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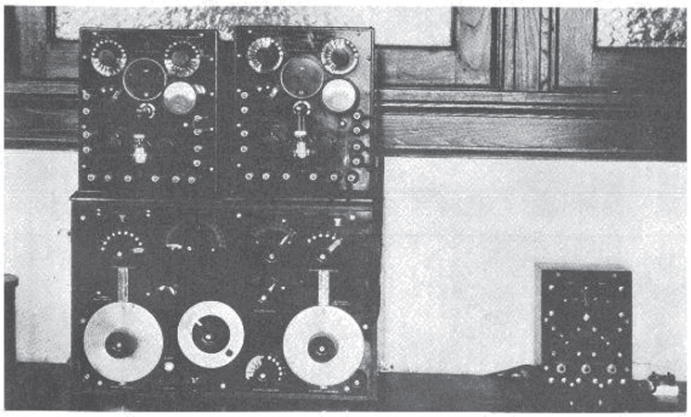
Historic Radio Artifacts Donated to the Radio Technology Museum

Al Klase and Ray Chase
New Jersey Antique Radio Club • 908-757-9741 • raydio862@verizon.net

Through the efforts and connections of a local New Jersey Antique Radio Club member, the Radio Technology Museum (RTM) recently obtained a generous donation of early historic radio equipment from a long time collector in Brooklyn. This gentleman, who has been a collector for 60 or 70 years, decided to relinquish his small business as a master machinist and donate some of his collection to NJARC in order to support our displays at the museum. In October we picked up the items in Brooklyn using a small box truck and now have them in secure storage in Neptune. We have not had the time to thoroughly inventory and review all the nearly 100 items, but we were aware that the collection contained many artifacts from the era spanning World War I and the early 1920's. A quick look while the items were being handled in transit revealed that it may include radio equipment similar to that used by the U.S. Navy when they operated the Marconi Belmar Station during the First World War. This site later became the U.S. Army's Camp Evans, and today is the home of the InfoAge Science History Learning Center.

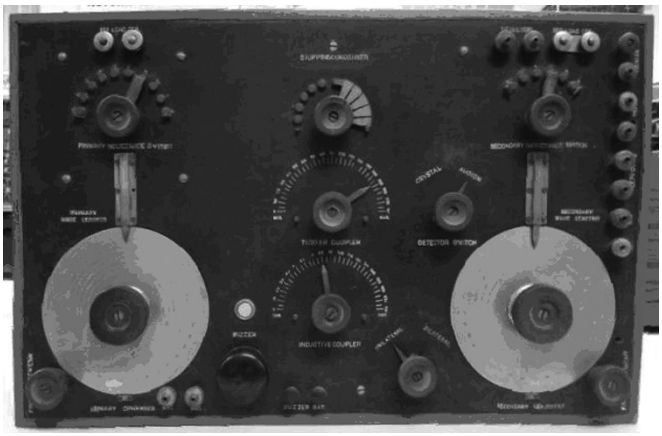
This prompted some research using The History of Communications-Electronics in the United States Navy, by Captain Linwood S. Howeth, USN (Retired), 1963. The photograph on the right from that publication shows receiving equipment installed at the Belmar Radio Station during that time period. A receiver (lower left) contained just the tuned circuits, variable coils and capacitors, that constituted a filter to select the desired signal from many collected from the antenna. An audion control box (two are shown on top of the receiver) provided detection and amplification of the selected signal. Sometimes an auxiliary audio amplifier (shown on the right) was connected to further strengthen the signal. We essentially have acquired one of the Audion Control Boxes, complete with tube, a U.S Navy SE-143 receiver, very similar to the one pictured and a two stage amplifier same as the one shown. This pretty much authenticates the equipment that we now have as equal to the ones that the U.S. Navy used while they were custodians of the Belmar Station.



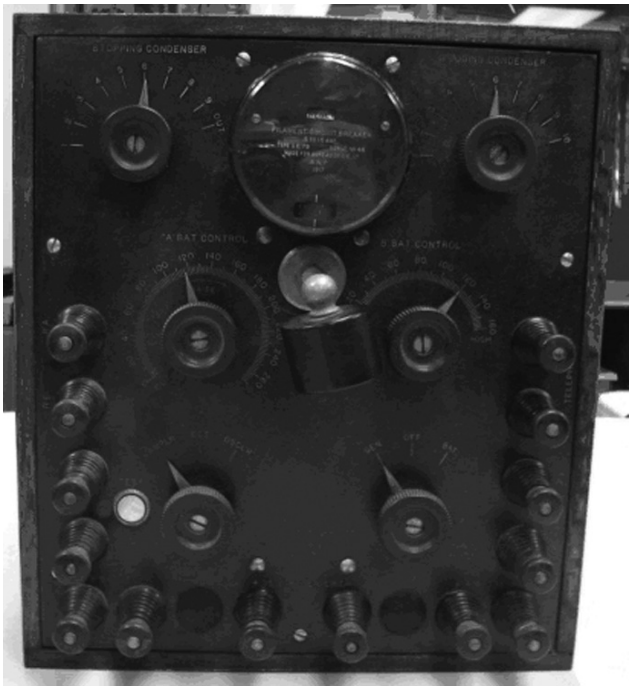
Standard Navy receiver, audion and amplifier, Radio Station, Belmar, N.J.

On page 2 is a photograph of the Museum's newly acquired U.S. Navy SE-143 receiver that is similar, and period appropriate, to the set pictured in the Howeth book. The Navy had adopted the Armstrong regenerative circuit for maximum performance, and this was accomplished using an external "Audion" control box. The "Audion" control box pictured used a Western Electric 201A triode vacuum tube hanging from the socket in the middle of the panel. This device, that is now quite rare, was a vastly improved version of Lee Deforest's original "Audion" tube and is not to be confused with the later RCA 201A tube that

would dominate home broadcasting radio receivers a few years later. The circular device at the top of the panel is a circuit breaker to protect the delicate and expensive tube. Keep in mind that this was the very early days of the development of the vacuum tube and much was still yet to be learned as to how to use and apply this new invention that would go on to dominate all aspects of electronics, radio, TV and communications for the better part of 75 years. The pictured two stage amplifier was available to provide even louder signals to the headphones and perhaps to drive a horn speaker, known in those days as a loud-speaking telephone. This amplifier likely used two Marconi "Moorehead" vacuum tubes.



Navy SE-143 Receiver



Audion Control Box

Two Step Amplifier

In the early 20th century the U. S. Navy was arguably the largest user of radio in the Western Hemisphere. Upon the entry of the United States into World War I, amateur radio was shut down, and the Navy assumed control of most long-range communications stations. This included the Marconi Belmar/New Brunswick High Power Station and the German stations at Sayville, Long Island and Tuckerton, NJ. The Belmar receiver site became the hub of the resulting Trans-Atlantic radio-telegraph network. During World War I the U.S. Navy used the Belmar Station to conduct considerable experimental work at seeking to improve radio reception and related wireless technologies.

While the display of more of these artifacts will have to wait until we have time to research them, clean them up and obtain more space in which to expand the RTM, we do have near term plans to display the above items in the appropriate time line areas of the present museum layout. During the next year we may be able to bring some more of these items into the museum as we can find the space and the appropriate areas to display them. One item that surely will be displayed as soon as we can is the actual first home made radio built by this gentleman as a youngster. He donated this very personal item and even provided his own hand drawn plans that were used in its construction.

These newly acquired RTM artifacts will become important pieces to help InfoAge present and display the historical significance of this site.

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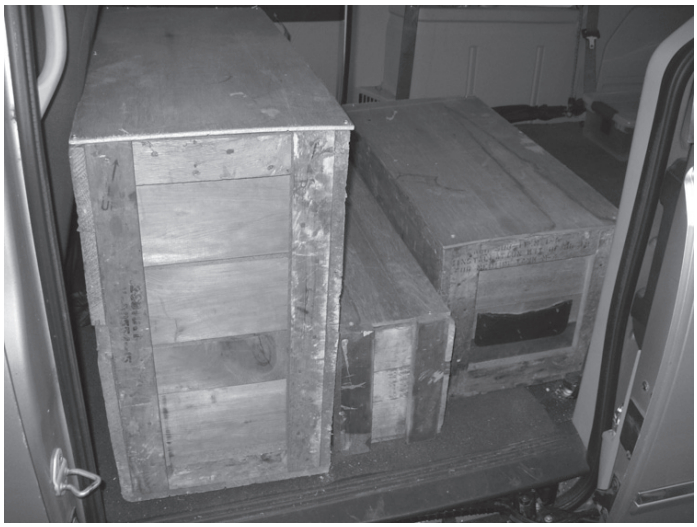
An Interesting WWII Radio Artifact is Added to Our Military Communications Display

Ray Chase
New Jersey Antique Radio Club • 908-757-9741 • raydio862@verizon.net

Louise Foley of Thendara New York earlier this year contacted the Smithsonian Institution in Washington regarding her wish to make a donation of a WWII radio set. Following WWII, her father had brought back an unused WS#19 MKII transceiver and it had rested in its original crates ever since. With her father's passing, Mrs. Foley felt that it would make a great addition to the Smithsonian's collection but, as most of us know, the Smithsonian gets hundreds of these "offers" every day and already has warehouses full of items they do not display. Plus they are more interested in unique items that are examples of our cultural history.

Fortunately, the Smithsonian advised her that InfoAge might be interested and referred the donor to us. Ultimately the message got to me and I contacted Mrs. Foley. I was familiar with the radio set mentioned and felt that it would be a nice addition to our WWII Communications exhibit. I obtained the dimensions of the three crates containing the transceiver and its accessories from her and found that they would "just fit" in my van. Ms. Foley was in Florida at the time but would be back at her New York residence in the summer. We agreed to stay in touch and try to arrange transport later in the year. Ms. Foley offered to split the shipping costs but considering the weight involved it would still be quite high so I said I would try to work something out. A side trip to the Adirondacks in the summer sounded like a pleasant undertaking.

However I do make a trip to the Rochester, NY area every August to attend the Antique Wireless Association (AWA) annual convention. Could these trips be combined? I normally take quite a load of books and ephemera to AWA to sell and trade so could I fit in these items as well? Careful calculations indicated that it would just about be possible and Ms. Foley would be available that week so the plan was on. Thendara, NY is about 50 miles north of Utica and involved a 150 mile detour plus an extra day's travel. The trip and pickup was made without a hitch, save for some unpacking and repacking of my van and my wife and I enjoyed the travel through the Adirondacks.



The three crates in my minivan.

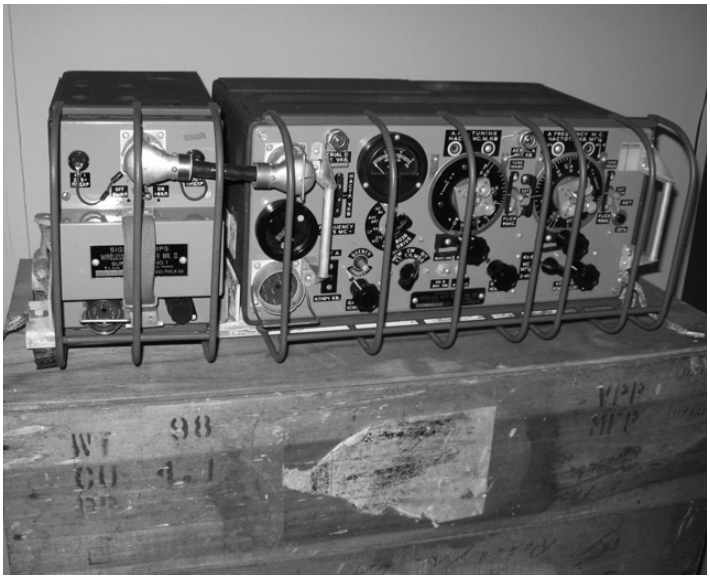
The radio set we obtained is of early WWII British/ Canadian design that was built by RCA in the United States and supplied to the Russians under the Lend-Lease program. Its panel and control markings are both in English and Russian Cyrillic. It was specifically targeted for use in Russian tanks but could also be used in other armored fighting vehicles, various wireless trucks and as a ground station. It was often installed in U.S. Sherman tanks that were also sent to Russia under the Lend-Lease program.

An interesting aside; the British, Russians and Germans all used AM modulation for their voice communications that was often rendered unusable because of static from their engine ignition systems. The U.S. Army early on had opted to use Major Armstrong's FM radio system that eliminated static problems. While our tanks were often outgunned by German tanks, our ability to better coordinate maneuvering through superior communications often equalized the score.

The WS#19 MKII consists of an "A" and "B" Transmitter & Receiver set. The "A" set operates between 2-8 MHz and provides tank-to-base or troop-to-troop communications. It has a range of at least 10 miles. The "B" set runs between 230-240 MHz and provides communications between vehicles in a squad with a range of 1,000 yards between vehicles. An intercom amplifier is provided for speech communication among crew members in the tank.

A pristine WS19 sees the light of day after 70 years.

On August 28, with a bit of fanfare, the transceiver was released from its 70-year old, wooden tomb on the InfoAge lawn. It was like Christmas morning with each new unwrapped discovery bringing "ooh's" and "aah's" from NJARC members. Immediately Al Klase took charge of putting some of the major components together and attaching them to the mounting rack. We might be missing some spare parts and spare tube kits but a little more digging in the crates is still required. It is not uncommon to run across one of these sets but finding one new in its original packing and with all of its cables, crew control boxes, antenna, microphones and headsets is truly unusual and fortunate for us. It is now set up temporarily in the 9032C Military Communications room. We will need to prepare a more expansive display interconnecting all its control boxes and accessories as well as creating the appropriate interpretive signage. I suspect that knowledge of the Lend-Lease program during WWII is rapidly diminishing from general public awareness.



On display in 9032C sitting on its crate.

As a postscript, Louise Foley continued to think of us as she e-mailed me in October indicating that she found three books in her father's things relating to radar, radio communications and vacuum tubes. She asked if we had any interest in them. I replied that our library always welcomed related publications so we worked out a deal whereby on her way back to Florida in November she was stopping to visit a friend in Clifton, NJ so I met her there to pick up the three books that are now in our library.

Electronic Warfare Display Upgrades: Phase I Completed

Bruce Williams
AOC Garden State Chapter • 732-396-8076 • bgoodwill08@comcast.net

Initially requested in May 2013, the EW Display Upgrade Project intends to make the "Association of Old Crows"/EW displays in Building 9032C, Room 134 more interesting for visiting guests. Especially targeted are grade school students who have no idea of the where today's electronic technology comes from: New Jersey-The Garden State!!!

Museum development along the lines of an interactive "pavilion/kiosk" concept was first proposed by InfoAge Trustee Emeritus, Mr. Robert F. Giordano, the former director of the US Army Communications-Electronics Command (CECOM) at Fort Monmouth. Our AOC/EW effort still in progress, has accomplished a significant task. We have erected an antenna mast, to which we've attached two receive-only "Sky Hooks". The antennas can feed RF signals to an assortment of receiver equipment, notably an original WWII era aircraft receiver, the AN/APR-1.

Before describing this initial success, it's important I clearly state and thank the many InfoAge volunteers who assisted us during this effort. Without their generosity: no-cost materials provided; ideas for design; never ending humorous sarcasms; and very useful constructive criticism the AOC/EW display room would not have advanced beyond "storage space." Thank You one and all !!!

Mounting antennas on a mast of suitable height was the initial task. Safety became an immediate concern once 1 3/8 inch fence pipes were found on site (free scrap). Used as horizontal rails on chain-link fences, these 24 foot mild steel pipes are quite heavy and flexible when stood on end, vertically up. The solution to this mechanical (dangerous) dilemma involved driving a 6 foot length of pipe into the ground for base support and using two fence end-caps forming an "elbow joint" for the mast pipe. Further securing the 24 Ft pipe vertically, a robust upper mounting bracket was made and attached to the exterior wall of Bld. 9032C. Figure1 shows the erected mast and Figure 2 its "elbow joint" and 8 foot ground rod.

Figure 1

Figure 2

Raising and lowering the mast was still a major safety issue, solved by mounting a 12 Volt electric, 2000 lb. winch to the mast upper mounting bracket. This together with a simply pulley system, allows the winch to easily handle the mechanical load of the mast during maintenance operations. Figure 3 shows the electric winch and its manual control switch, later supplemented by wireless control. In use (after removing the upper mast retainer strap from the mast), the manual switch operates the winch to begin lowering the mast to about 75°, thereafter the wireless control is used to bring the mast down further. Safety in mind, this none the less is a two-man job.

Figure 3

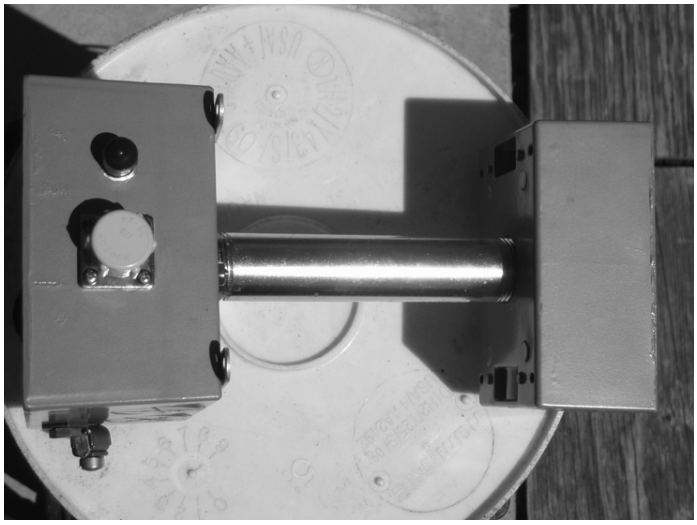


Figure 5

Other safety concerns indicated that some level of lightening protection was required. This was implemented in the 4-port Mast Interface Boxes, mounted on both exterior and interior walls of Room 134. Exterior, wet location, electrical boxes were used to mount two BNC and two N-type RF bulkhead connectors. Lightening protection for these ports consists of a Siemens B1-A350 gas discharge Surge Voltage Protectors in parallel connection with solid core Spark Plugs (gapped at 0.015”), installed at each RF bulkhead connector inside the exterior 2-gang electrical box. Furthermore, the outside electrical box is also bonded to the same 8 Ft. ground rod connected to the mast. The Mast Interface Boxes are shown in Figures 4 & 5. Figure 6 shows the completed mast base with “elbow joint”, mounted exterior Interface Box, Ground Clamp wire and the 12 Volt DC power cable for the overhead winch.

Figure 6

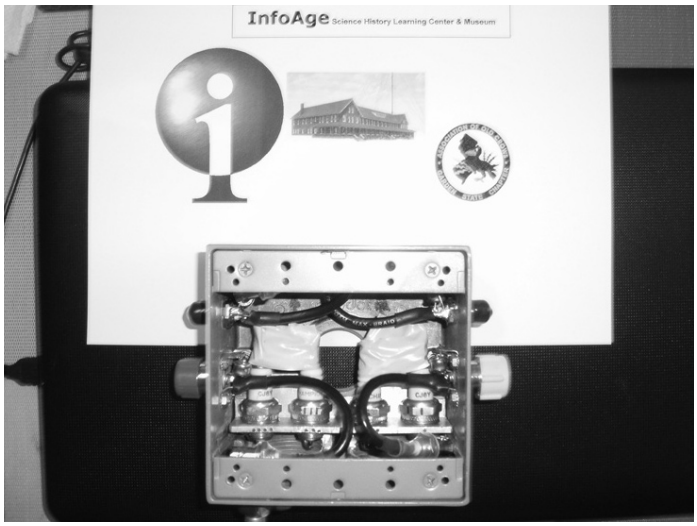


Figure 4

Antennas currently mounted are an inexpensive VHF/ UHF TV antenna below which is mounted a WWII omni-directional antenna used with AN/APR-1 aircraft receivers. Figure 7 shows the WWII antenna on its mast mounting base, together with its companion WWII aircraft receiver (lower right). Figures 8 & 9 illustrate the APR-1 Omni antenna and the completed dual antenna assembly stably erected outside Building 9032C, in the behind the Marconi Hotel. A complete historical/technical description of this venerable WWII receiver/antenna combination is unfortunately beyond the scope of this brief newsletter announcement.

Figure 7

Figure 8

Figure 9

Other AOC/EW Display upgrades recently include: framing and mounting several US Army posters focused on the "Army After Next" (ANN); procuring and wall mounting a flat panel TV/DVD set; and creating a library of well over 20 DVD discs of documentary videos spanning major World War II events, as well as recent developments and applications of the business we "Old Crows" chose….US Electronic Warfare.

A Monomoy At InfoAge

The New Jersey Historical Divers Association, Inc., has just acquired a Monomoy Pulling Boat for their New Jersey Shipwreck Museum at InfoAge. The boat will be a primary exhibit in the museum when it expands in the near future. At 26 feet in length, the boat weights over a ton. It had a 14 person capacity and required at least 8 to operate. Built in 1939 for the US Coast Guard, the boat was built off plans first developed in the 1740's on Monomoy Island off Cape Cod. We will have more information about the Monomoy exhibit and the shipwreck museum in future issues of the InfoAge newsletter.

The Longest Field Day
(Or How to Run a Radio Club Without Commercial Power)

Jeff Harshman
Ocean – Monmouth County Radio Club • 732-996-0637 • n2lxm@juno.com

It' all started on December 26, 2012. After surviving Super Storm Sandy Our club lost all commercial power to our facility. A three phase 12 kilovolt to 4.16 kilovolt transformer that supplied power to our club facility failed. The failure was due to effects of Super Storm Sandy. When it was determined that the commercial power was not going to be restored any time soon, work started to winterize our facility. It was all hands on deck as the cold weather was starting to close in. After shutting off the water main and draining all the pipes, preparations were made to hook up a standby generator. This was no small feat as our facility is powered on 120/208 three phase power. With the great help from the club membership the standby generator was connected to the main power panel. Circuits were rewired to allow the use of single phase power. This would allow us to have lights and run the heating plant. So with partial power restored we at least be able to hold meetings, VE sessions, and maybe our spring Hamfest. But no bathrooms till the spring warm up.

During the year we nominally hold several events from our facility. So this year these were going to be field day style. With limited AC power from a generator loaned to us by a club member we went about planning our events. These include Project Diana Day (First EME Transmission), International Marconi Day, Our Spring Hamfest and of course Field Day. With limited power we were not going to be able to put multiple stations on the air, or use our networked computers to do logging. So it was back to the old days of paper and pencil. Also during this time work was continuing on interior projects to enhance our facility. This work was slowed quite a bit do to the lack of power, But progress was made none the lest. Our Spring Hamfest was a great success. We had to wire a generator into building 9162 to run lights for the indoor sellers, and a third one to run the coffee pots. We had great weather, and a good turnout.

Then it was on to Field Day. Again we ran multiple generators and stations. The weather was great and a good time was had by all who worked the event. Since Field Day weekend work parties have been working on projects that we could do with out air conditioning. fans will get you just so far.

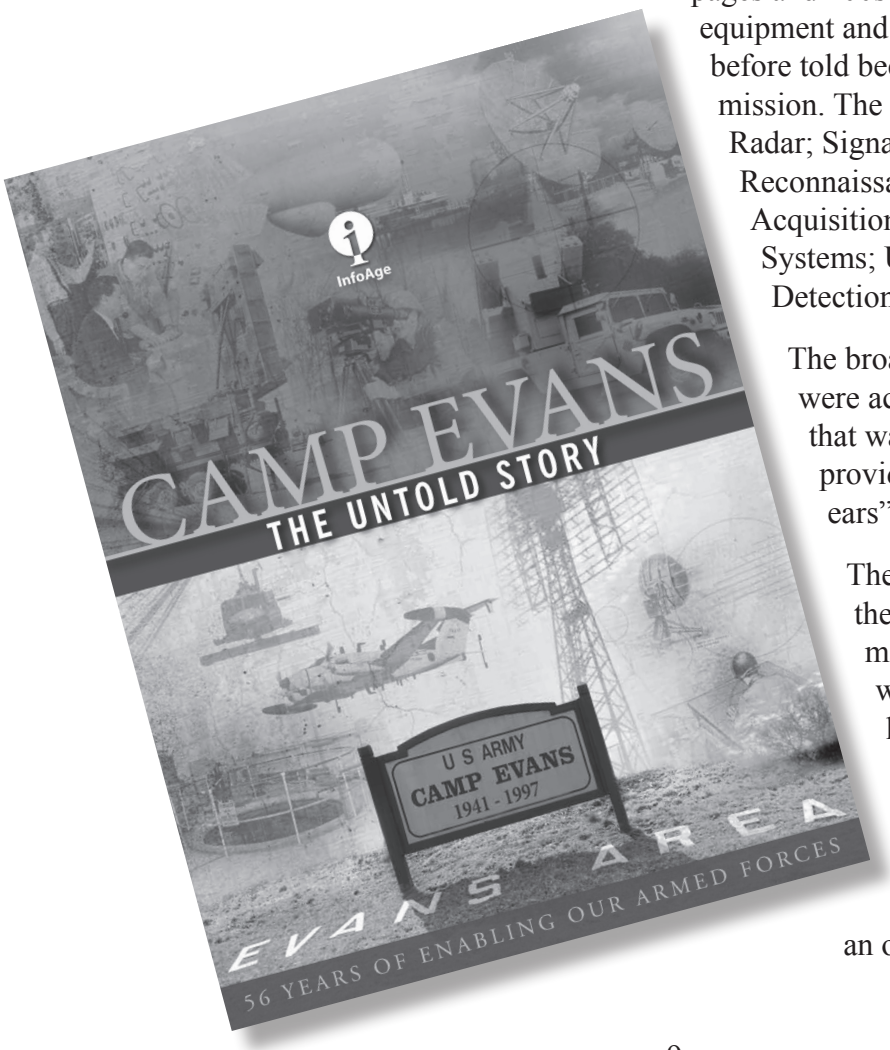
As the year has passed work progressed on getting the high voltage transformer replaced. This was a very complicated process, and involved many Government entities and commercial companies. Once the new transformer was placed on order our hopes started to rise. But like all things done by the Government things always seem to run slow. And Mr. Murphy's appearance did not help at all. After having been turned off for over thirty six weeks, just throwing the switch was not going to be easy. All the high and medium voltage systems had to be checked out and certified, but around 11:00 Hours Friday, September 6, 2013 all power was restored. After not having commercial power for so long, walking into our facility and turning on a light without having to gas up a generator seemed very strange. A great deal of thanks mostly goes to Wall Township personal, and all those companies and volunteers who worked so hard to restore the power.

Now that main power has been restored, work is going on to erect and connect more high frequency, VHF and UHF antennas. Our new patch panel and feed line support system is complete. Two runs of hard line have been run from the panel to each operating position. Once the new patch panel has had all the antennas switched over to it, we will decommission the old panel. Our IT build is nearly complete. We have to run a few more cables and connect them up. Once done we will start work on activating the phone system. This will allow us to have a phone at each operating position, if needed. Our Class / Meeting Room is also nearing completion. A few last items to install and hook up. When done the sound and video systems will be fully functional. We do have a few more bells and whistles to add, but you will have to wait to see what they are.

Camp Evans: The Untold Story

InfoAge is proud to sponsor the book, "Camp Evans: The Untold Story," in recognition of the significant contributions made by men and women, both military, civilian, and contractors who served at Camp Evans, Wall Township, New Jersey and who left a legacy of innovation that had enabled and continues to enable our Armed Forces.

The InfoAge Science History Learning Center and Museum at Camp Evans is a focal point for the preservation and interpretation of New Jersey's rich communications, computer, and electronics history, providing a specialized learning center for all visitors. The area is especially significant in history, serving as the site of the Marconi Wireless Telegraph Company of America. During World War I the Navy operated the station under the authority of the Radio Act of 1912. The message announcing that World War I had ended and the Armistice had been signed was received at the Marconi Station and retransmitted to Washington.



Camp Evans' U.S. Army Signal Corps provided America's first World War II radar systems. In 1946, Camp Evans under Project Diana opened the "space age" by reflecting radar signals off the moon. During the 1950s, innovative and far reaching technologies were developed at Camp Evans.

It is appropriate that InfoAge, as a science and technology learning center, has its start at such an historic location. The intent of InfoAge is to provide visitors a dynamic and evolving interactive atmosphere, rich in specialized history, technologies, and basic science, and similarly, to invoke an appreciation for the vital contributions of the many engineers and scientists who developed the technology.

We ask that you consider purchasing this important book which captures the tremendous heritage of technological innovation at this historic site.

"Camp Evans: The Untold Story" has over 200 pages and 100s of photographs showing the actual equipment and technology developed in a story never before told because of the classified nature of the mission. The breadth of the work described covers Radar; Signals Intelligence; Electronic Warfare; Reconnaissance and Surveillance Sensors; Target Acquisition Systems; Identification Friend or Foe Systems; Unattended Sensor Systems; Radiation Detection Systems; and Meteorology Systems.

The broad spectrum of accomplishments were achieved with an assembled workforce that was considered the best in the country, providing products that were the "eyes and ears" on the battlefield.

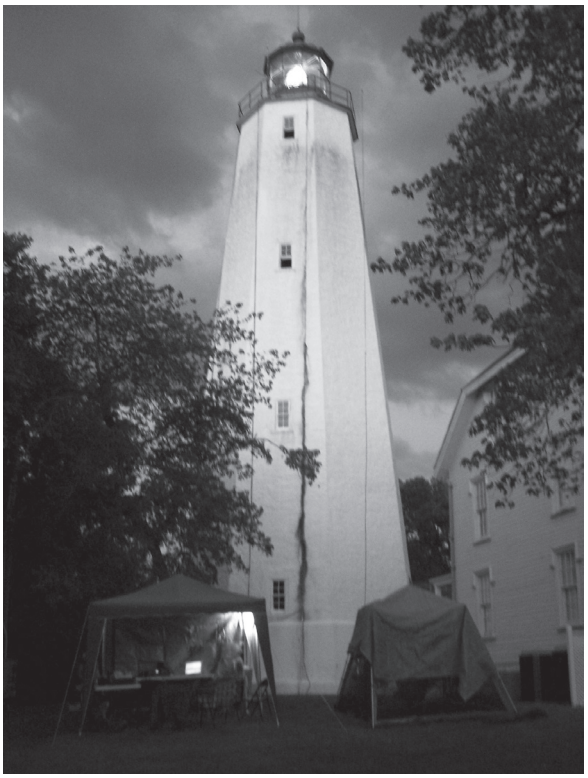
The legacy of Camp Evans will live on in the hearts and minds of those who helped make that history. Their contributions will hopefully be better appreciated by having been recounted in this book.

To order your copy of "Camp Evans: The Untold Story," contact InfoAge at 732-280-3000, or contact us via e-mail at rfginc@optonline.net and an order form will be forwarded.

International Lighthouse/Lightship Weekend N2MO, Sandy Hook Lighthouse US0035

Jeff Harshman
Ocean – Monmouth County Radio Club • 732-996-0637 • n2lxm@juno.com

For the last seven years the Ocean – Monmouth Amateur Radio Club has participated in the International Lighthouse/Lightship Weekend. As in years passed we were hoping to operate from the Sandy Hook lighthouse, US0035 this year. Sandy Hook Lighthouse is located on the grounds of the former U.S. Army Fort Hancock facility, which is now part of the National Gateway Park System. After Super Storm Sandy in October of 2012 we were worried that we would not be able to use the facility as the storm had caused major damage to the Sandy Hook Gateway National Park area. Working with our contact in the park system we were informed in May of this year that the lighthouse had not suffered any major damage from the storm, and we would be able to once again to operate form the light. So we started to plan operation "Stronger Then The Storm."



Sandy Hook Lighthouse US0035

Plans were worked up to operate three stations. Two high frequency and one VHF station. As in past years we were going to hang wire antennas off the top of the light tower. The decision was made to use an Alpha – delta sloper off the North East quadrant and a G5RV hung as a sloper off the western quadrant. This would give use multi band capability with paths to both Europe and the United States. With the Antennas at ninety degrees to each other interference was keep to a minimum. And having the Atlantic Ocean and Raritan Bay on either side as ground plans would not hurt either. Our first HF station was an Yeasu FT-990, running about 125 watts phone and CW. Station two was an Kenwood TS-50 running 100 watts on phone.

Arriving at the lighthouse at 06:00 Saturday morning work started. First order of business was to unload our vehicles and put up the shelters, then get the antennas ready to haul up the light tower. It was about this time that Mr. Murphy showed up. Our VHF station was to be operating on six and two meters, but the club member who would be bringing the VHF equipment had another engagement he forgot about and could not make it. So in true Ham Radio fashion we improvised something. A small homemade J-pole was hauled up the tower along with two hundred feet of coax and mounted to the light tower railing. The other two antennas followed and we were soon ready to get on the air.

Operations commenced around 0800. We worked mostly twenty and forty meters (which was as hot as a pistol) in the High Frequency bands. A mobile two meter radio powered by an AC power supply were hooked up to the J-pole and we were off and running. With about forty watts output on 146.520 simplex we were making contacts as far north as New Hampshire, west to Harrisburg PA. and south to Cap May. Our clubs premiere CW Operator also put up an end fed wire into a tree and operated a Solar QRP CW station, running three watts.

Bill KD2EEY (far left) on 20 meters and Holger K2HES (left) and George N2VEH (right) on 40 meters.

His most notable contact was to a Lighthouse in Cuba on Forty Meters. Both HF Stations were running and the only issue we had was the state side contest that started around midday. So finding a quite spot to work was sometimes a challenge. But as night fell most of the contesters faded away and the bands were once again quite. Operations worked into the night, until the overnight crew could not keep their eyes open. One member had set up a small six man tent. A few sacked out there. The others caught some sleep in there vehicles. Waking before dawn we got back on the air. During the early Sunday morning hours other club members arrived, bringing coffee, donuts and other snacks.

As with all our events food and drinks were available to the members who attended. Our clubs resident breakfast chief was not with us this year, and his blueberry pancakes were missed. So I provided the needed items and hardware to serve pork roll, egg & cheese on hard rolls for Sunday breakfast. I have not heard of any issues with my cooking as of yet, and yes I had some too. We also would offer food and drink to any of the Park Rangers or other Park personal who came by to see us. Operations continued until 1100 Sunday. With the threat of bad weather coming in we decided to pull the plug. After dropping the antennas, packing up the shelters and doing a ground clear walk we started off the hook. We as a Club cannot speak highly enough of the Sandy Hook National Park Staff. Any issues or questions were promptly answered or fixed. They came by often to be sure we were O.K. and to see if we needed anything. We have been informed that we will once again be welcomed back to operate in next year's International Lighthouse / Lightship Weekend. We will all be looking forward to next year's event.

Jeff N2LXM making breakfast.

InfoAge
Science/History Center
at Camp Evans, Wall, NJ

InfoAge Science History Learning Center and Museum
2201 Marconi Road • Wall • NJ • 07719

732-280-3000 • www.InfoAge.org

The Newsletter of InfoAge
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Save The Dates

Mid-Atlantic Retro Computing Hobbyists

Vintage Computer Festival

April 4-5, 2014

New Jersey Historical Divers Association, Inc.

New Jersey Shipwreck Symposium

April 26 or May 3, 2014
(TBD)

For more information about these events, such as admission costs and times,
call 732-280-3000 *or visit us online at* ***www.infoage.org****.*

The Information Age Learning Center (InfoAge) received a General Operating Support grant from the New Jersey Historical Commission, a division of the Department of State.