

Chapter 24
Madison, Wisconsin

Society of Broadcast Engineers

December 1993

SBE Committed To Serving the Changing Broadcasting Industry

by Paul Stoffel, SBE Chapter 24

"Rethink your self-defining terms of your job," challenged SBE Vice-President Terry Baun.

SBE President Chuck Kelly agreed, "We are going to have to define what we do in a broader term and find ways to increase our value. It is important for us to get training and learn new skills for the future positions in broadcast engineering."

Baun and Kelly, along with SBE Executive Director John Poray and SBE General Counsel Chris Imlay, spoke during the SBE All-Chapter National Teleconference held on November 10 in conjunction with the 1993 Broadcasters Clinic in Madison, Wisconsin.

This "first-ever" hour-long SBE teleconference, a panel discussion moderated by Chapter 24 Chairman Leonard Charles, brought the National SBE to the local chapters.

The teleconference, fed via satellite to SBE members nationwide, gave panel members an opportunity to talk, listen and share ideas about SBE, broadcasting and the broadcaster.

Baun said, "You and I have a new job description, whether you are a staff engineer, chief engineer, director of engineering or contract engineer.

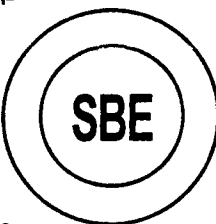
"You are in the business of managing communications technology profitably and efficiently. The business of business is pleasing the customers.

"The opportunities are only limited by our own abilities to understand the emerging technologies and understand the ways in which we can be of substantial and substantive benefit to the people who hire us.

"We must understand the way we fit into the greater scheme of the telecommunication industry."

What should we as SBE members be doing about this?

Kelly suggests we recognize and develop new skills, understand the technical aspects of our jobs, learn the business aspects of broadcasting and be able to communicate with other key station personnel as peers. Imlay affirms, "The SBE needs to communicate better with the management of broadcast and communication facilities the important things that broadcast engineers and their professional society are doing that directly benefit the licensees."



What is the National SBE doing?

New certification programs are being planned to help our members determine their own skill level. Baun said, "New Certification program questions are much more closely related to the kinds of engineering we are doing today, such as: computer and networking questions, quality control, management issues." A telephone caller commented, "SBE chapters [need to] make a concerted effort to let the general management of broadcast facilities know that the SBE has a certification program and know that they can use this when screening prospective engineers."

Kelly talked about the educational opportunities available to members, "The SBE will provide the technical programming for Spring and Fall convention and provide technical education to the broadest possible audience. The Ennes Road Shows will also address these needs."

Poray said, "SBE will continue to develop services and programs that will be beneficial to you as an SBE member and that fulfill the objectives of SBE to advance the profession of broadcast engineering and those who are a part of it."

DECEMBER MEETING

Thursday, December 16

DINNER: CJ's Restaurant
Located in the Westgate Mall, corner of Odana Road and Whitney Way (5:30p.m.)

MEETING (7:00 p.m.)
at WKOW-TV
PROGRAM (7:30 p.m.)
at WKOW-TV Channel 27
5727 Tokay Blvd.

PC-based Audio and Newsroom Automation
Presenter: Dan Maney

IN THIS ISSUE

There are two inserts in this month's issue:

- First, there is the regular program insert.
- Second, Tom Weeden has written a review of the 1993 Broadcasters Clinic held in November.

Here are some examples:

- The SBE Bookstore offers SBE members a 20 percent discount off retail prices on selected broadcast engineering books from McGraw-Hill and CRC Press.
- The SBE Lending Library provides videos for Chapter meetings, staff training or individual member use.
- Available from the National, a sample contract designed to be used by contract engineers. The contract provides for many of the contingencies that should be considered when dealing with your clients. Contract engineers can use the portions of the con-

Continued on page 2

CHAPTER 24 OFFICERS

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H - 274-0041

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SECRETARY:

Kerry Maki (WMSN TV)
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TREASURER:

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Denise Maney	277-8001
Kerry Maki	833-0047
Steve Zimmerman	274-1234

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Sustaining Membership: Stan Sarch

Strategic Plan: Dennis Behr

Special Events: Kevin Ruppert

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Tim Trendt, Platteville

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414-873-7807 (BBS)

SBE Teleconference *Continued from page 1*

tract that apply to their business. The sample contract is on 3.5 WordPerfect formatted disk or in printed form. Chip Morgan of Chip Morgan Broadcast Engineering (CMBE) and Chris Imlay of Booth Freret & Imlay are authors of the contract.

- SBE Jobline accepts calls from those who are unemployed, as well as those currently employed who are seeking to improve their employment status.

- There are insurance plans available to members for term life, disability income, high limit accident, excess major medical and comprehensive health care plans.

Terry Baun offered these examples, "By installing a headquarters BBS, the National will know if members and staff are getting comfortable with computers and keyboard technology. HAMNET provides members who are hams additional opportunities to keep in touch with each other and with the National office, while at the same time maintaining and sharpening their amateur radio communication skills. By associating SBE chapters with their State Broadcasting Associations, engineers and station managers can communicate in a common venue."

From the legal perspective, Imlay said the SBE Counsel answers organizational details such as incorporation, insurance, tax and liability questions for the local chapters and, also, state licensing matters, ethical issues, employment, contract engineering agreements, FCC technical regulatory questions for the individual SBE member. Information about these and other issues are available to chapters and individuals directly from Imlay or by a referral from the National.

Imlay stated, "The SBE has been active for approximately twelve years in providing technical input to the FCC rulemaking proceedings. SBE has organized a committee of experts, all volunteers who serve on the FCC liaison committee chaired by Dane Ericksen, to achieve consensus on important issues of technical rulemaking."

Recent SBE interests and comment filings include:

- ANS/IEEE 1992 Rf radiation exposure standard
- Revision to EBS
- Clarification of rules regarding FM peak modulation and maximum occupied bandwidth.
- Revision of broadcast auxiliary license applications.

The SBE will continue to pursue legislation requiring each FCC Commissioner have an engineering assistant among their three professional staff assistants. Imlay emphasized that the SBE will need members to help with this legislative plan. Also, SBE is represented on a panel of experts who are putting together multi-industry petitions concerning zoning and land-use preemption matters.

The success of SBE comes from the participation at both the national and local chapters level. Terry Baun said, "The SBE will be remembered as a total failure unless it adequately and actively assists in preparing you as members to meet the challenges of the telecommunications technology in the '90s and beyond. It is the SBE board's responsibility to provide you with the tools you need to become broadcast technology managers in the years ahead. It is the members responsibility to make sure the SBE doesn't fail you in that task."

TV News... Radio News

Compiled by Kevin Ruppert

It finally looks like standards are setting down in the world of High Definition TV. The Motion Pictures Experts Group (MPEG) has moved to standardize on just one profile of its MPEG-2. Things are not so well ordered as of yet in the FCC's Advisory Committee on Advanced Television Service (ACATS).

FCC acting chairman James Quello has said that the FCC will conduct a full examination on the issue of interoperability of the Grand Alliance (GA) system. He said that the GA appears to understand the need for keeping the terrestrial broadcast system an open one to provide a gateway for interface with other electronic and computer media.

House Telecommunications chairman Edward Markey has submitted questions to the FCC concerning digital TV and the GA plan. Markey's questions include whether the GA has fulfilled its commitment to consult with the computer industry and others and whether the Advisory Committee on Advanced Television Service has included representatives from other industries in its selection process.

The question of what impact a proposed digital VCR standard will have on the whole standard setting process has also been raised by Markey.

Meantime, in Europe, new alternatives are being pursued in HDTV. The MAC transmission scheme has been killed off after years of rivalry among European broadcast entities. The latest blows to MAC came after a meeting of European Commission state ministers in May, when the U.K. maintained its refusal to back any subsidy for the system's implementation. Germany has also dropped its backing for HD-MAC. Some say that these actions will make way for a digital television system in Europe.

Coming up in the next few months here in TV News... How your station can work with the local power utility to deal with interference? What small market stations need to do to get ready for HDTV? And another article on the CUTTING EDGE of Data Reduction. (Excerpts from *Broadcast Engineering* and *TV Technology* magazines)

Mark Croom, WNBC-FM

● The FCC in late October announced the selection Motorola's C-QUAM system as the national standard for AM stereo. After years of wrangling among competing systems, and most recently among the final two competitors, C-QUAM has emerged as the standard. The Commission approved the order by circulation rather than in a regular monthly meeting, in order to meet a one-year deadline mandated by an act of Congress last year. Stations operating with alternative systems have one year to cease using them. Stations using AM stereo exciters from Kahn Communications that include the POWER-side feature may continue using them as long as they broadcast identical material in both channels.

● The FCC has denied a petition by the Association of Federal Communications Consulting Engineers (AFCCE) which asked the FCC to reconsider FM application processing requirements. Essentially the Association asked the FCC to reinstate the "Hard Look" policy which was relaxed in 1992 to allow for the filing of applications that were in the

Commission's view "sufficiently complete." AFCCE said that certain engineering information was too important to be missing from an application. The group feels that applicants will begin filing more speculative or simply incomplete applications which could lead to processing delays. The FCC claims the modified "hard look" system is working well.

(Information from *Radio World*)

Local Legals

Transfers:

Applications: WMBJ-FM Evansville, WI., (Janesville) 105.9 Mhz with 1.4 kw ERP at 493 ft. Sold by Wisconsin Radionet LP (Carl W. Hurlbaas) to Seehafer Broadcasting Corp. (Donald W. Seehafer) for \$565,000. Seehafer Broadcasting owns WOMT-AM/WQMT-FM Manitowoc and WXCO-AM/WYCO-FM Wausau. Wisconsin Radionet LP has no other broadcast interests. Filed October 29.

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Stan Scharch

Frequency Coordination Process

by Tom Smith

Chapter 24 Frequency Coordinator

Your station is adding a new remote pick-up unit or a STL to the new transmitter site. A project budget is completed and then OK'd by the station manager.

It is time to file an application with the FCC. Remember, the FCC no longer coordinates frequency selection; it only assigns frequencies. In fact, as SBE's Frequency Coordinator Task Force Chair Paul Lentz wrote in a past SBE SIGNAL, "Calls have been received from the FCC about frequency coordination and from persons who have been referred by the FCC for coordination information."

On some applications, the FCC may ask if you have requested frequency coordination from the SBE coordination program. If not, your application may be held up. This is where your local SBE Frequency Coordinator comes in.

How is a frequency is selected?

There are two important facts: you are responsible for the selection of your new frequency and the Frequency Coordinator cannot assign a frequency, only the FCC can do that.

The Coordinator maintains a database file containing a list of Broadcast Auxiliary frequencies that are "in-use" by local broadcasters. The Coordinator can supply you a list of users within the desired frequency band. Through this process, a frequency can be selected that will not cause interference.

The file also has information about transmit and receive site coordinates and path direction. Database telephone

numbers and addresses allows you to contact in-band users about potential problems.

With most Remote Pickup (RPU) frequencies in-use, you may need to share a frequency with another user. The FCC has made this easier by allowing channel splitting. The channel is divided into small segments. The segments are stacked while still maintaining the required bandwidth.

By using a radios with a narrower bandwidth, a user can fit in-between existing users. Also, RPU frequencies are not assigned on an exclusive basis.

Obtaining a frequency for a studio-to-transmitter link (STL) is more difficult. In many areas there are few, if any, frequencies available, and many users' receivers are located at a common site.

A new user must come up with creative ways in which to fit new STL's and must work with existing users to solve problems. The directional aspects of STL systems along with opposite polarization can help. Be aware of potential interference to receive sites, in-line and beyond. Also, receivers can receive interference from backside of their antennas. STL's are accorded interference protection from new users.

In the case of low power auxiliaries such as wireless microphones, the FCC does not grant exclusive frequency assignments. It is up to the users to select frequencies that do not interfere. Low power auxiliaries must maintain certain mileage separations from full-

power TV stations that are on the same frequency. Be aware that there are many unlicensed wireless mic units owned by non-broadcast groups on which there is little database information.

What does the Coordinator do for you?

The Coordinator provides the basic information for you to make a frequency selection. Also, the Coordinator can help you with contacting other users and Frequency Coordinators in other areas. If you are located between coordination areas, or you are going to operate in another area for a short time, you will need to contact other Coordinators.

The newest user is responsible for avoiding and correcting interference problems. Read Part 74 of the FCC Rules pertaining to the service for which you are applying. Contact other users to see if they have any problems with your proposed operation. Do listening tests at your receive site for other signals that may interfere with your proposed signal. Contact the manufacturer of your equipment for special needs.

For coordination to work, all users need to keep their Coordinator updated on any changes they make to their systems. Besides Broadcast Auxiliary users, the FCC now requires coordination in other services, such as two-way radio.

Additional information is available from the National SBE Coordination Task Force and from Part 74 of the FCC Rules pertaining to coordination requirements.

Chapter 24 BBS
608-277-5239
 Chris Cain, Sysop

Leonard Charles is the editor for the Electronic Version of this Newsletter that is available on the Chapter 24 BBS.

27

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Chip Developed


Maney-logic has developed a chip to transmit any RS422 command to BETA, D2, etc. The 18-pin micro controller, plus 8-pin line driver, fits on a 1" by 1.5" PC board. The board is mounted inside a small alarm clock to allow the alarm to roll the deck in record for WKOW TV. The finished product is an alarm clock with an RJ11 connector and a push-to-test button mounted on the back. An RJ11 to DB9 cable connects to the deck.

When the button is pressed, or the alarm sounds, the multi-byte command is transmitted to roll the deck in record. The command is repeated three times for assurance, though it has proved unnecessary. Because the chip is a micro-controller, assembly language software was created to provide a three second hands-off period after power up, and a 50 ms debounce to ignore glitches. The chips are available from maney-logic with up to eleven commands, triggered by separate input pins. Custom configurations are welcome.

Submitted by Dan Maney

ITCA Chapter Honored

The Midwest Chapter of ITCA (International TeleConferencing Association) won the Best All Chapters Award at ITCA 93 in Washington D.C. Chapters were judged on membership growth, publications and programs. The Midwest Chapter of ITCA is based in Chicago with members from Wisconsin, Michigan, Illinois and Indiana. Outgoing president of the Midwest ITCA Chapter, Jamie Diana Poindexter, was awarded one of six Star Performer Awards for promoting the teleconferencing profession, the ITCA association, and her place of business. Poindexter is Manager of Technical Operations at Instructional Communications System (ICS) University of Wisconsin-Extension in Madison. The National ITCA has been in existence for ten years.



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KEITH EMMONS

Broadcast Communications to Install GTE Airfone System

Needham, Massachusetts - Broadcast Communications Systems (BCS), of New Glarus, Wisconsin, announced today that it has been selected by GTE Airfone to install a digital air-to-ground communications system at various sites in the central and western region of the United States. When completed, the air-to-ground communications system will offer digital communications coverage to private and commercial commuters all over the country. The system, which is fully digital, will offer superior voice quality to the corporate and commercial aviation market, as well as increase the number of available channels for customers.

"The installation offered by the Broadcast Communications team will supplement GTE's commitment to offering communications service to both private and commercial aircraft," said James Crooks, President of BCS.

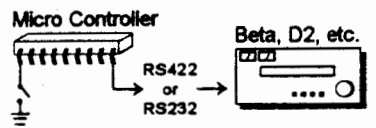
Broadcast Communications offers installation, maintenance and project management services to the cellular paging, microwave, PCS, two-way and supervisory control and data acquisition (SCADA) industries.

James Crooks Honored

James M. Crooks, President of Broadcast Communications and sustaining member of SBE Chapter 24, was inducted into the Radio Club of America in New York.

The Radio Club of America, founded in 1901, has a roster of members containing many of the names of the industry's pioneers. It is the oldest active electronics organization in the world. Crooks was nominated by Don Bishop, Radio Club of America board member and Editor of Mobile Radio Technology magazine.

Any serial commands, One chip.



maney-logic
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McFarlane Offers Guidelines to WBA Members

The Wisconsin Broadcasters Association's newsletter has been running a series of articles outlining Jim McFarlane's "Making Money Within the New Ownership/LMA Guidelines." McFarlane is group Vice president for The Cromwell Group and was one of the WBA Summer Convention's featured speakers. The series has included topics covering General Ideas/Office/Personnel, Utilities, Telephones, Sales/Promotions, Programming and Engineering.

Here's how McFarlane addressed Engineering:

1. Employ a contract engineer. Get a good engineer: Someone who is up to speed on new technology is preferable to someone who simply knows how to make do. If you have a full-time engineer, contract him out to other stations.
2. Consider satellite monitoring or local monitoring during satellite operation time periods.
3. Buy right. Use rebuilt tubes as back-up/used transmitters. Find lower priced outlet for spare tubes and parts.
4. Purchase equipment on the NAB exhibit floor on the last day with cash in hand....negotiate price (don't forget shipping and installation costs).
5. Arrange sale or leaseback of technical equipment.
6. Look into lowering the filament voltage on your final tubes to just above where they need to be. Check with your engineer. This should improve the life of your tube.
7. Use new technology to control transmitter.
8. Replace tube equipment with solid state equipment which saves on electricity and parts replacement cost. Be sure you install surge and lightning equipment on all of this new equipment. It's worth it.
9. Consider new transmitter (lower tube and electrical costs).

Videos Sent to SBE Video Library



Chapter 24 has submitted two videos to the National SBE Library: "The All-Chapter National Teleconference" and "SBE REWIND: An Historical Perspective."

The one-hour "National Teleconference" was taped November 10, 1993.

"SBE REWIND", recorded in August 1993, is a panel discussion with some of the greats of broadcasting sharing their experiences and stories. The 90-minute panel discussion, moderated by Leonard Charles, was produced by Denise Maney.


These, and other videos, are available to SBE chapters and individuals. Call or fax the SBE National Office with your request.

15
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New SBE Certification Study Guides are available.

The SBE Certification Committee has prepared new Study Guides for all levels of certification exams. These programs run on IBM compatible computer systems and are MS-DOS format. Each guide contains over one hundred questions. The levels available are:

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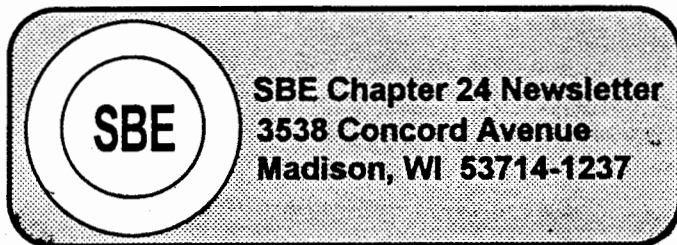
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For additional information, contact: Linda Godby, Certification - National Office, at 317-253-1640, or Jim Wulliman, Chair, SBE Certification Committee, at 602-648-1250.

1994 Test Dates	Location	Application Deadline
March 22	NAB Convention	January 21
June 3-13	Local Chapters	April 15
October 14	SBE Conference	August 13
November 4-14	Local Chapters	September 9



FIRST CLASS MAIL

Happy Holidays!

Tom Weeden
6802 Putnam Road
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Newsletter edited on Pagemaker 5.0 by: Paul Stoffel Typist: Joanne Stoffel
Contributors this month: Mark Groom, Kerry Maki, Tom Weeden, Stan Scharch, Kevin Ruppert, Jim Hermanson,
Tom Smith, Dan Maney, Denise Maney, Chris Cain for downloading information from CompuServe®
This issue is dedicated to my computer harddrive that died recently. Thanks to Karen B. for the use of her computer in the interim.

BROADCASTERS CLINIC SUMMARY

by Tom Weeden

Twenty-three presentations, equipment exhibits, and a satellite uplink made up the 39th annual Broadcasters Clinic in Madison. This year's Clinic was held November 9-11 at the Holiday Inn SE.

The first day's sessions on Tuesday focused on digital advancements in radio and audio production. Laura Tyson from Broadcast Supply West talked about different types of digital audio workstations and how broadcasters should evaluate their needs before choosing one. Tyson mentioned that there are 52 different brands of workstations to choose from, most being PC-based. Only a handful are dedicated audio systems. In general, PC systems are simpler and only one parameter of a mix can be handled at a time by using a mouse. Dedicated systems generally have several outboard controls which can be manipulated simultaneously. Many radio stations get into digital audio by choosing PC-based systems whose primary function is hard-disk storage and automation.

Motorola's Greg Buchwald summarized various advancements in broadcasting technology. Technical improvements in AM radio include NRSC processing and protection (which stations will have to comply with by next June), expanded band licensing, and the FCC's recent choice of an AM stereo standard. On the FM front, FCC has proposed to judge modulation on the basis of occupied bandwidth. Buchwald noted that FM stations transmitting in mono could greatly increase modulation and still comply with the 200 kHz bandwidth requirement unless the proposed rule is modified. An audio "masking" demonstration was given to show how bit-rate reduction methods operate. Buchwald also touched briefly on the state of digital audio broadcasting (DAB) ranging from "in-band/on-channel" systems for AM and FM to new-band systems such as Eureka 147.

Gareth Nelson from Sony Professional Products gave an update on Sony's optical mini-disk, one alternative to the broadcast cart machine. Using magneto-optical technology, the mini-disk can record 74 minutes of 5:1 compressed stereo audio. The professional mini-disk is compatible with the consumer format. Advantages of this technology are its reusability and lack of head wear or media wear.

A panel of four experts was assembled

for the afternoon sessions on digital audio. Dave Obergöenner, Chief Engineer of KUSA/KSD-FM, St. Louis and Jeff Andrew of Gannett Radio, Chicago discussed how stations can distribute digital audio via V-SAT technology cost-effectively. WGCI-FM in Chicago has a mobile system with a 1.2 meter dish and 1 watt Ku-band uplink (which was on site at this year's Clinic), enabling the station to do remotes from practically anywhere.

Herb Squire, Chief Engineer of WQEW/WQXR, New York, presented a paper similar to one given at the 1993 NAB, on "Dueling Algorithms." This was a simulation of a typical combination of digital audio devices at a radio station. He offered a history lesson on audio quality called "Squire's Subjective Sonic Evolution" while playing recordings of music made at various times through the 20th century. Squire also played a recording of tandem bit-rate-reduced audio processors, drawing various reactions from those listening in the audience. He suggested that when archiving audio, keep it in the linear domain, not bit-reduced, as much as possible.

Dick Becvar of California Digital showed diagrams of satellite and telco distribution of digital audio on networks, including the CBS Hispanic Network. CBS, unable to coordinate a C-band uplink from their Manhattan studios, send MPEG-coded audio on switched-56 lines to Teleport Minnesota who does the network uplink. CBS is able to monitor the downlinked audio from Minnesota on the return switched-56 link. Becvar also talked about a non-transcoded DAB system. This system would code the audio once, in 128 kbs Musicam for instance, and keeping the audio coded without ever converting it back to analog. All processing and hard-disk storage would be done in the Musicam format to avoid multiple codings and decodings.

Jeff Andrew and Dave Obergöenner took the microphones again to give an update on the Project Acorn DAB system. They reported that in-band, on-channel AM DAB was demonstrated at the spring NAB convention. A temporary AM station was set up outside Las Vegas on 1660 kHz with Acorn digital audio being transmitted simultaneously with the standard amplitude modulation. Obergöenner said that most people who listened to the demo preferred the quality of the AM's digital signal over analog FM. Mobile tests are ongoing for both AM and FM DAB systems, and EIA testing is scheduled for early 1994. Andrew also gave a presentation on how FM multipath was tested in a mobile system in Chicago.

The Tuesday evening session was given by Don Markley, summarizing how RF engineers can stay "out of trouble." Drawing from personal experience, Markley touched on how to draw up contracts for consulting work, avoiding FCC forfeitures, and insurance issues.

The Wednesday sessions began with a talk by John Cummata of Marketline, on the engineer being an asset or an anchor to management. Cummata suggested several ideas for the engineer to be more of a part of the management team at a station. Suggestions included establishing specific areas of improvement, having a "media plan," how to participate in meetings, dress code, how to request and justify expenditures, and the how the engineer portrays his/her "perceived sensitivity to the bottom line."

A humorous role-playing session was held by Steve Brown, Chief Engineer of WLTE-FM, Minneapolis and George Werl, Jr. of Consulting, Inc. in St. Paul. Demonstrating how to manage your consultant, they pointed out potential problems when a station contracts a consulting engineer or programming consultant. Communications between the general manager, chief engineer and consultant are critical so that all parties involved are working with common information. Problems to be solved must be well-defined before starting on the solutions.

Mark Durenberger of Teleport Minnesota spoke on how new technologies are converging: broadcast, cable, telephone, "cellular" television and new satellite technology. Durenberger showed how close we are to services such as "video dial-tone," "video-on-demand" and interactive multimedia. The broadband distribution network is already in place, but the question of how close to the end user does the wide bandwidth have to go remains to be answered. For instance, cable TV is wideband to the user, but the service is only one-way. Cellular services are wireless and two-way, but are narrowband. The new Asymmetrical Digital Subscriber Line system being tested has a high bandwidth from the phone company's central office to the user, but low bandwidth from the user back to the CO. Broadband radio services in the 27-29 GHz band are being explored, providing a wideband cellular service in 6-8 mile diameter "cells." Durenberger quoted Dick Green of CableLabs as saying the information superhighway is inevitable, and noted that information providers will have the greatest advantage.

John Browne, a telecommunications consultant, gave a talk on antenna

considerations for HDTV. Browne asserted that new HDTV systems will require highly increased care in design and installation to give consistent service in the current NTSC coverage area. Presenting a mathematical analysis of gain and loss factors, Browne feels that HDTV peak power requirements will be about 5 dB more than NTSC peak power levels. HDTV antennas will likely need to be low to medium gain with heavy null fill, have a flat frequency response for various depression angles, and have good horizontal circularity.

Broadcast Communications' president Jim Crooks introduced a talk on line sweeping, using both time-domain and frequency domain reflectometers. Doug Hartzell of Riser-Bond demonstrated one version of a portable TDR. Hartzell explained how a TDR is essentially a pulse generator and a sampling oscilloscope, useful for finding faults in transmission lines. For higher frequency work and for locating faults in connectors, an FDR is more appropriate. Fernando Terillio of Marconi demonstrated the operation of an FDR and how it can be used to determine line problems over a range of frequencies (possibly not visible on a TDR).

In an intense talk on transient voltage surge suppression, Jim Harrison of Control Concepts, told how a station should have a power control strategy. Using a facility approach for power control gives the highest benefit at the lowest cost. Harrison quoted statistics estimating losses of \$26 billion in 1991 from equipment damage and downtime in US industry because of transients. By the year 2000, Harrison said that estimates range from \$75-100 billion in losses. A good suppression system includes parallel surge current diverters, series inductance, and parallel RF/EMI filtering before the load. Harrison urged buyers to check manufacturer's claims before installing any suppression devices.

A panel discussion on tower regulations and procedures rounded out the Wednesday afternoon sessions. Joy Wood of Skyline Communications, Scott Nordine of Pederson Associates and Michael Val Dovinos of the Wisconsin Department of Industry, Labor and Human Relations were the panelists. They talked about tower regulations from the points of view of the tower contractor, the consulting engineer (PE), and the State of Wisconsin. Each of these parties is involved in all stages of tower construction and must communicate together well.

SBE Chapter 24 held the Society's first satellite teleconference Wednesday evening. The all-chapter teleconference

featured Chuck Kelly, SBE President, board member Terry Baur, SBE counsel Chris Imlay and National Executive Director John Poray as panelists. Chapter 24 Chairman Leonard Charles was the moderator. Several chapters, including one in Central America, were known to be watching via satellite. Questions for the panel were taken from the floor and from viewers over the phone.

In a late presentation following the teleconference, Mark Persons of M.W. Persons & Associates and Mark Croom, Chief Engineer of WNWC Radio discussed computer applications for radio. Persons touched on the evolution of computer usage, from remote transmitter control to computer-aided schematic drawing. Croom showed how WNWC uses various applications running under Windows, including news wire capture, biblical database, and a personal information manager.

Thursday's sessions were devoted to television. Mark Aitken and Jim Rogers of Comark spoke on IOT transmitter design, using class A amplification throughout the transmitter up to the final amplifier, where class AB is employed. Comark says that IOT transmitters will work well for HDTV operation. Current HDTV transmission schemes under consideration include 32-QAM and 4- and 6-level vestigial sideband (VSB).

How does videotape fit into the transition to advanced television? Sony Corporation's Richard Strauss gave Sony's plan to allow stations a painless conversion from NTSC to 525-line widescreen (16:9) using the existing 13.5 MHz video sampling rate. Stations could originate in 525 widescreen, then both upconvert to high-definition and downconvert to standard 4:3 at 525 lines in the Digital Betacam format.

Dana Myers, who teaches RF courses for Harris-Ailled, gave a mini-course on hybrid directional couplers. Myers explained how a sampling line in a directional coupler with a small coupling ratio evolved into what's known as a 3 dB hybrid. The hybrid is a basic building block for a redundant RF system, being able to combine the outputs of two transmitters into a common transmission line and antenna.

Harris's Mitchell Montgomery then introduced Bob Plonka of Harris, who commented on recent digital HDTV tests. Plonka explained how the Digicipher and Zenith field tests worked, using existing Harris TV transmitters. Conclusions reached in the tests, according to Plonka, were that an NTSC transmitter can be successfully set up for ATV; NTSC test equipment can be used; class AB amplifi-

cation is comparably linear to class A and can be a matter of choice; and, contrary to the paper presented by John Browne on Wednesday, high HDTV power levels are NOT required for equivalent NTSC coverage.

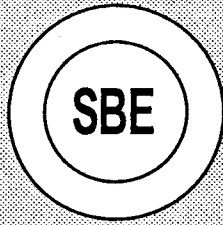
Bill Carpenter of Ampex Corporation gave an overview of Digital Component Technology (DCT), Ampex's cost-effective solution for using the CCIR-601 video format. DCT is aimed mainly at post-production and film-to-tape transfers. Carpenter delved into many products, but mainly spoke on the DCT 700d tape drive's unique aspects including switchable 525/625 line recording, auto-edit optimizing, and its floppy disk drive for machine software updates.

Phil Livingston presented Panasonic's position on evolving technology and conversion to digital video. With future interactive television and entertainment/information services, Panasonic believes that video compression should not take place in VTRs, but in transmission. Livingston referred to this as the "closer to the viewer" rule, saying that more compression is acceptable as the signal gets closer to the end user. Panasonic's D-5 format runs at 300 Mbs, 10-bit samples, and no bit-rate-reduction. It also offers an 8-bit, 18 MHz mode. Livingston also mentioned a consumer tape format being developed jointly by Panasonic, Sony, and other manufacturers, called Digital Video Cassette (DVC). The format will employ 5:1 compression and CD-quality digital audio. DVC could have professional benefits, equal to Betacam or M-II, but he estimated that the format will not be available for three years.

The final presentation of this years Clinic was given by Wisconsin Public Television's Phil Mikalofsky on uplinking digital compressed video (DCV). WPT's satellite uplinks have evolved from standard Ku-band analog video with a 36 MHz bandwidth to a digital system which has an IF bandwidth of only 3 to 4 MHz. Using quadrature phase-shift-keyed modulation, the digital signal is sent on a standard 70 MHz IF to the standard 14 GHz upconverter for transmission. The lower bandwidth results in cost savings, as 10 simultaneous compressed channels can be carried on a single satellite transponder. Since there is no change to the RF portion of the uplink equipment, standard analog transmissions can still be easily made.

Plans are already in the works for the 40th annual Broadcasters Clinic, scheduled to be held November 8-10, 1994.

DECEMBER MEETING and PROGRAM



Society of Broadcast Engineers CHAPTER 24 MADISON, WISCONSIN Thursday, December 16, 1993

Dinner: 5:30 p.m. CJ's Restaurant, 354 Westgate Mall (Whitney Way & Odana)

Business Meeting: 7:00 at WKOW-TV 5727 Tokay Blvd.

Program: 7:30 at WKOW

Research, Development and Implementation of PC-based Audio and Newsroom Automation.

The presenter will be Dan Maney of WKOW-TV and maney-logic. During an informal walk-around show-and-tell, Dan will demonstrate and explain PC, micro-controller, and hardware systems in use at WKOW-TV.

These all involve custom software and circuits devised by WKOW staff or by maney-logic:

- Newsroom cut-ins are automated by a micro-controller controlling set-lights, ON-AIR lights, speaker mute, alerts, and counting talent out.
- Simple **Soundblaster** point-and-click batch file software, and a BBS/LAN allows uploading of audio files.
- Microwave receiver AGC controls audio oscillator pitch to allow truck to peak RF path via communications radio.
- Micro-controller added inside an alarm clock rolls Beta, D2, etc., via RS422.
- Micro-controller STEREO tone generator with left/right channel ID.
- ACCESS data base for audio and video documentation.
- Network VITC decoder locks PC to universal time. PC drives LED displays.

Visitors and guests are welcome at all our SBE meetings!

1994 MEETING/PROGRAM DATES

<u>Date</u>	<u>Topic</u>	<u>Location of Meeting / Dinner</u>	<u>Presenter</u>
Jan. 18, '94	Tues. Antenna Change Out	WMTV / T.B.A.	Rich Wood
Feb. 23, '94	Wed. Telephone Equip. for Broadcasters	WISC / Shakey's West	Stan Scharch
Mar. 31, '94	Thurs. NAB Review		Members
Apr. 26, '94	Tues. Elections and Vender Program		Roscor
May 25, '94	Wed. Advanced Electronics	UW Hospital? / T.B.A.	T.B.A.

Program Committee:	Mark Croom 271-1150	Kerry Maki 833-0047	Denise Maney 277-8001	Steve Zimmerman 274-1234
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