

THE signal

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Society of Broadcast Engineers

50 SBE
YEARS
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From Chicago to Las Vegas - SBE celebrates 50 years

By John Poray, SBE Executive Director

On April 5, the Society of Broadcast Engineers officially reaches its 50th anniversary. The SBE began at a meeting held during the 1964 NAB convention at the Conrad Hilton Hotel in Chicago. Approximately 100 broadcast engineers from across the country attended the meeting, chaired by John Battison of Annapolis, Md.

Battison had first posed the idea of a new organization devoted solely to radio and television engineers in an editorial that appeared in Broadcast Engineering magazine in 1961. Battison was the magazine's editor at the time. In subsequent issues, he published a number of letters to the editor received in response to his editorial; most were in favor of the idea. Many broadcast engineers belonged to the Institute of Radio Engineers (IRE) at the time but that organization had voted in 1961 to merge into the American Institute of Electrical Engineers (AIEE, now IEEE). Battison was concerned that broadcast engineers would get lost among the other engineering disciplines that the much larger IEEE encompassed.

Battison's continued efforts sparked interest across the country. He decided to publish a

membership application in the April 1963 issue of Broadcast Engineering and, with help from members of his family, mailed letters to almost 5,000 engineers in the U.S. and Canada. Again, he received mostly positive feedback, so he arranged with the NAB to hold a meeting during its 1964 convention in Chicago.

At the meeting, the decision was made to organize a new association devoted to the needs and interests of broadcast engineers. They decided to call it the Institute of Broadcast Engineers (IBE), but over concerns that the name would be confused with a labor union, the International Brotherhood of Electrical Workers (IBEW), they immediately elected to change the name to the Society of Broadcast Engineers during that first meeting.

Battison chaired a steering committee to



Nine current and past presidents that span 50 years of the SBE, assembled in 2011 at the SBE National Meeting held in Columbus, Ohio. Seated (left-right) Chris Scherer, John Battison, Barry Thomas. Standing (left-right) Ralph Hogan, Vinny Lopez, Rick Farquhar, Chuck Kelly, Ed Miller and Ray Benedict.

help guide the organization during its first year. He edited and produced the society's first membership publication, the Journal of the Society of Broadcast Engineers, which included technical

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Membership Meeting, Anniversary Reception



Then vice president, Joe Snelson at the 2013 member meeting

The SBE will celebrate 50 years at the NAB Show, held this month in Las Vegas. If you're attending the show, reserve Tuesday, April 8 beginning at 5:30 to take part in the festivities.

It begins with the spring SBE Membership

Meeting, from 5:30 to 6:30 pm in room S-225 of the South Hall, Las Vegas Convention Center. We are pleased to have Vislink Broadcast return as our sponsor. This year's event will include a special look back at the SBE's first fifty years; recognition of SBE chapter certification chairmen who have achieved milestone service years and updates on implementation of the society's strategic plan, programs and government relations efforts. Everyone attending will be eligible to win prizes, including three \$25 dinner gift cards, SBE beverage tumblers and a \$350 gift card to Fry's Electronics.

The meeting will be followed by a special SBE 50th Anniversary Reception, held across the hall in

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Room S-219 from 6:30 to 8:30 pm. Two drink tickets and "finger food" will be provided. Members of the SBE and guests are invited. No RSVP is required. The reception is made possible in part with support from the following SBE Sustaining Members:

MEMBERSHIP, page 3

Begin NAB Show week with Saturday Ennes Program

Fred Baumgartner, CPBE, CBNT

We all remember our first NAB spring show. The sheer cerebral overload of the event -- there isn't a chance in the world that anyone can take it all in. It's the realization that even the most aggressive personal show schedule skips over all but a fraction of a percent of all that goes on there. It's hard to get our heads around how really big our industry is. How do all these people have a role? How is it that after a few years of involvement we now stop every 100 feet to greet someone we know?

This next show is special. The Society of Broadcast Engineers was born at one of these NAB events exactly half a century ago. I can't imagine how the folks attending that foundation meeting would look upon the presence and progress the SBE has made since then. Especially the SBE/Ennes program on opening day (Saturday 5 April, 2014). This is our 19th day-long program. Attendance does require a full admission, which SBE members get at a discount. This is also part of PBS TECHCON, and your registration for TECHCON is also good here. If you are in the PBS/NPR fold, it is well worth attending TECHCON (the complete list of presentations and tracks is on the web site) and the Ennes program.

Every year we address what it is that Broadcast Engineers most need to know, and we start each program with an early morning tutorial. What Broadcast Engineers don't know about finances and how monetization works in our new digital media world, can hurt us. Hence, we've asked two frontline finance and new media sales authorities to teach us what we need to know to best manage our engineering financial assets, and construct our facilities and workflows to accommodate the shift to revenue from newer digital media distribution.

This year's program focus is "Best Practices." In this business we are blessed with two professionals that have made quite a reputation of presenting the best and worst of engineering

practices. You no doubt read Mark Persons' and John Bisset's Radio World columns. Trust me; this is even better in person.

You might have noticed that this year's Super Bowl coverage on CBS included 6 Ultra-HDTV Heyeper-vision slow motion cameras using the 3840 x 2160 / 300 Frames Per-Second video format. Just how one does this is the topic of Robert Seidel, CBS VP Engineering & Advanced Technology.

More immediately, 4K seems to be inevitable. Stan Moote covers what it is we do to accommodate 4K, higher resolution video, in our facilities. Along similar lines, Evertz is introducing IPX; their software defined networking (SDN) for broadcast. Our facilities are always being improved and Ethernet and higher resolutions are clearly part of that trend.

There is some fun in the day also. Brief looks at Jim Dalke's 5 kW on 500 kHz maritime CW station, what Shane O'Donoghue is doing with the Empire State Building' RF infrastructure, and Michael Pettersen's take on the 75th anniversary of the Shure model 55, give us a chance to look at some things that are just plain good old fashioned fun.

Over-the-top (OTT) is still on the must-know agenda, as we take a look at QuickPlay and their OTT headend in the cloud strategy presented by their President, CEO and Co-founder, Wayne Purboo.

Is your group or station into advertising other than broadcast? Many broadcasters do outdoor, print and specialty advertising, and recently Digital Out-Of-Home (DOOH) or digital signage is picking up broadcaster's interest as a natural extension of their business. Even if you don't expand into DOOH, the displays and players have found their way into TV and radio studios and events, with more likely to follow. DSI's Tom Percich takes us through the business of building DOOH systems and in-studio applications.

News drones? When we were putting this program together, it seemed that regulation and liability would keep news operations from flying news gathering drones. Even in the last few months, momentum seems to be building in the direction of some broadcast drone capability. Chris Day, Schiebel's head of capability engineering, gives a tour what is available, how it is used and where this might lead.

Ultimately, most of us are working towards ratings. We do a lot to get viewer ratings, and we do a lot to make sure our signals are counted in the right ways. How we get ratings, what we do to facilitate ratings is the subject of Paul Kempter's presentation. Definitely something broadcast engineers must understand.

Broadcast engineers definitely need to know how to support ever expanding social media integration into broadcasting. Ross' Scott Bowditch takes a close-up look at the integration of Social Media and Broadcast in contemporary News Room Computer Systems.

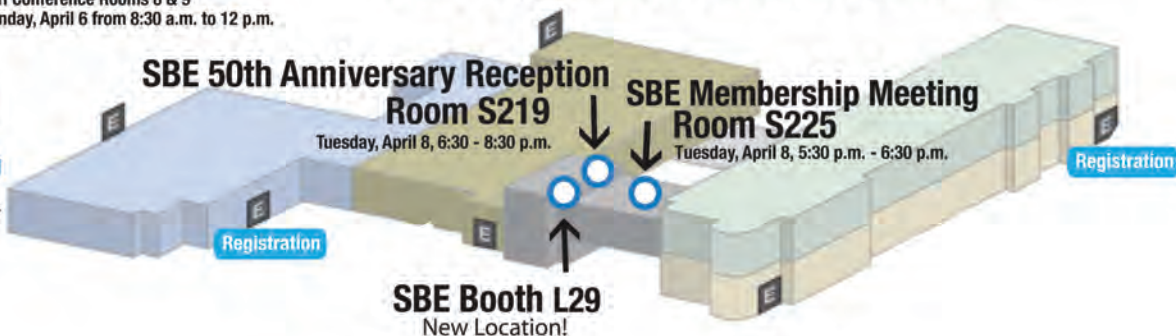
Few of us work in just Radio or TV anymore. We all work in the continuously converging while expanding world of electronic media that has a multitude of delivery devices and modes of communication. Still, we have buildings, bugs and broadcast transmitters to care for. A half a century ago, who would have thought a day-long series of tutorials would barely cover what all a broadcast engineer needs to know this year. For a broadcast engineer, it's not crazy to spend a Saturday in Las Vegas participating in the Ennes program. If you are one of us, and of course you are, what happens in Vegas, comes back to our stations and businesses in tangible form. We'll look forward to seeing you April 5th.

Fred Baumgartner is a Trustee of the Ennes Educational Foundation Trust, the non-profit, charitable arm of the SBE. He organizes the Ennes program held at the NAB Show, as well as regional Ennes Workshops held in cooperation with the SBE.

Las Vegas Hotel & Casino (LVH)



Las Vegas Convention Center



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MEMBERSHIP from page 1

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Bronze Sponsors - AC Video Solutions, Blackmagic Design, Econco, Steve Moreen - RF Specialties of California, Sutro Tower, ATSC and WideOrbit.

During the reception, several special guests will be introduced, each member will be invited to sign-in on a member number timeline and view a timeline that recalls important dates in the history of the SBE. Five \$50 bills will be given away. ●

New Awards Added

Many of you dedicate time and effort to promote and improve the field of broadcast engineering and the SBE, but you may not be recognized in your efforts. Here is an opportunity for individuals and chapters to be recognized for what they do for the industry.

The SBE has added two new awards recently to better recognize your contributions; Best Social Media Site and Chapter Engineer of the Year. Other awards available include: Most Interactive Chapter, Best Chapter Website, Best Technical Article, Book or Program by an SBE Member, the Technology Award and Best Chapter Newsletter. The top two awards presented each year are the Robert

W. Flanders SBE Engineer of the Year and the James C. Wulliman SBE Educator of the Year.

To nominate a worthy individual or chapter, go to the SBE website to download and submit the nomination form. Nominations are due by June 13, 2014. Winners will be notified in July and the awards will be presented during the SBE National Meeting on October 8 in Verona, N.Y.

For more information, please visit the SBE website or contact SBE Awards Chairman, John Heimerl, at johnh@finetuning.com or Megan Clappe, Certification Director, at mclappe@sbe.org.

Kissel Joins SBE Staff

Dan Kissel has joined the SBE national office staff as Communications and Membership Coordinator. Kissel is a graduate of the University of Evansville in Evansville, Ind. where he earned a B.S. degree in Communication, with concentrations in advertising, public relations and journalism and German. Kissel is from

the Evansville area and, while in college, completed internships with the Evansville Courier and Journal and Tucker Publishing Group. We welcome Dan to the SBE! ●



Stay Connected, Renew Today

It's not too late to renew your membership in the SBE. Those in the Member, Senior, Student, Associate and Fellow membership categories may renew by returning the renewal form received in February by mail or fax, or renew online at <http://www.sbe.org>. The online system is a quick, complete and secure renewal method available 24/7. An automated email message is sent to the renewing member confirming renewal and payment.

Members attending the 2014 NAB Show may renew their membership at the SBE exhibit booth, L29, located at the north end of the South Hall, second floor lobby area of the Las Vegas Convention Center.

SBE Booth hours:

Sunday, April 6 - 2 to 4 pm

Monday, April 7 - 9 am to 6 pm

Tuesday, April 8 - 9 am to 5 pm

Wednesday, April 9 - 9 am to 6 pm

Thursday, April 10 - 9 am to 2 pm

Members with questions about renewal, or those who did not receive a renewal reminder in February, are asked to contact Scott Jones at the SBE National Office at (317) 846-9000 or kjones@sbe.org. ●

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LETTER FROM THE PRESIDENT

by Joe Snelson, CPBE, 8-VSB
SBE President
jsnelson@sbe.org

A New Year and Hitting the Road Running

It seems like for each New Year I find myself hitting the road running, so to speak. What I'm referring to is the Consumer Electronics Show (CES) which typically occurs within the first week or so in January and just after the holiday season. Some may wonder why many broadcasters attend the CES show. Well, this is the place where consumer technology is introduced. Many broadcasters have attended CES for several years to get a glimpse of what their customers, the listeners and viewers, will have available in the near future to not only consume their product but also to compete against it. This month I want to present a few things I observed at the CES since some of the things seen there may well affect many of us at some point in the future.

One of the things that stood out to me was the plethora of 4K video displays at the show. I recall several years ago that the big push seemed to be towards 3D. This year there was still some 3D on display but, in my opinion, not as much as there was a few years earlier. The 3D on display included both those that required glasses and those that didn't. While not perfect, yet, glass-less 3D certainly seems to be coming along and looks better than what I recall seeing earlier. Off axis viewing also seems to be improving though one still needs to be directly in front of the display for the optimum 3D viewing experience.

Circling back to 4K displays, the use of Organic Light Emitting Diodes continues to develop and looks great. One of the other things that stood out to me was more curved screens. Most of the curved screen displays were adjustable. The adjustment range went from flat to about two inches out from the wall on the sides of the display. The goal of this is to tend to wrap the display around the view for a more enjoyable user experience.

One vendor showed not only 4K displays but also a couple of 4K cameras for acquisition. Also shown was an upconverter to convert 2K to 4K. I will admit the upconversion was pretty impressive. Of course, being an engineer, I tend to be skeptical on what I see at a trade show without seeing it in the field under conditions we deal with daily.

So, how does all this relate to today's broadcast engineer since we have no way to transmit 4K material? I found an answer to that question when I went by the Samsung booth and saw a demonstration. They demonstrated a 4K

transmission that originated on Black Mountain and was broadcast on a 6 MHz television channel. It was explained to me that the bit rate being used was 25 mb/s and to no surprise, video encoding was not MPEG 2. Certainly this demonstrated it was possible to achieve 4K transmissions within a 6 MHz bandwidth. I was not the only one interested in viewing this demonstration. While standing there waiting to ask some questions the booth person was talking to somebody from the FCC who also seemed very interested in the dazzling live broadcast and how it was being achieved in 6 MHz. Of course, as we all know, the ultimate decision on the adoption of any new technology whether it be 3D, 4K, 8K or whatever, will be made by the consumer who votes with their billfold.

On the radio side I was glad to hear that HD radio will be available in more mid-sized and lesser expensive cars. If you have never had the opportunity to attend the CES, most of the North Hall of the Las Vegas Convention Center is devoted to automobile entertainment systems. There are some pretty sophisticated audio systems available for automobiles. It was in the North Hall that I recall seeing my first one farad capacitor in the automobile sound area of the CES. It brought back memories of text books I read when I was a teenager and first getting into electronics. I recall one of those books describing the size of a one farad capacitor as the size of a bathtub. Well, the ones I saw for automobile sound systems were about the size of the classical cylindrical oatmeal box.

While CES kicks off the beginning of the year, showing what will be available for the consumer, the NAB Show comes along about three months later showing the technology that creates and distributes both radio and television content to the consumer. While I am writing this article well in advance of the NAB Show to meet editorial deadlines, it appears the show will again deliver in terms of exhibiting technology and technical papers. And, of course, the SBE plays an integral part in the Broadcast Engineering Conference with its notable Saturday Ennes program and programs

ranging from Developing Engineering Budgets to Software Defined Networking. The SBE Ennes program is well attended and if you plan on attending the NAB Broadcast Engineering Conference, we hope to see you there.

Of course, what makes this year's NAB Show particularly special for the SBE is the celebration of our 50th Anniversary. We will be holding a




2013 NAB Show

reception following our membership meeting on Tuesday evening. If you will be attending the NAB Show this year, do be sure to attend the membership meeting and our 50th Anniversary reception.

The New Year also started with a bang for the SBE.

We kicked off the year with our Advanced Networking webinar presented by the chair of the Education Committee, Wayne Pecena. I attended this webinar and Wayne gave an excellent presentation that was well attended.

On the regulatory front, the SBE Government Relations Committee, chaired by Ched Keiler, worked on filing comments with the FCC regarding AM Radio Improvements. And as I write this, we are looking at filing comments on the Public Notice regarding interference between wireless broadband and digital television services as part of the DTV spectrum repacking initiatives. I will add that the SBE Government Relations Committee invites any thoughts or comments you might have on the various regulatory topics that come up. Ched will be at the SBE booth on Monday of the NAB Show from 12:30 to 2:30 pm so stop by and share your thoughts with him. You can also contact Ched at grc@sbe.org.

We have a lot going on and that's all I have time for this month. I look forward to sharing more as the year progresses. For those of you that will be attending the NAB convention please be sure to stop by the SBE booth and say hello and we also look forward to seeing you at our membership meeting and 50th anniversary reception. 



EDUCATION UPDATE

by Wayne Pecena, CPBE, 8-VSB, AMD, DRB, CBNE
SBE Education Committee Chairman
w-pecena@tamu.edu

How Do You Learn Broadcast Engineering?

Broadcast Engineering is a unique field requiring an education that crosses many disciplines. This is as true today as it was 50 years ago when the Society of Broadcast Engineers was formed. Over the course of the last fifty years, the broadcast engineer has found himself or herself constantly challenged to learn current technology and keep up with the new technology in the profession. Broadcast engineering is truly unique in that knowledge and skills in diverse electrical, mechanical, electronics, and now information technology is required to be successful.

Many broadcast engineers have simply come up through the ranks to gain the knowledge and experience to have a successful career. A formal course of study in Electronics through a community college, trade school, University, or military training was often the starting point to pursue a career in broadcast engineering. The basics was then applied through on-the-job training through the course of the days for often several years before a true "journeyman" level of skills and knowledge was obtained. Unfortunately, very few formal broadcast engineering core curriculums have ever existed.

The SBE has always been there to provide relevant broadcast engineering education resources and programs to its members. In person presentations at SBE hosted conferences and ENNES workshops was the

starting point for engineering education delivery. Many of our bookshelves contained numerous texts penned by Harold Ennes, the namesake of ENNES Workshops today. The SBE was an early adoptee of "Distance Learning" before the terminology was common place. Before the Internet, VHS tapes were distributed from the SBE National Office on topics ranging from Understanding a Waveform Monitor and Vector Scope to CCD Camera Technology to the Economics of Using Rebuilt Power Tubes. Today of course, the Internet has become the mainstream delivery mechanism for a wide variety of course and program offering. And of course the SBE Bookstore continues to offer relevant technology publications to members at discounted prices for our private libraries.

Regardless of the path your career has taken you, it is likely filled with hands-on experience and personal time to learn and keep up the technology through self-study. The successful broadcast engineer is said to possess three character traits: talent, technique, and tenacity (broadcast engineering – November 2005). The engineer's technique is developed by a combination of education and on-the-job experience. The SBE has been there supporting the educational needs of the broadcast engineer for the past fifty years.

What About Today?

The latest SBE University course "Broadcast Engineering & the Management Team" is now

available online. Authored by industry veteran Gary Ellingson, the course offers the broadcast engineer insight into understanding business and financial management.

Remember that the society offers numerous recorded or archived webinars in addition to the live delivered ones. Webinars cover the diverse topics of interest to the broadcast engineer ranging from AM Directional Antenna Systems to understanding FCC regulations to numerous IP Networking topics. These webinars are less intensive, are usually an hour or so in length, and available on your schedule. Several are free, based upon generous support of industry sponsors. Others are available to SBE members at a nominal cost.

Future Education Events

- Regional ENNES Workshop – May 30, El Paso, Texas
- RF Safety Course with Richard Strickland, June 24
- 2014 Leadership Development Course with Purdue Professor Rodney Vandever, August 12-14, Atlanta, Ga. ●

For more information on any SBE Education program, contact Kristin Owens, kowens@sbe.org, Education Director at the National SBE office.

SBE Leadership Development Course Journeys to Atlanta

The 2014 SBE Leadership Development Course will take place Tuesday-Thursday, August 12th-14th in Atlanta, Ga. at the Hyatt Place Atlanta Airport-South. This professional development course is a three-day intensive study of successful leadership and management. The course includes a leadership self-assessment, provides insights on generational differences, and explains the value of communication. The course differs from other management courses as it is geared towards broadcast engineers

Rodney Vandever, a Professor of Organizational Leadership and Supervision at Purdue University, will be instructing the course again this year. Vandever

brings more than 30 years of experience in human resources management, training, development and manufacturing. Vandever also owns a leadership training business,



Some of the class members participating in the SBE Leadership Development Course held in 2013

VanTech Training.

To register for this professional development opportunity, visit the Leadership Development Course page on the SBE website, under Education. The enrollment fee is \$599 for members of the SBE and \$650 for non-members. The hotel is close and convenient to Atlanta's Hartsfield/Jackson airport and the room rate is \$89 per night, plus tax. If it is difficult to obtain company approval to attend, visit the SBE website under the Education section for tips on how to justify professional development to an employer. If you have any questions contact Kristin Owens at kowens@sbe.org. ●



CERTIFICATION UPDATE

by Megan E. Clappe, SBE Certification Director
mclappe@sbe.org

Certification Volunteer Recognition

Every year at the annual membership meeting during NAB, the SBE recognizes the local certification chairmen who devote volunteer time to their Program of Certification. These local certification chairmen receive a plaque on their recurring five year anniversaries. Here is a list of those who will be recognized in April. Thank you very much to all of the volunteers who devote so many hours to the SBE and the certification program.

25 Years

Chapter 60 Samuel Straus, CPBE
Chapter 63 Henry Kaul, CPBE

20 Years

Chapter 45 Thomas Green, CSTE

10 Years

Chapter 18 James Perry, CPBE, CBNT
Chapter 76 Chris Heck, CPBE
Chapter 113 Ernest Sutton, Jr., CPBE

5 Years

Chapter 36 Gary Stigall, CPBE
Chapter 58 Richard Klein, CBTE
Chapter 145 Thomas Lowther, CSRTE, CBNT

National Certification Committee

25-Years

Dane Ericksen, P.E., CSRTE, 8-VSB, CBNT

10-Years

Terrence Baun, CPBE, AMD, CBNE



Certification Question

answer on page 15

A service level agreement for networks would include:

- a. minimum levels of link QoS
- b. items such as delay, jitter, bandwidth and packet loss
- c. minimum service availability
- d. all of the above

A snapshot in time



At the 1977 SBE Annual Meeting held during that year's NAB convention, SBE President, Bob Wehman (center) recognizes two of the three SBE members instrumental in the creation of the SBE certification program; John Wilner (l) and Ben Wolfe. (Jim Wulliman was the third. See the February 2014 issue of The Signal)

Accredited SBE Frequency Coordinators

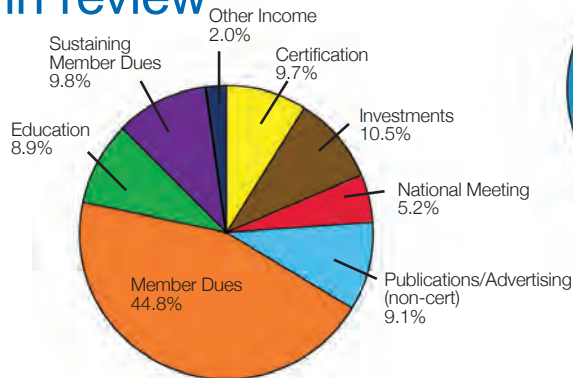
The Society of Broadcast Engineers began the Accreditation program to provide volunteer SBE coordinators the opportunity to be recognized as part of a standards-based, nationally recognized program of local voluntary broadcast-auxiliary frequency coordinators. The program also makes it possible for SBE to demonstrate to the broadcasting industry the widespread acceptance of a voluntary set of standards guiding local coordination.

Gary Becknell - Suffolk, Va. - Chapter 54
Luis Espinal - New York, N.Y. - NFL Coordinator

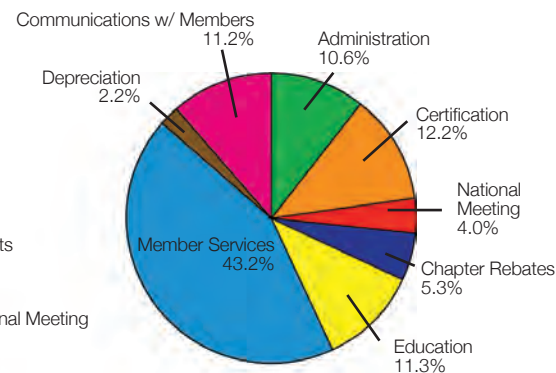
2013 SBE financial year in review

The Society of Broadcast Engineers, Inc. completed 2013 with net revenue from all operations of \$80,159. Gross income from all sources was \$721,341 while expenses were \$641,182. The value of SBE savings and investments as of December 31, 2013 \$1,106,573. Total SBE assets as of December 31, 2013 were \$1,143,676, an increase of \$54,147 over 2012.

A percentage breakdown of SBE income and expenses is depicted in the accompanying charts. A financial statement will be published in the June issue of The SIGNAL, following completion of the Society's annual audit.



Income from All Sources



Expenses from All Sources

New SBE Certification Achievements

CONGRATULATIONS

LIFE CERTIFICATION

Certified Professional Broadcast Engineers® and certified senior broadcast engineers who have maintained SBE certification continuously for 20 years, are at least 59 ½ years old and are current members of SBE may be granted Life Certification if so requested. All certified who have retired from regular full-time employment and are at least 59 ½ years old 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™) Larry Beavers, Fall River, Mass. – Chapter 11 Phil Jennings, Sturgis, Mich. – Chapter 142 William Greep, Louisville, Ky. – Chapter 35 Carlos Marcelo Sanchez, Miami, Fla. – Chapter 53	Philip Mowbray, Grand Junction, Colo. – Chapter 81 Kishore Persaud, Catonsville, Md. – Chapter 46 Certified Professional Broadcast Engineer® (CPBE®) 8-VSB Specialist™ (8-VSB™) Daniel Rapak, Randolph, N.J. – Chapter 15	Certified Broadcast Radio Engineer™ (CBRE®) John Valenta, Wheaton, Ill. – Chapter 26 Certified Broadcast Television Engineer™ (CBTE®) Scott Curts, Aurora, Ill. – Chapter 26	Certified Broadcast Networking Technologist® (CBNT®) Daniel Rapak, Randolph, N.J. – Chapter 15 Certified Broadcast Technologist® (CBT®) Dale Podracky, Batavia, Ohio – Chapter 78
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FEBRUARY EXAMS

Certified Broadcast Radio Engineer™ (CBRE®) Curtis Gomez, Burbank, Calif. – Chapter 47 Evan Baker, Albuquerque, N.M. – Chapter 30 Certified Broadcast Television Engineer™ (CBTE®) Dale Comer, Burien, Wash. – Chapter 16 Certified Audio Engineer® (CEA®) Matthew Buck, Seattle, Wash. – Chapter 16 Curtis Gomez, Burbank, Calif. – Chapter 47 Kevin Salger, Charlotte, N.C. – Chapter 45	Certified Broadcast Networking Technologist® (CBNT®) Tim Ahern, Culver City, Calif. – Chapter 47 Evan Baker, Albuquerque, N.M. – Chapter 34 Jamie Baumann, San Antonio, Texas – Chapter 69 Lara Jessen, Riverside, Calif. – Chapter 131 Horace Murray, Glen Burnie, Md. – Chapter 132 Carl Sene, Pago Pago, American Samoa Stanley Zuidema, Wausau, Wis. – Chapter 112	Certified Broadcast Technologist® (CBT™) Paul Schminke, Phoenix, Ariz. – Chapter 9 Travis Wussow, Appleton, Wis. – Chapter 80 Certified Radio Operator® (CRO®) Isaiah Chavez, Lithia, Fla. – Chapter 39 John Skiba, New York, N.Y. – Chapter 15 Certified Television Operator® (CTO®) Beresford Daley, Boston, Mass. – Chapter 11 Robert Anderson, Van Nuys, Calif. Isaiah Chavez, Lithia, Fla. – Chapter 39 James Culligan, El Cajon, Calif. – Chapter 36 Jason James, Madison, Wis. – Chapter 24	Gregory Jarrell, Henderson, Nev. – Chapter 128 Michael Johnson, Palmdale, Calif. – Chapter 47 Jaime Perez, Los Angeles, Calif. – Chapter 47 Blayne Risvold, Huntington Beach, Calif. – Chapter 47 Jeffrey Yeagley, Las Vegas, Nev. – Chapter 128 Rebecca Yerdon, Menands, N.Y. – Chapter 58
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SPECIAL PROCTORED EXAMS

Certified Broadcast Networking Engineer™ (CBNE™) Patrick Perez, Los Angeles, Calif. – Chapter 47	Certified Broadcast Technologist® (CBT®) Alabama Broadcasters Association Ben Ellis, Tuscaloosa, Ala. – Chapter 68	Ronald Merkel, Gardendale, Ala. – Chapter 68 Robert Williams, Alabaster, Ala. – Chapter 68
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SBE CERTIFIED SCHOOL COURSE COMPLETION

Certified Broadcast Technologist® (CBT®) Bates Technical College Ethan Abraham, Tacoma, Wash. – Chapter 16 Matthew Alexander, Lakewood, Wash. – Chapter 16 Sean Badure, Lake Tapps, Wash. – Chapter 16	Trevor Gilligan, Gig Harbor, Wash. – Chapter 16 Tyler Greenham, Spanaway, Wash. – Chapter 16 Jamison Jensen, Spanaway, Wash. – Chapter 16 Riley O'Neill, Tacoma, Wash. – Chapter 16 Martin Patricelli, Edgewood, Wash. – Chapter 16	Chapter 16 Edward Prescod, Tacoma, Wash. – Chapter 16 Nicholas Vanderlinda, Gig Harbor, Wash. – Chapter 16 Jordan Williams, Montgomery, Texas	Cleveland Institute of Electronics Jeffrey Biernat, Murrieta, Calif. – Chapter 131 DINFOS Adam Flores, Colton, Calif. – Chapter 131 Nicholas Leija, Lockhart, Texas – Chapter 79 Michael Walsh, New Cumberland, Pa.
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CERTIFIED BY LICENSE

Certified Broadcast Technologist® (CBT®) Russell Cheatham, Madison, Ala. James Friddle, Rogers, Ark.	Sergio Plasencia, Miami, Fla. – Chapter 53 Steven Russell, Noblesville, Ind. – Chapter 25 Gregory Schmitke, Glyndon, Minn. – Chapter 17	Nicholas Slade, Ottawa, Ontario Canada
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CERTIFIED RADIO OPERATOR® (CRO®)

Andres Martinez Lopez, Pasadena, Calif. Sean Vaughn, Alvin, Texas – Chapter 105	Gene Wisniewski, Wendell, Idaho	Parma City Schools Charles Rhodes, Parma, Ohio	Raymond Tam, Parma Heights, Ohio Vladimir Ysotoskiy, Parma Heights, Ohio
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CERTIFIED TELEVISION OPERATOR® (CTO®)

Ethan Abraham, Tacoma, Wash. Fred Abramson, Albany, N.Y. Steven Alfano, Clifton Park, N.Y. Heather Carter, Bozeman, Mont.	Robert Ilowiecki, Watervliet, N.Y. Sean Lawless, Pomona, Calif. Chris Miller, Medford, Ore.	Craig Moss, Reno, Nev. David Nicosia, Amsterdam, N.Y. Andrew Plas, Amherst, Ohio	Nathan Sides, Cape Girardeau, Mo. John Skiba, New York, N.Y. Reginald Thompson, Cohoes, N.Y.
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JUBILEE PROJECT

Certified Senior Radio Engineer™ (CSRE®) Marshall Rice, Troy, Ill. – Chapter 55 Paul Thurst, Kerhonkson, N.Y. – Chapter 58	Certified Broadcast Radio Engineer™ (CBRE®) Matthew Lightner, Claysburg, Pa. – Chapter 41 Certified Broadcast Networking Technologist®	Larry Gregg, Canyon, Texas – Chapter 105 Louis Johnson, IV, Clinton Township, Mich.	– Chapter 82 Certified Broadcast Technologist® (CBT®) David Bialik, New City, N.Y. – Chapter 15
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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.

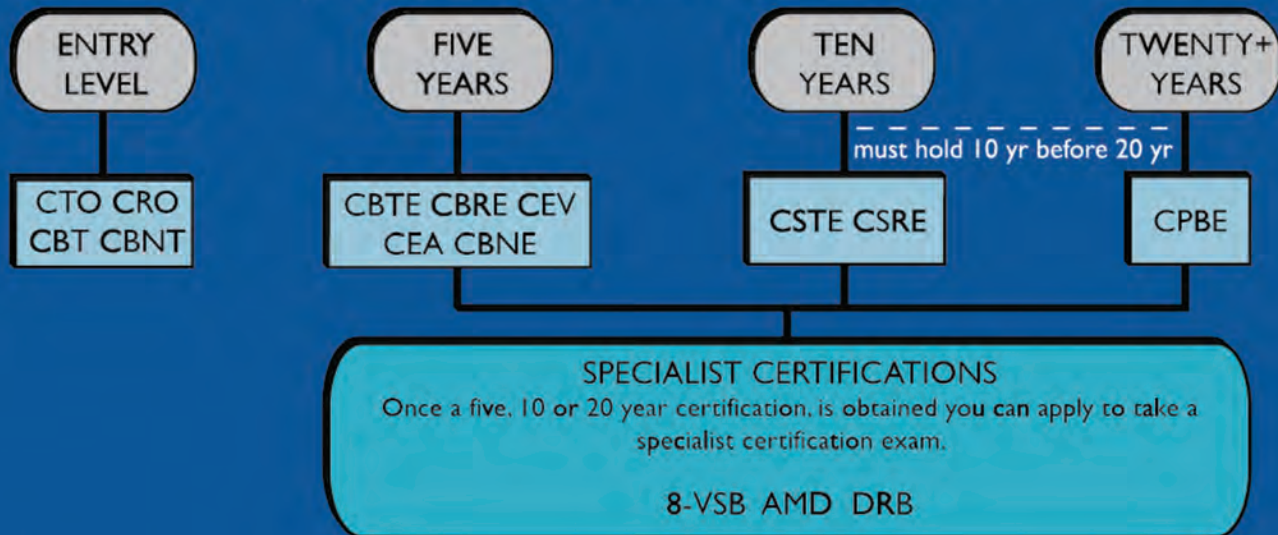
Certified Professional Broadcast Engineer® (CPBE®) Kevin Rodgers, Hacketts Cove, Nova Scotia Randolph Staley, Redlands, Calif. – Chapter 131 Certified Professional Broadcast Engineer® (CPBE®) 8-VSB Specialist™ (8-VSB™) Louis Johnson, IV, Clinton Township, Mich. – Chapter 82 Charles Keiler, Fort Lauderdale, Fla. – Chapter 53 Charles Mikowski, Grand Rapids, Mich. – Chapter 102 William Magliocco, Detroit, Mich. – Chapter 5 Certified Professional Broadcast Engineer® (CPBE®) AM Directional Specialist™ (AMD™) Tim Walker, Arlington, Texas – Chapter 67 Certified Professional Broadcast Engineer® (CPBE®) AM Directional Specialist™ (AMD™) Joseph Huk, Adrian, Mich. – Chapter 82 Certified Senior Radio Engineer (CSRE®) AM Directional specialist™ (AMD™) John Hovanec, North Royalton, Ohio – Chapter 70 Certified Senior Radio Engineer™ (CSRE®) David Dobes, Waterloo, Iowa – Chapter 65 Noel Richardson, So. Charleston, W.V. – Chapter 116	Certified Senior Television Engineer™ (CSTE®) Wayne Murphy, Murrieta, Calif. – Chapter 131 James Myers, Mount Wolf, Pa. – Chapter 41 Mark Pridgeon, Osceola, Ind. – Chapter 30 Adrian Washington, Riverside, Calif. – Chapter 131 Certified Broadcast Radio Engineer™ (CBRE®) John Beck, Raymore, Mo. – Chapter 59 Donald Bohrer, San Antonio, Texas – Chapter 38 James Glanz, Brooklyn, N.Y. – Chapter 15 Dale Schiesser, Marshall, Mich. – Chapter 91 Matthew Stadtmueller, Denver, Colo. – Chapter 80 John Tyler, Pawcuctuck, Conn. – Chapter 14 Certified Broadcast Television Engineer™ (CBTE®) David Haralambou, Marlborough, Mass. – Chapter 11 David Kuether, Brea, Calif. – Chapter 47 Greg Richwine, Des Moines, Iowa – Chapter 109 Kenneth Scott, Seattle, Wash. – Chapter 16 Mark Seekins, Columbus, Ohio – Chapter 52 Dennis Wallace, Waldorf, Md. – Chapter 37 Certified Audio Engineer® (CEA®) Charles Youngs, Atlanta, Ga. – Chapter 5 Certified Audio Video Engineer™ (CEAV™) Mike Curran, San Diego, Calif. – Chapter 36 Certified Broadcast Networking Technologist® (CBNT®) Robert Army, Jr., Moreno Valley, Calif. – 131 Darryl Jones, Pasadena, Md. – Chapter 132	James Glanz, Brooklyn, N.Y. – Chapter 15 John Hovanec, North Royalton, Ohio – Chapter 70 Joseph Huk, Adrian, Mich. – Chapter 82 Charles Keiler, Fort Lauderdale, Fla. – Chapter 53 Charles Mikowski, Grand Rapids, Mich. – Chapter 102 Kishore Persaud, Catonsville, Md. – Chapter 46 Kevin Rodgers, Hacketts Cove, Nova Scotia Kenneth Scott, Seattle, Wash. – Chapter 16 Walter Sewell, Belleville, Ill. – Chapter 55 Randolph Staley, Redlands, Calif. – Chapter 131 Jimmy Truong, Romoland, Calif. – Chapter 131 Tim Walker, Arlington, Texas – Chapter 67 Adrian Washington, Riverside, Calif. – Chapter 131 Mark Wittkoski, Grand Rapids, Mich. – Chapter 102 Charles Youngs, Atlanta, Ga. – Chapter 5 Certified Broadcast Technologist® (CBT®) Jon Anderson, Davenport, Iowa – Chapter 65 Ronnie Barnes, APO, AE – Chapter 132 Yezmin Blue, Seattle, Wash. – Chapter 16 James Clarke, Valley Stream, N.Y. – Chapter 15 Dale Comer, Burieh, Wash. – Chapter 16 Andrea Cummis, Roseland, N.J. – Chapter 15 Adam Daniel, Tacoma, Wash. – Chapter 16 Charlie Farr, Jr., Virginia Beach, Va. – Chapter 54 Damion Giunta, Highlands Ranch, Colo. –	Chapter 47 James Grace, Mitchell, S.D. Ronald Huffaker, Maryville, Tenn. – Chapter 113 M. Sajid Malik, Saudi Arabia – Chapter 70 Jerry Manes, Mableton, Ga. – Chapter 5 Randall Miller, Harrisburg, Pa. – Chapter 41 Don Mussell, Jr., Kilauea, Hawaii – Chapter 63 Benjamin Rodriguez, Gilbert, Ariz. – Chapter 9 Charles Sawner, E. Syracuse, N.Y. – Chapter 22 Urban Stiess, Los Angeles, Calif. – Chapter 47 Chris Thomas, Seattle, Wash. – Chapter 16 Richard Warren, San Diego, Calif. – Chapter 36 Jeff Windsor, Oswego, N.Y. – Chapter 22 Robert Worek, Cheswick, Pa. – Chapter 20 Certified Television Operator® (CTO®) Craig Fisher, Charlotte, N.C. Steven Hardinger, North Jackson, Ohio Robert Holden, Alexandria, Ohio – Chapter 52 Chris Homer, Aelandria, VA Martin Loercher, Houston, Texas Bradley Meyer, Anover, Minn. – Chapter 56 Joseph Miller, Hixson, Tenn. – Chapter 113 Tim Parish, Sacramento, Calif. – Chapter 43 Chris Rundel, Topeka, Kan. Chris Zentkowski, Duluth, Minn.
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WHAT YOU NEED TO KNOW ABOUT SBE CERTIFICATIONS

The SBE certification program is the only professional recognition available to broadcast engineers, which provides standards of professional competence. It is the primary method of verifying the attainment of educational standards in the industry.

YEARS OF EXPERIENCE

SBE certifications are based on years of experience in the broadcast engineering field. Broadcast engineers can apply for a certification once they meet the year requirements. An associate degree counts as two years of experience and a bachelor's degree counts as four years of experience. No experience is required for entry level.



Life certification is available to those who are retired or may also be granted to professional broadcast engineers and senior broadcast engineers who have maintained certification continuously for 20 years and are current members of the SBE upon application.

LISTING CERTIFICATIONS

Broadcast engineers may hold multiple certifications. SBE certifications are listed from highest (most experience required) to lowest. Specialist certifications are listed after their corresponding category certification.

EXAMPLES:

Joe Brown, CSRE,AMD, CBNT
 Kevin Jones, CBT, CBNT, CRO
 Heather Cosby, CSTE, CBRE, DRB
 Ray Osmond, CPBE, 8-VSB,AMD, CBNT

Most certifications stand alone however, some certifications supersede and replace existing certifications.

CBTE replace with → CSTE replace with → CPBE
 CBRE replace with → CSRE replace with → CPBE
 CBNT replace with → CBNE

CERTIFICATIONS IN PRINT

Certifications may be referred to in various ways in text, including levels or general terms. The colors used with the following general terms correspond with the certifications in the below levels.

GENERAL TERM KEY: operator, technologist, audio engineer, video engineer, senior certification, professional certification, networking technologist, broadcast engineer, networking engineer, specialist

OPERATOR LEVEL

Certified Radio Operator® (CRO®)
 Certified Television Operator® (CTO®)

TECHNOLOGISTS LEVEL

Certified Broadcast Technologist® (CBT®)

BROADCAST NETWORKING LEVEL

Certified Broadcast Networking Technologist® (CBNT®)
 Certified Broadcast Networking Engineer™ (CBNE™)

SPECIALIST LEVEL

8-VSB Specialist™ (8-VSB™)
 AM Directional Specialist™ (AMD™)
 Digital Radio Broadcast Specialist™ (DRB™)

ENGINEERING LEVEL

Certified Broadcast Technologist® (CBT®)
 Certified Audio Engineer® (CEA®)
 Certified Video Engineer® (CEV®)
 Certified Broadcast Radio Engineer™ (CBRE™)
 Certified Broadcast Television Engineer™ (CBTE™)
 Certified Broadcast Networking Engineer™ (CBNE™)
 Certified Senior Radio Engineer™ (CSRE®)
 Certified Senior Television Engineer™ (CSTE®)
 Certified Professional Broadcast Engineer® (CPBE®)

Looking Back Over 50 Years

How Binghamton, N.Y. became home to SBE's Chapter 1

by Gino Ricciardelli CPBE Member #117

In 1964, Charles Hallinan received a letter from SBE founder, John Battison suggesting an organization for radio and television engineers be organized. Charles and I were members of the Institute of Radio Engineers, which was part of the IEEE. This organization was primarily made up of industrial engineers, with companies such as IBM and GE. The SBE was organized in the spring of 1964 and Charles and I decided to apply to make Binghamton, Chapter 1 of the SBE. Our application was accepted later in 1964.



We then invited all broadcast engineers in our area, which consists of Elmira, Ithaca and Binghamton, N.Y., to become members. We started monthly meetings and have continued them to this date. Charles and I have served as chapter chairmen; I have served as frequency coordinator and program and certification chairman for approximately thirty years. The chapter held a local convention and exhibits in Owego, N.Y., but we realized we could not sustain that effort, so years ago we asked Chapter 22 in Syracuse, N.Y. to continue this effort, which they do to this day.

Gino Ricciardelli is a technical broadcast industry consultant, living in Vestal, N.Y. According to the *Journal of the Society of Broadcast Engineers*, Volume 1, Number 2, published by the SBE in October, 1964, Chapter 1 held its first meeting on June 30, 1964 at "Your Home Library" (pictured below) in Johnson City, N.Y. Charles Hallinan, was elected chairman and Gino Ricciardelli

was elected vice-chairman. Ricciardelli was with WINR AM-TV in Binghamton, N.Y. at the time and Hallinan was with WKOP AM-FM, also in Binghamton. Hallinan, who was member #99 and served as the society's second national president, passed away in 1998.



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Donald L. Bargmann - Hillsdale, IL
Arkaprava Chaudhuri - Oakton, VA
Isaiah Chavez - Lithia, FL
Nicholas S. Geist - Houston, TX
Shonty E. Hawkins - Silver Spring, MD
Michael K. Jarnagin - Broken Arrow, OK
Beppu Masaaki - Nagoya, Aichi, Japan
Paul W. Schminke - Phoenix, AZ
Gregory D. Bennett - Cabool, MO
Nicholas A. Leija - Lockhart, TX
Ronald T. Merkel - Gardendale, AL
Andrew P. Plas - Amherst, OH
Sergio Plasencia - Miami, FL
Ken Stiver - Amherst, NY
Daniel Baer - Palo Alto, CA
Adam C. Flores - Colton, CA
Sean E. Graves - Round Rock, TX
Phil L. Jennings - Sturgis, MI
Douglas S. Bean - Columbia, MD
David M. Brizendine - Irving, TX
Luis Espinal - New York, NY
Brian F. Gullikson - Eagan, MN
Peter J. Keys - Broomfield, CO
Gregory I. Schmitke - Glyndon, MN
Douglas Kimpel - Central Point, OR
Paul V. Sedler - St. Paul, MN
Nicholas A. Slade - Ottawa, Ontario, Canada
Glenn P. Stewart - Pasadena, MD
Joshua Tittiris - Greenville, SC
Harold G. Eder, II - Newtown Square, PA
Dean Gross - White Bear Lake, MN
David A. Harris - Beaver Falls, PA
John M. Hassebrock - Colorado Springs, CO
Lorenzo Kemp - Atlanta, GA
Paul Lawicki - Holland, OH

Israel Ortiz - Guayama, PR
J. Barratt Godfrey - Seattle, WA
Anthony M. Hemming - Elizabeth Lake, CA
Curt J. Hemming - Elizabeth Lake, CA
Lester B. Roberts, III - Johnson City, TN
Archie Woodard - Sunnyvale, TX
Russell L. Cheatham - Madison, AL
Ben E. Ellis - Tuscaloosa, AL
Nathan P. Emery - Athens, AL
Eddie L. Green - Odessa, FL
Greg Ireland - Cincinnati, OH
Kevin S. McKay - Tacoma, WA
Greg T. Reams - Cincinnati, OH
Robert D. Ewing - Presque Isle, ME
Phillip H. Hayes - Viper, KY
Joey M. Verrett - Prairieville, LA
Andrew Q. Cleveland - Escondido, CA
Eric Moore - Missoula, MT
David Williams - Santa Barbara, CA
Peter J. Allen - Baltimore, MD
Bruce D. Anderson - Maricopa, AZ
Nick A. Elliott - Kittitas, WA
Ernie Ensign - Arlington, VA
John Heheman - Cincinnati, OH
Richard W. Krumreig, III - Charleston, SC
Andy Kupas - Cumberland, MD
Ernest L. LeClair - Saginaw, MI
Steve J. Lemay - Blaine, WA
Eugene B. Simmons - Las Vegas, NV
Gerald Tremblay - Roseville, CA
Jordan K. Williams - Montgomery, TX
Marion Lester B. Alcantara - Delmar, MD
John B. Kocur - Columbus, IN
Andrew P. Merfeld - Toluca Lake, CA
Alex A. Reyes - Sylmar, CA
Terry L. Spann - Weatherford, OK

NEW STUDENT MEMBERS

Caleb M. Dixon Galbreath - Lakewood, WA
Andrew Wagner - Arlington, VA
Juan C. Dent - Augusta, GA

Paul E. Stewart - Albion, MI
Luis Ortega - Santa Clarita, CA
John A. Pooley - Norwood, MA

NEW ASSOCIATE MEMBERS

Kenneth N. Miller - Canton, GA
Jeffrey Beyer - Vienna, VA

Saket Havaladar - Fairfax, VA
Andrew D. Ing - Woodland Hills, CA

NEW YOUTH MEMBERS

Clifford N. White - Tyler, TX

RETURNING MEMBERS

Peter J. Stohrer - Concord, NH
Todd R. Crane - Wichita, KS
Patrick E. Wahl - Chippewa Falls, WI
John S. Fanady - Akron, OH
Jay B. Schell - Toledo, OH
Jason J. Pepino - Odenton, MD
Clark Jillson - Boscobel, WI
Hugo L. Morales - Westminster, CA
Robert E. Williams - Alabaster, AL
Donald L. Perkins - Johnson City, NY
Adam L. Daniel - Tacoma, WA
Oliver Robinson - Cambridge, MD
Aaron Farnham - Phoenix, AZ
Alyn Dagher - Chicago, IL
Mark D. Williams - Kingston, OK

Dennis J. McSorley, Jr. - Lewis Center, OH
Derrick K. Cullison - Santee, CA
Jon C. Hartmeyer - Zanesville, OH
Bill Bachmann - North Haven, CT
Karl C. Hillway - Duluth, GA
Louis Johnson IV - Clinton Township, MI
Jaime R. Martinez - El Paso, TX
John D. Hurni - Elmhurst, IL
Evangel V. Arcega - Abu Dhabi, UAE
Geoffrey D. King - Decatur, GA
Timothy A. Kelly - Columbus, OH
Zachary A. Akey - Woodbridge, VA
Edward Kothera - St. Augustine, FL
Daniel C. Rasmussen - La Crescent, MN



LEGAL PERSPECTIVE

by Chris Imlay, CBT
SBE General Counsel
cimlay@sbe.org

What is the World Thinking?

My dad used to hire a guy to do work at our western Maryland property who said that he had never traveled out of Washington County, much less the State of Maryland. As the result, this kind, hardworking man had a very limited perspective of the world around him. Many people who follow telecommunications regulation think very locally as well. I tend to do that too. But it is a mistake. Telecommunications regulation within the United States is just a small bit of the picture, and one's perspective is not sufficiently wide, absent an understanding of international allocations proceedings. Case in point: the UHF television broadcast band, 470-698 MHz.

Everyone knows by now about the FCC's plan to repack the TV broadcast band in the United States so that some of the UHF band can be auctioned for broadband. That is an American steam train heading down the tracks at full speed, with Congress, the White House and the FCC all shoveling on the coal. But is the rest of the world ready to jump on board that train? Maybe. But maybe not.

At the end of January, FCC issued a Public Notice (DA 14-88) asking for comments on draft recommendations for agenda items that will be considered at the 2015 World Radiocommunication Conference (WRC-15). The FCC WRC-15 Advisory Committee (WAC), which includes private sector entities, submitted some recommendations for various WRC-15 agenda items, and the public has had the chance to comment on them. One of the recommendations of the WAC is labeled "WAC/066." It deals with WRC-15 Agenda Item 1.1, which is as follows:

Agenda Item 1.1 -- to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution 233 (WRC-12).

"IMT" is the international allocations term for mobile broadband. Right now, in the band 470-698 MHz, there is a primary broadcasting allocation in the international table of allocations in all three ITU regions. In ITU Region 1 (Europe and Africa) the allocation

internationally is for Broadcasting only. In ITU Region 2 (the Americas) Broadcasting is primary and the Fixed service is secondary. In ITU Region 3 (Asia and Oceania) there is a co-primary Fixed, Mobile and Broadcasting allocation. Current allocations in the UHF band to the mobile service require that any administration wishing to implement a mobile service do so only subject to the explicit agreement of affected administrations. So, any administration wishing to deploy mobile services in this band have to coordinate with neighboring countries in order to ensure the protection of broadcast operations.

Keep in mind that, in general, administrations do not have to adhere to the international table of allocations, as long as domestic allocations that differ from it do not cause interference internationally.

The WAC working group on this issue, IWG-2, could not reach consensus (which is the preferred method of doing business in these industry WRC preparation working groups) on a United States response to Agenda Item 1.1. Instead, there were two, non-consensus proposals that went forward from the WAC for comment. One was by the broadband providers in the United States, led by Alcatel-Lucent, AT&T, Ericsson, Intel, Motorola Mobility, Nokia, Samsung, Sprint-Nextel, Telecommunications Management Group and Verizon. Not surprisingly, they recommended that in all three ITU regions, the United States should support modifications to the international Radio Regulations that would make the Broadcasting and Mobile services co-primary in the range 470-698 MHz. This is based on the broadband providers' allegation that a "globally harmonized" allocation to the mobile service in the 470-698 MHz band would enable introduction of innovative broadband services while preserving access to spectrum for the existing services, such as broadcasting, and would provide administrations with the flexibility to apportion the band between the two services as each administration sees fit.

Squarely on the other side of the fence are the broadcasters. NAB, CBS and Fox provided their own recommendation on Agenda Item 1.1. They argued that a co-primary allocation for broadcasting and mobile would lead to interference issues, and criticized the mobile

service advocates for not providing a shred of technical evidence with respect to cross-border compatibility. The broadcast group recommendation stated, in part, that: "The assertions ... that administrations can merely implement either broadcast or IMT without regard to international interference concerns are simply not true... Studies... indicate that sharing in the UHF band between IMT and [digital terrestrial broadcasting] is 'difficult and may not be practical due to the large distance and frequency separations required.' These studies indicate that co-channel sharing between IMT base stations and a [DTV] receiver may require separation distances of approximately 100 km for co-channel operation and 20 km for adjacent channel operation. Studies submitted in the FCC's Incentive Auction proceeding by both broadcast and wireless interests suggest that sharing between high power TV transmitters and broadband base station receivers may require significantly greater co-channel and adjacent channel separations. Finally, the real-world difficulties of sharing even adjacent channel operations between broadcast and wireless are well documented with the Commission with regard to interference from TV channel 51 to wireless operations on former TV channel 52. The technical fact that large distance or frequency separations are required between TV and IMT to prevent interference has not been disputed by any party in IWG-2."

While the war within the WAC on WRC-15 Agenda Item 1.1 rages on in the United States in preparation for WRC-15, what is the position of the rest of the world? It is too early to say, because many countries simply do not show their cards this far in advance of the 2015 WRC. However, the trend seems to be for administrations to be rejecting an international IMT co-primary allocation in the band 470-698 MHz. Active ITU participants that I have talked to about this, and a sort of "scorecard" that is published by the ITU summarizing the views on Agenda Item 1.1 indicate that the IMT allocation proponents in the television broadcast band are a distinct minority. The United States, Sweden, Japan, and Egypt have weighed in in favor of the allocation, preliminarily. Against, however, include all RCC nations (i.e. the 12 former



FOCUS ON SBE

by John L. Poray, CAE
SBE Executive Director
jporay@sbe.org

50 YEARS from page 1

articles submitted by members. The early issues included full page advertisements from Electro-Voice, one of the first companies to join the SBE as a Sustaining Member. That first issue, which was released in June of 1964, also prominently included an article from FCC Chairman, E. William Henry, who welcomed the society and extolled the importance of the engineer to the broadcast industry.

Within the first two months of the organization's existence, five chapters were formed. Chapter 1, in Binghamton, N.Y. (see related article on page 9) was followed by Chapter 2 in Scranton, Pa. (now the Northeastern Pennsylvania chapter), Chapter 3 in Hutchinson, Kan. (now referred to simply as, Kansas), Chapter 4 in Albuquerque, N.M. (which is now Chapter 34) and Chapter 5 in Atlanta, Ga.

The second annual meeting was held on March 20, 1965 at the Shoreham Hotel in Washington, D.C., site of that year's NAB convention. The society approved articles of incorporation and by-laws and elected its first officers. They included Battison as president, Charles Hallinan of Binghamton, N.Y. as executive vice president, Robert Houston of deFuniak Springs, Fla. as

secretary and Ambrose (Bill) Kramer of Arlington, Va. as treasurer. By that time, seven more chapters had been organized; Butte, Mont. (6), Jacksonville, Fla. (7), Hollywood, Calif. (8), Phoenix, Ariz. (9), Portland, Ore. (10), Boston, Mass. (11) and Princeton, N.J. (12).

Over fifty years, the society has continued to grow and now numbers more than 5,300 members and 114 chapters. Members are found in every U.S. state, several U.S. territories and possessions and in 29 other countries. Canada boasts the most members outside the U.S. with 80. The SBE certification program, now close to 40 years old itself, serves as the benchmark of the technical broadcast field for measuring knowledge and experience. The SBE offers dozens of educational programs each year, many of them available 24/7/365 via the Society's website.

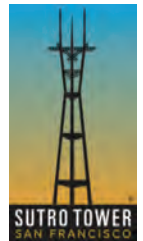
Looking forward, the SBE Board of Directors, supported by a number of strategic working



SBE members tour a broadcast facility on Mt. Willson during the 1994 SBE Convention in Los Angeles, Cal.

groups, is developing ways to increase the value of SBE membership, promote membership to a wider technical multi-media audience and promote the field of broadcast technology as a career to young people. Announcements about these developments will be made later in this 50th year of the SBE. ●

SBE 50th Anniversary Reception sponsors

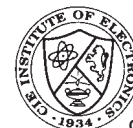


Director Candidates Sought

The national SBE Nominations Committee is looking for capable leaders interested in serving on the national board of directors. Candidates must hold Member, Senior, Life, or Fellow membership status, or be the official representative of a SBE Sustaining Member. All candidates must hold an engineering level certification from the SBE, and if elected, maintain the certification, as well as membership, throughout their terms.

Directors serve two-year terms and are expected to attend two full meetings of the board each year; in the spring during the NAB Show, and in the fall during the SBE National Meeting. Terms of officers are one year. Officers are expected to attend the two full meetings of the board plus two meetings of the executive committee, held each year in January and June.

Members interested in running for office are asked to contact Ted Hand, CPBE, 8-VSB, AMD, DRB, chairman of this year's nominations committee (ted.hand@coxinc.com, (704) 335-4732). ●



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Engineering Perspective

by David Davies, Consolidated Engineering Inc
ddavies@conenginc.com

Broadcast Towers and Galvanic Corrosion

Broadcast transmission towers bring the world into our homes. Be it music, internet, cable or satellite TV/radio, all network programming originates from terrestrial or earth-based broadcast towers. And these towers are under attack!

Guyed towers, are held upright by a series of cables providing lateral support, with steel shafts connecting these cables to deeply buried anchor blocks. This system works to balance these incredibly tall, yet slender



Figure 1

structures. (See figure 1 above)

The structure itself is easily inspected for damage and maintenance issues. Unfortunately, the anchor shafts are buried several feet underground, creating a real problem for tower inspectors. Over time, corrosion, or rust, begins to attack and erode the steel shafts, compromising the stability of the tower.

The corrosion process begins when a refined metal attempts to 'un-refine' itself, due to the electro-chemical reaction taking place. The failed tower, is the result of a corroded anchor shaft.

Corrosion of an anchor shaft is the result of an electrochemical process or galvanic action, causing metal to deteriorate. A galvanic cell requires five elements:

- 1) Anode
- 2) Cathode
- 3) Electrical Path (conductor)
- 4) Electrolyte
- 5) Current Flow

The source of the electrical current or potential classifies corrosion into two types; Galvanic or Electrolytic. With galvanic corrosion, the electrical current is the result of the naturally occurring electrical potential between two different types of metal or the same metal in different environments.

The Corrosion Cell illustrates how an electrical

current is created between the copper grounding system and the galvanized anchor shaft. The same process starts our automobile every morning. Current flow causes material migrates. In a controlled environment this would be termed "electro-plating". In an uncontrolled environment, this galvanic corrosion proves extremely detrimental to the anchor shaft integration.

The following two examples depict how a continuous piece of metal may be affected by different soil types or the difference between the soil and the concrete anchor block.

Electrolytic corrosion occurs when the tower system captures transient electrical current. An example of this phenomenon may occur when a corrosion-protected pipeline is in close proximity to tower anchors. Electrical current is artificially induced into an anode bed which, in turn, sacrifices to the pipeline, in an effort to prevent one area of the pipeline from sacrificing to another area of the same pipeline. Problems arise when the ground current is induced into the tower system. The current is received at one anchor and conducted through the metal guy wires to a second anchor. The second anchor shaft sacrifices to the pipeline, resulting in failure of the tower. Remember, with current flow so goes material migration. Unless an alternate electrical pathway is offered, corrosion can be prevented by electrically connecting, via wire, the second anchor to the pipeline. Other examples of transient current generators would include; Heavy manufacturing facilities, high tension electrical transmission lines and AM towers.

Galvanic and Electrolytic corrosion can be avoided by disrupting the electrical circuit. Insulating the shaft from its environment using a concrete collar is a proven method of accomplishing this in soils with a high pH. This method is less effective when the soil has a low pH.

The polarity, or direction, of the current may also be reversed. Replacing the typical copper grounding system with a metal higher in the Galvanic Series is the solution.

A "passive" anode grounding system composed of Zinc or Magnesium alloy will reverse the polarity of the galvanic cell. When the soil becomes sufficiently conductive to permit electrical current to flow, the anode system will sacrifice to the anchor shaft, thus

preventing destructive material migration.

This system is more cost effective than the "active" anode systems used to protect pipelines, and less costly than encasing the

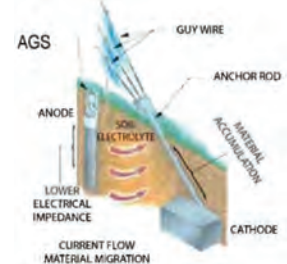


Figure 2

anchor shafts in concrete or other isolative material. (See figure 2 above) The anode system can easily be monitored for current flow in the correct direction and easily replaced when the anode becomes depleted.

How can you determine your corrosion risk? The most economical method would be to conduct a CRA or Corrosion Risk Assessment. The CRA examines several site specific, corrosion inducing factors including soil composition and chemistry, electrical conductivity, and transient electrical current sources. The CRA results in establishing the site's corrosion potential and also provides an estimate of corrosion-related damage to the buried anchor shaft and concrete anchor. Contact CEI, 812-459-1341 for additional information and learn how you can self-examine your site.

Recent innovations like the anode grounding system and Corrosion Risk Assessments are examples of combining different engineering disciplines to protect the commercial broadcast system and 'keep the music playing' for your enjoyment!

David Davies is a partner with CEI: Consolidated Engineering, Inc., an engineering consulting firm specializing in the broadcast tower industry. Earning degrees in both Civil and Mining Engineering, he's a 30-year veteran of the tower industry. Davies is a member of the Society of Broadcast Engineers, NACE National Association of Corrosion Engineers, and the TIA/EIA Design Standard Committee and authored the Electrical Grounding and Corrosion chapter of the current code.

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Members With 25 or More Years of Membership
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Jim Leedham has Broadcast Engineering in his blood. His father, Robert Leedham, was a broadcast engineer and among the earliest members of the SBE. Jim's own Broadcast Engineering career spans almost fifty years. Not surprisingly, he counts his father as one of his mentors, saying, "I was around studio and transmitter sites as a kid." This started his interest in electronics. He enlisted in the Navy, serving as an Electronics Technician, and went through several electronic schools. After his discharge from the Navy, he went to college for electronics and later got an education in computers and networking.

Leedham is chief engineer for Salem Communications, stations KGBI-FM, KCRO and KOTK, as well as KYFG-FM of the Bible


Broadcast Network, in Omaha, Neb. He cites two others who have been mentors to him that go back to the 1970's; John Bruna, who was formerly chief engineer for KFAB/KGOR-FM, and Gale Totten, who was Director of Engineering, both with May Broadcasting in Omaha. Totten is a Life member of the SBE, #308.

Leedham has been a member of the SBE since 1975, member #3176. He holds CPBE and CBNT certifications from the SBE and is a member of Chapter 74, The Midlands, in Nebraska. He's always stepped up to take on leadership roles in the chapter. He's served as chairman three different times, was the treasurer for several years and has been the chapter's certification chairman for many years. He enjoys helping his fellow broadcast engineers in times of need.


Asked what he enjoys the most from his involvement in the SBE, Leedham says, "The programs that our chapter puts together. I also enjoy seeing and talking with my fellow engineers and sharing stories about technical problems."

When he's not working, Leedham says he loves HAM radio. "I like rag chewing with others on the air, working CW and repairing ham gear," he says. Leedham holds Extra Class HAM radio license, WB0BIK. He also enjoys woodworking and music, and has a huge record and CD collection of Rock and Roll and other types of

music.


When he's not at work or in his HAM shack, he enjoys playing around with old tube type equipment and tries to get them in working order. He also likes playing with computers and watching college baseball and football. One thing most don't know about him is that one of his first jobs before getting into broadcasting was as a Fuller Brush salesman. "That job lasted just one day after I discovered I couldn't give the stuff away." 

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Together, Shaping our Future for Over a Half Century

That's right, the SBE is celebrating 50 years of serving Broadcast Engineers like you. We will continue to do that through membership, certification, education and legislative initiatives but we need your help!

Many of you know colleagues who are not familiar with the SBE but could benefit from membership. These individuals can apply for membership at any time throughout the year, but from March 1-May 31, the SBE would like to entice you to be extra vigilant in recruiting new members.


For every new member you recruit during this time period, when he or she adds your name to the "sponsor's line" on the membership application, you will receive \$5 off your 2015 dues (up to \$25). Your name will also be entered into the membership prize drawing for items that have been donated by the SBE, SBE Sustaining Members and affiliated book publishers. Members are entered into the drawing once each time they sponsor a new, full-dues paying member, and entered five times for sponsoring a Sustaining Member.

The grand prize winner will be awarded a trip to the SBE 50th National Meeting, held in conjunction with SBE Chapter 22 Broadcast and Technology Expo at the Turning Stone Resort in Verona, N.Y., October 7-8, 2014. The prize package includes round trip airfare for one; two nights stay at the Turning Stone Resort,

free admission to all national meeting and expo events.

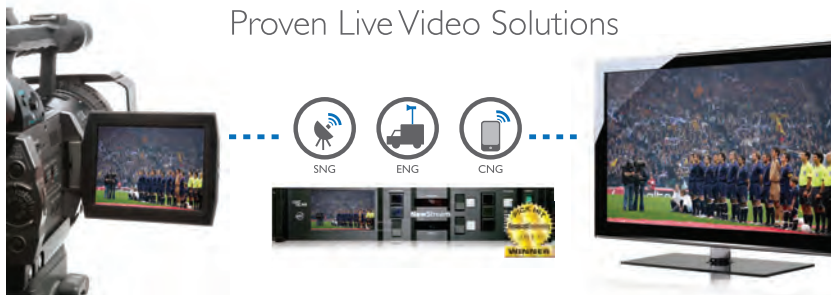
Additional prizes include an Optimod-PC Card 1101 courtesy of Orban, Tascam DR-05 Handheld recorder courtesy of Broadcast Supply Worldwide (2), Callaway Hex Warbird golf balls and Rohn ball cap courtesy of Rohn (2 sets), Leather portfolios with Rohn logo embossed courtesy of Rohn (2), Networking for Dummies, 10th edition and Communications Systems and Networks, 3rd edition, courtesy of Wiley; Directional Antennas Made Simple, 2nd

edition courtesy of Layton Technical Services, SBE 50th anniversary membership pin, SBE University course (your choice), SBE CertPreview download (your choice) and SBE logo tumbler, all courtesy of SBE.

Two SBE chapters will be presented Golden Recruiter Awards at the end of the drive. This recognizes a chapter, one each in the large and small chapter size divisions, that has the highest percentage of current SBE members participating in the Member Drive. Participation is defined as recruiting one or more new members. 


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James Quinn, Riverton, N.J.

MEMBERS ON THE MOVE



James Bernier, Jr., CPBE, CBNE is now Senior Director, Maintenance and Transmissions Engineering, Technology and Engineering, U.S. Network Operations at Turner Entertainment Networks in Atlanta, Ga.



Robert Sulecki, CBTE has been named Engineering Shop Supervisor at WRTV-6 in Indianapolis, Ind.

Have you recently made an employment change or received a promotion? Let your fellow SBE members know about it. Send your news to jpokay@sbe.org.

CQ

Answer

question on page 6

d. all of the above

MARK YOUR CALENDAR

SBE Membership Drive
March 1 - May 31, 2014

SBE Events at 2014 NAB Show
April 6, 2014, Board of Directors Meeting
April 8, 2014, Exams, Membership Meeting, 50th Reception

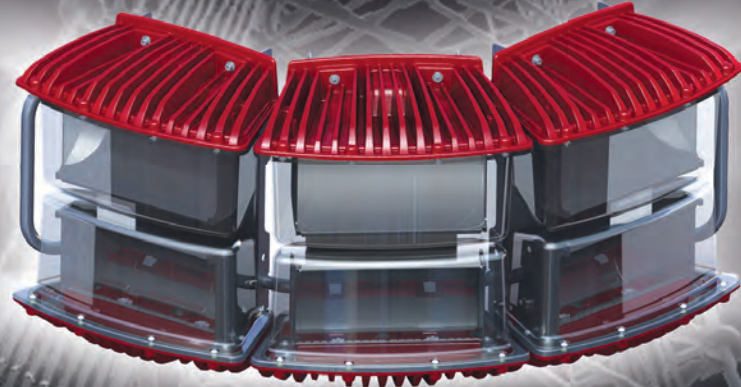
2014 NAB Show and NAB Broadcast Engineering Conference (Co-Sponsored by SBE)
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Networking Technology for Broadcast Engineers Speaker - Wayne Pacena
May 28
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Soviet nations, excluding the Baltics), Russia (separate from RCC), Australia, Cameroon, ECOWAS (Benin, Burkina Faso, Cape Verde, Côte D'Ivoire, Gambia, Ghana, Guinée, Guinée Bissau, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo), Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Germany, Italy, Vatican City, Iran, Argentina, and Brazil. On the fence are Canada and the United Kingdom. Of those countries which have not declared their intentions at this stage, most tend to take positions similar to those of the many

countries opposing the allocation. Each administration gets a vote in ITU processes. The United States does not control the ITU at all.

The outcome of Agenda Item 1.1 is not a small problem for the United States, because IMT, like many types of telecommunications services, requires worldwide harmonized allocations in order to make economic sense. So, we will see what we will see. ●

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