MEETING NOTICE

The next NJARC meeting will take place on Friday, September 11th, at 7:30 P.M. The meeting will be conducted "on-line" via the video conferencing app Zoom. Information may be found at the club's website (http://www.njarc.org) with a link being sent out on the NJARC Communicator prior to the meeting. This month, Technical Coordinator Al Klase will present the topic "Understanding the All-American Five - The Evolution of an Engineering Masterpiece."

As a result of his desire to get more active in the club, we are happy to announce that Joe Giliberti is the new owner of our capacitor program. Thanks go out to Sal Brisindi and Matt Reynolds for keeping the program afloat over the years. Joe says that you can send requests to capacitors@njarc.org. He'll be sending out a price list soon and is hoping to expand the program a bit with other values and possibly other types of radio/TV repair parts. Joe is also looking into the feasibility of mailing capacitors. If you have any other suggestions, please let Joe know.

Dave Sica reminds us that recordings of our recent Zoom meetings are available on the club's YouTube channel. For July (Third-Order Intermodulation Distortion in Radio Receivers/An Introduction to the NanoVNA), go to:

https://youtu.be/XkCq_nTYG1g

And don't forget that most of our recent meeting videos are also available on YouTube:

https://www.youtube.com/user/njarc

On another topic, Dave noted that if you'd like to send a signal to your "Armstrong-band" FM radio, the signal from the Sony HO-800 wireless headphone transmitter is within the original FM band of 42-50 MHz.

Finally, make a note that the Kutztown Antique Radio Meet, co-hosted by the Delaware Valley Historic Radio Club, is still scheduled for September 18 and 19. Doors open for buyers at 7:00 am. Information at Renninger's website talks about an auction in the White Room but it doesn't appear that one will take place, although some other accommodation may be considered.

Over 40 members attended our August Zoom meeting with a vote of thanks going out to Prof. Tom Perera for his presentation on "Phil Weingarten's Fabulous Fakes." The meeting may be viewed on the club's YouTube channel, courtesy of Dave Sica, at:

https://youtu.be/PuVv06QEEpw

It appears that Tom was quite excited to hear some of the stories and additional information related to his topic that were provided by our members. He was especially interested in member Darren's Hoffman's ability to identify some of the equipment shown in a photo of Hugo Pici ciani's machine shop where some of Weingarten's creations took shape. Darren had visited Hugo's shop many years ago and it was amazing that he remembered the specifics of some of the machinery.

Your NJARC Board met on September 4th to firm up a schedule for the rest of the year. Changes are provided in the list of Upcoming Events. Of note is that all remaining meetings will be conducted via Zoom and no Repair Clinics are scheduled. The Holiday Party is still listed but it is still very much up in the air.

President Lee emphasized that "in-person" meetings will resume as soon as possible and there is no intent to maintain the Zoom format indefinitely. He noted that there was no substitute for getting together "in the flesh" to renew friendships, trade stories, kibitz one another and share in the NJARC radio collector's fellowship. However, Covid 19 has justifiably influenced many of our members, especially our older ones, to avoid direct contact for the present time. Of course, things may change but Richard is required to make plans for the near future to avoid the problems associated with last minute decisions. On a positive note, for those members who are too distant or unable to attend future in-person meetings, the club is working on the capability of "Zooming" them.

Upcoming Events

September 18-19 - Kutztown Radio Show
October 9 - Monthly meeting via Zoom; FM talk by Mike Molnar
November 13 - Monthly meeting via Zoom; Show & Tell, Hints & Kinks
December (date TBA) - Holiday Party at West Lake Golf and CC - still tentative
January 8 - Monthly meeting at InfoAge Bldg. 9032A, Members Only Auction, dues collection
**WWV REVISITED**

*In the August "Broadcaster," I featured an article by James Careless titled “Why WWV and WWVH Still Matter.” Similar to the response from our NJARC members, commentary provided to "Radio World" where the article was first carried, was both positive and questionable regarding the usefulness of WWV. Below are two of those comments.*

**Several cesium atomic clocks provide the precise timing information broadcast by WWV.**

**WWV Is Nice But Not All That Critical**

The following was submitted by Ira Wilner and updated on August 4th. Ira is chief engineer of the Monadnock Broadcasting Group in Keene, N.H.

While I agree with most of the points raised by the author of “Why WWV and WWVH Still Matter,” as an engineer I’ve long abandoned zero beating WWV to calibrate local frequency references. In fact, I owned a WWVB comparator, basically a loop antenna and TRS receiver tuned to 60 kHz that permitted fairly precise calibration. But it took many minutes to center the reading due to the typical path instability of radio waves, even using the ground wave, which is only useful in daylight hours.

At night, WWVB is unusable for frequency/phase measurements due to skywave propagation but is the best time for those so-called atomic clocks to calibrate to the slow time code repeated once a minute on a daily basis. So, how do I calibrate the frequency references of my frequency counters and spectrum analyzer used for broadcast engineering? The answer is GPS.

The line-of-sight microwave band signals provide much less jitter, especially when more than one SV is used for a timing solution. You can buy GPS timing receivers on eBay and elsewhere for under $100. Add a cheap patch antenna or a quality outdoor antenna and you’re good to go. You’ll get both data for time of day and a precision 10 MHz reference signal you can lock to a synthesized RF signal generator to dial in any frequency precisely. And just in case a GPS signal is for some reason not available, I have an old Rubidium Atomic Oscillator on hand, also quite inexpensive second or third hand.

So, ultimately as nice as WWV is to have around, except for WWVB there really isn’t a great need for HF time signals anymore.

**Don’t Dump on WWV**

The following was submitted by Mark Persons on August 17th who is a frequent contributor to "Radio World."

Here is my response to the letter to the editor "Why WWV is Nice But Not All That Critical." The letter raised an eyebrow with me. The notion of eliminating the HF (2.5 to 20 MHz) service of the NIST National Institute of Standards and Technology station WWV is a bad idea. I regularly use the 5 and 10 MHz signals to calibrate time bases in my spectrum analyzer, signal generators, receivers and frequency counters. It is a time-proven technique to zero-beat their reference oscillators with WWV and still valuable today in commercial and amateur radio use.

Yes, the Global Positioning System does that job, but it is vulnerable to enemy attack. WWV is the fallback to save us from problems of synchronizing networks, including the internet in the event that GPS becomes unusable.

The 60 kHz WWVB is the source for automatically setting “atomic” watches, wall clocks and other devices. Since we agree on that, then keeping the HF transmitters of WWV working is a small price to pay in the overall scheme of things. They are all at the same site in Fort Collins, Colo., operating from the same fre-
It may seem improbable that two radio stations that announce the time could end up being world-saving superheroes. But one day Colorado shortwave station WWV and its sister station WWVH in Hawaii may do just that. Actually, the right term is not “if” but “when.” In 1859, a massive solar flare hit the atmosphere; it was named the Carrington Event after UK astronomer Richard Carrington, who spotted the flare and deduced what was coming. The resulting nighttime auroras were so bright that sleeping miners in the Rocky Mountains woke up and made breakfast.

At the time, telegraph networks in North America and Europe were the only electronics in widespread use, and the Carrington Event flare definitely affected them. The current induced into the telegraph wires was so strong that some operators received serious shocks. Others discovered that they could send and receive Morse Code over the network, without having to connect power sources to it.

In our modern world, a Carrington Event-sized solar storm “could lead to power loss for a period of weeks or more,” according to a 2013 analysis prepared by Lloyd’s of London and Atmospheric and Environmental Research. “This would cause major disruption to transport, food supplies, emergency and hospital services ... It is also likely that financial markets (especially as the financial sector is generally concentrated in the areas most at risk i.e. the northeast of the U.S.) could be significantly disrupted by a severe space weather event.”

When the next Carrington Event-sized solar storm hits the Earth, WWV and WWVH will step up to quell the chaos. The reason: Not only do WWV and WWVH’s powerful shortwave radio signals easily cover North America and much of the world, but the facility has a generous supply of diesel standby generators, screened/shielded facilities to protect equipment from power surges and a robust, non-digital transmission infrastructure. “Quite frankly, much of our equipment is tube-based analog technology,” said Glenn Nelson, an electronics technician at WWV and sister time code station WWVB. “This mean it is less vulnerable to power surges damage than digital equipment.”

**With Assistance from MARS**

WWV and WWVH won’t be the only superheroes working to bring order back to a world blasted by a solar storm (or a man-made electromagnetic pulse; either will do). The stations will be joined in their efforts by their partners in the Department of Defense Military Auxiliary Radio System. MARS members are amateur radio volunteers trained and certified to operate on DOD frequencies using military messaging protocols in order to communicate with the U.S. military. MARS was established by DOD back in 1925, to enlist the help of hams during man-made and natural disasters, and to serve as trained pool of radio operators to support the military.

“It is always difficult to coordinate rescue officials and volunteers when there is a widespread communications breakdown, especially on the scale of a Carrington Event,” said Paul English, who runs the U.S. Army’s MARS program. “Hams will play a vital role in such emergencies gathering situational awareness information for the military on a county level,” he told Radio World. “They’ll tell us what’s the status of electricity, water and transportation, and we’ll compile that information on a national level to help guide the nation’s response.”

**Website of the Army MARS program. The Air Force has one too.**

Using their powerful transmissions and broad coverage, WWV/WWVH will serve as central information hubs for MARS team members. The team will be packed with hams from across the United State, “who use their own equipment and donate their time to provide this service,” said amateur radio operator Cal Zethmayr (ham callsign W4GMH). WWV and WWVH’s broadcast will keep everyone on the same page and working together despite the chaos.

**Getting Ready for Disaster**

Mindful that solar storms can strike at any time, DOD holds MARS exercises on a regular basis. Since April 19, 2019, WWV/WWVH have been a part of this process, by announcing current and upcoming MARS exercises during their 24/7 time broadcasts. “The WWV and WWVH announcements will provide information to Amateur Radio participants regarding the purpose, dates, times and locations of the exercises and other information,” states the WWV web site www.nist.gov/pml/time-and-frequency-division/radio-stations/wwv. “WWV will air MARS announcements on the 10th minute of each hour, and WWVH will use the 50th minute. The announcements will air for about two weeks, prior to and during each exercise.”

It is impossible to say when the next Carrington Event-level solar storm may hit our planet. It could be hundreds of years from now; it could be tomorrow. But when this storm does strike, the staff at WWV/WWVH and their MARS team members will be there to help quell the chaos. They’ll be real-life superheroes aiding the U.S. government in finding out which Americans urgently need help, so that it can be sent as soon as possible.
"When you look at today’s world where we are completely dependent on computer-controlled electronics in all aspects of our lives, a Carrington Event-sized coronal mass ejection could be devastating," said English. “WWV, WWVH, and MARS will help us cope in such emergencies.”

Information about upcoming MARS exercises can be found at the following site: www.dodmars.org. You can read about a recent exercise from the Army point of view by “Googling” an article by Gordon Van Vleet, "Communications is Key as MARS Auxiliarists Refine Skills."

NJARC EXHIBITS SHINE AT INFOAGE’S WWII WEEKEND

By
Marv Beeferman &
Ray Chase

InfoAge honored the 75th anniversary of the end of WWII (VJ Day) on August 15-16 with a “WWII Weekend.” Included was a display of historic artifacts from the U.S.S. Arizona and the Battle of the Bulge. Visitors could also view realistic WWII dioramas, a typical WWII “home front” living room, National Archives WWII posters, military vehicles and a group of displays and posters set up by NJARC members Ray Chase and Al Klase.

InfoAge members John Cervini and Bob Perricelli offered a display of the Rebecca/Eureka Beacon System and a quarter-scale model of the "Little Boy" atomic bomb used on Hiroshima. The radar altimeters used on the bomb were modified AN/APS-13 tail warning radars and Camp Evans played a role in their use. Al Klase calculated the size of the four radar antennas on the bomb that functioned with internal radar sets used to trigger it at the correct height. The Railroad Club fabricated the antennas.

Included in the displays was a carrier homing system, canteen prison camp radio, spy radio, cryptography, a vacuum tube display, a "code talker" radio and a Pearl Harbor radar story in video format.

A vote of thanks go out to Al and Ray and all those InfoAge volunteers who devoted their time and effort in honoring our veterans. Their work is especially commended during a time when supporting an effort such as this took precedence over the potentially harmful consequences.
Most of us are familiar with WWJ as an easy catch during the club's Broadcast Band DX Contest. However, during this period of celebrating radio's first 100 years, the station is significant in many other ways than just sharing a common birthday.

Detroit's first station was born when Detroit News publisher and radio enthusiast William E. Scripps had a leased 20 watt rated DeForest OT-10 transmitter set up in a corner of the sports department (today it's 50,000 watts). Initial broadcasts, by what was then called the "Detroit News Radiophone," were sent under an amateur station license operating with the call sign "8MK." Regular broadcasting began on August 31, 1920 with the station claiming to be the first commercial broadcaster. However, this claim has been disputed by Pittsburgh's KDKA and KCBS in San Francisco with reality coming down to a matter of technical definitions which are still in question to this day. One complicating factor is that the

U.S. government initially did not have a formal definition of "broadcasting" or any specific regulations.

Pittsburgh's KDKA got its federal license a few months before WWJ, but 8MK, as WWJ was known in 1920, was on the air with an amateur license well before Pittsburgh. KDKA made its first commercial broadcast on November 2, 1920, two months after WWJ's first broadcast. (This date was chosen by KDKA because it was election day and the power of radio was proven when people could hear the results of the Harding-Cox presidential race before reading about it in the papers.)

On October 13, 1921, the government issued WWJ a "limited commercial license" with call letters WBL. (Listeners had trouble hearing WBL correctly and it was changed to WWJ on March 3, 1922.) While this had the desired benefit on now being on a less congested wavelength, it also meant that the station's continued use of DeForest equipment was technically in violation of the commercial radio equipment patent rights held by AT&T. This potential problem was soon resolved by the purchase of a 500-watt transmitter from AT&T subsidiary Western Electric which was installed on January 28, 1922.

Competition between KDKA and WWJ was constant and vigorous. Time Magazine got its hand slapped in 1945 when it reported that the National Association of Broadcasters had declared WWJ to be 10-and-a-half weeks older than KDKA. Clearly worried about blowback from Pittsburgh, the NAB President J. Harold Ryan wrote time to complain they'd just put out information, without taking a stand. "To imply that the mere reprint of a chronology amounts to a 'final decision' on a disputed date of history," he wrote, "is manifestly unfair."

Ryan's apology didn't win him much. KDKA's parent company still went ahead and pulled all its stations out of the NAB for eight years.

In 1977, the Journal of Broadcasting published a study "Broadcasting's Oldest Stations: An Examination of Four Claimants which reviewed KDKA, WWJ, WHA (in Madison Wisconsin) and KCBS. The authors ultimately favored KDKA, though unmentioned by the review was the fact that the lead author had formerly been the station's manager.

Largely ignored by WWJ and KDKA, KCBS in San Francisco, still contends it is significantly older than both stations. KCBS traced its history to a pre-WWI station operated by Charles "Doc" Herrold in San Jose, California. The station made test audio transmissions in 1909, and began broadcasting weekly concerts in 1912. It has been argued that because broadcasts were suspended during WWI when the U.S. government prohibited the operation of civilian radio stations, this gap disqualifies KCBS from "oldest station" consideration. However, KCBS still has adopted the slogan "The World's First Broadcasting Station."

For its part, San Francisco's KCBS was on the air occasionally for years before 8MK, but got its federal license after both of the other stations. WWJ reporter Joe Donovan dismisses KCBS before 1920 as just a "ham-radio" operation. "People had been experimenting with radio since the 1880s, but broadcasting with paid employees bent on creating a new medium, was born in Detroit, the Motor City."

WWJ's first night of commercial programming included regularly updated primary election returns and a recording of singer Lois Johnson. Later, WWJ racked up many other nationwide firsts.
They included the first live concert with vocalist Mable Norton Ayers in 1920 and the first broadcast of a church service in 1922. The station is also believed to be the first to broadcast news reports regularly and the first to present regularly scheduled play-by-play sports reports. In 1923, the station aired the first play-by-play coverage of a University of Michigan football game with celebrated announcer E.L. "Ty" Tyson.

WWJ also helped propel a number of storied careers. Comedian and actor Will Rogers had his radio debut on WWJ, and when Japan bombed Pearl Harbor in 1941, it was Hugh Downs - decades later, the legendary host of NBC-TV's popular "Today" show - who was at the microphone. The station was able to attract numerous "illustrious persons" to appear over the airwaves from the station's "phonitorium" studio, including Lillian Gish, Fanny Brice, Ty Cobb and Babe Ruth.
THE WOMEN WHO OVERCAME RADIO'S EARLIEST GLASS CEILINGS

By

John F. Schneider

The following article comes during the recognition of two major events in American history, the 100th anniversary of radio and the passage of the 19th Amendment. Thanks go out to Mr. Schneider and "Radio World" for permission to reprint it here. The article first appeared in the August 1st edition of "Radio World" and is part of its series "Radio at 100." John Schneider is a lifetime radio historian, the author of two books and dozens of articles on the subject, and a Fellow of the California Historical Radio Society. He also edits the internet website "The Radio Historian" which is a collection of articles and photographs about early radio broadcasting in the United States...Ed

Sixteen-year-old Nancy Clancy was reportedly the youngest radio announcer in the country in 1924. Here she is shown in the studios of WAHG, the Alfred H. Grebe station in Richmond Hill, N.Y. WAHG grew to become today's WCBS in New York City. (Credit: Author's collection.)

Additionally, women were frequently hired as "program managers," responsible for booking the live entertainment that filled their stations’ airwaves, and they often came before the microphone to introduce the entertainers. But, by the start of the network era in the mid-1920s, there came to be a prejudice against women’s voices on the radio.

"FLAT" OR "SHRILL"

Broadcasters complained that the tone quality of early receivers and speakers made women’s higher-pitched voices sound shrill and dissonant; but this prejudice remained even as higher-fidelity receivers became available in the early 1930s. The conventional wisdom was that "audiences don’t like or trust women as announcers" and “only male voices can speak with authority.”

An audience survey conducted by WJZ in 1926, with 5,000 respondents, determined that listeners of both sexes preferred the male voice by a margin of 100 to 1. In 1934, an article in the Journal of Social Psychology concluded that “the male voice is more natural, more persuasive and more likely to arouse interest over the air than the feminine voice.” In 1935, Cantril and Gordon Allport published “The Psychology of Radio, and determined that 95% preferred hearing male voices over the radio.

Before the dawn of broadcasting, women were frequently hired as wireless operators, and so it was not a surprise that women’s voices were heard as announcers and program hosts in the early days of broadcast radio. Sybil Herrold was perhaps the world’s first disc jockey; she played Victrola records on her husband Charles Herrold’s experimental station, which broadcast in San Jose from 1912 to 1917.

In Boston, Eunice Randall’s voice was heard on a variety of programs over AM-RAD station 1XE (which became WGI in 1922). In New York City, WOR audienc-
**WAR YEARS**

World War II temporarily opened employment opportunities for women in radio, as the male staffs of the networks and local stations were siphoned off by the armed services. Women assumed the roles of announcers and newscasters, studio engineers and sound effects specialists. In 1943, NBC hired 10 young “pagettes” to supplement its depleted staff of Radio City pages. Around the country, women were also hired as advertising sales persons, program directors, traffic managers, continuity directors and even station managers. But sadly, just as occurred in manufacturing plants, when the men returned home after the war the jobs reverted to men who “had to support their families,” and the women were told to go home and be happy homemakers.

In the 1950s, as the radio industry adapted to the new competition from television, many radio announcers turned into disc jockeys, but the prejudice against female voices on the radio continued. The big-name deejays at local stations around the country were all men.

But there were a few exceptions. In 1955, Sam Phillips (of Sun Records fame) opened WHER in Memphis. Phillips enjoyed hearing women’s voices on the air, and he hired an all-female staff to run the station. WHER operated from studios in a Holiday Inn motel, and this led to a spinoff program, sponsored by Holiday Inn. WHER personality Dottie Abbott, taking the air name Dolly Holiday, hosted an overnight program of easy listening music syndicated to stations around the country. Her soothing voice and soft music could be heard across the AM band after midnight almost anywhere in the country into the early ’70s.

WHEN in Memphis was the first of several stations to adopt an "all-women" format during the disc jockey era. In 1955, Sam Phillips (of Sun Records fame) opened the station; his wife Becky was one of the first DJs. WHER broadcast until 1973. Other stations tried "all-girl" formats, as they were often called.

**CHANGING TIMES**

In the late 1960s, FM station WNEW in New York City experimented with an all-female format. Allison Steele won an audition against 800 other women and began working there as a disc jockey. She stayed on when the format was abandoned 18 months later, and gained popularity as “The Nightbird.” Her overnight show drew an estimated audience of 78,000, and she was chosen by Billboard Magazine in 1976 as the “FM Personality of the Year.”

As the 1970s progressed, the barriers against hearing women on the air gradually faded away. CHIC in Toronto and KNIT in Abilene, Texas, both had all-female deejay staffs, although the newscasts continued to be voiced by men. An all-woman format was tried at WSDM in Chicago, where Yvonne Daniels sharpened her chops before moving on to the AM powerhouse WLS in 1973. Also in Chicago, Connie Czersin debuted on WIND in 1974. Maxanne Sartori played progressive rock at KOL(FM) in Seattle before moving to Boston to take the afternoon slot at WBCN(FM). Donna Halper, whose written work has appeared in the pages of Radio World, played the hits at WMMS in Cleveland, where she was credited with discovering the rock band Rush in 1974. Liz Kiley started her career at WLAV in Grand Rapids in 1976, and within three years had moved up the ranks to WABC in New York.

The many who came after them benefited from the work of the women named above, and dozens of others, in challenging radio’s glass ceilings.