook.

Incoming video is analyzed on a picture element by picture element basis in real time, and not as a function of the overall picture. Picture improvement shows as much as 12 to 15 dB SNR gain. A marginal 40 dB input color video signal becomes an improved 52 dB output signal. At low frequencies, such as in cases of streaky chroma noise, often present in 3/4-in cassette recorders, the digital noise reducer is especially effective. The device has applications wherever video noise reduction is desired. For instance, it could be of value in electronic journalism (EJ) situations where low light level conditions existing in the field have produced marginal signal quality.

The many other applications include the improvement of the signals from studio cameras engaged in electronic film production, the removal of noticeable noise from microwave and CATV transmission, noise reduction in off-air reception, and grain reduction in telecine film.

Figure T-2 shows vectorscope and oscilloscope displays of a 40 dB S/N signal as measured by a Rhodes and Schwartz noise meter operating in the wide band mode.

Figure T-3 shows vectorscope and oscilloscope displays of the same signal after a noise reduction of 12 dB (52 dB S/N) output signal as measured by a Rhodes and Schwartz noise meter.

Digital Video Effects

The application of digital television techniques showed major progress in 1977 in the area of digital video effects (DVE). DVE will have a big impact on production techniques in studio program production, news and sports in the future. Studio and field video switching systems in use by the networks and independent stations are now being modified and expanded to include DVE.

By combining high-density/high-speed digital storage and digital video processing, digital systems have been developed that allow a video signal, synchronous and nonsynchronous, depending on the system, to be compressed or expanded, or further manipulated.

In addition, these systems allow chroma key operation where the foreground scene and the background track each other during panning or zooming. When the digital processing equipment is integrated into a switcher, a very wide range of effects become possible by re-entry.

A technical paper was given by Michael D. Patten at the 119th SMPTE Technical Conference on "The Digital Video Effects System."⁴

Electronic Still Store

Progress in digital signal processing and frame storage techniques has made possible the development of more dependable and compact, digital computer controlled, high-speed frame storage/retrieval systems in 1977 that will have a big impact on program production and television operations. This system will also, along with other digital techniques, open the door to new production techniques in the use of graphics.

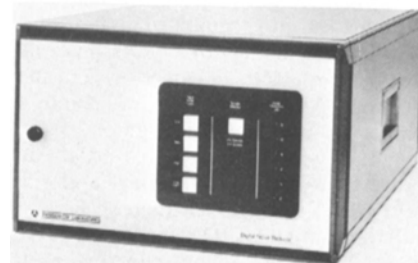


Fig. T-1. Digital Noise Reducer (Thomson-CSF).