



August 2017

Society of Broadcast Engineers Chapter 24 Newsletter Madison, Wisconsin

Next Meeting

Tuesday, August 23

LIGHTNING PROTECTION

EMP Solutions presents the physics of lightning and ways to protect broadcast facilities from them.



The basic concepts will be of interest to Ham Radio operators and homeowners with OTA antennas. The following is an outline of topics covered:

- Thunderstorm days/year by region, lightning strikes and tower height
- Typical lightning rod protection & grounding issues
- The costs of attracting lightning strikes and how grounding is not totally effective and how existing standards work against us
- The solution is to prevent lightning strikes and methods to do so

A number of case studies will be presented and how to do a site survey.

Dutch Treat Dinner 5:30 PM
Culvers Frozen Custard
2102 W. Beltline (north frontage road)
Madison, WI
(no reservation - just gather together)

Meeting and Program at 7:00PM
Wisconsin Public Broadcasting Center
3319 W. Beltline Hwy
Madison, WI

Visitors & Guests are welcome
at all Chapter 24 events!

Remembering Herbert P. Jordan

.....

Herbert (Herb) P. Jordan, 89, of Madison, WI passed away on Friday, July 7, 2017. Herb was born on January 31, 1928 in Prairie du Chien, WI, son of the late Reverend Franklin and Leona (Beidelman) Jordan.

After graduating from Hartford High School, Herb served in the United States Army. He then graduated from North Central College (IL) where he received a BS degree in engineering.



Shortly thereafter he obtained a FCC First Class commercial license and went to work for WTKM in Hartford. He moved to Madison in 1953 and went to work for WKOW-TV, where he

helped to get the first TV station on air in Madison. He also worked for WISC-TV and WHA-TV, where he retired in 1990. Herb was working at WHA-TV as an engineering and studio supervisor when the new Vilas Communication Hall opened in 1972 on the UW-Madison campus. (See pages 18-23 at <<http://www.americanradiohistory.com/Archive-RCA-Broadcast-News/RCA-155.pdf>>)

>>> **Herb** continued on page 4



Coming Up

Thurs., Sept. 21	OPEN
Wed., Oct. 11	Broadcasters Clinic — UW Engineering Autonomous Car Study
Wed., Nov. 15	Broadcast IP Standards

Broadcasters Clinic 2017

>>> by Leonard Charles,
WBA-SBE Broadcasters Clinic
Committee Chair

In this newsletter you will find the 2017 full color brochure for the Broadcasters Clinic. The program committee has worked very hard to put together another session line up that is reflective of the technology that we all work with or hear about every day. Our goal, and why the Clinic exists, is to give you the tools to help you do the best job you can for yourself and the stations under your care.

Let me tell you a little about the committee. It is made up of a cross section of Radio and TV engineers from across the upper Midwest representing all four Wisconsin SBE Chapters and beyond. Their volunteerism toward this task is humbling to me as their leader. Planning meetings are spent dissecting our industry and profession to insure we are covering the subjects of most value to you as an attendee. We take pride in what we do because we take pride in what you do. We truly are all in this together.

One thing is for sure, broadcast technology doesn't stand still, and neither can you. It is our hope that you will find the time in your busy schedule to attend the Clinic this year. I am confident that you will return recharged and ready to make the future happen.

Linda Baun and the amazing staff at the WBA stand ready to accept your registration and save a seat for you at the 2017 Broadcasters Clinic. Once you have browsed the brochure please make the commitment to join us. We'll be glad to see you in October.



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Meeting Minutes

from the July 2017 Business Meeting

Chapter 24 of the Society of Broadcast Engineers held its monthly meeting on Tuesday, July 25, 2017 at the Wisconsin Public Broadcasting Center in Madison. There were 11 members present, including 10 who were certified, and one guest.

The meeting was called to order at 7:04pm by Chapter Chair Rich Wood, and quick introductions were made around the table. There were no changes to the June meeting minutes as listed in the July *Newsletter*, so they were approved as published.

Treasurer Roy Henn stated there were no expenditures since last month and that the Chapter bank balance remains positive. As a related item, Rich Wood brought up a new business topic: Treasurer Roy Henn had received an authentic-looking email which appeared to come from Chair Rich Wood. The email indicated that a payment in excess of \$1000 needed to be quickly sent to a vendor in Florida for a past-due bill. It was determined that the request was a scam and didn't actually come from the Chair, but not before a check had been overnighted. A stop-payment request was made with the bank before the check cleared. Chair Rich Wood notified the SBE National office of this scam, then learned other SBE chapters have been targeted by similar attempts. Following discussion a motion was made to view this as an educational experience, and \$77.70 from the Chapter would reimburse the Treasurer for personal funds used for the overnight cost and stop payment bank fee. The motion passed on a unanimous vote.

In other new business, Rich Wood informed everyone that FEMA has announced a National EAS test planned for September 27. Stations will be required to register with the FCC CORES online system prior to the national test; check the FCC and SBE websites for instructions and details. Finally, Chapter 24 is searching for interested individuals to take on responsibility as the Newsletter editor and as membership coordinator. Contact one of the current officers if you are interested.

With the Sustaining Membership report, Fred Sperry announced that one new sustaining member was recently added, and that Resonant Results was the most recent renewal. There are a total of 16 sustaining members supporting Chapter 24.

Program committee chair Steve Paugh announced topics for the next three meetings. The Wednesday, August 23 presentation will be on lightning protection. The September program will be a tour of the WMUU-LP studio, while the October Broadcasters Clinic program will be about autonomous vehicle testing at UW-Madison.

For the Certification and Education report, Jim Hermanson forwarded information that one recertification application was in process. The next upcoming local certification exam opportunity is November 3 – 13, with applications due at SBE National by September 25.

Leonard Charles gave a National report, reminding everyone of the upcoming National election to be held July 24 – August 23. Electronic ballots have been emailed for members to vote for the 6 director and 4 officer positions. The RF101 webinar part 7 of 8 will happen on August 24, while the Fundamentals of IP Networking webinar is on August 29.

There were no old business topics brought forward for discussion.

The meeting was adjourned at 7:20pm, and was followed by a presentation on tower structural standards and changes. Dave Lyshek, P.E. from Edge Consulting Engineers in Prairie du Sac gave an overview of the applicable standards and practices applied to broadcast towers.

Submitted by Mike Norton, Secretary

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.



Amateur Radio News

compiled by Tom Weeden, WJ9H

- Amateur radio will play a part in an experiment during the upcoming solar eclipse. Virginia Tech electrical engineering professor Greg Earle, W4GDE, is heading up a National Science Foundation (NSF) funded experiment dubbed CEDAR — Coupling, Energetics, and Dynamics of Atmospheric Regions. The experiment proposes to study the effects on the ionosphere of the August 21 total eclipse of the Sun, using a combination of GPS receivers, the university's SuperDARN (Super Dual Auroral Radar Network) radar system, HF Amateur Radio, and plasma modeling. Several graduate students and researchers, as well as the Virginia Tech Amateur Radio Association (K4KDJ) and the Amateur Radio community at large have been recruited to help.

"We want to understand how the ionosphere is affected by blockage of sunlight over a relatively short interval (~2 hours), understand how man-made systems are affected by the changes in the ionosphere, and use the data to improve our numerical models," Earle told ARRL, noting that the "plan has morphed a bit" since the initial proposal of more than a year ago, although "the idea is still the same."

Earle and his team are will use the data they collect to characterize ionospheric plasma density variations caused by the eclipse, measure HF scintillation -- rapid fluctuation of signal phase and/or amplitude -- during the eclipse, study the motions of plasma irregularities produced in both the E and F layers, and use numerical models to test cause-and-effect scenarios to compare with empirical data.

"The proposed study will utilize diagnostic capabilities that have never before been used to study a mid-latitude eclipse," the CEDAR abstract explains. "Through this work we will answer several fundamental questions that remain unresolved, despite previous eclipse studies, and we will engage a huge cohort of non-scientists in gathering data that will constrain our models and enrich our

understanding of ionospheric behavior."

That "huge cohort" includes participants in the Solar Eclipse QSO Party (SEQP), sponsored by the American Radio Relay League and HamSCI.

"During this event, radio operators will actively communicate throughout the eclipse interval over paths that transect the eclipsed region of the ionosphere," the CEDAR proposal outlines. "These data will include information on the signal strength and maximum usable frequency in various HF bands, which are directly related to the density and altitude of the ionosphere."

- Hoping to chart a firmer future for the Amateur Radio service, the ARRL Board of Directors met July 21-22 in Farmington, Connecticut. Goals were to enhance the value of the entry-level license and to provide ongoing support for new licensees. ARRL President Rick Roderick, K5UR, chaired the second regular meeting of 2017.

ARRL New England Division Director Tom Frenaye, K1KI, presented the report of the Ad Hoc Entry-Level License Committee, saying the committee's initial, informal survey attracted nearly 7,900 responses. A second random survey drew another 375 responses. "A clear majority favored a revision to the Technician rather than a new entry-level license," the committee's report said, noting that this would require no change to the Technician examination, which already covers more material than necessary for an entry-level examination. "This choice requires the simplest revision to FCC rules," the committee report said. The committee suggested expanded digital access on 80, 40, and 15 meters, where Technicians already have CW access, as well as the addition of Technician phone privileges on those bands. Frenaye pointed out that while the Amateur Radio population is growing, the annual rate of growth has stagnated at about 1%. "There is a general consensus... that 'something needs to happen,'" the committee's report

said, noting a generally favorable attitude toward attracting newcomers.

"The general goal here is to have an entry-level license that offers a way for a newcomer to experience multiple facets of Amateur Radio," the committee's report said, "encouraging them to get on the air, meet other licensees, and engage in a lifetime of learning while using Amateur Radio."

Later in the meeting, the Board charged the ARRL Executive Committee with developing a plan to implement the ad hoc committee's recommendation to make the current Technician class license more attractive and useful by expanding its operating privileges on HF to include phone and digital modes. The Board asked the Ad Hoc Entry-Level License Committee to further research and develop the details of a second recommendation to improve successful outreach to prospective radio amateurs and help them through the licensing process.

The committee began with the premise that ARRL must act in order to remain relevant going forward. It proposed instituting a Lifelong Learning Program to focus on developing a clear developmental path for all radio amateurs, from newcomers to established radio amateurs. The committee recommended the creation of new programs and services to increase the knowledge base of newcomers in order to get them active, as well as programs to keep experienced amateurs up to date with changing technology and practice.

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



September 2017 Chapter 24
Newsletter deadline:

Tuesday, September 5, midnight
pgstoffel@gmail.com

edited using Adobe InDesign CC

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>>> **Herb** continued from page 1

Herb loved to travel and was an avid amateur photographer. Herb earned his Class B amateur license in July of 1950 and was issued W9LAA. In 1951 he obtained a Class A license. In 1975 he progressed to Amateur Extra and became W9LA in 1976. He was especially proud of the fact that he had made



contact with amateur radio operators from every country in the world. He was a member throughout the years of several various groups including AARL, FLARC, MDXC, INDXA, ARES, RACES, Rag Chewers Club (amateur radio award) and NCDXF. He earned various awards from these clubs in regards to his enthusiasm for amateur radio. (See <<http://www.madisonxclub.org/members/w9la/w9la.html>>)

Herb was involved with the SBE, serving as Chapter 24 Chair, 1980-1981, and Certification Chair, 1983-1986. A search of the Chapter 24 archives has Herb presenting at a chapter meeting, "Colorimetry and Color TV Basics," January 1970.

Herb is remembered for his mentoring, kindness, friendship and great memories. He was fun to be around and will be dearly missed. Chapter 24 member Jim Hermanson recalled, "Herb was a good man. He always loved his chats and visits with broadcast engineers. Every chance he had, he attended SBE chapter meetings. It was enjoyable to visit with him during some rides to and from those meetings. Being part of the start of Madison television broadcasting, and having worked for a few of the stations, Herb carried a lot of history. He was a friend since I first met him. I learned a lot from him about broadcast engineering and amateur radio. He had a great voice for his amateur radio

transmissions (the non-code ones), and a heart of gold."

Tom Weeden said, "I lived just up the street from Herb, and my wife Lesa was one of his in-home caregivers through Senior Helpers in his final years. Herb suffered from macular degeneration, and once in a while I'd get a call from Lesa asking me to come over and help Herb get his bearings on his Kenwood rig so he could continue chatting on the air. Herb was part of an informal network of hams who were former CBS employees and would meet regularly on 20 meters. I enjoyed hearing him talk about the early history of Madison TV, and he would often ask me questions about digital television, since he had retired before the DTV transition began. Herb was one of the kindest persons I'd ever met."

Paul Stoffel added, "Above all, Herb taught me that quality control is foremost and needs to be supported with employee training."

Another search of the Chapter 24 archives produced a photo of the chapter's first certification recipients. The photo was taken at a Chapter 24 meeting in early 1977. The occasion was the grant of the first round of certifications to engineers (including Herb) who had been in the broadcasting business for ten years. These were the original CSBE certifications, a category that no longer exists. They were awarded on the basis of experience, rather than tests. At the time tests were just being developed.

Ken Dixon was chapter chair at the time.



Appearing in the photo from left to right:

(Back row) Gene Zastrow-WHA-TV, Dennis Behr-WHA-TV, **Herb Jordan**-WHA-TV, Paul Hendrickson-WHA-TV, Don Moran-WHA-TV, Don Borchert-WHA-TV, Jim Crooks-City of Madison, Elmer Weisensel-WMTV, Neal McLain-Complete Channel TV, Bob Zuelsdorf-WKOW-TV, Warren Sommerfield-City of Madison.

(Front row) Ken Dixon-WHA-TV, George Reynolds-WHA-TV, Paul Norton-ECB, Ron Bornstein-UW-Madison, Bob Wickhem Sr.-WKOW-TV

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

The Open 2017 Exam Schedule

Exam Dates	Location	Application Deadline (to SBE National Office)
November 3-13, 2017	Local Chapters (Madison Area)	September 25, 2017

If you currently hold an SBE Certification, you can purchase a corresponding SBE Certification Pin. A pin costs \$17 (\$14 each + \$3 S/H) and is a great way to show what you have worked hard to accomplish. SBE membership pins are also available. If you have any questions contact SBE National Certification Director Megan Clappe.

- | | |
|--|---|
|  Certified Radio Operator (CRO) |  Certified Broadcast Radio Engineer (CBRE) |
|  Certified Television Operator (CTO) |  Certified Broadcast Television Engineer (CBTE) |
|  Certified Broadcast Technologist (CBT) |  Certified Senior Broadcast Radio Engineer (CSRE) |
|  Certified Broadcast Networking Technologist (CBNT) |  Certified Senior Broadcast Television Engineer (CSTE) |
|  Certified Audio Engineer (CEA) |  Certified Professional Broadcast Engineer (CPBE) |
|  Certified Video Engineer (CEV) |  Certified Broadcast Networking Engineer (CBNE) |

Society of Broadcast Engineers



The Association for Broadcast and Multimedia Technology Professionals

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

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

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Mark Bartolotta

DIGITAL SOLUTIONS
Broadcast/Professional

SBE RF101 Module 7: August 24, 1:00pm CT

This RF Test and Measurement webinar builds upon the previous modules. The discussion will include the following: signal generators; power measurements; AM Field Strength measurements; RF voltage and power; modulation characteristics; network analyzers; spectrum analysis and spectrum analyzers; noise figure and noise figure measurements; and spectral growth. 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 7.

SBE Members: \$57

Non-Members: \$87



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PRO AUDIO VIDEO A/V LIGHTING



CHAPTER 24 SUSTAINING MEMBERS

Recent Renewal:

Resonant Results, Ltd.

Thanks to all our Sustaining Members:

Alpha Video

AVI Systems

Belden, Inc.

Clark Wire and Cable

Full Compass Systems

Heartland Video Systems

Joseph Electronics

The Mink Company

Ross Video

Sound Devices, LLC

Token Creek Productions

WISC-TV 3

WMTV-TV 15

WKOW-TV 27

WMSN-TV 47

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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 with signal waves, a red car with signal waves, and a yellow signal strength indicator with 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

**ALPHA VIDEO & AUDIO,
INC.**

**ANYWAVE
COMMUNICATION
TECHNOLOGIES**

BELDEN GRASS VALLEY

**BROADCAST SUPPLY
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**BROADCASTERS
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FULL COMPASS

GATESAIR

**HITACHI KOKUSAI
ELECTRIC AMERICA**

IHSE USA, LLC

JOSEPH ELECTRONICS

KATHREIN USA, INC.

LECTROSONICS, INC

LINEAR ACOUSTICS

LOGITEK

MINNETONKA AUDIO

NAUTEL

OMNIA AUDIO

PHASETEK INC.

RESONANT RESULTS

ROHDE & SCHWARZ

SBE

THE TELOS ALLIANCE

**TIELINE, THE CODEC
COMPANY**

UTAH SCIENTIFIC

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



WEDNESDAY BREAKFAST

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TECHNICAL EQUIPMENT



MONITORS & SCREEN



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

STATE OF THE ART PROJECTOR



BROADCASTERS CLINIC
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WOODWARD RADIO
GROUP



DENNIS BALDRIDGE
BALDRIDGE COMMUNICATIONS



MARK BURG
WLAX-DT/WEUX-DT



GREG DAHL
SECOND OPINION
COMMUNICATIONS



CLIF GROTH
NEW RADIO GROUP



BILL HUBBARD, UW-
GREEN BAY



KEITH KINTNER,
UW-OSHKOSH



GARY MACH, GEMCOM



KEVIN RUPPERT,
WISC-TV



TOM SMITH



MICHELLE VETTERKIND
WBA PRESIDENT & CEO



LINDA BAUN
WBA VICE PRESIDENT &
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**