The 2016 SBE National Awards, which recognize excellence and achievement by individual members, SBE chapters and Sustaining Member companies, have been announced. The two highest individual awards are the Robert W. Flanders SBE Engineer of the Year and the James C. Wulliman SBE Educator of the Year.

The Robert W. Flanders SBE Engineer of the Year award is presented to a member who has excelled in his or her career while furthering the mission of the SBE. Candidates are nominated by their peers. Winner of the award for 2016 is Michael Hendrickson, CPBE, CBNT of Lakeville, MN. Hendrickson is a former SBE Chapter 17 chair, and currently a member of the SBE National Board of Directors.

The recipient of the James C. Wulliman SBE Educator of the Year award is Cheryl Lustenberger, CBNT, CTO, of Chapter 11 in Boston. Lustenberger is the assistant manager at the Tufte Television Facilities at Emerson College and has been instrumental in creating a fun and educational environment to students interested in broadcast engineering.

Mike Hendrickson has been in the broadcast engineering industry for more than 35 years. Recently retired, Mike, recently was elected to the Board of Directors. Prior to retirement, Mike was director of engineering for American Public Media and was responsible for the upgrade of Minnesota Public Radio stations in Minnesota and several stations in Florida. In addition to being a former chapter chairman of Chapter 17, Mike has held several offices. Mike wrote an early version of a database that contained entries of most of the 950MHz aural studio/transmitter link assignments in the area. He is remembered by some SBE members for the demonstration of this database at an SBE meeting in the early 1980s, when a static discharge from bad carpet to the computer ended the database demo.

Cheryl Lustenberger has spent the last nine years educating future broadcast engineers at Tufte Television Studios at Emerson College. Having previously worked at several network affiliates in Massachusetts before coming back to her alma mater as staff, she was always happy to help students learn about the technology behind the productions they were developing and carrying out. In addition to formal workshops on safety, rigging and technology; Cheryl makes herself available to students.

**SBE Announces 2016 National Awards Winners**

The 2016 SBE National Awards, which recognize excellence and achievement by individual members, SBE chapters and Sustaining Member companies, have been announced. The two highest individual awards are the Robert W. Flanders SBE Engineer of the Year and the James C. Wulliman SBE Educator of the Year.

**Jay Adrick To Keynote SBE National Awards Dinner in Columbus**

SBE President Jerry Massey has announced that nationally known broadcast consultant Jay Adrick will be the keynote speaker at the 2016 SBE National Awards Dinner. The dinner is the closing event of the SBE National Meeting, held in conjunction with the Ohio Broadcast Engineering Conference in Columbus, Ohio on October 27.

Adrick is a 50-year veteran of the broadcast industry and is a leader in the design and integration of digital broadcasting systems. He retired as VP of broadcast technology from Harris Corporation’s Broadcast Communications Division and is now a technology advisor to the Transmission Business Unit that was known as Harris Broadcast, but is now named GatesAir.

At Harris, Adrick led the development of the Advanced Television Systems Committee (ATSC) Mobile DTV system, provided strategic guidance for the development of new broadcast products and represented Harris in the world of broadcast standards. He led the teams that designed and built many of the leading broadcast facilities, among them, The Golf Channel, The Weather Channel, The Discovery Channel, National Public Radio, The Voice of America, Georgia Public Broadcasting and the Iraqi Media Network.

Adrick served as...
With room for up to 8 blades, T-Rax is the most powerful and affordable IP video solution for broadcasters and production companies. Combined with the Core Cloud Management Platform, T-Rax encoders and decoders can be managed remotely and routed to any number of destinations around the world, including decoders, online video platforms, and computers.
vice chairman of the ATSC and as chairman of the Open Mobile Video Coalition (OMVC) Forum. He currently chairs the ATSC Mobile Emergency Alerting System Implementation Team.

In addition to his role as a technology advisor to GatesAir, Adrick also is focused on the development of ATSC 3.0, Mobile DTV and spectrum/regulatory issues. He is also advising clients on the preparation for TV spectrum repacking that will follow the TV band spectrum auctions.

SBE National Meeting events begin on Wednesday, Oct. 26 with meetings of the national SBE Certification Committee and the SBE Board of Directors. On Thursday, Oct. 27, activities include the annual SBE Fellows Breakfast (invitation-only), sponsored by Kathrein USA, Frequency Coordinators meeting, the SBE Annual Membership Meeting (webcast live), sponsored by AC Video Solutions, Blackmagic Design and DVEO, as of this writing. The SBE Annual Awards Reception, sponsored by Correx, is followed by the SBE National Awards Dinner, sponsored by Telos Systems. Presentation of the society’s major awards will be made.

SBE National Meeting events will be held at the downtown Columbus Crowne Plaza Hotel, with the exception of the Annual Membership Meeting, which will be held across the street at the Greater Columbus Convention Center.

Our hosts are the Ohio Association of Broadcasters (OAB) and the SBE chapters of Ohio. The Ohio Broadcast Engineering Conference, held at the convention center, includes an industry tradeshow and technical sessions of interest to all media engineers, technicians and IT personnel. Register for the Ohio Engineering Conference and SBE National Meeting through the OAB website at www.oab.org. Reservations to attend the SBE National Awards Reception and Dinner ($15) are available through the SBE National Office website and by telephone, Monday – Friday from 8:30 a.m. to 4:30 p.m. ET at 317-846-9000. Reserve your room at the Crowne Plaza by Sept. 24 by calling 800-338-4462 or go to www.crowneplaza.com/cmcrowneplaza. A special room rate of $134 per night plus tax has been reserved. Rooms include complimentary internet connection and reduced valet parking of $18 per day.

Certification Question
Answer on page 6

The impedance of a non-resonant transmission line is determined by:

A. the lines length, size of conductors and current in the line
B. the terminating impedance, the lines length and the dielectric
C. the dielectric, the spacing of conductors and the lines length
D. the spacing of conductors, size of conductors and the dielectric

### Certification Question Answer

The impedance of a non-resonant transmission line is determined by:

A. the lines length, size of conductors and current in the line.

D. the spacing of conductors, size of conductors and the dielectric.

---

**Disruptive Digital Video Products for Innovators**

**IBC Stand 2.A34**

**“NEWER, BETTER, FASTER.”**

**OUR “UPDATED CLASSIC” OFF-AIR 8VSB DEMOD/RECEIVER**

**TLV400E-8VSB**

858-613-1818 www.dveo.com
Summer Vacation? Not for the SBE

Here it is summer already and many of you, our members, are taking vacations while trying to keep transmitter facilities cool, transmitters online and working on new projects. This seems to be the busiest time of the year for SBE members, and your national SBE leaders are also working on projects for you, the member. I want to touch on some of those SBE projects.

As we know, broadcasting is constantly evolving and adding new technologies and methods to better reach our listeners and viewers. At the SBE, we too are evolving in areas with the intention to better serve you, the member. Recently, the SBE Board of Directors approved a modification to our EAS efforts to improve our efforts with EAS, both with regulatory issues and providing educational opportunities for you. The EAS Education Committee was dissolved, and the work of that group has been reassigned to the SBE Education Committee and the SBE Government Relations Committee.

Each committee will handle the responsibilities appropriate to its function. The first action from the Education Committee is to form an advisory group that will develop new educational, informative training programs, from EAS 101 to implementation of new procedures and regulations. Look for more information and advisories from the Education Committee on this in the future.

Compensation Survey

Recently, the SBE conducted a comprehensive compensation survey, and I hope you contributed to that project. Many members did. You will find a sample of the survey results on page 14 of this issue of The Signal, as well as information on how SBE members can access the survey results. If you participated in the survey, I thank you.

One item of note involves SBE Certification. While this is the first compensation survey the SBE has conducted, previous salary surveys have shown that holding SBE Certification makes a difference in an individual’s compensation. Our survey shows that this trend continues.

There’s lots of great information in the full survey report. I encourage you to read it and use the information.

Local Chapter Efforts

Chapter meetings are the lifeblood of the SBE, and for the program chairman of your local chapter it can be a challenge to constantly provide an informative meeting topic and guest. The SBE is updating its list of speakers and topics from our sustaining members who are available to speak and work with your local chapter. This list will be posted on the SBE website under chapter administration. Check it for ideas for your chapter’s upcoming meetings.

While on the subject of chapter meetings, we always want to welcome to our chapter meetings anyone who has an interest in broadcasting and the SBE even though he or she may not be members of the SBE. At the same time, we challenge SBE chapters to encourage these attending non-members to join the SBE. The SBE depends on membership dues for about half of its total revenue. Without sufficient dues revenue we would not be able to produce our education programs, produce technical books for our members and maintain the other member services we offer.

Though many of our services generate revenue, most of them, including those mentioned above, are not self-supporting. Support for the organization is best demonstrated by not just attending meetings but by being a member as well. The SBE represents our members on technical issues with the FCC and other federal agencies. The larger and more representative of the media technical community we are, the more effective we are in those endeavors.

Everyone attending an SBE meeting is asked to sign in. It’s easy to see who is and who is not a member. Keep some membership materials on hand at meetings and give them to the non-members. Explain the benefits of SBE membership. Some employers may even cover the cost of dues.

Thank you all for your continued support of the SBE. Let us know how we may best represent you.
There Is Always More To Learn

During the April 2016 SBE Board of Directors meeting in Las Vegas a recommendation from the chair of the Emergency Alert System (EAS) Education Committee was adopted by the Board to dissolve that committee and reassign its functions to the Education Committee for educational aspects and the Government Relations Committee for policy and regulatory matters. The EAS Education Committee was somewhat unique as it grew out of the original EAS Committee. With new responsibilities in hand, the Education Committee needs your help as we seek volunteers to serve on a EAS subcommittee to identify aspects of EAS importance and further the charter of the Education Committee with regards to EAS education for the broadcast engineer. It is envisioned that this subcommittee will be comprised of EAS equipment manufacturer representatives as well as practicing broadcast engineers with an interest in EAS. Our goal is to provide practical educational information related to EAS compliance to assist broadcast engineers in their chief operator duties. Please express your interest in serving on this important subcommittee by contacting Education Committee Chair Wayne Pecena or SBE Education Director Kristin Owens at the National Office.

Speaking of recent EAS activity, I trust you are aware of the Federal Communications Commission EAS Test Reporting System (ETRS) portal recently established. In case you have not kept up with this EAS action, the ETRS system outlines a reporting process for all EAS participants to provide feedback to the FCC with regards to National EAS test results. A first step is to register with the FCC to gain reporting system access and complete an information form referred to as Form One. This document must be filed on or before Aug. 26, 2016. It seeks information such as your broadcast facility number, transmitter location coordinates, equipment manufacturer representatives as well as practicing broadcast engineers with an interest in EAS. Our goal is to provide practical educational information related to EAS compliance to assist broadcast engineers in their chief operator duties. Please express your interest in serving on this important subcommittee by contacting Education Committee Chair Wayne Pecena or SBE Education Director Kristin Owens at the National Office.

The CIA Model

If you recall from the June Education Update in The Signal, the best practice network security implementation follows a model of Confidentiality, Integrity, and Availability (CIA). This model should not be associated with the Central Intelligence Agency.

"The CIA model defines confidentially as preventing access to sensitive information or data flowing across the network by those unauthorized to access the data. 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." Network exploits exist to impact the cornerstones of the CIA model. Confidentially is often the most challenged or attacked aspect of network security and is associated with privacy of information. Exploits are often based on unauthorized users attempting to and gaining access to the network, IT resources, and information through social engineering. A failure to change host devices default login information is often a common occurrence. The use of strong login passwords, data encryption, and need-to-know information segmentation are common mitigation approaches. Integrity is exploited by intercept of original sending host data and replacing the data before it reaches the intended recipient host. Exploit attempts include tactics such as a SQL database injection attacks. Mitigation steps include data transmission path encryption, checksums, and minimization of transmitted data.

Availability is often challenged by Denial of Service (DoS) attacks. These attacks disrupt host performance to the point of becoming unusable by the intended users or application. TCP/IP synchronization or SYN attacks are a common tactic employed. DoS attacks are commonly executed in a distribution manner creating a more effective disruption impact by involving multiple host devices in an attack. These distributed DoS attacks become more difficult to mitigate, due to the multiple sources executing the attack. Security is an ongoing IT process and should never be considered a one-time setup and forget process. Simple to implement best practices towards creating a secure network environment include:

• Change host default logins
• Disable unnecessary host services
• Close unused host TCP/UDP ports
• Keep system software updated and patched
• Terminate use of unsecure protocol(s) (example: Telnet)
• Utilize encrypted communications path(s) (example: VPN)

As broadcast station IP networks have grown and become an integral part of the broadcast technical facility, so have the security threats grown such that network security is an ongoing essential task for the broadcast engineer with IT responsibilities. Do you need to learn more about network security? Don’t miss future SBE webinar(s) that dive into the practical aspects of IP network security. Part 1 will be offered on Aug. 23, 2016, and Part 2 follows on Oct. 18, 2016. Additional detail and registration information can be found at sbe.org.

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 adding a 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.
A New Certification Preparation Reference

It is a daunting task to construct and maintain broadcast studios, transmitter facilities, ENG/DNSG vehicles and remote sites. To be a broadcast engineer is to be a modern day “jack-of-all-trades”, but in our case, we must also be a master of many skills. Perhaps you are an IT person new to the broadcast industry, or a studio engineer unfamiliar with the transmitter. The SBE is the only organization that certifies your skills as a broadcast engineer.

The SBE Broadcast Engineering Handbook was introduced at the 2016 NAB Show. This book offers valuable knowledge for you to broaden your skills. If you have taken or plan to take a Certification test then you know that most tests are open-book, except for essay questions. The SBE provides a list of texts and reference material that may help you during the test. We now have this new SBE Broadcast Engineering Handbook to add to the list.

To aid the Certification Committee in covering the most up-to-date information in certification exams, the Ennes Education Foundation Trust has provided a grant to supply each member of the SBE Certification Committee with a copy of the book. This book is a hands-on guide to station design and maintenance published by McGraw-Hill. The editor-in-chief is Jerry C. Whitaker, a well known author and editor in the broadcast industry. I was blessed to be part of the Editorial Advisory Board that selected authors and topics for inclusion into the handbook. I focused on the RF section.

In-depth Coverage

The SBE Broadcast Engineering Handbook features in-depth tutorials that stress important broadcast engineering topics. It provides comprehensive coverage of radio and television technologies. It is written by broadcast engineers for broadcast engineers. More than 50 authors contributed their expertise to this book. This 912-page handbook is divided into seven sections plus three reference annexes.

- **Regulatory Issues.** This section provides information to keep your station legal as well as providing a quick reference resource. It covers EAS, ABIP and broadcast accessibility requirements. A broadcast station must have a Designated Chief Operator; we have a chapter devoted to the responsibilities of a chief operator.

- **RF Transmission.** The very essence of broadcast engineering requires the transmission of radio frequency emissions through the ether. This section covers AM and FM transmitters, AM directional arrays, FM combiners, FM and TV antennas, coaxial transmission line, 8-VSB transmission theory, DTV transmitters, DTV measurement and evaluation of TV coverage and interference. Perhaps your background in RF began as a ham radio operator. We have a chapter on one of my favorite subjects, international shortwave broadcasting.

- **DTV Transport.** This section explains DTV transport and metadata in depth. It includes MPEG-2 transport, PSIP, IP transport for Mobile TV, Mobile EAS and ATSC Mobile DTV.

- **Information Technology Systems.** It is a field as diverse as broadcasting engineering itself. It is an integral part of today’s broadcasting. This section covers IT and the broadcast plant, a network systems overview, time and frequency transfer over Ethernet using NTP and PTP. It also covers the history; development and current standards for video transport over internet protocol networks.

- **Production Systems.** Local content is one of the essential elements of serving the community. The scope of this section covers production facility design, audio system interconnections, audio monitoring, and remote audio broadcasting and intercom systems. Also covered are video switchers, master control and centralized facilities, automation systems, media asset management and even broadcast studio lighting.

- **Facility Issues.** This section looks at the key elements of broadcast facility planning, installation and maintenance. This includes facility design, wire management, rack enclosures and environmental cooling of the broadcast systems. AC power system, grounding and transmission system maintenance are also covered.

- **Broadcast Management.** This section focuses on leadership and management. As a manager, you move from personal accomplishments to leading the combined efforts of an entire department. Covered are budget planning and compliance, strategic planning, personnel staffing and scheduling, staff training and interdepartmental relations. You must keep a close eye on industry trends and regulatory mandates.

This book is a great addition to your personal library or your station’s library. As a member of the SBE Certification Committee, I can tell you that we are always looking for good technical resources as we develop questions to use on certification tests. The tests are always intended to be practical in their scope and reflect a real-world test of the applicant’s abilities. The SBE Certification Committee will be using this handbook in the future to develop and add questions to the existing database of test questions. This SBE Broadcast Engineering Handbook can be ordered online at the SBE Bookstore at www.sbe.org/bookstore. The price is $159 for SBE members and $199 for non-members.

**Order Today!**

By Jerry Whitaker, CPBE, 8-VSB; and the Society of Broadcast Engineers

In-depth tutorials of radio and TV topics, written by more than 50 broadcast engineering experts.

sbe.org/bookstore
Chapter Engineers of the Year Chosen

In conjunction with the SBE National Awards program, SBE members who are honored by chapters as a chapter engineer of the year are automatically entered into consideration for the Robert W. Flanders SBE Engineer of the Year award. Six people were selected by seven chapters for the local honor.

- Mike Cole, CTO; Ch. 32 Tucson
- Owen Smith; Ch. 38 El Paso
- Ted Hand, CPBE, 8-VSB, AMD, DRB; Ch. 45 Charlotte
- Ted Hand, CPBE, 8-VSB, AMD, DRB; Ch. 54 Hampton Roads
- Ron Bartlebaugh, CBNT; Ch. 70 Northeast Ohio
- Gary Mach, CPBE, CBNT; Ch. 80 Fox Valley

SBE Certification Achievements

CONGRATULATIONS

LIFE CERTIFICATION

- Certified Professional Broadcast Engineer® (CPBE®) 6-VSB Specialist® (6-VSB®)
  - Kenneth Sell, Phoenix, AZ - Chapter 9
- Certified Senior Television Engineer™ (CSTE®)
  - Ronald Hacker, Perth Amboy, NJ - Chapter 15
- Certified Broadcast Networking Technologist®
  - Kenneth Sell, Phoenix, AZ - Chapter 9

NAB SHOW EXAMS

- Certified Senior Radio Engineer™ (CSRE®)
  - Michael Aurand, Fresno, CA - Chapter 48
- Certified Broadcast Radio Engineer™ (CBRE®)
  - Alan Kline, Des Moines, IA - Chapter 109
- Certified Audio Engineer® (CEA®)
  - Eric French, Columbus, OH - Chapter 52

JUNE EXAMS

- Certified Broadcast Radio Engineer™ (CBRE®)
  - John Elberly, Long Beach, CA - Chapter 47
- Certified Broadcast Networking Engineer® (CBNT®)
  - Robert Nemitz, Tucson, AZ - Chapter 32

SPECIAL PROCTORED EXAMS

- Certified Broadcast Television Engineer™ (CBTE®)
  - Brian Reilly, Nashville, TN
- Certified Broadcast Radio Engineer™ (CBRE®)
  - Thomas Howard, Cheyenne, WY - Chapter 129
- Certified Broadcast Networking Technologist® (CBNT®)
  - Sheryl Bowin, Galion, OH - Chapter 52

SBE CERTIFIED SCHOOL COURSE COMPLETION

- Certified Broadcast Engineer® (CBE®)
  - Southern Alberta Institute of Technology
  - Mitchell Anderson, Calgary, AB
  - Brandon Harmen, Airdrie, AB
- Certified Broadcast Networking Engineer®
  - Southern Alberta Institute of Technology (cont.)
  - Thomas Gray, Calgary, AB
  - Brandon Harmen, Airdrie, AB

CERTIFIED BY LICENSE

- Certified Broadcast Engineer® (CBE®)
  - Jon Bock, Davenport, IA
  - Stephen Guye, Loomis, CA - Chapter 43
- Certified Broadcast Engineering Technician®
  - Brian Reilly, Nashville, TN

CERTIFIED RADIO OPERATOR® (CRO®)

- Ken Bryant, Rocklin, CA
  - Capital Public Radio
- Rick Hesman, Rocklin, CA
- Hannah Porter, Lincoln, CA

CERTIFIED TELEVISION OPERATOR® (CTO®)

- Ryan Barto, Irving, TX
  - Killeen Independent School District
  - Jonathan Burns, Killeen, TX
  - Carmen Delara, Killeen, TX
  - Cherisse Evans, Killeen, TX
  - Jamie Garrett, Killeen, TX
  - Cody Rena, Cooper-Mitchell School District
  - Tyra Pracht, Killeen, TX
  - Hector Quinones, Killeen, TX

Dubois Career High School
- Jazmine Birch, Grand Prairie, TX
- Karen Chenavira, Grand Prairie, TX
- Jackson Hanesbro, Grand Prairie, TX
- Heather Losch, Grand Prairie, TX
- Leslie Lorenzo, Grand Prairie, TX
- George Sanchez, Grand Prairie, TX

St. Ambrose University
- Allison Adams, Davenport, IA
  - Jake Harmon, Davenport, IA
  - Donald Schneider, Davenport, IA
  - Killeen Independent School District
  - Jeffrey Griffin, Winston-Salem, NC
  - Rachel Tose, Winston-Salem, NC

Mesquite ISD
- Brittany Cheney, Mesquite, TX
- Grant Chapparo, Mesquite, TX
- Madison Craver, Mesquite, TX
- Abram Gallagros, Mesquite, TX
- Beverly Manriguez, Mesquite, TX
- Virgina Moore, Mesquite, TX
- Shonda Tharp, Mesquite, TX
- Carmen Turner, Mesquite, TX
- Kailin York, Mesquite, TX

Garland ISD
- Adam Bohn, Garland, TX
- Hannah Hill, Garland, TX
- Ydairy Lovo, Garland, TX
- Zachary Medlock, Garland, TX
- Lida Rivera, Garland, TX
- Friendswood High School
  - Abi Ardoin, Friendswood, TX
  - Dylan McKinnon, Friendswood, TX

cont. on pg. 8
Fifty New SBE Members In Member Drive

The SBE Mentor Program helps broadcast engineers who are new to the field. The program partners a new engineer with a more-seasoned professional. This allows the more-experienced person to share his or her gained knowledge, both empirical and practical, with someone new to the field. The SBE Mentor Program provides this conduit for the participants.

The partnership lasts for one year beginning on Oct. 1, 2016. Applications are due by Aug. 31, 2016. We have lots of mentees, but we need more mentors. More info at sbe.org/mentor.

SBE Certification Achievements

Certified Professional Broadcast Engineer® (CPBE):
- Rick Hartford, Edmond, OK - Chapter 85
- Mark Heller, Two Rivers, WI - Chapter 80
- Julius Syutai, Vienna, VA - Chapter 37

Certified Broadcast Radio Engineer® (CBRE®):
- Robert Yankowitz, New Bedford, MA - Chapter 11
- John Masters, Maryville, IL - Chapter 55
- John Mulhern, Liberal, KS - Chapter 36

Certified Broadcast Television Engineer® (CBTE®):
- John Arthur, Jr., Brandon, MS - Chapter 125
- John Beach, Metairie, LA - Chapter 26

Certified Broadcast Networking Engineer® (CBNE®):
- Richard Bucchi, Columbus, OH - Chapter 52

Certified Broadcast Networking Technology® (CBNT®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Senior Radio Engineer® (CSRE®):
- William Bobich, Columbus, OH - Chapter 52

Certified Senior Television Engineer® (CSTE®):
- William Bobich, Columbus, OH - Chapter 52

Certified Senior Video Engineer® (CSV®):
- Seth Morth, Marietta, PA - Chapter 41

Certified Audio Engineer® (CEA®):
- Joshua Smith, Eiel Longmeadow, MA - Chapter 11

Certified Video Engineer® (CVE®):
- B. John Boren, San Diego, CA - Chapter 36

Certified Broadcast Technologist® (CBT®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Video Technologist® (CVT®):
- Adam Truax, West Lafayette, IN - Chapter 14

Certified Audio Technologist® (CAT®):
- Thomas Kettwig, Boise, ID - Chapter 115

Certified Studio Engineer® (CSE®):
- Daniel Thienman, Antioch, TN - Chapter 36

Certified Broadcast Engineering Assistant® (CBEA®):
- Richard Reyes, Honolulu, HI - Chapter 63

Certified Broadcast Networking Assistant® (CBNA®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Technology Assistant® (CBNTA®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Transmission Engineer® (CBTE®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Technician® (CBT®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Assistant® (CBNA®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Technology Assistant® (CBNTA®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Engineering Assistant® (CBEA®):
- Adam Truax, West Lafayette, IN - Chapter 14

Certified Broadcast Engineering Assistant® (CBEA®):
- Thomas Kettwig, Boise, ID - Chapter 115

Certified Broadcast Transmission Engineer® (CBTE®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Technician® (CBT®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Assistant® (CBNA®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Technology Assistant® (CBNTA®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Transmission Engineer® (CBTE®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Technician® (CBT®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Assistant® (CBNA®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Technology Assistant® (CBNTA®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Transmission Engineer® (CBTE®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Technician® (CBT®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Assistant® (CBNA®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Technology Assistant® (CBNTA®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Transmission Engineer® (CBTE®):
- John Arthur, Jr., Brandon, MS - Chapter 125

Certified Broadcast Technician® (CBT®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Assistant® (CBNA®):
- William Carpenter, San Francisco, CA - Chapter 40

Certified Broadcast Networking Technology Assistant® (CBNTA®):
The annual election of SBE officers and directors is currently underway. Ballots are due by 4:30 p.m. EDT on Aug. 25. Voting is via the 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 an email address. They will receive their ballots through the mail. Up for election are 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, CBNE; 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, GA
  - Kirk Harnack, CBRE, CBNE; Chapter 103, Nashville, TN
  - Brian Oliger, CBT, CBNT; Chapter 37, District of Columbia
  - Jason Ornellas, CBRE, CRO; Chapter 43, Sacramento, CA
  - 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, Charleston, SC

If you have not yet cast your vote, do so today.

---

**Chapter and Individual Awards**

Chapters are the lifeblood of the SBE, and 2016 marks the third year that the Chapter Engineer of the Year Award has been a way to highlight the achievements of members within their chapters. This year, seven chapters selected their own award recipients. (See page seven.) Each winner will be presented with a special certifi-
The Squeaky Wheel of Ambient RF Noise: Is Some Grease on the Way?

The SBE has aggressively and repeatedly stated its members concerns about increases in ambient noise, especially in the AM broadcast band. But RF noise from man-made sources is not only an AM problem; it is also a limiting factor for FM and television reception. And it is getting worse, according to the FCC’s recent order and further notice in the AM Improvement docket. But the bottom line is that the FCC doesn’t really know what the levels of ambient noise are in the broadcast and other allocations. Without this knowledge, it is impossible to know whether the Part 15 radiated and conducted emissions limits for intentional, unintentional and incidental radiators are adequate. Because the FCC has neither the resources nor the inclination to address individual cases of interference attributable to, for example, RF consumer devices, power lines, switching power supplies, RF lighting systems and the vast array of other noise contributors in the field, it is critical that ambient RF be regulated properly prior to the point of retail sale.

Finally there are signs that the FCC is taking this problem seriously. A June, 2016 FCC Public Notice announcing that the FCC Technological Advisory Council (TAC) will investigate changes and trends to the radio spectrum noise floor to determine if there is an increasing problem with unwanted radio frequency (RF) energy from man-made sources. The TAC will investigate its scope and the quantitative evidence available over the past 20 years. Initially, the FCC on behalf of the TAC is asking the public to comment as to how a noise study should be performed. The study will not be frequency-limited. In the SBE’s experience, ambient, man-made noise exists in the MF, HF and VHF bands. The TAC expects to find that the noise floor in the radio spectrum is rising because of increasing numbers of unlicensed, intentional and unintentional RF radiators (Part 15 devices) and industrial, scientific and medical (Part 18 devices) in use. However, the FCC says there is not much hard evidence of increased noise floors and there is a lack of quantitative data.

It is right and proper for SBE members and chapters to plan to participate in gathering evidence for the TAC to help this study. The wide geographic distribution of SBE members and chapters in all RF environments makes the SBE an asset to the TAC in the conduct of this study.

One of the biggest sources of RF noise in the broadcast bands is RF lighting devices. The FCC Office of Engineering and Technology (OET) on June 17 issued a paper in its knowledge database discussing RF lighting devices and noting the radiated and conducted emission rules that apply to them. The rules are intended to avoid harmful interference to licensed radio services. General illumination includes applications such as traffic signaling, roadway lighting, manufacturing processes, agriculture, etc. RF LED lighting devices intentionally generate RF energy via electronic power conversion or digital circuitry, but are not intended to radiate RF energy, so they are classified as unintentional radiators according to the FCC rules. As such, they are subject to the Part 15 rules for unintentional radiators, and are subject to the verification equipment authorization procedure and are required to meet the line-conducted and radiated emissions limits in Rule Sections 15.107 and 15.109, respectively. In any case, however, the FCC noted that operation of Part 15 unintentional radiators is subject to the condition that no harmful interference is caused, and that manufacturers and users should be aware that lighting devices are required to cease operation if harmful interference occurs. Radiated emission measurements must be performed at least from 30MHz to 1000MHz to adequately demonstrate compliance with Part 15 (§15.109). Routine radiated emissions measurements are needed under Part 15, based on the highest frequency generated or used in the device. The FCC said that it had found that emissions from RF LED lighting devices are non-periodic, broadband in nature, and are produced as a byproduct of the internal driver circuitry within the RF LED lighting device. These types of emissions have adequate energy and potential to generate radiated emissions well above 30MHz.

The limits are higher for Part 15 LED bulbs than for Part 18 fluorescent and CFL bulbs, and local governments are purchasing LED bulbs in great numbers. Be aware that noise generated by street and traffic lighting can be widespread throughout your market. It may be helpful to commence a dialog with your local government that may deploy RF lighting devices. Make them aware of the Part 15 non-interference requirement. They won’t know of it otherwise. Be a squeaky wheel.
The importance of local chapters of the SBE can't be overstated. It's the best place for members to come together and interact, learn from each other and absorb information from presenters that many times is tailored to a technical broadcast audience. Chapters are the lifeblood of the SBE because that's where many of our members make their strongest connection with the organization and get the most benefit.

Trends within the broadcast industry over the past ten years have made it more of a challenge to operate an effective and successful chapter. There are fewer engineers doing more work, making time more scarce that can be set aside for individual professional development.

Some of our chapters go through periods of inactivity because of this, but many chapters continue to present quality programs and events on a monthly basis and are having solid attendance. It's easy to trace the source of the success of these chapters – its leadership. From those who serve as the chapter chair to the member who arranges the programs; from the chapter's certification chair to the secretary and treasurer and the rest, they all play key roles in the success of the chapter.

Limited space prohibits listing the entire leadership team for each SBE chapter, but I would like to recognize the chapters that earned quality chapter status in 2015 and qualified for the annual cash rebate of dues. Please thank yours for their service the next time you see him or her.
As the FCC proceeds in its task to transfer spectrum currently assigned to TV broadcast use to be used for wireless broadband in the Incentive Auction, one of the unanswered questions is where will the remaining TV stations relocate to in the new smaller TV spectrum. The FCC set a target of 126MHz of TV spectrum to be transferred to wireless broadband use. This will reduce the TV band down to 28 TV channels starting from channel 2 and ending at channel 29. There are 1,782 full-power stations that will have to fit in the 28 channels instead of the previously allotted 49 channels. The reverse auction will reduce the number of stations that need to fit in the new band, and the remaining number of stations still needing to fit in the new TV bands will not be known until the auction is completed.

One way to get an idea of how much spectrum will be available for stations that will have to move from the new wireless band to the reduced TV band is to look at the DTV transition. The FCC had to find a second channel for the 1,640 stations that were on the air at the end of 1996. That doubled the number of transmitters allowed to operate in the TV band to 3,280. Before the FCC issued its final allotments for the second digital channel for each existing TV station, the FCC made a last call for applications for new analog TV stations. That added about 135 stations, of which only a few were given a second digital channel. This gave a total of 3,338 transmitters in the TV band at the end of the DTV transition. To fit all of these transmitters in the reduced TV band is to look at the TV channel allocation comparison before, during and after the DTV transition. The following chart compares the number of transmitters per channel during the DTV transition to the stations currently on the air.

The question is now how many stations can fit in the remaining TV bands. One of the first issues that will reduce the spectrum available for stations to move to is that the FCC has stated that it will avoid assigning stations wishing to move to low-band VHF to channel 6 to avoid interference to the lower FM frequencies. They are also avoiding using channel 14 to avoid interference to the 450-470 MHz land mobile band. That leaves channels 15 through 29 in the new band, and the remaining number of stations per channel during the DTV transition to the stations currently on the air.

In reality, fewer than 1,050 stations could be placed in the UHF band due to market variations. In markets like New York, Los Angeles, San Francisco and Chicago and the crowded Eastern seaboard, the number of stations and the amount of overlap require more channels needed than will be available. Only by reducing the number of stations or having stations elect to move to VHF through the auction may solve the crowding in those areas. Moving to high-band VHF is nearly impossible as it is nearly full with possibly only 40 to 50 openings in the band. Low-band VHF has more openings as the there is only 40 stations in the band. With only channels 2 to 5 available, about 250 stations could fit into the lower VHF band. There is the question on how many stations are willing to move to low-band due to the reception issues in that band. The following chart compares the number of stations per channel during the DTV transition to the stations currently on the air.

Next Steps

The question is now how many stations can fit in the remaining TV bands. One of the first issues that will reduce the spectrum available for stations to move to is that the FCC has stated that it will avoid assigning stations wishing to move to low-band VHF to channel 6 to avoid interference to the lower FM frequencies. They are also avoiding using channel 14 to avoid interference to the 450-470 MHz land mobile band. That leaves channels 15 through 29 in the new band, and the remaining number of stations per channel during the DTV transition to the stations currently on the air.

The question is now how many stations can fit in the remaining TV bands. One of the first issues that will reduce the spectrum available for stations to move to is that the FCC has stated that it will avoid assigning stations wishing to move to low-band VHF to channel 6 to avoid interference to the lower FM frequencies. They are also avoiding using channel 14 to avoid interference to the 450-470 MHz land mobile band. That leaves channels 15 through 29 in the new band, and the remaining number of stations per channel during the DTV transition to the stations currently on the air.

In reality, fewer than 1,050 stations could be placed in the UHF band due to market variations. In markets like New York, Los Angeles, San Francisco and Chicago and the crowded Eastern seaboard, the number of stations and the amount of overlap require more channels needed than will be available. Only by reducing the number of stations or having stations elect to move to VHF through the auction may solve the crowding in those areas. Moving to high-band VHF is nearly impossible as it is nearly full with possibly only 40 to 50 openings in the band. Low-band VHF has more openings as the there is only 40 stations in the band. With only channels 2 to 5 available, about 250 stations could fit into the lower VHF band. There is the question on how many stations are willing to move to low-band due to the reception issues in that band. The following chart compares the number of stations per channel during the DTV transition to the stations currently on the air.

It can be seen from Figure 1 that there is room for stations to move to new channels, but because of market variation, there will not be enough for everyone. Depending on the number of stations that were attracted to participate in the Reverse Auction and accepted an offer from the FCC, some stations will no doubt be forced to occupy guard bands or in some cases share spectrum with wireless broadband providers. And many stations that already occupy channels 14 through 29 may have to move to a new channel because of the ripple effect as stations are reassigned to new frequencies.

As we await the outcome of the Incentive Auction, we can see from the past experience of the DTV transition and looking at the availability of possible spectrum for stations to move to, it can be seen how difficult it is for the FCC to create a plan to reassign stations in the reduced TV band and it may give some indication of the possible difficulties and chaos that the repacking of the TV band that the remaining TV stations will have to endure.
Member Spotlight: Tom Bole

Member Stats
SBE Member Since: 2014
Certifications: CBNT, CTO
Chapter: 128 Las Vegas
Employer: KLVX, Las Vegas PBS
Position: Broadcast Engineer
Location: Las Vegas

I’m Best Known For: Being the retired military guy! I served 20 years on active duty in the Air Force. I was an RF transmission guy the whole time. The experience gave me a lot of confidence and made me a jack of all trades and a master of none, lol!

Q. What do you value most about your SBE involvement?
A. The relationships with other broadcast engineers in the area. The meetings are a good time to talk to other engineers and hear about the issues they are dealing with and collaborate on solutions.

Q. What got you started in broadcast engineering?
A. I kind of stumbled into broadcast engineering. As I retired from the military, I was contacted by our former chief (also prior military) about a temporary position to help out the station during a tough transition period. I fell in love with the people and the job, and luckily for me it turned into a permanent position.

Q. What do you like most about your job?
A. I love the fact that my job is different every day. Sitting behind a desk doing the same thing over and over is not for me. I like to get out and work on the transmitter and translators, and I also love working on our in-house equipment. I really don’t mind doing a little paperwork either, so this is the perfect job for me.

Q. When I’m not working I...
A. ...enjoy spending time with my wife and my teenage sons. We go to the gym together and we also like to do projects around the house together. I love being able to give my sons skills that will benefit them later in life.

Q. What is your favorite gadget?
A. Automation. Anything WIFI, Bluetooth, etc. that makes my life easier at home.

Compensation Survey Sampler

The SBE conducted its first (and ongoing) compensation survey in April and May. The results of the survey have been compiled, and SBE members can download the report. The goal is to provide practical information to SBE members about individual compensation (salary and benefits) based on the type of broadcast or multimedia involvement (beyond just radio and TV), market size and years of experience.

The survey asked for demographic information, such as working in radio, TV or both, market size, and job title category. We also asked if respondents received a raise in the last year (and if so, how much, and to report current salary and benefits received. We also asked about contract engineering rates and practices.

Respondents were asked if they held any broadcast- and media-relevant professional certifications. We compared salaries of those respondents with and without SBE Certification and reported the results. Read the report to learn what difference SBE Certification makes. (Hint: It is worth being SBE Certified.)

At the end of the survey we asked two open-ended questions: If you could change one thing about your job, what would it be? Whose concern is it to encourage new talent to choose broadcast engineering as a career? The answers to both questions brought out some interesting ideas.

We provided a few graphs from the survey report here. The survey report is available on the SBE website. You will need your SBE website login to access the page. Also, the PDF report is password protected. The password is noted on the download page.
The recipient for 2016 is Amber Carlyle of Kennewick, WA. She plans to attend Columbia Basin College to study audio engineering and art. In the photo, Carlyle receives her scholarship check from Chapter 51 Tri-Cities Chairman Art Blum.

The scholarship is awarded to a Tri-Tech Radio Broadcasting student who plans to continue his or her education in broadcasting.

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.
**Members On The Move**

- **Gary Stigall**, CBT, has rejoined the KFMB stations in San Diego as director of engineering.
- **Bill Hamilton**, CBT, is now broadcast systems engineer at Meredith Corporation in Madison, WI.
- **Dan Ryson**, CBT, became associate director, spectrum management, for CBS in April. For the previous 16 years he was a senior engineer with Cavell, Mertz & Associates, Inc.
- **Juan Dent**, CTO, is a master control operator with Watchmen Broadcasting WBPI-TV 49 in Augusta, GA.

- **Bill Moede** is now the director of engineering for the Cumulus Media stations in Appleton/Green Bay, WI.
- **Raul Velez** is the market manager at Universal Media Access in San Francisco.
- **Michael Wenglar**, CPBE, of KULP-AM El Campo, TX, was awarded the George Marti Award for Engineering Excellence from the Texas Association of Broadcasters.
- **William "Clay" Jones** has left KDAF Dallas to become director of engineering at KRQE Media Group in Albuquerque, NM.

**MARK YOUR CALENDAR**

- **SBE Certification Exams**
  - Local Chapters
  - Aug. 5 - 15, 2016
  - sbe.org/certification
  - Application deadline is closed.

- **NBA Convention/SBE Ennes Workshop**
  - Lincoln, NE
  - Aug. 17, 2016
  - ne-ba.org

- **SBE Webinar: IP Network Security Part 1**
  - online
  - Aug. 23, 2016
  - sbe.org/webinars

- **WBA Broadcasters Clinic**
  - Madison, WI
  - Oct. 11 - 13, 2016
  - wi-broadcasters.org

---

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