the SIGNAL

BIMONTHLY PUBLICATION OF THE SOCIETY OF BROADCAST ENGINEERS

OCTOBER 2008

Volume 21, Number 5

Have you visited us on the web yet?

www.sbe.org

Thomas re-elected SBE President

Four will serve on Board for first time

Running unopposed, SBE President, Barry Thomas was re-elected for a second one-year term that will begin on October 15. Results of the annual election of national officers and directors for the Society were tabulated by a board of tellers consisting of SBE members from Chapter 25 in Indianapolis, Ind.

President
Barry Thomas, CPBE, CBNT

Vice President
Vinny Lopez, CEV, CBNT

Secretary
Ted Hand, CPBE, AMD, 8-VSB

Treasurer
Ralph Hogan, CPBE, DRB, CBNT

Thomas is Vice President of Engineering – Radio for Lincoln Financial Media in Atlanta, Ga. and has been a member of the Society since 1986. He has served on the national Board for eight years during two stints of duty. He is active with SBE Chapter 5 in Atlanta.

See **ELECTION** *on page* **12**

SBE National Meeting October 14-15

Chapter 24 of Madison, Wis. will host the 2008 National Meeting of the Society of Broadcast Engineers in conjunction with the Wisconsin Broadcasters Association (WBA). The event will take place October 14-15.

The National Meeting will be held in conjunction with the annual Wisconsin Broadcasters Clinic, a three-day event that features broadcast technical presentations for radio and television engineers and a broadcast equipment expo. Chapter 24 and SBE National invite any and all SBE members and others interested in broadcast technology to attend.

The SBE National Meeting and Expo will be held at the Madison Marriott West Hotel, located in Middleton, Wis. on Madison's west side. The Madison Marriott West Hotel address is 1313 John Q Hammons Drive, just off Highway 12 in Middleton, Wis. and just minutes from downtown Madison and the University of

See **MEETING** *on page* **20**

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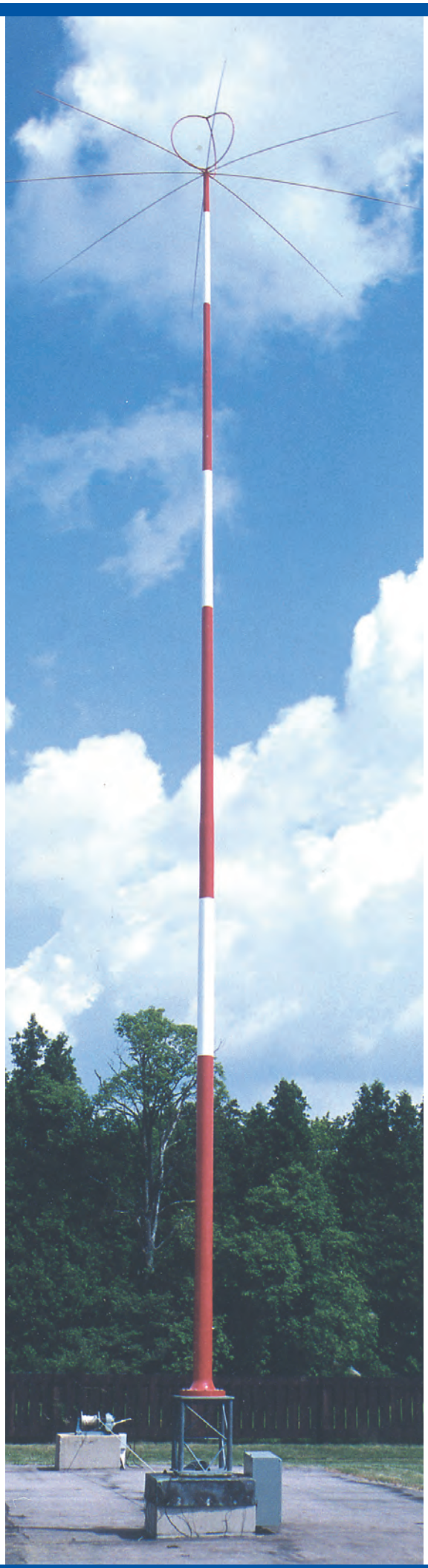

Free Standing AM Broadcasting Antenna

FCC Media Bureau Adopts Simplified Application Procedures for AM Nondirectional Valcom Antennas

By this Public Notice, the Media Bureau ("Bureau") announces simplified procedures for AM station construction permit applications which specify Valcom antennas. Based on its review of the Valcom field tests and internal reports submitted to the Commission for evaluation, the Bureau announces that it will not routinely require the submission of a proof of performance, current distribution measurements, or a formula for the vertical plane radiation characteristic for nondirectional AM facilities which utilize these antennas.

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Tune in to SBE National Webcast October 13

For a second consecutive year, SBE will conduct a one-hour national web-conference on Monday evening, October 13. The program will begin at 8:00 pm EDT (5:00 pm PDT) and emanate from the facilities of Wisconsin Public Television in Madison. The program will feature SBE President Barry Thomas, Vice President Vinny Lopez and other national leaders of SBE. Viewers will be able to submit questions during the program.

The program will also be available via satellite. Log-in information and satellite coordinates will be available after October 1 at the SBE website, www.sbe.org. Chapters may want to consider making this event their chapter meeting program for October. Save the date!

SBE Partners with NAB on 2009 Engineering Conference

For the fifteenth consecutive year, the Society of Broadcast Engineers will again be the organizing partner with the National Association of Broadcasters for the upcoming NAB Broadcast Engineering Conference (BEC) at the 2009 NAB Show. The 2009 event will be held in Las Vegas from April 18-24.

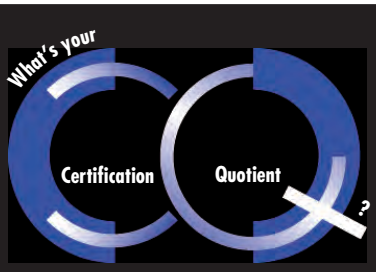
SBE and the Ennes Educational Foundation Trust will be presenting a full-day Ennes Workshop to kick off the BEC on Saturday, April 18.

Lew Zager, President of LZ Solutions and Ennes Trustee, Fred Baumgartner, CPBE CBNT, are organizing the Ennes Workshop. Attendees of the PBS and NPR Engineering Conferences will have the opportunity to attend the Ennes Workshop in 2009 as the final day of their respective technical conferences. To attend the Ennes Workshop during the BEC, you must be registered through NAB for the full Broadcast Engineering Conference.

Watch for a complete program description in future issues of The SBE Signal and at the SBE website, www.sbe.org.

A nine member committee is working to plan the six-day Broadcast Engineering Conference. They include Joe Snelson, CPBE (chairman), Meredith Broadcasting Group; Dom Bordonaro, CSRE, Cox Radio Connecticut; Michael Cooney, Beasley Broadcast Group; Michael Doback, CPBE, E.W. Scripps Station Group; David Folsom, Raycom Media, Inc.; Thomas Hankinson, ABC Network; Andy Laird, Journal Broadcast Group; Glenn Reitmeier, NBC Universal; Jeff Smith, CEA, CBT, CBNT, Clear Channel Radio – New York City;

Registration and hotel information will be available at the NAB website.



Q: The OSI layer beneath the Presentation Layer is:

A) Application

B) Session

C) Physical

D) Network

Question taken from SBE CertPreview. Turn to page 21 for the answer

SBE provides teamwork, strength and professional support system

BY **Barry Thomas, CPBE, CBNT**
SBE President


barryt@sbe.org

This issue I'm going to be uncharacteristically brief. Many of you may be aware that I've recently been faced with some health challenges. Quickly, for those that might not be aware: Last month I required fairly drastic surgery to mitigate damage from a type of cancer. I am recovering very well from the surgery; am back at work and will be facing the balance of my treatment very soon. I'm encouraged by my prospects and expect to be around for a while.

I have a couple of reasons for highlighting this: One reason is to point out the excellent mechanisms our Society has for making sure things get done. We have a dedicated and gifted national staff led by our Executive Director, John Poray who take care of the day-to-day issues of running the Society. Many decisions however lie with the elected leaders of the Society. In my case, once I discovered that I might be unavailable for a short while during surgery and recovery, I discussed the issue with John, our Vice President Vinny Lopez, and our Immediate Past President Chriss Scherer. I asked them to take a bigger role in a few projects I was working on and requested they be available in case I needed extended assistance. As it turned out, the best outcome was realized and I was able to resume work (mostly by email) within days. If I was further incapacitated, the role of President would, of course, fall to the Vice President but organizations like this work best when we're a team. I always depend on the advice and assistance of our Executive Committee, our Immediate Past President, and our Executive Director. For this reason, all of our efforts would have continued without significant impact if I could not drive them. This is teamwork!

This needs to be a model for how our chapters should run! It's typical that chapters are dominated by a single person who has the dedication to actually administrate the chapter. I want to encourage all of you to take an active hand in your chapters…take on even a small job, and communicate among the leaders often. This will help the chapter grow, reduce the extreme time commitment required by individuals, and will help insure the chapter will operate normally if for any reason the "kingpin" is not available. It will have the side benefit of helping avoid "chairperson burnout" which has been the demise of several chapters. The work we're doing as a society is much greater than any individual. We want to make sure our efforts aren't dependent on single individuals but on our group strength.

I have another reason for bringing up my recent health issues: I've referred to the "strength in numbers" that the SBE offers; combining your participation with that of 5,600 of your colleagues to make our industry better. This "strength" has another, much more personal impact as well. As the symptoms that required my surgery peaked; word spread like wildfire through the SBE channels. As a result, I received assistance, support, and encouragement from colleagues all over. I'm not referring to cursory emails and calls to the "SBE President" but honest and heartfelt demonstrations of support given by talented and gifted colleagues I've met through my work in the Society. People I've been able to work with from chapters all over the US! My family and I received calls, visits, gestures of assistance from all over and I found out about groups across the nation who held me in their prayers! Even if you do not believe in the power of prayer and regardless of your faith, you cannot deny positive affects of colleagues who show their concern and support. I certainly gained from it. This outpouring was enormously therapeutic. It helped me regain strength through determination to work with all of you again as quickly as possible and to regain my health quickly enough to see you again at the national meeting. As of this writing I am planning to be fully involved in our meetings in Madison as well as in our 2nd National Webcast. I have made an effort to individually thank all of you who showed support but I want to collectively do that as well. I also want to recognize that this support system is largely in place because of the incredible opportunities provided through the SBE: Opportunities to network, to assist, to learn, to befriend. This was an invaluable, if somewhat intangible benefit to my active participation in the Society. The SBE provided for me a built-in PERSONAL support system.

This circumstance also reminded me of a number of incidents over the years. A couple of times since I've been involved with the SBE, I have encountered a contract engineer member who was stricken with a health crisis. In those circumstances there are at least two victims: the broadcast engineer, who is facing a loss of income through an inability to fulfill his or her obligations, and the engineer's customers who invariably have technical problems that need to be addressed.

See **PRESIDENT** *on page* **13**

Ennes Trust makes substantial contribution to SBE Education Effort

Of all the things the SBE has done, and needs to do, an earnest educational effort is by far the most demanding undertaking. It will take focus, dedication, leadership and frankly, more resources than we have on hand. It will take grants, donations and funds from related budgets and accounts.

The trustees of the Ennes Educational Foundation Trust meet regularly; and this year has done something that they have wanted to do for some time. They have contributed $10,000.00 from the Trust to the Society of Broadcast Engineers to be used for the expansion of its educational program. In addition, they have pledged access to additional funding, as needed, to provide the seed monies for the most ambitious educational effort undertaken by the SBE.

Doubtless, since you are reading this, that you attached yourself to the SBE sometime ago to advance the profession both in the larger world and within yourself. Undoubtedly, the SBE has constantly matured in that duty. It is almost hard to believe that there once was no certification program, no publications, no employment services, no mentoring, no student program, no school affiliations, no scholarships, no Ennes at NAB or road shows… but there was never a day when broadcast engineers didn't know that the very professionalism of this vocation depended on education. The first fledgling mimeographed SBE publications were all about training and sharing know-how. The first recognitions the SBE awarded were and continue to be for labors in instruction. Battison, Wulliman, Ennes and the many that followed, came from and worked vigorously to improve the instruction and opportunity in our industry.

The Ennes Education Foundation Trust is a non-profit organization that operates with close ties to the SBE and is chartered principally to support education and scholarship. Since its inception, the Trust has allocated funds yearly to a scholarship committee who has awarded dozens of deserving students with a primary interest in broadcast engineering. The Trust has also funded SBE publications and educational programs over the years. Following the World Trade Center disaster, the Trust collected funds and distributed over $250,000 to the families of the six broadcast engineers lost.

The Ennes Trust operates on donations from chapters, sustaining members, individuals and other contributions and investment income. The Ennes Trust has trivial operating expenses (mostly postage and printing), but it also has been low key in asking for additional funding, which comes mostly from SBE members supportive of the Trust and close to its causes. Being a Trust, a portion of donations is directed at investments and the revenue in turn is directed to educational projects. In a typical year, between 5% and 10% of the Ennes Trust is allocated as the trustees weigh the long and short term conditions and needs. This grant is exceptional.

Much has happened within the SBE along the lines of education; almost entirely on a volunteer and unfunded basis. But there is a limit to how far any initiative can grow with such limited resources. By releasing this funding and seeking to gather more, the Ennes Trust is doing exactly what it is supposed to do, and that is support the professional educational efforts of the Society.

Like most endeavors; the critical costs come up front. Like other undertakings; there comes a point where resources can best be utilized. In the opinion of the Ennes Trustees, that time is now. Keep in mind that the Ennes Trust is separate from the SBE; though its purpose is to support the SBE's educational efforts. The trustees do not set policy or exert any other control other than to husband the Trust funds, allocate them in the most effective manner we can, and do so with proper checks and balances. So, this is unusual too, in that with this action, we are sending a note of support and encouragement to the SBE Board to continue to apply the Society's resources to this effort. We presume also to send a message to the profession in general, that we believe that now is the time to step up to the education initiative and follow the SBE board and education committee's lead and take it to the next level. We believe that for the profession and the future of broadcast engineering, there is nothing more important than taking this course.

We, the Ennes Trustees, are grateful for and much impressed with what the Education Committee, chapters and the SBE Board has accomplished with little, and look forward to supporting the cause in the near future.

The Ennes Trustees:
David Carr, CPBE, 8-VSB
Doug Garlinger, CPBE, 8-VSB, CBNT
Fred Baumgartner, CPBE, CBNT

cimlay@sbe.org

Wireless Microphones at 944-952 MHz; SBE's View

BY Chris Imlay, CBT
SBE General Counsel

The inevitable fallout of the reallocation of television channels 52-69 (698-806 MHz, commonly known as the "700 MHz band") for public safety and commercial broadband use has been a severe reduction in available spectrum for Part 74, Subpart H Low Power Auxiliary (LPA) operation. This in turn has spawned a scramble for spectrum on which licensed wireless microphones and other LPA facilities can operate. There are presently no good solutions to this problem, and the FCC has not, to date, proposed to allocate any replacement spectrum for LPA operation. There are, however, some really bad solutions being pursued and implemented by certain equipment retailers and leasing companies.

Indeed, the FCC has, as the result of requests from public safety organizations and others, recently awakened to the fact that there are many hundreds of illegally operated wireless microphones in regular use. The problem is akin to the unlicensed CB radio problem in the 1970s: the FCC has absolutely no ability to enforce the Communications Act or its own rules, which require licenses for Part 74 wireless microphones, because the magnitude of the unlicensed, unlawful operation far outstrips the enforcement resources of the Commission. This fact, which broadcast engineers have known about for many years (because their legal, licensed and coordinated LPA operations have been disrupted by illegal, unlicensed wireless microphones operating unpredictably) has been brought to the Commission's attention by public safety entities and others. Now, at the eleventh hour before the DTV transition date, the FCC has finally proposed in WT Dockets 08-166 and 08-167 to prohibit, after the end of the DTV transition, the operation of any LP Auxiliary facilities in the 700 MHz band, and as well the manufacture, sale, importation, or marketing of LP Auxiliary devices that operate at 700 MHz. In an order accompanying the NPRM in that proceeding, the FCC already imposed a freeze on all new 700 MHz LP Auxiliary applications. It is a simple matter to see that the compression of all LP Auxiliary facilities, and especially wireless microphones ("WMs") into the television broadcast channels below 698 MHz is extremely likely, if not inevitable, after February 17, 2009. This, coupled with: (1) the Commission's relentless effort to permit so-called "white spaces" devices in those same remaining television channels; (2) the migration of Class A and LPTV facilities into those same channels; (3) the failure of the FCC to provide or even propose any replacement spectrum for licensed LPAs at all; and (4) the exceptionally large volume of unlicensed (and unlawful) operation of Part 74 WMs, makes the situation far more challenging than even the most dedicated SBE frequency coordinator could handle without spectrum conflicts.

The response of some vendors of LP Auxiliary WMs to this challenge has not been at all encouraging. Manufacturers are producing and selling WMs that operate in the 944-952 MHz Aural Broadcast Auxiliary Services (BAS) band. This, they are perfectly entitled to do. Section 74.802 of the Commission's rules permits broadcast licensees and broadcast networks to operate LPA devices including WMs in the 950 MHz Aural BAS band. However, it is only broadcast licensees and broadcast network entities that can use this band, cable television operators, motion picture producers and television program producers are not eligible to use any BAS band for LPA operation except unoccupied television channels.

The problem, though, is that retailers and dealers of equipment of even the most scrupulous manufacturers have actively marketed these products to ineligible entities, and their marketing has been accompanied by serious misrepresentations and lack of candor regarding the obligations of users of the devices. Of course, there is no point of sale control of radio transmitters. The FCC has never imposed such. That is precisely why a lot of church choirs, theaters, hotel conference rooms, schools, and just about anywhere there are performing arts, have all acquired LPA WMs (most perfectly innocently, unaware of any regulatory and licensing obligations imposed by the FCC). Neither are there clear marketing restrictions in the equipment authorization rules of the Commission that apply to retailers or leasing companies.

Recently, a company called Location Sound Corp., in their publication called The Production Sound Report for Summer/Fall 2008 carried an article called "Important RF Spectrum News." The first two paragraphs of this article read as follows:

Lectrosonics and other professional quality wireless microphone manufacturers such as Shure and Sennheiser are now delivering new RF products designed to operate in the 944 MHz broadcast range. This little known area of UHF spectrum is, for the most part, wide-open and available for production use.

Most UHF wireless microphones in the United States are manufactured in the Part 74 broadcast bands, from 470 MHz -806 MHz. Part 74 is the FCC regulation section that assigns this spectrum for broadcast and motion picture production. There is, however, a lesser known chunk of Part 74 between 944 MHz and 952 MHz – an 8 MHz band also known as the STL (Studio-to-Transmitter Link) (sic). Little used and unaffected by the DTV changes, this band is allowed for production use under the same regulations as the regular UHF wireless microphones.

The article goes on to describe the 944-952 MHz band as "largely unused" and "less crowded than the UHF TV band." The 950 MHz Aural BAS band is, effectively, being portrayed as an available band for anyone to operate displaced wireless microphones that will have to vacate 700 MHz. In fact, the article recited an instance of an installation by Location Sound Corporation of 944 MHz Sennheiser transmitters at a show at Universal Studios.

SBE, as readers of this column well know, advocates the interests of licensed users of BAS spectrum and provides volunteer BAS spectrum frequency coordination. The active marketing, sale, or

leasing to ineligible or unlicensed persons, or the operation by those persons of LPA WMs is in SBE's view a huge step in the wrong direction.

Why is this? A recent check by SBE showed that the ULS database at FCC shows 101 Part 74 LPA stations licensed to operate in the 944-952 MHz band, or parts of it. This is surprising. With that many WMs authorized to operate in the 950 MHz Aural BAS band, one may expect some instances of reported interference to radio station STLs and ICRs. SBE is, however, unaware of such complaints. Aural STLs and ICRs are engineered paths with presumably high fade margins, and they use directional receive antennas. Wouldn't they withstand some very low power WM operation, at a substantial elevation differential to the STL path?

The problem is that WMs are mobile, itinerant and utilize variable polarization. The STLs and ICRs may not have a high probability of interference from LPA WM operation, but the interference would be completely unpredictable, and the need for high reliability in STL and ICR operation precludes any uncoordinated operation of LPAs at 944-952 MHz. The FCC rules contain nothing that makes licensed WM operation secondary to fixed links at 944-952 MHz, and the proliferation of LPA devices in that band, whether licensed and coordinated or unlicensed and uncoordinated, creates an unacceptable interference threat.

Given the need to protect radio stations against unpredictable interference from LPA devices, SBE has developed a policy statement, of which we hope the FCC will take notice. It is based on the following, rather obvious premises.

First, it must be understood that wireless microphones with powers of 100 to 250 mW (20 to 24 dBm) have far too much power to qualify as unlicensed, Part 15 devices, and those higher power LPA WMs are not certified for Part 15 operation anyway. They require an FCC license to be operated legally. While there are Part 15 WMs being marketed as well, those are not what are typically found in churches, theaters, etc. Instead, the higher-powered, Part 74-certified WMs are what are typically in use.

Second, to obtain a Part 74, Subpart H Low Power Auxiliary (LPA) license for a wireless microphone, one must first be eligible for licensing in that service. Eligibles include licensees of broadcast stations, broadcast network entities, cable television operators, motion picture producers or television program producers. Entities not meeting these eligibility criteria will not be able to obtain an FCC LPA license. Furthermore, and more importantly for this discussion, cable television operators, motion picture producers, and television program producers cannot use the 26 MHz, 162 MHz, 450/455 MHz, and 950 MHz Aural BAS bands. These non-broadcast entities must use only television broadcast channels for LPA WM operation.

Third, eligible entities must coordinate their use of LPA (and all BAS) frequencies. Existing links already using these frequencies must be protected against any WM operation. Contrary to allegations by some retailers and lessors of wireless microphones, the 944-952 MHz band is most certainly not lightly used. There are currently 11,009 licensed 950 MHz band Aural studio-to-transmitter link (STL) stations and Aural inter-city relay (ICR) in the FCC's ULS database. As an example of the loading of these channels, within 50 miles of Los Angeles there are eighty-two 950 MHz Aural BAS stations. Within that same radius in New York City, there are 86 such stations; in Chicago, 61 stations; in Atlanta 54 stations; in San Francisco 90 stations; and in Seattle, 59 stations.

SBE-affiliated frequency coordinators will continue to work with all eligible entities that wish to obtain LPA licenses, or to operate licensed stations, in the 950 MHz Aural BAS band where possible without disruption of aural STLs and ICRs. However, SBE notes the recently issued FCC WT Docket 08-166/167 Notice of Proposed Rulemaking addressing the problem of unlicensed users of Part 74-certified wireless microphones, and will provide assistance and serve as a resource to the FCC Enforcement Bureau in locating entities who illegally operate Part 74 wireless microphones without benefit of the required FCC license, especially where interference is caused.

SBE will also continue to seek and advocate the allocation of replacement BAS spectrum for LPAs, and to avoid any further disruption in or reduction of the remaining available BAS LPA spectrum. The essence of these principles is set forth below as the SBE's policy on 944-952 MHz wireless microphone operation.

1. Wireless microphones with powers of 100 to 250 mW (20 to 24 dBm) have field strengths far too high to operate as unlicensed, Part 15 devices; these are certified by FCC for use under Part 74, not Part 15. They must be operated only by a Part 74 licensee.

2. Those eligible for Part 74, Subpart H Low Power Auxiliary (LPA) licenses for wireless microphones are broadcast station licensees, broadcast network entities, cable television operators, motion picture producers or television program producers. The latter three groups can operate only on TV channel frequencies, however. The 26 MHz, 162 MHz, 450/455 MHz, and 944-952 MHz Aural BAS band frequencies can be licensed to and legally used only by broadcast licensees and networks. The rest must use unoccupied television broadcast channels exclusively for LPA operation.

3. All LPA licensees must coordinate their use of these frequencies in advance with local SBE coordinators. Coordinators will not coordinate LPA devices for eligible, licensed users on 944-952 MHz channels where there are existing fixed Studio-to-Transmitter (STL) or Inter-City Relay (ICR) links already using these frequencies in close geographic proximity, if interference will predictably result.

4. Contrary to false and misleading allegations by some vendors of wireless microphones, the 944-952 MHz Aural BAS band is heavily occupied in most areas of the United States. The band offers very little capacity for the operation of wireless microphones by eligible LPA licensees, and there are normally no options for unlicensed or ineligible licensees to use this spectrum at all.

5. SBE will actively monitor this situation and will continue to pursue equivalent replacement spectrum for that lost in the 698-806 MHz band due to relocation, in bands other than 944-952 MHz, to facilitate licensed LPA operation.

(Note: Thanks to SBE Board Member Dane Ericksen for his helpful contributions to this artcle. Any errors herein are exclusively my own, however. Chris Imlay)

The art of composing SBE Certification Exams

BY Terrence M. Baun, CPBE, AMD, CBNT

Administrator, Engineering and Operations, Wisconsin Educational Communications Board

Terrence M. Baun

The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.
~Alvin Toffler

While the SBE Program of Certification itself does not directly teach, it does have the companion educational task of assessing the level of vocational accomplishment through creation and administration of testing. As part of that effort, SBE has the implicit duty to adjust the scope and content of its examinations to reflect current broadcast technology. If Certification examinations fail to reflect industry principles and practices it not only dilutes the value of certification for all who participate, but also threatens the credibility of the Certification effort as a whole.

It is not surprising then, that one of the most important duties of the Certification Committee requires regular examination of the relevance of every certification question, ascertaining whether some need to be rewritten to improve their clarity, and creating new ones as our industry evolves. If you've ever been curious about just how questions get into the Certification exams, you may find the following points of interest.

1. Every question on every Certification Exam is authored by a member of the Certification Committee and reviewed by that Committee before it is incorporated into the question pool, so each question is based upon the personal industry experience of one or more of our Committee Members. This committee authorship is one if the primary ways we insure that the questions are relevant to broadcast technology. But selecting the subject of a question is only the first step!

It is surprisingly difficult to frame a clear and unambiguous question—and even more difficult to compose and structure the possible responses in such a way as to present only one challenging, but absolutely correct, answer. And frequently we find it far more difficult to compose the incorrect answers that the correct ones! Educators have written many books on the art of constructing fair but effective multiple choice exams, and here are some of the rules we try to follow:

- We frame the question (what educators call "Writing the Stem") so as to clearly pose a problem or state a question. The test-taker should be able to understand the question without reading it several times and without having to read any of the possible answers;
- We write the correct answer ("Writing the Response") in such a way as to be unquestionably the only correct answer;
- We base the other possible answer choices ("Composing the Distractors") on logical fallacies or common errors related to the stem question, so as to further challenge the test-takers understanding of the stem question;
- We minimize use of "all of the above" or "both A&B" as distractors, since they make it possible to guess the correct answer with only partial knowledge;
- We use "none of the above" infrequently, as it is only appropriate for situations in which there are only absolutely correct answers, such as mathematics problems;
- We examine the entire selection of questions in each Certification Exam to prevent inadvertently providing answers to previous or subsequent questions through question wording or choice of distractors.

Writing effective and fair multiple choice questions is not easy. It demands not only careful selection of topic and achievement level, but also development of a clearly defined answer accompanied by plausible distractors.

2. Every question in the test pool is periodically reviewed by the Certification Committee members. We ask:

- Is this question still relevant to the industry? A majority "No" response from the panel will remove such questions from the question pool immediately;
- Is this question framed accurately and is the correct answer the unambiguous correct choice? Often someone on the Committee will bring a fresh viewpoint to the question, resulting in revision of one or more of the "distractors" or changes in the language used for the correct answer;
- What is the level of technical competency reflected by this question? Is a question suitable for more than one Certification level? Should its level be adjusted upward or downward because of changes in the industry? Can this question be used for more than one Certification area?

3. When a question is missed consistently by a significant number of test-takers, or is the subject of specific comment by an individual test-taker, that question is brought to the Committee to consider the following:

- Is the question clear and unambiguous? Are the distractors appropriate?
- Is there a cultural bias or false assumption in the question that has gone undetected?

See **CERT** *on page* **20**

CONGRATULATIONS
New SBE Certification Achievements

LIFE CERTIFICATION

Certified Professional Broadcast Engineers® and Certified Senior Broadcast Engineers® who have maintained SBE certification continuously for 20 years and are current members of SBE may be granted Life Certification if so requested. All certified who have retired from regular full-time employment may be granted Life Certification if they so request. If the request is approved, the person will continue in his/her current level of certification for life.

CERTIFIED PROFESSIONAL BROADCAST ENGINEER® (CPBE®)
Michael Fast, Lutherville, MD – Chapter 46
John Harvey, Houston, TX – Chapter 105

CERTIFIED BROADCAST TELEVISION ENGINEER® (CBTE®)
Annette Epinger, North Charleston, SC – Chapter 107
Alphonse Tobia, Groveland, CA – Chapter 40
Timothy Toole, San Diego, CA – Chapter 36

CERTIFIED BROADCAST TECHNOLOGIST® (CBT®)
Robert Sassaman, Canal Fulton, OH – Chapter 70

NEWLY CERTIFIED CPBE®

Applicant must have had 20 years of professional broadcast engineering or related technologies experience in radio and/or television. The candidate must be currently certified on the Certified Senior Broadcast Engineer® level.

CERTIFIED PROFESSIONAL BROADCAST ENGINEER ® (CPBE®)
Craig Beardsley, Chicago, IL – Chapter 26
George Maier, Sudbury, MA – Chapter 11
Randall Mullinax, Gainesville, GA – Chapter 5

JUNE EXAMS

"Thank You" CHAPTER CERTIFICATION CHAIRS FOR YOUR ASSISTANCE

CERTIFIED SENIOR TELEVISION ENGINEER (CSTE®)
Michael Herring, Cocoa, FL – Chapter 42

CERTIFIED SENIOR RADIO ENGINEER® (CSRE®)
Mark Hill, Bloomington, IL – Chapter 49
Thomas Ringer, Herndon, VA – Chapter 37
Curt Yengst, Allentown, PA – Chapter 120

CERTIFIED BROADCAST TELEVISION ENGINEER (CBTE®)
Steven McGonagle, Watertown, MA – Chapter 11

CERTIFIED 8-VSB SPECIALIST® (8-VSB®)
Fred Willard, Arnold, MD – Chapter 37

DIGITAL RADIO BROADCAST SPECIALIST (DRB)
Raymond Klotz, Bella Vista, AR – Chapter 56
John Mulhern, Liberal, KS
John Ross, Brownsville, TX – Chapter 136

CERTIFIED BROADCAST NETWORKING TECHNOLOGIST® (CBNT®)
Alex Bershadsky, Toronto, Ontario Canada
Daniel Brown, Natick, MA – Chapter 11
Mark Samuel, San Francisco, CA – Chapter 40

CERTIFIED BROADCAST TECHNOLOGIST® (CBT®)
C. Austin Wright, Chatham, Ontario Canada

AUGUST EXAMS

"Thank You" CHAPTER CERTIFICATION CHAIRS FOR YOUR ASSISTANCE

CERTIFIED BROADCAST RADIO ENGINEER® (CBRE®)
Chris Wygal, Lynchburg, VA – Chapter 78
Larry Oberg, Sain Paul, MN – Chapter 17

CERTIFIED BROADCAST TELEVISION ENGINEER® (CBTE®)
Michael Proffitt, Sacramento, CA – Chapter 43
George Teplansky, Chapel Hill, NC – Chapter 11

CERTIFIED AUDIO ENGINEER® (CEA)
William Taylor, High Springs, FL – Chapter 7

CERTIFIED VIDEO ENGINEER® (CEV®)
William Taylor, High Springs, FL – Chapter 7

CERTIFIED BROADCAST NETWORKING TECHNOLOGIST® (CBNT®)
Patrick Bradshaw, Raleigh, NC – Chapter 93
Ken Brown, Edgewood, NM – Chapter 34
Steven Campbell, Albuquerque, NM – Chapter 34
Richard Demyanovich, Wyandotte, MI – Chapter 82
Robert Henry, Albuquerque, NM – Chapter 34
Michael Mazzo, Richmond, VA – Chapter 93
James Miller, II, Columbus, OH – Chapter 52
Roberto Rochet, Glen Allen, VA – Chapter 93
Henry Sisler, III, New Orleans, LA – Chapter 72
George Teplansky, Chapel Hill, NC – Chapter 11
John Tiesi, Albuquerque, NM – Chapter 34
David Walczybock, Clinton Township, MI – Chapter 82

CERTIFIED BROADCAST TECHNOLOGIST® (CBT®)
Kathryn Crum, Wilmington, OH – Chapter 33
Michael Seaver, Quincy, IL – Chapter 49

CERTIFIED RADIO OPERATOR® (CRO®)
James Abron, Jr., Livonia, MI – Chapter 82
George Becht, Sarasota, FL – Chapter 39
Nathan Miller, Albuquerque, NM – Chapter 34
James Scardino, Hollister, CA – Chapter 40

CERTIFIED BY LICENSE

CERTIFIED BROADCAST TECHNOLOGIST® (CBT®)
David Andrews, Liberty Hills, TX – Chapter 79
Steven Herman, Washington, DC
Stephen Jensen, Oregon City, OR – Chapter 124
Carl O'Day, Redlands, CA – Chapter 131
Michael Orto, Youngstown, OH – Chapter 122
Carlos Perdomo, Fayetteville, TX – Chapter 93
Melvin Rydman, Tualatin, OR – Chapter 124
Esteban Sanchez, APO, AE – Chapter 132
Samuel Smith, Trevor, WI – Chapter 28
Russell Vander Horst, Goffstown, NH – Chapter 110
Richard Van Hoose, Eureka, CA

CERTIFIED RADIO OPERATOR (CRO)

CERTIFIED RADIO OPERATOR® (CRO®)
Ali Abdul-Sater, Chino Hills, CA
Tasian Taylor, Van Nuys, CA

CERTIFIED TELEVISION OPERATOR® (CTO®)

CERTIFIED TELEVISION OPERATOR® (CTO®)
Matthew Anderson, Cleveland, TN
James Carnes, Las Vegas, NV
Joseph Hale, Chattanooga, TN
Tom Muchmore, Memphis, TN
Carl O'Day, Redlands, CA
Donovan Rothschild, Ann Arbor, MI
Yoshiyuki Takahashi, Foster City, CA

RECERTIFICATION

The following applicants completed the recertification process either by re-examination, point verification through the local chapters and national Certification Committee approval and/or met the service requirement.

CERTIFIED PROFESSIONAL BROADCAST ENGINEER® (CPBE®)
Steve Epstein, Columbia, MO – Chapter 59
William Hubbard, Green Bay, WI – Chapter 80
Steve Mankowski, Palmdale, CA – Chapter 47
Paul Miller, Stafford, VA – Chapter 37
Thomas Nielsen, Milwaukee, WI – Chapter 28
Timothy Schultz, Westchester, CA – Chapter 47
Robert Springer, Saipan, MP – Chapter 126

CERTIFIED SENIOR RADIO ENGINEER (CSRE®)
David Creel, Saipan, MP - Chapter 126
Robert Kelley, Agana, GU – Chapter 126
Troy Langham, Tulsa, OK – Chapter 56
Timothy Neese, Swannanoa, NC – Chapter 86
John Price, Kirkland, WA – Chapter 16
Allen Sherrill, Raleigh, NC – Chapter 93
Joseph Soucise, Plaistow, NH – Chapter 11
James Turaville, Colorado Springs, CO – Chapter 48

CERTIFIED SENIOR TELEVISION ENGINEER (CSTE®)
James Cutright, Fredericksburg, VA – Chapter 37
Emir Hadziahmetovic, Columbia, SC – Chapter 101
Bob Hinkle, Louisville, KY – Chapter 35
Danny Huffman, Olympia, WA – Chapter 16
James Sams, Pulaski, WI – Chapter 80
Richard Van Genderen, Meridian, ID – Chapter 115

CERTIFIED BROADCAST RADIO ENGINEER (CBRE®)
Tom Gardull, Toledo, OH – Chapter 104
Ralph Jones, Yucaipa, CA – Chapter 131
Russel Kendrick, West Monroe, LA – Chapter 44
David Moberg, Hudson, WI – Chapter 17
John Schneider, Quincy, IL – Chapter 49

CERTIFIED BROADCAST TELEVISION ENGINEER (CBTE®)
Gary Baylor, Metairie, LA – Chapter 72
David Boyer, Menifree, CA – Chapter 131
Theran Davis, Ellenwood, GA – Chapter 5
Timothy Derstine, Jacksonville, FL – Chapter 7
Darryl Douglas, Vail, AZ – Chapter 32
Michael Hayes, Tallahassee, FL
Michael Kulis, Cross Plains, WI – Chapter 24
Donald Nahumck, Whitesboro, NY – Chapter 22
Gary Seleski, Livonia, MI – Chapter 82
Michael Shovan, Newbergh, NY – Chapter 58
André Smith, Thornton, CO – Chapter 48
John Tway, Chapter 131

CERTIFIED AUDIO ENGINEER® (CEA®)
Richard Rarey, Kensington, MD – Chapter 37

CERTIFIED VIDEO ENGINEER® (CEV®)
Matt Kinnan, Lenexa, KS – Chapter 59
David McIntyre, Kingston, WA – Chapter 16
John Vavroch, Beavercreek, OH – Chapter 33

CERTIFIED BROADCAST NETWORKING TECHNOLOGIST® (CBNT®)
Tom Dailey, Denver, CO – Chapter 48
Theran Davis, Ellenwood, GA – Chapter 5
Dan Entingh, Denver, CO – Chapter 48
Matt Kinnan, Lenexa, KS – Chapter 59
Steve Mankowski, Palmdale, CA – Chapter 47
James Sams, Pulaski, WI – Chapter 80
Gary Seleski, Livonia, MI – Chapter 82
Nandini Sen, Chapel Hill, NC – Chapter 93
Chris Verdi, New Condon, NH – Chapter 110

CERTIFIED BROADCAST TECHNOLOGIST® (CBT®)
Victor Alcala, San Antonio, TX – Chapter 69
Matthew Baptista, Concord, CA – Chapter 37
Ronnie Barnes, APO, AE – Chapter 132
Joseph Bartnik, Lawton, OK – Chapter 67
Timothy Byrne, Delphos, OH – Chapter 104
Chris Courtney, Urbana, IL – Chapter 49
William Elliott, Williston, FL – Chapter 42
Edgar Hatchel, Amarillo, TX
Mary Beth Leidman, Indiana, PA – Chapter 46
Paul Lohman, Florissant, MO – Chapter 55
Peter McElvein, Syracause, NY – Chapter 22
Mark MacKinnon, Hudson, ME – Chapter 110
Donald Peters, Pullman, WA – Chapter 117
Richard Rarey, Kensington, MD – Chapter 37
Calvin Schantz, Deland, FL – Chapter 22
Michael Strobel, Flanders, NJ – Chapter 15

CERTIFIED TELEVISION OPERATOR® (CTO®)
Christina Barranco, Huntington Beach, CA – Chapter 47
Daniel Berdeguer, Miami, FL
Thomas Bland, Jr., Raleigh, NC
Randy Borgwardt, El Cajon, CA
James Brestin, Virginia Beach, VA
Andy Christensen, Raleigh, NC
Andrea Cummis, Bensalem, PA – Chapter 15 – August Signal Correction
Rosa Maria Faraco, Miami, FL
Dianne Mulherin, El Cajon, CA
Patricio Palacios, Miami, FL
Carlton Reis, La Mesa, CA
Javier Silva, N. Miami, FL
Gary Tann, Raleigh, NC
Steven Tanner, Raleigh, NC
Richard Weronko, Grand Rapids, MI

DTV Transport Stream Verification

BY **Jerry Whitaker**
VP Standards Development, ATSC

The Advanced Television Systems Committee (ATSC) has published a Recommended Practice (RP) on digital television (DTV) transport stream verification. An ATSC RP is a document that states specifications or criteria within advanced television systems that are not strictly necessary for effective implementation and interoperability, but that are thought to be advisable and may improve the efficiency of implementation or reduce the probability of implementation errors. An ATSC Recommended Practice may also specify a preferred methodology for implementation and operation, and may recommend a choice from among alternatives.

Document A/78, "ATSC Recommended Practice: Transport Stream Verification," outlines a common methodology for describing transport stream conformance criteria for digital television. This document explicitly describes the elements and parameters of ATSC Standards A/53 and A/65 that should be verified in a transport stream for it to be considered a proper emission. This document does not cover RF, captioning, or elementary streams.

About the Document

While ATSC Standards strictly define the contents and characteristics of the DTV emission transport stream, there may be a number of interactions and interrelationships amongst various components. Successful tuning and display of programs can be ensured if the transport stream adheres to the applicable specifications.

This Recommended Practice identifies transport stream issues by type, dividing errors into the general following categories:

• **PSI errors.** An ATSC conformant transport stream is also required to be MPEG-2 conformant. Therefore, an ATSC transport stream must include the two mandatory Program Specific Information (PSI) tables. These two tables are known as the Program Association Table (PAT) and the Program Map Table (PMT).

• **PSIP errors.** The Program and System Information Protocol (PSIP) is the glue that holds the DTV signal together. Although PSIP is a voluntary standard of the ATSC (document A/65), it is—in fact—a requirement in terms of actual real-world operation. The purpose of PSIP is to describe the information at the system and event levels, and to enable an abstract of the collection of programs (a virtual channel).

• **Timing Model and Buffering errors.** Timing is the key to the MPEG-2 encoding and decoding processes. MPEG-2 defines a model for the system timing, adherence to which allows independent design of encoders and decoders that can interoperate. An MPEG-2 decoder's 27 MHz reference clock needs to be synchronized with the equipment that is creating the encoded stream.

• **Consistency errors.** Before a receiver can decode a transport stream, it must identify the relationship between components in the stream. Some components contain audio and video (elementary streams), and other components contain information describing the relationship between them (metadata). The receiver uses metadata to identify each component, determine its function and select an appropriate set of components when the user selects a virtual channel for decoding. Conflicts and problems within the structure of metadata are called 'consistency errors.' Consistency errors can result in broken decoding, missing system components (such as closed captioning), and/or missing program guide information.

• **General errors.** These errors cover a variety of types of problems, typically transport-related.

Each error type is provided with a defined "error severity", as detailed below:

• **Transport Stream Off-Air:** The station is effectively off-air as the transport stream errors are severe enough that transport level logical constructs are damaged beyond utility. Receivers will not be able to tune and decode anything within the broadcast. The complete or repeated absence of sync bytes would be an example of this level of error.

• **Program Off-Air:** A main service (virtual channel) is flawed to the point that that service is effectively off-air for conformant/reasonable receiver designs. This could involve all of the program elements being improperly constructed or incorrect/missing signaling about elements. The absence of an entry in the Virtual Channel Table (VCT) for a service would be an example of this type of error.

• **Component Missing:** One or the program components that is signaled by PSIP or the Program Map Table (PMT) as present is either not present or cannot be found and decoded. One example would be a mismatch between the video Program ID (PID) signaled in the Service Location Descriptor (SLD) and the actual PID used for the video elementary stream.

• **Quality of Service:** Parameters are out of specification by such a margin that a significant fraction of the receivers can be expected to produce flawed outputs. In many cases, the broadcast is viewable, but may exhibit some form of degradation to the viewer. An example might be the Master Guide Table (MGT) cycle time being somewhat larger than the specification, which would cause slower than normal channel-change tuning.

• **Technically Non-Conformant:** Violates the letter of the standard, but in practice will have little effect on the viewing experience. Errors of this type should be corrected, but do not have the urgency of higher severity errors. An example might be a single instance of a 152 ms MGT cycle time (with the remainder of the MGTs coming at less than 150 ms intervals).

The distinctions between these error classifications are important and drove work on the RP. After some study it became clear that a layered approach that indicated the severity of the error would be

beneficial within the confines of real-world television station operation. For example, if the threshold for an error was set at strict adherence to the applicable rules—regardless of the ultimate impact at the consumer's receiver—could lead to such a high false alarm rate that the monitoring equipment would, after a time, tend to be ignored.

Work on the Recommended Practice on Transport Stream Verification was led by Richard Chernock of Triveni Digital. Dr. Chernock is a frequent presenter at SBE Ennes conferences around the country. Document A/78, and all other ATSC Standards and Recommended Practices, can be downloaded at no charge from the ATSC Web site (http://www.atsc.org).

ELECTION *from page* **1**

Upon his election, Thomas said, "I'm looking forward to a second term and the opportunity to continue the work we began a year ago. Our goal is to continue to concentrate our efforts on the core purposes of SBE, strengthen SBE chapters and facilitate our members' involvement in creating the next innovations in broadcasting."

Re-elected as the Society's vice president was Vincent Lopez, CEV, CBNT, of Syracuse, N.Y. Lopez is Director of Engineering for WSYT/WNYS TV/Sinclair Broadcast Group in Syracuse. He is a past chairman of Chapter 22 of Central New York and has been a member of the national SBE Board of Directors since 2000. He was elected an SBE Fellow in 2004.

Ted Hand, CPBE, 8-VSB, AMD, of Charlotte, N. Car. was re-elected to the position of SBE secretary. Hand is Chief Engineer of WSOC-TV and WAXN-TV in Charlotte, N.C. He is a Senior member of SBE, joining in 1982, and has served as a member of the Board of Directors for five years.

Elected treasurer was Ralph Hogan, CPBE, DRB, CBNT of Tempe, Ariz. Hogan is Director of Engineering for KJZZ-FM/KBAQ-FM in Tempe. He's been a member of SBE since 1990, is a Senior member and has served seven years on the SBE Board.

Six members were elected to two-year terms on the Board of Directors including four members who will be serving for the first time. They include:

• Ralph Beaver, CBT, President and CEO, Media Alert, Inc., Tampa, Fla.

• James T. Bernier, Jr., CPBE, CBNT, Director, Maintenance, Design and Engineering, Turner Entertainment Networks, TBS, Inc., Atlanta, Ga.

• Gary Liebisch CPBE, Regional Sales Manager, Nautel, Milford, Ohio *

• Scott Mason CPBE, Regional Director of Engineering, CBS Radio, Los Angeles, Calif. *

• Mark Simpson CPBE, AMD, CBNT, Director of Engineering/MIS, Citadel Broadcasting – Tucson, Marana, Ariz. *

• Jeffrey Smith CEA CBNT, Supervisor Broadcast Systems, Clear Channel Radio – NYC, New York, N.Y. *

* - First time member of the Board

Completing the 2008-2009 Board of Directors will be six directors who were elected in 2007 and who will be continuing their two-year terms:

• Cris Alexander, CPBE AMD, Director of Engineering, Crawford Broadcasting Company, Denver, Colo.

• Andrea B. Cummis, CBT, CTO, Chief Operating Officer, Total RF Productions, Bensalem, Pa.

• Dane E. Ericksen, P.E., CSRTE, 8-VSB CBNT, Senior Engineer, Hammett & Edison, Inc., San Francisco, Calif.

• Clay Freinwald, CPBE, Entercom, Seattle, Wash.

• Hal H. Hostetler, CPBE, Senior Engineer/I.T. Director, KVOA Television, Tucson, Ariz.

• Jerry Massey, CPBE, 8-VSB, AMD, CBNT, Corporate Regional Engineer and Director of Engineering, Entercom Communications, Greenville, S.C.

Rounding out the Board will be Immediate Past President, Chriss Scherer, CPBE, CBNT of Overland Park, Kan.

Four members of the Board have completed their terms of service and we extend our deep appreciation for their dedication and contributions to the SBE. They are:

• Keith M. Kintner, CPBE CBNT, Radio-TV-Film Engineer, University of Wisconsin Oshkosh, Oshkosh, Wis.

• Thomas R. Ray, III, CPBE, Vice President, Corporate Director of Engineering, Buckley Broadcasting/WOR Radio, New York, N.Y.

• Christopher D. Tarr, CBRE CBT CBNT, Director of Engineering, Entercom Milwaukee/Madison, Delafield, Wis.

• Larry J. Wilkins, CPBE AMD CBNT, Prattville, Ala.

The newly elected officers and directors will be inducted into office during the Annual SBE Membership Meeting, held as a part of the SBE National Meeting on October 15, in Madison, Wis. The National Meeting is being held in conjunction with the annual Wisconsin Broadcasters Clinic, sponsored by the Wisconsin Broadcasters Association and SBE Chapter 24 of Madison.

Elected to two-year terms to the Board:

Ralph Beaver, CBT

Jim Bernier, CPBE, CBNT

Gary Liebisch, CPBE

Scott Mason, CPBE

Mark Simpson, CPBE, AMD, CBNT

Jeff Smith, CEA, CBNT

Election Night

Members of Chapter 25 in Indianapolis served as the 2008 Board of Tellers (back, l-r): Don G. Hemenover, Larence Oaks, Steve Longenecker, David Fort, Bill Ellison, Tim Frye, James Bryant, Douglas Salewsky, Roger Bishop, (front, l-r) Charlie Sears, Dale Smiley, Mike Rabey, Phil Alexander, Chapter Chair.

PRESIDENT *from page* **4**

In the two circumstances I remembered, nearby SBE members coordinated efforts and temporarily covered the regular customers of the contract engineer at the cost of, at the most, expenses. I donated my service to benefit his family as did several other engineers. We shared the load so none of us were unduly overworked. As a result, these engineers did not need to worry about their business but could concentrate on recovery. We demonstrated the type of spirit that is the best part of being in our profession. Teamwork. In these cases, the SBE provided a built-in PROFESSIONAL support system.

Significant PERSONAL and PROFESSIONAL support! Available as a benefit of your active participation in the only group dedicated to the promotion and support of your profession! How's that for value?

Elsewhere in *the Signal* you will see a report on some distressing developments in wireless microphone spectrum. If you subscribe to the SBE Roundtable (http://www.sbe.org/Roundtable.php) and some chapter newsletters you saw a flurry of activity. I want to recognize our interim FCC Liaison Committee Chair and General Counsel, Chris Imlay for his efforts to build a very quick, very complete response to this issue. I also want to highlight how this effort took place. A couple of interested persons literally "sent up the warning flag" by email to the SBE leadership… in this case part of the SBE Board of Directors, the FCC Liaison and Frequency Coordination committees. The reaction in this case was alarm and a great deal of discussion, followed by a conference call, then an action plan on the SBE National response but, more importantly, a package of information for you to draft your own response. This came together extremely quickly and effectively. I want to thank all of you who took the time to participate in the issue. I also want to encourage you to "raise the flag" in broadcast engineering issues you consider important. SBE contact information is available on the web site 24-hours a day. Get in touch with us with your concerns and questions.

Speaking of concerns and questions; Make sure you mark your calendars for the evening of October 13th, 2008. This will be our 2nd National Webcast.

Get your questions ready and watch for *SBE-news* and check the SBE Web Site for more information and login instructions.

Finally; congratulations to all the winners of the SBE National elections. I'm looking forward to working with great leaders in our industry.

See you in Madison!

Input on education needs requested

BY Cris Alexander, CPBE, AMD, DRB
SBE Education Committee Chair

Your Education Committee has for the past year been working on a new online educational platform by which we can provide topical educational opportunities to our membership and the broadcast engineering community in general. Last spring, we contracted with a vendor to provide this platform.

We put together several courses to kick off the online educational program, and it was our hope to have these available sometime during the summer. For a number of reasons, none of which had anything to do with the SBE, that didn't happen. The contractor has promised that the first courses will be available this fall. We will do everything we can to hold them to that timeline.

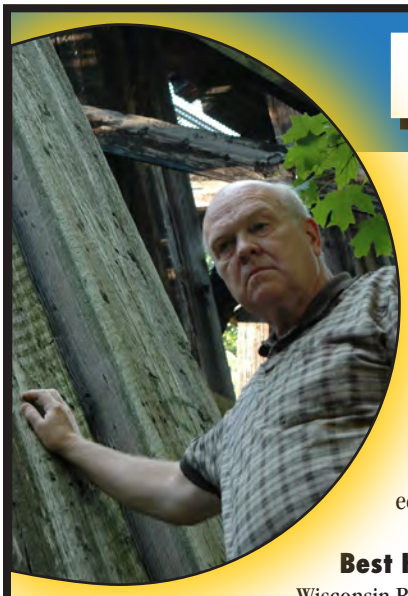
Going forward, we are in the process of developing several more courses for the online platform. Our biggest challenge remains finding people to develop the course materials. We have had some response over the last few months, our good members stepping forward to help out where they can. We do intend to utilize these folks in the peer review process, but the burden of developing new courses remains. We have an immediate need to develop comprehensive courses on such timely topics as:

- 8VSB/DTV
- Digital Radio
- Antenna Modeling

Our online educational efforts must be tailored to meet the needs of broadcast engineers, so we look to you to tell us what other topics we should seek to develop materials for. Let us hear from you. What do you need by way of training? Who do you recommend to develop or contribute to the course development? You may send your suggestions to me at crisa@crawfordbroadcasting.com.

Working together with our membership, we hope to make the SBE the source for continuing technical education for the broadcast engineering community.

In the Circle ... a snapshot of an SBE Member



Gordon S. Carter. CPBE, CBNT
Chief Engineer
WFMT - Chicago
La Grange, Ill.
SBE Chapter 26, Joined SBE in 1994

Getting Started: In high school I became interested in listening to music and wanted a stereo system. I saved money from a part-time job to buy parts to make a stereo. I copied the electronics from a mono record player and expanded on it to make a stereo with "big" speakers. I had no idea what I was doing. If anything went wrong I would have no idea what to do to fix it. A man at our church introduced me to the equipment and I knew I had to learn how to work on it.

Best Known For: Certification Chairman of Chapter 26 (Chicago). Member of the planning committee for the Wisconsin Broadcasters' Clinic. Member of the planning committee for the Public Radio Engineering Conference. Author of several articles in various radio-related trade publications.

When I'm Not Working I ... Trains, both model and real. I enjoy researching unusual railroad equipment or routes and building models of it.

You May Not Know ... I spent 3 months in Aruba in 1967 helping to erect a stainless steel AM broadcast tower. The previous galvanized tower rotted out in 8 years due to the salt air, so they had this one custom fabricated. While there, a freak storm hit and the tower (sitting on wood planks in a tidal mud flat) floated away. We found it, intact, tangled in a mangrove and were able to retrieve it with no damage.

The Society of Broadcast Engineers would like to welcome its newest members to the organization:

New Members

Brian C. Gagnon - Fort Worth, TX
William R. Gibson - Barrigada, GU
Ed Holland - Destin, FL
Leonard W. Johnson - Shawnee, OK
Chris W. Larsen - West Hartford, CT
Steven Latino - Fort Bragg, NC
Michael K. Mitchell - Antelope, CA
Mark J. Moss - Glenside, PA
Dean Phannenstiel - Edgewater, CO
Joseph D. Rother - Tucsan, AZ
Thomas B. Silliman - Chandler, IN
Joel Wilhite - Menlo Park, CA
David Chhy - Odenton, MD
Wong Wai Ming Eric - KLN, Hong Kong
James R. Bryant - Indianapolis, IN
John C. Chrystal - Tahoma, CA
Robert J. Hageny - Oswego, NY
William G. Larrabee - Dover-Foxcroft, ME
Sarah M. Nagata - Parker, CO
Michael C. Olson - Centerville, UT
Dean M. Rosenthal - West St. Paul, MN
Robert A. Serret - Dorchester, MA
George A. Stein IV - Bedford, VA
Patrick Bradshaw - Raleigh, NC
Michael A. Mazzo - Richmond, VA
Kathryn A. Neal - Bloomington, IN
Roberto Rochet - Glen Allen, VA
Carl C. Catherine - Springfield, VA
Aaron J. Coseo - Erie, PA
James Ferguson - Tulsa, OK
Kyle T. Fisher - Woodbridge, VA
Justin M. Daviault - Southington, CT
Gail M. Pineda - San Diego, CA
Samuel N. Smith - Trevor, WI
Clarence R. Isaacks II - Centennial, CO
Michael C. Rinos - Hollywood, CA
Luis O. Lua - Thousand Palms, CA
Nicholas du Plessis - Sparks, NV
Brad A. Bodnar - Stockbridge, GA
Anthony J. Caiola III - Caldwell, ID
Ron Davis - Salem, UT
Eddie Hill - Red Bank, TN
Eric Johnston - Seattle, WA
Kwok-Luen Lam - Kowloon Tong, Hong Kong
Lloyd Laranang - Federal Way, WA
Nathan H. Miller - Albuquerque, NM
Jon J. Olesnevich - Allison Park, PA
Carlos M. Perdomo - Fayetteville, NC
Roy A. Phillips II - Phoenix, AZ
Esteban Sanchez - APO, AE
Russell S. Vander Horst - Goffstown, NH
Dana D. Cole - Stillwater, OK
Ryan J. Klindtworth - Spokane, WA
Melvin L. Rydman - Tualatin, OR
Brian J. Wheatley - Toronto, Ontario, Canada
Stanley P. Zuidema - Wausau, WI

New Students

Cody Richter - Philadelphia, PA
Gregory M. Zenger - Potsdam, NY
Adrian Koziol - Hamilton, Ontario, Canada
George H. Knaepple - Greenville, WI

New Associates

Brice Rich - Tampa, FL

New Youth

Richard J. Esposito - Cos Cob, CT
Christopher P. Vandenberge II - Lake Ronkonkoma, NY

Reinstated Members

Jeff B. Twilley - Millsboro, DE
David W. Andrews - Libery Hill, TX
Keith A. Turcot - Peoria, IL
Rick A. Lewis - Boise, ID
Ramon K. Dall - Euless, TX
Mary Beth Leidman - Indiana, PA
Tommy Bowerman - Laurel, MD
Carlton R. Reis - La Mesa, CA
Michael A. Dunlap - Harrisonburg, VA
Brian A. Schauer - Englewood, CO
Larry G. Oliver - Rio Rancho, NM
Robert P. Bertrand - New Brunswick, NJ
Rod R. Roberts - Shawnee, OK
Mark E. Quella - Watertown, MA
Timothy J. Williams - Kearney, NE
James S. Stanley - Saint Louis Park, MN

Reinstated Students

W. Mark McKibben - Chatsworth, CA

Chapters Must File Annual Tax Return with IRS

jporay@sbe.org

BY **John L. Poray, CAE**
SBE Executive Director

Officers of SBE chapters typically keep busy with ordinary duties like arranging programs for meetings, getting meeting announcements out, updating the chapter's website and so on. Chapter officers may now find they have a new task, now that the IRS has enacted changes to the tax filing requirements for non-profit organizations.

For years, many SBE chapters have existed as unincorporated entities with no official non-profit status from the IRS. Most chapters weren't required to file a federal tax return because annual gross revenues didn't exceed $50,000. Those chapters that were generating lots of gross revenue, typically those running regional conventions with trade shows, were the only ones that were filing annual tax returns and which had obtained a non-profit status from the IRS.

In recent years, the IRS has looked very closely at the non-profit community with an eye towards eliminating cases of abuse of the privileged tax status they held. As a result, the IRS approved new guidelines for non-profits and, beginning with the 2008 tax year, has introduced a new and more complex Form 990 that requires far more information about a non-profit's operations. At the national level, SBE (a 501(c)6 non-profit but NOT charitable organization) will be filing the new Form 990 next winter but, unfortunately, that doesn't cover the more than 100 SBE chapters which also have filing responsibilities.

SBE chapters are essentially independent organizations that have their own by-laws, elect their own officers and determine their own programs, schedules, income and expenses. To qualify as chapters of the national SBE, chapters agree to the same societal mission, to hold meetings, provide educational opportunities for SBE members in their area and in general, conduct their business per the *SBE Chapter Manual*. Generally, most SBE chapters will qualify as non-profit charitable organizations because their purpose is educational and they do no political lobbying.

Swept up in all this change were small organizations. From Boy Scout Troops to PTA's, and yes, SBE chapters, the IRS now requires all non-profit entities, regardless of the amount of annual gross revenue, to file annual federal tax returns. But the good news for most SBE chapters is that they will only need to file what's called the, "E-Postcard."

Chapters with annual gross revenue of less than $25,000 will be able to file this simple report via e-mail. In fact, the IRS doesn't even make it available in traditional paper format nor can the report be mailed to the IRS.

The filing requirement likely will trigger another step for most chapters. To successfully file the E-postcard, the chapter must have received a non-profit designation by the IRS. Without it, the IRS has no record that the chapter exists as a non-profit organization and can't process your E-postcard. Obtaining an IRS non-profit designation, especially the educational/charitable 501(c)3, had long been a somewhat difficult task with a rather high qualification bar, but with the new filing requirements in place, it now appears to be much more readily available – at least for small non-profits like our chapters.

SBE Chapter 47 of Los Angeles

Follow These Steps to File Your Chapter's E-post Card and Obtain an IRS Non-profit Designation

1) Call the IRS [877-829-5500] and ask to apply for a Non-Profit EIN [Employer Identification Number]. All chapters should already have these as they are required to open a bank account.

2) Once the EIN is established, call the IRS and ask to do a telephone application for 501(c)3 status. As long as the chapter's annual gross revenue (all revenue generated by the chapter before deducting expenses) is under $25,000, the phone application is acceptable.

3) 90 days after the application for 501(c)3 status has been submitted, log on to http://epostcard.form990.org and register the chapter EIN. If the IRS granted 501(c)3 status to the chapter, the registration process will be allowed and an ID with password will be issued.

4) Once the ID & Password are confirmed by return email (by epostcard.form990.org) again log on to http://epostcard.form990.org to electronically file Form 990 for the past reporting year.

For subsequent years, all the chapter treasurer (or other responsible, reporting officer] need do is log on to http://epostcard.form990.org after January 1 with the ID & Password, confirm the chapter's annual gross receipts of under $25,000 and click on, "'Submit."

recently went through the process of obtaining a non-profit, charitable 501(c)3 designation and filing the E-postcard. Chapter 47 Treasurer, Urban Stiess, CBT, CBNT, CTO, did the leg work and has shared the step-by-step process he used to get it done. See the sidebar article for this process. Urban found that he was able to apply for the non-profit status over the telephone and then later, file the E-post card via e-mail. In his words, "Not very difficult or complex to set up…it is the procedure I used with total success."

By now, you may be asking, "What if we don't file the E-post card or get a non-profit designation?" The IRS will not impose a monetary penalty on small organizations that do not file the E-postcard. However, an organization that does not file the E-postcard in three successive years risks losing its non-profit status. That means being treated like a for-profit company and paying for-profit tax rates on the chapter's revenue. Not an enticing alternative.

The temptation may be to just "stay under the radar," not file the E-postcard and not obtain the IRS non-profit designation. That might work for a while but we don't recommend it. The IRS has beefed up its non-profit compliance unit and will be working to identify organizations that are not in compliance. Besides, there are some benefits that chapters will gain by holding a 501(c)3 non-profit charitable designation in addition to knowing you are operating within the law and being good citizens. Chapters will be able to accept tax deductible donations and could take advantage of non-profit postage rates. Remember though, that organizations that hold 501(c)3 designations are barred from almost all political lobbying activity.

All in all, the annual effort to file the E-postcard will not be much of a burden. There will be some work at the front-end for chapters that don't have the non-profit charitable designation but once that's obtained the process should be fairly painless.

One more note. Your chapter may want to contact a CPA locally if you have questions about your filing status or procedures or about any special requirements that may exist in your state, especially if your annual gross revenue is above $25,000. Also, the information provided here is not intended or offered as legal advice.

Contributors Sought for New Book

National Board member and SBE Publications Committee chairperson, Andy Cummis, CBT, CTO, is planning a new SBE/Focal Press book that will cover how broadcasters prepare and respond to natural disasters. She's looking for real-world examples from broadcast engineers on their personal experiences in this area. If you would be interested in contributing to this work, contact Andy at acummis@totalrf.com.

Ennes Trust scholarships awarded for 2008

The Ennes Educational Foundation Trust has awarded three scholarships for 2008. Winners are chosen from applications received by July 1 from the previous 12 months.

The Harold E. Ennes and Robert D. Greenberg scholarships are awarded to individuals interested in continuing or beginning their education in broadcast engineering and technology. The Youth Scholarship is specifically for a graduating high school senior interested in broadcast engineering as a career. Each scholarship awarded this year is for $1,500. This year's recipients are:

Robert D. Greenberg Scholarship

Eric Boyle is currently a student member of SBE. Boyle was first introduced to radio in 1989 as a part time radio announcer on the overnight weekend shift of a local AM news and sports radio station. He became interested in Amateur Radio while working as an audio/visual technician at a school supply store, where he met his "Elmer" who helped him attain his Technician Class HAM ticket.

From there he eventually became a Senior Technician and Supervisor for Internet companies. Afterward he became the Information Systems Technician at a local school district, where he worked on PA systems, closed circuit video distribution systems, telephone systems, cabling for the systems and the computer network including splicing fiber optics.

For the last 16 months Boyle has been working part time at KSAL and KYEZ, the same radio stations he started at in 1989. Boyle really enjoys radio and would like to eventually make a career for himself in Broadcast Engineering. Boyle is using his scholarship towards an Associate Degree in Electronics Engineering from Cleveland Institute of Electronics.

Harold E. Ennes Scholarship

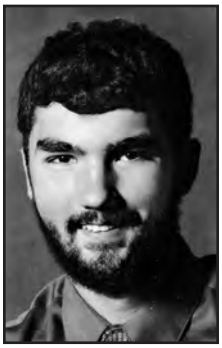
Ettore Albuquerque has always been interested in broadcasting and computer engineering, but never had the chance to pursue the field until 2005. While he was living in Gulf Shores, Alabama he decided that he had to go back to school to get a professional degree. However, being that there were no schools in the area he could attend, he moved to a place where he could earn a professional degree.

Albuquerque decided to move to Washington State and his close friend suggested moving to the city of Spokane. In 2005, Albuquerque and his son moved to Spokane, where he immediately enrolled in Spokane Community College (SCC) to pursue his dream of getting a higher education degree. He began earning his degree in a broadcast/computer engineering field that SCC offered.

While juggling a part time job, a family and his full-time school schedule, Albuquerque was able to maintain a high GPA, get involved in SkillsUSA, Amateur Radio and Phi Theta Kappa clubs, as well as volunteer with the American Red Cross. He is very excited to use his scholarship to move toward the completion of his Associates Degree and potentially earn a Bachelor Degree in Broadcast Engineering.

Youth Scholarship

Michael Nutting intends to use his newly received scholarship to help pay for college and books, as well as aid him in obtaining his dream job of becoming a broadcast engineer. Nutting graduated from Fairport High School in Fairport, NY this past June with an advanced regents diploma, and from the Radio and Television Broadcasting Program at the Eastern Monroe Career Center. He is an Eagle Scout and a Skills USA Television Production New York State award winner two years in a row.



Nutting has worked at the Fairport Area Community Television station and interned at WXXI, a PBS member station, and WHEC-TV, an NBC affiliate station in Rochester, New York. For the past four years, Nutting has participated in Reach Workcamps, repairing and rebuilding homes in impoverished areas. He is attending the State University of New York, College at Brockport studying Broadcast Communications with a minor in physics.

The Ennes Educational Foundation Trust is a non-profit, charitable organization dedicated to the education of current and future broadcast engineers. It provides scholarships, offers workshops and supports other projects that meet the Trust objectives of training broadcast engineers, as well as preparing a new generation for the field. The Ennes Scholarship Committee congratulates the above recipients and wishes them well in future endeavors.

M. W. Persons and Associates, Inc.
RADIO BROADCAST TECHNICAL CONSULTING
10032 Island Drive
BRAINERD, MINNESOTA 56401
PHONE (218) 829-1326 FAX (218) 829-2026
http://mwpersons.com mark@mwpersons.com

August 4, 2008

Society of Broadcast Engineers
9102 N. Meridian Street, Suite 150
Indianapolis, IN 46260

Mark and Paula Persons

Dear SBE:

Many thanks for drawing my name for a prize in the recent membership drive. It is an Eton E1XM AM/FM/SW/XM Radio. What a great reward for talking-up the SBE this year and in past years. I even tell station managers about the SBE because they need to know the organization is a good and true one that helps Broadcast Engineers be good at what we do.

Years ago, I was too busy to be bothered with the newly organized Society of Broadcast Engineers. I was in our family owned and operated radio station fixing cartridge tape machines, reel to reel tape decks, and turntables, not to mention transmitters. Who had time to think of anything else?

It was at an NAB convention that I was formally introduced to the SBE by the likes of Bob Jones and John Battison. It became clear that the SBE was, and still is, a viable and needed organization. However, it wasn't until after joining that I discovered there were certification exams to be conquered. The deadline for "grandfathering" into the SBE had passed. Not to be deterred, I forged ahead studying and then passing exam after exam. It was also apparent that the examinations were written by Broadcast Engineers for Broadcast Engineers. The questions were well thought out so they could be understood by those working in the industry. You can't beat that.

Just when it seemed I was on the top as a CPBE (Certified Professional Broadcast Engineer), SBE management raised the bar by offering additional certifications. So, it was back to the exam room to pass the CBNT (Certified Broadcast Networking Technologist) exam followed by the AMD (AM Directional Specialist) exam. Someday soon you may find my face in an exam room to take the recently created SBE DRB (Digital Radio Broadcast Specialist) certification too.

All of this is really for the best. The SBE has stretched my capabilities to make me a better Broadcast Engineer. Good people are running this organization and I am glad of it. We should all be thankful for the guiding light of the SBE in this ever changing world. SBE....lead on.

Sincerely,
M. W. PERSONS AND ASSOCIATES, INC.
Mark W. Persons
Mark W. Persons

2008-09 SBE Certification Exam Schedule

Dates	Location	Application Deadline
November 7-17, 2008	Local Chapters	CLOSED
February 6-16, 2009	Local Chapters	December 31, 2008
April 21, 2009	NAB	April 1, 2009
June 5-15, 2009	Local Chapters	April 17, 2009
August 7-17, 2009	Local Chapters	June 5, 2009
November 6-16, 2009	Local Chapters	September 18, 2009

MEETING *from page* 1

Wisconsin, Madison Campus.

Just prior to the SBE National Meeting, the Society will produce a national Webcast, similar to the one held last year from Pittsburgh, Pa. The program is planned for Monday, October 13 at 8:00 pm EDT and will involve a number of SBE Board members and other leadership. A portion of the program will be dedicated to taking questions from members.

The schedule for the National Meeting starts with the Certification Committee Meeting in the afternoon on Tuesday, October 14. Tuesday's schedule also includes the fall meeting of the Board of Directors from 6:00 pm to 10:00 pm. Activities on Wednesday, October 15 will include the annual SBE Fellows Reunion. This year, it will be a breakfast from 8:00 am to 9:00 am. This breakfast is being sponsored by Kathrein Inc., Scala Division.

Also on Wednesday, will be the Annual Membership Meeting from 4:00 pm to 5:00 pm. The National Awards Reception will follow the meeting from 5:00 pm to 6:00 pm., which is sponsored by Trilithic. The SBE National Awards Dinner (ticket required) will highlight the evening beginning at 6:00 pm. The dinner will include special guest speaker Richard D. Cupka Sr., and of course, the SBE National Awards will be presented. The dinner is being sponsored by Microsoft Radio Communications.

For more information about the Wisconsin Broadcasters Clinic, please see the WBA website at www.wi-broadcasters.org.

Tickets for the SBE National Awards dinner are $14 per person and can be ordered by contacting Debbie at the SBE National Office at (317) 846-9000 or dhennessy@sbe.org. VISA, MasterCard, and American Express are accepted.

Leader-Skills instructor Richard D. Cupka Sr. will be this year's keynote speaker at the SBE National Awards Dinner.

CERT *from page* 8

• Is the question appropriate for this particular level and area of Certification?

Upon further discussion, the offending question(s) are either rewritten or removed from the exam pool.

4. Generating the tests. All questions are contained in a large database, with each question tagged with the level of difficulty and appropriate Certification specialty. About one month prior to every exam period, questions for each level and certification specialty are randomly selected from this database and forwarded to a group of Committee members for review. This double-check is designed to catch any typographic, grammar, or coding errors in the database, and to verify again that the questions are relevant for the particular levels and certification specialties to which they are assigned. It is not unusual at this stage for several questions out of several hundred to be flagged and either replaced or corrected prior to the printing and distribution of the examinations. After this review, it is from this group of questions that the actual session examinations are selected.

5. Essay Questions. At the Senior and Specialist level, an essay question allows the applicant to express more completely an understanding of a particular segment of broadcast engineering technology. Committee members, who also write the essay questions, select appropriate questions for each applicant based upon that applicant's past knowledge and experience as detailed in the examination application. Three questions are selected in this manner and presented to the test-taker, who chooses one to answer.

Grading is done by Certification Committee members, each of whom independently assigns a numerical value to the essay answer, which are added and averaged to become the final score. To help in grading these tests, essay questions have suggested "answer highlights" to assist reviewers in determining the completeness of the answer.

MARK YOUR CALENDAR

October 7 & 8 , 2008
SBE Chapter 22 Broadcast & Technology Expo
Event Center at Turning Stone Casino & Resort in Verona, NY
Sponsored by: SBE Chaper 22

October 14-15, 2008
2008 SBE National Meeting
Marriott Madison West Hotel, Middleton, (Madison) Wisc.
In conjunction with: The Wisconsin Broadcasters Clinic, presented by SBE Chapter 24, Madison and the Wisconsin Broadcasters Association.

October 14-16, 2008
2008 Wisconsin Broadcasters Clinic
Marriott Madison West Hotel, Middleton, (Madison) Wisc.
Sponsored by: SBE Chapter 24 and the Wisconsin Broadcasters Association

October 20-21 2008
2008 Annual Engineer Workshop
Sheraton Indianapolis Hotel & Suites, Indianapolis, IN
Sponsored by: Indiana Broadcasters Association

October 20-21, 2008
2008 Chapter 20 Annual Equipment Expo
Pittsburgh ExpoMart, Monroeville, Pa.
Sponsored by: SBE Chapter 20

November 14, 2008
6th Annual Ohio Broadcast Engineering Conference
DoubleTree Hotel, Columbus, OH
Presented by: Ohio Association of Broadcasters, SBE Ohio Chapters, The Ohio Section of the Society of Motion Picture and Television Engineers

Chapter 85 sponsors first Ennes Workshop held in Oklahoma

Left: Presenting "The Real World of Disaster Recovery" speaker Skip Erickson talked about what happened when the CBS and Fox affiliate in Grand Junction, Colo. burned completely to the ground in January.

Right: Chapter 85 organized a vender table-top tradeshow in conjunction with the Ennes Workshop.

SBE Members on the Move

Jim Turvaville, CSRE, has recently been promoted to Corporate Director of Engineering and Expansion for WAY-FM Media Group, Inc. in their corporate offices in Colorado Springs, Colo. Jim served as WAY-FM Network Engineer in Nashville for 8 years before moving to Colorado in 2006 as the Expansion Director for WMG, which owns 18 full power FM's and 61 translators across the U.S.

If you or someone you know moved, changed positions, or been honored in some way in the broadcast engineering industry, submit details to "Members on the Move" at hessex@sbe.org or to Attn: Holly Essex SBE, 9102 North Meridian St., Suite 150, Indianapolis, IN 46260

Letter from Chapter 78: Making Changes

The following letter was received by SBE Immediate Past President and current Chapter Relations Committee Chair, Chriss Scherer, CPBE CBNT. It serves as an excellent testimonial of how one chapter, which had struggled with attendance and programming, made changes that have had very positive results. (ed.)

Hello, Chriss-

Well, in response to your question, we are not yet where we want to be, but we are making progress in Chapter 78. We were at the point of folding as a Chapter, but the few members we had sat down to figure out what we were going to do. The few members we had felt the Chapter was worth continuing, but we had to change "business as usual."

-We had to have the willingness to change/adapt.

-A willingness to ask and respond to members and potential attendees their preferred meeting time.

-A willingness to expand to other broadcasters: Our primarily TV-oriented chapter was willing to expand the chapter to attract and have programs/equipment demos etc. for radio engineers- we have quite a few now.

Perhaps it may seem trite, but the old saying, "Everything rises and falls on leadership," (John Maxwell) is still true. A Chapter must have people at the helm who believe a Chapter can be turned around. Here at Chapter 78, since our decision to go forward, successfully hosted Gary Sgrignoli's DTV Seminars (twice) and co-hosted a regional trade show in July, plus other programs. Sometimes you can do the "impossible" if you're willing to try, and work at it. As the chapter grows (absolutely necessary to overcome attrition) you will have a larger base to draw from as leaders and workers. A chapter, like anything else, you must be willing to "sow" for a while before expecting the "reaping" of expanded membership, better quality programs, etc.

-You must invest first.

Al Stephens, CSTE, former officer. Chapter 78, Blue Ridge Chapter of southwestern Virginia.

Peter Maroney, President of Virginia Association of Broadcasters, presents the J. Jerry Freeman Engineer Of The Year award to SBE member Jon Bennett, CPBE at the VAB Convention in June 2008.

A:
B) Session. From the top down, the OSI Seven Layer Model is: Layer 7-Application; Layer 6-Presentation; Layer 5-Session; Layer 4-Transport; Layer 3-Network; Layer 2-Data Link; Layer 1-Physical.

ANSWER from page 3

Silver Members, those with at least 25 years of membership, are highlighted with a silver box, New Members are listed in blue

ADC Telecommunications Inc.•1998
Anne-Marie Gunderson
(952) 917-3072
End to End Connectivity Solutions

Advanced Test Equipment Rentals•2006
Martin Jahn (800) 404-2832
Test and Measurement Equipment Rentals

Ai•1995
Mark Polovick (607) 215-0653
UHF TV Broadcast Transmitters

American Tower Corporation•2000
Peter A. Starke (781) 461-6780
Broadcast Tower Development/ Construction/Management

Anixter•2005
David Ste-Marie (800) 995-6158
Audio/Video Cable & Interconnect Products

Anton/Bauer Inc.•2004
Paul Dudeck (203) 929-1100
Battery Solutions for ENG

Audemat-Aztec Inc.•2000
Sophie Lion Poulain
(305) 249-3110
RDS Generator, Metering, Monitoring, Remote Control Manufacturer

Autodesk•1998
Christina Shackleton
(212) 338-3888
Digital Content Creation Software

AXCERA•1983
Mike Rosso
(800) 215-2614 ext. 101
Television Transmitters & Exciters

Belden Electronic Division•1991
George Stillabower
(765) 983-5200
Cable and Connectivity

Beveridge Consulting, Inc.•2006
Gregory J. Beveridge
(720) 810-3464
Broadcast Engineering Technical Consulting

Broadcast Electronics, Inc.•1978
Ray Miklius - Studio Products
Tim Bealor - RF
(217) 224-9600
Radio Equipment Manufacturer

Broadcast Engineering Magazine•1984
Bradley L. Dick (913) 341-1300
Journal of the Broadcast Industry

Broadcast Microwave Services, Inc. •1997
Russell Murphy - East
Jim Kubit - West
(540) 932-3660, (805) 581-4566, (800) 669-9667
Manufacturer, Transmitters, Receivers, Antenna Systems

Broadcast Supply Worldwide•1986
Shannon Nichols
(800) 426-8434
Audio Broadcast Equipment Supplier

Broadcasters General Store•2004
Buck Waters (352) 622-7700
One Stop Broadcast Store

Canon USA, Inc.•1985
Gordon Tubbs
(201) 807-3300, (800) 321-4388
Broadcast Lenses & Transmission Equipment

Chyron Corp.•1992
Carol Keane (631) 845-2031
HD/SD Character Generators & MOS

Clark Wire & Cable•1991
Shane Collins (800) 222-5348
Audio, Video and Remote Camera Cables

COMET North America•2005
Steve Claterbaugh
(214) 235-6596
Capacitors, Variable & Fixed

Comrex Corporation•1997
Chris Crump(978) 784-1776
Remote Audio Broadcast Equipment

Comsearch•2004
Tim Hardy (703) 726-5651
Frequency Coordination Services, Continental Electronics

Continental Electronics Corporation•1976
Michael Troje
(214) 381-7161, (800) 733-5011
AM & FM IBOC Transmitters

Crispin Corporation•2006
Brian Gleason(919) 845-7744
Broadcast Automation Solutions

Crouse-Kimzey Co.•2008
Mark Bradford (972) 660-6100
Broadcast Equipment Sales

CUC Broadcast•2008
Michael Johnson
\(951) 278-5626
Shared Storage System Integrator

Dataworld•1998
John T. Neff (800) 368-5754
Coverage Maps and Services

Dialight Corporation•2006
Doug Woehler (732) 991-2837
Obstruction Lighting, L.E.D. Based

Dielectric Communications•1995
Jay S. Martin (207) 655-4555
TV & FM Broadcast Products

Digital Alert Systems, LLC•2005
Bruce Robertson(520) 488-8667
IP Based EAS ENDEC

DiskStream Incorporated•2006
Rein Taul
(519) 579-8166, ext. 57
Capsa Video Archive

DMT USA, Inc.•2003
Tom Newman
(856) 423-0010
Television Transmitters, Translators and Antennas

DSC Laboratories•2002
Michael Kent (905) 673-3211
Test Charts & Illuminators

DTVinteractive•2007
Jennifer Jang
(+82) (0)2-3446-2040
Test & Measurement Solution Provider

du Treil, Lundin & Rackley, Inc.•1985
Jeff Reynolds (941) 329-6000
Consulting Engineers

DYMO Corporation•2006
Robert Garvey (717) 342-8090
RHINO Professional Labeling Products

e2v technologies Inc.•1997
Rick Bossert
(800) 433-8269, (800) 342-5338
Klystrons, MSDC IOTs, IOTs, Satcom Amps, TWTs

Econco•1980
(800) 532-6626 or (530) 662-7553
New & Rebuilt Transmitting Tubes

Electrorack Enclosure Products •2008
Todd Schneider (714) 776-5420
Racks, Enclosures, Power, Accessories

Empower RF Systems•2008
Jon Jacocks (310) 412-8100
DTV Transmitter & Translator

ENCO Systems Inc.•2003
Don Backus(800) 362-6797
Digital Audio Automation & Delivery

Environmental Technology Inc.•1997
John Cahill
(800) 234-4239, ext. 229
Dehydrators, Deicing Sensor & Controls for Broadcast/FM and Satellite Antennas

ERI - Electronics Research•1990
David White (812) 925-6000
Antennas, Towers, Filters, Combiners

ETS-Lindgren/Holaday EMF Measurement•2003
Dave Seabury
(908) 876-5042
RF Safety Instrumentation

Excelsior College•2007
Andre Adams(518) 464-8777
Distance Education Degree Programs

Florical Systems•2008
Jim Berry(352) 372-8326
Television Braodcast Automation

Freeland Products•1997
Joel Freeland (800) 624-7626
Rebuilt Power Tubes

Frontline Communications Corp. •2000
Doug McKay
(727) 573-0400, ext. 120
Broadcast/Command/HLS Vehicles

Fujinon, Inc.•1986
Thom Calabro
(973) 633-5600
Broadcast & Communications Products

Gepco International, Inc.•1995
Ken Bernd
(847) 795-9555
Audio, Video Cable Products

Google Inc.•2005
Scott Bodgan
(949) 791-1200
SS32, Maestro, ASP Solutions

Harris Corporation, Broadcast Communications Division•1977
Joe Mack (TV), Chris Pannell (Radio), Bob Duncan (Software)
(513) 459-3406, (406) 556-0280, (719) 439-0130
Broadcast Equipment & Services

HD World•2006
Michael Driscoll
(203) 371-6322
HD World Conference & Exposition
(Oct. 10-11, 2007, New York)

Holbrook Enterprises, Inc.•2006
Heywood Bagley
(208) 468-8797
WireCAD - Serious design tools

Image Video•1997
Dave Russell
(416) 750-8872 ext. 230
Under Monitor Tally Display Systems, Monitor Walls, Signal Alarm Systems

JDSU•2007
Brigette Robbins
(919)338-5061

Joseph Electronics Inc.•2003
Yohay Hahamy
(847) 501-1584
Broadcasters One-Stop Supplier

Kathrein Inc., Scala Division•1985
Michael W. Bach or Mike Johnson
(541) 779-6500
Antennas for Broadcasting & Communications

KPFF Consulting Engineers•2004
Madison Batt
(206) 926-0508
Tower Engineering, Inspections Design

L-3 Communications Electron Devices•2003
Steve Bliek
(570) 326-3561, ext. 229
Tubes, Power

LBA Technology, Inc.•2002
Jerry Brown
(252) 757-0279
AM/MW Antenna Equipment & Systems

LEA International•2004
Carol Rassier
(208) 762-6121
Power Quality Products & Services

Lincoln Financial Media•2007
Don Shaw
704-374-3639
Media, Communications

LP Technologies, Inc.•2006
Samuel Lee
(316) 816-9696
Spectrum Analyzers

LYNX Technik•2007
Steve Russel
(661) 251-8600
Broadcast Terminal Equip

Mackay Communication•2002
Patrick Fisher (919) 850-3164
Satellite Communications Equipment & Airtime

Markertek Video Supply•2002
Tom Moretti
(845) 246-3036
Audio, Video, Audio Visual Broadcast Supply

Maxell Corporation of America•1991
Patricia Byrne
(201) 794-5900
Broadcast Video Products

Micro Communications, Inc.•1998
Frank Malanga
(603) 624-4351, (800) 545-0608
TV & FM Antennas & RF Components

Micronet Communications,Inc.•2005
Jerry Armes
(972) 422-7200
Coordination Services / Frequency Planning

Microwave Filter Company, Inc.•2003
Sherry Bell
(315) 438-4700
Passive Electronic Filters

Microwave Radio Communications•1991
Nadine Frechette
(978) 671-5700
Video Microwave Systems

Microwave Service Corporation•1997
Warren J. Parece
(978) 556-0970
Microwave Equipment Rentals/ Sales/Service

Middle Atlantic Products•2005
David Amoscato
(973) 839-1011, ext. 1197
Enclosures, Power, Accessories, Furniture

Minkin Design Inc.•2005
Jay Minkin
(206) 250-7481
System Integration/Design/ Documentation

Mohawk•1995
Jamie Silva
(800) 422-9961
Wire and Cable

Morrow Technologies, Inc.•2002
Tish Boyles
(727) 531-4000
Spectrum Analyzers

Moseley Associates, Inc.•1977
Dave Chancey
(805) 968-9621
RF & T1 STLs

National Association of Broadcasters•1981
(202) 429-5340
Industry Trade Association

National Football League•1999
Jay Gerber
Game Day Coordination Operations

Nautel, Inc.•2002
Wendell Lonergan
(207) 947-8200
Radio Broadcast Transmitter Manufacturer

Neural Audio•2006
Mark Seigle
Surround Sound Technologies

Nott Ltd.•2002
Ron Nott
(505) 327-5646
Folded Unipole Antennas; Detune Systems; Lightning Prevention

Nucomm, Inc.•1996
John Dulany
(908) 852-3700
Digital Microwave Transmission Equipment

NVISION, Inc.•1997
Doug Buterbaugh
(530) 265-1000
Routers, Master Control & Terminal Equipment

Oldcastle Precast, Inc.•2006
Douglas Domas
(678) 371-8315
Precast Buildings/General Construction/Program Management

OMT Technologies Inc.•2001
Ron Paley
(888) 665-0501
Automation, Skimming/Logging Software

Orban/CRL•2008
David Rusch
(480) 403-8300
Audio Processing

Panasonic Broadcast & Digital Systems Company•1985
Tom Moore
(201) 392-6176
Professional Broadcast Equipment

Pasternack Enterprises•2001
Christine Hammond
(949) 261-1920
Coax & Fiber Products

PESA Switching Systems, Inc.•1997
Robert McAlpine
(800) 328-1008
Routing Switcher Manufacturer

Pike & Fischer•1991
Andy Myers
(800) 255-8131, ext. 234
FCC Rules & Regulation

Prime Image, Inc.•1997
Rodney Hampton
(408) 867-6519
Digital Audio/Video Equipment

Pro-Bel•2002
Terry Barnham
(631) 549 5159
Automation, Routing & Infrastructure

Propagation Systems, Inc.(PSI)•2005
Doug Ross
(814) 472-5540
Quality Broadcast Antenna Systems

Prophet Systems Innovations•2003
John Gager
(308) 284-3007
Audio and Video Content Management

ProVideo Systems, Inc.•2000
Dave Goldsmith
(419) 874-2850
Sales, Consulting, Design & Integration

Pulsecom•2003
Stan Bailey
(630) 961-3253
Telco Broadband Audio Transmission

Quintech Electronics and Communications Inc.•2002
Richard E. Bush
(724) 349-1412
RF Signal Management

Radian Communication Services Inc.•1986
John McKay
(866) 4-RADIAN
Towers, Antennas, TV Transmitter Installation

RDL•2004
John Gatts
(928) 778-9678, ext. 111
Audio, Video, Control & Test Equipment Manufacturer

RF Central, LLC•2005
Jeff Winemiller
(717) 249-4900, ext. 222
Digital Wireless Microwave Equipment

RF Specialities of Texas, Inc. •2008
Don S. Jones
(806) 372-4518
Trasmitters, Antennas and More

RF Technologies a Ferrite Company •2008
Paula Terrasi
(800) 634-4075
Television Broadcast Antenna Systems

Richardson Electronics•1987
Chris Chinchilla
(800) 348-5580
Power Grid Tubes

Richland Towers•2001
David Denton
(813) 286-4140, ext. 6872
Tower Owner/Management

Rohde & Schwarz•2003
Eddy Vanderkerken
(469) 713-5322
Broadcast Transmitters, Test & Measurement

ROSCOR Corporation•1998
Tom Voigts
(847) 299-8080
DTV System Integration

Ross Video Ltd.•2000
Burt Young
(613) 652-4886
Manufacturer, Television Broadcast Equipment

SCMS, Inc.•2000
Bob Cauthen
(800) 438-6040
Broadcast Equipment- New/Used

Seacomm Erectors, Inc.•1997
John Breckenridge
(360) 793-6564
Tower/Antenna Erections

Sencore, Inc.•2005
Jeff Murray
(800) 736-2673
Audio/Video Test Equipment

Shively Labs•1996
David Allen
(207) 647-3327 or 888-SHIVELY
FM Antennas & Combiners

SignaSys•2005
Jeff Wolter
(408) 350-7210
Integration, Support, Training

Snell & Wilcox, Inc.•1995
John Shike
(818) 556-2616
Video Equipment Manufacturer

Stainless LLC/Doty-Moore•2004
Les Kutasi
(215) 631-1313
Tower Engineering/Tower Service

Stantron/APW•2006
Jay McGrath
(518) 731-7447
Equipment Racks

Stratos Global Corporation•2006
Folef Hooft Graafland (Eastern USA), Chris Mott (Western USA)
(888) 766-1313 (USA)
(709) 748-4233 (Rest of World)
Streaming & Voice via Satellite

Strobe Tech, LLC•2008
Wes Pimentel
(931) 648-8414
Tower Lighting Experts

Sundance Digital, Inc.•2004
Steve Krant
(972) 444-8442
Broadcast Automation Solutions

Superior Broadcast Products•1999
Benny Springer
(800) 695-7919
Vacuum Tube & Solid State Transmitters

Superior Electric•1995
Michael J. Miga
(860) 585-4552, (800) 787-3532
Power Protection Equipment

Sutro Tower, Inc.•1989
Gene Zastrow
(415) 681-8850
Broadcast Tower Leasing

Switchcraft, Inc.•1995
Jim Hoffman
(773) 792-2700
Electronic/Electromechanic Components

TC Electronic•2008
Stacey Moran
(818) 665-4906
DTV Audio Level Processing

Tektronix, Inc.•1977
Jon Hammarstrom
(503) 627-6936
TV Test, Measurement Equipment

Telex Communications, Inc.•1992
Murray Porteous
(818) 566-6700
Intercom Systems, Microphones, Headsets

Telos Systems/Omnia/Axia•2003
Denny Sanders
(216) 241-7225
Telos Systems - Talk-Show Systems

Terrestrial RF Licensing Company•2003
Steven Slocum
(888) 373-4832
FCC Licensing Services

TESSO Technologies • 2008
Scott Palermo
(410) 229-1562
STL, Cable, Test Equipment

The Durst Organization – 4 Times Square•2004
John M. Lyons, CPBE
(212) 997-5508
TV/FM/Microwave Tower Site

The Whitlock Group•2000
Kevin Thompson
(800) 726-9843
Broadcast and Presentation Solutions

Thomson Broadcast & Media Solutions•2000
William Powers (404) 929-5007
TV/Film Production & Broadcast Professionals

Tieline Technology•2003
Kevin Webb (888) 211-6989
POTS, ISDN Codecs & Audio/ Video Products

Total RF Marketing•2001
Tom Sharkoski (215) 633-1000
Wireless Broadcasting Equipment Rental

Trilithic, Inc.•2007
Art Leisey (317) 895-3600
EAS ENDEC Equiptment

Troll Systems, Inc.•2006
Brian Goldberg (661) 702-8900
Broadcast Control Systems

TRON-Tek, Inc.•1993
W.M. (Bill) Grass
(888) 819-4877
Part 74 Video Links

Turner Broadcasting/CNN •2007
Brad Ramer
(404) 827-5020
Television Engineering Services

Unimar, Inc.•2001
Michael A. Marley
(315) 699-4400, (800) 739-9169
Tower Obstruction Lighting Designer, Manufacturer, Distributor

TV Magic•2008
Eva Langer
(858) 650-3155
Broadcast Systems Integrator

VALCOM•1996
Bill Burtenshaw
(519) 824-3220
AM/FM Broadcasting Antennas

VCI Solutions•2007
Kristin Garini
(413) 272-7200
Broadcast Traffic & Automation Solutions

Venture Technologies Group, LLC•2006
Larry Rogow
(323) 965-5400
Television Stations

V-Soft Communications•2002
Adam Puls
(319) 266-8402
Broadcast Engineering Software & Consulting

Ward-Beck Systems Ltd.•2004
Michael Jordan
(416) 335-5999
Metering, Monitoring, Distribution, Conversion

Warning Systems, Inc.•2008
Elysa Jones
(256) 880-8702
CAP, Warning, Emergency Alert

Wire Wizards Integration•2007
Mr. Mark Guidire
(619) 992-0549
Reliable Specialized Installation Technicians

Wireless Infrastructure Services•2006
Mr. Travis Donahue
(951) 371-4900
Broadcast System Integration Services

Wohler Technologies Inc.•2004
Milton Garcia
(510) 870-0810
In-Rack Audio & Video Monitoring

WSI Lighting•2008
Randy Daremus
(800) 783-1450
Lighting Distributor/Obstruction Lighting

Wysong Enterprises Inc.•2005
Rodney Wysong
(423) 325-6900
Helicopter E.N.G. Solutions

AM Antenna Solutions

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Diplexer/Triplexer Systems

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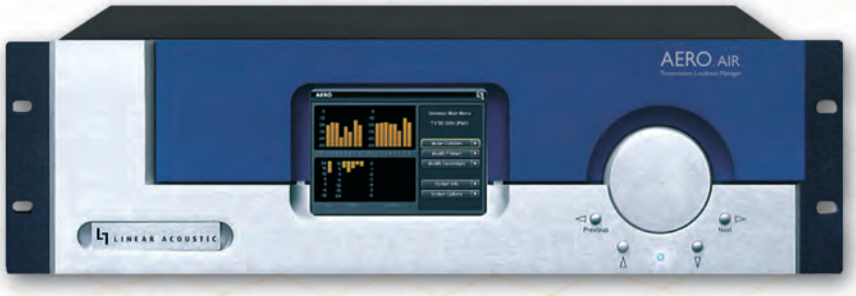

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