

# THE Signal

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Society of Broadcast Engineers



The Association for  
Broadcast and  
Multimedia Professionals

[www.sbe.org](http://www.sbe.org)

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## Peer Recognition: 2023 SBE National Award Winners Announced

The 2023 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. The winner of the award for 2023 is Joseph Conlon of Inver Grove Heights, MN, and a current member of SBE Chapter 17 Central Minnesota.

Conlon has been an SBE member for 17 years. He has held various roles within Chapter 17 including secretary, treasurer, assistant chair and chair. Chapter 17 nominated Conlon as its Chapter Engineer of the Year for his passion for helping others in the field of broadcast engineering. Throughout his years as an SBE member, Conlon has introduced others to the SBE, helping their local chapter

grow. He highly values volunteering and giving back to the community.

The recipient of the James C. Wulliman SBE Educator of the Year award is recognized for outstanding service and excellence in sharing knowledge through teaching other broadcast engineers. The winner of the 2023 award is Andrew Gladding, CBT, of Brooklyn, NY, and a member of SBE Chapter 15 New York City.

Gladding has been an SBE member for eight years and is the secretary of



Conlon



Gladding

see [AWARDS](#), p. 9

## SBE National Meeting Goes to Columbus



The MBMTC hosts an exhibit hall and sessions. (MBMTC photo)

The SBE holds its annual National Meeting in the fall. The event is held in conjunction with another fall broadcasting event, and this year the SBE National Meeting will be held in Columbus, OH, during the Midwest Broadcast & Multimedia Technology Conference, which is jointly produced by the state broadcast associations of Ohio, Indiana, Kentucky and Michigan.

The highlight of the SBE National Meeting is the annual SBE Membership Meeting, which will be held from 4:00 to 5:00 p.m. EDT on Sept. 28. The Membership Meeting provides information on the latest activities of the SBE, including education, certification and frequency coordination. During the meeting, the newly elected SBE directors and officers will be sworn into office. SBE President Andrea Cummis, CBT, will begin the meeting. The meeting will be recorded and presented on the SBE YouTube channel.

SBE National Meeting events begin on Sept. 27 with meetings of the national SBE Certification Committee and the SBE Board of Directors. On Sept. 28, activities continue

with the annual SBE Fellows Breakfast (invitation-only), sponsored by Kathrein USA, and the SBE Annual Membership Meeting, sponsored by Blackmagic Design, Dielectric, and Nautel.

That is followed by the SBE Annual Awards Reception, sponsored by Comrex, and the SBE National Awards Dinner. Presentation of the society's major awards will

see [MEETING](#), p. 3

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# I Trust ViA for Sports Remotes



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Dan Israel, Executive Producer & Co-host, Chiefs Radio Network

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WLVT-TV | Bethlehem, PA  
acummis@sbe.org

**VICE PRESIDENT**

**Ted Hand, CPBE, 8-VSB, AMD, ATSC3, DRB**  
Cox Media Group | Charlotte, NC  
thand@sbe.org

**SECRETARY**

**Jason Ornellas, CBRE, CRO**  
Bonneville International | Sacramento, CA  
jornellas@sbe.org

**TREASURER**

**Kevin Trueblood, CBRE, CBNT**  
WGCU Public Media | Estero, FL  
ktrueblood@sbe.org

**DIRECTORS**

**David Antoine, CBRE, CBNT**  
WBGU/Newark Public Radio | New York, NY  
dantoine@sbe.org

**Greg Dahl, CPBE**

Second Opinion Communications | Rockford, IL  
gdahl@sbe.org

**Mark Heller, CPBE**

WTRW, Metro North Communications | Two Rivers, WI  
mheller@sbe.org

**Zhulieta Ibisheva, CBTE**

E.W. Scripps Co. | Honolulu, HI  
zibisheva@sbe.org

**Jeff Juniet, CBTE**

Cox Media Group | Orlando, FL  
jjuniet@sbe.org

**Charles "Ched" Keiler, CPBE, 8-VSB, ATSC3, CBNE**

E Three Services; WPLG | Deerfield Beach, FL  
ckeiler@sbe.org

**Thomas McGinley, CPBE, AMD, CBNT**

McGinley Enterprises | Missoula, MT  
tmcginley@sbe.org

**Geary Morrill, CPBE, AMD, CBNE**

Alpha Media | Saginaw, MI  
gmorrill@sbe.org

**David Ratener, CPBE, CBNT**

Salem Media | Seattle, WA  
dratener@sbe.org

**Shane Toven, CPBE, DRB, CBNE**

Educational Media Foundation | Antelope, CA  
stoven@sbe.org

**Dan Whealy, CBTE**

Quincy Media | Waterloo, IA  
dwhealy@sbe.org

**Fred Willard, CPBE, 8-VSB, ATSC3, CBNT**

Univision | Washington, DC  
fwillard@sbe.org

**IMMEDIATE PAST PRESIDENT**

**Wayne M. Pecena, CPBE, 8-VSB, AMD, ATSC3, DRB, CBNE**

Texas A&M University/KAMU | College Station, TX  
wpecena@sbe.org

**SBE NATIONAL STAFF**

**James Ragsdale | Executive Director**  
jragsdale@sbe.org

**Megan E. Clappe | Certification Director**  
mclappe@sbe.org

**Cathy Orosz | Education Director**  
corosz@sbe.org

**Chriss Scherer, CPBE, CBNT  
Member Communications Director**  
cscherer@sbe.org

**Debbie Hennessey  
Sustaining Membership Manager**  
dhennessey@sbe.org

**Scott Jones | Database Manager**  
kjones@sbe.org

**RJ Russell, CPBE, ATSC3  
Frequency Coordination Manager**  
rjrussell@sbe.org

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**SBE National Office**  
317-846-9000 www.sbe.org

**MEETING, from p. 1**

be made, including the Robert W. Flanders SBE Broadcast Engineer of the Year, James C. Wulliman SBE Educator of the Year, the SBE Technology Award to a Sustaining Member company and the Best Technical Article, Book or Program by an SBE member.

SBE chapters will be presented with awards recognizing achievement for Best Chapter Communications, Best Regional Educational Event, Greatest Member Growth, Highest SBE Certified Chapter and Highest Meeting Attendance. Winners of the local SBE Chapter Engineer of the Year will also be recognized.

The Midwest Broadcast & Multimedia Technology Expo will be held at the Greater Columbus Convention Center. The Expo events are all held on Sept. 28, with a trade show and technical presentations. The annual event attracts broadcast engineers and technicians from Ohio, Indiana, Kentucky,

Michigan and the surrounding states. SBE National Meeting events will be held at the Hyatt Regency Columbus.

Registration for the Expo is required and costs \$50. Visit the Expo website (mbmtc.oab.org) for details and to register.

Tickets for the SBE National Awards Reception and Dinner are available through the SBE website (sbe.org) and by telephone, Monday - Friday from 8:30 a.m. to 4:30 p.m. EDT at 317-846-9000. There is no registration required or fee to attend the Annual SBE Membership Meeting.

Accommodations are available at the Hyatt Regency Columbus. A limited room block has been set aside for our guests. A hotel registration link in on the SBE website at sbe.org/sbe-2023-national-meeting.

The SBE invites all SBE members to take advantage of this opportunity and attend all of the events on Sept. 27 and 28.

**SBE Sustaining Member Sponsors**

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**KATHREIN**

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**Membership Meeting**

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Awards Dinner Sponsorship Available. Contact Debbie Hennessey

**SBE Election: Vote by August 15**

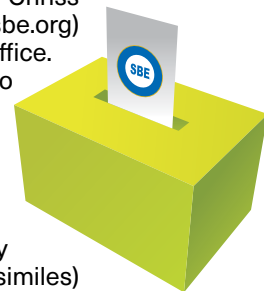
The annual election of SBE officers and directors is currently underway. Up for election are all four officers for one-year terms and half of the 12 directors for two-year terms.

All ballots are due by 4:30 p.m. EDT on Aug. 15. Voting is via an online ballot, 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. An email test message was sent on July 6, and the ballot link was sent to valid email addresses on July 14. Reminder emails were also sent if an online vote was not yet cast. If you did not receive

your email ballot, check your spam folder first, then contact Chriss Scherer (cscherer@sbe.org) at the SBE National Office.

For members who received a paper ballot in the mail, your ballot must be received in the SBE National Office by mail, express delivery or in person (no facsimiles) by 4:30 p.m. ET on Aug. 15.

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



**Certification Question**



**SBE CERTIFIED**

Answer on page 6

A power supply produces 9000V with a current drain of 3A. This power supply operates from 3-phase, 60Hz utility power mains. The ripple frequency for this power supply when using a full-wave rectifier circuit is:

- A. 60Hz.
- B. 180Hz.
- C. 360Hz.
- D. A power supply this large does not have any ripple
- E. Ripple frequency cannot be measured due to the high-voltage



## LETTER FROM THE PRESIDENT

By Andrea Cummis, CBT, CTO  
SBE President  
acummis@sbe.org

### Looking Back at the Past Two Years

To our Society of Broadcast Engineers members and supporters, thanks so much for allowing me to be your president for the last two years. It has been an honor to not only be your president, but to also be the first woman president in our long, almost 60-year history. I really appreciate everyone's support, and I enjoyed getting to know many of you along the way. It's hard to believe my second term is about to end, and that this is my last article as president. Although I won't miss writing the articles, I do wish I could get back the first six months of my first term since we were still holding board meetings virtually, and I felt that it took quite a while to get things moving in the right direction.



The SBE Board of Directors met in person at the 2023 NAB Show.

One of our many accomplishments from that last two years was that we have been able to work with Davit Robakidze to start chapter 148 Eastern Europe. We are presently working with our members in Canada to start a Canadian chapter, too. We already have chapters in Hong Kong and Saipan, and we hope to add more members and chapters around the world.

We had a great response to our strategic planning membership survey with more than 300 people responding. In addition, 127 respondents were willing to meet virtu-

ally with Jim Ragsdale and me to talk about the future of our organization. We have met with most of these members at this point, and we plan to meet with the rest of the interested members by the end of my term so we can give a report to the board at the fall meeting.

The primary topics that have come up in most of our meetings are about how to find and train the next generation of engineers, and how to expand our membership. We are reaching out to many related organizations to see how we can participate in more events where we could reach other technicians and engineers with similar skills. For instance, many of our members suggested



Chapter 148 Eastern Europe was chartered in 2022.

that we find a way to reach out to production engineers that work in the events space or houses of worship. We are also looking at how to connect with more college broadcasting programs and high schools that have radio and video production programs.

We had a great turnout for the SBE Ennes Workshop at the NAB Show in Las Vegas this past April. We are already talking about what to do next year, and we are speaking with some of the other broadcast-related organizations to see if they would like to work with us for this and other future events.

This way, instead of having competing educational events we can all work together to have one event for everyone's members. We are also looking at offering our RF101 program in a few different locations across the country over the year, and possibly shortening the program to one day so it's easier to find speakers and participants.

Kevin Trueblood has taken the lead on writing a request for proposal for finding someone to step up our social media presence. Hopefully this will help us reach younger potential members, and show off what our organization is about to a different audience.

There have been many more accomplish-



The SBE Ennes Workshop at the 2023 NAB Show was a huge success.

ments over the past couple of years, and there will be many more coming in the future. The organization is in great hands with Ted Hand taking over as president, Kevin Trueblood as vice president, Jason Ornellas as treasurer, and Geary Morrill as secretary, as well as a great slate of board members. I'll still be on the board as the immediate past president, so I hope you will all keep in touch. Please find me at any of our events and let me know how things are going and how we can help.

### Verify 13GHz ENG Licenses in FCC ULS

The FCC has established GN Docket 22-352, titled Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use. In this proceeding, the FCC has proposed repack and/or relocation of broadcast (and other) existing authorizations in the 12.7-13.25 GHz band. A forthcoming certification deadline for existing, incumbent 12.7-13.25 GHz broadcast licenses operating under Part 74 is outlined as part of this proceeding, but the FCC has not yet set the actual deadline by which such certifications must be filed. Accordingly, the SBE does not yet know when the FCC will require licensees to file such certifications or how well that date — as well as the requirements for making such certifications — will be communicated to licensees.

It is imperative that you verify all license data in the FCC's Universal Licensing System (ULS) related to your 13GHz broadcast aux-

iliary services licenses as soon as possible. In addition, if you are currently using 13GHz for ENG, not fixed links, please notify SBE Frequency Coordination Manager RJ Russell at rjrussell@sbe.org of the licensee call sign and designated market area.

More information is available at the link below. Paragraphs 83-84 and 143-147 further explain the need to confirm the accuracy of ULS data for your 13GHz licenses and prepare to certify as accurate all information on such licenses that fall under Part 74.

#### LINK

GN Docket 22-352

[docs.fcc.gov/public/attachments/FCC-23-36A1.pdf](https://docs.fcc.gov/public/attachments/FCC-23-36A1.pdf)



## EDUCATION UPDATE

By Greg Buchwald  
Member, SBE Education Committee  
gbuchwald@sbe.org

### AM Can Sound Good

While some may say AM really doesn't matter today, I beg to differ. AM still attracts large rating shares in many markets and it's very important in rural markets. It is my opinion that AM remains viable and important. It is often neglected technically. Listener disgruntlement with the on-air product becomes a self-feeding engine of decline. It does not need to be. Many are leaving considerable coverage and audio performance on the table through neglect. Comparably, FM is generally easier to "get right" than AM is.

Why are bandwidth and symmetry of sidebands important? AM is fundamentally a double-sideband, full-carrier system. If the sidebands are symmetric, one tenet of quality has been met. If one sideband is attenuated or removed by means of incidental phase modulation or by phasing and/or matching networks, distortion will occur in most receivers. Without going deep into the math, looking at phasor diagrams or understanding undesirable quadrature terms, suffice it to say that the end result of most sideband asymmetry is undesirable distortion. Fact: If you remove one linear sideband from an AM transmission, the resultant envelope distortion for a single, 100% modulated tone is 33% and, for a two-tone signal, you can add up to 50% intermodulation distortion! I learned decades ago working with Ampliphase and Doherty transmitters, as well as poorly neutralized plate modulated transmitters, that sideband asymmetry caused by incidental phase modulation can make the radiated signal sound very bad!

We used to run proof of performance measurements, and it often became difficult to keep envelope distortion below 5% at higher frequencies. The envelope would not be sinusoidal; rather, it would have a skewed trough of modulation that presented itself as distortion to the listener. Worse, the large amounts of IM distortion also produced fold into the lower audio spectrum and pass through the receiver untouched while the higher frequency terms are attenuated by filters in the radio. It still occurs today and the problem is made much worse because of the poor audio response characteristics of many of today's radios!

Enter the example of WION in Ionia, MI: It's a non-directional at 4.7kW daytime and 330W directional using a three-tower array at night. During the day, the station has crisp, clean audio and a good on-air presence, but during night operation, remnants of IM could be heard in the signal. Upon investigation, it was found that the phasor consisted of a resonant power divider (often referred to as a jeep coil). The power divider was tuned to present a near 50 ohm real component at 1430kHz with some residual reactance. A tee network was used to fine tune the common point to 50+j0 at the transmitter output. While the transmitter was matched at carrier, the network was not actually tuned to resonance. It was simply adjusted to present a usable load at the carrier frequency through the rest of the network. This is not uncommon.

The first thing we undertook was to modulate the transmitter to 90% at 5kHz and above. We found considerable distortion and skewing present in the envelope. The transmitter then fed bandlim-

ited, 10kHz white noise. Spectral images indicated more than 11 dB of sideband tilt at 1437kHz! Next, we swept the common point using the conventional method: OIB and RF generator. The resulting sideband impedances confirmed our spectrum observations. The resonating capacitor had been tuned to obtain a carrier match with no consideration of sideband impedances. The power divider was not actually resonant; resonance occurred well below carrier frequency. This left us with two choices: (1) Rebuild the entire network at considerable expense and time required plus the great possibility of requiring at least a partial proof afterwards, or (2) get creative.

Removing the resonating capacitor across the power divider, I found the impedance dropped to 11.2=j8.5 Ohms. Using a single tee network to transform that impedance would result in considerable bandwidth limiting: It may be symmetric but it will likely be narrow as well leading to the possibility of detuning during certain weather conditions and other issues; something WION had already observed. I considered more complex networks but I decided to resolve it with a simple autotransformer. Some were skeptical.

Linear transmission lines and transformers are inherently wideband. A section could be used to match the power divider to the transmitter, but this was not practical. I settled on a 4:1 UnUn approach: An unbalanced 4:1 toroid to transform the low impedance presented by the untuned power divider to a resistance close to 50 ohms with some minor reactance present. The toroid we developed was overkill: I used three large 2.4" cores stacked. I chose to use #77 ferrite. Broadband transformers from 500kHz to well over 10MHz may be made with this material. There exists a commercially available balun for use up to 5kW at 1 to 30MHz, but don't use it. It contains #43 core ferrite and will get quite hot. We tested it to confirm its performance and, at 330W carrier and 1500W peak envelope power with modulation present, it soon reached the Curie point temperature from core loss heating and all magnetic properties were lost. Thankfully, the transmitter protected itself. The

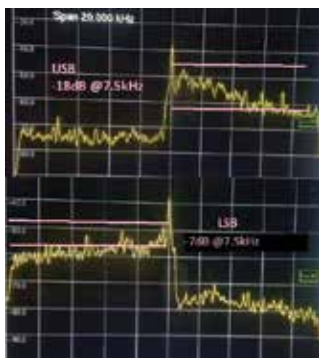


Figure 1. Initial spectrum tilt; lower sideband vs upper sideband

see AM, p. 14

### Education Almanac

#### Webinars by SBE

- Aug. 17: HD Radio Monitoring: What Has Been Done and What Can Be Done With Modern Monitoring Equipment
- Aug. 31: Basic RF for IT Module 3
- Sept. 21: Basic RF for IT Module 4



#### SBE Ennes Workshops

- Aug. 21: Nashville, TN
- Sept. 16: Jekyll Island, GA
- Oct. 23: Kansas City
- Oct. TBD: New York City

Contact the SBE to arrange an SBE Ennes Workshop in your area.

sbe.org/ennes\_workshop



For more information on any SBE education program click the Education tab at sbe.org, or contact Education Director Cathy Orosz at the SBE National Office at 317-846-9000 or corosz@sbe.org.



# CERTIFICATION UPDATE

By Megan E. Clappe  
SBE Certification Director  
mclappe@sbe.org

## SBE Certification FAQ

**W**hen someone has a question about SBE certification, I'm usually the main contact. The questions I receive cover a wide range of elements of the SBE Program of Certification, but there are several common areas. The SBE maintains a list of certification frequently asked question on the website to provide immediate answer. Even so, here are some of the recurring questions I receive.

**Q. What is a passing score for the SBE certification exams?**

**A.** For all exams without an essay portion, the passing score is 70 out of a possible 100 points. These exams include:  
Certified Television Operator (CTO) and Certified Radio Operator (CRO)  
Certified Broadcast Technologist (CBT)  
Certified Broadcast Networking Technologist (CBNT)  
Certified Audio Engineer (CEA) and Certified Video Engineer (CEV)  
Certified Broadcast Radio Engineer (CBRE)  
and Certified Broadcast Television Engineer (CBTE)

For exams with an essay question, the passing score is 84 out of a possible 120 points. These exams have a multiple-choice portion (up to 100 points), and a written essay portion (up to 20 points). The essay must be graded with a score of 10 or more points to pass. The final exam score is the combination of the scores of two portions. These exams include:

Certified Broadcast Networking Engineer (CBNE)  
Certified Senior Television Engineer (CSTE)  
Certified Senior Radio Engineer (CSRE)  
All SBE Specialist Certification exams:  
8-VSB Specialist (8-VSB), AM Directional Specialist (AMD), ATSC3 Specialist (ATSC3), and Digital Radio Broadcast Specialist (DRB)

**Q. What happens if I don't pass the exam?**

**A.** You can retake the exam for a small fee as early as the next scheduled exam session. (Applicants are only notified whether they passed or failed an exam. Scores are not provided to anyone.)

**Q. How long will it be once I've taken the test before I know the results?**

**A.** That answer varies depending on the type of test you have taken. An exam that doesn't include an essay question can be graded and the results sent back within a couple days of being received at the SBE National office. If there was an essay included with the exam, those grades may take longer. The essays are sent to members of the National Certification Committee to be graded.

**Q. Once I pass the exam, then what happens?**

**A.** You will receive a card and certificate of certification in the mail. Your certification is valid for five years. The SBE will also

notify your employer, or anyone else you designate, of your certification accomplishment if you request at the time of application.



**Q. How many books may I bring to the examination?**

**A.** As many as you like, but remember they cannot be used during the essay portion of the senior, specialist or networking engineer exams. You may also take in any book that you think may be helpful for your exam, even if it does not appear on the Suggested Reference Lists.

**Q. How about written notes?**

**A.** You may utilize notes during the examination process. However, if you make notes during the exam, those must be turned in with the test and cannot be taken out of the testing room. This is done to ensure the integrity of the question database.

**Q. Are calculators and computers allowed during the test?**

**A.** As of April 2017, the internet can be utilized during exams during the open-book period. Examinees are responsible for procuring the internet feed. Proctors are not responsible to provide internet access.

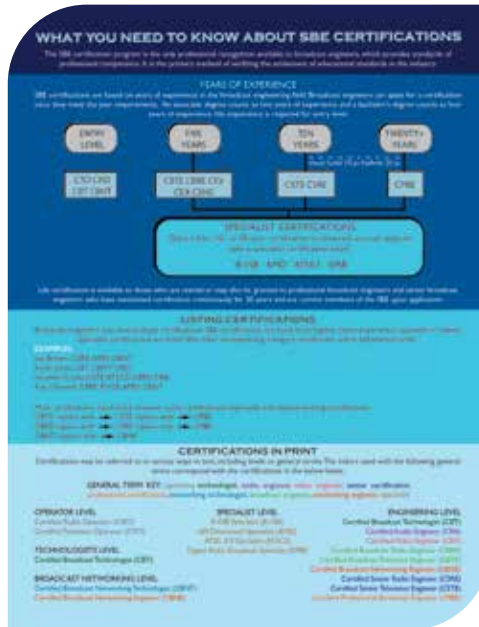
**Q. Will success in a certification test guarantee a pay increase for me?**

**A.** Sorry, no one can guarantee that. However, you will be joining a select group that proclaims to the world that they believe in investing in their future and improving their value to their employees.

**Q. How do I list my certifications?**

**A.** All SBE Certifications have an initialism to simplify listing them. Consistency in referencing these SBE certifications is important to the Program of Certification. For those who hold more than one SBE Certification, there is an established order in which to list them. Check out the certification chart on the SBE website under "Certification" to better explain how to list your certifications. You can also access the information directly at [sbe.org/ListingCerts](http://sbe.org/ListingCerts).

If you have any other questions, please let me know.



**There is a convenient reference online showing the proper order and abbreviations for SBE Certifications.**



Answer from page 3

The answer is C

There would be a pulse on both the positive- and negative-going parts of each cycle on each phase, so  
 $2 \text{ pulses} \times 60 \text{ Hz} \times 3 \text{ phases} = 360 \text{ Hz}$ .

# SBE Certification Achievements

## CONGRATULATIONS



<b>LIFE CERTIFICATION</b>	<p><b>Certified Professional Broadcast Engineer (CPBE) 8-VSB Specialist (8-VSB)</b> Mansur Abdulhussain, Houston, TX - Chapter 105</p> <p><b>Certified Senior Radio Television Engineer (CSTE)</b> Dean Maluski, New Britain, CT - Chapter 14 Richard Strack, Homedale, ID - Chapter 115</p> <p><b>Certified Senior Radio Television Engineer (CSRTE)</b> Brian Hoover, South Bend, IN - Chapter 30</p>	<p><b>Certified Audio Video Engineer (CEAV)</b> Gregory Lesko, Monroe, NC - Chapter 45</p> <p><b>Certified Audio Engineer (CEA)</b> Vincent Piantanida, San Jose, CA - Chapter 40</p> <p><b>Certified Broadcast Technologist (CBT)</b> Eric Heidendahl, Brighton, Ontario Canada - Chapter 57 Gregory Lesko, Monroe, NC - Chapter 45</p>	<p>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.</p>
<b>JUNE EXAMS</b>	<p><b>Certified Broadcast Radio Engineer (CBRE)</b> Paul Cargill, Evansville, WI - Chapter 24</p> <p><b>Certified Broadcast Television Engineer (CBTE)</b> James Mueller, Des Moines, IA - Chapter 109 Jorge Quinones, Kissimmee, FL - Chapter 42</p> <p><b>Certified Broadcast Networking Engineer (CBNE)</b> Jorge Quinones, Kissimmee, FL - Chapter 42 Michael Wallin, Dayton, MN - Chapter 17</p>	<p><b>Certified Broadcast Networking Technologist (CBNT)</b> Melissa Lauby, Akron, OH - Chapter 70 Byron Johnson, Waterloo, IA - Chapter 109 Richard Parker, III, Tucson, AZ - Chapter 32 Jonathan Walsh, Brook Park, OH - Chapter 70 Olivia Williams, Nepo, NC - Chapter 45</p>	<p><b>ATSC 3 Specialist (ATSC3)</b> Craig Fincher, Fort Worth, TX - Chapter 67</p> <p><b>Certified Broadcast Technologist (CBT)</b> Alexander Goehring, Stow, OH - Chapter 70</p> <p><b>Certified Television Operator (CTO)</b> Nakyii Fox, Covington, KY - Chapter 33</p>
<b>SPECIAL PROCTORED EXAMS</b>	<p><b>Certified Senior Radio Engineer (CSRE)</b> Christian Vang, Smyrna, GA - Chapter 5</p> <p><b>Certified Audio Engineer (CEA)</b> Ryan Guarino, Long Beach, NY - Chapter 15</p>	<p><b>Certified Broadcast Networking Technologist (CBNT)</b> Dennis McLaughlin, Kent, WA - Chapter 16</p> <p><b>Certified Radio Operator (CRO)</b> Benjamin Riggs, Spring Hill, TN</p>	<p><b>Alabama Broadcasters Association Certified Broadcast Technologist (CBT)</b> Dylan Paschall, Sarasota, FL Aaron Schultz, Bradenton, FL Cody Weaver, Boise, ID Amelia Vlahogiannis, Rutherford, NJ Benjamin Riggs, Spring Hill, TN</p>
<b>CERTIFIED RADIO OPERATOR (CRO)</b>	<p>Drew Albert, Tomahawk, WI Sophia Cherry, Evansville, IN Reginald Jean, Woodland Hills, CA MaryJane Peters, Seaside, CA Mark Wendell, Van Nuys, CA</p>	<p><b>Arcadia High School</b> Tallulah Abitbol Jose Lopez Arellano Brandon Cutberth Madison Mau Grayson Maxwell Gage Samaddar</p>	<p><b>Arcadia High School(cont.)</b> Ari Schott Olivia White</p> <p><b>St. Petersburg College</b> Sandra Grecco, St. Petersburg, FL Dimitri Muscavage, Safety Harbor, FL</p>
<b>CERTIFIED TELEVISION OPERATOR (CTO)</b>	<p><b>Bates Technical College</b> Amal Dahi, Des Moines, WA Isabelle Hall, Tacoma, WA Zach McHugh, Bonney Lake, WA Zoey Taiting Fong, Spanaway, WA Waytt Tays, Bonne Lake, WA</p>	<p><b>Riverside High School</b> Martin Alvarado, El Paso, TX Natalia Bravo Cera, El Paso, TX Alyssa Hernandez, El Paso, TX Juan Moreno, El Paso, TX Fernanda Rosales, El Paso, TX</p>	<p><b>Got your SBE Certification pin?</b> <a href="https://sbe.org/pins">sbe.org/pins</a></p> 
<b>RECERTIFICATION</b> 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.	<p><b>Certified Broadcast Technologist (CBT)</b> Jordan Carter, Muncie, IN - Chapter 25 Joel Gascot, Seven Valleys, PA - Chapter 41 James Hill, Calgary, Alberta Canada Raymond Mayberry, Henrico, VA - Chapter 60 Steven Mena, Sacramento, CA - Chapter 43 Martin Papst, Burnaby, BC Goran Poprzen, Calgary, AB Jonah Riner, Vidalia, GA</p>	<p><b>Certified Television Operator (CTO)</b> Dan Jensen, Brownsburg, IN Zara Mannion, Pray, MT Doug Maulden-Locke, Manassas, VA - Chapter 37 Juan Rivas, Alhambra, CA</p> <p><b>Certified Radio Operator (CRO)</b> Cody Gelsinger, Boston, MA - Chapter 11 Alvaro Montealegre, Tampa, FL Rosario Villarino, Roseville, CA</p>	

## Get Notified of SBE JobsOnline Updates

**S**BE JobsOnline assists SBE members in locating available broadcast engineering positions throughout the country. It is comprised of job openings that have been submitted to this site by prospective employers. Each job listing contains essential information about the position. Jobs are listed in the order they are received, with the most recent listings at the top. Anyone can view the listing summaries, but only SBE members can access the details.

The service has a feature to notify you by email when new job listings are posted. You can also set criteria based on the type of job you are looking for to filter the results. Once a search is entered you can have those results emailed to you regularly.

Go to [sbe.org/jobs](https://sbe.org/jobs) to see the listings. SBE members will log in to see the full details. Once you are logged in, click the "searching" link to set filter criteria (or select all listings), and run the search. You will then see the option to have updates emailed to you.

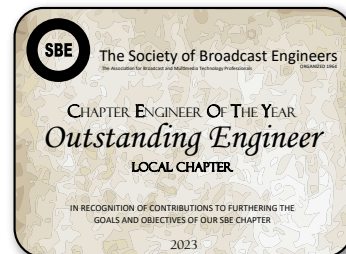


## SBE Chapter Engineers of the Year of 2023

**I**n 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.

Chapters set their own criteria to make their selections. These seven SBE members were selected by their chapters for the local honor this year.

- Chapter 1 Binghamton**
- David Chandler
- Chapter 15 New York City**
- Andrew Gladding, CBT
- Chapter 16 Seattle**
- Steve Allen
- Chapter 17 Minneapolis**
- Joseph Conlon
- Chapter 37 Washington**
- Eric Hoehn, CSRE, CBNT
- Chapter 38 El Paso**
- Bruno Cruz
- Chapter 70 Northeast Ohio**
- James Arcaro, CPBE



The chapter honorees will be featured in an upcoming issue of *The Signal*.

# Membership Drive Draws 68 New Members

Each year, the Society of Broadcast Engineers, the association for broadcast and multimedia technology professionals, conducts a member recruitment drive. The drive calls on current SBE members to encourage their non-member colleagues to join the association. This year, 65 individual members and three Sustaining Members were recruited.

The SBE Membership Drive ran from March 1 until May 31. As a recruiting incentive to members, the SBE asks for prize donations from SBE sustaining member companies. In addition, the recruiter will earn \$5 per new member (up to \$25) off his or her 2024 membership dues. Eight sustaining member companies plus the SBE provided prizes this year, ranging from shirts and hats to broadcast equipment. The SBE donated logo items, a copy of CertPreview, and a free Webinars by SBE registration. The theme for the 2023 drive was The SBE and You: The Perfect Fit.

All the recruiters were eligible for the Membership Drive Grand Prize: A trip to the SBE National Meeting this fall. (A cash prize option is available if the winner is not able to travel to the SBE National Meeting.) That meeting will be held during the Midwest Broadcast & Multimedia Technology Conference in Columbus, OH. The Grand Prize winner this year is Randy Lee of KXXV-TV, Waco, TX.

The SBE thanks the sustaining members who provided prizes: BSW, Davicom, Dielectric, Heartland Video Systems, Nema Electronics, Orban, Telos Alliance and Tieline. The list of prizes and the winning recruiters is published here and on the SBE website.

The close of the drive resulted in 68 new recruited members, who

were sponsored by 57 current members. The recruiters represent 43 different SBE chapters.

## Golden Recruiter Awards

The SBE also recognizes the chapters that recruit the most members during the drive with the Golden Recruiter Awards. Chapters are divided into two classes: Class A chapter are those with fewer members than the chapter member average, Class B are those with equal to or more than the chapter member average.

Golden Recruiter Award, Class A: Chapter 6 Montana, Chapter 21 Spokane, Chapter 38 El Paso, Chapter 86 Greenville Area, Chapter 148 Eastern Europe

Golden Recruiter Award, Class B: Chapter 39 Tampa Bay Area, Chapter 48 Denver



Lee

published here and on the SBE website.

The close of the drive resulted in 68 new recruited members, who



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Prize Donor	Prize	Winner	Location	Chapter
SBE	trip to the SBE National Meeting	Randy Lee	Waco, TX	67
BSW	Shure SM7B microphone	Robert Owen	Missoula, MT	6
Davicom	\$50 Amazon gift card	Troy Jones	Shreveport, LA	44
Dielectric	Dielectric polo shirt	Andrea Cummis	West Orange, NJ	15
Dielectric	Dielectric polo shirt	Eric Scace	Boulder, CO	48
Heartland Video Systems	\$100 Amazon gift card	Steven Heaton	Spencer, IA	0
Heartland Video Systems	Rocketbook smart notebook	Martin Stabbert	Reno, NV	139
Heartland Video Systems	stadium throw	Heidi Roach	Luzerne, PA	2
Heartland Video Systems	clear glass tumbler	William Floyd	Marfa, TX	38
Heartland Video Systems	coffee mug	Isaiah Chavez	Largo, FL	39
Heartland Video Systems	wireless charger	Zhulieta Ibisheva	Honolulu, HI	50
Heartland Video Systems	graph-ruled notebook	Robert Cram	Spokane, WA	21
Heartland Video Systems	blue glass tumbler	Robert Cram	Spokane, WA	21
Nema Electronics	\$100 Amazon gift card	Cary Gaffney	Easley, SC	86
Orban	1101e card and breakout cable	Marc Roost	Omaha, NE	74
Telos	iTunes gift card	Amanda Hopp	Aurora, CO	48
Telos	Telos swag bag	Isaiah Chavez	Largo, FL	39
Tieline	Yeti insulated cup	Robert Owen	Missoula, MT	6
Tieline	Yeti insulated cup	Isaiah Chavez	Largo, FL	39
Tieline	Yeti insulated cup	David May	Lexington, KY	35
SBE	SBE-logoed hat	Andrea Cummis	West Orange, NJ	15
SBE	copy of SBE CertPreview	Peter Femal	Chicago, IL	26
SBE	SBE coffee mug and magnet	Dale Baker	Nashville, TN	103
SBE	SBE coffee mug and magnet	Christopher Pulliam	Aiken, SC	101
SBE	\$25 gift certificate to the SBE Store/SBE Bookstore	Dean Phannenstiel	Edgewater, CO	48
SBE	Webinars by SBE registration	Richard Thomas	Okemos, MI	91



## AWARDS, from p. 1

Chapter 15. In his role as adjunct professor for audio production at Hofstra University, he has taken numerous steps to recruit and engage new SBE members by teaching them about the broadcasting business and engineering in particular. He is solely responsible for the addition of 40 student members to Chapter 15.

Nautel won the SBE Technology Award for "Just Add Audio: Nautel GV<sup>2</sup>", a technology that dramatically simplifies the HD Radio air chain for broadcasters, synchronizes FM and HD audio streams and eliminates FM and HD main channel blend drift. Nautel's GV<sup>2</sup> series transmitters can host the full digital radio air chain including all HD Radio coding and all audio processing on the GV<sup>2</sup> transmitter platform without external equipment.

The SBE Wisconsin chapters and the Wisconsin Broadcasters Association have won the Best Educational Event for the Wisconsin Broadcasters Clinic held in October 2022. The clinic includes three days and two nights of educational sessions. The Clinic day one is a radio day; day two is a combined radio, TV and IT day; and day three is a TV day. There is also dedicated exhibit time. Several speakers represented SBE Sustaining Member companies including American Tower, Davicom, Di-



electric, GatesAir, Nautel, Orban, and Telos Alliance.

Chapter 15 New York City won the Best Chapter Communication for the second year in a row. The chapter doesn't have a traditional newsletter, but makes innovative



use of multiple channels and platforms to communicate to its members. The communication channels used are an email list, the Chapter 15 website, [sbe15.com](http://sbe15.com), a Twitter

and Facebook page and a Zoom account.

Donald Smith has won Best Technical Article, Book or Paper for his paper *ATSC 3.0 and Public Broadcasting, a Case for Flash Cut*, which was presented at the 2023 NAB Show.

### Statistical Awards

The following awards are determined with statistical information based on Dec. 31, 2022, figures on file at the SBE National Office. Chapters with 26 members (the chapter median) or fewer are Class A. Chapters with 27 member or more are Class B.

### Percentage Growth of New Members:

Class A: 111 Huntsville

Class B: 15 New York City

### Highest Percentage of Certified Members:

Class A: 115 Southern Idaho

Class B: 131 Inland Empire

### Highest Percentage of Member Attendance at Meetings:

Class A: 60 Richmond

Class B: 39 Tampa Bay Area

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- ▶ IR COMPLIANT
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## LEGAL PERSPECTIVE

By Coe Ramsey, Patrick Cross and Noah Hock  
SBE Regulatory Counsels  
cramsey@sbe.org, prcross@sbe.org, nhock@sbe.org

# New Rules Clarify Multicast Hosting During ATSC 3.0 Transition

In the June issue, we shared some of the newest developments and innovations for the ATSC 3.0 broadcast standard, including the recent launch of a public-private Future of TV taskforce aimed at facilitating the continued transition to NextGen TV. Now, the FCC has updated its rules governing the ATSC 3.0 transition in hopes of further streamlining the process for communities to convert to the new standard. On June 23, the Commission released a Third Report and Order and Fourth Further Notice of Proposed Rulemaking that modifies several rules around the hosting of programming streams and extends two rules governing the content and technical standards of some streams.

As a reminder, the ATSC 3.0 standard is not backwardly compatible, meaning a viewer who currently receives signals in the legacy ATSC 1.0 standard cannot receive 3.0 signals without additional or upgraded equipment. As such, at this early stage of the transition, broadcasters must continue to offer their programming in both 1.0 and 3.0 or risk losing the vast majority of their viewers. This makes business sense, and is also a regulatory requirement: Broadcasters transitioning to 3.0 must, at a minimum, continue to offer their *primary* programming stream in 1.0 to viewers in their community of license. Because no additional spectrum is available to facilitate this transition, broadcasters within a DMA must work together through hosting arrangements to ensure 1.0 programming is maintained while 3.0 channels are launched.

FCC rules already address the required hosting of a station's primary stream. The 3.0 and 1.0 programming streams being simulcast must be "substantially similar," meaning they must share the same programming, except for advertisements, promotions, and features based on the enhanced capabilities of 3.0 (e.g., hyper-localized weather, interactive emergency alerts, etc.). Such hosted streams are treated as "temporary second channels" of the *originating* station (not the host station). Of course, stations often broadcast more than a single programming stream—many produce several multicast channels as well. FCC Rules did not address the need to host these multicast streams as part of a transition to 3.0, until now.

### New Licensing Rules

The R&O adopts several rules to facilitate and regulate the hosting of multicast streams. These multicasts may be simulcast or non-simulcast.

- **Simulcast Multicast** streams occur when the station offers a substantially similar multicast stream in both 1.0 and 3.0, with one or the other hosted by another station. In that case, the originating station may modify its license to include the simulcast multicast stream(s). This is permitted whether the station is broadcasting the 1.0 or 3.0 transmission from its own facilities.

- **Non-Simulcast 1.0 Multicast** streams occur when a transitioning station that is broadcasting its own 3.0 primary stream must host one or more of its 1.0 multicast streams on another station. In this case, the 3.0 station may modify its license to include the hosted 1.0 multicast stream. Note, however, this allowance is only given for a station broadcasting in 3.0 on its own channel, not for a station broadcasting in 3.0 on a host channel.

Notably, the FCC declined to permit so-called "lateral hosting," wherein a station broadcasting in 1.0 would be permitted to move some of its multicast channels to a different 1.0 host station in order to facilitate the hosting needs of other transitioning stations in the market.

As with the FCC rules for primary streams, hosted multicast streams will be treated as temporary channels of the originating station, will not impact the license of the host station and will not result in ownership attribution for the licensee of the host station. There are several benefits to these rule clarifications. Most notably, they provide clarity and greater certainty for transitioning broadcasters, many of whom have been relying on special temporary authority to facilitate the types of multicast hosting arrangements authorized by the R&O. Additionally, these clarifications will allow noncommercial educational (NCE) stations to host commercial multicast channels. Prior to the R&O, there was concern such hosting would violate the NCE station's prohibition on using or offering its facilities for provision of commercial advertising—under the new rules, the facilities would not be exclusively utilized by the NCE station, but instead shared by both stations operating pursuant to their own licenses.

### Limitations


The R&O's new licensing allowances are largely designed to facilitate the transition to ATSC 3.0 while maximizing the continued availability of programming to the viewing public and balancing the rights of other participants in the market. To that end, the FCC has provided several limitations on multicast hosting arrangements, including:

- **Capacity:** A station broadcasting in 3.0 may not license multicast streams hosted on other channels beyond what the station could broadcast if operating solely from its own facility in 1.0. In other words, the 3.0 station cannot broadcast more multicast channels through hosting agreements than it would have been able to on its own, if it had not transitioned to ATSC 3.0.

- **Coverage:** As with simulcast primary streams, hosted 1.0 multicast streams must continue to cover the originating station's entire community of license, and the host station must be in the same DMA. 3.0 multicast streams must only be hosted by a station in the same DMA.

- **Children's Programming:** In order to count toward the originating station's children's programming requirements, a hosted multicast stream must cover at least 95% of the population served by the station pre-transition.

In addition to establishing new multicast hosting rules, the R&O extends two rules originally set to sunset this year. First, the substantially similar rule, described more fully above, requires simulcast 1.0 and 3.0 streams to broadcast "substantially similar" content. Second, under the A/322 standard, 3.0 broadcasters are required to transmit programming using a specified physical layer protocol, which "defines the waveforms that ATSC 3.0 signals may take."

The A/322 standard was originally set to sunset in March 2023, while the substantially similar rule would have expired July 2023; both have now been extended an additional four years, and will expire July 17, 2027. In each case, the FCC will initiate a review of the rules one year prior to expiration to determine whether they should be extended "based on marketplace conditions at the time." 



## FOCUS ON THE SBE

By James Ragsdale  
SBE Executive Director  
jagsdale@sbe.org

# Strategic Planning Preparation

Many SBE members participated in a Members Survey last year that was undertaken to prepare for strategic planning efforts by the Board of Directors. This survey was intentionally kept short, just eleven questions, if you answered every question. The survey questions were:

1. How long have you been a member of the SBE?
2. How did you first learn about the SBE?
3. If you first learned about the SBE through Social Media, which site was your source?
4. How often do you attend an SBE event?
5. If you don't attend SBE events, please tell us why.
6. What types of events would you like to see?
7. What SBE membership benefits do you find most valuable?
8. What SBE membership benefits do you find least valuable?
9. What is your preferred form of communication with the SBE?
10. How likely are you to renew your SBE membership? Please explain your answer.
11. Would you be willing to participate in a small, virtual focus group discussion with SBE President Andrea Cummis and SBE Executive Director Jim Ragsdale to help us understand what we should be planning for in the future? If so, please provide your contact information.

There were 463 respondents to that survey, which was a healthy response rate. Among the respondents, 127 indicated that they would be willing to participate in focus groups with Andy and me, providing their contact information. I emailed the respondents to identify dates/times that would work for them to participate. Fridays consistently seemed like the best day. Since then, we have held seven focus groups, inviting 78 respondents. There are 49 yet to be invited. We anticipate completing the focus group meetings by August 31.

Table 1 shows the common discussion points that were raised during the meetings.

### Chapter Chairs Meeting

Last year, I initiated an open monthly Zoom meeting with chapter leadership. These meetings are scheduled for the first Monday of each month at 4:00 p.m. ET. The purpose was to provide a communication channel among chapter leaders and the national office. This was initiated before

### Need to energize existing members:

- Holding Ennes Workshops around the country, especially in areas without strong chapters
- Providing Zoom licenses for chapters to hold virtual or hybrid meetings?

### Need to promote the SBE to potential members

- Social media promotion
- Establish a presence at high school and college broadcasting events
- Establish a presence at religious and sports streaming conventions

### Develop education and certification for production and media technicians

- Lighting and/or audio for Zoom, YouTube, Facebook Live streaming platforms
- VoIP, AoIP
- Short educational and/or instructional videos on basic skills (i.e. how to coil a cable)

**Table 1. Common discussion points from the focus group meetings.**

the Members Survey mentioned above, but has been a valuable time to address many of the discussion points that came up in the Members Survey. The chapter leaders have shared successful strategies for increasing the attendance at their monthly chapter meetings and invited each other to join in virtual meetings so they can attract speakers to present educational programs. A result of this monthly meeting was establishing a Slack Channel so that the chapter leaders could share ideas throughout the month, rather than just having one meeting a month for sharing. Since April, the meetings have gained energy as more chapter chairs joined in the discussion.

In several meetings, I have encouraged our chapters to expand collaboration with each other and peer organizations, such as AES and SMPTE. Several chapters schedule joint meetings with other chapters or with these peer organizations. Through our monthly Chapter Leadership Zoom, I learned of an organization that is affiliated with the Radio Advertising Bureau and National Radio Talent System, the Kellar Radio Talent Institute (Appalachian State University). I am exploring how we can connect students that attend their institutes and express an interest in the technical side of broadcasting with our local chapters and Ennes scholarships.

The scheduling of SBE Ennes Workshops has been really active this year, with five

already planned. Recently, we held a Workshop in El Paso, TX, and we have upcoming Workshops in Nashville, TN; Jekyll Island, GA; and Kansas City. A New York City Workshop is being discussed.

Last fall, we began to explore creating a chapter experience for those members who don't live near a chapter and aren't assigned to one. Among those approximately 140 members, some 50 are in Canada. This spring, I emailed the Canadian members to ask them if they were be interested in participating in a virtual chapter. Every response I received back was very positive about the idea. Out of that interaction, it was suggested that we contact the Central Canada Broadcast Engineers, Technologists & Technicians (CCBE) and the Western Association of Broadcast Engineers (WABE) to talk about how we could collaborate. Out of those contacts, we have been invited to lead certification exam sessions at their annual conferences in August and November.

As you can see, the strategic planning preparation has already benefited the SBE, as we have identified gaps in our services and coordination. We will continue to address these gaps, working to strengthen our local chapters, education and certification efforts, and collaboration with peer organizations. We will work to make membership in the SBE more valuable and rewarding to our members. And we will continue to reach out to you to get your feedback on how we are doing.

## ENNES

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### THANKS TO THE FOLLOWING SUPPORTERS FOR THEIR CONTRIBUTIONS

Harold E. Ennes Scholarship  
SBE Chapter 3, Kansas  
SBE Chapter 40, San Francisco  
Stephen Smith, Loudon, TN  
James White, Springfield, MO

Robert D. Greenberg Memorial Scholarship  
Milford Smith, Jr., Lawrenceville, NJ

[sbe.org/ennes](http://sbe.org/ennes)



# ENGINEERING PERSPECTIVE

By R.J. Russell, CPBE, ATSC3  
SBE Frequency Coordination Manager  
rjrussell@sbe.org

## Are You Ready for Wi-Fi at 6GHz?

The Federal Communications Commission issued a Notice of Proposed Rulemaking on October 24, 2018, ET Docket No. 18-295, and followed that up with a Report and Order and Further Notice of Proposed Rulemaking on April 24, 2020, that expanded unlicensed use (mostly Wi-Fi) on a non-interference basis to the 5925–7125 MHz band. Four new unlicensed bands were established as part of the Unlicensed National Information Infrastructure (U-NII).

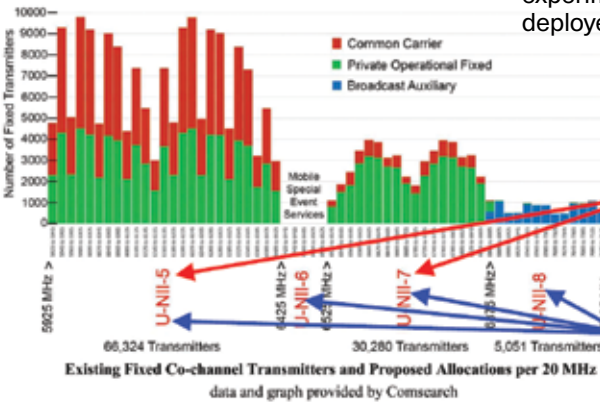
ed to U-NII-5 and U-NII-7 and must be under the control of an automated frequency coordination system (AFC). These devices will be required to report their GPS position to the AFC a minimum of every 24 hours to assist in the interference mitigation plans laid out in the report and order.

There are currently 13 AFCs in the final approval stages with the FCC which means that these standard-power devices are beginning to operate in the band on an experimental basis but will soon be widely deployed.

interference will be from sites within the first mile of your antennas and within 5 degrees of boresight.

**Monitor/Document Path Performance.** Monitoring the availability of your links (alarms) and establishing a baseline for received signal level (RSL) is important but isn't enough. Increased error rates or frame loss will indicate a problem before RSL will. A higher error rate in one direction or modulation states switching without RSL changes indicate potential interference. If you don't already have automatic logging for your 6 GHz (and 13 GHz) links, get a logbook and establish a regular interval (weekly to monthly) to record the link data.

**Document Interference.** If you are experiencing interference, report it to the FCC. Ensure that you have captured all the necessary data to report the interference case. Your documentation should contain the following, your call sign, address/GPS coordinates, frequency, and contact information for the site receiving interference. It should also include a detailed description of the interference including when the interference began, its duration (if not constant), and how often the interference occurs. Documentation of path performance (above) may be helpful in establishing that your link was working properly prior to the interference. You may want to take the path out of service and sweep with an analyzer while receiving the interference.



An AFC function is required of all standard-power devices.

Standard-power access points and clients can operate only on specific frequencies and power levels in the U-NII-5 and -7 bands, as determined by an AFC.

Low-power indoor access points and clients can operate on any frequency in the 6 GHz band without AFC.

The bands are U-NII-5 (5925–6425 MHz), U-NII-6 (6425–6525 MHz), U-NII-7 (6525–6875 MHz), and U-NII-8 (6875–7125 MHz). Incumbent licensees, including broadcasters, remain primary users under these rule revisions.

The systems being deployed in this band will operate at either very low-power (VLP), low-power indoors (LPI), or standard-power. VLP systems are not yet authorized by the FCC but are likely to be authorized soon. VLP and LPI systems are devices that can operate in any of the four new unlicensed bands, but the FCC believes are not likely to interfere with incumbent licensees. VLP and LPI systems can pop-up anywhere, although LPI equipment is supposed to be restricted to indoor use. VLP and LPI can cause co-channel interference to broadcast systems, both fixed links and ENG, operating in the U-NII-6 and -8 bands.

Standard-power systems are also not yet authorized by the FCC, but are likely to come into use very soon. Although standard-power unlicensed systems do not operate in U-NII-6 and -8 bands, most commonly used by broadcasters, we as the broadcasting community also need to be paying attention to out-of-band interference from those systems. Standard-power systems can operate both indoors and outdoors but are restrict-

ed to U-NII-5 and U-NII-7 and must be under the control of an automated frequency coordination system (AFC). These devices will be required to report their GPS position to the AFC a minimum of every 24 hours to assist in the interference mitigation plans laid out in the report and order.

With millions of LPI devices already operating and the upcoming widespread deployment of devices at standard-power, what can you do to ensure that your operations are not impacted adversely. There are four steps that I would recommend all licensees take moving forward.

**Verify ULS Data.** While this should have been done some time ago, it is never too late to ensure that all your license data is current. If you have equipment outside the BAS bands (U-NII-6 and -8), the ULS will be relied upon by the AFCs to mitigate interference to incumbent licensees. While you are at it, ensure that any 13GHz licenses have been updated as well since the AFC system is one that is being considered for unlicensed use in this band as well.

### Risk Analysis.

Perform a path risk analysis using Google Earth. Draw your link path and look for sites along the line where these unlicensed systems may be deployed. The highest risk of

interference will be from sites within the first mile of your antennas and within 5 degrees of boresight.

interference will be from sites within the first mile of your antennas and within 5 degrees of boresight.

interference will be from sites within the first mile of your antennas and within 5 degrees of boresight.

These are just a few of the steps you can take to ensure you are prepared for Wi-Fi at 6GHz. As we continue to see unlicensed use of various frequency bands, we should be taking these steps for all our microwave paths. Imagine the case we could have made for the interference we now see at 2450–2500 MHz if we had this information.



Perform a risk assessment of your network.

<b>AC Video Solutions • 2014</b> Andrea Cummis 201-303-1303 Consulting, Systems Design/Integration	<b>Digital Alert Systems, LLC • 2005</b> Bill Robertson 585-765-1155 Emergency Alert Systems	<b>LumenServe • 2023</b> Bear Poth 512-423-8323 Tower Lighting	<b>Shure Incorporated • 2012</b> Bill Ostry 847-600-6282 Microphones, Wireless Systems, Headsets
<b>American Tower Corporation • 2000</b> Tiffany Yu 603-930-9091 Development/Construction/Management	<b>DoubleRadius, Inc. • 2012</b> Jeffrey Holdenrid 704-927-6085 IP Microwave STL	<b>LYNX Technik • 2007</b> Steve Russell 661-251-8600 Broadcast Terminal Equipment Manufacturer	<b>Sierra Automated Systems and Eng. Inc. • 2011</b> Al Salci 818-840-6749 Routers, Mixers, Consoles, Intercoms
<b>BB&amp;S Lighting • 2023</b> Tom Yuhas 800-820-6610 Manufacturer and Developer of High-end LED Lighting	<b>Drake Lighting • 2015</b> Dave Sheppard 270-804-7383 FAA Obstruction Lighting - Medium and High Intensity	<b>MaestroVision • 2021</b> Claude Turcotte 888-424-5505 Broadcast Automation Software	<b>Staco Energy Products Co. • 2010</b> Paul Heiligenberg 937-253-1191 x128 Manufacturer of Voltage Regulators, UPS
<b>Barnfind-USA, Inc. • 2021</b> George Gonos 919-748-7373 Fiber Transport Solutions	<b>DTS Inc./HD Radio Technology • 2014</b> George Cernat 443-539-4334 HD Radio Technology	<b>Markertek • 2002</b> Adam June 845-246-2357 Specialized Broadcast & Pro-Audio Supplier	<b>SuiteLife Systems • 2019</b> Nigel Brownnett 310-405-0839 Manage. Monitor. Control
<b>Birns &amp; Sawyer • 2022</b> Jim Alcantara 323-466-8211 Systems Integration, Sales, Rentals	<b>du Treil, Lundin &amp; Rackley, Inc. • 1985</b> Jeff Reynolds 941-329-6000 Consulting Engineers	<b>Micronet Communications Inc. • 2005</b> Jeremy Lewis 972-422-7200 Coordination Services/Frequency Planning	<b>Sutro Tower Inc. • 1989</b> Raul Velez 415-681-8850 Broadcast Tower Leasing
<b>Blackmagic Design • 2012</b> Terry Frechette 408-954-0500 Production Switchers, Digital Cameras, Routers, Video Editing and Monitoring, Color Correction, Video Converters	<b>The Durst Org. - 4 Times Square • 2004</b> Tom Bow 212-997-5508 TV/FM/Microwave Tower Site	<b>Moseley Associates Inc. • 1977</b> Bill Gould 805-968-9621 x785 Digital STLs for Radio and Television	<b>Synthax Inc. • 2020</b> Brittany Hiltton 754-206-4220 Audio Codecs and Converter Solutions
<b>Bracke Manufacturing LLC • 2012</b> Patra Largent 949-756-1600 RF & Microwave Components	<b>Econco • 1980</b> Debbie Storz 800-532-6626, 530-662-7553 New & Rebuilt Transmitting Tubes	<b>MusicMaster • 2014</b> Jerry Butler 352-231-8922 Advanced Music Scheduling Solutions	<b>TBC Consoles • 2023</b> Jansen Hahn 631-293-4068 Technical Furniture for Broadcast/AV
<b>Broadcast Depot • 2018</b> Tim Jobe 305-281-7540 TV, Satellite, Radio, IP	<b>ENCO Systems Inc. • 2003</b> Samantha Bortz 248-827-4440 Layout and Automation Solutions	<b>Nascar Productions • 2014</b> Abbey Kielcheski 704-348-7131 Live/Post Production Services	<b>Technical Broadcast Solutions, Inc. • 2018</b> Robert Russell 302-414-0055 Engineering and Consulting Services
<b>Broadcast Devices, Inc. • 2015</b> Robert Tarsio 914-737-5032 Audio/RF Support Products	<b>ERI - Electronics Research • 1990</b> Zachary Bailey 812-925-6000 Broadcast Antennas, Transmission Line, Filters/Combiners, Towers and Services	<b>National Association of Broadcasters • 1981</b> Industry Trade Association 202-429-5340	<b>Televs USA, LLC • 2021</b> Andy Ruffin 937-475-7255 Antennas Transmitters Measurement Distribution
<b>Broadcast Electronics Inc. • 1978</b> Perry Priestley 217-224-9600 Radio Equipment Manufacturer	<b>Floral Systems • 2008</b> Shawn Maynard 877-774-1058 Television Broadcast Automation	<b>National Football League • 1999</b> Ralph Beaver 813-282-8612 Game Day Coordination Operations	<b>Telos Systems/Omnia/Axia • 2003</b> John Bisset 216-241-7225 Talk-Show Systems
<b>Broadcast Software International • 2016</b> Marie Summers 541-338-8588 Radio Automation, Audio Logging	<b>GatesAir • 1977</b> Mark Goins 513-459-3710 Radio/TV Transmitters, STL Codecs	<b>Nautel Inc. • 2002</b> Jeff Welton 877-662-8835 Radio Broadcast Transmitter Manufacturer	<b>Teradek • 2011</b> Jon Landman 949-743-5783 Camera-top ENG Solutions
<b>Broadcast Supply Worldwide • 1986</b> Shannon Nichols 800-426-8434 Audio Broadcast Equipment Supplier	<b>Heartland Video Systems, Inc. • 2011</b> Dennis Klas 920-893-4204 Systems Integrator	<b>Nemal Electronics Int'l Inc. • 2011</b> Benjamin L. Nemser 305-899-0900 Cables, Connectors, Assemblies and Fiber Optic	<b>Tieline The Codec Company • 2003</b> Dawn Shewmaker or Jacob Daniluck 317-845-8000 Audio Codec Manufacturer
<b>Broadcasters General Store • 2004</b> Shane Finch 352-622-7700 Broadcast Audio Video Distributor	<b>Hilights, Inc. • 2016</b> Timothy Nash 352-564-8830 Obstruction Lighting Maintenance	<b>Orban Labs, Inc. • 2011</b> Mike Pappas 480-403-8300 Audio Processing AMFMTV	<b>Unimar Inc. • 2001</b> Thad Fink 315-699-4400, 813-943-4322 Tower Obstruction Lighting Designer, Manufacturer, Distributor
<b>Burk Technology • 2019</b> Matt Leland 978-486-0086 x703 Transmitter Facility Control Systems	<b>Hitachi Kokusai Electric Comark • 2013</b> Jack McAnulty 413-998-1523 Manufacturer Broadcasting Transmission Equipment	<b>Potomac Instruments • 1978</b> Zachary Babendreier 301-696-5550 RF Measurement Equipment Manufacturer	<b>Vizrt Group • 2022</b> Anne Hrubala 917-771-8330 More Stories. Better Told.
<b>Calrec Audio • 2016</b> Helen Carr 703-307-1654 Audio Mixing Equipment	<b>Indiana Broadcasters Association • 2019</b> Dave Arland 317-701-0084 Indiana Association for Radio & TV Broadcasters	<b>ProAudio.com - A Crouse-Kimzey Co. • 2008</b> Mark Bradford 800-433-2105 x560 Proaudio Broadcast Equipment Distributor	<b>Wheatstone • 2010</b> Jay Tyler 252-638-7000 IP Consoles, Routers & Processors
<b>Cavell, Mertz &amp; Associates Inc. • 2011</b> Gary Cavell 703-392-9090 Consulting Services	<b>Inovonics Inc. • 2012</b> Gary Luhrman 831-458-0552 Radio Broadcast Equipment	<b>Propagation Systems Inc. - PSI • 2010</b> Doug Ross 814-472-5540 Quality Broadcast Antenna Systems	<b>WideOrbit • 2012</b> Brad Young 415-675-6700 Radio Automation and Layout
<b>Comrex Corporation • 1997</b> Chris Crump 978-784-1776 Audio & Video Codecs & Telephone Interfaces	<b>Jampro Antennas Inc. • 2011</b> Alex Perchevitch 916-383-1177 DTV, FM-HD Radio, DVB-T/2, ISDB-T, DAB	<b>Quintech Electronics and Communications Inc. • 2002</b> James Herbstritt 724-349-1412 State-of-the-art RF Hardware Solutions	<b>Wireless Infrastructure Services • 2006</b> Travis Donahue 951-371-4900 Repacking Services - West Coast Turnkey Services
<b>Continental Electronics • 1976</b> Dale Dalesio 412-979-3253 TV and Radio Transmitters	<b>Kathrein USA Inc. • 1985</b> Les Kutasi 541-879-2312 Antennas for Broadcasting & Communications	<b>QVC • 2011</b> Kevin Wainwright 484-701-3431 Multimedia Retailer	
<b>Crawford Broadcasting Company • 2021</b> Cris Alexander 303-481-1800 Media Company	<b>Kintronc Labs, Inc. • 2015</b> Brad Holly 423-878-3141 Radio Broadcast Antenna Systems - ISO9001 Registered Company	<b>Rohde &amp; Schwarz • 2003</b> Walt Gumbert 724-693-8171 Transmitters, Test & Measurement, Video	
<b>CueScript • 2014</b> Michael Accardi 203-763-4030 Teleprompting Software & Hardware	<b>latakoo • 2021</b> Paul Adrian 214-683-0791 Media Workflow Automation	<b>Ross Video Ltd. • 2000</b> Jared Schatz 613-228-0688 Manufacturer, Television Broadcast Equipment	
<b>Cumulus Media, Inc. • 2021</b> Conrad Traumann 212-419-2940 Audio Media Company	<b>LBA Technology Inc. • 2002</b> Jerry Brown 252-757-0279 x228 AM/MW Antenna Equipment & Systems	<b>Sage Alerting Systems Inc. • 2010</b> Harold Price 914-872-4069 x113 Emergency Alert Systems Products	
<b>Davicom, Division of Comlab, Inc. • 2014</b> Louis-Charles Cuierrier 418-682-3380 x512 Remote Site Monitoring and Control Systems	<b>Linkup Communications Corporation • 2017</b> Mark Johnson 703-217-8290 Satellite Technology Solutions	<b>SCMS Inc. • 2000</b> Bob Cauthen 800-438-6040 Audio and RF Broadcast Equipment Supplier	
<b>Dielectric • 1995</b> Cory Edwards 207-655-8131 Radio & TV Antenna Systems and Monitoring		<b>Shively Labs • 1996</b> Dale Ladner 888-SHIVELY FM Antennas & Combiners	

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# Member Spotlight: Greg Schmitke

## Member Stats

**SBE Member Since:** January 2014

**SBE Certifications:** CBRE, CBT

**Employer:** Northwestern Media - KFNW/ KLBF, owned and operated by the University of Northwestern - St. Paul

**Position:** Chief Engineer

**Location:** Fargo, ND

**Chapter:** 17 Central Minnesota

**I'm Best Known For:** Being a listener for someone who may just need a sounding board or encouragement or a word of advice.

**Q.** *What do you enjoy or value most about your SBE involvement?*

**A.** The SBE stands with us, supports us, and offers education to not only keep us up-to-date with engineering and the high standards we're expected to maintain, but to also help us prepare for the future and the new technology.

**Q.** *What got you started in broadcast engineering?*

**A.** As a kid I'd pretend to be an announcer. I'd introduce records, or I'd do play-by-play of a game and record it all on my cassette recorder. I attended Brown Institute in 1986 for radio and TV broadcasting and realized a boyhood dream when I started working for WTCN in Stillwater, MN.



Greg and his wife on his motorcycle.

**Q.** *Who was your mentor or who in the industry do you admire?*

**A.** An incredible engineer, a great brother, a natural teacher, and from my hometown: Gary Ellingson. He was chief engineer of KFNW when I started here. Gary helped me join the SBE and was my mentor and teacher as I studied for my CBRE exam.

**Q.** *What do you like most about your job?*

**A.** I really enjoy the hands-on engineering, sometimes you're into a transmitter up to your shoulders or more. Two years ago, we moved our entire AM array to a new site. It was a lot of work, and a lot of fun too!

**Q.** *When I'm not working I...*

**A.** ...I really enjoy fishing, flying, and riding motorcycles. Living so close to MN Lakes Country is great for fishing, and there's beautiful scenery for riding. Over the last 30 years my wife and I have been very involved with The Christian Motorcyclists Association. I have my private pilot's license, but haven't had the opportunity to fly in quite a while.

**Q.** *What's something people don't know about you?*

**A.** I've visited Hawaii over a dozen times. The laid-back lifestyle is appealing, and of course the incredible weather and tropical scenery doesn't hurt either.

**Q.** *What's your favorite gadget?*

**A.** My motorcycles. Riding with the Christian Motorcyclists Association allows us to minister to other bikers and meet them with the love and message of Jesus at the point of their need.

## AM, from p. 5



Figure 2. Prototype 1:4 UnUn 2.4" diameter type 77 ferrite core

three-stack, Type 77 material runs very cool.

Figure 1 shows the sideband tilt we observed, Figure 2 shows the prototype toroid utilized for testing purposes, and Figure 3 shows the (no longer) resonant power divider. I have since replaced the toroid with an encased version and cleaned up the installation.

From a quantitative standpoint, an initial 17% 1:1 IM at 7/8kHz and 12.5% 4:1 IM at 60Hz/7kHz dropped to 1.4% and 1.3% respectively (80% modulation). Harmonic

distortion dropped from 8% at 7.5kHz/80% modulation to 1.2%. Furthermore, the broad match obtained removed nearly all sensitivity to weather and icing this past winter. From a qualitative standpoint, the station sounds much cleaner and intelligibility at night has increased substantially. Denser processing is now utilized, with no degradation in day vs night audio quality yielding significant coverage increases. Because the power divider taps to each tower were unchanged, the ratio of power, and phase, was also unchanged. Superposition held. The antenna monitor indicated no change in readings and monitor points confirmed no change in field strength values. This was a huge Win-Win; technically and operationally.

This approach can work for many applications at the 1kW and below power levels using readily available materials, and I now have special order toroids obtained to do a similar modification at the 5kW level. One must carefully engineer the matching, though. Each situation presents different constraints and one must carefully choose where lumped elements are also utilized to achieve the final match while presenting low reactive terminations to the toroid. Since WION still uses a stereo exciter, we have other tools to further improve sideband matching, but I'll save that for a future article.

AM can sound good. Improving perfor-

mance, gaining better sound quality and often increasing coverage as a result do not always incur large expenditures. It's time we look at AM again.



Figure 3. WION phasor power divider; resonating network removed

# WELCOME TO THE SBE

## NEW MEMBERS

Robert J. Adair - Carlisle, IA  
Joseph B. Allotey - Accra, Ghana  
Stephen J. Barnes - Lakeland, FL  
Dylan Berichon - Denver, CO  
John Blok - St. Petersburg, FL  
Cameron Boswell - Los Angeles, CA  
Alexander Brownstein - Newtown, PA  
Gregory J. Buchwald - Crystal Lake, IL  
Steven Carl - Henderson, NV  
Jeffrey Cozart - Columbia, MD  
Rich Culbertson - Fort Bragg, CA  
David Dillinger - Milwaukee, WI  
Stephen Dixon - Coal Center, PA

Tim Finley - Savannah, GA  
Dawn Gabor - Holly Springs, GA  
Tiffany Gaines - Quinton, VA  
Gregory J. Hadwick - Honolulu, HI  
Josh Hayenga - St. Petersburg, FL  
Drew Horigan - Huntsville, AL  
Jim D. Huffman - Conroe, TX  
Craig Landis - Honolulu, HI  
Ian P. Lewis - Marfa, TX  
Carl R. Lind - Overland Park, KS  
Timothy J. Linder - Brambleton, VA  
Wilberto Lorenzo - Moca, PR

Timothy Lyons - Savannah, GA  
Rafael A. Mafra - Winter Garden, FL  
Umesh B. Manedi - Duncansville, PA  
Bob Matter - Cranberry Township, PA  
Robert B. Morrison - Lexington, KY  
Jim Pallwitz - Pasco, WA  
Yuzhe Qiu - Guangzhou, China  
Armando Ramos - Vancouver, BC  
Benjamin T. Riggs - Spring Hill, TN  
LeeAnn Saulsbury - Nashville, TN  
Ivy S. Sheppard - Emory, VA  
Maxwell Sidell - Yonkers, NY

Michael A. Sisk, II - Las Vegas, NV  
Henry Stahl - Washington, DC  
Jim T. Stenberg - Portland, ME  
Amelia Vlahogiannis - Rutherford, NJ  
Maximillian L. Vokoun - Mesa, AZ  
Cody R. Weaver - Boise, ID  
Devin AW Wheeler - Temple Hills, MD  
Olivia M. Williams - Nebo, NC  
Jansen KK Wong - Kaneohe, HI  
William A. Wortelboer - Orlando, FL  
Kenneth J. Wright Miller - Clermont, FL  
Carl B. Yocher - Guthrie, OK

## NEW STUDENT MEMBERS

Seamus Butcher - Somerville, MA  
Bryan M. Maldonado - San Diego, CA  
Morgan F. Pierce - Baton Rouge, LA

## NEW ASSOCIATE MEMBERS

Beau B. Jordan - Red Bluff, CA

## RETURNING STUDENT MEMBERS

Mitchell J. Sulkowski - North Tonawanda, NY

## RETURNING MEMBERS

Stanley J. Armstrong - Rocky Mount, NC  
Frederick J. Bennett - Coleman, MI  
Jonathan B. Bernstein - Washington, DC  
Curtis A. Brothers - Wake Forest, NC  
Robert C. Carroll - College Grove, TN  
Daniel P. Crandell - Lansing, MI  
Benjamin R. Datin - Orlando, FL  
Anthony A. Dennis - Akron, OH  
David Dieter - Denver, CO  
John A. Fox - Etters, PA  
Joel A. Gascot - Seven Valleys, PA  
Wade T. Giddens - Cleveland, OH

Shannon Harrison - Houston, TX  
Kristopher E. Hoopes - Davis, OK  
Kenneth R. Hunold - Hackettstown, NJ  
David A. Katz - Phoenix, OR  
Eric D. Kuglin - Wendell, NC  
Jacob Lockwood - Las Cruces, NM  
Michael S. McCune - Torrance, CA  
MD Salauddin Mia - Dhaka, Bangladesh  
Anthony J. Porras - Las Cruces, NM  
Alan W. Reed - Richmond, KY  
Joseph D. Rother - Springfield, IL  
Diane L. Streett - Torrance, CA

Bryan Switzer - Plano, TX  
Michael S. Wallin - Dayton, MN  
Ward R. Witt - Madison, VA

## In Memorium

Stephen R. Brown - Robbinsdale, MN  
Donald A. Dobbs - Tulsa, OK  
Michael R. Sprowls - Tulsa, OK  
Marc C. Tarplee - Rock Hill, SC  
Robert J. Walkney - Albuquerque, NM

## It Pays to be SBE Certified

The SBE conducted its eighth compensation survey in April through June. The survey goal is to provide practical information to SBE members about individual compensation (salary and benefits) based on the type of broadcast or multimedia involvement, market size, and job title category. 354 respondents answered the survey questions about salary and benefits.

We asked if respondents received a raise in the last year, and if so, how much, and to report benefits received. We also asked about contract engineering rates and practices.

Respondents were asked if they held any broadcast- or media-relevant professional certifications. We compared salaries of respondents with and without SBE Certification and reported the trend compared to past salaries. Typically, those who hold SBE certification earn a higher wage than those who do not.

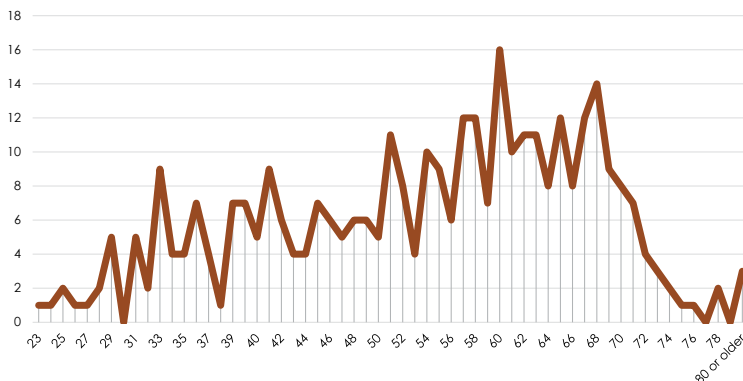
The survey report is available via the SBE Bookstore and is free to SBE members as a member benefit. You will need your SBE website login to access it. Also, the PDF report is password protected. The password

is noted on the download page. Non-members can purchase the survey via the SBE Bookstore. Some survey highlights are shown here.

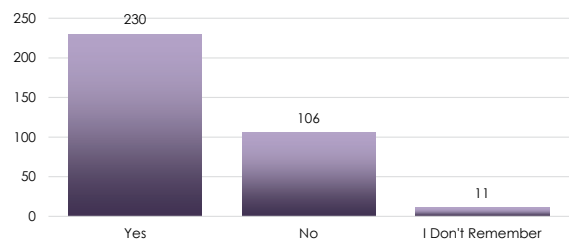
If you participated in the survey this year, thank you. We encourage your participation next year so we can provide the most useful results.



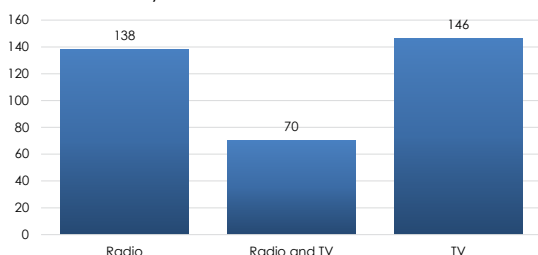
Please tell us how old you are (in years):



Did you receive a salary increase in the past 12 months?



Do you work in radio, TV or both?



Average Salary With and Without SBE Certification

