Society of Broadcast Engineers December 1994

1994 Broadcasters Clinic Filled with Technical Insights

by Tom Smith

The 40th Annual Broadcasters Clinic was held on November 8, 9 and 10 at the Holiday Inn Southeast. Despite elections, and other conflicts, turnout was a very good .

Don Borchert opened the Clinic by remarking about the milestone of these meetings reaching its 40th anniversary. Don gave a brief history of the Clinic and acknowledged the attendance of Jack Steele, the founder of the FM Clinic which eventually became the Broadcasters Clinic. The FM Clinic was originally founded in the 50's to help broadcasters during the early development of FM radio. The FM Clinic was renamed the Broadcasters Clinic in the 70's as subject matter was expanded to cover all forms of broadcasting. Don read from brochures of the 1975 and 1976 Clinics to show the changes in subject matter in the last 20 years of the Clinic.

Don then gave an update on the Madison Candelabra project. Steve Terbaar of US West spoke about cellular phones and broadcasting. Steve described frequency allocations, interference problems, and standards for both analog and the newer digital phone systems. He described the newer digital systems that allow for more capacity by the use of greater frequency reuse and spread spectrum modulation. The increased capacity will buy a margin of 10 to 1. The new digital phones will have greater security and allow for direct data transmission. The cost will also increase by about a factor of 10 over the current analog phones.

Next, a discussion of case studies in RFI, shielding, and grounding by Dana Myers of the Harris Corporation. Dana went over the various types of signal interference and the grounding and shielding methods to eliminate interference problems. He presented a number of case studies of interference from RFI and power lines and their solutions. In most cases, increasing shielding of the signal or power line will solve the problem. In one station, its transmitter building had to be wrapped with a copper screen to keep out RF from their own transmitting antenna. Dana also discussed what made a good ground, conflicts between good signal grounding and the electrical code, and the use of dissimilar metals.

A panel on maintenance was presented by Mike Langer, Mike Hendrickson, and Blaine Webster.

Mike Langer of KHFM of Albuquerque de-

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DECEMBER MEETING

Tuesday, December 13

Dane County Public Safety Emergency Operations Center,

115 West Doty Street Room 2107

Dutch Treat Dinner at 5:30 PM The Library Club and Terrace 131 W. Wilson Street

Program promptly at 7:00

Jim Engeseth will show us the new home of the Dane County Emergency Management Office

IN THIS ISSUE

New "Interchangeable" Area Codes Coming

Contributed by Neal McLain
Communication Technologies, Inc.

As previously reported in these pages, "interchangeable" area codes will be introduced in North America beginning January 1, 1995. Interchangeable area codes don't have 0 or 1 as the second digit; hence, they're interchangeable with (and indistinguishable from) central office codes.

As of this writing, 14 interchangeable area codes have been announced. Underscoring the immediate need for new area codes, three of these new codes will go into service during the first two weeks of January: 334 in Alabama, 360 in Washington state, and 630 in the Chicago area.

Several of the new codes will be overlays. Overlay area codes were first introduced as a means of generating new numbers for wireless (cellular and pager) services without forcing current landline users to change area codes. However, it now appears that overlays will be used for new landline numbers ("landline overflow") as well. A primary reason seems to be local political opposition to forced area-code changes, particularly in rapidly-growing areas which have already experienced previous splits.

The table below lists new codes announced by Bellcore as of December 1, 1994. Codes with firm start dates have been formally assigned. Codes with pending start dates have been "reserved," subject to approval by state-level utility-regulatory agencies.

Notable anomalies:

-Depending on the outcome of state-level regulatory proceedings, pending splits in Miami (305) and Atlanta (404) may turn out to be overlays instead. Both of these codes were split recently, and the locals don't want to go through it again: 305 in 1988 (creating 407), and 404 in 1992 (creating 706).

-By the end of 1995, subscribers in three states will have had their area codes changed twice. Central North Carolina started out in 704, then became 919, and recently became 910. Eastern Tennessee started out in 901, then became 615, will soon become 423. Southwestern Florida started out in 305, then became 813, will soon become 941.

-Houston's 281 will remain a wireless overlay for a year or so, then open to landline overflow as well. By the end of 1996, ten-

See Area Codes, Page 3

CHAPTER 24 OFFICERS

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H - 274-0041

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Program Committee:

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

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Sustaining Membership: Fred Sperry

Strategic Plan: Dennis Behr

Special Events: Kevin Ruppert

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November Business Meeting Minutes

Broadcasters Clinic
11/9/94

This year's meeting at the Broadcasters Clinic began with a video presentation by Chris Cain of WISC-TV. He showed an edited version of his documentary on the progress of the Educational Communications Board's Candelabra Tower project here in Madison.

At approximately 8:00 PM Chapter 24 Chairman Leonard Charles opened the business meeting by welcoming the many guests, and having a roll-call of Chapters. There were representatives of at least nine SBE chapters other than Chapter 24. Chuck then provided an overview of the benefits of SBE membership for those engineers present who were not current members of the SBE.

Chuck then presented the awards which were garnered by members of Chapter 24 for 1993. These included the award for Best Regional Conference which was awarded to Chapter 24 for the first annual SBE Teleconference. Paul Stoffel received the award for the Best Chapter Newsletter, and gave a kind acceptance speech in which he thanked all the regular contributors by name, and thanked WKOW-TV and Steve Zimmerman for the use of his station's facilities for copying and folding the newsletter each month.

Chapter 24 Student Members Matt Moammerts, Andy Rothschadl, Kurt Miller, and instructor Tim Trendt received the award for the Best Article by a Student Member.

Chuck then read a brief summary of the history of the National SBE's beginnings in 1964. His material was taken from a thesis written by Brad Dick which described the history of SBE.

Chuck then recalled that this year marks the 25th anniversary of Chapter 24, and he read a memo which essentially is the minutes of the first meeting of the Chapter in 1969. This memo has been placed into a plaque and was given, along with a citation, to Don Borchert, who was the first President of Chapter 24.

After that final presentation Chuck dismissed the meeting, at 8:38 P.M.

Mark W. Croom
Secretary

New Area Code Assignments As Of 12/1/94

DATE	CODE	LOCATION	DESCRIPTION
1/95	334	Alabama, southern	Split from 205
1/95	360	Washington, western except Seattle metro	Split from 206
1/95	630	Illinois, Chicago metro	Overlay on 312 and 708
3/95	281	Texas, Houston metro	Overlay on 713
3/95	520	Arizona, state except Phoenix metro	Split from 602
4/95	970	Colorado, northwest except Denver metro	Split from 303
5/95	941	Florida, southwest except Tampa metro	Split from 813
7/95	540	Virginia, southwest	Split from 703
9/95	562	California, Los Angeles metro	Overlay on 213, 310, and 818
Unknown	456	National	Inbound international
Pending	423	Tennessee, eastern	Split from 615
Pending	770	Georgia, Atlanta metro	Split from 404 (?)
Pending	954	Florida, southeast	Split from 305 (?)
Pending	?	Bermuda	Split from 809

Source: Bell Communications Research; Telecom Digest.

Area Codes, Continued from page 1

digit dialing will be mandatory for all local calls within the Houston metro area.

-California's 562, originally intended as a wireless overlay on 213, 310, and 818, will be used for landline overflow in all three areas codes. This process will begin in 310 and eventually migrate to 213 and 818. Apparently, 310 (which just split from 213 three years ago) is already running out of numbers.

-The area encompassed by an area code isn't necessarily one contiguous area any more: at least two area codes consist of two separate pieces straddling another area code. In Georgia, 706 straddles 404 (Atlanta metro), and probably will continue to do so no matter how the 404/770 split shakes out. In western Washington, 360 will straddle what's left of 206 (Seattle metro) after 206 splits next month.

-The local political situation in Bermuda seems to be working in reverse. Bermuda has requested its own area code, in spite of the fact that its present area code (809, shared with most of the Caribbean) is not running short of central office codes. Evidently, changing area codes is less objectionable than sharing an area code with certain Caribbean nations.

-Area Code 456 has been assigned as an access code for "inbound international calls from outside NANP." I haven't been able to get any more information about what this is or how it works.

Broadcasters Clinic 1994
Continued from Page 1

scribed the changes and problems encountered when doing today's maintenance. Mike said that many manufacturers were no longer supplying manuals with their equipment and that it was getting more difficult to get parts. Many manufactures have discovered a profitable new revenue source when providing service options to the customer. Manufactureres were promoting the fact that they would like to service the equipment they sell. The use of someones time was covered, particularly in the case of the parttime engineer maintaining the station. It may be more cost effective to purchase a piece of equipment instead of building it or repairing it. Mike suggested modifying equipment so it can be serviced quicker. He suggested placing air filters on the outside of transmitters so they can be changed without going off the air and labeling test and adjustment points on circuits boards so you don't have to find or check the manual when making routine adjustments. These and other modifications to equipment could greatly speed-up and ease service. Good record keeping was also stressed. Mike also suggested that the engineer of the future may run a maintenance service much like a medical HMO. The engineer would be contracted to maintain a station for a fee and it is his responsibility to keep it on the air.

Mike Hendrickson of Hedberg Broadcasting asked, "When it is better to fix it or just replace it." With the increase of computers and consumer audio equipment in stations, time spent repairing that equipment may cost more than it would to replace it with a new one. Mike uses consumer CD players and replaces them when they fail. He also keeps spare computer boards and power supplies in stock. The use of anti-static mats and surge protectors also save down time. As another cost saver, Mike suggested the purchase of storm insurance to cover the cost of storm or lighting damage.

Blaine Webster of WLIT-FM in Chicago covered the testing of CD's for error problems. Before putting them on the air, the station tests all CD's using a modified CD player and scope and have found a high percentage to have dropouts or other defects.

Bill Ammons of CRL talked about the potential uses of FM SCA's. Bill gave a number of scenarios on the use of FM subcarriers for the transmission of digital data. He started with a description of RBS services and then went into a proposal for a multi-mode SCA generator that could support a number of analog and data services. He suggested that a station could run a number of SCA services during the day. A scenario given was the operation on a 67 khz music service and a 92 khz narrow band data service during the day with the 92 khz service switching to reading-for-the-blind programming in the evening. At midnight the station would switch to a 76 khz wide band data service. By switching types of services during day, stations could increase revenues on their SCA's. Bill noted that digital subcarriers required lower injection levels and caused less SCA to Main carrier problems.

A panel on digital audio was presented by Don Coulter of Telos, John Schweitzer of WTMJ, and Jeff Andrew of USA Digital Radio.

Don Coulter lead off the panel with a presentation on audio transmission over digital ISDN lines. He described ISDN protocol, standards, interfacing, and audio compression. Services on a ISDN line vary from data to a combination of digital/voice services. It was stated that ISDN is still going through a lot of growing pains and is not available in all areas. Knowledge of ISDN varies among telephone companies employees and it may be difficult to find the someone to help you. Because of these problems ISDN is still not a plug and play service. John described the installation of both ISDN and Switched 56 at WTMJ Radio and at the Bradley Center in Milwaukee. The National Basketball Association set-up a switched 56 network a couple of years ago for backhauls of radio broadcasts among NBA teams. John said it took the phone company technician 3 days to install the first switched 56 line. They have since installed ISDN lines for Major League Baseball and other remotes and it now takes about a day to install. This year WTMJ used ISDN lines to broadcast from the State Fair for ten days and had a minimum of problems. WTMJ saved $2100 from the $2700 that had been previously spent on three 8 khz lines for the fair remote. They now use 1 ISDN line in place of four regular phone lines with frequency extension todo remotes with a savings of over $125 a remote.

The panel concluded with an update by of USA Digital Radio's in-band digital radio system by Jeff Andrew. Jeff played a video tape showing routes taken during tests of both the AM and FM in-band digital systems. The videotapes Hi-fi audio tracks contained audio recorded as the test vehicle followed the test routes. The AM Digital system showed a dramatic increase in fidelity over that of a standard Delco AM radio. The FM Digital System sounded about the same as standard FM radio but broke up less often and less severely than a regular FM radio did in poor reception areas. Tuesday evening finished with a round up of the day's sessions with Steve Terbaar answering many questions on cellular phones for most of the session.

Starting Wednesday's session was a panel discussing the navigation of the 950 MHz auxiliary band. It was conducted by George Werl, a Twin Cities consultant and Steve Brown of WLTE-FM. George went through the frequency search process and stated that the old way of going through the FCC database had many problems as the information had an error rate of 50 to 70%. The SBE frequency coordination program's database has proven better but it is only as good as the information supplied to it.

Steve and George discussed the causes and cures of interference between users. With only 15 frequencies available under normal circumstances and with the use of common tower sites, frequency sharing and good planning is a must. The panel gave a number of causes and cures for interference between users. Among the causes are transmit or receive antennas placed too high so signals can travel a great distance. Antennas should be placed only high enough to meet fresnel zone requirements. The second major problem is polarization which is used by many user's to lessen interference with frequency reuse. It was found that the cross-polarization rejection fell from 29 dB on the antennas main axis to as low as 3 dB form the side or back. Also horizontal beamwidth increased greatly when para-flector type antennas are horizontally polarized. Scatter from obstructions in or alongside the path can be another cause of unwanted signals. Because of its wide bandwidth, digital STL's are subject to fading from high interference to carrier ratios. They stressed the need for good planning and awareness in the construction of STL systems.

Mark Durenberger of CBS/Teleport Minnesota polished up his crystal ball and gave us look into the future of the information super highway. Mark described the future plans of the information and media industries. He quoted many industry leaders and showed diagrams and slides depicting many of the new technologies. Noting that many of these plans are well on the way to implementation, the question is not if, but when, many of these services will become available. This will require broadcasters to redefine how we deliver our product and will cause changes in the way we do business. We will also need to be aware of potential opportunities and determine how best to take advantage of them. Mark concluded that there was a certain amount of hype and that no one knows what will be accepted by the consumer.

After a midday exhibit session, Don Markley presented a demonstration of a number of useful programs for the broadcast engineer. Programs included audio pads, AM antenna design, FM and TV station coverage and STL path analysis. The

DECEMBER MEETING and PROGRAM

Society of Broadcast Engineers
CHAPTER 24 MADISON, WISCONSIN
Tuesday, December 13, 1994

Meeting and Program

5:30PM Dutch Treat Dinner Library Club and Terrace, 131 W. Wilson St. Across Wilson Street from the new Public Safety Building

7:00PM Meeting (Please be prompt) In the new Emergency Operations Center in the Public Safety Building, Rm. 2107 115 W. Doty Street

Parking on the street or in the Doty Street Ramp 1 block east of the CCB. There is also a parking ramp across Doty street from the new PSB which may accommodate public parking in the evening.

Access to the building can be gained off the parking lot on the Wilson Street side of the building. Staff will meet you to direct you to the meeting location.

Program: Jim Engeseth of the Dane County Emergency Management office will be our host. He will show us the new home of Dane County Emergency Center inside the new Public Safety Building (the new Jail).

Visitors and guests are welcome at all our SBE meetings!

UPCOMING MEETING/PROGRAM DATES

Date	Topic
January 19, 1995	New Studio Tour WTDY/WMGN/WJJO
February date TBA	BTS Media Pool Demonstration

Program Committee: Kerry Maki 833-0047 Denise Maney 277-8001 Steve Zimmerman 274-1234 Mark Croom 271-1025

"SHORT CIRCUITS VIA BBS"

NOVEMBER 30, 1994

SBE INTRODUCES TV OPERATOR HANDBOOK

The Society of Broadcast Engineers will publish the "Television Operators Certification Handbook" in early 1995. Co-authors are Fred Baumgartner, CSRE, CSTE, engineering manager of KDVR-TV in Denver and Douglas W. Garlinger, CPBE, of Indianapolis, director of engineering of LeSEA Broadcasting. The Handbook, funded in part by a grant from the Ennes Educational Foundation Trust, will help prepare television operators to handle their day to day responsibilities. It includes basic information and procedures typically used at most stations. FCC rules which apply to all stations and an outline of a typical station operations manual are also included.

Completion of the Handbook will prepare the reader to take a 50 question exam offered by the Society. Successful completion of the exam will earn the candidate certification from SBE as a Certified Television Operator. The Television Operator Certification Handbook can be ordered through the SBE National Office. Pre-publication orders will be accepted through December 31, 1994, at the special rate of $28 each. Beginning January 1, 1995, the Handbook will sell for the regular price of $35. Prices include shipment if within the United States. The price also includes the exam fee.

SBE ANNOUNCES LIABILITY INSURANCE PROGRAM FOR MEMBERS

SBE has developed a commercial general liability insurance program designed for contract engineers. Through Myers-Baker and Company, Inc. in Chicago, SBE has arranged a source of high quality coverage with very competitive rates. Commercial general liability coverage provides protection in the event you are accused of negligence, resulting in bodily injury or property damage to members of the general public during the course of business. Many who are active full or part time contract engineers have sought this kind of coverage in the past, without success. Premium rates will be very competitive. Rates will depend on the amount of insurance limits desired, location of the company and annual payroll level. Those who currently have a policy may find the SBE program to be more economical. Information on the SBE Commercial General Liability Insurance program will be mailed to all members in early December.

Using the postage paid reply card included, members will be able to get an application directly from Myers-Baker and Company. A professional liability insurance program for SBE members is also in the works. Professional liability coverage protects individuals from claims alleging wrongful acts. Contract engineers and those who offer consulting services have expressed interest in obtaining this coverage at an affordable rate. SBE has located a company to provide this coverage and is working now to finalize the details. Its availability will be announced as soon as work is complete.

SBE BEGINS CAREER PLACEMENT REFERRAL SERVICE

In conjunction with Keystone International, Inc., the dominant broadcast engineering employment service in America, SBE members are now able to take advantage of a new service that helps those seeking new employment. Keystone International will evaluate and consider SBE member candidates when looking to fill client (TV and Radio stations and corporate video) needs. There is no cost to the member for this service. Fees are paid by Keystone International clients. The service is completely confidential. To participate, contact the SBE National Office at (317) 253-1640 and ask about the new Career Placement Referral Service for members.

SBE ENGINEERING CONFERENCE ATTENDANCE INCREASES

The SBE Engineering Conference, held in conjunction with World Media Expo in Los Angeles, experienced a 23% growth in attendance over the Conference held in 1993. Full Conference registrations were up 32%. Attendees came from all over the United States and from Mexico, Korea, the Philippines and Germany. Watch for the November/December SIGNAL for a complete rundown on the Conference and Expo.

Thanks to Paul Stoffel for editing these items

Excerpts from

THE BROADCAST NEWSLETTER

Chapter 28, Milwaukee

Terry Baun, Editor

Chapter 28's November meeting was the long-awaited tour of the brand new 50 KW WTMJ transmitter plant near Union Grove. The new 50 KW signal should be on the air toward the end of this year. Congratulations to Wil and the WTMJ crew, and thanks for being such good hosts! The appeal of this program resulted in near-record attendance, with members from Madison, Chicago, and Fox Valley in the audience.

Digital technology is making its way into the Emergency Broadcast System (EBS). In early November the FCC required broadcasters to begin replacing today's EBS technology with an "Emergency Alert System" (EAS). The new system, the commission said, will include several changes aimed at boosting the speed and efficiency of disaster warnings. Features will include a digital architecture allowing broadcasters to send and receive alerts. The digital technology also will allow for weekly tests inaudible to viewers and listeners. In addition to the "unobtrusive" tests, the new rules call for a monthly on-air test lasting at least eight seconds.

The revised system also requires broadcasters to monitor at least two sources for alerts and allows for the transmission of alerts in languages other than English. The commission is requiring radio and TV broadcasters to replace their gear with EAS equipment by July 1, 1996. By July 1, 1995, stations will need to modify their current equipment to decode the eight-second version of the present EBS tone.

The new rules also require cable participation, a provision mandated by the 1992 Cable Act. Because of cable's newness to the system, the FCC is granting the industry an extra year to install the equipment. The commission is inviting information on how to define smaller cable systems and whether such systems should be exempt from the new rules.

From Broadcasting&Cable Magazine, 11/14/94

Young Broadcasting, Inc. has completed the acquisition of WBAY-TV (2) In Green Bay from Nationwide Communications, Inc. WBAY becomes the second of Young's Wisconsin properties, including WKBT-TV (8) in La Crosse.

Special thanks from your Chapter 24 Newsletter editor to each member who worked to make this month's newsletter possible. For 2 months in a row we have had to produce it early, and you have all been just great in rising to the need. I couldn't do it without you!

Thanks again,

Mark Croom

handout for Don's presentation was a floppy disk of the programs demonstrated. The next two presentations were on the NRSC compliance for AM radio stations.

Greg Buchwald of Motorola explained the results of the NRSC bandwidth rules. First, he showed overheads to illustrate the effects on bandwidth during modulation, including clipping and overmodulation. All clipping and audio processing should occur before the NRSC filter and all clippers in the transmitter should be disabled. Greg then showed pictures of the occupied spectrum of WMAQ, WGN and WBBM before and after the standard. Before the filters were required, the station's sidebands filled the 30 khz space between them. After the filters were installed the station's had very sharp skirts at 10 khz from their carriers. It is now possible to hear distant 2nd adjacent stations.

John Bisset made a presentation for Delta Electronics on using the Splatter Monitor and compared it to the use of a spectrum analyzer in measuring NRSC compliance. Both Greg and John stated that there was some vagueness in the FCC rules. They both found that it is difficult to do the measurements at 1 km from the antenna to do noise and interference measurements from other stations, including carriers from stations in the RF mask. Both suggested doing baseline measurements at the output of the transmitter before doing the 1 km field measurements.

Selecting and supervising a tower crew was the subject of a talk by Jim Wilson of LDL Communications. He described the differences between tower erectors and tower maintenance crews and the equipment that each requires. Tower erectors require heavier equipment and tend to travel large areas. Maintenance crews are usually equipped lighter and are more local. Jim stressed the need for all crews to be properly insured and that they follow all OSHA rules including RFR rules. Make sure the crews you use are professional and have high work standards as you probably will not inspect their work at several hundred feet above the ground.

Thursday's sessions were devoted to television with Jan Pritzel of WMVS/WMVT and Ben Evans of Ralph Evans and Associates leading the day with a tour of the proposed Milwaukee Teleport. Jan gave the history of the Channel 10 and 36 transmitter sites. Their first 2 sites were shared with Channel 6. WMVS/WMVT's current site is shared with Channel 18 and a number of FM's. Ben covered the Milwaukee Teleport which is proposed to be a multi-station site with both NTSC and ATV transmission facilities for a half-dozen TV stations, multi-station FM with common antenna, ITFS/MMDS transmitters, cellular and 2-way facilities. It would be built by a consortium, with common ownership of the site and equipment and built as a turnkey project. The stations would lease back there facilities and have them serviced by a contracted pool of engineers. A KU-band uplink, a microwave and fiber switching center, and a possibility of a studio facility is proposed. The advantages of the Teleport: it would be easier to site one tower as ATV facilities are needed with reduced aviation hazards; there would be less environmental impact; greater access to programming sources; a sharing of costs and maintenance. This would leave the stations engineering departments free to do greater programming support.

Bob Long of Dynatech talked on the Revolution in the Newsroom. He told of the current status of newsroom automation as it having developed from a word processing and database system built around a central computer to a total newsroom automation system. From a system that supported script writing, newswire editing and filing to a system that now supports these functions plus e-mail, teleprompter and closed captioning, rundowns, assignment schedules and automation logs for production equipment control. Newer systems will be able to do still file searches, character generator composition and, in the near future, off-line non-linear editing. They have found that camera and teleprompter control is not practical. Bob also mentioned that they have installed systems in a Berlin, Germany TV facility that had been the secret police headquarters, and in a Moscow building that was a deportation center to the Soviet Gulags.

Two sessions on Thursday covered the results of the over the air ATV tests in Charlotte. John F.X. Browne of John F.X. Browne and Associates and Mark Aitken of Comark gave separate reports on the tests. John gave the history on how the current reception standards were developed from which the FCC based the TV service contours. With a digital signal, there is only one service grade. Either it is here and good, or it is gone. The test determined that a digital signal needed a lower carrier to noise ratio than a NTSC signal so it gave a usable signal in more of the reception locations. The quality of the digital test signal was based on bit error rate. They started the test with the digital transmitter peak output at 10 dB lower then the NTSC signal. During the test it was determined that the digital signal peaks needed to be 1 dB higher than the NTSC to get the same coverage.

Mark Aitken reiterated the test results and described the transmitter used. A Comark transmitter was used for both the NTSC and digital tests. It was a 40 kw common mode transmitter with an EEV 60 kw IOT. The driver operated in a class A mode. The test also indicated that the proposed VSB system is more tolerant of transmitter linearity problems than the QAM systems. Mark stated that IOT and tetrodes will give the most linear operation and efficiencies needed for digital transmission. More tests will be run to evaluate co-channel interference, indoor antennas and directional transmit antennas.

Joe Zula of Dielectric described a multi-channel NTSC/ATV ready antenna system they recently installed. Maryland ETV needed to replace an aging antenna at one of their stations and determined that it should operate on both its current NTSC channel and on any of the proposed ATV channels for their area. Dielectric had an Italian partner build a 16 level panel antenna with 2 elements in each panel. There was a total of 48 panels on the 4 faces of the antenna. Dielectric then optimized the antenna in the US so it was flat across the UHF band with special attention to the 4 channels of interest to Maryland ETV. Joe also showed slides of the new antennas for WISC and WHA that will be installed on the new candelabra tower.

Gary Stephens of Leitch gave a primer on digital signal processing including the causes and correction of jitter. Jitter is caused by noise and crosstalk in signal transmission and instability of reference signals. To correct the signal it needs to be re-equalized and regenerated by either reclocking, reslicing or buffering and reclocking through a memory device similar to a TBC. Gary also stated that some computer-based equipment have jittery outputs do to the use of genlock circuits that have long been discontinued by broadcast manufacturers. As we move from analog to digital, it seems we trade one set of problems for another.

Burt Young of BTS introduced the Media Pool Video Server. The Media Pool is designed for both on-air and production use. It currently consists of a 4 input/output with 4 audio channels each. Each channel is controlled by a RS-422 port that follows Sony

See Conclusion, Page 7

Why Technology Doesn't Matter— Broadcast Engineering Becomes Media Technical Support

Excerpts from a luncheon speech made by Terry Baun, SBE National Vice President, to Madison Broadcasters Clinic attendees on Tuesday, November 8, 1994.

Edited by Paul Stoffel

Back in the those good old days, broadcast engineering was a rock; it was perhaps the only position in broadcasting that promised and delivered the kind of job security that our brothers and sisters in the industry could only dream about. The federal government told our managers and owners that we were not only useful, but NECESSARY to the legal operation of their stations. Then a funny thing happened to that definition of our profession about ten years ago. It went away. You and I have new job description now—one that is far more broad and far more challenging than the old one. We now spend more time planning for and installing equipment than fixing it. We now spend even more time training folks to use equipment that formerly was hands-off to everyone except engineers. We're more eager to network with other engineers about how to get the job done rather than hiding our handiwork from each other. And we spend more time maintaining and managing the internal telecommunications systems within our broadcast plants. We are getting out of the broadcast engineering business and into the communications management business. We are being asked to expand our horizons and do the two things that traditionally engineers were never accused of: being good business people and embracing change. You might think of the transition like this: We were broadcast engineers...We are now broadcast technology managers...We are becoming media technical support managers.

Whether you are a staff engineer, a Chief, a Director of Engineering, or a contract engineer, you are in the business of managing media and communications technology profitably and efficiently. By taking the time to seek out new and better ways of doing your job, learning more about the technologies you work with now and in the future, you are preparing to better serve your customers—the people who actually give up time or money to be entertained and informed by the organizations you work for. I say that this can be a great business if we learn how to work with managers and help them solve their problems. Think how valuable a engineering department can be when it plays an important role in holding down costs and providing non-sales revenues. YOU be the one to make engineering budget adjustments. Part of your new job as a technical manager is to show your superiors that what you do is vitally important to the fiscal health of the broadcast enterprise. It is important that you not only be on the management "Committee," but also be part of the management TEAM.

We as broadcasters must not fail to see the larger picture of media and data transmission and find our place within it. This new media technology is based upon the efficient use of data transmission systems. [It] is important [to attain] a basic comfort level when using PCs, modems, and data transmission technology. The future success of our careers as media technical support managers will be determined by our overall vision of the transmission process. In the future, you are far more likely to have a Local Area Network Analyzer in your tool kit than a Simpson 260. You are far more likely to spend more time on the phone and fax getting equipment repaired than in the shop actually using a soldering iron. Board swapping will become the standard repair procedure. What becomes critical then is having the knowledge of what spares to keep on the shelf. You are far more likely to be working with Ma Bell, the Cable companies, and satellite folks as equal partners in an enterprise rather than as vendors (or worse yet, competitors).

Get to know other technologies and other technicians. Your ability to respond quickly to requests for technical information will be valued. You will be the resource called upon when decisions need to be made about technologies that are to be purchased. Our business is the business of data transmission. Our business is, and has always been, getting data to the customer. We just thought of it as "radio" or "TV." In the future, that will change. One of the striking aspects of broadcast television is that it caught on so fast and reached its heyday so rapidly. Now imagine combining television with aspects of multi-media education, two way communication, interactive video, and home shopping and voting—and guess how long it will take before a PC-based media center is a majority of US living rooms. And when we are in charge of the transmission plant whose "receiver" is a PC, just what business will we be in?

The changes in our industry, while coming at a rapid pace, still do not obsolete the basic analytical and troubleshooting skills that we all depend upon every day. Ohm's law remains Ohm's law, even in a digital universe. Electrons in motion will still represent the core of our industry. But we must remember that our engineering tasks involve more than just directing those electron flows—we need to be thinking of new ways in which to manage those systems to be even more efficient conveyors of the information that is our core business. Technology doesn't matter. But our attitude most certainly does.

WANT TO BE CERTIFIED?

HERE ARE THE 1995 EXAM DATES

The SBE Certification Exam schedule for 1995 offers four opportunities to take an exam. The first will be during the NAB Spring Convention in Las Vegas on April 11. The Spring exam period in local chapters will be June 9-19. The SBE Engineering Conference and World Media Expo in New Orleans will be the next opportunity with the test date set for September 7. The final period for 1995 will be in the local chapters November 10-20. For information on how to become SBE Certified, contact Jim Hermanson, Chapter 24 Certification/Education Chairman, at (608) 836-8340, or call the SBE National Office.

From the SBE National BBS

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

Leonard Charles is the editor for the Electronic Version of this Newsletter uploaded monthly onto SBE Chapter 24's BBS.

Broadcasters Clinic, Conclusion

protocol and will support SMPTE ES-BUS, Ethernet and Ethernet 422. The Media Pool will eventually support 32 inputs/outputs and editor controller manufacturers are writing software for it. It also supports variable playback. The Media Pool allows access to any drive by any channel at all times. This allows the use of the same video by multiple users at the same time. The Media Pool uses either 8 or 10 bit video and follows CCIR 656/SMPTE 259E standards with or without compression. The compression mode operates in DCT with constant bit rate and is user selectable from 2/1 to 30/1. The basic unit has seven 9 gigabyte drives in a raid 3 format and will store 40 minutes of uncompressed video. Storage can be increased by adding drives or compressing the video to get up to 4 1/2 hours of uncompressed video or up to 160 hours of compressed video. The Media Pool is a good example of allowing the merging of the new and existing technologies for maximum flexibility. In closing, Don Borchert announced the future dates for Broadcasters Clinic 1995, November 14-15-16. See you next year!

SBE INTRODUCES TV OPERATOR'S HANDBOOK

From the SBE National BBS

The Society of Broadcast Engineers has announced it will publish the "Television Operator's Certification Handbook" in early 1995. Co-authors are Fred Baumgartner, CSRE, CSTE, Engineering Manager of KDVR-TV in Denver and Douglas W. Garlinger, CPBE, of Indianapolis, Director of Engineering of LeSEA Broadcasting.

The Handbook, funded in part by a grant from the Ennes Educational Foundation Trust, will help prepare television operators to handle their day-to-day responsibilities. It includes basic information and procedures typically used at most stations. FCC rules which apply to all stations and an outline of a typical station operations manual are also included. The Handbook will prepare the reader to take a 50 question exam offered by the Society.

Successful completion of the exam will earn the candidate certification from SBE as a Certified Television Operator. When prepared to sit for the exam, the candidate will request the exam from the SBE National Office. Exams can usually be arranged to be taken in your local area. The Television Operator Handbook can be ordered through the SBE National Office. Pre-publication orders will be accepted through December 31, 1994, at the special rate of$28 each. Beginning January 1, 1995, the Handbook will sell for the regular price of $35. Prices include shipment if within the United States.

The price also includes the exam fee. The exam must be taken within one year of purchase of the Handbook. Jim Hermanson, Chapter 24 Certification/Education Chairman, has some special price order forms for the new handbooks. Contact him at (608) 836-8340, or contact Linda Godby at the SBE National Office.

Cable Television Pioneer Dies

Milton Jerrold Shapp 1912-1994

Contributed by Neal McLain Communication Technologies, Inc.

Milton Jerrold Shapp died of Alzheimer's Disease on Thanksgiving Day, at age 82. Shapp was Governor of Pennsylvania from 1971 to 1979, and ran unsuccessfully for President in the 1976 Democratic primaries.

Shapp was the founder of Jerrold Electronics Corporation, known today as the Jerrold Division of General Instrument. Jerrold is a major supplier of headend and distribution equipment to the cable television industry, and an industry leader in the development of CATV distribution products. Among its credits are the first strand-mounted cable-powered line amplifier, and the first line amplifier to use push-pull circuitry.

The introduction of push-pull circuitry was a major milestone in CATV amplifier technology. By greatly reducing second-order distortion, this amplifier made it possible for cable operators to use the so-called "midband" spectrum between the FM Band and Channel 7. To this day, cable channels 14 through 23 occupy the midband.

Locally, TCI's Madison system and Crown's Fitchburg system both use Jerrold's "Starline 20" line of push-pull distribution equipment.

I once attended a meeting of the Philadelphia Cable Club at which Shapp was the honored speaker. In his speech, he related a story about one of his first "cable" systems. I have forgotten the details, but the story goes something like this: an association of furniture manufacturers was holding an exhibition in Atlantic City. Since there were no television stations in Atlantic City at the time, television-set manufacturers had nothing but snow in their exhibit booths. Shapp came to the rescue: Jerrold built a distribution system to distribute Philadelphia television stations to the exhibit floor.

CHAPTER 24 SUSTAINING MEMBERS

Our latest renewals:

WISC-TV 3
WKOW-TV 27

Thanks to all our Sustaining Members:

BTS
Broadcast Communications
CTI
Clark Wire and Cable
Comark Communications
Dynatech Video
Electronic Industries
Emmons Associates
Fuji Film I&I
Harris Allied Broadcast
Maney Logic
MRC Telecommunications
Panasonic Broadcast
Roscor Wisconsin
Scharch Electronics
Skyline Communications
Sony Broadcast
Tectan, Inc.
Teleport Minnesota
The Tape Co.
Video Images
WMSN 47
WMTV 15

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SBE Chapter 24 Newsletter
34 Rustic Parkway
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Greetings 29 USA

FIRST CLASS MAIL

Happy Holidays!

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