



Ennes Workshop Opens 2016 NAB Show

by Fred Baumgartner, CPBE; TV Product Manager, Nautel

On Saturday, April 16 at 8 a.m. at the Las Vegas Convention Center, the SBE's annual Ennes Workshop educational program at the NAB Show takes flight for the 21st time. Attendance requires a full NAB convention registration (available at a discount to SBE members) or either a PBS Technon or NPR APRE registration and badge.

The Ennes Workshop at the NAB Show has always addressed what broadcast engineers most needed to know to be successful. The presenters are the best teachers, recruited specifically to address the topics at hand. The 2015 Workshop was so popular, an additional room was opened to handle the crowd overflow.

When we began programming this year, we knew immersive sound, unmanned aircraft systems (a.k.a. drones) for broadcast, some advancements in terrestrial radio

and Ultra High Definition TV would need to be addressed. Frankly, we first dismissed ATSC 3.0 as neither ready to look under the hood (least of all start building towards) and likely a little over glorified. We've since changed our view.

ATSC 3.0 is moving fast because it is one of those rare disruptive technologies that makes a quantum step forward and replaces the broadcast TV we know with a more effective and profitable platform. We are accustomed to incremental improvements in technology that are often hyped with great fanfare only to quickly fade. Still, there are broadcast technologies that profoundly changed



Fred Baumgartner opens the 2015 Ennes Workshop.

broadcast. We are also habituated to the notion that big changes are slow because they require the sluggish spread of all new, often expensive, hardware platforms both in the station and often in the home, car,

see [ENNES](#), p.8

SBE Compensation Survey Coming in April

It's said that if you love your job and your work, the size of your paycheck doesn't matter. While there is an element of philosophical truth to that, most of us still need to earn a decent wage to live. How do you know if your earnings are in line with other professionals in your field or your market?

You can ask around, but that's not really a practical or socially acceptable way to find out. And you may not receive real answers.

To provide a guide to

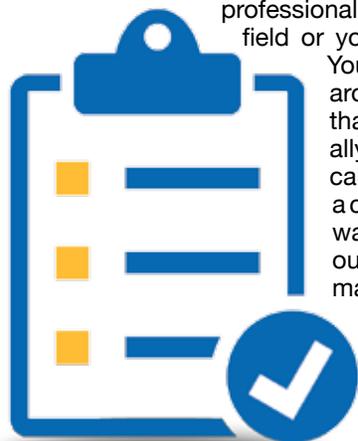
SBE members, the SBE will conduct its first (and ongoing) compensation survey in April. The goal is to provide practical information to SBE members about individual compensation (salary and benefits) based on the type of broadcast or multimedia involvement (beyond just radio and TV), market size and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

There is some compensation data available from other sources, but it is limited to a single service or pulls data from a small survey sample, which can provide misleading results. We encourage every SBE member to participate to provide a large sample base of responses. All responses are anonymous. With your help we can provide a useful and practical resource to SBE members.

Having compensation data is useful if you're applying for a new job, or to simply gauge your current earnings with others in

a similar situation. You'll be able to access the data all year when it is compiled and made available in June.

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



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Entercom Greenville, LLC | Greenville, SC
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iHeart Media - Miami | Boynton Beach, FL
jleifer@sbe.org

SECRETARY

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

TREASURER

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

DIRECTORS

Tim Anderson, CPBE, DRB, CBNE
GatesAir | Mason, OH
tanderson@sbe.org

Benjamin Brinitzer, CPBE, AMD
iHeart Media | Charlotte, NC
bbrinitzer@sbe.org

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

Mike Hendrickson, CPBE, CBNT
Amerian Public Media Group | 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

Gary Kline, CBT, CBNT
Cumulus Media | Atlanta, GA
gkline@sbe.org

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

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

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

Kimberly Sacks, CBT
www.optimod.fm | Lanham, MD
ksacks@sbe.org

Eric Schecter, CBRE
CBS Radio - Phoenix | Phoenix, AZ
eschecter@sbe.org

IMMEDIATE PAST PRESIDENT

Joe Snelson, CPBE, 8-VSB
Meredith Corporation | Henderson, NV
jsnelson@sbe.org

SBE NATIONAL STAFF

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

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

Kristin Owens | Education Director
kowens@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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317-846-9000 www.sbe.org

Recruit a New Member During the SBE Membership Drive

The SBE Membership Drive will kick off on March 1. The theme this year is The Road To Success. With more than 50 years of history, the SBE provides broadcast engineers the best in certification, continuing education, 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 anytime during the year, there's an added benefit 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 attend the SBE National Meeting held in conjunction with the 2016 Ohio Association of Broadcasters Engineering Conference in Columbus, OH, Oct. 26-27.

And as a further bonus, for every new member you sponsor you will receive \$5 off your 2017 dues (up to \$25).



**SBE Membership:
The Road to Success**



Certification Question

Answer on page 6

A circuit with a high input impedance that causes minimum loading on the circuit supplying the signal is a:

- A. Darlington pair.
- B. bridging amplifier.
- C. Cassegrain system.
- D. parametric LNA.



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LETTER FROM THE PRESIDENT

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

Make Your Resolutions Real Goals for 2016

As I write this article, we have just completed our first full work week in 2016. You have likely returned to work following the holidays and have begun planning your work, projects and commitments for the year. Like many, I am sure many of you thought about and made New Year's resolutions, and hopefully some of those were positive resolutions related to the SBE and your profession. Also, I am sure you reflected back on 2015 about your positive and negative experiences, and asked the question, "What could have been done differently?"

As I look back on the SBE in 2015, I see many positive accomplishments that have been made. We continued to offer many training opportunities for you, our members, and have made plans for additional webinars and educational opportunities in 2016. The SBE's Government Relations Committee has been a big advocate for

you in several areas including the closing of the FCC field offices, AM improvements, and wireless mics just to name a few. While the activities and plans for 2016 are being formulated now, the SBE will be there for you this year with the start of the TV repacking, AM improvement translators and continually monitoring how the FCC's new field office structure is working.

What resolutions have you made for 2016? Hopefully you have resolved to either become certified or to add to your certifications. Let me encourage you to consider that if you have not already. What better way to show the engineering community that you have the skills and also to prove it to yourself. Also consider becoming more involved in your local chapter by participating and not just attending the meetings. Volunteer to present a meeting, seek out a new member for your chapter (our annual Membership Drive begins in March, by the way), and encourage all members of your chapter to become certified. It would be great to see your chapter listed in the 2016 top 10 certified chapters wouldn't it?

Let me personally thank you all for your support of the SBE in 2015 and we look forward to your involvement in 2016. As always, we want to hear from you on your thoughts and recommendations so feel free to contact me or any officer or board member.

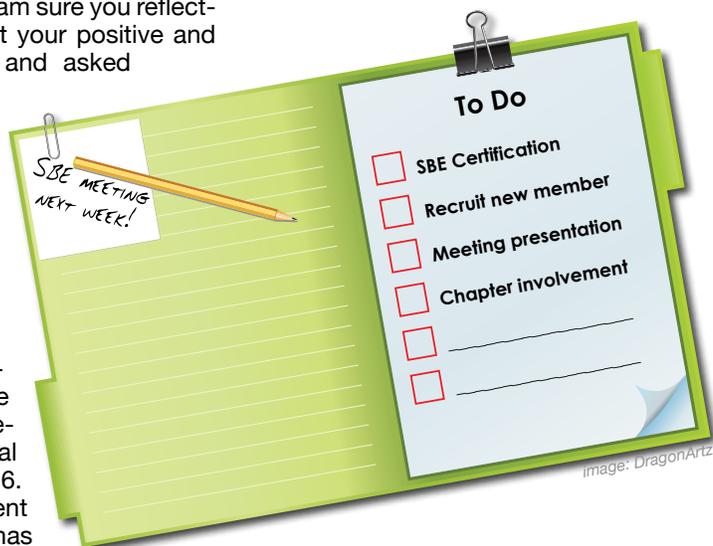


image: DragonArtz

Dues Increased January 1

The SBE Board of Directors approved a dues increase for most members, the first in three years, which took effect on Jan. 1, 2016. Dues for individual members in the Regular, Senior, Associate and Fellow categories increased \$7 to \$82 per year. Sustaining Member dues increased to \$725 per year. Dues for Student and Youth members remain the same.

"The increase will help keep the society's finances in solid shape," said SBE president, Jerry Massey. Massey added, "We've done a good job at managing our expenses but, like any business, our basic operational expenses do increase each year."

Dues from individual members account for about 46 percent of SBE annual revenue, and another 11 percent from Sustaining Member (corporate) member dues. The remaining 43 percent is from non-dues sources including educational courses, certification fees, book sales, and other areas. Massey said, "To maintain and further develop the level of service to members that we have, we need to ensure that we have adequate revenue."

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EDUCATION UPDATE

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

What Are Your Professional Development Goals for 2016?

I am sure you have your New Year's resolutions declared and are now well on the way to achievement rather than being counted as one of those who let their resolutions lapse by February. Losing weight and getting out of debt commonly dominate one's resolution list, but have you thought about your professional development resolutions or goals for the year?

More than 70 percent of one's goals are not achieved. Not achieving desired goals are often attributed to not effectively setting the desired goals. The legendary professor and management consultant, Peter F. Drucker developed the Management by Objectives process more than 50 years ago as a management strategy. An approach to effective goal setting came from Drucker's work and is referred to as the SMART approach. The SMART approach

- S**PECIFIC
- M**EASURABLE
- A**CHIEVABLE
- R**EALISTIC
- T**IME-BASED

states that goals should be specific, measurable, achievable, realistic, and time-based. A specific goal defines exactly what you wish to achieve. A measurable goal allows you to see progress and defines the goal line. An achievable goal is one which you can control the outcome. A realistic goal should provide challenge to achieve growth. And finally, a time limit should be incorporated to remain focused on reaching the desired goal. Ensure 2016 is your year to improve your knowledge and value to the broadcast engineering industry. Ensure you achieve your professional development goals by utilizing an effective approach in goal setting. The SBE offers numerous educational programs to assist your professional development efforts.

Troubleshooting the optical Physical Layer

The December 2015 *Signal* column focused on use of the OSI or Open Systems Interconnection model to form a structured approach to IP network troubleshooting. Eighty percent of network abnormalities are often found at the Physical Layer in terms of defective cabling, often of the unshielded twisted pair (UTP) variety.

The IEEE 802.11 body of Ethernet standards continues to grow as technology advances, often utilizing optical technology to implement faster network speed and increased cabling length between connected devices. Equipment can be commonly found with Gigabit network interfaces implemented with a universal interface that can accommodate a wide range of standard specific transceivers. With this advancing technology comes a move to fiber optic cabling as the physical medium and often presents troubleshooting challenges. The Gigabit Interface Converter (GBIC) was developed to allow a manufacturer to produce a network product with a standardized hardware interface slot and allow the end-user to select an appropriate GBIC transceiver module to match their specific needs with regards to fiber type and/or optical launch power required. The GBIC has largely been replaced by the mini-GBIC or small form pluggable (SFP) optical transceiver module. The SFP module is considerably smaller than the GBIC and allows a higher interface density to be provided on equipment. The

SFP is identical in concept to the GBIC, offered in many varieties to accommodate the network PHY interface needs, but is simply smaller in physical size.

Optical path determination and verification

Optical network path design is similar in concept to RF path design. You begin with a desired receive optical level and work back to the source accommodating for various path loss factors. Or you begin with a source launch power and work towards the receiver accounting for loss factors throughout the path. SFP optical transceivers are chosen based upon the fiber type (multi-mode or single-mode) and launch optical power expressed in dBm. An LED or laser-emitter device will be found based upon the specified power. Loss factors that should be accommodated for include fiber path loss, connector loss, and fusion splice loss. Do not forget to design some margin into the optical path. Fiber loss will range from 3dB/km (multi-mode fiber at 850nm) to 0.4dB/km (single-mode fiber @ 1510nm). Best practice designs recommend utilizing a connector loss and splice loss of 0.3dB. Keep in mind the TIA/EIA specification for maximum fiber connector loss is 0.75dB. Recognize that too much optical light level at the receiver can produce data errors. Most optical receivers require a light level within the range of -27 to -8dBm. Best practical designs recommend that you design for a "sweet spot" or a receiver light level between -23 to -17dBm. When too much signal is found, optical attenuators are used to decrease the optical light level to a suitable level.

Optical power meter measurements are essential to troubleshooting. A handheld optical power meter is the common tool utilized. A typical device allows an optical light level to be measured at various optical wavelengths accommodating the common ITU wavelengths found in products. Common wavelengths include 850nm and 1300nm for multi-mode fiber and 1310nm and 1510nm for single-mode fiber. In a similar manner to twisted-pair cabling test devices, optical time domain reflectometer (OTDR) capability can be found in more expensive test products and useful to certify a installed fiber optical path or provide detailed fault location distance measurements.

Remember, learning is an on-going process for the broadcast engineer. Don't let 2016 slip by without learning a new technology, enhancing your current skills and knowledge, renewing a certification, or adding a certification to your professional portfolio. Continuous learning is a key trait of the successful technology professional and the SBE Education team is at work to bring you quality professional development programs covering relevant broadcast industry topics delivered in different media to meet your needs. Your comments, ideas for future programs, and feedback are always welcome.

SBE Webinars On-Demand

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- White Spaces & Wireless Mics
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- Grounding
- HD Radio
- Antennas
- RF Safety
- ...and more!

sbe.org/webinars

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



CERTIFICATION UPDATE

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

All About SBE Certification

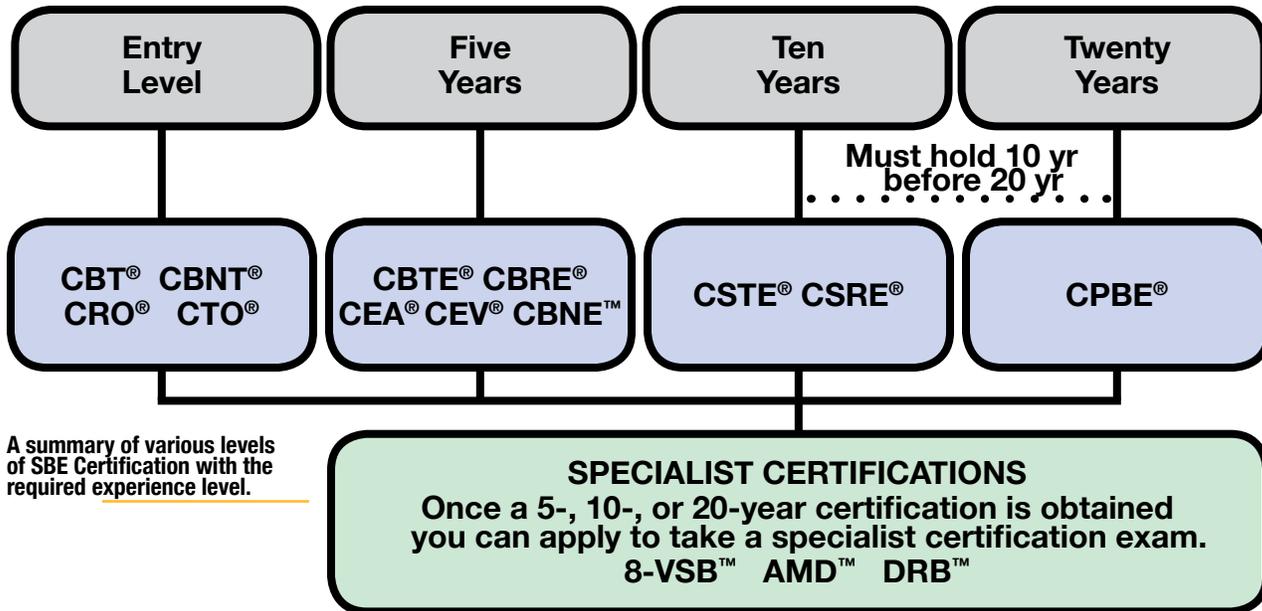
The SBE certification program is the only professional recognition available to broadcast engineers that provides standards of professional competence. It is the primary method of verifying the attainment

Life certification is available to those who are retired or may also be granted to professional broadcast engineers and senior broadcast engineers who have maintained certification continuously for 20 years and

CBRE is replaced with CSRE, which is replaced with CPBE.
CBNT is replaced with CBNE.

Names and abbreviations

All levels of SBE Certification are placed into specific categories as well. Here are those categories.



A summary of various levels of SBE Certification with the required experience level.

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

Technologist Level
Certified Broadcast Technologist® (CBT®)

Broadcast Networking Level
Certified Broadcast Networking Tech-

of educational standards in the industry. SBE President Jerry Massey has made a call to everyone in broadcast engineering and multimedia technology to obtain or advance his or her SBE Certification. Here's some useful information to help you achieve that.

Years of experience

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

are current members of the SBE upon application.

Listing certifications

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

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

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

CBTE is replaced with CSTE, which is replaced with CPBE.

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

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

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



Answer from page 3

B. bridging amplifier.

A terminating load would have the two circuits' output and input impedances being equal so the input draws the maximum current from the source. A bridging load has an input impedance much higher than the source, which draws less current from the source.

SBE Certification Achievements

CONGRATULATIONS

LIFE CERTIFICATION

Certified Professional Broadcast Engineer® (CPBE®)

Paul Boykin, Green Cove Springs, FL - Ch. 42
Jack Davis, Sacramento, CA - Ch. 43
Michael Waldman, Chesterfield, MO - Ch. 55

Certified Audio Engineer® (CEA®)

Arthur Phelps, Blue Springs, MO - Ch. 59

Certified Broadcast Television Engineer™ (CBTE®)

Stewart Romain, Sun City, AZ - Ch. 9

Certified Broadcast Networking Technologist® (CBNT®)

Paul Boykin, Green Cove Springs, FL - Ch. 42
Michael Waldman, Chesterfield, MO - Ch. 55
Certified Broadcast Technologist® (CBT®)
Paul Boykin, Green Cove Springs, FL - Ch. 42

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®)

Rafael Aguillon, Murrieta, CA - Ch. 131
Zachary Brockett, Gran Terrace, CA - Ch. 131

Certified Senior Radio Engineer™ (CSRE®)

Edwin Allen, III, Sarasota, FL - Ch. 39

Certified Broadcast Radio Engineer™ (CBRE®)

Dylan Sjollem, Pinellas Park, FL - Ch. 39

Certified Broadcast Television Engineer™ (CBTE®)

Beau Hilbig, Austin, TX - Ch. 79

Ken Jaquess, Garden Grove, CA - Ch. 47

Certified Audio Engineer® (CEA®)

Gustavo Contreras, Key Biscayne, FL - Ch. 53

Certified Video Engineer® (CEV®)

Andy Parker, Salem, VA - Ch. 78

Certified Broadcast Networking Engineer™ (CBNE™)

Leslie Garrett, Terre Haute, IN - Ch. 25

Cary Smith, Las Vegas, NV - Ch. 128

Michael Streby, Wausau, WI - Ch. 80

Digital Radio Broadcast Specialist™ (DRB™)

Scott Solko, Sacramento, CA - Ch. 43

Certified Broadcast Networking Technologist® (CBNT®)

Emmanuel Cobian, Henderson, NV - Ch. 128

Mohanad Faisal, Syracuse, NY - Ch. 22

Daniel Gurzynski, Tully, NY - Ch. 22

Michael Hancock, Round Rock, TX - Ch. 79

Beau Hilbig, Austin, TX - Ch. 79

Larry Marini, Rexburg, ID - Ch. 145

Certified Broadcast Technologist® (CBT™)

David Leishman, Antelope, CA - Ch. 43

Certified Radio Operator® (CRO®)

Heidi Ferrara, St. Petersburg, FL - Ch. 39

Daniel Mehlhose, Sterling Heights, MI - Ch. 82

Benjamin Willis, Bloomsburg, PA - Ch. 2

Certified Television Operator® (CTO®)

Mike Alessi, Glendale, CA - Ch. 47

Hadley Craddock, Inglewood, CA - Ch. 47

Jason George, Torrance, CA - Ch. 47

Klonaris Ingram, Birmingham, AL - Ch. 68

Jose Ramos, Lake Elsinore, CA - Ch. 131

Nicholas Rieth, Castle Rock, CO - Ch. 48

Paul Wortham, Altair, TX - Ch. 105

SBE CERTIFIED SCHOOL COURSE COMPLETION

Certified Broadcast Technologist® (CBT®) DINFOS

Richard Moser, Forney, TX - Ch. 67
Aissa Thai, Baldwin Park, CA - Ch. 131

CERTIFIED BY LICENSE

Certified Broadcast Technologist® (CBT®)

James Markus, Stamford, CT

Roland Hoffman, Alta Loma, CA - Ch. 131
Tracey Liston, Medina, OH - Ch. 70
Hung Nguyen, Garden Grove, CA - Ch. 47

Nicholas Rieth, Castle Rock, CO - Ch. 48
Philip Shockey, Hempstead, TX

CERTIFIED RADIO OPERATOR® (CRO®)

Alan Gonzalez, Tucson, AZ
St. Ambrose University
Danielle Baresel, Davenport, IA
Jake Hannon, Davenport, IA
Sam Heath, Davenport, IA
Ryan McEvoy, Davenport, IA

Pasadena City College
Joshua Bonilla, Burbank, CA
Daniel Brown, Los Angeles, CA
Samuel Castillo, South El Monte, CA
Nathan Cumplido, Monrovia, CA
Mary Joyce Dungca, Baldwin Park, CA
Mike Garey, Los Angeles, CA

Pasadena City College (cont.)
John Lloyd, Sierra Madre, CA
Parker McDaniels, North Hollywood, CA
Krystal Puma, Los Angeles, CA
Daniel Roa, Montebello, CA
Jennifer Vigil, Pasadena, CA
Nicholas Villalobos, Los Angeles, CA
Brandon Washburn, Chino Hills, CA

CERTIFIED TELEVISION OPERATOR® (CTO®)

Donald Holcomb, Cape Girardeau, MO
James Long, O'Fallon, MO
Derly Ramirez, II, Houston, TX
Jean Seyer, Cape Girardeau, MO
Tammy Wiser, Shasta Lake, CA

DIRECTV
Michael Acosta, Los Angeles, CA
James Beck, Lake Forest, CA
Thoams Decidue, Huntington Beach, CA

DIRECTV
Andrew Lavin, Lawndale, CA
Michael Park, Torrance, CA
Aaron VanDeMortel, Irvine, CA

RECERTIFICATION

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

Certified Professional Broadcast Engineer® (CPBE®)

Andres Diaz, Guaynabo, PR
David Fort, Indianapolis, IN - Ch. 25
Christopher Scherer, Overland Park, KS - Ch. 59
Thomas Woods, Pleasant Hill, OR - Ch. 76

Certified Senior Radio Engineer™ (CSRE®)

Digital Radio Broadcast Specialist™ (DRB™)

Kenneth Colwell, Davenport, IA - Ch. 65

Certified Senior Television Engineer™ (CSTE®)

Thomas Schuessler, Irving, TX - Ch. 67

Certified Senior Radio Television Engineer™ (CSRTE™)

Lewis Ray, South Bend, IN - Ch. 30

Certified Broadcast Radio Television Engineer™ (CBRTE™)

Dave Buckowski, Covis, CA - Ch. 66
Brian Goodman, Eau Claire, WI - Ch. 112

Certified Broadcast Radio Engineer™ (CBRE®)

Richard Barnes, Pasadena, MD - Ch. 46
Nestor Criscio, Montevideo Uruguay
Tim Diehl, Tulsa, OK - Ch. 56
Frank Grundstein, Newtown Square, PA - Ch. 18
Daniel Gurzynski, Tully, NY - Ch. 22

Certified Broadcast Television Engineer™ (CBTE®)

Brent Branley, Sacramento, CA - Ch. 43

Timothy Davis, Fort Worth, TX - Ch. 67

Timothy Mance, Dallas, OR - Ch. 124

David Ericksen, Anchorage, AK - Ch. 89

B. Allan Pullman, Saint Cloud, FL - Ch. 42

Alan Weissman, Williamsville, NY - Ch. 133

Certified Broadcast Television Engineer™ (CBTE®) 8-VSB Specialist™

Patrick Mahon, Roseville, MI - Ch. 82

Certified Broadcast Networking Technologist® (CBNT®)

Jessie Balos, Moreno Valley, CA - Ch. 131

Dave Buckowski, Covis, CA - Ch. 66

Frank Grundstein, Newtown Square, PA - Ch. 18

John Lorentz, E. Citatham, NY - Ch. 15

Patrick Mahon, Roseville, MI - Ch. 82

Art Mistretta, Murrieta, CA - Ch. 131

Christopher Scherer, Overland Park, KS - Ch. 59

Carl Swanson, Washington, DC - Ch. 37

Floyd Turner, Haubstadt, IN - Ch. 121

Certified Broadcast Technologist® (CBT®)

Dennis Kronenberg, Boyds, MD - Ch. 37

James Martin, Richardson, TX - Ch. 67

Robert McCormick, Chicopee, MA - Ch. 11

Michael Parrish, Lakeland, FL - Ch. 42

Elaine Poppell, Saint Johns, FL - Ch. 7

James Sherred, Columbia, NC - Ch. 93

Charles Thomason, Woodstock, GA - Ch. 5

Frank Torbert, Orlando, FL - Ch. 42

Certified Television Operator® (CTO®)

Debra Carroll, Knoxville, TN - Ch. 113

Evelyn Chmura, Reno, NV - Ch. 139

Tom Dailey, Denver, CO - Ch. 48

Mark Flesner, Indianapolis, IN - Ch. 25

Justin Hempstead, Orlando, FL

Rachel Johnson, Milwaukee, WI - Ch. 28

Walter Lopez, Davenport, FL

Gary Makowsky, Cypress, TX - Ch. 105

Shawn Morgan, Riverside, CA

Megan Shaw, Bozeman, MT

Cathy Shimamoto, Los Angeles, CA

Lawrence Smith, Bozeman, MT

Matthew Vinke, Los Angeles, CA

Certified Radio Operator® (CRO®)

Frank Baptista, Westport, MA - Ch. 11

Thomas Haynie, Virginia Beach, VA - Ch. 54

Nominations Open for SBE Awards

Do you know an SBE member or chapter that you believe goes above and beyond the call of duty in his or her job, the broadcasting industry or to the SBE? Often these efforts go unrecognized. Don't let that happen this year. Nominate a deserving individual or SBE chapter for a National SBE Award.

At the end of 2015 the SBE Board of Directors approved some changes and additions to the SBE Awards program to reflect the changes in the industry and to find ways to better recognize you, our members. New for 2016 are two new awards: Facility Innovation of the Year and the Freedom Award. The Facility Innovation of the Year award will recognize a member who has incorporated an innovative idea through technology and/or new media that results in improved facility or operational management. The Freedom Award will recognize an individual or group who has performed extraordinary service to the U.S. through the use of media technology. Candidates will have applied the principles of the SBE in a position that supports our U.S. Armed Forces broadcast initiatives through actions overseas or domestically.

Two other new award categories combine some previous categories to reflect the ongoing changes in broadcast and multimedia technology engineering. Best Chapter or Regional Educational Event



takes the place of the Best Regional Convention or Conference Award. This award has expanded to also include chapter-sponsored seminars, Ennes Workshops and other events that chapters promote and produce that have an educational objective. Best Chapter Communication award combines the Best Chapter Website, Best Social Media Site and Best Chapter Newsletter awards.

Two award categories have been retired: Most Interactive Chapter and Best Frequency Coordination Effort.

The remaining awards are the same: Chapter Engineer of the Year, Best Technical Article, Book or Program by an SBE Member and the Technology Award. Additionally, the top two awards presented each year are the Robert W. Flanders SBE Engineer of the Year and James C. Wulliman SBE Educator of the Year.

To nominate a worthy individual or chapter, go to the SBE website to download and submit the nomination form. Nominations are due by June 15, 2016. Winners will be notified in July and the awards will be presented during the national meeting on Oct. 27.

All the national awards were created to recognize the efforts of members and chapters. For more information contact Megan Clappe at mclappe@sbe.org, 317-846-9000 or go to sbe.org/awards.

ENNES, from p.1

or other device. It's impractical to explain in *The Signal* why ATSC 3.0 has such deep support, few detractors and has the capacity to quickly and deeply change broadcasting and broadcast engineering. ATSC 3.0 is both a bundle of improvements – video, audio and RF – and reinvention of IP, allowing it to be mixed with other IP traffic, which in turn supports interactive media including more profitable advanced advertising and personalized viewing experiences.

The Workshop day

We begin the day with Dr. Richard Chernock, who is synonymous with digital television and chair of the ATSC Technology Group in ATSC 3.0, for a tutorial on what's different and what we'll need to implement this. Skip Pizzi, NAB senior director of new media technologies, is well known for his work in digital audio and educating broadcast engineers and has agreed to familiarize us with immersive audio, a component of ATSC 3.0. It's impossible to experience immersive audio without being fascinated with what this does to the TV experience. Sony's Luke Fay chairs the specialist group on the Physical Layer for ATSC 3.0. This is the first piece of ATSC 3.0 to be released, and it is generally unbound by the

restrictions found in ATSC 1.0. The basic RF distribution of TV in ATSC 3.0 favors the addition of a single frequency network design that penetrates buildings and venues reaching both homes and mobile devices. Fox VP of Spectrum and Advanced Engineering Winston Caldwell talks about the practical design of the RF distribution system. Emergency alerting takes on new capabilities under ATSC 3.0. We have a tutorial from Gates Air's Jay Adrick who chairs the ATSC Advanced Emergency Alerting (AEA) Implementation Team. Moving ATSC 3.0 around via IP is an important part of the equation. Dr. Chernock returns to address the issue, and Merrill Weiss dives into the studio-transmitter link and what is necessary to support, among other things, the SFN distribution network. ATSC 3.0 isn't confined to a 19.54Mb/s payload or an aging codec, so the Super Bowl can be broadcast in Ultra High Definition TV. With UHDTV televisions leaving store shelves, Stan Moote, recently named CTO of the International Association of Broadcast Manufacturers, explains why it isn't so much about pixel count, but what seems like every other imaginable video parameter. Qualcomm's Kent Walker does cellphone 101 for broadcasters. Everything from the

MEMBERS ON THE MOVE

Isaiah Chavez, CBT, CRO, CTO, has been promoted to production tech II at Home Shopping Network in St. Petersburg, FL.



Dave Dybas, CBRE, AMD, is the senior broadcast engineer at Vertical Bridge LLC in Chicago, where he manages the TV, FM and two-way antennas at the Willis Tower. He is also the regional site manager for Vertical Bridge-owned or managed broadcast sites in IL, WI, IA, MN, MO.



Dustin Hapli, CBNE, is now the chief engineer at WMNF-FM, Tampa. Previously he was the operations manager at WUSF Public Media in Tampa.



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

front-end module to how the display affects the mobile piece of ATSC 3.0.

If you have attended the SBE Ennes Workshop before, you know we also travel some interesting side roads in a day. SMPTE will celebrate its 100th year, so executive director Barbara Lange and retiring Director of Standards and Engineering Peter Symes will give us a trip through the last century of moving pictures. Paul Schmutzler proves that he can produce a full remote from a carryon bag in 20 minutes. Nautel engineering's inventive Philipp Schmid looks at what's new and creative in digital radio, where multimedia capability is challenging what we think of broadcasting. Imagine's Senior System Architect John Mailhot takes us through origination in the cloud, our focus of last year, looks like on the ground. And we land with a drone as Scripp WCPO DE Doug Houston follows his passion to bring UASs to broadcast. Somewhere out there is management that correctly thinks the opening Saturday of the NAB Show is just engineers having fun in Vegas.

MORE INFO

ATSC 3.0 and why it's important:
sbe.org/whitepapers

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 an 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 leadership 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 2016 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. 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 chairman of the SBE Nominations Committee, R.J. Russell, CPBE, at rjrussell@sbe.org or 215-982-5310. A slate of nominees will be assembled by the committee by April 29. Other qualified members may be nominated by members in good standing no later than July 12.

The election takes place from July 25 through Aug. 25. The election is held online, but SBE members can opt-out of electronic voting and have a paper ballot mailed to them. Candidates elected will be installed into office during the SBE National Meeting in Columbus, OH, on Oct. 27 in conjunction with the Ohio Association of Broadcasters Engineering Conference.

Nominate an SBE Fellow

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, 76 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 compre-

hensive 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 2016 must be received no later than March 11, 2016, for consideration. The Fellowship Committee will bring the names of nominees to the Board of Directors for consideration and election at the April 2016 meeting. The SBE sec-



SBE Fellows gather at the 2015 National Meeting

retary will notify those elected. Awards will be presented at the SBE National Awards Dinner during the 2016 SBE National Meeting to be held in Columbus, OH.

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

Attend the SBE Leadership Development Course

Save the dates: August 9-11, 2016. The SBE Leadership Development Course returns to Atlanta and will be taught by Rodney Vandever, a 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 began in 1965 through the National Association of Broadcasters. The intense course is designed specifically for broadcast engineers who have or aspire to have management responsibilities. It's designed for technically adept people to acquire and develop the skills for sound leadership, supervisory 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. Several broadcast organizations send a group of students to the course to share the experience of this highly interactive event. Registration includes all course materials, three days of instruction, the Leadership Development Webinar Series of three webinars, a certificate of completion, light breakfast items and classroom beverages. SBE Members receive a discount on registration.

The course will be held at the Hyatt Place Atlanta Airport South. Register online now at sbe.org/ldc or by contacting Kristin Owens (kowens@sbe.org, or



Students work on an assignment at the 2015 class.

317-846-9000) at the National Office.



LEGAL PERSPECTIVE

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

Ambient RF Noise: It Isn't Just an AM Problem

Relative to my recent article about the FCC's lack of focus on the increasing levels of ambient RF noise in the AM Broadcast band (a problem for MF and HF users generally), I received an eye-opener from Steve Johnston, the director of engineering and operations at Wisconsin Public Radio. Steve has studied ambient noise in detail and presented a paper on the impact of ambient noise on FM reception at the NAB Show a few years ago (see link).

Steve noted that the ambient noise problem extends to FM and TV as well as to AM. The nature of FM analog and TV digital reception experience tends to hide the noise, making it more difficult to attribute interference to man-made (typically Part 15 and Part 18 device) sources. However, Steve has noted that the higher noise floor has made the range of FM stations effectively shrink. As an example, Steve noted that a listener to a Wisconsin FM station (in an reception area of quite strong desired signal strength) said that after many years of solid reception, she could no longer pick up the station in her kitchen. When asked if she had any new electronics or appliances, she said she had added a new microwave oven. An on/off test with the oven resulted in suddenly clear reception, all back to normal, with the oven unplugged. She acquired a replacement oven of the same make and model, and experienced the same problem. When exchanged for a product from a different manufacturer, no problem.

In another case, an FM listener put his cellphone and its charger on his bedside table and could no longer hear one of the WPR stations. Steve suggested he move the charging of the cellphone across the room, away from the bedside radio, and reception returned to normal. Steve's colleagues at Wisconsin Public Television report similar incidents experienced by over the air viewers.

I highly recommend reading Steve's paper. His theory was that the growing levels of indoor noise from modern electronics may be masking weaker FM signals – and probably digital HD Radio and HDTV as well. He suspected this ambient noise increase creates the impression that HD Radio and HDTV have difficulty with building penetration and that misperception contributed to the effort to increase digital power. To get a sense of the noise present in the FM band in a variety of indoor situations, Steve made measurements with a portable spectrum analyzer and antenna in

several urban apartments, suburban houses, and urban offices. All were found to have higher noise levels inside than outdoors on the same property.

Growing interference

Surely, most broadcast engineers have heard and responded to reception complaints. Steve, however, has noticed a new trend: that long-time listeners report deteriorating reception over time. In the past five years, Steve found that WPR Audience Services Listener Logs show a 37 percent increase in email and telephone complaints related to reception. Doubtless, this is due to a deteriorating ambient RF environment.

Steve's study of some WPR listener and staff homes used a battery-powered spectrum analyzer and a loop of stiff wire about one-quarter wavelength in circumference on a short length of coaxial cable as a pickup antenna. His goal was to get a better sense of the noise encountered at 88-108MHz in a variety of indoor situations.

The strongest noise sources Steve found inside residences were recently manufactured switch-mode power supplies used for charging batteries in cellphones and digital cameras. Some made a broad hash while others produced a series of noise peaks on discrete frequencies through the band, probably related to the switching frequency. Some HDTV sets and DVD players were also very noisy in the FM band, perhaps due to their power supplies as well. Personal computers, digital clocks and telephones were quite noisy in the FM band also. In urban apartments, ambient noise was found to be much higher than the background level in the parking lots outside. Fewer square feet of space meant the noise sources were more concentrated than in the single-family residences. Steve found a similar array of noise sources, though, and a similar increase in the overall noise from outside in the driveway to indoors.

Within urban office structures, Steve found a bad combination of significant attenuation of the desired FM signals and high noise levels indoors. Specific causes of the noise in this environment were harder to identify, likely because of the number of contributors on various floors and rooms, with reflection and multipath propagation on the noise signals from the metallic structures, all of which tend to blur the source.

Amateur Radio operators are typically able to avoid purchasing Part 15 or Part 18 devices for use in their own homes (though they have no control over their neighbors' purchases of RF noise contributors). That level of awareness is not present with all or most non-technical broadcast listeners, however. Concern about this problem tends to be focused on the HF and MF bands on the theory that ambient RF noise increases are principally a problem for AM broadcasters, radio amateurs and other HF and MF band users. Steve has convincingly established qualitatively that the problem extends to FM and TV broadcast reception as well. It is time for FCC to sit up and take notice, because once the contributing devices are deployed, there is no turning back.

LINK

Steve Johnson's Ambient Noise Paper
www.wd8das.net/nab-paper.pdf

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FOCUS ON SBE

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

Make Your Membership Count

We are only a month into 2016. If you asked yourself, “Am I making the most of my SBE membership?”, what would your answer be? Broadcast engineers today are as busy as ever. Many of you would say the busiest you’ve ever been. There are fewer hands but with more responsibilities. But it’s never been a more important time than today to make time for your own professional development. Technology advances, changes in content delivery systems, regulatory changes, sales of stations and entire station groups, all combine to make keeping yourself at the top of your professional game a must.

Looking at the months ahead, the SBE has many opportunities for members who want to continue to develop professionally and even personally. We are eagerly anticipating the release of the *SBE Broadcast Engineering Handbook: Hands-on Guide to Station Design and Maintenance*, edited by Jerry Whitaker and the SBE and published by McGraw-Hill. At roughly 1,000 pages and covering the gamut of broadcast engineering and technology topics, it is sure to become a valued resource for you. More than 40 subject matter experts have contributed to this comprehensive volume. We expect an April release.

For those able to attend the annual NAB Show in Las Vegas, April 16-21, the NAB Broadcast Engineering Conference will provide dozens of technical sessions, including the full-day SBE Ennes Program on Saturday, April 16 (look for the Ennes speaker and topic lineup on page 1 in this issue of *The Signal*). The SBE will also hold its regular Spring Membership Meeting on Tuesday, April 19 at 5:30 p.m., followed immediately by a free member reception.

To help you navigate the show, the SBE will include a special insert in the April issue of *The Signal* featuring SBE Sustaining Member companies that will be exhibiting.

In March and April, the SBE, for the first time, will conduct a compensation survey of SBE members. The results will be provided to members and will be helpful for your own personal or company planning.

The SBE Education Department is planning a full slate of new webinars, Ennes Workshops and other programs that cover a variety of topics of interest. Webinars on information technology for broadcasters, RF safety, ATSC 3.0 (in cooperation with ATSC) and others are in the works. There are 40 archived webinars also available to you at the SBE website, 24/7/366. Regional Ennes Workshops so far are planned for El Paso, TX (May) and Columbia, MO (August), with South Florida and others to be added later. The SBE will also present the SBE Leadership Development Course, August 9-11 in Atlanta, designed for those who have, or aspire to have, engineering management responsibilities.

Of course, opportunities to use your knowledge and experience to become SBE certified are available all year-long. SBE certification is the best way to indicate to your colleagues, employer or clients that you are a professional in your field. With 15 different SBE certifications, there are one or more that match your level of experience and knowledge.

You can take in the SBE National Meeting on Oct. 26-27, being held in conjunction with the Ohio Association of Broadcasters’ Broadcast Engineering Conference in Columbus, OH.

And lastly, the most effective way for many of you to make the



Members of Chapter 26 Chicago tour Fermi Labs.

most of your membership is to attend monthly meetings of your local SBE chapter. You’ll have opportunities to develop professional and personal friendships with fellow media engineers and technicians and gain knowledge from the educational programming that chapters provide.

I hope you will choose to make the most of your SBE membership this year by making time to participate in events, courses and programs that will help you meet the professional goals you’ve set for yourself.

Member renewal

About the time you are reading this issue of *The Signal*, you will be receiving your annual membership renewal invitation. I hope you will renew your membership at your first opportunity, either on-line at the SBE website or through the mail or by fax. I also ask you to encourage at least one colleague who is not currently a member to join the SBE this year. No matter what career stage he or she may be in, a newcomer or an experienced veteran, the SBE has something that will benefit them.

A good way to start is to invite them to a chapter meeting or suggest they sign up for one of the many webinars the SBE offers. You’ll be doing them a favor and the SBE as well.

Passing of an industry icon

We were saddened to hear of the death of George Marti in December. A giant in our industry and a giant in Texas and his home town of Cleburne, his life touched so many in positive ways. His remote pickup (RPU) equipment became ubiquitous in the radio industry. The SBE was fortunate to have Marti Electronics as a Sustaining Member until 1994, when Marti sold the business to Broadcast Electronics, another long-time SBE member. The SBE extends its condolences to the Marti family and friends.



George Marti



Engineering Perspective

By Chris Tarr, CSRE, DRB, CBNE
Director of Engineering, Entercom Wisconsin
chris@tarr.cc

Spring Is A Good Time for a Check-up

We're near that time of year again when the discussion turns to spring cleaning. If you're in a warmer climate, this likely means less than for those in the north (myself included) who have spent our winter staying inside as much as possible and are ready to get out of the house!

Metaphors aside, the change in seasons is a good time to think about routine maintenance and making sure your transmitter sites are ready to go for the coming year. Instead of going right in to the physical maintenance, I'll start with regulatory maintenance. Often we don't pay much attention to the regulatory issues of our stations until we have to. Sometimes that's already too late.

As part of your spring routine, get a copy of the FCC self-inspection checklist. There is one for each type of broadcast service. Go through your studio and transmitter sites, and run through the checklist. Did you notice there isn't a "No" option to the

questions? That's the FCC's way of telling you that compliance is mandatory, and you'll need to correct the issue.

On to the Public File. Here's something that is commonly overlooked: Does your receptionist know how to handle a request to inspect the file? You'd be surprised how many don't. As you check the public file to make sure the contents are current, are there any documents that are no longer needed? A common comment during a Public File inspection is that there are often more documents than necessary in the file. I usually have a cheat sheet with me that details the rules for each section and the required retention period. This helps me determine what can be weeded out. Do you have EAS handbooks conspicuously posted where necessary? Be sure to ask your control room staff if they know how to run a weekly test. Have them describe the steps for you to make sure they understand.

As you're running down the checklist, think about the items that are related to the questions: Do you have all the current licenses and authorizations posted at the control point? What about at the transmitter site? Were there any renewals or changes in the authorizations? Often those get put in the Public File right away, but never seem to make it to the transmitter site.

Take it outside

From there, we can easily move to the physical aspects of spring cleaning. Take the time to go around and check your tower fences. Are they in good condition and locked? What about lighting and paint? Do all the tower appurtenances and associated cables look secure? Better yet, do you have it all properly documented? Are the tower bases cleared of debris? Are all appropriate signs (warnings and registration) still posted?

Walk around the building itself. Have any wildlife visitors taken up residence? If you can easily get up there, look at the roof as well. Do you have satellite dishes? Has anything worked itself loose over the winter?

Head into the transmitter building. Are there any transmitter alarms that need to be cleared? If so, be sure to investigate why. Look around and make sure you have all of the equipment documentation and manuals available for those late night problems. If you're measuring power using the indirect method does the math add up? Has something changed in the efficiency of the transmitter? Do you have a chart or efficiency factor posted to make it easy to determine your power output?

While you're in there, check the calibration of the remote control. Is it accurate? Take some time to make sure the proper numbers are programmed, and that the limit monitors are set properly so that you're promptly notified of an out-of-tolerance condition.

Since we're poking around, take some time to check temperature sensors and other building security features for proper operation. Is the site clean? Make sure to take out the trash and make sure tools are put away. While you're there, take note of whether or not you're due for some PM on the HVAC units. If you have a generator, make sure the fuel tank is topped off and that it's up-to-date on maintenance.

These are really just thought starters. Every site is different and has different needs. The point is to come up with your own spring-cleaning site checklist and bring that along with the FCC checklist when you head out. With all that we do, site maintenance and compliance often gets pushed to the back burner while we try to keep the wheels moving. Of course, compliance is something we need to strive for every single day, but the reality is that paperwork often gets stale and we overlook minor things. Taking the time once or twice a year to do a deep dive is not only a great way to ensure compliance and make sure your operation is in peak condition, but it's also a good way to get a good understanding of FCC rules and regulations.

FCC Self-Inspection Checklists

transition.fcc.gov/eb/bc-chklists/



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Peter A. Starke 781-461-6780
Development/Construction/Management
- 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
- Avid Technology • 2011**
Rich Griffin 303-248-3259
Broadcast Products and Services
- A-Ware Software/MusicMaster • 2014**
Shane Finch 352-351-3625
Advanced Music Scheduling Solutions
- Belden Electronic Division • 1991**
Steve Lampen 800-235-3361
Cable and Connectivity
- Black Box • 2014**
Brian Kutchna 724-873-6719
HD-KVM Switching & Extension
- Blackmagic Design • 2012**
Terry Frechette 978-337-0991
Switchers, Digital Cameras, Routers
- 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 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
- 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
- Comark • 2013**
Jack McAnulty 860-763-1100
Manufacturer Broadcasting Transmission Equipment
- 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**
Guy Fournier 418-682-3380
Site Remote Controls
- DEVA Broadcast • 2015**
Todor Ivanov 305-767-1207
Monitors, IP Audio Codecs, 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
- du Treil, Lundin & Rackley, Inc. • 1985**
Jeff Reynolds 941-329-6000
Consulting Engineers
- Drake Lighting • 2015**
Dave Sheppard 270-804-7383
FAA Obstruction Lighting - High Intensity
- DVE0 - Division of Computer Modules Inc. • 2011**
Laszlo Zoltan 858-613-1818
Everything About Transport Streams
- e2y • 1997**
Mark Strohecker 914-593-6831
Electronic Components, SATCom Amplifiers
- Econco • 1980**
Debbie Storz 800-532-6626, 530-662-7553
New & Rebuilt Transmitting Tubes
- Emerson Network Power/Avocent • 2014**
George Morgan 917-592-0956
Avocent High Performance KVM
- ENCO Systems Inc. • 2003**
Kenneth Frommert 800-362-6797
Audio Automation and Playout
- ERI - Electronics Research • 1990**
David White 812-925-6000
Broadcast Antennas, Transmission Line, Filters/Combiners, Towers and Services
- Floral Systems • 2008**
Shawn Maynard 877-774-1058
Television Broadcast Automation
- Frontline Communications • 2015**
Tracy Brink 727-280-8843
Broadcast Vehicle Manufacturer
- Fujinon, Inc. • 1986**
Thom Calabro 973-633-5600
Broadcast & Communications Products
- GatesAir • 1977**
Dave Hopson (TV) 513-445-5243
Mark Goins (Radio) 513-899-9124
Broadcast Equipment Manufacturer
- Geppo/General Cable • 1995**
Dennis Thompson 407-405-0756
Innovative Cabling & Custom Solutions
- Graham Brock, Inc. • 2012**
Marilyn Matherly 912-638-8028
Technical Consultation - Radio/TV
- HD Radio/iBiquity Digital • 2014**
Rick Greenhut 443-539-4335
HD Radio Technology
- Heartland Video Systems, Inc. • 2011**
Dennis Klas 920-893-4204
Systems Integrator
- IWEC • 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 Luhman 831-458-0552
Radio Broadcast Equipment
- Integrated Microwave Technologies • 2009**
Elena Waldhuber 908-852-3700
Microwave Video Transmission and Receive Systems
- JAMPRO Antennas Inc. • 2011**
Alex Perchevitch 916-383-1177
DTV/DVBT & HD Radio-IBOC Solutions
- JVC • 2014**
Lon Mass 973-317-5117
Professional Video Products
- Ka You Systems • 2011**
George Gimourginas 301-585-4302
Audio, Video, IP - Satellite
- Kathrein USA Inc. • 1985**
Michael W. Bach 541-779-6500
Antennas for Broadcasting & Communications
- Kintronc Labs, Inc. • 2015**
Joaquin Raventos 423-878-3141
Radio Broadcast Antenna Systems
- LBA Technology Inc. • 2002**
Katie Sneed 252-757-0279
AM/MW Antenna Equipment & Systems
- LYNX Technik • 2007**
Steve Russell 661-251-8600
Broadcast Terminal Equipment Manufacturer
- Markertek Video Supply • 2002**
Andrew Barth 845-246-3036
Audio, Video, A/V Broadcast Supply
- Maxell Corporation of America • 1991**
Patricia Byrne 973-653-2423
Data/Broadcast Video Media
- Micronet Communications Inc. • 2005**
Jeremy Lewis 972-422-7200
Coordination Services/Frequency Planning
- Microwave Video Systems • 2011**
Warren J. Pareco 781-665-6600
Microwave Equipment Rental, Sales & Service
- Middle Atlantic Products • 2005**
David Amoscato 973-839-1011
Equipment, Mounting, Solutions
- 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**
Dave Chancey 805-968-9621
Digital STLs AM/FM/TV
- 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. Nemer 305-899-0900
Cables, Connectors, Assemblies and Fiber Optic
- Neutrik USA, Inc. • 2012**
Kathy Hall 704-972-3050
Ruggedized Optical Fiber Systems
- Orban • 2011**
David Rusch 480-403-8300
Audio Processing AM/FM/TV
- Pasternack Enterprises • 2001**
Christine Hammond 949-261-1920
Coax & Fiber Products
- 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 Ross 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**
Broadcast & Telecom Antennas & Systems 207-523-0990
- RCS • 2003**
Diana Stokey 308-284-3007
Audio and Video Content Management
- RDL • 2004**
Chuck Smith 928-778-9678 x142
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
Broadcast Transmitters, Test & Measurement
- Ross Video Ltd. • 2000**
Darren Budrow 613-228-0688
Manufacturer, Television Broadcast Equipment
- Sage Alerting Systems Inc. • 2010**
Gerald LeBow 914-872-4069 x210
Emergency Alert Systems Products
- SCMS Inc. • 2000**
Bob Caithen 800-438-6040
Audio and RF Broadcast Equipment Supplier
- Seacom 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 Saldi 818-840-6749
Routers, Mixers, Consoles, Intercoms
- Signiant • 2012**
Sharon Palermo 781-312-7792
Signiant Content Delivery Software
- 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 Consoles/Routers
- Staco Energy Products Co. • 2010**
Paul Heiligenberg 937-253-1191 x128
Manufacturer of Voltage Regulators, UPS
- Superior Electric • 1995**
Michael J. Miga 860-507-2025
Power Protection Equipment
- Sutro Tower Inc. • 1989**
Eric Dausman 415-681-8850
Broadcast Tower Leasing
- Tektronix Inc. • 1977**
Michael Brett 503-627-5888
Video Test & Measurement, Equipment Manufacturer
- Teletream • 2013**
Mark Wronski 530-470-1337
Transcoding, Captioning, Workflow Automation
- Telos Systems/Omnia/Axia • 2003**
Denny Sanders 216-241-7225
Tels Systems Talk-Show Systems
- Teradek • 2011**
Jon Landman 949-743-5783
Camera-top ENG Solutions
- Terrestrial RF Licensing Company • 2003**
Jennifer Smith 888-373-4832
FCC Broadcast Auxiliary Licensing Services
- The Durst Org. - 4 Times Square • 2004**
John M. Lyons, CPBE 212-997-5508
TV/FM/Microwave Tower Site
- The Switch • 2011**
Peter Hartz 323-645-8011
Fiber Transmission Provider
- Thomson Video Networks • 2014**
Matt Tietze 301-537-6288
Video Compression and Processing
- Tielne The Codec Company • 2003**
John Lackness 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 Broadcast • 1991**
Mark Tommey 978-671-5700
Video Microwave Systems
- Volicon • 2015**
Russell Wise 781-221-7400
Broadcast Monitoring 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
Broadcast Microwave, Tower & ENG Installation, Integration Maintenance Services
- WnewTech Corporation • 2014**
Luiz Santiago 310-220-5664
Systems Integration

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Member Spotlight: Evan Baker

Member Stats

SBE Member Since: 2013
Certifications: CBNT
Chapter: 34 Albuquerque
Employer: Cumulus Media
Position: Engineer/Fleet Manager/Remote Operations
Location: Albuquerque, NM
I'm Best Known For: Contributions to *Radio World's* Workbench column for a Plexiglas control room cabinet cover and a news-room speaker mute switch.

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

A. I value the camaraderie among engineers no matter where you work. We're all here to help.

Q. What got you started in broadcast engineering?

A. I started as an intern with the station cluster where I currently work, which was under a previous owner. I received hands-on training in soldering, networking and general office



Evan Baker outside the studios of Cumulus Media Albuquerque.

work. I enjoyed the people and the work environment, so I decided to work in radio.

Q. What do you find most satisfying in your job?

A. I like the variety. Different things happen every day, and you never know what will happen. I'm part of a strong engineering team, and the talented, motivated people in other departments make this a fun and enjoyable place to work.

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

A. ...play soccer, dabble in some woodworking and music creation.

Q. What is your favorite gadget?

A. The iPhone 6. Yes, the phone that keeps me busy at work at all hours is also my source of great benefit. I use it to VPN into work or watch friend's cat videos.

Membership Renewals Are in the Mail

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.

As announced last November in SBE news and in the December issue of *The Signal*, membership dues increased to \$82 per year as of Jan. 1, 2016. This is the first increase in three years and affords the SBE to continue to provide programs and services at a level members have come to expect.

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 main page. The on-line 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 au-

tomated retrieval system available to you on the renewal page.

Life Members of the SBE don't have to renew their membership. In April, you'll receive a letter in the mail that provides an update on SBE activities and an opportunity for you to update your contact information.

Balloting for the annual election of the national board of directors will be conducted online and through the mail in July 2016. More than ninety percent of the election ballots cast in 2015 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 (paper renewal or online version). The letter to Life Members in April will also provide the opt-out opportunity.

If you have questions about your membership renewal, please contact Scott Jones at the SBE National Office at 317-846-9000 or kjones@sbe.org.



Chapter Check

Chapter 48
Denver, CO



At the Chapter 48 Christmas lunch, held in conjunction with the Denver SMPTE section, Don Hayford was honored on his retirement from KUSA-TV. He worked there for 33 years. Before that he worked at various radio stations in Colorado.

Chapters: Send your meeting and event photos to cscherer@sbe.org.

SBE's NAB Show Resource Guide Coming in April

The Society of Broadcast Engineers is preparing a resource to help you navigate your way around the 2016 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 included in the April issue of *The Signal* and will be available at the SBE booth at the NAB Show in April.

Columbus, OH, to Host 2016 SBE National Meeting

SBE President Jerry Massey has announced that the 2016 SBE National Meeting will be held in Columbus, OH, on Oct. 26-27. The venue will be the downtown Greater Columbus Convention Center and the adjacent Columbus Crowne Plaza Hotel. The event is being hosted by the Ohio Association of Broadcasters in conjunction with its annual Ohio Broadcast Engineering Conference. The conference is supported each year by the SBE chapters of Ohio.

The SBE National Meeting includes the SBE Annual Membership Meeting, the SBE National Awards Reception and Dinner and the SBE Fellows Breakfast.

The national Board of Directors will also meet during the event, as will the national SBE Certification Committee.

The OAB Broadcast Engineering Conference includes broadcast technical presentations of interest to radio and television engineers planned and organized by an advisory committee of broadcast engineers within the state of Ohio and OAB staff. A trade show of equipment and service suppliers is also a popular part of the OAB Conference.

The downtown Columbus Crowne Plaza

Hotel is a 375-room, first-class hotel connected by covered walkway to the convention center. The hotel and convention center have easy access off I-670 and is



The Columbus Crowne Plaza is the site of the 2016 SBE National Meeting in October.

adjacent to Columbus' Short North neighborhood of shops, art galleries and restaurants.

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 Ohio or neighboring states are particularly encouraged to attend while the SBE National Meeting is close by. Save the dates: Oct. 26-27 for the 2016 SBE National Meeting and OAB Broadcast Engineering Conference.

WELCOME TO THE SBE

NEW MEMBERS

Jeff B. Anderson - Mebane, NC
Justin E. Baczek - Hoffman Estates, IL
Taylor R. Barker - Fridley, MN
Jerome H. Biggars - Wichita, KS
Joseph S. Bleakie - Pipe Creek, TX
Alexander J. Brewster - Olympia, WA
Andrew Broome - Rock Hill, SC
Jonathan S. Byrd - West Hartford, CT
Michael P. Doenges - Lebanon, OH
David Evans - Lake Dallas, TX
Jason G. George - Torrance, CA
Robbie Green - Richmond, TX
Mike Hanna - Rush, NY
Joshua Harstad - Seattle, WA
Thomas Howard - Cheyenne, WY
Nick Jones - Blaine, MN
Michael G. Kahrs - Fullerton, CA
Jeffrey Konrad - Rock Island, IL
Timothy Kyobe - Kampala, Uganda
Scott Laird - East Stroudsburg, PA
Rich Lamotte - Kew Gardens Hills, NY
Preston Lanier - Burbank, CA
Steve E. Miller - Omaha, NE
Benjamin Nam - San Mateo, CA
Jessica L. O'Rourke - Albany, NY
Michael Oat - Leesburg, VA
Robert Pantazes - Fort Myers, FL
Muhammad A. Rashid - Doha, Qatar
Phillip L. Shockey - Hempstead, TX
Tim Stephens - Jacksonville, FL
Alissa Thai - Baldwin Park, CA
Peter I. Walker - Los Angeles, CA
Ian Westwood - Los Angeles, CA

NEW STUDENT MEMBERS

Jerron Collins - Chesapeake Beach, MD
Huston C. Holston - Las Vegas, NV
Richard J. Moser - Forney, TX
Michael Muldrew - Las Vegas, NV
Adam J. Steinbach - Bonduel, WI
Cameron Stuckey - New York, NY

NEW ASSOCIATE MEMBERS

Jay Feick - Woodland, CA
Brendan Smith - Marietta, GA
Ja'Marjay C. Tooke - Shreveport, LA

RETURNING MEMBERS

Lloyd Berg - Oregon, WI
Michael J. Harrington - Cape Coral, FL
Eduardo Barroso - Torrance, CA
Charles Garfield - Portland, OR
Lance E. Harper - Pasadena, CA
Robert J. Koepfel - Clovis, CA
Ronald L. Myers - St. Julien-en-Gvs, France
Dominick M. Pannone - Juneau, AK
Gonzalo L. Penagos - Miami, FL
Richard Reagan - Brevard, NC
John P. Schlusser - Poughkeepsie, NY
Julius M. Suyat - Vienna, VA

Recruit a new SBE member during the 2016 SBE Membership Drive. More info on page 3.

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MARK YOUR CALENDAR

Webinar: IP Networking Troubleshooting - Part 3

Feb. 23, 2016 sbe.org/webinars

SBE Membership Drive Begins

March 1 - May 31, 2016 sbe.org

2016 NAB Show

Las Vegas
April 16 - 21, 2016 nabshow.com

Ennes Workshop @ the 2016 NAB Show

Las Vegas
April 16, 2016

SBE Certification Exams

2016 NAB Show
April 19, 2016 sbe.org/certification
Application deadline is March 18, 2016.

Dayton Hamvention

Dayton, OH
May 20 - 22, 2016 hamvention.org

SBE Membership Drive Ends

March 1 - May 31, 2016 sbe.org

SBE Certification Exams

Local Chapters
June 3 - 13, 2016 sbe.org/certification
Application deadline is April 15, 2016.

SBE Leadership Development Course

Atlanta
Aug. 4 - 6, 2016 sbe.org/lcd

SBE Certification Exams

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

TAB Convention

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

NBA Convention/SBE Engineering Conf.

Lincoln, NE
Aug. 17, 2016 ne-ba.org



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