

THE Signal

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Society of Broadcast Engineers



The Association for
Broadcast and
Multimedia Professionals

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2017 NAB Show Ennes Workshop: State of the Art

By Fred Baumgartner, CPBE



I was peeking through the programs from the Ennes Workshop the SBE has organized for the NAB Show since they began in 1995. It's literally a brief history of broadcast engineering. The Ennes Foundation's goal has always been to present what is most useful to broadcast engineers in a one-day tutorial format. Over the decades, one can see the topics introduced, developed, and then retired to status as "basics we all know and practice." I didn't find a single year where there weren't fascinations that markedly changed the business of broadcasting. In a way, this year is business as usual. It's pretty likely that when we arrive in Las Vegas on April 22 that the TV spectrum auctions are over and the scramble to repack, relocate, and rebuild America's OTA TV infrastructure will be ramping up. At the same time, the first ATSC 3.0 installations will be replacing the 8-VSB we've outgrown. Radio will continue its march

to HD Radio. We'll all continue to marvel at immersive audio and improvements in the resolution, dynamic range and color imaging. All of broadcast engineering will continue the conversion to IP, fiber and UTP. The NAB BEITC (Broadcast Engineering and IT Conference) is packed throughout the week with all of this.

For the SBE/PBS/APRE (we all get to come to this program) this is a year of execution and introspection. I have taken notes of Ennes sessions over the years. What's interesting is that interwoven with captured facts is a series of doodled schematics and flow charts and little check boxes that remind me to add something to the to-do list or look up a reference, term or concept I need to take a deeper look at. A lot of times, it's not so much the presentation's content, but where it takes me creatively and functionally. I

see [ENNES WORKSHOP](#), p. 8

Include the SBE In Your NAB Show Planning

With the NAB Show just around the corner, be sure you include the many SBE events on your convention calendar. While the Ennes Workshop launches the convention on Saturday, the highlight for SBE members is the annual Membership Meeting, which will be followed by a reception. The Membership Meeting, sponsored by Blackmagic Design, will be held on Tuesday, April 25, at 6 p.m. in a location to be announced. The event brings you up to date on all the SBE activities and programs, and it includes a milestone-service recognition of SBE chapter certification chairmen, and updates on the society's plans, programs and government relations efforts. Everyone attending will be eligible to win prizes, including a \$300 gift card for Fry's Electronics and restaurant gift cards.

You'll want to be one of the first in line as well, because the first 100 people at the meeting will receive a special SBE memento.

The Membership Reception starts immediately after the meeting at 7 p.m. in a location to be announced. Light snacks and drinks are made possible through the generous support of several Sustaining

Member sponsors. There will also be a prize drawing at the reception.

Complete details of all the SBE events and meetings will be shared in the April issue of *The Signal*, and also posted in our online NAB Show Resource Guide



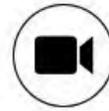
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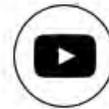
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iHeart Media - Miami | Boynton Beach, FL
jleifer@sbe.org

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Wayne M. Pecena, CPBE, 8-VSB, AMD, DRB, CBNE
Texas A&M University/KAMU | College Station, TX
wpecena@sbe.org

TREASURER

Andrea Cummis, CBT, CTO
AC Video Solutions | Roseland, NJ
acummis@sbe.org

DIRECTORS

James Bernier, CPBE, CBNE | Alpharetta, GA
Turner Broadcasting System
jbernier@sbe.org

Mark Fehlig, CPBE, 8-VSB, CBNT
Jampro Antennas | Lafayette, CA
mfehlig@sbe.org

Kirk Harnack, CSRE, CBNE | Nashville, TN
The Telos Alliance
kharnack@sbe.org

Mike Hendrickson, CPBE, CBNT
Retired | Lakeville, MN
mhendrickson@sbe.org

Ched Keiler, CPBE, 8-VSB, CBNE
E Three | Ft Lauderdale, FL
ckeiler@sbe.org

Jeff Keith, CPBE
Wheatstone Corporation | New Bern NC
jkeith@sbe.org

Kevin Plumb, CPBE
ESPN Technology | Bristol, CT
kplumb@sbe.org

RJ Russell, CPBE
Fox 29 Philadelphia | Philadelphia, PA
rjrusell@sbe.org

Marcelo Sanchez, CPBE
WBFS-TV/WFOR-TV | Miramar, FL
msanchez@sbe.org

Mark Simpson, CPBE, AMD, DRB, CBNE
Townsquare Media | Tucson, AZ
msimpson@sbe.org

Justin "JT" Tucker, CSRE, AMD, CBNE
Cumulus Media | Charleston, SC
jttucker@sbe.org

IMMEDIATE PAST PRESIDENT

Joe Snelson, CPBE, 8-VSB
Denver, CO
jsnelson@sbe.org

SBE NATIONAL STAFF

John L. Poray, CAE | Executive Director
jporay@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

Carol S. Waite | Certification Assistant
cwaite@sbe.org

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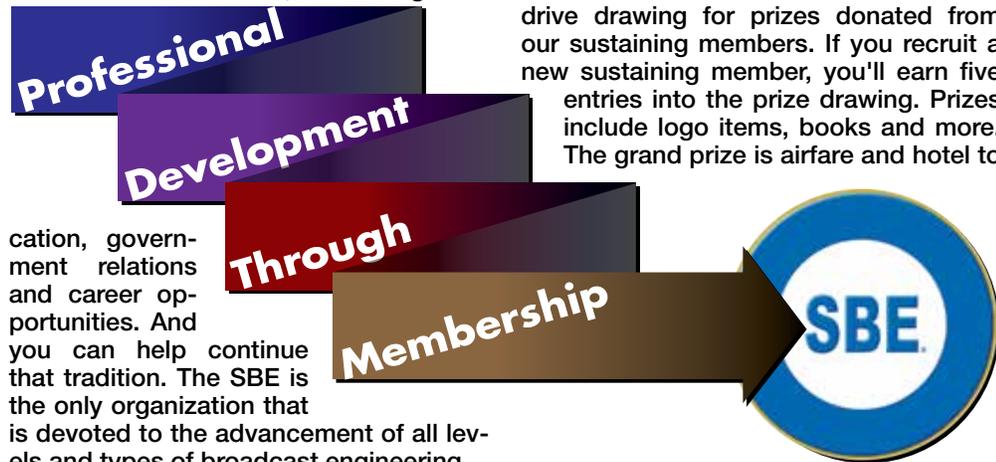
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317-846-9000 www.sbe.org

Recruit a New SBE Member

The SBE Membership Drive will kick off on March 1. The theme this year is Professional Development Through Membership. With more than 50 years of history, the SBE provides broadcast engineers the best in certification, continuing edu-

cation, government relations and career opportunities. And you can help continue that tradition. The SBE is the only organization that is devoted to the advancement of all levels and types of broadcast engineering.

to joining during the SBE Membership Drive, held from March 1 to May 31. If you recruit a new member during the Drive and your name is on the sponsor's line of the membership application, your name will be entered into the member drive drawing for prizes donated from our sustaining members. If you recruit a new sustaining member, you'll earn five entries into the prize drawing. Prizes include logo items, books and more. The grand prize is airfare and hotel to



ation, government relations and career opportunities. And you can help continue that tradition. The SBE is the only organization that is devoted to the advancement of all levels and types of broadcast engineering.

As a member, you know the benefits of membership. Chances are you have a colleague or two who are not familiar with SBE, but could benefit from membership. While anyone can join the SBE at any time during the year, there's an added benefit

attend the SBE National Meeting held in conjunction with the 2017 Audio Video Expo in Denver, Oct. 25-26.

And as a further bonus, for every new member you sponsor you will receive \$5 off your 2018 dues (up to \$25).



Certification Question

Answer on page 6

When considering a bonded ENG system versus a conventional ENG system using TV BAS frequencies:

- A. No FCC TV BAS license is required for a bonded ENG system.
- B. Any interested party or entity can use bonded ENG, but only entities eligible for Part 74, Subpart F, TV BAS frequencies can use a conventional ENG system.

- C. A bonded ENG system is less expensive than a conventional ENG system using TV BAS band frequencies.
- D. All of the above.
- E. None of the above; bonded ENG systems are currently prohibited in the U.S.

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LETTER FROM THE PRESIDENT

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

Enlighten, Educate and Challenge

And a belated Happy New Year to all! We are finally into 2017 and it is time to look forward to the remaining 11 months and what it holds for the Society of Broadcast Engineers. 2016 was an eventful year for broadcast with the political events, the national EAS test and of course last year's SBE educational events.

As we look at 2017, we will see changes in almost every area of broadcasting and the SBE. Let me list just a few.

SBE Educational Opportunities

This year, you have a great opportunity to expand your education in the area of RF. This is a great time to start picking up the RF side of broadcasting if you have not been exposed to that yet. The first in a series "RF101: Terrestrial Transmission Systems Course" was held on Jan. 26 with more than 60 SBE members taking the webinar. It's not too late to pick up this webinar as it is available on-demand for you to take whenever it is suitable for you! This was but just the first in a series of RF related webinars so keep watching your newsletters for future webinar announcements!

While on the subject of education, I hope that one of your New Year resolutions was to expand your knowledge and cer-

tifications. There is no better way to do that than to invest and take some of the SBE on-demand webinars. No matter what your interest may be, we have courses that will certainly fit your needs. These courses range from AM directional systems, IT, management and relations, broadcast processing, TV audio and video, ENG truck operations and many more. Check out all these courses on the SBE website and sign up there to take some of these that interest you!

SBE Board Update

Last month I accepted the resignation of Tim Anderson, CPBE, DRB, CBNE, as the secretary of the Board of Directors. Tim has a new gig as a commercial airline pilot, which has been a dream of his. First, we wish Tim all the best in his new profession! Tim is not leaving broadcasting but will be working on projects as time permits. With Tim's resignation, the Executive Committee has approved my nomination of Wayne Pecena, CPBE, AMD, DRB, 8-VSB, CBNE, as the new SBE secretary. In addition, the Executive Committee approved Jim Bernier, CPBE, CBNE, to fill Wayne's unexpired position on the Executive Committee. Thank you gentlemen for your willingness to step up to fill these positions.

NAB Show

Just around the corner is the NAB Show, coming up April 22 - 27. If you plan to attend the NAB Show, you will certainly want to attend the events that the SBE has planned for you, including the Ennes Workshop on Saturday April 22. What a great opportunity to have an entire day of technical presentations that are sure to be informative. Also please visit the SBE booth. We look forward to meeting all our SBE members.

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SBE Compensation Survey Returns

Money can't buy happiness (so the saying goes), but some will argue that it can certainly get you closer. But how do you know if your earnings are in line with other professionals in your field or your market?

The SBE will again conduct a compensation survey in April. In its second year, 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,

market size and years of experience. SBE members will have access to the full report. We encourage every SBE member to participate to provide a large sample base of responses. All responses are anonymous. We had a healthy response last year, and we hope participation will continue to grow.

The survey opens April 1. Look for a link to the survey in our regular email communications and on the SBE website. The results will be published in June.





EDUCATION UPDATE

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

What Is There to Learn in 2017?

2017 is well underway and is shaping up to bring plenty of change to broadcasting. Change has always been a part of the industry, but the rate of change today is record setting. The TV spectrum auction results are hopefully to be understood soon and the resulting channel re-pack impact on individual stations known. ATSC 3.0 continues to advance as standards are solidified. ATSC 3.0 will provide a unique RF and IP delivery platform for the broadcast engineer to master.

The Internet Protocol (IP) environment is with us, like it or not, whether radio or ATSC 3.0 is in your station's future. You cannot ignore the IP influence even if simply maintaining a conventional technical facility is your agenda. A clear message that was heard from industry leaders at the SBE Education Summit held this past fall was that IP technology was clearly the future, and in-depth knowledge of IP networking and information technology was essential for the successful broadcast engineer today and in the future. Whereas the message heard was not a surprise, the message served as a confirmation that SBE education efforts are headed in the right direction with more work required in definition of specifics. The broadcast engineer today is kin to an information technology professional with specialized skills in audio, video, and RF technologies.

I sought to define what in-depth knowledge in IP networking and information technology really means to the broadcast engineer who desires to enhance his knowledge base. What specific areas need to be learned since information technology is a very diverse field? What began as a short list continues to grow into a diverse and lengthy compilation of knowledge and skills. In an attempt to begin creation of a taxonomy focused upon broadcast engineering IT skills, I offer the following competency areas to define in-depth IT knowledge for the broadcast engineer:

- IP Networking
- Operating Systems
- Object Oriented Programming (OOP)
- Cybersecurity

I continue to promote IP networking as the foundation of all IT areas. Essential knowledge includes an understanding and application of the IEEE/IETF protocols and standards associated with Ethernet switching, VLAN utilization, QoS, segmented networks, and IP routing. The traditional OSI model provides an excellent roadmap. Operating systems includes administrative level knowledge of the various Microsoft Windows platforms, Mac OS, and of course Linux in many flavors. Don't overlook the embedded environment. You might question, Object Oriented Programming (OOP) as a knowledge need for the broadcast engineer. Whereas, I do not suggest that the broadcast engineer should become a software engineer, skills in script writing with OOP languages such as C++, Perl, PHP, and Python can add a handy skill set to automate many routine IT system administrative tasks. An understanding of OOP principals often helps one to navigate and understand the endless GUI configuration menu screens utilized in manufacture's equipment designs. And cybersecurity will be the most critical responsibility of the broad-

cast engineer in the support of a broadcast technical facility. Cybersecurity was listed as one of the opportunities to strengthen EAS in the National EAS test report released by the FCC in December. Security responsibility is likely to become eternal employment for the broadcast engineer as cybersecurity demands never have an end.

Yes, there is a lot to learn and the learning demand will continue. One reality that often occurs as you expand your knowledge is the more you actually learn, the more you realize there is even more to learn. Often, a little knowledge can be dangerous and lead to the expert mentality. In this state of mind, the actual knowledge is often pretty low. So be careful out there and keep in mind to avoid the Expert Mountain mentality as you further your knowledge.



What Can You Look Forward to in 2017?

SBE education program development will continue to focus on IT-related topics beginning with a revised and updated Fundamentals of IP Networking for the Broadcast Engineer webinar series beginning in March. In addition, a cybersecurity webinar series is under development with the first webinar of this series expected to be offered in mid-2017.

As emphasis in the IT needs of the industry continues, the SBE has not forgotten about the fundamentals that are a foundation of broadcast engineering. Many have already taken advantage of the RF101 Webinar Series which held the first of eight planned webinars on Jan. 26, 2017. If you missed the first webinar, remember that all SBE webinars are available on-demand so you can take part on your own schedule. The RF101 Webinar Series was developed and conducted by industry consultant Dennis Baldrige. He targets those new to broadcasting with minimal RF experience, but I bet there is something for everyone to learn. Based on the January enrollment, Dennis has created an award winner. Be sure to read more about the RF101 webinar series from Dennis himself in this issue of *The Signal*.

What else is needed? Let your SBE Education Committee know your career professional development needs. Consider providing your expertise and knowledge to your SBE peers through one of many program delivery platforms. Lend your advice and guidance to the SBE Education Committee. 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.

Also, join me in welcoming Cathy Orosz to the SBE family. She began as education director in January. Welcome Cathy!

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



CERTIFICATION UPDATE

By Megan Clappe
SBE Certification Director
mclappe@sbe.org

Make 2017 Your Year To Get Certified

The year is young and hopefully your goals are still plentiful. Whatever your situation, make 2017 the year that you get certified. There are certification levels for everyone. The eligibility for SBE certification is based on your years of broadcast engineering experience. There are a number of entry-level certifications available if you are just entering the field or only have a few years of experience. From there the SBE offers certifications if you have a minimum of five or ten years of experience. You don't need to complete one level in order to qualify for a higher certification. All the applications are available on the SBE website, and exams are given four times a year with your local chapters and one time in April during the NAB Show. If you aren't able to make these times, I can work with you to set up a special proctoring time.

If you are already certified and have been thinking of taking it to the next level, consider upgrading your certification. If you have held an SBE certification for at least five years, then you probably have the experience required to upgrade to the next level. The process is the same as if

you were first applying for a certification: there is an exam involved. Exams consist of 50 multiple-choice questions. The senior certifications and the networking engineer certification also have an essay component. The exam is 3

hours and is open book except for the essay (that portion is closed book).

To help you study for any of the certification exams you can use the reference list of suggested books that is available on the SBE website and you can use the SBE CertPreview practice exam question software.

If you have any questions about which certification is right for you, contact me at mclappe@sbe.org.



Employer Notification

Something you may consider when you apply for certification is your option to request a letter be sent to your employer from the SBE President. This letter would state that you have obtained a level of SBE Certification. While the certification itself looks good on a resume, this letter "steps it up" to acknowledge your efforts for career improvement in the broadcast engineering field. (Certification applicants can request the employer letter when they are filling out the certification or recertification application.) The employer letter is only sent out when the applicant passes an exam.



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Answer from page 3

The answer is D.

The cost of bonded cellular allows for putting ENG live capability into the hands of multiple users versus the high cost of an ENG Van (approximately \$150K) per unit and ENG receive site development along with having to obtain an FCC Part 74 authorization that is only available to certain eligible entities. Most stations, however, have not abandoned classical ENG systems since bonded cellular systems may not be available in certain areas or in times of emergencies when the cellular network is overloaded.

Correction: In the December 2016 CQ we applied the units of dB in the calculations. They should have been expressed as voltage ratios.

SBE Certification Achievements

CONGRATULATIONS

LIFE CERTIFICATION

Certified Professional Broadcast Engineer (CPBE)
Thomas Skubel, Pittsburgh, PA - Chapter 20

Certified Professional Broadcast Engineer (CPBE) 8-VSB Specialist (8-VSB)
Mark Fehlig, Walnut Creek, CA - Chapter 40

Certified Broadcast Radio Engineer (CBRE)
Richard Archut, Monroeville, NJ - Chapter 18

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.

NOVEMBER EXAMS

Certified Senior Television Engineer (CSTE)
Matt Rogers, Marietta, GA - Chapter 5

Certified Senior Radio Engineer (CSRE)
Dennis Graiani, New City, NY - Chapter 15
Joshua Taylor, Pontotoc, MS - Chapter 68

AM Directional Specialist (AMD)
Christopher Tarr, Mukwonago, WI - Chapter 28

Certified Broadcast Radio Engineer (CBRE)
Joshua Ferrara, Erie, PA - Chapter 130
Richard Lozano, San Antonio, TX - Chapter 69
Bradley Rakestraw, Tupelo, MS - Chapter 68
Mark Rogers, Rolla, MO - Chapter 55

Certified Broadcast Television Engineer (CBTE)
Jan Andrews, Alexandria, VA - Chapter 37
Joshua Ferrara, Erie, PA - Chapter 130
William McKinney, Middlefield, OH - Chapter 70
Scott Rohrer, Dayton, OH - Chapter 33

Certified Audio Engineer (CEA)
Seth Morth, Marietta, PA - Chapter 5
Phil Van Liew, Edmonds, WA - Chapter 16
Samuel Wallington, Auburn, CA - Chapter 43

Certified Video Engineer (CEV)
Jon Elmore, Ft. Worth, TX - Chapter 67
Troy Robinson, Naperville, IL - Chapter 26

Certified Broadcast Networking Engineer (CBNE)
Corey Gregory, Harpers Ferry, WV - Chapter 132
Sam Lewis, Chattanooga, TN - Chapter 113
Mustafa Muhammed, Dayton, OH - Chapter 33
Francis Obikoya, Riverton, WY - Chapter 129
Kira Parker, Boise, ID - Chapter 115
Edick Safarians, Burbank, CA - Chapter 47
Walter Strogoff, Lincoln, NE - Chapter 74
Emmie Tran, Fort Meade, MD - Chapter 132
Corey Walters, Union City, NJ - Chapter 15
Ma Louella Wong, Odenton, MD - Chapter 132

Certified Broadcast Networking Technologist (CBNT)
Kurt Bauer, Lincoln, NE - Chapter 74
Ann Bruun, Tulsa, OK - Chapter 56
Jason George, Torrance, CA - Chapter 47
Stephen Hinton, Cincinnati, OH - Chapter 33
James Greg Ireland, West Chester, OH - Chapter 33
William McKinney, Middlefield, OH - Chapter 70
Matt Rogers, Marietta, GA - Chapter 5
Jon Zucco, Denver, CO - Chapter 48

Certified Radio Operator (CRO)
Will Anderson, Franklin, MA - Chapter 11
Elizabeth Delaquess, Madison, WI - Chapter 24
Tom Gaggin, Tampa, FL - Chapter 89
Zachary Shore, Olney, MD - Chapter 37

Certified Television Operator (CTO)
James Altman, Lake Park, FL - Chapter 88
Ryan Beal, Hobart, IN - Chapter 26
Keith Salvas, Camarillo, CA - Chapter 47

SPECIAL PROCTORED EXAMS

Certified Broadcast Television Engineer (CBTE)
Brett Hancock, Holland Landing, Ontario

WABE with Wayne Pecena
Certified Broadcast Networking Technologist (CBNT)
Mitchell Bunda, Calgary, AB
Trevor Stuart, Edmonton, AB
Richard Woelk, Saskatoon, SK

SBE CERTIFIED SCHOOL COMPLETION

DINFOS
Certified Broadcast Technologist (CBT)
Paige Blackcloud, Augusta, GA - Chapter 101
Eric Hurtado, Severn, MD

CERTIFIED BY LICENSE

Certified Broadcast Technologist (CBT)
Jonah Nemeec, Chicago, IL - Chapter 26
Edward Stofferahn, Zimmerman, MN - Chapter 17

CERTIFIED RADIO OPERATOR (CRO)

Vanessa Araico, St. Petersburg, FL
Jason Martinez, Dunedin, FL
Greg Schumacher, Niagara Falls, NY

Pasadena City College
Jessica Almaguer, Los Angeles, CA
Michael Gorse, Altadena, CA
Jeff Lundquist, Burbank, CA
Jesse Moreno, Rosemead, CA
Julia Paskin, Temple City, CA

Columbus Career & College Academy
Shayla Arruda, Whiteville, NC

Mesquite ISD
Abigail Fields, Mesquite, TX
Jamel Davis, Mesquite, TX
Nicholas Carr, Mesquite, TX
Meagan Bailey, Mesquite, TX
Chandler Gibson, Mesquite, TX

Mesquite ISD (cont.)
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Christopher Leake, Mesquite, TX
Eli Meredith, Mesquite, TX
Sid Vanlandingham, Mesquite, TX
Chasatey Virgil, Mesquite, TX
Jonathan Welle, Mesquite, TX

CERTIFIED TELEVISION OPERATOR (CTO)

Brian Allred, Nampa, ID
Daniel Eason, Phenix City, AL
Patricia Nelson, Chattanooga, TN
Tim O'Gorman, Rancho Cucamonga, CA
Kyle Potter, Spokane, WA

Greg Schumacher, Niagara Falls, NY

Town Square Media
Gerald Acosta, El Paso, TX
Brad Bishop, El Paso, TX
Brianna Carbaja, El Paso, TX

Town Square Media (cont.)
Josue Diaz, El Paso, TX
Daniel Eason, Phenix City, AL
Glen Gonzalez, El Paso, TX

RECERTIFICATION

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

Certified Professional Broadcast Engineer (CPBE) 8-VSB Specialist (8-VSB) AM Directional Specialist (AMD)
Stephen Lockwood, Seattle, WA - Chapter 16

Certified Professional Broadcast Engineer (CPBE) Digital Radio Broadcast Specialist (DRB)
Timothy Anderson, Covington, KY - Chapter 33

Certified Senior Television Engineer (CSTE)
Edward Weible, Pasadena, MD - Chapter 46

Certified Broadcast Networking Engineer (CBNE)
Timothy Anderson, Covington, KY - Chapter 33
Veronica Mazuca, San Marcos, TX - Chapter 79

Certified Broadcast Radio Engineer (CBRE)
Darrell McCalla, Mountain Brook, AL - Chapter 68

Certified Broadcast Television Engineer (CBTE)
Veronica Mazuca, San Marcos, TX - Chapter 79
David Miscia, Framingham, MA - Chapter 11
Francis Obikoya, Riverton, WY - Chapter 67
Anthony Peiffer, Brooklyn, NY - Chapter 15

Certified Audio Engineer (CEA)
Darrell McCalla, Mountain Brook, AL - Chapter 68
Errol McKinson, Laurel, MD - Chapter 132

Certified Video Engineer (CEV)
Darrell McCalla, Mountain Brook, AL - Chapter 68

Certified Broadcast Networking Technologist (CBNT)
Randy Garrett, Louisville, KY - Chapter 35
Darrell McCalla, Mountain Brook, AL - Chapter 68
Paul Spinelli, Kingsville, MD - Chapter 46

Certified Radio Operator (CRO)
Alex Gonzalez, Maywood, CA

Certified Television Operator (CTO)
Rudy Gonzalez, Missouri City, TX
Craig Koster, Boise, ID
Marla Nefflen, Liverpool, NY
Glen Samletzka, Arlington, MN
Elizabeth Silva, Phoenix, AZ

Certified Broadcast Technologist (CBT)
Jesse Aeron, San Diego, CA - Chapter 36
Victor Boggess, Glen Allen, VA - Chapter 60
Clifford Button, Girard, OH - Chapter 122
Jerry Erwin, Maineville, OH - Chapter 33
Frank Felker, Glassboro, NJ - Chapter 18
David Festa, Bristol, CT - Chapter 14
Peter Fountain, Littleton, CO - Chapter 48
R. Allen Fowler, Murray, KY - Chapter 103
Astley Grant, New Market, Ontario, Canada
Don Hemenover, Indianapolis, IN - Chapter 25
Robert Lyon, Draper, UT - Chapter 62



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Nominations Committee Seeks Board Candidates

The annual election of officers and directors to the national SBE Board of Directors will take place this summer. The SBE Nominations Committee is seeking qualified candidates who are voting members (Member, Senior, Fellow or the designated representative of a SBE Sustaining Member) in good standing (dues paid). Candidates must hold an engineering level of SBE certification (CBT or higher or CBNE) and maintain it the entire duration of service on the Board, if elected. Candidates should have a desire to serve and lead, not only as a member of the board, but through service as a national committee chair or member. Members of the Board represent all members, not any one specific region, state, city or chapter. It is suggested that candidates have previous experience as a leader in his or her local chapter, or other volunteer leader-

ship experience, prior to running for the national SBE Board.

Members of the Board are expected to attend two regularly called meetings each year; in the spring, held during the annual NAB Show, and in the fall, at the annual SBE National Meeting. Other meetings may be called via conference call during the year.

The national SBE board includes 12 directors, four officers and the immediate past president. Directors serve two-year terms and officers serve one-year terms. Six director seats will be contested in 2017 as will all four officer positions. The SBE By-laws limits the number of terms of elected members of the Board. Directors may serve three consecutive terms. The secretary and treasurer may serve up to four consecutive terms and the president and vice president may serve up to

two consecutive terms. The maximum number of years anyone may serve on the board is ten consecutive years. The time spent as immediate past president does not count towards the ten-year total.

Members interested in offering their candidacy and serving on the national Board if elected are encouraged to contact the SBE Nominations Committee Chair Jim Bernier, CPBE, CBNE, at jim.bernier@sbe.org or 678-466-0002. A slate of nominees will be assembled by the committee by April 28. Other qualified members may be nominated by members in good standing no later than July 10.

The election takes place from July 24 to Aug. 23. Candidates elected will be installed into office during the SBE National Meeting in Denver, CO, on Oct. 26.

Ready for the NAB Show? The SBE Can Help

The Society of Broadcast Engineers is again preparing a resource to help you navigate your way around the 2017 NAB Show. The convention occupies nearly the entire Las Vegas Convention Center, and trying to see everything in four days is a challenge. Our NAB Show Resource Guide provides useful information to let you get the most from your limited time at the convention.



The Guide will include a listing of SBE events, including the annual Membership Meeting and Ennes Workshop, and a directory of all the SBE Sustaining Members exhibiting at the show. The exhibitor information will include descriptions of that exhibitor's products and services listed to help you better navigate the convention and get the information you need quickly.

The Guide will be posted on the SBE website. Look for a prominent link on the home page beginning in March.

Orosz Joins SBE National Staff

Catherine Orosz joined the SBE national staff on Jan. 3, serving as education director. Cathy comes to the SBE after five years with McGuffey and Associates, LLC, an association management and government affairs firm in Indianapolis. Her primary responsibility was as director of client services and association manager for the Indiana State Chiropractic Association. Prior experience includes serving as Indiana executive director and director of operations for the Printing Industry of Indiana/Illinois Association for ten years. She is a graduate of Kent State University in Kent, OH, with a Bachelor of Science degree in Communications and Health Science.



Orosz

We welcome Cathy to the SBE!

ENNES WORKSHOP from p. 1

never leave an NAB Show Ennes Workshop without new direction and insight, often unexpected. Grab a big soda, the cellphone camera, and a notebook with grid squares, and sit back and see where your mind goes and what you learn.

This year, we'll start with a tutorial on the state of imaging. The speaker is something special in that we have Andrew Jones, the head of training for IABM, the International Association of Broadcast Manufacturers, providing the instruction. Besides the content, it's a taste of the kind of things the IABM has undertaken in the realm of broadcast engineering training. While we know the SBE well, and probably SMPTE, the IEEE, etc., for most of us in frontline broadcasting, the IABM is not on our radar, yet it's a rather important part of our "ecosystem."

Through the rest of the day, we'll hit the IP conversion, ATSC 3.0 from the viewpoint of the business cases and thus the very different content side and back-office operations we probably will be supporting that are undoubtedly more interesting and essential than the better known transmission and protocol side. Ennes sets the stage for the rest of the BEITC explaining "why this matters" more than "how it works" this year.

As always, there will be a smattering of thought provoking and just plain interesting pieces. For example, at the end of the day, Jay Adrick, just recently elevated to SBE Fellow, talks about the Voice of America and the work that has gone on to restore and preserve this important piece of our broadcast history. There's a lot more between the opening tutorial and the closing feel good piece.

SBE members receive a discount for the required NAB registration. PBS Technon or Association of Public Radio Engineer Conference registration also gains you access to the program. The program begins at 9:00 a.m. Saturday, April 22.

Accredited SBE Frequency Coordinators

The SBE provides accreditation to broadcast auxiliary spectrum (BAS) frequency coordinators who agree to conduct their coordination using a voluntary national standard of procedures. Accreditation has been recently granted to:

Dan Nezgoda • Henderson, NV
Chapter 128

Denver Will Host 53rd SBE National Meeting

The Mile High City of Denver, CO, will host the 2017 SBE National Meeting on Oct. 25-26. SBE President Jerry Massey made the announcement at the end of the 2016 SBE Annual Membership Meeting held in Columbus, OH, last October. The National Meeting will be held in conjunction with Audio/Video Expo (AVX) at the Crowne Plaza Denver International Airport Hotel. The host chapter is Chapter 48 of Denver and the Colorado Front Range.

The SBE National Meeting includes the SBE Annual Membership Meeting, the SBE National Awards Reception and Dinner and the SBE Fellows Breakfast. Also meeting during the event will be the national SBE Board of Directors, and the national SBE Certification Committee.

The AVX is a two-day event that includes a trade show with

more than 100 media and A/V oriented exhibiting companies, and two dozen workshops and seminars.

The Crowne Plaza DIA is a first class hotel that includes a 60,000 sq. ft convention center and offers free shuttle service to and from Denver International Airport. The SBE National Meeting was last held here in 2012.

More information about the SBE National Meeting will be available beginning in June. Watch for it in *The Signal* and SBE-news. All members and friends of the SBE are invited to attend. Members in Colorado and neighboring states are particularly encouraged to attend while the

SBE National Meeting is close by. Save the dates: Oct. 25-26 for the 2017 SBE National Meeting and AVX!



The Crowne Plaza Denver International Airport

Education Almanac

RF101: Broadcast Terrestrial Transmission Systems

By Dennis Baldrige, CPBE, 8-VSB, AMD, DRB, CBNT

An increasing concern in the broadcast industry is the obvious number of engineers nearing retirement age, versus the fewer replacements joining the ranks. Many broadcast facilities find themselves employing personnel who can meet the demands of the modern technological developments, but have little or no experience with the final step of the broadcast facility: the RF transmission system. The SBE is stepping up to help educate broadcast engineers in the necessary basics of RF, thus enabling them to more efficiently monitor a broadcast facility.

The RF101 course will be an introductory survey of the RF fundamentals needed to successfully monitor a broadcast facility. The target audience for this course will be for those relatively new to the field with minimal or no background in RF. Many come to the field of broadcasting from varied back-

grounds such as IT, electronic technicians, or military vets, and find themselves immersed in the complexity of a broadcast facility, and lacking essential understanding of the RF end of the system. This multi-module course will present an overview of RF, providing information needed to understand the basics and make informed decisions. RF101 modules will be presented in eight 1- to 1.5-hour webinars. These are ideally suited to state broadcast conferences and SBE chapter presentations.

I presented the first webinar, entitled Introduction to Radio Frequency (RF), on Jan. 26, 2017. It is available now on-demand.

Links

[SBE Webinars
sbe.org/webinars](http://sbe.org/webinars)

[RF101 Module 1
sbe.org/sections/RF101.php](http://sbe.org/sections/RF101.php)

Membership Renewal Reminders Coming This Month

The annual renewal for Regular, Associate, Senior, Student and most Fellow members of the SBE begins this month. Renewal letters and membership cards are in the mail to you. The due date for membership renewal is April 1.

Membership dues for Regular, Senior, Associate and Fellow members remain at \$82 per year in 2017. Student membership remains at \$25 per year. The SBE continues to provide education and certification programs and services as well as opportunities for member interaction, at a level members have come to expect. The National SBE also supports a network of 115 chapters that provide opportunities for education, access to local

SBE certification exams and interaction with local technical media.

You may renew your membership online at the SBE website, www.sbe.org. Click on "Renew Membership" in the upper right-hand corner of the home page. The online system is secure and accepts Visa, MasterCard and American Express.

The system automatically generates a receipt, sent to your email address. You'll need your member number and website password to access the renewal system. If you have forgotten your number or password, there is an automated retrieval system available to you on the renewal page.

SBE Life Members don't have to renew their membership. In the spring you'll receive a letter that provides an update on

SBE activities and an opportunity for you to edit your contact information.

Balloting for the annual election of the national board of directors will be conducted on-line and through the mail in July 2017. More than 90 percent of the election ballots cast in 2016 were submitted using our web-based balloting system. All voting members are encouraged to use the electronic ballot method as it is quick, easy and saves the society printing, mailing and postage expense.

Members who prefer voting by mail may opt-out of electronic balloting by checking the appropriate box on their member renewal form (available on both the paper renewal or the on-line renewal form). The letter to Life Members will also provide the opt-out opportunity.

Questions about your membership renewal? Contact Scott Jones at the SBE National Office at -317-846-9000 or kjones@sbe.org.





LEGAL PERSPECTIVE

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

Mobile Satellites Hit the Earth

Since 2004 – for 12 years – the SBE has had on file at the FCC a 2.5 GHz (2450-2500 MHz) rebanding proposal. It would narrow the 2.5 GHz BAS channel bandwidths to harmonize those with the roughly 12.5 MHz bandwidths at 2 GHz; it would re-create three channels from the two now available for all BAS eligibles; and it would move the top end of the band downward from 2500 MHz to 2486 MHz. That rebanding proposal was contained in a reconsideration petition that the SBE filed and that the FCC has *never* adjudicated. As we have written about here recently, Globalstar since 2013 has been asking for terrestrial use of part of BAS Channel A9 (2467-2483.5 MHz) as a component of its S-band Big LEO mobile satellite system. As originally proposed, it would have precluded the SBE's rebanding proposal, and it would have caused, as we saw it, severe interference to 2.4 GHz BAS operation, (where there is already a lot of noise from Part 15 and Part 18 devices).

Until now, Globalstar's MSS license has allowed only satellite downlinks. The FCC, however, in Docket 13-213, proposed in 2013 two changes: It would allow Globalstar to implement an ancillary terrestrial component (ATC), by which Globalstar could communicate directly from towers to handsets – no satellite needed. Second, it would expand the Mobile Satellite Service ATC band down to 2473 MHz – the lower part of BAS Channel A9. In the SBE's view, this was a major threat not only to BAS 2.5 GHz operations at A9 and the grandfathered BAS facilities at Channel A10 (2483.5-2500 MHz) now and in the future; it would also preclude the SBE's spectrum-efficient 2004 2.5 GHz rebanding plan. So we opposed it. Vehemently.

Just before Christmas 2016, the FCC released a report and order in Docket 13-213. As you may have heard and as we certainly expected, the FCC found a way to allow Globalstar's ATC in the 2.5 GHz band. However, the situation is nowhere near as dire as it was originally proposed. In fact, Channel A9 is no longer threatened, and there is some room to negotiate with Globalstar on some interference-avoidance protocols and perhaps even obtain their concurrence and support for the SBE's rebanding proposal in the process. Globalstar, as late as November 2016, backed off its proposal to operate its low-power

broadband network in the 2473-2483.5 MHz band. Instead, it will remain within its licensed MSS spectrum within BAS Channel A10: 2483.5-2495 MHz and will make no use of the adjacent 2473-2483.5 MHz band.

So, BAS Channel A9 has been spared. The grandfathered BAS operations in Channel A10 however, including a large number of network licenses in all major television markets, are very much still under the gun for co-channel interference from the ATC networks operating at 2483.5-2495 MHz. There are rules dealing with this already. Section 25.255 of the Commission's rules governing satellite facilities states in part that "[i]f harmful interference is caused to other services by ancillary MSS ATC operations, either from ATC base stations or mobile terminals, the MSS ATC operator must resolve any such interference." That rule, though absolute in its terms, is unhelpful as a practical matter to address MSS terrestrial interference to BAS, (especially ENG), because of the absolute unavailability of enforcement in either the short term or the longer term from the FCC. Even if it was available, by the time the enforcement would be brought to bear, the ENG shot is lost, the newscast is over and the BAS licensee is the loser for it.

A New Hope

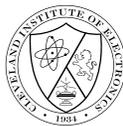
But the FCC imposed some new restrictions on Globalstar that just might help avoid interference to Channel A10-grandfathered licensees. The FCC decided that Globalstar must utilize a network operating system (NOS) consisting of a network management system located at an operations center or centers, staffed 24/7 with the technical capability to address and resolve interference issues. The contact information for the NOS must be made publicly available on the licensee's website. The NOS must have the capability to control the operation of all low-power ATC transmitters so that it can address any interference concerns by whatever means necessary, including but not limited to reducing power or terminating operations at a particular location or installation. These requirements are adopted in new rule Section 25.149(g)(2). So far, so good.

Currently, MSS licensees operating ATC in 2483.5-2500 MHz are required to coordinate their proposed operations to avoid causing harmful interference to grandfathered BAS operations in Channel A10 (and to BAS Channels A8 and A9 stations in the adjacent band) with SBE frequency coordinators. So Globalstar must consult local coordinators for information on the frequencies used and the geographic locations of the BAS systems that could potentially receive interference from the ATC base stations. If a mutual agreement between ATC operators and BAS licensees cannot be found, the parties must notify the Commission, and the Commission will take necessary action to ensure that BAS systems are protected. Not too shabby. The FCC said that it understands that coordination can be difficult where BAS is mobile and itinerant. But Globalstar must coordinate its operations with BAS operations to avoid causing harmful interference to those grandfathered operations.

So the sky didn't fall. But FCC, can you please address our 2.5 GHz rebanding plan soon please? Twelve years is a long time to wait to do the right thing for BAS. Thanks.

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FOCUS ON SBE

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

Changes Coming to This Year's NAB Show

The annual NAB Show is coming up in April in Las Vegas and for those of you who have been regulars at this largest of industry events, you will notice some changes. Not all the details were available as of this writing in January, but the NAB's engineering conference will be moving from the Las Vegas Convention Center South Hall to meeting rooms in the North Hall. The name of the conference has also been changed to reflect the broadening of the media technical field. It's now



The Membership Meeting at the 2016 NAB Show.

known as the NAB Broadcast Engineering and Information Technology Conference.

The physical move of the conference may also result in a move for the SBE exhibit booth, membership meeting and member reception. We are working out the details now and will announce the locations in SBE-news and the April issue of *The Signal*.

Educational Opportunities

The first module of the new SBE RF 101: Terrestrial Transmission Systems Course; Introduction to Radio Frequency, was held on Jan. 26. A sizable crowd par-

ticipated in the live webinar, instructed by SBE member, Dennis Baldrige, CPBE, 8-VSB, AMD, DRB, CBNT. The date of the second of the eight-part series, Transmission Lines, will be announced soon. Module 1 was recorded, as are all SBE webinars, and is now available on-demand at the SBE website.

Another educational program of the SBE is the SBE Leadership Development Course. This is a great opportunity for anyone with supervisory responsibilities in broadcast engineering, and those who aspire to a management role. The three-day course will be held in Atlanta,

Aug. 8-10, and is led by professional leadership trainer and Purdue University professor Rodney Vandevener. Look for more details on page 15 in this issue of *The Signal*.

Don't forget the free monthly educational opportunities provided by your local SBE chapter. Most chapters include a guest speaker on a technical topic at each meeting. Chapters also afford opportunities to meet and share experiences with other technical media profes-

sionals in your area. Everyone's time is tight these days, but you can't afford not to take advantage of what your chapter has to offer. A complete list of chapters is available at the SBE website, and includes the name and contact information for the chapter's chairperson.

Speaking of chapters, at your next opportunity, be sure to thank the chair and other members who are providing leadership to your chapter. They are giving of themselves for the betterment of the field of broadcast engineering, and each member working in the field.

Chapter Check

Chapter 118 • Montgomery, AL ▼

At the chapter's October 2016 meeting, Richard Hickey of Highlights led a discussion on tower lighting. WSFA-TV hosted the meeting.



Chapter 14 • Connecticut Valley ◀

In January, Chapter 14 met at the Telefunken Elektroakustik facility in South Windsor, CT.



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ENGINEERING PERSPECTIVE

By Tony Peterle, CPBE
Worldcast Systems
peterle@worldcastsystems.com

Approaching the Ultimate in IP Audio Links

With the ever-increasing use of audio over IP (AoIP) to deliver and distribute audio in the broadcast environment, it is a natural extension to consider the benefits of using AoIP for linking studio to transmitter or studio to studio sites. Many engineers have come to depend on the reliability and flexibility of AoIP for in-house audio networks, but what happens when you send your audio beyond the wall and into the unprotected mayhem of the public internet?

There are many challenges to ensuring reliability of critical audio links over public bandwidth. The internet is simply a best effort network; there are no guarantees of service level in terms of either uptime or delivery of data. However, the cost savings and flexibility of internet audio transport cannot be ignored, so as engineers we must do as we have always done: Find a way to make it work.

and audio will be lost. However, using multiple pathways and providers at each end to deliver redundant streams can result in seven or eight 9s (99.99999%) reliability when delivering audio across public internet links. Redundant streaming links have been established on every conceivable type of bandwidth, from DSL to fiber, WISP, cellular, satellite and more. Microwave IP links are a popular, economical and flexible solution, though care must be taken to plan the links and use professional grade equipment, particularly in urban and other areas where microwave congestion is prevalent. Properly configured, redundant streaming links using multiple providers and pathways often operate for weeks and even months without losing a single packet of audio data!

Source Redundancy and Adaptability

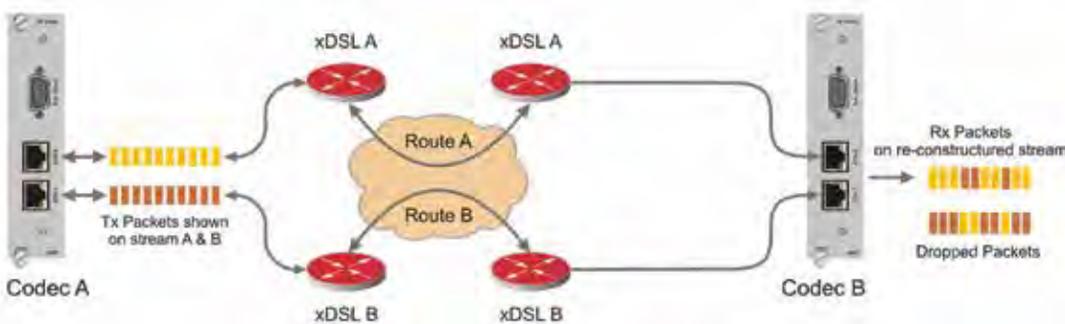
The goal is to eliminate all single points of possible failure, and that certainly applies to the source encoder of the link. Of course a second encoder could be standing by, but ideally the solution would be applied without operator involvement. The receive decoder must be smart enough to detect the failure of the incoming audio streams and alter its own configuration to receive the backup data. And it is also likely that the backup encoder would not

be streaming 24/7, so it would need to be enabled as well.

This brings us to the IT concept of adaptability. System admins know, for example, that defending a private network from external attacks requires not only a firewall and appropriate configuration, but the ability to monitor the network activity, detect potential threats, and adapt the firewall settings to counter each new challenge before the network is compromised. Likewise, when we plan for ultimate reliability on an IP audio link, consideration should be given to establishing a monitoring system that surveys both ends of the link, and can command configuration and other changes in the network to enable backup schema as desired. This can be achieved with external monitoring and control systems, typically using the Simple Network Management Protocol (SNMP) for communications. Some manufacturers are already building this kind of intelligence and control capability into the codecs themselves.

One other capability supported by some manufacturers that can further improve the reliability of an IP audio link is a second form of source redundancy called packet forwarding. A decoder that supports packet forwarding can receive one or more redundant streams of data, decode them to audio and/or send them on to another decoder, in effect making any codec in the network a potential backup source for any other site.

Using redundant streams traveling over multiple network pathways and providers, we can confidently trust AoIP for reliable audio delivery over any distance. Redundant sources, packet forwarding, and the embedded intelligence to monitor and control the system can support that reliability across a single link or an entire network.



To do so, we must incorporate both redundancy (a philosophy that has served broadcasters well) and adaptability (something more familiar to IT admins) to arrive at the most effective solutions for enhancing the reliability of IP audio transport.

Stream Redundancy

The first building block of an ultimate IP link is reliable delivery of a single audio feed from point A to point B. The technology that has proven to be most effective for this is redundant streaming.

At its most basic level, redundant streaming could be described as a belt-and-suspenders approach. The data stream containing the audio is duplicated and two or more streams can be added for additional (albeit progressively smaller) gains. If packets are missing from stream A, they are likely to already be in the buffer from stream B. This requires sufficient bandwidth at both ends of the link, but in general internet bandwidth is commonly available, and priced at a much lower cost than common synchronous links such as ISDN or T1. One redundant stream is enough to make a large improvement in link reliability; two or more streams can be added for additional (and progressively smaller) gains.

Path Redundancy

Each redundant stream can only be as effective as its underlying transport structure will permit, delivering multiple streams via a single common pathway or provider can typically only achieve five or so 9s of service (99.999% packets delivered). Plus, if that one pathway or provider suffers an outage there is no recourse

- 305 Broadcast • 2015**
Anthony Gervasi 305-406-3560
Broadcast Equipment Supplier
- AC Video Solutions • 2014**
Andrea Cummis 201-303-1303
Consulting, Systems Design/Integration
- AEQ Broadcast International • 2015**
Peter Howarth 954-581-7999
Broadcast Audio, Video and Communications
- American Tower Corporation • 2000**
Peter A. Starke 781-926-4772
Development/Construction/Management
- ATV Broadcast, LLC • 2016**
Doug Smith 317-258-6280
Telecommunications Consulting Group
- Audemat-Worldcast Systems Inc. • 2000**
Christophe Poulain 305-249-3110
Control Manufacturer
- AVCOM of Virginia, Inc. • 2010**
Tom Pagonis 804-794-2500
Spectrum Analyzers
- AVDB Group • 2014**
Maria Cody 720-940-7131
Audio/Video/Lighting & Control
- A-Ware Software/MusicMaster • 2014**
Shane Finch 352-351-3625
Advanced Music Scheduling Solutions
- B&H Photo, Video & Pro Audio • 2016**
Israel Low 212-239-7500 x2962
Broadcast Equipment and Workflow Solutions
- Belden Electronic Division • 1991**
Sales 800-235-3361
Cable and Connectivity
- Black Box • 2014**
Brian Kutchma 724-873-6719
HD-KVM Switching & Extension
- Blackmagic Design • 2012**
Terry Frechette 408-954-0500
Production Switchers, Digital Cameras,
Routers, Video Editing and Monitoring, Color
Correction, Video Converters
- Bracke Manufacturing LLC • 2012**
Patra Largent 949-756-1600
RF & Microwave Components
- Broadcast Devices, Inc. • 2015**
Robert Tarsio 914-737-5032
Audio/RF Support Products
- Broadcast Electronics Inc. • 1978**
Tom Beck 217-224-9600
Radio Equipment Manufacturer
- Broadcast Microwave Services Inc. • 1997**
Jim Kubit 805-581-4566
Manufacturer, Transmitters, Receivers,
Antenna Systems
- Broadcast Software International • 2016**
Marie Summers 888-274-8721
Radio Automation, Audio Logging
- Broadcast Supply Worldwide • 1986**
Shannon Nichols 800-426-8434
Audio Broadcast Equipment Supplier
- Broadcasters General Store • 2004**
Buck Waters 352-622-7700
Broadcast Audio Video Distributor
- Calrec Audio • 2016**
Dave Lewty 805-305-5711
Audio Mixing Equipment
- Canon USA Inc. • 1985**
Larry Thorpe 201-807-3300,
800-321-4388
Broadcast Lenses & Transmission Equipment
- Cavell, Mertz & Associates Inc. • 2011**
Gary Cavell 703-392-9090
Consulting Services
- Comrex Corporation • 1997**
Chris Crump 978-784-1776
Audio & Video Codecs & Telephone Interfaces
- Comsearch • 2004**
Tim Hardy 703-726-5651
Frequency Coordination Services
- Continental Electronics Corporation • 1976**
Michael Troje 800-733-5011
AM & FM IBOC Transmitters
- CueScript • 2014**
Michael Accardi 203-763-4030
Teleprompting Software & Hardware
- Dakota Lighting Supply • 2015**
Randy Doremus 303-748-6241
FAA/Obstruction Lighting Products
- Davicom, Division of Comlab, Inc. • 2014**
John Ahern 418-682-3380
Remote Site Monitoring and Control Systems
- DEVA Broadcast • 2015**
Todor Ivanov 305-767-1207
Monitors, IP Audio Codecs, RDS/RBDS
Encoders, Audio Processors, Broadcast Tools
- Dialight Corporation • 2006**
US Headquarters 732-919-3119
FAA Obstruct. Lighting, LED Based
- Dielectric • 1995**
Cory Edwards 207-655-8131
TV & FM Transmission & Cellular Products
- Digital Alert Systems, LLC • 2005**
Bill Robertson 585-765-1155
Emergency Alert Systems
- DoubleRadius, Inc. • 2012**
Jeffrey Holdenrid 704-927-6085
IP Microwave STL
- Drake Lighting • 2015**
Dave Sheppard 270-804-7383
FAA Obstruction Lighting - Medium and High
Intensity
- DTS Inc./HD Radio Technology • 2014**
Rick Greenhut 443-539-4335
HD Radio Technology
- du Treil, Lundin & Rackley, Inc. • 1985**
Jeff Reynolds 941-329-6000
Consulting Engineers
- The Durst Org. - 4 Times Square • 2004**
John M. Lyons, CPBE 212-997-5508
TV/FM/Microwave Tower Site
- DVEO - Division of Computer Modules Inc. • 2011**
Laszlo Zoltan 858-613-1818
Everything About Transport Streams
- e2v • 1997**
Dominic Piarulli 914-593-6828
Electronic Components
- Econco • 1980**
Debbie Storz 800-532-6626,
530-662-7553
New & Rebuilt Transmitting Tubes
- Emerson Network Power/Avocet • 2014**
George Morgan 917-592-0956
Avocet High Performance KVM
- ENCO Systems Inc. • 2003**
Ken Frommert 800-362-6797
Playout and Automation Solutions
- ERI - Electronics Research • 1990**
David White 812-925-6000
Broadcast Antennas, Transmission Line,
Filters/Combiners, Towers and Services
- Fiber Group Inc. • 2016**
Dennis Ford 336-859-2031
Fiber, Video, Satellite and Drone Products
- Floral Systems • 2008**
Shawn Maynard 877-774-1058
Television Broadcast Automation
- Frontline Communications • 2015**
Tracy Brink 727-280-8843
Broadcast Vehicle Manufacturer
- Fujifilm/Fujinon • 1986**
Gordon Tubbs 973-686-2769
Broadcast & Cine Lens Products
- GatesAir • 1977**
Dave Hopson (TV) 513-445-5243
Mark Goins (Radio) 513-899-9124
Broadcast Equipment Manufacturer
- Geppo/General Cable • 1995**
Mike Vivian 859-572-8000
Innovative Cabling & Custom Solutions
- Graham Brock, Inc. • 2012**
R. Stuart Graham 912-638-8028
Technical Consultation - Radio/TV
- Harmonic Inc. • 2014**
Matt Tietze 301-537-6288
Video Compression and Processing
- Heartland Video Systems, Inc. • 2011**
Dennis Klas 920-893-4204
Systems Integrator
- Hilights, Inc. • 2016**
Richard Hickey 352-564-8830
Obstruction Lighting Maintenance
- Hitachi Kokusai Electric Comark • 2013**
Jack McNulty 860-763-1100
Manufacturer Broadcasting Transmission
Equipment
- IEWC • 2014**
Matt Granard 425-286-1900
Global Connectivity Solution Provider
- Image Video • 1997**
Zach Wilkie 416-750-8872 x228
Under Monitor Tally Display Systems,
Monitor Design and Manufacture Broadcast
Equipment
- Inovonics Inc. • 2012**
Gary Luhrman 831-458-0552
Radio Broadcast Equipment
- Integrated Microwave Technologies • 2009**
John Payne 908-852-3700
Wireless Video Systems
- JAMPRO Antennas Inc. • 2011**
Alex Perchevitch 916-383-1177
DTV, FM-HD Radio, DVB-T/T2, ISDB-T, DAB
- JVC Professional Video • 2014**
Lon Mass 973-317-5117
Professional Video Products, Camcorders,
Display Monitors, Recording Decks
- Ka You Systems • 2011**
George Gimourginas 301-585-4302
Audio, Video, IP - Satellite
- Kathrein USA Inc. • 1985**
Les Kutasi 214-238-8835
Antennas for Broadcasting & Communications
- Kintronc Labs, Inc. • 2015**
Joaquin Raventos 423-878-3141
Radio Broadcast Antenna Systems - ISO9001
Registered Company
- LBA Technology Inc. • 2002**
Javier Castillo 252-757-0279
AM/MW Antenna Equipment & Systems
- LYNX Technik • 2007**
Steve Russell 661-251-8600
Broadcast Terminal Equipment Manufacturer
- Markertek • 2002**
Wesley Brewer 800-522-2025
Specialized Broadcast & Pro-Audio Supplier
- Maxell Corporation of America • 1991**
Al Dripchak 973-653-2414
Data/Broadcast Video Media
- Micronet Communications Inc. • 2005**
Jeremy Lewis 972-422-7200
Coordination Services/Frequency Planning
- Microtech Gefell GmbH • 2016**
Michael Militzer +49 36649-82245
Microphones
- Microwave Video Systems • 2011**
Warren J. Parece 781-665-6600
Microwave Equipment Rental, Sales & Service
- Middle Atlantic Products • 2005**
David Amoscato 973-839-1011
Equipment, Mounting, Solutions
- Midtown Video • 2016**
Jesse Miller 305-669-1117
Complete Studio Production Support
- Midwest Digital Corp. • 2015**
Brian Falatovich 708-790-4040
New and Used Broadcast Sales
- MoreCom Inc. • 2009**
Kyle Moorehead 763-533-5535
Networking & AV Construction
- Moseley Associates Inc. • 1977**
Bill Gould 805-968-9621 x785
Digital STLs for Radio and Television
- Nascar Productions • 2014**
Abbey Kielcheski 704-348-7131
Live/Post Production Services
- National Association of Broadcasters • 1981**
Industry Trade Association 202-429-5340
- National Football League • 1999**
Ralph Beaver 813-282-8612
Game Day Coordination Operations
- Nautel Inc. • 2002**
Jeff Welton 877-662-8835
Radio Broadcast Transmitter Manufacturer
- Nemal Electronics Int'l Inc. • 2011**
Benjamin L. Nemser 305-899-0900
Cables, Connectors, Assemblies and Fiber
Optic
- Neutrik USA, Inc. • 2012**
Kathy Hall 704-972-3050
Ruggedized Optical Fiber Systems
- Orban Labs, Inc. • 2011**
David Rusch 480-403-8300
Audio Processing AMFMTV
- Pasternak Enterprises • 2001**
Christine Hammond 949-261-1920
Coax & Fiber Products
- Pebble Broadcast Systems • 2016**
Kurt Schini 612-345-0461
Television Broadcast Playout Automation
- Potomac Instruments • 2012**
Guy Berry 301-696-5550
RF Measurement Equipment Manufacturer
- ProAudio.com - A Crouse-Kimzey Co. • 2008**
Mark Bradford 800-433-2105 x560
Proaudio Broadcast Equipment Distributor
- Propagation Systems Inc. - PSI • 2010**
Doug Floss 814-472-5540
Quality Broadcast Antenna Systems
- Quintech Electronics and Communications Inc. • 2002**
James Herbstritt 724-349-1412
State-of-the-art RF Hardware Solutions
- QVC • 2011**
Kevin Wainwright 484-701-3431
Multimedia Retailer
- Radio Frequency Systems • 2015**
Scott Martin 812-589-4755
Broadcast & Telecom Antennas & Systems
- RCS • 2003**
Diana Stokey 308-284-3007
Audio and Video Content Management
- RDL • 2004**
David Zovod 928-778-9678 x104
Audio, Video, Control & Test Equipment
Manufacturer
- RF Specialties Group • 2008**
www.rfspecialties.com
Everything from the Microphone to the
Antenna
- Rohde & Schwarz • 2003**
Walt Gumbert 724-693-8171
Transmitters, Test & Measurement, Video
- Servers & Storage
- Ross Video Ltd. • 2000**
Jared Schatz 613-228-0688
Manufacturer, Television Broadcast Equipment
- Sage Alerting Systems Inc. • 2010**
Gerald LeBow 914-872-4069
Emergency Alert Systems Products
- SCMS Inc. • 2000**
Bob Cauthen 800-438-6040
Audio and RF Broadcast Equipment Supplier
- Seacomm Erectors, Inc. • 1997**
John Breckenridge 360-793-6564
Tower/Antenna Erections
- SEG • 2014**
Chris Childs 913-324-6004
Supply Chain Products and Services
- Shively Labs • 1996**
Dale Ladner 888-SHIVELY
FM Antennas & Combiners
- Shure Incorporated • 2012**
Bill Ostry 847-600-6282
Microphones, Wireless Systems, Headsets
- Sierra Automated Systems and Eng. Inc. • 2011**
Al Saici 818-840-6749
Routers, Mixers, Consoles, Intercoms
- Signiant • 2012**
Steve Gillen 781-221-4000
Accelerated File Transfer Solution
- Silvus Technologies • 2015**
Mark Tommey 617-816-6588
Wireless Video Mesh Network
- Snell Advanced Media • 1995**
John Shike 818-556-2616
Video Equipment Manufacturer
- Solid State Logic • 2014**
Steve Zaretsky 212-315-1111
Digital Audio Mixing Consoles, Networked
Audio Routing, Embedded Audio Solutions
- Staco Energy Products Co. • 2010**
Paul Heiligenberg 937-253-1191 x128
Manufacturer of Voltage Regulators, UPS
- Sutro Tower Inc. • 1989**
Eric Dausman 415-681-8850
Broadcast Tower Leasing
- The Switch • 2011**
Peter Hartz 323-645-8011
Fiber Transmission Provider
- Tektronix Inc. • 1977**
Jim Lang 503-627-2980
Video Test & Measurement, Equipment
Manufacturer
- Telematics Inc. • 2016**
Anthony Cuomo 201-848-9818
Camera Robotic Control Systems
- Telos Systems/Omnia/Axia • 2003**
Denny Sanders 216-241-7225
Telos Systems Talk-Show Systems
- Teradek • 2011**
Jon Landman 949-743-5783
Camera-top ENG Solutions
- Terrestrial Inc. • 2003**
Billie Layman 888-373-4832
FCC Broadcast Auxiliary Licensing Services
- Tieline The Codec Company • 2003**
John Lackness or Jacob Daniluck
317-845-8000
POTS, ISDN, Codecs & A/V Products
- Unimar Inc. • 2001**
Thad Fink 315-699-4400, 813-943-4322
Tower Obstruction Lighting Designer,
Manufacturer, Distributor
- Vislink Inc. • 1991**
Mike Payne 978-671-5700
Video Microwave Systems and Services
- Volicon • 2015**
Russell Wise 781-221-7400
Media Intelligence and Logging Solutions
- Wheatstone • 2010**
Jay Tyler 252-638-7000
IP Consoles, Routers & Processors
- WideOrbit • 2012**
Brad Young 214-923-6337
Broadcast Management Software, Automation
and Master Control
- Wireless Infrastructure Services • 2006**
Travis Donahue 951-371-4900
Repacking Services - West Coast Turnkey
Services
- WnewTech Corporation • 2014**
Luiz Santiago 310-220-5664
Systems Integration

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Member Spotlight: Bob Hinkle

Member Stats

SBE Member Since: 1978
Certifications: CSTE, SBE Accredited Frequency Coordinator
Chapter: 35 Kentucky
Employer: WAVE-TV, subsidiary of Raycom Media
Position: Engineering Manager
Location: Louisville, KY
I'm Best Known For: Dealing with RF, audio and chief operator duties.

Q What do you value most about your involvement in the SBE?

A The SBE EAS Exchange, frequency coordinator emails, *The Signal*, local chapter meetings, educational opportunities and professional networking.

Q What got you started in broadcast engineering?

A I began with an interest in shortwave listening and then AM band DXing. At 11 I read anything I could find regarding electronics. High school chemistry required science fair involvement and the inspiration to build a CO₂ laser. After high school I attended Jefferson Technical College for a two-year degree and obtained my FCC First Class license. I spent a couple years repairing stereos, TVs, and CBs. In 1979, I took a position at the independent UHF station WDRB. There was also a short time spent at WLKY. In 1988 I moved to WAVE-TV.



Hinkle with the old WAVE logo from about 1960. WAVE-TV dates to 1948.

Q Who do you admire or consider a mentor?

A There are several who shaped my career. One who not only influenced my career but the way I respect life is Gil Lochner. He is a very respected man in all ways. Now in his 70s and retired from WLKY, he still comes out and loves to do the big remote productions.

Q What do you like most about your job?

A In this business you get to put forth your best for the team and see the results of your efforts. At the same time, you are utilizing

your enthusiasm of electronics experience.

Q When I'm not working I...

A ...used to be involved in photography and electronics. Now I have a deeper purpose: a daughter (Jinny), a girlfriend (Sherry), and a parent (Mom) with Parkinson's.

Q You may not know this, but...

A ... in 2010, my doctors found I needed a quadruple bypass. Without that I would not have lived to see my daughter graduate college. She now has a bachelor's degree in animation working for TinyMonsterStudios in Atlanta.

Recognize Excellence: SBE Awards

By Mike Hendrickson, CPBE, CBNT
Awards Committee Chair

The time has come to nominate SBE members and chapters for SBE awards. Please consider your chapter and chapter members when you think about these awards. There may be an individual in your chapter who has been an outstanding engineer, educator or mentor for new broadcast engineers. Recognize that person by nominating him or her for the Robert W. Flanders SBE Engineer of the Year and the James C. Wulliman SBE Educator of the Year awards.

Perhaps someone has written a notable technical article or presented a technical paper at a meeting. The SBE Freedom Award recognizes an individual or group that has performed extraordinary service to the United States through the use of media technology. For the hardware and software side, the SBE Technology Award recognizes the person, group, or company that has developed innovative new technology or systems for media technology.

These are a few of the awards that are presented each year by the SBE. Of the 13 awards that are presented each year, the local chapter or SBE member nominates for 10 of them.

Many SBE members are highly qualified and deserving of recognition. Likewise, many chapters do an excellent job promoting the ideals and goals

of the SBE. I urge you to nominate these members and chapters so they can receive the recognition they deserve. Nominate someone or a chapter today.

Find all the details on the SBE awards at sbe.org/awards. If you have any questions or need further information, please contact Certification Director Megan Clappe at mclappe@sbe.org or me at mhendrickson@sbe.org.

SBE Awards Program Individual Awards

Robert W. Flanders SBE Engineer of the Year
James C. Wulliman SBE Educator of the Year
SBE Technology Award
SBE Freedom Award
Best Technical Article, Paper or Program by an SBE Member
Best Technical Article, Paper or Program by an SBE Student Member

Chapter Awards

SBE Chapter Engineer of the Year
Best SBE Chapter Communication
Best SBE Chapter or Regional Educational Event
Facility Innovation of the Year
SBE Chapter with Greatest Percentage Growth of New Members
SBE Chapter with Highest Percentage of SBE Certified Members
SBE Chapter with Highest Percentage of Member Attendance at Meetings



Registration Open for SBE Leadership Development Course

The highly acclaimed SBE Leadership Development Course returns to Atlanta, GA, on Aug. 8-10. Returning to instruct the course will be Rodney Vandever, professional leadership and management trainer and a professor of organizational leadership and supervision at Purdue University.

The SBE has presented the SBE Leadership Development Course since 1997. The course originally began in 1965, sponsored by the National Association of Broadcasters. The intense course is designed specifically for broadcast engineers who have or aspire to have management responsibilities. It helps technically adept people acquire and develop skills of sound leadership, supervision and management skills.

The SBE Leadership Development Course is equally beneficial for those who are already in management and for those without prior management or supervisory experience. The three-day event challenges attendees to refine leadership skills and better understand and improve interaction with others. A number of broadcast companies have regularly sent one or more employees to the course each year to experience this highly interactive and educational event.



Students at work during the 2016 Leadership Development Course

Registration includes all course materials, three days of instruction, a certificate of completion, light breakfast items each day and classroom beverages. SBE Members receive a discount on registration. Each person registered will also have free access to the SBE Leadership Development webinar series that consists of three webinars covering leadership, communication and motivation. The webinar series is also led by Vandever.

Registration is available online now at sbe.org/ldc or by contacting Cathy Orosz (corosz@sbe.org, or 317-846-9000) at the SBE National Office. The course will be held at the Hyatt Place Atlanta Airport South. The SBE has reserved a block of rooms for course participants. Make your hotel reservations directly with the hotel by calling 770-994-2997.

SBE Fellow Nominations Are Open

by Troy Pennington, CSRE, CBNT
Chair, SBE Fellowship Committee

There is still time to recognize a broadcasting peer who has contributed to the success of an SBE chapter or broadcasting. The membership grade of SBE Fellow is the highest in the society, and it honors those who have exhibited a dedication to the advancement of the broadcast engineer, the field of broadcast engineering and the Society of Broadcast Engineers itself. To date, 79 members have been recognized with the honor in the society's more than 50 years of existence.

To nominate a member, candidates must be proposed in writing by a voting SBE member to the Fellowship Committee. The nomination must include a comprehensive professional history of the nominee and an explanation of why the candidate is deserving of this honor. The nomination must also include the written endorsements of at least five other voting SBE members. Nominations are confidential. No others besides the nominators and the members of the Fellowship Committee should be aware of the nomination. The nominee should not know that he or she has been nominated.

Nominations for 2017 must be received no later than March 17, 2017, for consideration. The Fellowship Committee will bring the names of nominees to the Board of Directors for consideration and election at the April 2017 meeting. The SBE secretary will notify those elected. Awards will be presented at the SBE National Awards Dinner during the 2017 SBE National Meeting to be held in Denver.

Submit your nominations to: Fellowship Committee Chair Troy Pennington, CSRE, CBNT; 6156 Hampton Hall Way; Hermitage, TN 37076; or to tpennington@sbe.org.

WELCOME TO THE SBE

NEW MEMBERS

Michael S. Arnold - Nashville, TN
Geourg M. Bashour - Skokie, IL
Michael D. Baxter - Norfolk, VA
Michael L. Bohlingner - Ewing, NJ
Adam Brown - Reno, NV
John Canant - Katy, TX
Brian Darragh - Tampa, FL
Nicole M. Fantozzi - Rhodesdale, MD
James Fining - Staten Island, NY
Tony Fiorella - Canyon Country, CA
Jake Ford - Winder, GA
Benjamin Garverick - New York, NY
David Grice - El Paso, TX
Alex M. Hartman - St. Cloud, MN
Timmy Hartman - Lacassine, LA
Michael C. Holcepl - Glenn Dale, MD
Jason R. Jones - Corona, CA
Robert King - Wesley Chapel, FL
Michelle King - Lewiston, ID
James Lidberg - Mesa, AZ
Andrew C. MacAllister - Houston, TX
Sam A. Mike - New Port Richey, FL
Stephen D. Palau - Riverside, CA
Allen T. Perry - Chardon, OH
John J. Saunders - Boonsboro, MD
Greg Schumacher - Waterloo, ON
Bradley E. Selke - Sugar Land, TX
Oscar Serrano - Florence, MA
Sarvesh Shah - Fords, NJ
Jeff Snyder - Elkhart, IN
Joseph F. Sweeney - Natick, MA
Zachary M. Tice - Colorado Springs, CO
Louis J. Volino - Rochester, NY
Todd TS Washburn - Norfolk, VA
Eric Wilkerson - Studio City, CA
David L. Williams - San Jose, CA

RETURNING MEMBERS

Michael A. Barnes - St. Helens, OR
Ed Boyer - Kissimmee, FL
David J. Gardner - Springtown, PA
Carl L. Lewandowski - Pottstown, PA
Dan L. Magden - Shoreline, WA
Jaime Martinez - West Palm Beach, FL
Patrick L. Person - Bothell, WA
Janice D. Reyes - Fresno, CA
Theodore R. Stewart - Silver Spring, MD
Curzon W. Thompson - Clearwater, FL
Ryan J. Tobin - Wexford, PA
James B. Vest - Sanford, NC

NEW STUDENT MEMBERS

Larry L. Aegerter - Federal Way, WA
Chi Kin David Au - Ma On Shan, NT, Hong Kong
Paige K. Blackcloud - Augusta, GA
Ka Chun Chiu - Shatin, NT, Hong Kong
Sek Hung Fung - Shatin, NT, Hong Kong
Eric Hurtado - Severn, MD
Kin Hei Leung - Sham Shui Po, Hong Kong
Yin Sheng Liang - Shatin, NT, Hong Kong
Sze Leong Liu - Tai Po, NT, Hong Kong
Ching Man Ma - Hong Kong
Wing Kong Ng - Tai Po, NT, Hong Kong
Eleazer Perez - Worcester, MA
Ka Wai Tai - Fanling, NT, Hong Kong
Nok Hin Tam - Shatin, NT, Hong Kong
Chak Yuen Tang - Ma On Shan, NT, Hong Kong
Lok Man Tsui - Shatin, NT, Hong Kong
Kwok San Wong - Fanling, NT, Hong Kong
Ka Lim Yuen - KLN, Hong Kong

NEW ASSOCIATE MEMBERS

Bernardo J. Mora - Modesto, CA

NEW YOUTH MEMBERS

Lindsay N. Cameron - Macomb, MI

RETURNING STUDENT MEMBERS

Andrew Wagner - Arlington, VA

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MEMBERS ON THE MOVE



▶ **Tim Anderson**, CPBE, DRB, CBNE, is now a first officer with CommutAir/United Express, a regional carrier for United Airlines.

▶ **Doug Irwin**, CPBE, AMD, DRB, is now VP of engineering for iHeartMedia Los Angeles region.



▶ **Peter Sockett**, director of engineering and operations, Capital Broadcast Company, has been elected to the ATSC board of directors.



▶ **Theran Davis**, CBTE, CBNT, is now senior product manager, occasional use, at Inletsat.



▶ **Cris Alexander**, CPBE, AMD, DRB, DOE of Crawford Broadcasting, is now technical editor of *Radio World Engineering Extra*. He replaces

Rich Rarey, CEA, CBNT, who has stepped down from that role to focus on his consulting business, Rareworks.



MARK YOUR CALENDAR

SBE Membership Drive

March 1, 2017

Drive runs until May 31, 2017.

sbe.org

SBE Compensation Survey

online

April 1 - May 16, 2017

sbe.org

NAB Show

Las Vegas, NV

April 22 - 27, 2017

nabshow.com

SBE Certification Exams

NAB Show

April 25, 2017

sbe.org/certification

Application deadline is March 17, 2017.

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

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