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The Fascinating World
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Marconi
transmitter complex
Poldhu, Cornwall, England

WTAM: Voice of the Storage Battery

Early Car Radios

AWA Salutes Collins

Fall 2016
The AWA Gateway is an electronic publication of the Antique Wireless Association, downloadable without charge from the AWA website, www.antiquewireless.org. Its purpose is to stimulate interest in vintage communications history, equipment, restoration, and collecting.

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AWA GATEWAY

Editor..................Mike Rosenhouse, K2CDX

COVER ART (by Will Thomson):
Transatlantic electronic wireless communication began on December 12, 1901, when three “dits” — “s” in Morse Code — were transmitted from the complex pictured on the cover to Guglielmo Marconi, at his St. John’s, Newfoundland, receiving station (pictured here). The towers shown on the cover were successors to the antenna masts used on that historic occasion (photo courtesy David Read).

The Antique Wireless Association, is nonprofit historical society founded in 1952.

Hi Everyone,

When I provide a tour of the Antique Wireless Museum for visitors, a frequent question is “how did you learn about all these wonderful exhibits?” Well, it takes time and being with other more knowledgeable collectors, historians, and technicians, it does begin to make sense and sink in my thick skull. Membership and fellowship in AWA allows each of us the opportunity to meet, spend time, and just plain talk about our hobby. Volunteering as a docent or guide at the Museum provides a very special opportunity for quality time with other knowledgeable members. Listening to the senior docents tell their stories about the artifacts and exhibits in the Museum for visitors makes the Museum “come alive” in a very special way and it is a fantastic way to learn more about the history of communications.

If you are interested in becoming a museum docent, AWA could use help on Tuesdays and Saturdays. We will provide the training you need and what a great way to increase your knowledge base. Please contact me at N2EVG@ARRL.net.

AWA has established Joint Membership Programs with Radio Club of America, formed in 1909 and the oldest radio club in America, and Collins Collectors Association, fostering preservation and documentation of the history and the equipment manufactured by Collins Radio and Rockwell Collins. We are pleased to announce if you are a member of AWA and would like to join RCA and/or CCA, you can join and receive a 5% discount on your memberships. If you are a member of one of these clubs, you can also receive a 5% discount on your AWA membership.

The lifeblood of AWA is volunteerism. If you have the time and skills that could help AWA, please consider volunteering. Although the pay is low (well there is no pay), the opportunity to volunteer your talents to make AWA grow and to interface with your fellow members is very rewarding. The current volunteers provide 1000s and 1000s of hours of their time and we have wonderful time together. Please don’t be shy and consider joining our merry band of volunteers by contacting me at N2EVG@ARRL.net.

Radio Club of America has announced that Robert Hobday N2EVG, AWA Deputy Director, and James Kreuzer N2GHD, AWA Librarian and Assistant Curator, have been elected Fellows in Radio Club of America for 2016. In addition, Marc Ellis N9EWJ, AWA Journal Editor, will receive the prestigious Radio Club of America 2016 Ralph Batchler Award for significant work in preserving the history of radio and electronic communication. The recipients will be honored at the 107th Banquet and Awards Presentation Friday, November 18, 2016 in New York City.

Today’s communication technologies define who we are as a world society based on instantaneous news from all over the globe. The basis of these technologies began nearly 200 years ago. AWA is dedicated to preserve and share the history of communication technologies. Please join us and share your knowledge and talents in our goal of preserving and sharing.

—Bob Hobday N2EVG
Deputy Director, AWA Museum

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You Want to Listen to that Thing While We’re Driving?
What a novel idea!

Developing a radio receiver that would work reliably in a moving automobile proved to be a greater challenge than most people anticipated. Home radios were often carried in cars to provide entertainment at fixed locations, such as picnics. For these applications, an antenna wire could be thrown over the branches of trees.

But how could an antenna be installed on an automobile that would be effective? One early installation was illustrated on the cover of a Popular Radio magazine published in June of 1923.
This may have been useful for radio listening at a fixed location with the engine off, but providing a suitable antenna was not the only change that was necessary for mobile operation.

One of the greatest challenges to the development of the car radio was overcoming the radio noise produced by the car itself. There was always the problem of ignition noise. But noise from the generator and voltage regulator could be equally difficult. Static electricity generated by the tires and inner tubes could also be distracting, especially in cold, dry weather.

To achieve satisfactory radio reception, a car radio had to be more sensitive, more selective, and have a more powerful audio amplifier with a better speaker than most of the radios used in the home in 1930. Car radios typically had an extra stage of tuned RF amplification to allow operation without a long outdoor antenna and ground connection, and to effectively increase the signal-to-noise ratio between the desired radio signal and the broad-band radio noise generated by the car. Extensive shielding was also used in automobile radio designs. To overcome the interior noise level of a car in motion, a powerful audio system and better speaker were needed. In addition, the radio had to be more rugged to provide reliable service in an automobile.

Early car radios used expensive dry batteries of the same type that were used in home radios. A more desirable solution was to develop power supplies that would allow the car radio to operate from the car’s six-volt battery. To provide a plate power supply, some early car radios used self-contained motor generators, commonly known as dynamotors.

But these were expensive, heavy, and unreliable. A better solution was to use an electromechanical vibrator to produce an alternating current to a transformer that could be rectified by a vacuum tube. Some vibrators used an extra set of contacts to provide synchronous rectification, but most car radios used a vacuum tube such as the 84/6Z4 tube that was specifically designed for use in automobile radios.

Most vibrators, including those shown here, plugged into sockets so that they could be easily replaced.

Although car radios were expensive accessories for cars in the 1930s, the demand was strong and major developments occurred between 1930 and 1940. Many of the manufacturers of home radios also manufactured radios for automobiles. In an age that had Victrola phonographs and RCA Radiola radios, it was only natural for the Galvin Manufacturing Corporation to use Motorola as their new corporate name after they achieved success in selling radios for automobiles. Philco, Zenith, and General Electric were also actively involved in the car radio market.

Initially, car radios were not designed to fit specific automobiles.

The large, heavy radio was usually mounted on the firewall of the car. A control head, mounted in the dash or on the steering column, was linked to the radio with flexible cables similar to speedometer cables to provide tuning and volume control. If the speaker was not part of the radio, it was sometimes mounted under the dash as a separate unit. Sometimes the control heads were customized to fit attractively in the dashes of certain car brands. The ad included with this article for a General Electric car radio appeared on the back cover of the July 1936 issue of Radio-Craft magazine. It shows car radio packaging that
was typical for that time. In later years, automobile manufacturers worked with radio manufacturers to design radios that were custom built for their automobiles. The GE ad shown here is from 1936.

but Ford used positive-ground designs. It is unclear why this situation developed, but car radio manufacturers had to incorporate flexible designs to accommodate both polarities.

In the 21st century, the collector's market for vintage automobile radios is often linked to the needs of antique car collectors. Many owners of old cars want an original car radio in working condition to make their automobile restorations complete.

I recently repaired a car radio for the owner of a 1948 Oldsmobile. The radio was completely dead. I discovered that the power supply vibrator was defective, a common occurrence. I installed a new solid-state vibrator replacement which brought the radio to life. This old radio had the excellent audio quality I remembered from the mid-1950s. Unfortunately, solid-state vibrators lack the expected vibrator hum that many people associate with old car radios.

By 1955, most automobiles standardized on 12-volt negative-ground electrical systems. But the days of vibrator power supplies were coming to an end. By 1957, car radios began using hybrid designs with a combination of low-voltage vacuum tubes and transistors. By the 1960s, nearly all car radios were completely solid state and much more reliable than the vacuum tube radios or earlier decades.

Generic radio designs faced an additional challenge. Most automobiles from the 1930s to the mid-1950s used six-volt electrical systems, but some cars grounded the positive terminal of the battery and others grounded the negative terminal. For example, Chevrolet used negative-ground systems, while Ford used positive-ground designs.

By the 1940s, car radio design had progressed from being only adequate to providing performance that was superior to many home radio receivers. This was especially true of the radios designed for Buicks and Oldsmobiles in the late 1940s. They had amazing audio quality. One radio collector built an AC power supply for an old Buick car radio just because he enjoyed the sound.

JIM COOK, the son of a radio technician, became a licensed amateur radio operator at 15 and obtained commercial radiotelephone licenses before he was 20. He worked as a transmitter operator for two radio stations while studying electrical engineering at the University of Kansas. After graduation he became an electronic circuit designer.
AWA Salutes Collins with Documentary DVD

By Mark Erdle

The Arthur A. Collins Legacy: A Culture of Innovation, an AWA produced documentary DVD that tells a story we’re more likely to associate with Silicon Valley than Cedar Rapids, tells a great story that could serve as a “prequel” to the more familiar stories of Hewlett and Packard, Wozniak and Jobs, Bezos or Musk.

On June 20th, 1925, two small ships left the port of Wiscasset, Maine, bound for Etah, Greenland, 700 miles south of the North Pole. The Peary, a former Canadian mine-sweeper carried a US Navy survey party headed by the well known explorer, Navy lieutenant commander Richard E Byrd, and a cargo of three crated airplanes. The Bowdoin, a two-masted, double planked schooner built for Arctic work, carried a National Geographic sponsored scientific party headed by Donald B. MacMillan. The official communications equipment for the Navy expedition was long wave gear, but poor propagation conditions and a conflict over control of the radios between Byrd and the expedition’s major financier, Navy Reserve lieutenant commander E.F McDonald, one of the founders of the Zenith Radio Corporation, often prevented effective communication on these bands.

John Reinartz, the expedition’s radio operator also had shortwave equipment on board that was provided by Zenith and this equipment was successfully used to make regular contacts, including contacts with a fifteen year old radio amateur in Cedar Rapids Iowa named Arthur A. Collins. Collins and Reinartz, who were acquainted with each other through amateur radio, had previously made arrangements for these contacts on bands that the Navy didn’t consider useful for long distance communication. While Reinartz used professionally designed equipment, Art Collins used transmitters and receivers of his own design. Eight years later Collins started The Collins Radio Corporation and unleashed a wave of creativity in the design and manufacturing of radios, computers, networks and avionics.

Extensive interviews with colleagues and employees at Collins Radio paint a picture of Art Collins as a person who was not only focused on current needs but who seemed to be able to see over the horizon and anticipate the ways that future needs and technologies might intersect. Art Collins was an information sponge who would take the latest technical and scientific texts home from the corporate library, read them cover to cover, and have a complete understanding of the subject matter the next morning. This focus on big ideas paid off with some spectacular successes along with some major failures. World War II brought tremendous expansion to Art’s company with innovative products like the remotely tuned ART-13 transmitter. After the war, Collins Radio went on to develop the communication equipment for a host of aerospace missions including the X-15 rocket plane and the Apollo program. When Art Collins set out to revolutionize the computer industry with a system based on networked computers in a distributed architecture, neither the marketplace nor the technology was ready and the resulting financial stress forced Collins into a merger with North American Rockwell, an unwieldy conglomerate that manufactured products ranging from water meters to rocket engines. Art Collins was forced out of the company in 1971. Eventually, Rockwell found its conglomerate model impossible to sustain and spun off all of its divisions except for Collins and Allen-Bradley, a manufacturer of industrial automation equipment.

The Antique Wireless Association and Collins Collectors Association have signed a Memorandum of Understanding that seeks to promote both organizations and to provide additional benefits to members. Under the terms of the MOU, members of both clubs will receive a 5% discount on their membership dues for either existing or new memberships. This agreement is effective immediately. If you are a member of Collins Collectors Association, you may join or renew your Antique Wireless Association dues for $33 ($38 non US). AWA believes this MOU will open avenues for existing or new members for both AWA and CCA, and we are excited to offer a Joint Membership Program with CCA.

Antique Wireless Association was formed in 1952 and is an educational non-profit chartered by the State of New York. AWA operates the Antique Wireless Museum in Bloomfield, New York and is dedicated to preserving and sharing the history of technology used to communicate and entertain from the first telegram to today’s wireless text messaging. The Museum is open Saturdays, 1 pm to 5 pm and Tuesdays 10 am to 3 pm, but closed on major holiday weekends.

Collins Collectors Association is operated solely for the benefit of the members and to further the stated objectives of fostering preservation and documentation of the anecdotal history of Collins Radio Company and Rockwell Collins as well as its employees.
Reflections of an Old-Timer

By Harold Cheetham

As a ham radio operator (W2HJC), besides being on the repeaters and listening to HF, I like to listen to the Old Time Radio shows (OTR) of the past. I have a collection on my computer, in mp3 format of several thousands of these different shows and it is growing daily. I play them through my Talking House. 5.0 AM transmitter and listen to them on my different antique radios I have set up to listen with. I also have a live 24/7 streaming radio station, from my house to the internet at sodusradio.com or people can find out about Old Time Radio at haroldsoldtimeradio.com.

Since its beginning ham radio operators are the ones who have brought us radio as we have it today. Pioneers in broadcasting as they were, started broadcasts that soon became the radio of then and now.

On Christmas Eve 1906, Reginald Fessenden is said to have broadcast the first radio program, consisting of some violin playing and passages from the Bible. While Fessenden’s role as an inventor and early radio experimenter is not in dispute, several contemporary radio researchers have questioned whether the Christmas Eve broadcast took place, or whether the date was in fact several weeks earlier. The first apparent published reference to the event was made in 1928 by H.P. Davis, Vice President of Westinghouse, in a lecture given at Harvard University. In 1932 Fessenden cited the Christmas Eve 1906 broadcast event in a letter he wrote to Vice President S.M. Kinter of Westinghouse. Fessenden’s wife Helen recounts the broadcast in her book Fessenden: Builder of Tomorrows (1940), eight years after Fessenden’s death. The issue of whether the 1906 Fessenden broadcast actually happened is discussed in Halper and Sterling’s article "Seeking the Truth About Fessenden" and also in James O’Neal's essays. An annotated argument supporting Fessenden as the world’s first radio broadcaster was offered in 2006 by Dr. John S. Belrose, Radioscientist Emeritus at the Communications Research Centre Canada, in his essay "Fessenden’s 1906 Christmas Eve broadcast."

It was not until after the Titanic catastrophe in 1912 that radio for mass communication came into vogue, inspired first by the work of amateur ("ham") radio operators.

8MK Had First News program

After the war (World War I), numerous radio stations were born in the United States and set the standard for later radio programs. The first radio news program was broadcast on August 31, 1920 on the station 8MK in Detroit; owned by The Detroit News, the station covered local election results. This was followed in 1920 with the first commercial radio station in the United States, KDKA, being established in Pittsburgh. The first regular entertainment programs were broadcast in 1922, and on March 10, Variety carried the front page headline: "Radio Sweeping Country: 1,000,000 Sets in Use." A highlight of this time was the first Rose Bowl being broadcast on January 1, 1923 on the Los Angeles station KHJ.
During the Golden Age of Radio, new forms of entertainment were created for the new medium, which later migrated to television and other media: radio plays, mystery, adventure and detective serials, soap operas, quiz shows, variety hours, talent shows, situation comedies, children's shows, as well as live musical concerts and play by play sports broadcasts. In addition, the capability of the new medium to get information to people created the format of modern radio news: headlines, remote reporting, sidewalk interviews (such as Vox Pop), panel discussions, weather reports, farm reports. The World War II radio show You Can't Do Business with Hitler with John Flynn and Virginia Moore, a series of programs, broadcast at least once weekly by more than 790 radio stations in America, was written and produced by the radio section of the Office of War Information (OWI).

The earliest radio programs of the 1920s were largely unsponsored; radio stations were a service designed to sell radio receivers. By the late 1920s, radio had reached critical mass and saturated the market, necessitating a change in business model. The sponsored musical feature soon became most popular program format. The sponsored musical feature soon became most popular program format. Most early radio sponsorship came in the form of selling the naming rights to the program, as evidenced by such programs as The A&P Gypsies, Champion Spark Plug Hour, The Clicquot Club Eskimos, and King Biscuit Time; commercials as they are known in the modern era were still relatively un-common and considered intrusive. During the 1930s and 1940s, the leading orchestras were heard often through big band remotes, and NBC's Monitor continued such remotes well into the 1950s by broadcasting live music from New York City jazz clubs to rural America.

Classical music programs on the air included The Voice of Firestone and The Bell Telephone Hour. Texaco sponsored the Metropolitan Opera radio broadcasts; the broadcasts, now sponsored by the Toll Brothers, continue to this day around the world, and are one of the few examples of live classical music still broadcast on radio. One of the most notable of all classical music radio programs of the Golden Age of Radio featured the celebrated Italian conductor Arturo Toscanini conducting the NBC Symphony Orchestra, which had been created especially for him. At that time, nearly all classical musicians and critics considered Toscanini the greatest living maestro. Popular songwriters such as George Gershwin were also featured on radio. (Gershwin, in addition to frequent appearances as a guest, also had his own program in 1934.) The New York Philharmonic also had weekly concerts on radio. There was no dedicated classical music radio station like NPR at that time, so classical music programs had to share the network they were broadcast on with more popular ones, much as in the days of television before the creation of NET and PBS. Country music also enjoyed popularity. National Barn Dance, begun on Chicago's WLS in 1924, was picked up by NBC Radio in 1933. In 1925, WSM Barn Dance went on the air from Nashville. It was renamed the Grand Ole Opry in 1927 and NBC carried portions from 1944 to 1956. NBC also aired The Red Foley Show from 1951 to 1961, and ABC Radio carried Ozark Jubilee from 1953 to 1961.

Radio attracted top comedy talents from Vaudville and Hollywood for many years: Fred Allen, Jack Benny, Victor Borge, Fanny Brice, Billie Burke, Bob Burns, Judy Canova, Jimmy Durante, Phil Harris, Bob Hope, Groucho Marx, Jean Shepherd, Red Skelton, Abbott and Costello, and Ed Wynn. Situational comedies also gained popularity, such as Amos 'n' Andy, Burns and Allen, Easy Aces, Ethel and Albert, Fibber McGee and Molly, The Goldbergs, The Great Gildersleeve, The Halls of Ivy (which featured screen star Ronald Colman and his wife Benita Hume), Meet Corliss Archer, Meet Millie, and Our Miss Brooks.

Minnie Pearl, Henry Morgan

Radio comedy ran the gamut from the small town humor of Lum and Abner, Herb Shriner and Minnie Pearl to the dialect characterizations of Mel Blanc and the caustic sarcasm of Henry Morgan. Gags galore were delivered weekly on Stop Me If You've Heard This One and Can You Top This?, panel programs devoted to the art of telling
jokes. Quiz shows were lampooned on *It Pays to Be Ignorant,* and other memorable parodies were presented by such satirists as Spike Jones, Stoopnagle and Budd, Stan Freberg and Bob and Ray. British comedy reached American shores in a major assault when NBC carried The Goon Show in the mid-1950s.

**“Coming, Mother!”**

Some shows originated as stage productions: Clifford Goldsmith's play *What a Life* was reworked into NBC's popular, long-running *The Aldrich Family* (1939–1953) with the familiar catchphrases "Henry! Henry Aldrich!," followed by Henry's answer, "Coming, Mother!" Moss Hart and George S. Kaufman's Pulitzer Prize-winning Broadway hit, *You Can't Take It with You* (1936), became a weekly situation comedy heard on Mutual (1944) with Everett Sloane and later on NBC (1951) with Walter Brennan.

Other shows were adapted from comic strips, such as *Blondie,* *Dick Tracy,* *Gasoline Alley,* *The Gumps,* *Li'l Abner,* *Little Orphan Annie,* *Popeye the Sailor,* *Red Ryder,* *Reg'lar Fellers,* *Terry and the Pirates* and *Tillie the Toiler.* Bob Montana's redheaded teen of comic strips and comic books was heard on radio's Archie Andrews from 1943 to 1953. *The Timid Soul* was a 1941–1942 comedy based on cartoonist H. T. Webster's famed Caspar Milquetoast character, and *Robert L. Ripley's Believe It or Not!* was adapted to several different radio formats during the 1930s and 1940s. Conversely, some radio shows gave rise to spinoff comic strips, such as *My Friend Irma* starring Marie Wilson.

The first soap opera, Clara, Lu, and Em was introduced in 1930 on Chicago's WGN. When daytime serials began in the early 1930s, they became known as soap operas because many were sponsored by soap products and detergents. The line-up of late afternoon adventure serials included Bobby Benson and the B-Bar-B Riders, The Cisco Kid, Jack Armstrong, the All-American Boy, Captain Midnight, and The Tom Mix Ralston Straight Shooters. Badges, rings, decoding devices and other radio premiums offered on these adventure shows were often allied with a sponsor's product, requiring the young listeners to mail in a boxtop from a breakfast cereal or other proof of purchase.

Outstanding radio dramas were presented on such programs as *26 by Corwin,* *NBC Short Story,* *Arch Oboler's Plays,* *Quiet, Please,* and *CBS Radio Workshop.* Orson Welles's *The Mercury Theatre on the Air* and *The Campbell Playhouse* were considered by many critics to be the finest radio drama anthologies ever presented. They usually starred Welles in the leading role, along with celebrity guest stars such as Margaret Sullivan or Helen Hayes, in adaptations from literature, Broadway, and/or films. They included such titles as *Liliom,* *Oliver Twist* (a title now feared lost), *A Tale of Two Cities,* *Lost Horizon,* and *The Murder of Roger Ackroyd.* It was on *Mercury Theatre* that Welles presented his celebrated-but-infamous 1938 adaptation of H. G. Wells's *The War of the Worlds,* formatted to sound like a breaking news program. *Theatre Guild on the Air* presented adaptations of classical and Broadway plays. Their Shakespeare adaptations included a one-hour *Macbeth* starring Maurice Evans and Judith Anderson, and a 90-minute *Hamlet,* starring John Gielgud. Recordings of many of these programs survive.

**Rathbone and Bruce; Holmes and Watson**

During the 1940s, Basil Rathbone and Nigel Bruce, famous for playing Sherlock Holmes and Dr. Watson in films, repeated their characterizations on radio on *The New Adventures of Sherlock Holmes,* which featured both original stories and episodes directly adapted from Arthur Conan Doyle's stories. None of the episodes in which Rathbone and Bruce starred on the radio program were filmed with the two actors as Holmes and Watson, so radio became the only medium in which audiences were able to experience Rathbone and Bruce appearing in some of the more famous Holmes stories, such as *The Speckled Band.* There were also several dramatizations of Sherlock Holmes stories on radio without Rathbone and Bruce.

During the latter part of his career, celebrated actor John Barrymore starred in a radio program, *Streamlined Shakespeare,* which featured him
in a series of one-hour adaptations of Shakespeare plays, many of which Barrymore never appeared in either on stage or in films, such as *Twelfth Night* (in which he played both Malvolio and Sir Toby Belch), and Macbeth.

Stay Tuned

Lux Radio Theatre and The Screen Guild Theater presented adaptations of Hollywood movies, performed before a live audience, usually with cast members from the original films. *Suspense, Escape, The Mysterious Traveler and Inner Sanctum Mystery* were popular thriller anthology series. Leading writers who created original material for radio included Norman Corwin, Carlton E. Morse, David Goodis, Archibald MacLeish, Arthur Miller, Arch Oboler, Wyllis Cooper, Rod Serling, Jay Bennett, and Irwin Shaw.

There have been many books written on Old Time Radio and 2 great ones which I own and recommend for finding out about the different shows and the development of radio are 1) *Tune In Yesterday* by John Dunning and 2) *Radio's First 75 Years* by B.Eric Rhoads.

Till next time 73's to you.

**WTAM**

The Voice of the Storage Battery

By “Al” Stewart, WSW

__Reprinted from the Sept. 1967 issue of the Old Timbers Bulletin__

The transmitter used McCullough water cool-ed tubes.

The banks of batteries were connected by conduit mounted on "molded mud" in-sulators and required the full time of one man to keep the cells filled with H2O and general maintenance. Ed Leonard was chief engineer of the station during these years. The battery supply was used for approximately seven years and gave way to the Model 50-B RCA 50 KW. trans-mitter.

You may be interested in the 50-B installation which took place in 1929 at a new location: Buckeville, Ohio, 16 miles south of Cleveland. The new site was necessary since the strong signal would be too broad for many of the non-selective receivers of the time. This type of transmitter was the first to be installed in the United States and was designated as "No. 2" --- No. 1 trans-mitter having been converted to 48 cycles and installed at the Vatican in Rome.

The transmitter was a coordinated project: 60% General Electric and 40, Westinghouse --- according to stock holdings in RCA.

The transmitter was constructed from available parts in stock in the two companies. Only a minimum of new design was used. For this reason the panels, meters, etc. were composed of regular substation power equipment. The five kilowatt driver was a complete transmitter in itself designed to Navy specifications. Similar units were placed on battleships such as the USS Texas.

Both the driver and final units were water-cooled requiring two driven...
wells for water supply. This water was distilled and circulated for approximately a month or until resistance test showed it had to be changed.

"No. 2" 50-B transmitter went through the usual 24 hour continuous test run and was shipped directly to the new station site where it was installed in a new building. All power equipment was located on the ground floor and consisted of 4600/2300 transformers, voltage regulators, filament motor generators and bias motor generators. The filament generator supplied power at 32 volts at 207 amperes to all tubes except of course the rectifiers. The bias generator was rated at 3000 volts at 1 ampere.

The ground level also had living quarters for the operators as was the custom in those days as well as water pumps, still, water storage tank, etc. The transmitter was serviced by two power lines at 4600 volts which came from two separate substations and conducted over different routes. The "audio lines" likewise came in on a similar route. In addition there was a backup telegraph circuit bridged from lines to ground return which orders and a signal light on the master control board indicating "carrier on" were carried.

The transmitter proper consisting of low voltage control, low level modulators and the five kilowatt amplifier were installed on the second floor to the left of the operator's desk. The high power final was in front along with the high voltage control panel. To the right were located the main rectifiers.

The tubes: After the crystal unit was a RF amplifier (865) driving the modulated amplifier (849) which in turn drove the 5 kilowatt amplifier with 892 tubes (water-cooled). The final amplifier used two 863's -- each rated at 100 kilowatts. These tubes were in parallel as a linear with 200 KW. peak output.

A switching system suspended from the ceiling and made up of 1 inch copper tubing was used to switch from the antenna to the 50 KW. or 250 watt amplifiers. Any of the lower amplifiers could drive the final at reduced power. In fact, several combinations of power output could be obtained: 250 watts, 5 kilowatts, 10 kilowatts, 25 kilowatts and of course -- 50 kilowatts. The high voltage rectifier used (6) 857's in a 3 phase full wave rectifier circuit.

The 5 KW unit consisted of a crystal control section with two buffer amplifiers in a plug-in cabinet. Two of these cabinets were available -- one acting as a "standby". The frequency of this transmitter did not vary over three cycles during its lifetime.
The following is a non-exhaustive listing of other vintage and antique radio clubs, including some detail as supplied by the clubs themselves at various times in the past. The accuracy of the detail is not guaranteed. Readers are advised to check the clubs’ websites or to contact the clubs directly for current, complete, and accurate information; and if you are an officer of a club, and you wish to supply or update a listing, please contact us. — Ed.

The Antique Radio Club of Illinois (ARCI) — Meets bimonthly. Meets generally held at the American Legion Hall, Carol Stream IL but meets in June in conjunction with the 6-Meter Club of Illinois at the DuPage County Fairgrounds and once per year for Radiofest, this year at the Medinah Shriners, Addison, IL. Check web-site for schedules, details and maps.) Contacts: President, John Stone, arcipresident@com; general information, clubinfo@antique-radios.org. Website www. antique-radios.org.

Antique Radio Collectors of Ohio — meets first Tuesday of each month at 2929 Hazelwood Ave., Dayton, OH (4 blocks east of Shroyer Rd. off Dorothy Lane) at 7 p.m. Also annual swap meet and show. Membership: $10.00 per year. For more info, contact Karl Koogle: mail to above address; phone (937) 294-8960; e-mail KARLKRAD@GEMAIR.COM.

California Historical Radio Society — For info on current meetings and events, see www.californiahistoricalradio.com.

CARS, the Cincinnati Antique Radio Society — Meets on the second Wednesday of each month at Gray's History of Wireless Museum, which is part of The National Voice of America Museum of Broadcasting, Inc., located in a building that is now on the National Historic Register at 8070 Tylersville Road, Westchester, Ohio. 45069. For more information contact Bob Sands at (513) 858-1755, or oltubes@roadrunner.com.

Carolinas Chapter of the AWA — Hosts “mini-swap-meets” plus an annual conference, “Antique Radio Charlotte,” on the 4th weekend in March. For more info, visit the website at CC-AWA.ORG or contact Ron Lawrence, W4RON, Chapter President, P.O. Box 3015, Matthews, NC 28106-3015; phone (704) 289-1166; e-mail W4RON@carolina.rr.com.

Central Ohio Antique Radio Assn. — Meets on the third Wednesday of March, June and September at 7:30 p.m. Swap meets: “Cabin Fever” in January and outdoor tailgate in July.

December Christmas party. For more info contact Barry Gould at 614-442-1518 or Dave Poland at 614-890-5422 or http://coara.org/.

Delaware Valley Historic Radio Club — Meeting and auction begins 7:30 p.m. on the second Tuesday of each month. Location: Telford Community Center on Hamlin Ave. in Telford, PA. Annual dues: $15.00, which includes a subscription to the club’s monthly newsletter The Oscillator. For more info contact Delaware Valley Historic Radio Club, P.O. Box 5053, New Britain, PA 18901. Phone (215) 345-4248.

Houston Vintage Radio Association (HVRA) meets the fourth Saturday (January thru October) at Bayland Park 6400 Bissonnet, 9 a.m. in SW Houston. Each meeting includes an auction and program. Annual two-day convention held in February includes three auctions, old equipment contest, technical talks, swap meet, and awards banquet. One day MEGA auctions held in the spring and fall. A newsletter, The Grid Leak, is published bi-monthly. Event postings, announcements, photos and other features are available on HVRA website: www.hvra.org. Membership is $20/yr. Address: HVRA, P.O. Box 31276, Houston TX 77231-1276 or call Bill Werzer, 713-721-2242; email: werz1943@gmail.com.

Hudson Valley Antique Radio and Phono Society [HARPS] meets the 3rd Friday of the month 7:30PM at the Episcopal Church of Suffern Annex, 65 Washington Ave., Suffern N.Y. 10901 for info contact Rev. Dale Cranston at (845) 357-1615 or dale.cranston@gmail.com.

Indiana Historical Radio Society — Active since 1971. Meets in Feb. (Lawrence), May (2-days, Kokomo) and Oct. (Greenfield). Flea market, old equipment contest, and auction at all events. Meet details and club info at website www.indianahistoricalradio.org. $15.00 annual dues includes the IHRS Bulletin published quarterly. Contact Herman Gross, W9ITT, 1705 Gordon Dr., Kokomo, IN 46902, 765-459-8308, email w9itt@comcast.net.

Irish Historical Radio Society — Monthly meetings, program and auction. 2015 schedule: Feb. 5th in Elkins Park, PA; May 7th at the Historic 1890 Schoolhouse in Harleysville, PA. Meets at the Historic 1890 Schoolhouse, Church of Suffern Annex, 65 Washington Ave., Suffern N.Y. 10901 for info contact Rev. Dale Cranston at (845) 357-1615 or dale.cranston@gmail.com.

London Vintage Radio Club — This Ontario, Canada club meets in London on the first Saturday of January, March, May, and November. Annual flea market held in Guelph, Ontario in June. Contact: Dave Noon, VA3DN, 19 Honeysuckle Cr., London, ON N5Y 4P3, Canada. Email: va3dn@execulink.co. Website: http://lvrc. home- stead.com/index.html.
·**Mid-Atlantic Antique Radio Club (MAARC)** — Meets monthly, usually on the third Sunday of the month at the Davidsonville Family Recreation Center in Davidsonville, MD. (But meets once or twice a year in Northern Virginia—check website for schedules, details and maps.) Contacts: President, Steve Hansman, 855 Arundel Drive, Arnold, MD 21012, (410) 974-0561, email: shans01a@comcast.net; Membership Chair, Geoff Shearer, (703) 818-2686, email: gshearer2@verizon.net. Website www.maarc.org.

·**The New Jersey Antique Radio Club** — Meets the 2nd Friday of the month 7:30 p.m. at either Info Age 2201 Marconi Rd. Wall Township N.J. 07719 or Bowen Hall, Princeton University. We hold three annual swap meets and four seasonal repair clinics. Visit the club’s web-site for details www.njarc.org or contact NJARC President Richard Lee (914) 589-3751 or president@njarc.org.

·**Northland Antique Radio Club (Minneapolis/St. Paul)** — hosts four events with swap meets each year (in February, May, September and November) including an annual conference, “Radio Daze,” for two days in mid-May. Annual dues are $12.00, which includes a subscription to the club’s quarterly newsletter. For more info, visit our website at www.northlandantique-radio-club.com.

·**Northwest Vintage Radio Society** — Meets the second Saturday of each month at Abernethy Grange Hall, 15745 S. Harley Ave. Oregon City, OR. Meeting starts at 10:00 a.m. Membership $25.00 per year. Guests welcome at all meetings and functions except board meetings. Spring show, the second Saturday in May. For more information, contact Mike McCrow 503-730-4639; e-mail: tranny53@comcast.net.

·**Oklahoma Vintage Radio Collectors** — Meets second Saturday of each month, (except for April, October, and December), at Hometown Buffet, 3900 NW 63rd St., Oklahoma City, OK. Visitors welcome. Dinner/Socializing, 6 p.m., meeting, 7 p.m. Swap meets on second Saturday in April and October at 8 a.m., Midwest City Community Center, 100 N. Midwest Blvd., Midwest City, OK. Membership $15/year including monthly Broadcast News. Info: contact Jim Collings at (405) 755-4139 or jrcradio@cox.net. Website: www.okvrc.org.

·**Ottawa Vintage Radio Club** — Usually meets the second Wednesday of every month (except July and August) in the Conference Room, Ottawa Citizen, 1101 Baxter Rd., Ottawa, Ontario, Canada. Auctions in October and May. Call Paul Guibord (613 5-523-1 315), or check www.ovrc.org for details.

·**The Pittsburgh Antique Radio Society** welcomes visitors to our Saturday flea markets, contests and clinics held at least four times yearly. A fall auction is included in September and our annual luncheon program is on the first Saturday in December. An annual Tri-State Radio Fest is held in April. Our journal, The Pittsburgh Oscillator, is mailed quarterly. For more information visit us at http://www.pittantiqueradios.org, email President Chris Wells at radioactive55man@comcast.net, or phone Treasurer Tom Dixon at 412-343-5326.

·**Society for Preservation of Antique Radio Knowledge (SPARK)** — Meets monthly at Donato’s Pizzeria, 7912 Paragon Rd., Centerville, OH. Annual swap meet. Membership $15/yr. Write SPARK Inc., c/o Dan Casey, 10075 Morrow-Rosburg Rd., Pleasant Plain, OH 45162 or call Dan Casey at (513) 265-8466 or email dansradioland@gmail.com.

·**Texas Antique Radio Club** — Meets alternate months in Kyle and Shertz, TX. Contact: Doug Wright, 625 Rolling Hills Dr., Canyon Lake, TX 78133. Email: dwjw@gvtc.com; website www.gvtc.com/~edengel/TARC.htm.

·**Vintage Radio and Phonograph Society (VRPS)** meets monthly on the third Saturday. Located in the Dallas, Fort Worth Metroplex, our current activities are annual convention, auctions, swap meets, repair training sessions and monthly programs. For details visit our website www.vrps.org, or by contacting VRPS President Jim Sargent at (817) 573-3546 or bsargent@swbell.net.
The Antique Wireless Association is an organization of about 1600 international members linked by a common interest in the history of electrical and electronic communications. AWA members come from all walks of life and our ranks include teenagers, octogenarians, and beyond in both directions. At one of our meets, you might find yourself shaking hands with a retired broadcast executive or military electronics specialist, an engineer in a high-tech electronics firm, or an eager young person looking for advice on restoring his or her first radio.

The organization was started in 1952 by Bruce Kelley, George Batterson, and Linc Cundall—amateur radio operators and radio collectors from upstate New York. Their initial goal was to establish a museum where they could collect and preserve early wireless and radio equipment and historical information before it was lost to future generations. Decades later, their legacy continues to motivate our members.

Some of us are most interested in the technical background behind the epoch-making discoveries that now make it as easy to communicate across the globe as around the corner. Others enjoy the romance surrounding the men and institutions that put these discoveries to work: the maritime radio operators who averted disasters with their alert ears and quick thinking; the short-wave stations that radiated glimpses of exotic cultures and mindsets; the giant radio networks that delivered unparalleled entertainment and timely news to our homes while hawking toothpaste, cigarettes and soap flakes.

Though AWA members share this common interest, which many can trace back to early childhood, they express it in different ways. Some of us collect radio-related literature and manuals. Others collect and restore hardware: Morse keys and sounders, battery radios of the 1920s, telephones, advertising signs, cathedral and console radios—you name it! Collections can become very specialized, restricted to such things as radio components crafted of shiny Bakelite and gleaming brass or perhaps the fragile and intricate vacuum tubes that made the communications miracles possible.

Among our members are meticulous craftsmen who enjoy replicating vintage receivers and/or transmitters. Those who are licensed amateurs frequently operate such equipment in special communications events sponsored by the AWA.

In addition to the commitment to the preservation of historical artifacts and background materials at our Museum, AWA also publishes The AWA Journal and The AWA Review. The Journal is a quarterly publication that gives our multi-talented members an outlet to share their historical research, equipment restorations, troubleshooting and servicing tips and other information of common interest. The AWA Review, which also publishes member contributions, contains more extensive and scholarly papers. It is published once a year.

The AWA Gateway is the latest addition to the AWA family of publications. It’s delivered electronically and free of charge—downloadable from our web site www.antiquewireless.org.

Our content is targeted at those who may not be familiar with the AWA and who perhaps are just becoming interested in the history, collecting or restoration of vintage communications gear. For that reason, our technical articles are more basic than those in our other publications and our articles about AWA generally do not assume knowledge that that only those familiar with our organization might have.

The AWA also sponsors a four day annual convention in August featuring technical presentations and forums, a large auction, an awards banquet, an equipment and artifact competition, a book sale, and an active flea market. The convention affords attendees plenty of time to renew and make friendships, time to engage in long conversations on collection, preservation and all other aspects of the hobby.

The AWA Museum campus is located in Bloomfield, New York. Membership in the AWA includes free admission to the world famous facility. It is crammed with too many treasures to describe here, but you can see some of the exhibits on our web site www.antiquewireless.org.

The AWA is chartered as a non-profit organization in New York State, an IRS 501(c)(3) tax-exempt corporation, and is a member of the American Association of Museums. To learn more about AWA or to join our organization, visit the AWA website.

DONATING ARTIFACTS TO THE AWA

You may have artifacts that you are interested in donating to the AWA. We would be pleased to discuss any possible donation. Please call us at (585) 257-5119.