

The 20th Annual SMPTE Television Conference February 7-8, 1986, Chicago

The 20th Annual SMPTE Television Conference took place on Friday, February 7, and Saturday, February 8, 1986. Engineers, scientists, and technical and management professionals from around the world met at the Marriott Hotel in downtown Chicago for a timely exchange of information on some of the latest developments in television technology.

Technical Program

The theme of the conference was "Tools and Technologies for Tomorrow's Television." A total of 23 papers and three panel discussions were grouped into four topic sessions, Television Audio Technology, Type D-1 Digital Television Tape Recorder (DTTR), Television Post-Production Techniques, and New Developments in Video Recording. Two entire half-day sessions were devoted to the Type D-1 DTTR, offering attendees the first definitive description of a TV tape recording format that utilizes digital components.

Twenty-eight organizations and representatives from five different countries participated in the overall program. The topic sessions did not run concurrently; hence each paper presentation was well attended. The papers were interesting and informative, and the panel discussions were

lively and thought-provoking.

The Society wishes to express thanks to General Electric Co., for furnishing a video display projector. GE's machine projected large, clear images on a screen behind the stage, making it possible for authors to use charts, graphs, and other diagrams in their presentations.

SMPTE Engineering Vice-President Richard G. Streeter, CBS, Inc.,

welcomed conference attendees with a brief speech prior to the opening session. SMPTE Editorial Vice-President Howard T. La Zare, Deluxe Laboratories, Inc., had been scheduled to make the presentation at the opening session, but circumstances at Deluxe prevented him from attending the conference.

Following is the text of Streeter's address.



SMPTE President Harold Eady speaking before the Board of Governors orientation breakfast.



SMPTE Executive Vice-President Carlos Kennedy speaking at the Board of Governors orientation breakfast.



Maurice L. French, Conference Vice-President, describing conference activities at the Board of Governors orientation breakfast.



Engineering Vice-President Richard Streeter speaking at the Board of Governors orientation breakfast.



The meeting of the SMPTE Board of Governors.



A gathering of SMPTE officers and members of the press at the SMPTE press briefing.

SMPTE Engineering Vice-President Speaks at the Opening Session

By Richard G. Streater

Good morning. I would like to welcome you to the 20th Annual SMPTE Television Conference. The theme of the conference is "Tools and Technologies for Tomorrow's Television." I think you will agree with me that Program Co-Chairmen Fred Remley and John Browne have put together a timely and informative technical program.

This morning's session covers various aspects of multiple television sound. During this afternoon and Saturday morning, you will hear about the D-1 digital television recording



Program Co-Chairmen Fred Remley (left) and John F. X. Browne at the conference press briefing.



SMPTE Engineering Vice-President Richard Streeter delivering the conference opening address.

standard. This standard is the result of intensive effort over several years by an SMPTE working group, chaired by Fred Remley and operating in close conjunction with the EBU. The standard is built on the foundation laid by CCIR Rec. 601, the international digital standard specifying the sampling parameters of the television signal. The SMPTE and EBU played major roles in building on that foundation.

The CCIR study groups, in October, approved essentially identical documents submitted by the U.S. and EBU. The specifications await only the expected ratification of the May Plenary session of the CCIR. Thus there will be four international standards: CCIR 601, the serial and par-

allel digital interfaces, and now the digital VTR.

The papers cover all the important aspects of the D-1 digital television recorder, from the tape and the cassettes to the mechanical and electrical considerations, including error-correction and concealment techniques. On Saturday afternoon, the session will be devoted to television post-production and new developments in small format recording and an improved HDTV digital VTR.

In conclusion, I would like to call your attention to the exhibits, which are in keeping with the theme of the conference. The exhibits are in Session Room 3 here on the seventh floor.

Again, welcome to the 20th Annual Television Conference. Thank you.



The audience at the opening session.

Equipment Exhibit

Some 9000 ft² of exhibit space was occupied by state-of-the-art tape recorders, switchers, time-base correctors, editors, and other television devices. Only equipment that related in some way to the papers program was featured. A total of 47 booths were occupied by the following 30 companies:

- Adams-Smith
- Alpha Video & Electronics Co.
- Ampex Corp.
- Artronics Inc.
- Audico Inc.
- AVC Systems, Inc.
- ColorGraphics Systems Inc.
- Comprehensive Video Supply Corp.
- FOR-A Corp. of America
- Graham-Patten Systems, Inc.
- Grass Valley Group
- Harris Corp.
- Hotronic, Inc.
- Image Video Ltd.
- Intergroup Video Systems
- JVC Co. of America
- Kintek, Inc.
- Lexicon Inc.
- Maxell Corp. of America
- Merlin Engineering Works, Inc.
- NEC America, Inc.
- New England Digital Corp.
- Panasonic Industrial Co. (Broadcast and RAMSA Divs.)
- Panasonic Industrial Co. (Computer Products Div.)
- Pinzone Communications Products, Inc.
- Quantel
- Recortec, Inc.
- Research Technology Int'l
- Sony Broadcast Products Co.
- 3-M Co.



The TV Conference equipment exhibit.

Get-Together Luncheon



SMPTE President Harold Eady welcoming visitors and guests at the Get-Together Luncheon.

The conference Get-Together Luncheon was held on Friday afternoon, in a large room conveniently situated between the paper presentations and equipment exhibit. SMPTE President Harold J. Eady, Novo Communications, Inc., addressed the gathering, then relinquished the podium to luncheon guest speaker Michael Sherlock, executive vice-president, Operations and Technical Services, NBC, Inc.

The texts of the two addresses follow.

President's Welcoming Remarks

By Harold J. Eady

Twenty years ago, the late Howard Town initiated the idea of specialized television conferences. At that time, it was known as the Winter Television Conference, and with the weather outside today, perhaps we should use that name again. Weather never seems to be a deterrent, however, to successful SMPTE conferences. At our first one in 1966 in Detroit, there was quite a violent snowstorm and, even so, over 500 were in attendance because of the importance of the subject of the day — color television.

Specialized subject matter is increasingly of more interest to our membership. Therefore, the Society is exploring and encouraging the presentation of an increased number of specialized tutorial-type meetings, such as the recent successes in Hollywood on the subjects of lighting and sound.

Our Society was formed in 1916 as a film organization. Today, of course, we are film and television. The sustaining members, which are listed on the back cover of our *Society Journal*, provide one of the major financial resources which the Society depends upon for its existence. I take this opportunity to encourage the television sector of our industry to lend equal support to that provided by our film industry members. As we all know, over the past 10 to 20 years, television activities in our Society have been increasing dramatically, and these activities require the support of the television sector of the industry.

I wish everyone a warm welcome to

this 20th Television Conference. Thank you.

Introduction of Guest Speaker

It is now my pleasure to introduce the guest speaker. Finding the right person to address such a prestigious group of television people is certainly not an easy task.

For this occasion, I thought it would be best to look to the major networks for such a person. As we know, there are three major networks: ABC, CBS, and NBC. After checking the recent ratings, we settled on NBC (which, by the way, I'm told stands for *Never Buy Cheap*.) While chatting with our guest speaker earlier, I asked him if the rumor is true, since GE bought RCA, that plans are under way to change the NBC peacock logo to a light bulb. He assures me it is not.

NBC has always had a very high reputation in engineering for making careful assessment of new technology which they would adapt to their needs. That approach and reputation has been consistent over the years in spite of some upper-echelon changes that have been made.

Our guest speaker first joined NBC in 1960. In 1973, he left for a few years; however, he returned in 1977 as Vice-President of Business Affairs and Administration. He has a bachelor's degree in business administration and presently lives in New Jersey with his wife Ann and four children. Ladies and gentlemen, it is indeed a pleasure to introduce the Executive Vice-President, Operations and Technical Services, for NBC Television Network — Mr. Michael Sherlock.

CONFERENCE COMMITTEES

General Arrangements Co-Chairmen: *Norman A. Thelen, Encyclopaedia Britannica Educational Corp.*, and *Michael H. Bailey, Allied Film & Video*
Papers Program Co-Chairmen: *Frederick M. Remley, Univ. of Michigan Media Resources Center*, and *John F. X. Browne, Browne Associates, Inc.*
Papers Program Vice-Chairman: *Robert Vavra, Video Corp. of America/Technicolor*
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Spouses Program Chairman: *Marion Thelen*

Excerpts from Guest Speaker's Luncheon Address

By Michael J. Sherlock

Thanks very much for inviting me to speak. I truly consider it a privilege to be addressing this audience.

I'm particularly pleased to be addressing the Conference this year, because we've got something to celebrate. SMPTE should be breaking out the champagne. For a new standard has been born, and it shall be named "Type D-1." I am referring, of course, to our new standard for a component digital television recording system.

In this brief talk, I'm going to offer a few thoughts about that standard, from a TV network man's point of view. I'd like to say why I think it's a great achievement, how it can be applied right now at my company, and how it fits into our long-term technological future.

First, why is a component-digital standard so important?

Well, it's a historic achievement in purely technological terms. Component digital can do a lot of things that broadcasters have long dreamed of doing. It can make virtually perfect recording and playback, through at least 20 generations. It offers digital audio of peerless quality. With all this, it will match the very best analog format, and, in its own way, will exceed it in giving producers nearly limitless versatility.

It's also an accomplishment in the art of international negotiation. As so often in the past, engineers from different countries have shown that they can succeed where presidents and foreign ministers sometimes fail: that is, to unite on a principle that transcends national boundaries.

This is the first global agreement on a truly universal format for broadcast program recording. Henceforth, all video signals recorded on tape by a Type D-1 recorder anywhere in the world will conform to the 4-2-2 sampling procedure agreed to by the CCIR for component digital television signals.

The agreement didn't come easy. The initial Digital Study Group took

years laying the groundwork. Then the DVS and DTTR Working Groups plunged into the real job and each, after two years of grueling sessions, hammered out a consensus.



Michael J. Sherlock addressing luncheon guests.

Committees usually are known for *not* getting things done, and everybody has heard the definition: "A committee is a group of the unwilling, picked from the unfit, to do the unnecessary." The DVS and DTTR teams have refuted that forever. I can think of no group of individuals more willing or more expert, or whose task was more necessary to the progress of the broadcasting industry. Chairman Fred Remley and his colleagues deserve a big vote of thanks from all of us. They've done an outstanding job.

If I sound enthusiastic about D-1, it's for good reason. NBC has an immediate need for it in a key area of our operations, and I'd like to turn now to that subject. We are excited by what digital components can do right now, today, in the area of television graphics.

Graphics and post-production are ideal points of departure for the component digital standard. An "invisible technology," free of generational losses, removes another limitation to the creative process. The matte, or compositing process, can be performed consistently and precisely. Currently, many picture-processing

devices are digital component systems, internally. Effects systems, paintboxes, and still stores are already capable of digital integration.

What we have in graphics and post-production, then, is an ideal "island" or enclave for exploring the immediate possibilities of component digital. That's where we can show its practical payoff for the broadcaster, right now, in the real world.

NBC is excited by these immediate possibilities of the new standard. But what about the long-term implications? That's the question I'd like to consider with you next.

The long-term possibilities of D-1 are exciting to everybody in the television business. A standard like this is terribly important for the long run. It is a beacon for the future, a fixed goal we can sight on as we try to navigate a course into the next generation of broadcast technology. In steering that course, we may not always go in a straight line. We may tack now and then, or veer aside sometimes to avoid the rocks and shallows. But we'll keep on heading for that fixed destination.

I think that over the next 5, 10, or 15 years, everybody in the business — networks, stations, manufacturers, producers — will be making their way toward the goal of component digital. Nobody wants to be left behind in obsolescence, and each of us will be mapping his own course for getting to that next generation of television technology. The routes taken may be different, because everyone will have a different starting point.

My company, for instance, is right now at another strategic crossroads in broadcast technology. Not only have we just implemented a tremendous explosion in network-distribution and news-gathering capabilities with our Ku-band satellite, we've also recently announced that we are moving out of 30 Rockefeller Plaza in Radio City, our historic home since 1933. "Thirty Rock" was built as a radio facility and has been adapted to television over the last 50 years, until today it contains the heart and viscera of NBC television technology: seven studios, a network release facility, a satellite distribution system, a TV station, radio facilities, extensive post-production

Michael J. Sherlock is executive vice-president, Operations and Technical Services, National Broadcasting Co., New York City.

facilities, and complete news and sports operations.

Some would look at this planned move as just a big headache in replacing all that hardware. On the contrary. NBC views it as a once-in-a-lifetime opportunity. It's a chance to rebuild ourselves technologically from the ground up — and we plan to take full advantage of it.

Wherever NBC moves to (and we haven't decided yet), we will want to install and equip ourselves with television and radio hardware that is absolutely state of the art. We want to create an electronic factory that will realize *all* the potential capabilities of the video and audio signal — creating it, manipulating it, recording it, storing it, and distributing it. That is our vision for the future, and to bring it about, we have to look ahead at each and every new technology. We will be studying and planning and making critical choices.

The D-1 standard we are all celebrating today figures very largely in those long-range plans. In fact, I'd like to take this occasion to announce a major goal of NBC engineering: by 1993, to have a plant dominated by component digital technology. The year 1993 may look quite a ways down the road. But we all have to recognize one fact: For component digital, the millenium will not arrive overnight. In broadcasting technology, we're still earthbound in our present NTSC systems.



Bud Stone (left), Auditing Chairman Chuck Zichterman, and General Arrangements Co-Chairman Michael Bailey.

The technology of total component digital is a kind of spaceship of the future. The question is: how do we get from earth to *Starship Enterprise*? We can't just say, "Beam me aboard, Scotty." To arrive at the desired destination, we have to take real steps in the real world.

Without the standards set by our engineers, broadcasting would be nowhere, and all of us in the business appreciate that, and we're committed to those standards. But we also have to remember that we *are* a business. And as business managers we have to

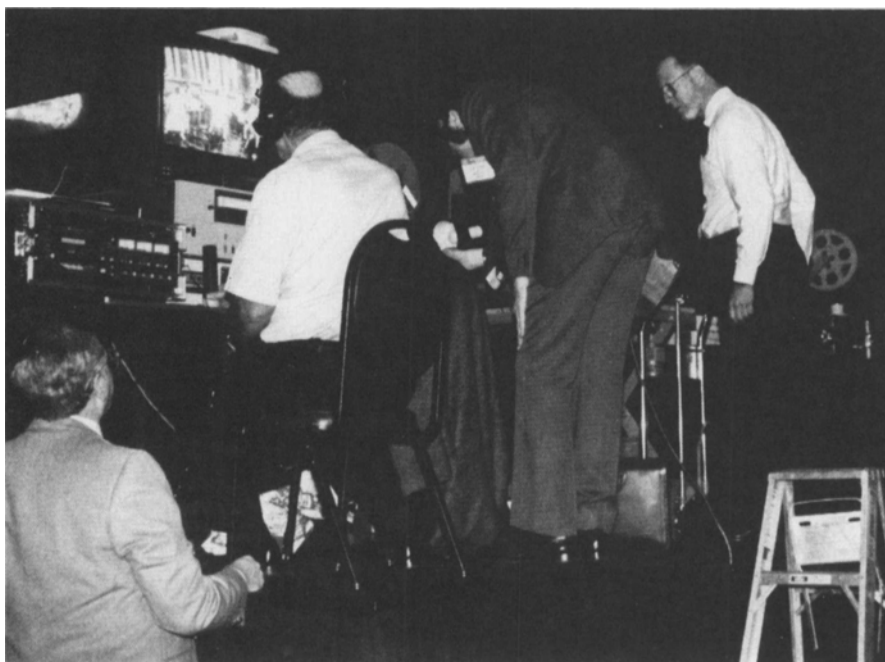
deal with things not in the abstract, but in the context of a lot of other commitments to our shareholders, our producers, our viewers. We have to make the practical decisions today that will get us where we want to be tomorrow.

I don't want anyone here to think I am looking for loopholes in the component digital standard. But at the same time, this single standard isn't the Bible either. If we must depart from it for one application or another, it's not a sin.

There is nothing in D-1, that I can see, that bars a broadcaster from using some other technology if that will help him reach a specific desired end more effectively. While it may apply beautifully to graphics, D-1 may not be so well suited right now in other specialized areas — for instance, all your news-gathering equipment. There may have to be many more generations of ENG equipment before component digital technology is feasible in this field.

Another example is the commercial cart machine, where the industry has a dire need for replacement now. As businessmen we have to look at this need realistically. We would like to acquire a cart machine model that is viable and efficient *and* component digital.

But whereas we see component digital as a natural in some areas, it hasn't yet evolved to solve every problem, such as the industry's spot-player needs. That day will come, but we may not be able to wait that long. In



The projection booth. Jack Behrend, projection chairman, is to the right.

the interim, we have to support any manufacturer who can offer a helping hand to us and to others in the industry who are trying to move out of an obsolescent technology. There are alternatives to D-1 in cart machines, and I think they deserve to be considered.

This is not a crime against the standard. We can achieve use of the component digital recording standard without swearing an *exclusive* loyalty oath to it. I believe the standard will be best served by making pragmatic use of it as one more engineering resource. D-1 will be stronger in the end if we introduce it step by step, where and when it serves our business needs.

Let me sum up what I've been saying here. The component digital recording standard *is* something to cheer about. It's particularly welcome to a company with major technological plans like NBC, and by 1993 we intend that our new broadcasting facilities will be dominated by that format. But in getting to that goal, we think we'll do better by being pragmatists rather than purists.

Stereo shows that, as long as there is an efficiency payback in the long run, we at NBC are willing to commit our resources to the fullest. We made a firm decision to go for stereo and followed through with a great effort.

We convinced program suppliers of the quality improvement and reasonable payback potential, and it worked. Today, we air 21 hours a week of stereo programming. We have 58 NBC stations servicing 58% of the homes with television. By the end of this year, more than 75% of the TV homes in the U.S. will receive NBC stereo TV transmitted locally.

We intend to follow that same policy — with the same certainty and commitment — as we approach component digital. That is another way of saying that we want D-1 to succeed in reality more than in theory. I think that's the best way of keeping faith with the standard, and with the fine people who produced it.

I'd like to say thanks again to all the members of the Digital Study Group and the DVS and DTTR working groups. You've opened a new door on television's future. You've given everybody in broadcasting, all over the world, something to cheer about. And I expect the cheering will get louder as we move closer and closer to our common goal.

In closing, I'd like to add a few personal comments. I started in this business 27 years ago. I've always found it to be exciting. Only for the last four years have I been directly associated with the technical side of

the business with responsibility for both operations and engineering. This job is the most exciting job I've ever had. One of the reasons is the very subject of this Conference — Tools and Technologies for Tomorrow's Television.

Every day we are creating new tools for the future — satellite technology is exploding; stereo is brand new to TV; smaller, lighter, more flexible field equipment is being developed; and graphics capabilities keep expanding geometrically. Every day things are changing.

That brings me to my final point. It's all the more important, then, that we have a group like SMPTE. We need help in sorting it all out. We need the benefits standards can bring us. To that end, Harold Eady has formed a President's Advisory Group. I'm proud to be a member, along with my counterparts at the other networks and manufacturers. The Advisory Council has suggested a streamlining of standards procedures by removing as many obstacles as possible. Harold Eady is to be congratulated for an aggressive and very bold start and should be strongly supported in his efforts.

Thank you for letting me speak to you today.



Participants in the Digital Television Tape Recording sessions, (L-R) Bernard L. Dickens, William C. Nicholls, Kenneth P. Davies, Arthur R. Moore, John P. Watney, Frederick M. Remley, John L. E. Baldwin, Peter A. Dare, Takeo Eguchi, Richard Brush, Jurgen K. R. Heitmann, J. H. Wilkinson, Rolf Hedtke, and Roland Mester.



A meeting of the Committee on Television Video Technology, Ken Davies, Chairman.

Committee Meetings

SMPTE Engineering Vice-President Richard G. Streeter, CBS, Inc., announced a full schedule of meetings for some of the Society's engineering committees, subcommittees, working groups, study groups, and subgroups. The meetings began prior to the actual two-day conference, on Tuesday, February 4, and ran through Friday, February 7. The schedule was as follows:

Tuesday, February 4

- Joint Ad Hoc Group on Component Studio Implementation
- Subgroup on Component Analog System Design
- Study Group on Filtering Requirements

Wednesday, February 5

- Working Group on Component Analog Standards
- Working Group on Digital Video Standards

Thursday, February 6

- Committee on Television Video Technology
- Subgroup on Camera/Recorder Interface
- Working Group on Stereo/Multi-Channel Audio Recording for TV
- Working Group on High-Definition Electronic Production

Friday, February 7

- Standards Committee

Subcommittee on Digital Control for TV

Some of the Society's administrative committees were also in session at the Television Conference. The Executive Committee meeting was held on Wednesday, February 5. On Thursday, February 6, the SMPTE Board of Governors met, following an orientation breakfast for new governors. The Nominating Committee held its meeting on Friday, February 7.

Coffee Club

A Coffee Club, courtesy Sony Broadcast Products Co., was situated

in a foyer outside the main meeting room. The Coffee Club was open to all conference registrants from 8:00 a.m. to 10:00 a.m. on both days.

Social Activities

The social activities at the Television Conference included the Get-Together Luncheon, a Welcome Reception, and a Spouses Program. The Welcome Reception, dubbed "Jazz — Chicago Style," took place at the nearby Boul-Mich Steak Place, on Friday evening, February 7. Sponsored by Eastman Kodak Co., the reception featured live jazz music, snacks and drinks, and plenty of good



DTTR session Co-Chairman Ken Davies (left) and Session Chairman Fred Remley.

conversation in a warm and congenial atmosphere.

Spouses were treated to an entertaining and educational program. Friday's activities included visits to Bradford Exchange, in nearby Niles, Ill., and to the Kitchens of Sara Lee, in Northbrook, Ill. At Sara Lee, the spouses viewed AV slides of recipes. Saturday's activities included a shopping excursion to the popular Water Tower Place, just down the block from the Marriott.

The Society wishes to thank the following companies for their contributions to the Spouses Program: Motion Picture Laboratories, Inc.; WBBM-TV; Deluxe Laboratories, Inc.; Forces, Inc.; Encyclopaedia Britannica Educational Corp.; Allied Film & Video; WLS-TV; Eastman Kodak Co.; Philips Television Systems, Inc.; and GTE/Sylvania Inc.

Conference Committee Chairmen

The Television Conference was under the overall supervision of SMPTE Conference Vice-President Maurice L. French, Canadian Broadcasting Corp., and SMPTE Editorial Vice-President Howard T. La Zare, Deluxe Laboratories, Inc.

As regards the technical program, La Zare named Frederick M. Remley, University of Michigan Media Resources Center, and John F. X.

Browne, Browne Associates, Inc., as Program Co-Chairmen. Robert Vavra, Video Corp. of America/Technicolor, was Program Vice-Chairman.

Norman A. Thelen, Encyclopedia Britannica Educational Corp., and Michael H. Bailey, Allied Film & Video, were the General Arrangements Co-Chairmen. Both were appointed by French. Other chairmen were appointed to handle specific conference functions. They were: Jack Behrend, Behrends, Inc., (A/V Projection); Robert W. Churchill, Roscor Corp. (P/A Recording); Elmo R. Clark, Eastman Kodak Co. (Hospitality); Bob Coleman, Optimus, Inc., (Security); John M. Ehrenberg, BHP, Inc., (Registration); Roland G. Johnson, Eastman Kodak Co. (Luncheon); Joseph J. Pusateri, Douglas Film Industries (Hotel); Edward T. Wicinski, Allied Film & Video (Membership); Cornelius Zichterman, Peterson Enterprises, Inc., (Auditing); and Marion Thelen (Spouses).

Papers Program

Session chairmen and vice-chairmen, respectively, for the technical sessions were as follows: Television Audio Technology, Edmund A. Williams, NAB, and Larry Ocker, WTTW; Type D-1 Digital Television Recorder (Part I), Frederick M.



Spouses Program Chairman Marion Thelen.

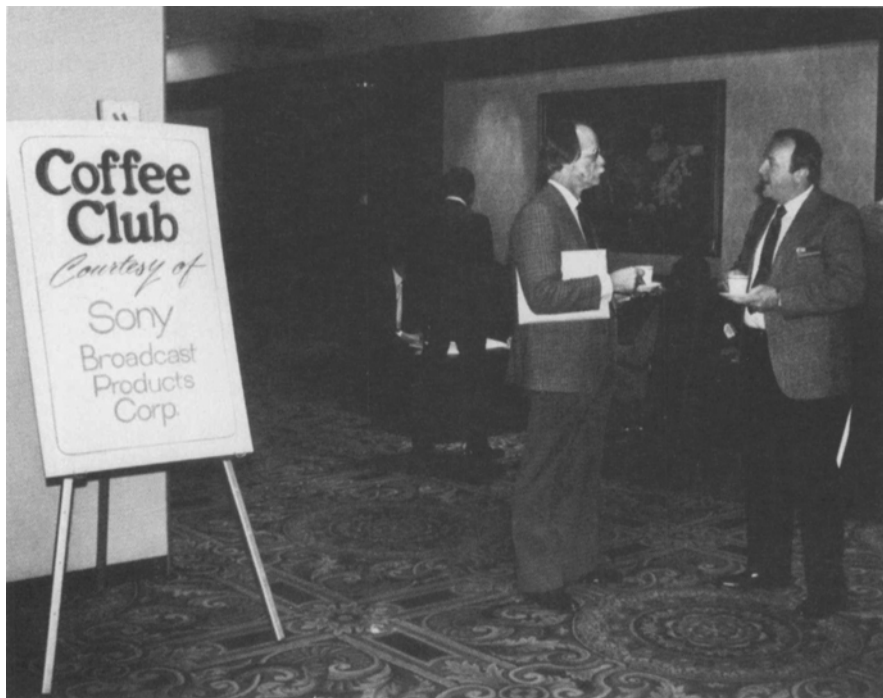
Remley, University of Michigan, and Kenneth P. Davies, Canadian Broadcasting Corp.; Type D-1 Digital Television Recorder (Part II), Frederick M. Remley and Bernard L. Dickens, CBS Television; Television Post-Production Techniques, Norman A. Thelen, Encyclopaedia Britannica Educational Corp. (no vice-chairman); and New Developments in Video Recording, no chairmen.

Three of the four topic sessions closed with panel discussions. The moderator for the panel discussion on Television Audio Technology was Edmund A. Williams, National Association of Broadcasters. The panelists were Douglas F. Dickey, Solid State Logic Ltd.; Randy Hoffner, NBC, Inc.; Larry Ocker, WTTW-TV; and Steven Sarafian, Sony Broadcast Products Co.

Program Co-Chairman Frederick M. Remley was the moderator for the panel discussion on Type D-1 Digital Television Tape Recorder. Serving on the panel were John L. E. Baldwin, Independent Broadcasting Authority; Kenneth P. Davies, Canadian Broadcasting Corp.; Bernard L. Dickens, CBS Inc.; Takeo Eguchi, Sony Corp.; and John P. Watney, Ampex Corp.

Program Vice-Chairman Robert J. Vavra moderated the Television Post-Production Techniques panel discussion. Anthony Izzo, Edit Chicago; Mickey Mitidero, Lake Shore Post Production; Lenard E. Pearlman, Editel; Jimmy Smyth, Optimus, Inc.; David Triunfal, Swell Pictures; and Jack A. Weinberg, Post Pro Video, Ltd., comprised the panel.

Synopses of the papers follow.



The SMPTE Coffee Club, sponsored by Sony Broadcast Products Corp.