



Society of Broadcast Engineers Chapter 24 Newsletter Madison, Wisconsin



Steve Paugh

Remembering Steve Paugh

*By Leonard Charles
Director of Engineering
Morgan Murphy Media, Midwest*



When I first met Steve after our company took over the Rustad-Wickem production facility on Hammersley Road, the first thing that struck me about Steve was his sense of humor. Like a fine bottle of Scotch, it took a few shots to acquire a taste for it. I can best describe Steve's wit as the Yogi Berra of broadcast engineers. Here are a few examples of Steve's wit:

I'm not sure if Steve was slowing down but he recently told me that it now takes him an hour and a half to watch *60 Minutes*.

On his most recent birthday I asked Steve how old he was, and he told me, but then immediately said, "It's not the years, it's the mileage".

At his retirement I wanted to give Steve a gift certificate as a token of appreciation so I asked Steve where would be an appropriate place. Without a second to think he looked at me and said Woodman's West Liquor store. (Steve was a hobby builder, so I went with Home Depot.)

I will miss Steve dearly, he is one of the gentlest gentleman I will ever know. His attention to the finest detail when designing an equipment installation was something to witness and admire. His dedication to SBE Chapter 24 was total, for as long as I can remember. As long-time program chair and forever nominations chair, Steve is as responsible for the success of the Chapter as anyone. I'll always remember Steve in front of the smoke-filled grill at an annual Chapter Picnic. Many a year was toasted with Steve at the Chapter Holiday Party he organized at Fitzgerald's.

My heart is sad that he passed so quickly I didn't have a chance to say goodbye. Rest in peace my friend.

Steve's Career:

Beecher's Stereo Sales and Service, 1969-1970
US Air Force, 1970-1974
Honeywell Defense, 1978-1979
WKOW 1979-1985
CTI/WMSN 1985-1987
Rustad-Wickem 1988-1997
Television Wisconsin, Channel 3 1997-2015
UW Engineering Fraternity, all of his adult life



In Remembrance

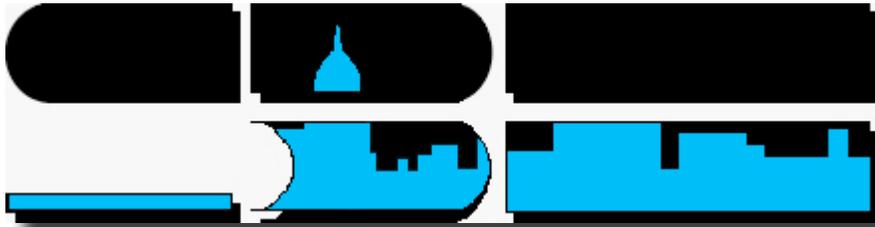


Donald Moran, CPBE, passed away on Wednesday, August 23, 2017. Don was born on August 24, 1933 in Madison. He grew up in DeForest and graduated from DeForest High

School in 1951. Don was a Korean War Veteran and received his first formal radio training there. He attended the Wisconsin School of Engineering. He was a chief engineer at WBEV-AM, Beaver Dam before accepting a position at WKOW radio and TV in Madison, where he was in charge of studio and transmitter engineering. Don retired from the Educational Communications Board (ECB), which oversees, along with UW-Extension, public broadcasting in Wisconsin. Don had been an SBE member since January 1983, according to SBE National Office's member records.

When you work with a guy side-by-side for over a decade, you get to know him pretty well. He becomes a part of your extended family. It was a great honor and pleasure to have worked with Steve, and to continue to associate with him at SBE meetings after he retired. We were all his extended family, as he was ours. Steve was an intelligent, considerate, down-to-earth, easy-going kind of guy who designed and planned the road ahead for us, so well. So many memories. To this day, I remember quips of his from over the years and I laugh. I will carry those memories with me.

Rest in Peace, Steve.
Jim Hermanson



September 2017

 **Next Meeting**

Thursday, September 21



**SPECTRUM
AUCTION**

The Spectrum Auction is over. What will the TV landscape look like in Wisconsin when the associated channel change projects are complete. What can your station do now to prepare for the fast paced construction schedule that starts in 2018. If you are an FM station you may not be able to escape the construction chaos. SBE member Leonard Charles and Chapter 24 Chair Richard Wood team up to sort out all the details.

Dutch Treat Dinner 5:30 PM
Jason's Deli
7349 Mineral Point Rd
Madison, WI
(no reservation - just gather together)

Meeting and Program at 7:00 PM
WISC TV
7025 Raymond Road
Madison, WI

Visitors and Guests are always welcome.

Thank you notes...

Happy Retirement, Chuck!

I first met Chuck when he became a member of the national SBE Board of Directors in 1994 and he has always been someone who would volunteer his time, talent and leadership. As chairman of Chapter 24, he served skillfully as the emcee of the first SBE National Teleconference, hosted by Chapter 24 in 1994. He led the SBE national EAS Committee while serving on the Board, which produced the SBE EAS Primer, a very popular publication explaining the "new" EAS system. For a number of years he has served as one of three trustees of the Ennes Educational Foundation Trust, the non-profit charitable arm of the SBE that provides scholarships, educational workshops and support of educational projects that benefit the field of Broadcast Engineering and engineers. Of course, he has chaired for many years now, the annual award winning Broadcasters Clinic; one of the most favorite and anticipated industry events each year. We wish Chuck the best in his retirement!

John Poray, SBE Executive Director



I thank Chuck for sharing his knowledge, mentoring SBE members, fostering teamwork, leading broadcasters, promoting fellowship, befriending all and smiling often. My favorite memories are working on the National SBE meetings with Chuck and his professional manner and efforts.

Paul Stoffel



I have always enjoyed working with Chuck and have learned a lot from him over the years. You could not ask for a better colleague or mentor. I will miss raising a glass with him and Judy at Battista's while the accordion player plays On Wisconsin.

Kevin Ruppert



I met Chuck the first time I attended the fall Broadcasters Clinic in the early 1990's. He stood out as a leader of the broadcasters then as he does now. He was an inspiration to me personally to strive for broadcast excellence and professional standards. In short, I wanted to become like Chuck in my own areas of work. Thank you Chuck for setting the bar high and encouraging me in so many ways.

Dennis Baldrige



I can't say enough about Chuck's selfless dedication to the broadcast engineering profession, SBE and EAS in particular. He wrote the first SBE EAS Primer back in the 90's. He has been a faithful attendee and contributor at every EAS and Amber Alert Committee meeting we have held – I can't think of one he's missed. His NAB Engineer of the Year award and WBA Hall of Fame induction attest to a career of honor. Chuck has certainly earned a well-deserved retirement, and can ride off now in pride knowing the numerous contributions he has made. We thank his wife Judy for sharing him with us – you can be so proud. I will deeply miss Chuck, but wish him all the best.

Gary Timm



I first met Chuck in the mid-80's when he was Chief Engineer at WIBA-AM/FM in Madison and I was just a couple of years into my broadcast engineering career. I reconnected with Chuck through SBE Chapter 24 when I moved to Madison in 1988. Since that time, I have worked with Chuck through many Chapter 24 initiatives and both our involvement with the State EAS Committee. I've always been impressed by Chuck's professionalism, hard work, dedication to the Broadcast Engineering field and his ability to communicate effectively whether to a large group or one-on-one. I can honestly say I can't think of a time when I had a discussion with Chuck that I haven't come away without learning something and having a few laughs. I have always considered Chuck to be a mentor and friend of mine. His retirement is well-deserved, but he will be greatly missed in the Madison broadcast community and beyond!

Fred Sperry



Chuck is highly worthy of the honor as he has been a real stalwart of SBE. I've enjoyed working with him on the EAS committee, too.

Steve Johnston



Chuck has always been a mainstay of Chapter 24 & Broadcasters Clinic and will be missed (but never forgotten).....

Pete Deets



Have you ever met a person who is the calm in the midst of chaos? That person for us is Leonard Charles. Chuck was charged by Don Borchert to continue the legacy of a great Broadcasters Clinic. Through many, many, many changes and challenges, Chuck has provided the leadership necessary to bring an award winning Broadcasters Clinic to each of you every year.

Having the privilege to work with Chuck while he was on the SBE Board and through the creation of the SBE EAS Primer, he certainly provided needed information and service to the members of the engineering community. If you look up the definition of a servant, you will see a person who performs duties for others. Chuck has and is a servant. He has given his time, talents and has been tenacious on our behalf.

Well Done!
Linda Baun



Besides Chuck being active with national organizations, as a member of the Broadcasters Clinic committee, I appreciate his leadership of the Clinic and Summer Engineering Conference. He also was willing to answer questions that I asked him over the years. He also was not afraid to ask others questions when he needed to. He tapped my brain (full of mostly useless information) a number of times over the years. Hopefully he will not completely abandon us, and show up at an occasional SBE meeting or stop by the Clinic. I do not want to lose contact with a good friend.

Tom Smith

I've known Chuck for a long time, since his days at WIBA Radio. Over the years, he continually developed his knowledge, skills, responsibility, and leadership.

Clearly, he has an exceptional passion for television and radio broadcast engineering and is at the forefront of technology that affects broadcasters and everyone.

He brings information back to share with chapter members for the betterment of us all, whether it relates to DTV, EAS, NAB, SBE, or WBA. I dare say that Chapter 24, the State of Wisconsin, and this country would not be what it is today without Chuck being part of the equation. Chuck certainly had an influence on the development of the professional skills of many people, mine included, perhaps more than he knows.

Congratulations on your retirement, Chuck! Very well-deserved. You've contributed much of your life to the industry. We are all better for your service.

Jim Hermanson

Mr. Leonard "Chuck" Charles: leader, mentor, husband, father and friend. He's a nationally recognized broadcast engineer and respected representative of the broadcasting industry. Chuck's broadcast engineering accomplishments are many. I'm a proud member of the Wisconsin Broadcasters Association's Broadcasters Clinic planning committee. Chuck has led this committee as Chairman for many years. I can attest that Chuck's wisdom, gentle guidance and commitment to be "the best" regional convention/clinic never wavered.

Chuck always welcomes others with a genuine smile and hearty hand shake.

After a distinguished career, he can now enjoy – without interruption – those who shared him with us. Judy Charles, Chuck's better half, understands the life of a broadcast engineer. Judy deserves our thanks, too!

Chuck has quietly instilled guidance for the WBA – Broadcasters Clinic, from which we will benefit for years to come. Committee members will undoubtedly say out loud or to themselves, "What would Chuck say?"

Thank you, Chuck.

Kent Aschenbrenner

My most memorable conversation with Chuck was several years ago while I was out of town.

He called me and said that the Channel 3 newsroom had heard on the police scanner that an airplane had flown into WMTV's tower, so they called him to see if he could find out more from a fellow engineer. Turns out that someone had seen an airplane near the tower and called in a false alarm to 911 since the top tower light didn't line up with the rest of the lights. (Only one of the two antennas is lit.) Chuck was relieved to hear the tower was still intact when I called him back.

Tom Weeden

It's hard to find an top notch personnel manager and down to earth technical mentor. A person of dedication to the employee, employer and the Broadcast Industry as a whole.

I've had the good fortune of working along side Leonard Charles, Director of Engineering WISC-TV for longer than he would care to admit. Looking back at a few not insignificant projects such as, Y2K Compliance Preparation, the Emergence of Digital in the Studio, the HD Transition, Radio and Television Facility Expansions, Chuck was the leading force in bringing it all together to a logical conclusion .

Good Luck, Chuck, in your Retirement.

Your technical inspiration and contributions will be remembered.

Mike Kulis

I have learned so many good lessons from Chuck. The best is how he relates to others. He explains technical things in a way that non-techies can understand, and places one at ease with the technology. I wish Chuck the finest retirement. Chuck, I hope nobody figures out your phone number!

Stan Sarch

In my life, it's a magic moment... We just completely ripped out the AM studio and replaced it overnight. Peter B, the morning guy's brief case and breakfast are at the end of the table, and Chuck is talking him through how to drive it. Everything is just perfect. This is how I remember Chuck. It's about 1984.

Fred Baumgartner



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**Meeting Minutes**

from the August 2017 Business Meeting

The Society of Broadcast Engineers Chapter 24 monthly meeting was held on Wednesday, August 23, 2017 at the Wisconsin Public Broadcasting Center in Madison. There were 11 members present, 8 who held SBE certification, and one guest.

Chapter Chair Rich Wood called the meeting to order at 7:03pm. There were no additions or changes to the July meeting minutes so they were approved as published in the August Newsletter. Rich then explained that Chapter 24 is searching for someone to take on responsibility as the Newsletter editor, and someone to act as membership coordinator. Paul Stoffel had forwarded information stating that there are currently 44 members in good standing.

In general announcements, Rich talked about the large party WMTV recently held to officially celebrate the grand opening of their new facility. For sustaining membership, Fred Sperry sent in a report showing a total of 16 companies supporting Chapter 24.

For the Program Committee, Steve Paugh previewed upcoming topics for the next meetings. On Thursday, September 21 at WISC, Leonard Charles and Rich Wood will give a presentation on the FCC TV spectrum auction and its local implications. October 11 during the Broadcast Clinic the program will be about automated vehicle testing happening at the UW. Current and evolving IP broadcast standards will be discussed at WKOW during the November 15 meeting.

Jim Hermanson provided a Certification and Education update, and noted one recent CBNT recertification was completed. There is an upcoming local certification exam window from November 3 – 13; the application deadline is September 25. There was no frequency coordination report available.

With the National report, Leonard Charles announced that voting for the National Board of Directors and officers has ended, and the results will be announced on Thursday, August 24. The newly elected will take office on October 26. He also mentioned that two webinars were happening in the next week: the sixth module of RF101 happens on Thursday, August 24, and the final part of the SBE IP Networking Fundamentals series is Tuesday, August 29. See the SBE education web page for details and to register.

Treasurer Roy Henn reported there were no expenses since the last report, and two sustaining membership checks were deposited. The Chapter bank account continues with a solid balance. There was no old or new business brought forward for discussion.

In professional announcements Leonard Charles announced he will be retiring from WISC-TV at the end of September, after more than 40 years in the business of broadcasting. He indicated he would continue helping with the Chapter 24 web site if desired.

The meeting was adjourned at 7:17pm, and program chair Steve Paugh gave a quick explanation that the scheduled talk on lightning protection was changed due to a business realignment of the original presenter. Rich Wood gave a quick summary of some lightning protection products. Rich then presented a series of photos and a detailed explanation from a recent job replacing damaged base insulators on a large self-supporting tower.

Submitted by Mike Norton, Secretary



Amateur Radio News

compiled by Tom Weeden, WJ9H

- Amateur Radio Emergency Service (ARES) volunteers have been pitching in to support communication at some Red Cross shelters in south Texas in the ongoing aftermath of catastrophic and unprecedented flooding resulting from Hurricane Harvey. ARES members also have been serving as net control liaisons to the Harris County Office of Emergency Management (OEM).

NASA's Johnson Space Center (JSC) in Houston had closed to all but mission-essential personnel through Labor Day, due to the effects of Harvey. Most US astronauts live in the Houston area. JSC said closing would allow the center to focus on its priorities, including the return to Earth last weekend of ISS crew members Peggy Whitson, ex-KC5ZTD; Jack Fischer, K2FSH, and Fyodor Yurchikin, RN3FI.

A variety of emergency, health-and-welfare, traffic, and tactical nets in south Texas have been active on HF at various times of the day as well as on a wide array of VHF and UHF repeaters, which remain available as needed. The Salvation Team Emergency Radio Network (SATERN) has been convening on 14.265 MHz, while the Military Auxiliary Radio Service (MARS) has been using the 5.330.5 (USB) MHz interoperability channel on 60 meters.

"During the storm response, all Amateur Radio operators — and perhaps especially those involved in contest activity — are advised to listen first and respect any frequencies in use for emergency response communication," Corey said. He cited the SATERN Net on 14.265 MHz and the South Texas Traffic Emergency and Health and Welfare nets on 7.285, 7.290, 3.873, and 3.935 MHz. Digital emergency and health and welfare frequencies are 3.5925 and 7.095 MHz.

ARES team members were advised that the impact to the region's communications infrastructure had been relatively minimal, considering the strength of the storm and the magnitude of the flooding. The storm did ravage cellular service in some Texas counties, however, especially Aransas (84%) and Refugio (73%) coun-

ties, the FCC reported. Overall, however, the FCC deemed the cellular system 95% functional.

ARRL South Texas Public Information Officer Mike Ulrich, KA5CVH, told the American Radio Relay League on August 30 that "hardening" of the telecommunications infrastructure to make it more immune to storm damage has diminished the need for Amateur Radio communication support and altered hams' traditional role there. Ulrich pointed out, however, that the Amateur Radio telecommunications infrastructure in South Texas has remained analog, as "the lowest common denominator" of technology — VHF/UHF FM, and HF — and has the highest degree of interoperability. "That's what we train to, that's what we teach, that's what we practice," he said.

- As of September 4th, Amateur Radio emergency communication interests in the Caribbean were getting ready to respond as Hurricane Irma threatened the region. The Federal Emergency Management Agency (FEMA) reported that it had already begun preparations in Puerto Rico and the US Virgin Islands. Irma was expected to impact the Dominican Republic, Haiti, the British Virgin Islands, Cuba, the Bahamas, Jamaica, and the Turks and Caicos.

The Hurricane Watch Net (HWN), which marked its 52nd anniversary in early September, had not yet activated for Irma, but HWN Manager Bobby Graves, KB5HAV, said that could happen soon.

"This morning, we have another monster storm threatening land and people — Hurricane Irma," Graves said September 4th. "The Hurricane Watch Net has upgraded its status to Alert Level 3 — Standby Mode, meaning a hurricane is forecast to threaten land within the HWN area of interest within the next 36 hours." Graves said the HWN could activate on 14.325 MHz as early as midday on Tuesday the 5th.

International Amateur Radio Union (IARU) Region 2 Emergency Coordinator

Cesar Pio Santos, HR2P, had compiled a list of emergency frequencies, subject to change, for use in the Caribbean in anticipation of Hurricane Irma.

Puerto Rico: 3.803, 3.808, 7.188 MHz. Radio amateurs in Puerto Rico also will cooperate with the HWN on 7.268 and 14.325 MHz.

Cuba: Daylight hours, 7.110 MHz (primary) and 7.120 MHz (secondary); Provincial Net — 7.045, 7.080 MHz, and on other lower frequencies as necessary. Nighttime, 3.740 MHz (primary) and 3.720 MHz (secondary) and on other lower frequencies as necessary.

Dominican Republic: 3.873 MHz (primary), 3.815 MHz (secondary), 7.182 MHz (primary), 7.255 MHz (secondary); 14.330 MHz (primary), 21.360 MHz (primary), 28.330 MHz (primary).

Caribbean Emergency and Weather Net (CEWN): 3.815 MHz and 7.162 MHz (when necessary)

As of 0000 UTC on September 6 (7 PM CDT Tuesday), Irma was a Category 5 hurricane, located about 85 miles east of Antigua, with maximum sustained winds of 185 MPH.

(Excerpts from the American Radio Relay League's <arrl.org> web site)



Don Borchert Broadcasters Clinic Fellowship

Applications are now being accepted for the 2017 Don Borchert Broadcasters Clinic Fellowship. This Fellowship honors the founder of the conference and will provide all expenses to attend the Clinic in Madison October 10th thru 12th. The program is possible through the financial support of all four Wisconsin SBE Chapters, and the WBA.

If you are interested please go to <http://www.sbe24.org> and click on the "Broadcast Clinic" button to find an application.

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Transition Begins for Broadcasters Leaving 600 MHz Band

August 25, 2017 from SBE News & Headlines

The SBE has noted recently that users of wireless microphones and UHF low-power auxiliary devices at the close of FCC Auctions 1001/1002 have significant options for continued access to the UHF television band. Among these options is the continued availability of the 600 MHz band (614-698 MHz, above TV Channel 37) during the 39-month transition period that is scheduled to end on July 13, 2020. At the end of this transition period, all television stations that participated in the auction will have cleared the spectrum between 614 MHz and 698 MHz.

During the 39-month transition period, wireless microphones, intercoms and other low power broadcast auxiliary devices can continue to operate normally in the entire 614-698 MHz band. However, it will be necessary during this entire period to protect any broadband systems that acquired the spectrum in the auction that begin operations during the transition period.

The difficulty for broadcasters and video production entities in the use of wireless microphones and low-power auxiliary devices in the 614-698 MHz band during the transition is that we have no way of knowing precisely when a particular auction winner plans to light up in a given area. T-Mobile, which was one of the larger successful bidders at the auction, has been in close touch with the broadcast community on this subject. We have not heard from other auction winners about their scheduled deployment in the 600 MHz band.

T-Mobile helpfully has released a list of counties in which they intend to commence operations before the end of November 2017. The list comprises counties in which, generally speaking, there are no television stations subject to rebanding. There are numerous western areas that are largely rural on this list. T-Mobile will release subsequent lists as its rollout plans develop. If you plan to deploy wireless mics in any of the listed counties in the 614-698 MHz band (other than in the guard band or the duplex gap) subsequent to November 2016, you are obligated to ensure that no use of the band by auction winners has actually commenced by that time.

Wisconsin and Michigan counties extracted from T-Mobile list:

FIPS	County	State	T-Mobile Market	T-Mobile Region	T-Mobile Owned blocks
26013	Baraga	MI	Milwaukee, WI	Central	BCDE
26153	Schoolcraft	MI	Milwaukee, WI	Central	DEFG
26071	Iron	MI	Milwaukee, WI	Central	BCDE
26041	Delta	MI	Milwaukee, WI	Central	DEFG
26061	Houghton	MI	Milwaukee, WI	Central	BCDE
26003	Alger	MI	Milwaukee, WI	Central	DEFG
26131	Ontonagon	MI	Milwaukee, WI	Central	BCDE
55141	Wood	WI	Milwaukee, WI	Central	BCDE
55069	Lincoln	WI	Milwaukee, WI	Central	BCDE
55073	Marathon	WI	Milwaukee, WI	Central	BCDE
55111	Sauk	WI	Milwaukee, WI	Central	BCDE
55119	Taylor	WI	Milwaukee, WI	Central	BCDE
55019	Clark	WI	Milwaukee, WI	Central	BCDE
55037	Florence	WI	Milwaukee, WI	Central	BCDE
55125	Vilas	WI	Milwaukee, WI	Central	BCDE
55067	Langlade	WI	Milwaukee, WI	Central	BCDE
55085	Oneida	WI	Milwaukee, WI	Central	BCDE
55041	Forest	WI	Milwaukee, WI	Central	BCDE
55003	Ashland	WI	Minneapolis, MN	Central	BCDE
55099	Price	WI	Minneapolis, MN	Central	BCDE
55007	Bayfield	WI	Minneapolis, MN	Central	BCDE
26083	Keweenaw	MI	Milwaukee, WI	Central	BCDE
26053	Gogebic	MI	Milwaukee, WI	Central	BCDE
26103	Marquette	MI	Milwaukee, WI	Central	BCDE
55115	Shawano	WI	Milwaukee, WI	Central	BCDE
55075	Marinette	WI	Milwaukee, WI	Central	BCDE
55103	Richland	WI	Milwaukee, WI	Central	BCDE
55051	Iron	WI	Milwaukee, WI	Central	BCDE
55019	Clark	WI	Milwaukee, WI	Central	BCDE
55007	Bayfield	WI	Minneapolis, MN	Central	BCDE

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Newsletter Editor Needed

Will Train.

Current editing software is Adobe InDesign CC.

Contact Rich Wood or Paul Stoffel.



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President's Club



SBE Chapter 24 Certification and Education News

Well Done

Congratulations to Derek Murphey, CBNT, of Fitchburg. WI on being newly recertified!

The Open 2017-2018 Exam Schedule

Exam Dates	Location	Application Deadline (to SBE National Office)
November 3-13, 2017	Local Chapters (Madison Area)	September 25, 2017
February 2-12, 2018	Local Chapters (Madison Area)	December 31, 2017

Upon passing a new certification exam or if you currently hold a valid SBE Certification, you are now able to use the SBE Certified logo on your business cards, letterhead, resume, website or email signature.

In order to use the SBE Certified logo, you must also use your valid SBE certification designations after your name. You may only use the official SBE Certified logo, that can be downloaded from the [Press Resources](#) page on the SBE website. No variations or interpretations of this logo can be used.

If you have any questions, contact SBE National Certification Director Megan Clappe.

For questions about applying for an exam, please contact Jim Hermanson at services@jimhermanson.com or Megan Clappe at mclappe@sbe.org. Also, see the SBE National Web site at www.sbe.org.

When you are ready to take an SBE exam, please fill out the appropriate application and send it into the SBE National office (see address below). You will be notified once your application has been approved. Approximately 3 weeks before the exam time, your local certification chairman will receive a list of applicants in his/her area. He/she will then contact those applicants to schedule a date, time and place for the exams. The exams will be mailed back to the National office for grading. The pass/fail grades will then be mailed directly to the applicants.

You may mail, email or fax your applications to: Megan E. Clappe, Certification Director
 9102 N. Meridian St. Suite 150
 Indianapolis, IN 46260
 317-846-9120 Fax



Thanks to Leonard Charles for maintaining the Chapter 24 web site and to Steve Paugh for mailing the meeting reminder postcards.



SBE RF101 Module 8: September 21, 1:00pm CT

This introduction to FCC regulations will explore the rules commonly applicable to broadcast facilities, which all engineers will be called upon to understand and apply. Sample topics include: Regulations: Friend or Foe?, Navigating the Maze, About the FCC, Checklists, Rules Common to All Services, AM specific, FM specific and DTV specific. The last module will be presented next month. The previous modules are available for purchase at: < <http://www.sbe.org/sections/WebinarsbySBE.php#OnDemand> >.

RF101: Broadcast Terrestrial Transmission Systems

Course Modules:

1. Introduction to Radio Frequency (RF) (January 26, 2017)
2. Transmission Lines (March 2, 2017)
3. Towers, Antennas, and Transmission Systems (April 13)
4. Antenna Gain - Feed-line Loss (May 18)
5. Modulation Fundamentals (June 15)
6. AM, FM, TV RF Propagation (July 20)
7. RF Transmitter Measurements (August 24)
8. FCC Regulations (September 21)



Upon completion of the entire course, attendees will be able to: 1) Understand the basic characteristics of RF and electromagnetic radiation; 2) Describe different types of transmission lines, antennas, and their characteristics; 3) Understand the fundamentals of RF propagation; 4) Understand modulation and different modern modulation methods; 5) Describe various components used in RF communications systems; 6) Explain the basic characteristics of RF transceiver systems; 7) Define common terms used to characterize RF systems; 8) Understand how to perform a range of basic RF measurements; 9) FCC regulations pertinent to maintaining a broadcast facility.

The completion of this webinar from Webinars by SBE qualifies for 1 credit, identified under Category I of the Recertification Schedule for SBE Certifications.

Dennis Baldrige, CPBE, 8-VSB, AMD, DRB, CBNT, a veteran of the broadcast engineering field for more than 30 years. Baldrige is a Senior member of the SBE, holds an FCC Lifetime General License (formerly a First Class FCC License) and Amateur Radio Extra Class License (K0DB). He also holds a M.A.E. and teaches science courses for Upper Iowa University. As owner of Baldrige Communications, LLC, he works as a contract engineer and has also authored articles for Radio Guide. Baldrige serves as an inspector for the FCC Alternate Inspection Program of the Wisconsin Broadcasters Association.

Registration for each module will be done separately. Register here for Module 8.

SBE Members: \$57

Non-Members: \$87

John Salzwedel
President

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PRO AUDIO VIDEO A/V LIGHTING



CHAPTER 24 SUSTAINING MEMBERS

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The background of the entire page is decorated with various autumn leaves in shades of red, orange, and yellow. Scattered throughout are several broadcast-related icons: a green square with a white outline and a cursor, a yellow antenna tower with signal waves, a red car with signal waves, and a yellow signal strength indicator consisting of four vertical bars of increasing height.

2017 Broadcasters Clinic

Upper Midwest SBE
Regional Meeting
October 10-12, 2017
Madison Marriott West



All sessions and activities are in the Superior Room unless otherwise noted.



7:45 A.M.
REGISTRATION & CONTINENTAL BREAKFAST

8:50 A.M.
OPENING REMARKS

9 A.M.
AM BROADCAST FACILITIES



BEN DAWSON,
HATFIELD &
DAWSON
CONSULTING
ENGINEERS, LLC

This session will discuss

possibilities for cost-effective changes in the AM plant; the cost-effectiveness of diplexing or tri-plexing; how to plan for facilities changes like frequency swaps or turning off a potential restricting station; what AM revitalization technical changes might arise; and how to configure your antenna to allow a moment method proof and when you should avoid one even if legally permissible.

9:45 A.M.
VIRTUAL RADIO: REAL APPLICATIONS



BILL BENNETT,
LAWO, INC.

IT's influence on radio broadcasters is strong, and awareness of hardware virtualization and the "glass cockpit" is growing fast. We'll look at what you can do today, and where things may go in the future, exploring the ways broadcasters can reap operational and monetary gains from IT's R&D investment.

10:30 A.M.
BREAK

10:45 A.M.
MAKING METADATA MATTER



DON BACKUS,
ROHDE &
SCHWARZ

Meta-data is "data about data," but smart broadcasters know it's so much more than that: It's information listeners want and use; it's material that engages audiences, enhances the radio experience and benefits advertisers; and, it's ultimately a way of turning data into dollars. We'll discuss the technical side of delivering and monitoring metadata and how you can help develop a winning strategy for your stations to make metadata a revenue center that matters.

11:30 A.M.
THE AUTOMOTIVE DASHBOARD INITIATIVE



DAVID LAYER,
SENIOR
DIRECTOR,
ADVANCED
ENGINEERING,
NAB

The automobile dashboard has historically been a stronghold for the AM/FM radio receiver, but 21st century technology is providing consumers with more and more dashboard options. A big part of this change is driven by the ever-greater availability of mobile broadband services and the ubiquitous smart-phone. Despite this, radio listening remains the dominant form of audio entertainment. In this presentation, Layer will offer a survey of the most popular digital dashboard technologies and discuss how radio broadcasters can use these to their best advantage. He will also consider the linkage between the growth of so-called "hybrid radio" services in smartphones (which use both wireless broadband and over-the-air signals) and how this can translate into increased listenership in vehicles.

12:15 P.M. - 1 P.M.

LUNCH

GENEVA/MENDOTA ROOMS

1:15 P.M.
**VIRTUAL TALKSHOW AND SPORTS
PRODUCTION**



**KIRK HARNACK & JOE TALBOT,
THE TELOS ALLIANCE**

Convenient connections create compelling content. Telecom technologies like SIP/VoIP are becoming more ubiquitous and less mysterious. Along with fast Internet and VPNs, they not only enable flexible workflows, they enable alternatives to single-studio or expensive remote solutions. This presentation demonstrates some clever implementations in-use now, as well as previews strategies and techniques for achieving efficient and effective talkshow and other radio production workflows.

2 P.M.
**HD RADIO: HOW TO IMPROVE
LISTENER EXPERIENCE WITH
PROPER TIME/LEVEL ALIGNMENT**



**MIKE PAPPAS,
ORBAN**

Since the first generation of HD Radio systems were installed back in 2004 maintaining diversity delay time alignment between the analog FM and the HD radio digital signal

has been a challenge that continues to this day. System drift is still an issue and directly impacts the user experience. So what are the best practices to monitor and correct this issue? How best to implement them? What to look out for?

2:45 P.M.
BREAK

3 P.M.
**HD SINGLE FREQUENCY
NETWORKING**



**JEFF WELTON,
NAUTEL**

This presentation won Best Engineering Paper for the NAB show. It discusses a practical case study using HD single frequency networking to seamlessly set up on channel coverage boosters with no interference zone. The presentation goes into both the theory involved in developing a solution and the practical implementation of the solution.

3:45 P.M.
**TRANSPORT ROBUST AND SECURE
FM COMPOSITE MULTIPLEX
SIGNALS IN AN IP STL**



**DAVE AGNEW,
GATESAIR
MASON, OH**

The emergence of high bandwidth IP network

connections is an enabler for the transport of the FM composite multiplex (MPX) signal in a Studio-to-Transmitter Link (STL). This session will present use cases to illustrate differences between all analog, all digital, and dual domain FM MPX STLs and the tradeoffs they present with respect to compatibility and network bandwidth, scalability, and delay.

4:30 P.M.-7 P.M.
**EXHIBITS OPEN—EXHIBITORS
RECEPTION**
WISCONSIN/MICHIGAN ROOMS

7 P.M.
**NUTS & BOLTS SESSION: SNMP
PLUGFEST**



**TONY PETERLE,
WORLDCAST
SYSTEMS, INC.**

A wireless network will be setup in this session over which attendees can connect with their own personal laptops. Attendees will be provided a USB key containing the installer for the iReasoning MIB browser (a popular tool for SNMP exploration). Using many SNMP devices in the room attendees will learn how to use the MIB browser to connect to the devices, poll for information and exercise control with SET commands.



9:15 A.M.

WEBRTC FOR BROADCASTERS



**CHRIS CRUMP,
COMREX**

WebRTC technology is already dramatically changing

the way we communicate with online retailers, and each other. Web browsers such as Google Chrome, Mozilla Firefox, Opera and, in the near future, Microsoft Edge and Safari, all have audio and video codecs built in. We will discuss the open source Opus algorithms, provide an overview of WebRTC and discuss ways of utilizing this transforming technology in a broadcast environment.

10 A.M.

**WISCONSIN/MICHIGAN ROOMS
EXCLUSIVE EXHIBIT TIME**

11 A.M.

**WISCONSIN/MICHIGAN ROOMS
LUNCH ON EXHIBIT FLOOR**

1:30 P.M.

THE SPECTRUM AUCTION REPACK



**PATRICK
MCFADDEN,
ASSOCIATE
GENERAL
COUNSEL, NAB.**

The auction is over but the Repack is just beginning. The NAB has been studying the process and polling members to identify

bumps in the road before they become potholes. This session will reveal the data, reaction, and future efforts surrounding the Closing and Change Reassignment Public Notice. The majority of TV stations and many FM stations will be impacted in different ways.

2:15 P.M.

AN FCC UPDATE

**DAVID OXENFORD, WILKINSON
BARKER KNAUER LLP; MICHELLE
VETTERKIND, WBA PRESIDENT**



What is the FCC up to? How will it affect your station? Let's find out.

3 P.M.

BREAK

3:15 P.M.

**WHY 0.01% DISTORTION
SOMETIMES MATTERS AND 30%
SOMETIMES DOESN'T**



**STEVE DOVE,
WHEATSTONE**

This session is a lighthearted romp through why some things sound the way they do, deflating some conventional wisdoms, and highlighting some surprising insights.

7 A.M.

**REGISTRATION & CONTINENTAL
BREAKFAST
LOBBY**

8:30 A.M.

**REAL WORLD RESULTS FOR A
SIGNAL MEASUREMENT DRONE**



**JOHN KEAN,
CAVELL MERTZ &
ASSOCIATES, INC.**

Development of drones has proceeded

quickly for video production in the broadcast industry. Applications for engineering study are beginning to catch up. Cavell Mertz & Associates developed the nation's first signal measurement drone for broadcast antenna systems and has been gathering substantial field experience with real-world antennas. This presentation will provide the results of studies for digital television stations and FM radio stations in both analog and digital mode, illustrated by charts and photographs.

4 P.M.
12 GHZ CABLE



**STEVE LAMPEN,
BELDEN**

When will copper fail us? When 4K and other high

data rate services first appeared it seemed only fiber could handle the bandwidth. Now cable has been developed to handle the speed. This presents some installation and connection challenges. This session will cover cables and interconnection in the 12Ghz world and what is likely to be the technology for the next generation.

5:30 P.M.
DINNER

6 P.M.
SBE ALL CHAPTER MEETING AND PROGRAM: AUTOMATED VEHICLE TESTING



**PETER RAFFERTY,
WISCONSIN
AV PROVING
GROUNDS,
UW-MADISON**

Things at the Proving Grounds with automated vehicles (AVs) have been taking off since January. This session will generally introduce Automated Vehicles, briefly explain what they are and aren't, how they work (or don't work, yet), address

common questions and allay common misconceptions. Ideally it will leave the audience with a better understanding of where we are and where we're headed.

EXHIBITORS

The Broadcasters Clinic Committee and the Wisconsin Broadcasters Association extend their gratitude to the Broadcast Clinic exhibitors and prize donors.

25-SEVEN

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YELLOWTEC USA, LLC

Exhibitor list is current as of July 19, 2017. The most up-to-date list is in the attendee packet.



THURSDAY
OCT. 12

7:45 A.M.
REGISTRATION AND CONTINENTAL BREAKFAST

8:30 A.M.
THE IP BASEBAND MIGRATION



TOM HARMON,
UTAH SCIENTIFIC

As the IP revolution sweeps through the broadcast industry,

there's little doubt that most video operations will be driven by IP technologies in the not-so-distant future. The good news is that the industry is making great strides in developing and adopting open IP standards and methodologies, the most important being SMPTE 2022-6 and TR-03/04, (SMPTE 2110 draft). This session will cover the history of IP technology and standards, the SMPTE 2022 family of standards, potential strategies for your conversion to IP, and IP islands and their role in your transition.

9:15 A.M.
SCTE-104/35 AND BEYOND: A LOOK AT AD INSERTION IN AN OTT WORLD



JACOB KINSEY,
COBALT DIGITAL

Ad Insertion is a very important part of many video delivery systems because it generates revenue! With Over-The-Top (OTT) video delivery on the internet, the holy grail of advertisement is finally achievable. It is technically possible to send individual, personalized ads to each viewer. Such systems are based, in part, on the traditional ad insertion workflows that use the SCTE-104 and SCTE-35 standards as their starting point. This session will show how a traditional ad-insertion workflow at the programmer side can be used as a basis for an OTT system.

10 A.M.
BREAK

10:15 A.M.
BROADBAND ANTENNA AND FILTER TECHNOLOGY FOR REPACK AND ATSC 3.0



CHRISTINE ZUBA,
DIELECTRIC

To date, broadband antennas have been largely designed with large panels and high windload.

Newer technologies such as waveguide slot-cavity antennas have been introduced within the last 12-18 months. Additional New Broadband Slot Antenna techniques are becoming available. The television channel repack not only means the need for broadband antenna applications, but additional filter considerations for closely spaced channels, and a future ATSC 3.0 environment. This paper will examine the latest in antenna and filter design techniques and specifications in a more crowded television band, anticipating ATSC 3.0.

11 A.M.
ADOPTING VOIP TO IMPROVE LIVE COVERAGE WORKFLOWS WHILE SLASHING EXPENSES



KIRK HARNACK,
JOE TALBOT,
MARTIN DYSTER,
THE TELOS ALLIANCE

Live coverage television is rife with difficulties and pitfalls, and every TV facility is looking to cut expenses. More TV stations are discovering VoIP/SIP service

along with the modern studio equipment that makes it effective. From instant IFB connections to great-sounding severe weather spotter reports, VoIP/SIP technology and equipment is improving audio quality both behind the scenes and on-air. This presentation demonstrates how TV stations are improving in-the-field reporting while saving hundreds to thousands on their telecom costs.

**12 P.M.
LUNCH**

**1 P.M.
ATSC 3.0: CHARACTERISTICS AND TRANSMISSION REQUIREMENTS**



**MARTYN
HORSPOOL,
GATESAIR**

ATSC 3.0 promises to bring with it many advanced features and capabilities which will enhance the future of over-the-air television. The differences between OFDM-based modulation and the current ATSC 8-VSB modulation are apparent. Some of these differences will impact the ability of existing transmission equipment to successfully and reliably perform their intended tasks. This presentation will dig into some of the key areas that need to be investigated

and provide some insight as to how to be prepared for the transition to ATSC 3.0 transmission.

and provide some insight as to how to be prepared for the transition to ATSC 3.0 transmission.

**1:45 P.M.
ATSC 3.0: THE BIG PICTURE**



**FRED
BAUMGARTNER,
NEXT GEN TV
IMPLEMENTATION, ONE
MEDIA/
SINCLAIR**

BROADCAST

This session will engage the audience in challenging the long held assumptions of “what is Broadcasting?” and provide new insight into the unique opportunities to establish relevance in today’s rapidly converging digital IP world with “BaaS (Broadcast as a service), positioning and developing Broadcasting’s central role in the emerging 5G world.

**2:30 P.M.
ATSC 3.0 PANEL**



**JAY ADRICK,
BROADCAST
CONSULTANT/
CHAIRS ATSC
ADVANCED
EMERGENCY
ALERTING**

IMPLEMENTATION TEAM; FRED BAUMGARTNER, NEXT GEN TV IMPLEMENTATION, ONE MEDIA-SINCLAIR BROADCAST; MARTYN HORSPOOL, GATESAIR; JERRY WHITAKER, ATSC; CHRISTINE ZUBA, DIELECTRIC

With the ATSC 3.0 standards process almost complete, this panel of experts will delve into what it will take to bring the technology to your market, and your station. This session will be highly interactive with the audience.

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TUESDAY REGISTRATION



TUESDAY BREAKFAST



TUESDAY BREAK



**Broadcasters
General Store**

TUESDAY LUNCH



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*In memory of Al Clark, engineer
with WITI for 45 years.*

STATE OF THE ART PROJECTOR



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GREEN BAY



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TOM SMITH



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EMAIL QUEEN





**The 2017
Broadcasters Clinic
is dedicated to
Leonard Charles
for his many years
of service
to the WBA
and the
Broadcasters Clinic**



HOTEL INFORMATION

The 2017 Broadcasters Clinic sessions are being held in the Superior Room at the Madison Marriott West Hotel, which is located at 1313 John Q. Hammons Drive in Middleton. The hotel deadline is 5 p.m., Sept. 18, 2017, and the discounted rate is \$124. Reservations can be made online at wi-broadcasters.org. To register by phone, call 888-745-2032.

Mention you are with the WBA Broadcasters Clinic to receive the \$124 rate.

REGISTRATION INFORMATION

Registration fee covers: program materials, continental breakfasts and luncheons as indicated, refreshment breaks and an evening reception with hot hors d'oeuvres (cash bar) and Beer and Brats at the Nuts and Bolts session.

Vegetarian meals can be requested by calling the WBA office at 1-800-236-1922, by Sept. 15, 2017.

The WBA will need to guarantee meal counts with the hotel, therefore the WBA will NOT refund any cancellations made after Sept. 15, 2017. The WBA will also invoice for all "no-shows."

CONTACT

For further conference or exhibit information contact: Linda Baun, lbaun@wi-broadcasters.org
608-729-1480

**MARK YOUR
CALENDARS
OCT. 9-11, 2018**