

THE Signal

Bimonthly Publication of the Society of Broadcast Engineers



The Association for Broadcast and Multimedia Professionals

www.sbe.org

Volume 29, Issue 3 • June 2016

OAB, Ohio SBE Chapters to Host SBE National Meeting in Columbus



The Crown Plaza Hotel in Columbus is the site of the 2016 SBE National Meeting

The Society of Broadcast Engineers will bring its 52nd annual national meeting to Columbus, OH, on Oct. 26-27, 2016. Serving as event hosts are the Ohio Association of Broadcasters (OAB) and the five SBE chapters of Ohio. The SBE National Meeting will be held in conjunction with the

annual Ohio Broadcast Engineering Conference presented by the OAB. The conference includes a broadcast/media equipment and services tradeshow and multiple technical sessions of interest to all media engineers, technicians and IT personnel.

SBE National Meeting events will be held at the Crowne Plaza Hotel in downtown Columbus. The Ohio Broadcast Engineering Conference will be held at the adjacent Greater Columbus Convention Center. The SBE Annual Membership Meeting will also be held at the convention center. The SBE national Awards Dinner will be sponsored by The Telos Alliance.

Registration and more details, including session topics and speakers will be available in July. Plan your travel now and contact the Crowne Plaza (800-338-4462 or crownplaza.com/cmhcrownplaza) to reserve a room by Sept. 24 at the special room rate of \$134 per night plus tax.

New SBE Fellows

At its meeting at the NAB Show, the SBE Board of Directors elevated three members to the membership rank of Fellow: Jay Adrick; Wayne M. Pecena, CPBE, 8-VSB, AMD, DRB, CBNE; and Joseph L. Snelson, CPBE, 8-VSB.

Jay Adrick is an independent broadcast consultant since he retired from Harris Broadcast. He now consults for GatesAir. He is the chairman of the ATSC Mobile Emergency Alerting System Integration Team. He is a former member of the board of directors and vice chairman of the ATSC. He is a Fellow of SMPTE and a member of the IEEE Broadcast Technology Society. He was the 2013 recipient of the National Association of Broadcasters Television Engineering Achievement Award.



Adrick

see [FELLOWS](#), p.3

SBE Plans Education Summit

What knowledge will the media engineer of the future need to master to meet the needs of his or her employer or clients? As new technologies continue to be developed and content delivery methods evolve, media engineers will need to keep pace to build and maintain the necessary systems these technologies require in the future. But just what technology will the media industry be using in 2021 or 2026?

The SBE will seek to acquire the necessary data to answer that question by hosting an Education Summit later this year. The summit will bring together a half-dozen media industry technology thought leaders for one day to discuss the technology in use today and the technology that they predict will be in use over the next five to ten years. The SBE will use the information gathered from the summit to develop

a forward-looking document that outlines the competencies of future technical media professionals. From that, the SBE will develop educational content that prepares them to meet the industry's needs.

Costs for the SBE Education Summit are being underwritten by the Ennes Educational Foundation Trust. Formed in 1980, the mission of the Ennes Trust is to provide and support educational opportunities for broadcast engineers through scholarships and educational programs, and provide support for education-related projects of the SBE. The Ennes Trust is supported through donations from members and chapters of the SBE and companies within the broadcast industry.

An SBE Education Summit planning group that includes SBE President Jerry Massey, Education Committee Chairman

Wayne Pecena and Executive Director John Poray, are developing the details for the summit. They have identified five de-

see [SUMMIT](#), p.14

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SBE National Office
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FELLOWS from p.1



Pecena

Wayne M. Pecena is the assistant director of educational broadcast services at Texas A&M University. He has served on the SBE Board of Directors since 2012 when he was also appointed the chair of the Education Committee. He has conducted scores of webinars, Ennes Workshops and is an instructor in the SBETechnical Presenters Group. In 2012, Wayne received the James C. Wulliman SBE Educator of the Year award.



Snelson

Joseph L. Snelson is vice president of engineering for Meredith Local Media Group. He is the immediate past president of the society, and has served on the Certification and Nominating Committees, and chaired the Frequency Coordination Committee. He is currently the chair of the Government Relations Committee. He has served on the NAB Broadcast Engineering Conference Committee, including terms as chair, and is active in the ATSC.

The three Fellow recipients will be recognized during the SBE National Awards Dinner on Oct. 27, 2016, in Columbus, OH, during the SBE National Meeting, which will be held in conjunction with the Ohio Association of Broadcasters Engineering Conference.

Sanchez
Appointed to
SBE Board of
Directors

SBE President Jerry Massey has announced that Carlos Marcelo Sanchez, CPBE, has been appointed to fill a vacancy on the national SBE Board of Directors. Sanchez is director of broadcast operations and engineering for WFOR-TV/WBFS-TV in Miami, FL. The Board ratified the appointment during its meeting held on May 13.



Sanchez

The Board vacancy was created as a result of the resignation of Kim Sacks, CBT, who resigned in March of this year. Sanchez will serve the remainder of the unexpired term, which runs through Oct. 27, 2016.



Certification Question

Answer on page 6

FCC rules require an operator's prime responsibility to be:

- A. Get programs on the air
- B. Make station identifications
- C. Operate transmitter
- D. Up to station management because it is not specified in the FCC rules



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LETTER FROM THE PRESIDENT

By Jerry Massey, CPBE, 8-VSB, AMD, DRB, CBNT
SBE President
jmassey@sbe.org

The Convention is a Wrap

Were you counted in the 103,000 attendees at the 2016 NAB convention? If you were, I trust you were able to meet some of our fabulous SBE board, officers and staff while you were there! I know I lost count of how many of you I had the privilege of meeting that week. Now that the convention is behind us, it is time to reflect and look forward to the rest of the year.

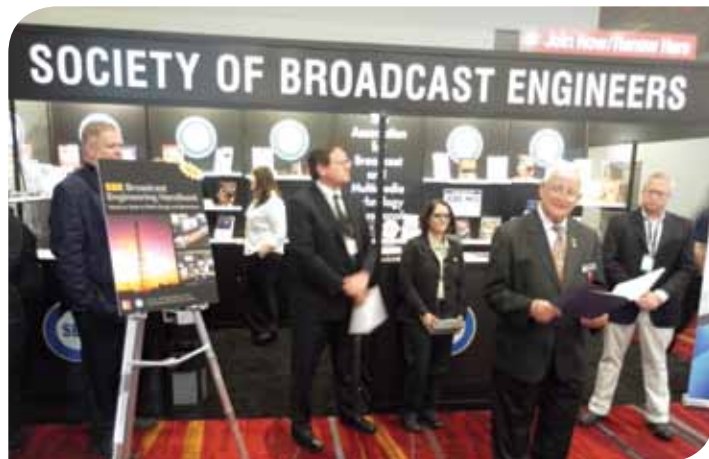
First in the reflection category are the BEC sessions that your SBE, as a presenting partner with the NAB worked so hard putting together, and I cannot say enough about the quality of the presentations and meeting attendance at the Saturday SBE Ennes Workshop. Most of all, I want to thank Fred Baumgartner and the Ennes Trust for the hard work they put in getting this organized for you. If you were there, I trust that you picked up information that will be useful to you in the coming year.

Another highlight for me was the opportunity to speak to the Association of Public Radio Engineers on Friday before the NAB convention started. The main topic was the all too familiar question of "Future Engineers and Where are They Coming From." I shared with the APRE the future goal of the SBE to bring our industry and broad-

cast engineering to the attention of military personnel reentering civilian life. This is a goal we hope to launch later this year through cooperation from veterans' organizations and others to present this information to returning military personnel with skill levels in RF, communications and IT. With their basic background, they would be perfect candidates for careers in broadcast engineering. We will have additional information for you on this subject later in the year. But again back to the APRE, it was great to not only speak to this group but to meet many of you in the process.

Big News at the Show

As I write this article, I have in front of me the latest publication of the SBE. The *SBE Broadcast Engineering Handbook* was unveiled at the NAB convention at a press conference on Sunday of the convention



SBE President Jerry Massey opens the Sunday press conference to unveil the *SBE Broadcast Engineering Handbook*.

week. It was my honor to introduce Jerry Whitaker, editor-in-chief of the handbook, Andrea Cummis, chair of our SBE Publications Committee, and Steve Chapman, publisher with McGraw-Hill, as they introduced some of the many chapter authors. This book has been years in preparation with the help of McGraw-Hill, and it is finally available to you. As I scan through my personal copy, I am amazed at the depth of knowledge that is presented in this book. All of this information is up-to-date including IT, a chapter on ATSC, DTV measurements, transport, mask filters, disaster planning and recovery, and of course radio from AM to HD Radio plus much more! If you are looking for a reference book on broadcasting, let me encourage you to go to the SBE bookstore at www.sbe.org/bookstore and order yours! And yes, there is a special rate for you the SBE member.

Another highlight of the NAB convention for me was the packed house we had at the SBE membership meeting and reception. I had a great time meeting so many of you then and congratulations to those of you who won special prizes.

We captured some of the SBE events in photos you can see in this issue.

I could keep going but in closing I do want to thank all of you who took time out to say hello. Your Board of Directors commented on the energy you expressed and suggestions you made to make the SBE even greater in the future. We are here to represent you. Please let us know your thoughts and comments as we represent you.

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EDUCATION UPDATE

By Wayne M. Pecena, CPBE, 8-VSB, AMD, DRB, CBNE
Chairman, SBE Education Committee
wpecena@sbe.org

IP Network Security

IP networks have become an integral part of the broadcast technical plant. As networks have grown, so has the security threats grown such that network security can simply not be ignored.

Network security implementation often follows a model of confidentiality, integrity, and availability. The CIA model defines confidentiality as preventing access to sensitive information or data flowing across the network by those unauthorized to access the data. It is common place to utilize data encryption to protect data transported by the network infrastructure. Integrity is defined as the prevention of data within the network to be altered or changed so that the data can be trusted by known endpoints. Availability is defined as insuring that needed network resources are available for use by those authorized to use the network resources.

Flaws often found within the network attempt to take advantage of the CIA framework by executing network exploits. Man-in-the-middle exploits seek to intercept data between network devices and alter the data without knowledge of the authorized network endpoints. A denial of service (DoS) attack is an exploit that attempts to interrupt access to network resources by flooding the network with dummy traffic rendering the network infrastructure un-useable.

Where to Start

Network security begins by securing access to all network devices such as Ethernet switches, IP routers, and host devices. Default login names and passwords should be immediately changed to phrases that meet the strong definition and test. Telnet remote access should always be disabled in favor of secure shell or SSH-based remote access. SSH is an encrypted protocol used in favor of the un-encrypted Telnet remote access protocol. The use of SSH provides data confidentiality and integrity when transported over an unsecure network.

Local area network(s) (VLAN) provide network segmentation that provides network security by separating host devices by function, but sharing a common physical network infrastructure. Each VLAN is a separate subnet or broadcast domain and access from other subnets can be disabled or controlled. In essence you are not able to exploit a network that you cannot access.

Another useful Layer 2 security technique is to implement Ethernet port security. Security features found in a managed Ethernet switch allow control of host devices that can be connected to a switch port. Options exist to limit a single known host device to connect to a specific switch port. If an attempt occurs to connect a foreign host, the port is disabled and the network administrator alerted that a security violation has occurred.

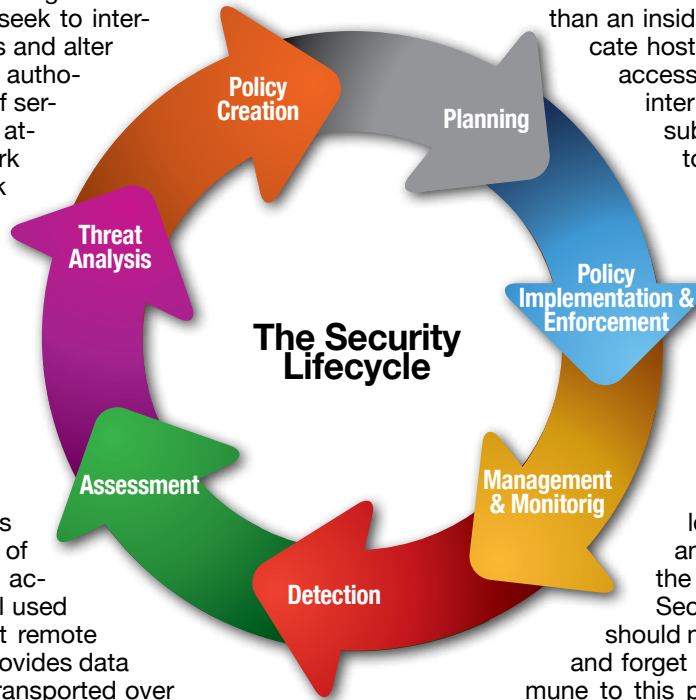
Firewalls are an essential tool in network security to allow or deny certain types of network traffic to enter or exit a network. Stateless firewall functionality can be implemented with an access control list (ACL) on an Ethernet switch port or a router interface. No awareness of a data flow is maintained and header info is utilized as the filter options. A best practice is to deny everything and then permit only what is necessary whether egress or ingress network traffic. A stateful firewall maintains awareness of traffic flow between two host devices. The awareness of the conversation between hosts is a more powerful filtering technique and utilizes header information up to Layer 4 or the Transport Layer for more filtering options.

The demilitarized zone (DMZ) defines a common area of the network that is neither inside or outside the firewall. In general, a DMZ is more secure than an outside network and less secure than an inside network. It is common place to locate host devices that need to provide public access within the DMZ subnet and locate internal company hosts within the secure subnet. Such a firewall is often referred to as a three-legged architecture by providing interfaces for the public, DMZ, and internal subnets.

Once the network is secure, then access to that network is often desired or required from a remote location via a public network. Virtual private network (VPN) access is the recommended approach to create a secure access portal from remote locations. The VPN approach creates a secure encrypted tunnel across the public network allowing the remote host to be seen as an internal network host and maintain the CIA provisions.

Security is an on-going IT process and should never be considered a one-time setup and forget process. Network security is not immune to this process. The Security Lifecycle process (SANS Institute 2001) defines a continuous process of security threat planning, threat implementation, network threat monitoring, network threat detection, assessment of threats occurring, threat analysis, threat policy creation, and back to security planning. Security is always a balance between usability and secure access that requires an on-going watch to insure that network resources remain secure, trusted, and available.

Learning is a continuous process for the broadcast engineer. Take advantage of SBE professional development events to learn a new technology, enhance your current skills, or to add an SBE Certification to your personal professional portfolio. Continuous learning is a key trait of the successful technology professional and the SBE Education team is dedicated to bringing you quality professional development programs covering relevant broadcast industry topics delivered in different mediums to meet your needs. Your comments, ideas for future programs, and feedback are always welcome.



For more information on any SBE education program, contact Education Director Kristin Owens: kowens@sbe.org or 317-846-9000.



CERTIFICATION UPDATE

By Ralph Hogan, CPBE, DRB, CBNE
Chair, SBE Certification Committee
rhogan@sbe.org

Change Is Coming to SBE Certification

By now you certainly know that the SBE has released the new SBE Broadcast Engineering Handbook. Released at the end of March, the book made a splash at the NAB Show and was sold at the SBE booth. This publication represents a hands-on reference for broadcast and media engineers. The many chapters of the handbook cover most of the knowledge area categories that are covered on the various certification exams. SBE members for some time have asked for a singular reference from which to study for an SBE certification exam. While the new handbook is not specifically a certification study book, it covers many of the subject areas in the exams, and it is well-suited for this use.

The book is divided into seven major sections, plus an extensive annex. Each section focuses on a particular area of expertise. The sections are Regulatory Issues; RF Systems; DTV Transport; IT Systems; Production Systems; Facility

Issues and Broadcast Management. Several annexes provide additional information with reference data and tables, information on the electromagnetic spectrum, and information about standards organizations and SI units.

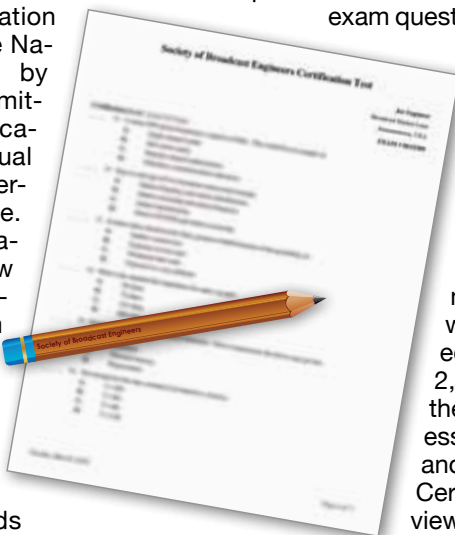
During the convention, the Ennes Educational Foundation trustees voted to support the National Certification Program by supplying the national committee with copies of the publication to assist with the continual revision and update of the certification question database. Once implemented, the database updates and CertPreview practice tests will include additional new questions from this single reference. Other areas to be addressed will be adding questions about ATSC 3.0, AES67, AES70-3-2015, and other new standards to make sure the exams represent the latest in technologies.

SBE National Meeting, which will be held during the Ohio Broadcast Engineering Conference in Columbus, OH, this fall.

I'll also note that at the beginning of 2015, the National Certification Committee began a complete question review of the entire question database. This includes the exam questions, essay questions and the

CertPreview questions. As this review is conducted, the review will deactivate or rewrite outdated questions, and new questions will also be added. In all, there are 2,356 questions in the database, 87 essay questions, and 972 questions in CertPreview to be reviewed. The National Certification Committee is about one-third

of the way through this review and should have it completed by the end of 2016.



Online Effort

From time to time questions are raised about allowing the internet to be used as a reference resource while taking a certification exam. Since most of us do not keep everything in our heads and increasingly go online to resolve problems, the National Certification Committee has embarked on a trial to examine if internet use can be a viable reference option while taking the open-book portion of an exam. Some exams are closed-book, as are exam essay questions. These elements will not be allowed internet usage. Our early results look promising. The final results of the internet usage option will be reviewed by the Certification Committee at the



Answer from page 3

The answer is D

Simply put the FCC (when it eliminated the requirement for operator licenses years ago) has no guidelines as to what an operator's responsibilities are. Therefore it is left up to station management.

SBE Compensation Survey Results Coming

If you participated in our first SBE Compensation Survey, thank you. The results are being compiled and will be made available to SBE members in the coming weeks. Overall participation was very good, which provides a sufficient sample base from which to provide the most accurate data.



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SBE Certification Achievements

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Certified Professional Broadcast Engineer® (CPBE®) AM Directional Specialist (AMD)
 Harry Hardisty, Tyler, TX - Chapter 67

Certified Broadcast Television Engineer™ (CBTE®)
 Tom Wolfersberger, Pembroke Pines, FL - Chapter 53
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 Ronald Bartlebaugh, North Canton, OH - Chapter 70

Certified Professional Broadcast Engineers® and certified senior broadcast engineers who have maintained SBE certification continuously for 20 years, are at least 59½ years old and are current members of the SBE may be granted Life Certification if so requested. All certified who have retired from regular full-time employment and are at least 59½ 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.

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Edwin Allen, III, Sarasota, FL - Chapter 39
 Robert Clinton, Stafford, VA - Chapter 37
 George Marshall, III, Laurence Harbor, NJ - Chapter 15
 Leonard Watson, Chicago, IL - Chapter 26

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.

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 Dominic Mitchum, Slidell, LA - Chapter 72
Certified Broadcast Radio Engineer™ (CBRE®)
 Charles Lelievre, Westport, CT - Chapter 14
Certified Broadcast Television Engineer™ (CBTE®)
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Certified Broadcast Technologist® (CBT™)
 Sara Brown, Waterbury, CT - Chapter 14
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 Brian Olinger, Dulles, VA - Chapter 37

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 Jessie Balos, Moreno Valley, CA - Chapter 131
 Mohanad Faisal, Syracuse, NY - Chapter 22
 Michael Rubeck, Martinsburg, WV - Chapter 132
Certified Television Operator® (CTO®)
 Luis Maldonado, Las Vegas, NV - Chapter 128
 Jonathan Tilley, Spokane, WA

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 Richard Osborn, Tacoma, WA - Chapter 16
 Daniel Ruiz, Chino, CA - Chapter 131
 Scott Solko, Sacramento, CA - Chapter 43
 Emmie Tran, Ft. Meade, MD - Chapter 37
 Britny Williams, Madison, WI - Chapter 24
 Ma Louella Wong, Odenton, MD - Chapter 37

NAB SHOW EXAMS

Certified Broadcast Radio Engineer™ (CBRE™)
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 Alexander Brewster, Olympia, WA - Chapter 16

Certified Audio Engineer® (CEA®)
 Joshua Wyatt, Goodhue, MN - Chapter 17
Certified Video Engineer® (CEV®)
 Ceyhun Ergin, Izmir, Turkey - Chapter 47

Certified Television Operator® (CTO®)
 Paul Lawicki, Holland, OH - Chapter 104
 David O'Shaughnessy, Las Vegas, NV - Chapter 128

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 Zachary Parker, Clarksville, IN

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 Shannon Wilson, Columbus, GA - Chapter 5

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DINFO
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 Kevin Caffrey, Fort Bragg, NC
 Ryan Cotto, Fayetteville, NC
 Nathan Eroh, Fort Bragg, NC
 Eugene Rogers, Fayetteville, NC
 Lamar Toqnanis, Fayetteville, NC

WKPW
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 Joah Fairchild, Knightstown, IN
 Sidney Grow, Knightstown, IN
 Megan Harris, Knightstown, IN
 Mason Luellen, Knightstown, IN
 John Lukens, Knightstown, IN

WKPW (cont.)
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Ian MacLeod, Knoxville, TN
 William Parker, Houston, TX
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 Dale Scholten, Jr., Grand Rapids, MI
 Adam Stone, Peabody, MA
 Jonathan Tilley, Spokane, WA

DiracTV
 Erik Andersen, Los Angeles, CA
 Matthew Colins, Los Angeles, CA
 Alec Golya, Los Angeles, CA
 Kenny Lane, Los Angeles, 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 Senior Radio Engineer™ (CSRE®)
 Dominic Mitchum, Slidell, LA - Chapter 72
Certified Senior Television Engineer™ (CSTE®) 8-VSB Specialist™
 Brien Laufer, Oceanside, CA - Chapter 47

Certified Broadcast Networking Technologist® (CBNT®)
 Dean Maluski, New Britain, CT - Chapter 14
Certified Television Operator® (CTO®)
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B

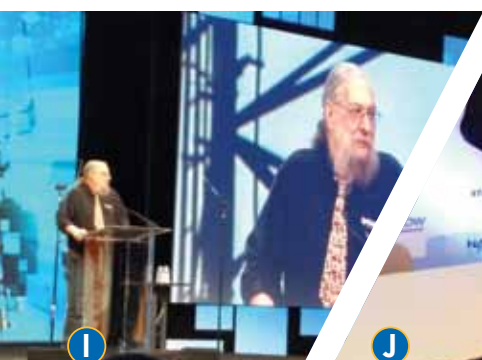


F



G

H



I



J



K

A. The annual Membership Meeting on Tuesday drew a large crowd. / **B.** The SBE booth featured technical books and SBE-logo items. / **C.** There was a daily booth prize drawing for a Fry's gift card, courtesy of our sponsors. / **D.** The SBE Broadcast Engineering Handbook debuted at the convention. / **E.** SBE frequency coordinators met on Tuesday. / **F.** The SBE Board of Directors met Sunday morning. / **G.** The SBE member reception was a chance to mingle and win prizes courtesy of our sponsors. / **H.** The SBE booth was a central meeting point and source for info about the SBE. / **I.** Richard Chernock accepts the NAB Television Engineering Achievement Award. / **J.** SBE Vice President Jim Leifer (right) draws prize winners at the Membership meeting. Bob Caniglia of Blackmagic Design



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assists with awarding the top prize: A Blackmagic Design Micro Studio Camera 4K. / K. The Ennes Workshop, held on Saturday, once again attracted a focused and engaged group. / L. At the Membership Meeting, chapter certification chairs were recognized for their service. Dick Burden, CPBE, receives a plaque for his 30 years of service to Chapter 47 Los Angeles.



LEGAL PERSPECTIVE

By Chris Imlay, CBT
SBE General Counsel
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Band Threats: Is Nothing Sacred?

Years ago I decided one day that it might be helpful to the American Radio Relay League's spectrum defense effort to develop a list of threats to Amateur Radio allocations. I sat down to do that and then quickly realized that each and every one of them had some potentially major threat to continued use of the bands. I thought about that day recently while at the NAB Convention preparing for presentations to the SBE Board of Directors and the Frequency Coordinators. In going through the list of Broadcast, and Broadcast Auxiliary allocations, I noted that virtually all of them are under some kind of direct threat. Here is an overview of the threats to some of those bands that will give you the big picture on critical primary and support spectrum for broadcasters.

The AM Broadcast band is under the gun in terms of ambient RF noise. The SBE filed new comments in the AM Improvement docket noting that no matter what else the FCC does to try to rejuvenate AM broadcasting, no lasting solution will exist unless and until the FCC gets a handle, pre-point of sale, on RF noise in the band, especially from major contributors such as RF lighting devices and power line radiated emissions.

The UHF Television band is steadily shrinking and with it, access to UHF wireless mic spectrum is reduced as well. The FCC's recently announced repacking plan, with its clearing target of 126MHz of UHF spectrum, bodes ill for future wireless mic use of the UHF band.

Of course, the FCC made an effort at

reaccommodation for displaced UHF wireless mics in the 942-960MHz and the 1435-1525MHz bands, among others. But wait! The 950MHz aural STL band is already very crowded in most areas. How can wireless mics be deployed there? The FCC assumed that SBE frequency coordinators would coordinate them. That is difficult though, because it has been well more than a decade since fixed BAS facility coordination at 950 MHz and elsewhere was taken from them when the FCC followed the fixed microwave coordination processes and the commercial coordinators were given the task of coordinating all BAS fixed facilities, and so the SBE coordinators' databases were no longer maintained. Restarting the coordination process at 950MHz in an effort to coordinate wireless mic operation with fixed BAS facilities is not a simple task.

The 2GHz band and DoD sharing you have read about often in these pages. But there are other sharing partners at 2GHz too. NASA has some new facilities to deploy in the band, and with manufacturers proposing new mesh network ENG systems in the band, it is a question whether the various types of DoD uses, incumbent ENG systems and new mesh systems can all get along in the same geographic areas. In addition, we have developed plans for sharing this band with some satellite control uplinks at various locations, and at least one additional uplink is planned near Washington, DC.

Moving Up


At 2.5GHz, the SBE has had on file at the FCC a long-pending 2.5GHz rebanding proposal (to narrow the 2.5GHz band and re-create three channels from the two now available for all BAS eligibles, while moving the top end of the band downward from 2500MHz). But in this band, Globalstar has been asking for terrestrial use of part of BAS channel A9. That would preclude the SBE's rebanding proposal and it would cause severe interference to 2.4GHz BAS operation, which is already subject to a lot of noise from Part 15 and Part 18 devices. Until now, Globalstar's license has allowed only satellite downlinks. The FCC, however, has proposed two changes: It would allow Globalstar to implement an Ancillary Terrestrial Component (ATC). Globalstar could communicate directly from towers

to handsets – no satellite needed. And, for this application, it would expand the Mobile Satellite Service ATC band down to 2473MHz. So, this proposal would be devastating to BAS 2.5GHz operations now and in the future.

At 6.5GHz, there was, in early 2015 a proposal in Docket 15-99 for possible sharing of the 6.425-6.525GHz mobile band with Aeronautical Flight Test Telemetry (AMT). The FCC had said that this docket was slated for a Report and Order during the first quarter of this year but there is no item on circulation among the Commissioners as of this writing. The SBE filed comments in this docket last August. We noted that no sharing studies existed that indicated any compatibility between BAS and AMT and that absent any evidence to the contrary, sharing this band with AMT is not feasible. BAS, CARS and LTTS use of this band is not limited to metropolitan areas. It is used for terrestrial video relay from remote locations for electronic news gathering. There may be aeronautical mobile applications done in connection with electronic news-gathering or video production operations from helicopters, but the primary use of the band is for terrestrial video relay from mobile cameras. There are also a vast number of additional terrestrial uses of the band, including video relay to video screens at large event venues, short-range video relay for video production at automobile racing, political conventions and golf events, just to name a few.

Because the RF footprint of flight tests is approximately a 200-mile radius of operation from the test location, it would be impossible to protect the BAS use of the 6.5GHz band from interference from unpredictable flight paths.

Finally, with respect to the 7GHz BAS band, 6875-7125MHz is now compromised by the addition of fixed wireless backhaul that was recently added to that band. On top of that, the Commission has allowed wireless microphones in that band as additional displacement spectrum for UHF wireless mics.

Broadcasters have recently suffered the perfect storm of compromises in the use of microwave spectrum. Virtually all BAS allocations are, or have recently been subject to serious threats of displacement due to either reallocation of spectrum or else addition of incompatible sharing partners. 

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FOCUS ON SBE

By John L. Poray, CAE
SBE Executive Director
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This Was Truly a Team Effort

In the April 2016 issue of *The Signal* we announced the release of the *SBE Broadcast Engineering Handbook: Hands on Guide to Station Design and Maintenance*. The creation of this book involved many members and friends of the SBE and without them, it would not have been possible. We were fortunate to work with a major publisher like McGraw-Hill Education, whose resources made the creation of this book possible. We were also fortunate to work with long-time SBE member, Jerry Whitaker, CPBE, 8-VSB, who has authored many technical books during his career and led a special editorial advisory board that was created to determine appropriate topics and identify subject matter experts to write for the book. He served as editor-in-chief and was the project's driving force.

Jerry, whose day job is vice president for standards development at ATSC, and his McGraw-Hill publisher Steve Chapman came to the SBE with the idea of creating a practical, comprehensive book written with the television and radio station engineer in mind. We are quite pleased with the result and we hope you will be, too.

The 955 pages of content consist of 51 chapters divided among seven sections. They include regulatory issues, RF systems, DTV transport, IT systems, production systems, facility issues and broadcast management. The book also includes three appendices, including reference data and tables, the electromagnetic spectrum, and standards organization and SI units.

I'm taking the opportunity in this issue of *The Signal* to recognize the members of the editorial advisory board (EAB) and our authors, all 55 of them, for their contributions to this landmark work of the SBE. Co-chairing the EAB with Jerry was the chair of the SBE Publications Committee, Andrea Cummis, CBT, CTO, of AC Video Solutions. Andrea has been at the forefront of the production and release of several SBE publications in this capacity.

Industry leaders also serving on the EAB were: Timothy Carrol, Linear Acoustic, Lancaster, PA; Dr. Richard Chernock, Triveni Digital, Princeton Junction, NJ; Douglas Garlinger, CPBE, 8-VSB, CBNT, of WISH-TV, Indianapolis, IN; Ralph Hogan, CPBE, DRB, CBNE, of KJZZ-FM/KBAQ-FM, Tempe, AZ; John A. Luff, HD Consulting, Pittsburgh, PA; Wayne M. Pecena, CPBE, 8-VSB, AMD, DRB,

CBNE, Texas A & M University, College Station, TX; John L. Poray, CAE, Society of Broadcast Engineers, Indianapolis, IN; and Gary Sgrignoli, Meintel, Sgrignoli and Wallace, Mt. Prospect, IL

The EAB met monthly, mostly by conference call but also in a few in-person meetings over the course of two years to determine the content of the book and identify subject matter experts. Most of the EAB members also each contributed at least one chapter to the book.

Our authors constitute an impressive list of experts from the technical broadcast-media field. They are listed in the table.

We also want to express our thanks to the production and editorial staff at McGraw-Hill and to SBE Member Communications Director Chriss Scherer, CPBE, CBNT, who provided editorial support.

I hope you or your employer will consider purchasing a copy of the new *SBE Broadcast Engineering Handbook*. It will be a great resource you'll refer to often.

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Engineering Perspective

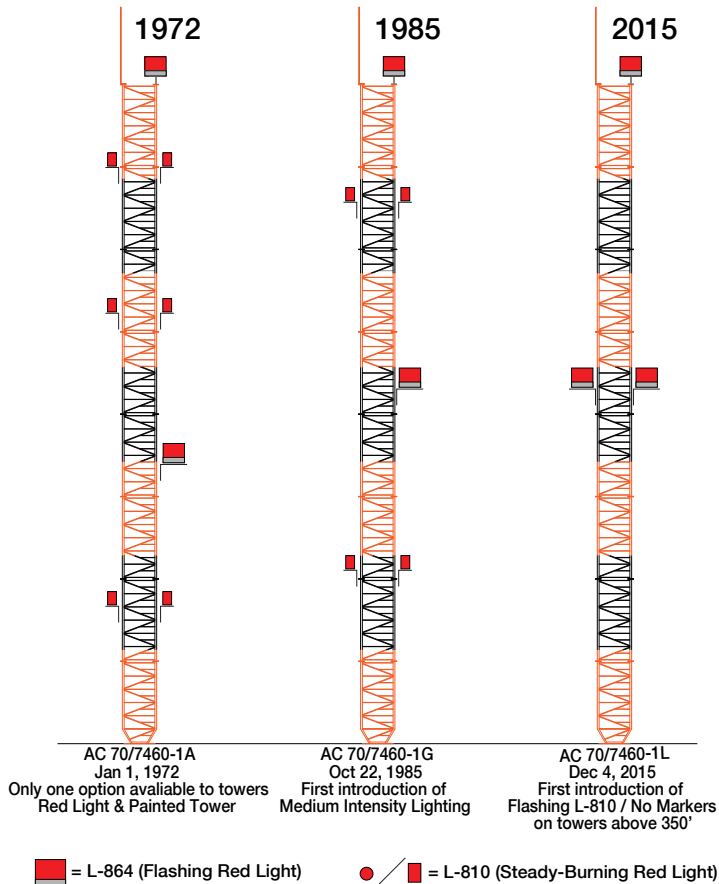
By David Sheppard
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Tower Light Grandfathering? Not Really.

A question I am often asked when a new AC 70/7460 tower lighting standard is published: "Am I grandfathered into the new AC 70/7460?" The simple answer is no, you're not grandfathered into the new standard. Here's why.

Tower lighting standards are reviewed and updated somewhat regularly. Any new structure is issued a specific Aeronautical Study Number (ASN) when the 7460-2 form is filed. At that time, the determination is made for that structure that indicates the marking and lighting recommendations. The FAA will indicate to which Advisory Circular (AC) the tower is to conform. It will also indicate the chapters to which your lighting scheme needs to adhere.

Because of this, and if a tower is not modified over the years, it is very common to see towers lit using the original configuration for which they were approved when the tower was installed. A new FAA AC does not make the previous determinations obsolete, and the early determinations are not "grandfathered" into the new AC. Each determination stands on its own. A determination is as valid as the first day it was issued, as long as the owner maintains the lighting equipment.



Comparison of changes in tower lighting standards for a 700' tower.

Even some changes won't affect the lighting requirements. The owner could replace the old red incandescent lighting system and maintain the original determination. A new determination would be required if you make a change such as converting a red light and painted system to a white only lighting system or dual lighting system.

Likewise, an owner could have an AC 70/7460-1A determination on a structure from 1972 and still be in compliance with the FAA today. But if you tore down the old tower and built a new tower in the exact same location you could not reinstall the old lighting scheme because a new determination would replace the previous one. From the perspective of the FAA, the original tower was lit as per the standard it was issued in 1972 and is still in compliance, but a new tower in this same location

would have to comply with the new standard since its determination would be issued under the new AC rules.

Time for a Review

Owners should always review any new standard and evaluate how their lighting scheme compares with the new standard. If the new standard uses better lighting plans, the owner should seriously consider updating the lighting, not viewing the situation from an FAA standpoint, but from an overall safety standpoint.

But making a lighting change is not simply done on its own. The tower owner files the 7460-2 form first, waits for the new determination, and then files it with the FCC before making any changes to the lighting.

VFR pilots use these determinations to know what lighting schemes are used on the tower. If the lighting is modified before the determination is issued, a pilot could be disoriented because of the unexpected lighting. You have to wait till you receive the determination before making any changes.

There are other reasons for updating to the new standard as well. You could take advantage of the new lighting standards to reduce migratory bird kills around the structure; which eliminates marker lights on towers above 350'. The new standard now allows medium intensity lighting on towers below 700' eliminating the need for painting of these towers. It's worth your time to evaluate your structure and determine if you would be better off using the new standard instead of the one currently in place.

Drake Lighting, Inc. and other lighting manufacturers can assist you with the decision to select the best overall lighting plan for your structure.

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David Sheppard discusses the 70/7460-1L Advisory Circular changes in our SBE webinar. More at sbe.org/webinars.

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Member Spotlight: Fred Krampits

Member Stats

SBE Member Since: 1988
Certifications: CPBE, CBNT
Chapter: 14 Connecticut Valley
Employer: Hitachi/Comark
Position: Service Engineer
Location: Southwick, MA
I'm Best Known For: my exploits in ham radio and ham TV, including constructing New Orleans first-and-only ATV repeater in 1984 just in time to go live from the World's Fair.

Q What do you value most about your SBE involvement?

A SBE meetings and workshops provide a great opportunity for me to learn about new technologies and products, and also learn through the experiences of colleagues. Shortly after attending my first SBE meeting, I became a member, then got certified. I also serve as chapter chairman, so that gives me a chance to give back to the SBE.

Q What got you started in broadcast engineering?

A An uncle owned a TV shop, and I was fascinated watching the techs



Fred Krampits with a Comark DCX Millennium cabinet on the assembly line.

repairing the TVs and stereos. In high school I was involved with the school's TV production program and AV club and also had a tour of WWLP-TV. That started my interest in broadcast engineering. My first hands-on experience was with WTCC-FM at Springfield Technical Community College for Electronic Technology.

Q Who was your mentor?

A My mentor was the late Ken Jones, a well-known engineer in the Spring-

field, MA, area and throughout New England. He was always willing to share knowledge and help you out if you got in over your head.

Q What do you like most about your job?

A I work with broadcast engineers to troubleshoot problems. It can be stressful, but I like the interaction. When you have helped someone solve a problem and he learns something, it is satisfying.

Q When I'm not working I...

A ...like going to movies and dinner with my friends. Also go to the beach anytime of year. I am also a scanner enthusiast (from my time at stations that had news rooms).

Q You may not know...

A I serve on the city council for the city of Chicopee, MA, the 2nd largest city in Western Massachusetts. I was appointed in 2003 after the death of my father and have been re-elected six times since then. I am also still the engineer for my college radio station, WTCC-FM

SUMMIT from p.1

sired outcomes for the event, which were approved by the SBE Board of Directors:

- What will the industry look like in 2019, 2021, 2026?
- What skills and knowledge will be needed for new technology?
- What skills and knowledge will be needed for legacy technology?
- Identify the cross-training needed for RF, IT and other personnel
- The unpredictable or unknown outcome generated from the group's discussion

The planning group is inviting participants that represent a cross-section of today's media technology community, bringing together some of our industry's leading technology thought leaders. They are also determining the date and location of the summit.

Watch for updates about the SBE Education Summit in future issues of *The Signal*.

SBE Officer, Director Candidates Announced

Each year the SBE membership elects members to serve on the National Board of Directors; the governing body of the society. This includes all four officers for one-year terms and half the 12 directors for two-year terms. The slate of candidates assembled by the Nominations Committee includes:

Officers:

President - Jerry Massey, CPBE, 8-VSB, AMD, DRB, CBNT; Chapter 86, Greenville, SC

Vice President - James Leifer, CPBE; Chapter 53, South Florida
Secretary - Tim Anderson, CPBE, DRB, CBNE; Chapter 33, Southwestern Ohio

Treasurer - Andrea Cummis, CBT, CTO; Chapter 15, New York, NY

Directors:

(top six vote getters will be elected):

Jim Bernier, CPBE, CBNE; Chapter 5, Atlanta

Kirk Harnack, CBRE, CBNE; Chapter 103, Nashville, TN

Brian Olinger, CBT, CBNT; Chapter 37, District of Columbia

Jason Ornellas, Chapter 43, Sacramento

Wayne Pecena, CPBE, 8-VSB, AMD, DRB, CBNE; Chapter 99, Bryan, TX

Marcelo Sanchez, CPBE; Chapter 53, South Florida

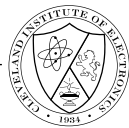
Mark Simpson, CPBE, AMD, DRB, CBNE; Chapter 32, Tucson

Justin "JT" Tucker, CSRE, AMD, CBNE; Chapter 107, Chareleston

Additional candidates may be nominated by the membership. Any eligible member proposed by at least ten members to the national Secretary by July 12 will be added to the ballot. The election will take place July 25 through August 25. Balloting will be via the

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WELCOME TO THE SBE

NEW MEMBERS

John M. Albea - Irondale, AL
 Olabanji A. Banwo - Kaduna, Nigeria
 John C. Baseley - Crownsville, MD
 Kurt M. Bauer - Lincoln, NE
 Marcelo Benfele Arosemena - Caracas, Venezuela
 Tyler D. Best - Luverne, AL
 Paul G. Blanchette - Longmont, CO
 Marc E. Blazer - Myrtle Beach, SC
 Jon Burkholder - Roscoe, IL
 Steve Busted - Omaha, NE
 Michael W. Carlyle - Albuquerque, NM
 Anthony S. Carmody - San Diego, CA
 David W. Clark - Chandler, AZ
 Charles Contreras - Culver City, CA
 Rick G. Copeland - Sacramento, CA
 Michael K. Cunningham - Clifton, VA
 Michael J. Day - Canyon Country, CA
 David A. Ehehalt - Mt. Freedom, NJ
 Paul R. Fisher - Austin, MN
 Jose L. Garcia - West Palm Beach, FL
 Rodney Gonzalez - New York, NY
 Grant A. Gysbers - Florence, OR

Jeremy M. Henley - Glen Burnie, MD
 Yoan Herrera - Las Vegas, NV
 Shane C. Hibbs - Austin, TX
 David M. Hoover - Huntsville, AL
 Michael J. Infante - Chicago, IL
 Jason A. Klocko - Rossford, OH
 Ryan Key - Knoxville, TN
 Jacek R. Krzywicki - Calgary, AB
 Jim A. Lange - Saint Petersburg, FL
 Dave Lot - Webster, NY
 Andrew V. Mannino - Metuchen, NJ
 Robert A. Martin, Jr. - Easley, SC
 Ray A. Mastel - Baldwin, WI
 Derek R. Mazon - Riverside, CA
 Daniel Mehlhose - Sterling Heights, MI
 Alexander M. Mooney - Plano, TX
 Thaddeus J. Moran - Ramona, CA
 Timothy K. Merritt - Ithaca, NY
 David Morris - Memphis, TN
 Timothy J. Mott - Arcade, NY
 Ed Nazario - Lawndale, CA
 Thomas Norton - Terre Haute, IN
 Adam Paul - Savannah, GA
 Tim Popham - Springfield, VA

Bryan J. Reeves - Elgin, SC
 Sean C. Richardson - Port Huron, MI
 Reynold T. Rossi - Knoxville, TN
 Mark Ruppert - Clearwater, FL
 Alan Schelzer - Candor, NY
 Ron Settle - Gurnee, IL
 Cameron B. Simms - Knoxville, TN
 Rachel K. Simon - Warwick, RI
 John W. Souza - Spokane, WA
 Philip J. Spina - Lake Worth, FL
 Johnny L. Story - Canyon, TX
 Scott A. Sumner - West Lafayette, IN
 Paul R. Tanner - Fort Myers, FL
 Debra L. Taylor - San Lorenzo, CA
 Steve A. Thomas - Panama City, FL
 Marvin E. Wessel, Jr. - Chandler, AZ
 Lonnie J. West - Madison, WI
 Matthew S. Willson - Boylston, MA
 Shannon E. Wilson - Columbus, GA
 Valencia D. Winston - Tuscaloosa, AL
 Joshua D. Wyatt - Goodhue, MN
 Lionel Villarreal - South El Monte, CA
 Jose V. Zerpa - Miami, FL

RETURNING MEMBERS

Jesse T. Acon - San Diego, CA
 Bobby D. Allen, Jr. - Lakeland, TN
 Curtis S. Allin - Knoxville, TN
 William R. Bennett - Carnegie, PA
 Mike Bertolino - Columbus, OH
 Clifford Cardwell - Montgomery, AL
 Paul R. Clark - South Bend, IN
 Ornette D. Crossley - Los Angeles, CA
 Christopher Dodson - Northport, AL
 Kevin H. Doerle - Seven Hills, OH
 Curt J. Eckstein - Riverside, CA
 Donald E. Engelhardt - Salinas, CA
 Jon C. Hartmeyer - Zanesville, OH
 Terry J. Harvey - Camillus, NY
 Daniel J. Hyatt - Littleton, CO
 Wade D. Klassen - Englewood, CO
 Terrance Leake - Kennesaw, GA
 Daniel C. LeBeau - Canton, OH
 Lucretia Lee-Arceneaux - Denver, CO
 Matt J. Lunati - Show Low, AZ

Michael Mallory - Tallapoosa, GA
 Paul A. Manning - Grand Blanc, MI
 Daniel Maxwell - Fredericksburg, VA
 John R. McLaughlin - Mount Joy, PA
 Timothy A. Meier - Bakersfield, CA
 George S. Melton - McDonald, TN
 George J. Molnar - Henderson, NV
 Bob Pectelidis - Glen Allen, VA
 Roger E. Rosendahl - Manchester, NH
 John R. Salmond - Newark, DE
 David R. Schank - Milwaukee, WI
 Thomas A. Strauch - San Antonio, TX
 Ling Ling Sun - Lincoln, NE
 David P. Thompson - Bedford, TX
 Jake Tremper - Tampa, FL
 Edmond R. Trombley - Jonesville, MI
 Terry L. VanBibber - Greenwood, IN
 Phillip Vaughan - Cathedral City, CA
 Mark A. Willett - Englewood, CO
 Nigel R. Worrall - San Diego, CA

NEW STUDENT MEMBERS

Roderick Bennett - Mesa, AZ
 Francine K. Grattan - Denton, TX
 Brad Shelton - Taylorsville, UT
 Heather C. Smith - Calgary, AB

NEW ASSOCIATE MEMBERS

Abdirahman M. Ali - Nairobi, Kenya
 Brent Colflesh - Camp Hill, PA
 Samuel Depina - Boston, MA
 Fred S. McNickle - Manahawkin, NJ
 Peter Sutherland - San Francisco, CA

NEW YOUTH MEMBERS

David A. Barnes - Menifee, CA
 Daniel P. Malone, Jr. - Dover, DE
 Nathan O. Thurmond - Romeoville, IL

SBE-news Roundup

Membership Renewal

Your SBE membership was due for renewal on April 1. If you still have not renewed, you can use our secure online renewal form at sbe.org, or use the printed renewal form mailed to you in February. The grace period for member renewal ends on June 30. After that, if you have not renewed your SBE membership will be dropped.

Training Video

The SBE has produced the first in a series of videos designed to inform and orient new and aspiring chapter chairmen and other officers and leaders about local chapter operations. The first video, titled Structure and Responsibilities, is available on the Chapters/Administration page of the SBE website. It is based on information contained in the SBE Chapter Manual.

Chapters can also use the video to help potential chapter leaders understand chapter responsibilities and how a chapter works.

View the video in the chapter administration section of the SBE website or on the SBE YouTube channel.

election website, except for those members who have opted out of electronic voting this year or who have not provided the SBE national office with their email address. They will receive their ballots through the mail.

For more information about candidacy, contact Ted Hand at thand@sbe.org or Executive Director John Poray at jporay@sbe.org or 317-846-9000.

Society of Broadcast Engineers, Inc. 2015 Audited Financial Statements

Combined Statement of Assets, Liabilities* & Net Assets - Dec. 31, 2015

ASSETS	
Cash & cash equivalents	\$13,056
Investments	1,045,117
Office Equipment	10,379
Intangible Assets	590
Total Assets:	\$1,069,142
LIABILITIES and NET ASSETS	
Liabilities	\$0
Net Assets:	\$1,069,142

TOTAL LIABILITIES and NET ASSETS
 \$1,069,142

* CPA-conducted financial audit reflects modified cash accounting method. Investments are listed at market value.

2015 SBE Revenue & Expense Statement

INCOME:	
Membership Fees & Support	\$379,052
National Meeting	45,835
Certification	77,218
Publications/Promotion	68,553
Education Services	77,474
Interest & Dividend Income	34,903
Net Realized/Unrealized Gain (Loss) from Investments	(40,287)
Miscellaneous Income	7,316
Total Income:	\$650,064
EXPENSES:	
Member Services	\$353,692
Chapter Rebates	38,101
National Meeting	28,039
Publications/Communications	63,466
Certification	80,506
Education	69,809
Administration	70,479
Depreciation/Amortization	10,396
Total Expenses:	\$714,488
CHANGE IN NET ASSETS:	-\$64,424
NET ASSETS 12/31/2014	\$1,133,566
NET ASSETS 12/31/2015	\$1,069,142



The trust offers scholarship and educational programming and grants that benefit broadcast engineering and the broadcast engineer. Submit tax-deductible donations, payable to the Ennes Educational Foundation Trust, to the Society of Broadcast Engineers, 9102 N. Meridian St., Suite. 150, Indianapolis, IN 46260.

THANKS TO THE FOLLOWING SUPPORTERS FOR THEIR CONTRIBUTIONS

Ennes Scholarship

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 John Frercks, Princeton, NJ
 Joseph Huk, Jr., Adrian, MI
 Philip Hartman, San Francisco, CA
 David Johnson, Benicia, CA
 Karl Lahm, P.E., Lake Villa, IL
 Kate Landow, Denver, CO
 James Linn, Atlantic Beach, FL
 William McCombs, Wichita, KS
 John McLaughlin, Mount Joy, PA
 Jan Pritzl, Milwaukee, WI
 Chad Thielen, Schaumburg, IL
 Michael Waldman, Chesterfield, MO
 Thomas Weber, Indianapolis, IN

Battison Scholarship

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 James Linn, Atlantic Beach, FL
 John McLaughlin, Mount Joy, PA
 Thomas Weber, Indianapolis, IN

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 John McLaughlin, Mount Joy, PA
 Mauro Pena, Honolulu, HI
 William Reynolds, Sarasota, FL
 Thomas Weber, Indianapolis, IN

Youth Scholarship

Joshua Bohn, Chelsea, AL
 Edward Damerel, Richmond, VA
 Dennis Dutra, Jr., Eliot, ME
 Gregory Foss, Riverside, CA
 John Frercks, Princeton, NJ
 James Linn, Atlantic Beach, FL
 John McLaughlin, Mount Joy, PA
 John Palumbo, Bala Cynwyd, PA
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 Larry Will, Glen Mills, PA
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MEMBERS ON THE MOVE



▶ **Jay Martin** has returned to Dielectric as VP of sales.

▶ **Conrad Trautmann, CPBE**, has been promoted to senior vice president of technology and operations for Cumulus Media.



▶ **Brad Humphries** has been named market director of engineering at Beasley Broadcast Group in Charlotte, NC.



▶ **Vinny Lopez, CEV, CBNT**, is chief engineer at Sinclair TV stations WSTM, WSTQ and WTVH in Syracuse. He was with WSYT and WNYS for 29 years.



▶ **Vince Richardson** is now director of engineering/IT at Cumulus Media in Oshkosh/Green Bay, WI.

▶ **Jim Bender** is moving to Guam to become director of engineering for the Sorensen Media Group.



Have a new job? Received a promotion? Let your fellow SBE members know. Send your news to Chrischerer@sbe.org.

MARK YOUR CALENDAR

SBE Certification Exams

Local Chapters
June 3 - 13, 2016 sbe.org/certification
Application deadline is closed.

SBE Leadership Development Course

Atlanta
Aug. 9 - 11, 2016 sbe.org/lhc

SBE Certification Exams

Local Chapters
Aug. 5 - 15, 2016 sbe.org/certification
Application deadline is June 3, 2016.

TAB Convention

Austin, TX
Aug. 10 - 11, 2016 tab.org

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