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What's In That Strange Building 9393?

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

Bldg. 9393 is just another large Quonset hut building with peeling paint, not unlike several others in the former Camp Evans compound. A decaying ruin that has not been ceded to the InfoAge Campus and some day in the not too distant future will be torn down by Brookdale College. Yet it is different from the other Quonset hut buildings; having only a small sealed door on the street end while on the opposite end there is a grafted on extension that contains another larger door. There are no windows anywhere. Inside among the litter left by local teenage intruders one finds an ethereal strange interior lined with spikes of blue foam jutting out from the walls, floor and ceiling at odd angles. We know that strange (for their time) scientific phenomena were pursued here when Camp Evans was in full swing but what was Bldg. 9393 used for?

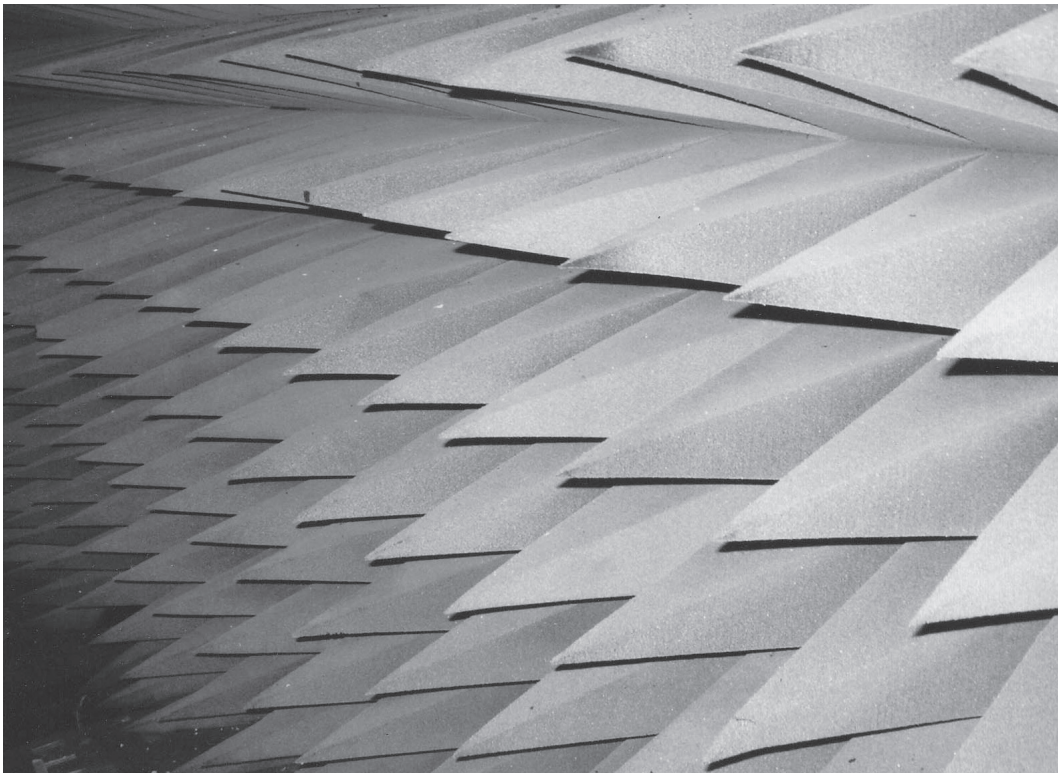
Well it turns out that it was nothing sinister or all that unusual for an advanced radar laboratory to have. This unassuming Quonset hut had been converted into a radio frequency anechoic chamber. What's that you say? The word anechoic was created in the 1940's and means "free of reverberations or reflections. It is derived from the Greek (an- "not" + echoic) and pronounced, "an-e-koh-ik". The term is more often used to describe "echo

The back side of Building 9393 and anechoic chamber.

free" rooms for audio frequency sound testing but in this case defines a chamber that is free from radio frequency echos or reflections. In essence it simulates being in free space where any released electromagnetic energy is never reflected or returned to the source. Why was this so important to the Camp Evans scientists?

It is a vital tool to aid in the development of radar antenna systems. Radar antennas must be design optimized to focus their electromagnetic energy in beams that concentrate the energy in a particular pattern depending on the type of radar being considered. In the most common ground based air search radars the desired beam would be fan shaped with wide coverage in the vertical plane and with a narrow beam in the horizontal plane. This would essentially yield a beam that would "sweep the sky" as the antenna is rotated. Very early radars used an array or stacks of "TV like" antennae that had poorly shaped patterns. This resulted in wasted power going off in side lobes where it also could produce erroneous replies that confused operators. Poorly shaped antenna patterns could also have gaps or holes in their coverage that would allow enemy targets to be missed altogether. Antennas were originally tested for their characteristics in outdoor antenna ranges but this method has several distinct disadvantages. One, it is virtually impossible to find an outside area that is totally free from ground or other reflections such as trees and buildings and this tends to produce distorted data. Also, outside electromagnetic interference such as other transmitters in the area will also spoil readings and one does not want to expose ones secret antenna designs to prying eyes nor risk having the radiation being picked so that the operating frequency can be determined.

The attached pictures show the exterior and interior of the chamber. Using a Quonset hut as a shelter was a bit of genius as it was cheap and the metal structure shielded the interior from interference from other electromagnetic sources. A complete wooden building was constructed inside the hut to which were installed thousands of pyramidal shaped sections of foam that were specially treated to absorb the radio energy at the frequencies of interest. The foam sections were arranged in a zigzag pattern so that there were essentially no flat surfaces that would tend to be reflective. In use, the antenna to be tested would be mounted on a turntable at one end of the chamber (the end with the grafted on



The foam lining of the anechoic chamber.

shelter) while a transmitting probe would be mounted at the opposite end. A radio signal would be transmitted while the antenna was rotated slowly and a test receiver connected to the antenna under test would receive the test signal. Chart recorders would record the strength of the received signal plotted against the azimuth angle and this would display the horizontal antenna pattern. By rotating the antenna mounting 90 degrees the vertical pattern could also be obtained. The transmitting probe was also mounted on a rail system so it could be moved in closer or further away from the antenna under test in order to record the "near field' and "far field" response of the antenna. This was important in making adjustments to minimize unwanted side lobes. Antennas are 100% reciprocal so that recording the receive pattern yields the transmitted pattern as well. If an antenna was too large to fit into this chamber, a smaller scale model could be used with an adjustment in the test frequency to compensate for the scaling employed.

Use of this chamber was "innovative" at the time and greatly helped microwave engineers to design the optimum antenna for the specific type of radar planned. (As an aside, the complex mathematics of radar antenna design was an important function and inspiration for some of the first computers used in the 1940s. Predicting the optimum antenna design shape required rapid mathematical computational capability that may have been enhanced with the creation of the Army's first general purpose digital computer ENIAC; but that is a story for another time). Construction of this particular anechoic chamber was assisted by the Emerson & Cummings Company of Canton, MA using their ECCOSORB foam material.

It is unfortunate that no current use can be made of this facility. Some inquiries have been made to this end but nothing has come of them so far. Time and vandals have taken their toll on the building so it is probably destined for the wrecking ball. It has no potential use in the plans for InfoAge but we will salvage a few sections of the ECCOSORD foam for future display of a sample of the radar design technology that was employed at Camp Evans.

The MARCH Exhibit Expands at InfoAge

Evan Koblentz
646-546-9999 • evan@snarc.net

InfoAge's computer museum, led by a club called MARCH (Mid-Atlantic Retro Computing Hobbyists), is experiencing dramatic growth and will soon triple its exhibit space.

MARCH formed in 2005 and opened its first exhibit, just 120 square feet, in 2006 . The group expanded to two exhibits, then four, reaching its current 900 square feet in 2008. Now, MARCH is moving into one of InfoAge's massive H-buildings, where the club will demonstrate vintage computers in 15 exhibits totaling 3,000 square feet. Their new space is scheduled for a grand opening this fall.

Upon the move, a highlight of the computer museum will be MARCH's UNIVAC 1219 mainframe. This system was built in 1963 for the U.S. Navy and was used aboard ships for controlling missiles and radar systems. It weighs approximately 6,000 pounds and was donated by the Johns Hopkins University Applied Physics Laboratory. Its tape drives alone hold just 14 megabytes of data per 1,000 pounds -- compared to a modern micro-SD memory card which holds several gigabytes and weighs a fraction of an ounce!

MARCH also recently announced the next edition of its flagship event, the Vintage Computer Festival East, to be held May 14-15, 2011 at InfoAge. VCF is akin to an antique car show -- except that at a car show you can't actually drive, and what fun is that? At VCF the exhibitors are required to demonstrate their vintage computers in live working condition. There are also lectures, prizes, and special events. For example, last year's show featured an 8-bit music concert.

Whether your own computer history is only as recent as Atari and BASIC, or if you go back to DEC and IMSAI, or even if you're an old hand at Big Iron and punch cards, MARCH has something for vintage computer fans of all formats. (Yes, that's an example of a vintage computer joke!)

For more information contact the club president, Evan Koblentz, at evan@snarc.net or (646) 546-9999. MARCH is online at www.midatlanticretro.org.

A time line of MARCH member Kelly Leavitt's Tandy computers at the VCF East. Photo by Bill Degnan.

The Atlantic Surfing Museum opens at InfoAge in Wall, New Jersey

Will Somers
732-207-5003 • director@atlanticsurfingmuseum.org

For those of you who don't already know this, surfing history is huge! The Atlantic Surfing Museum (ASM) was founded in 2008 with this mission:

"As a non-profit center for exhibition and education, the Atlantic Surfing Museum is dedicated to collecting, conserving, and researching the culture, heritage, art, lifestyle and science of the sport of surfing for the public's enjoyment. We will work to honor the Atlantic beaches, our playground."

The museum's first location is opening in Wall, NJ this summer, just a couple of miles from Belmar beach, home of the Belmar pro invitational surfing contest. The museum is for all ages, bu t is intended to be particularly "kid friendly." Focus is on what makes waves and weather, and education is a goal along with fun. We are also on the Web, at www.AtlanticSurfingMuseum.org

A little history lesson

In 1962 and 1963, the trickle of the salt water sport of surfing from the US West Coast and Hawaii to the Atlantic shores became a flood. By the time the three years following (1965-1966) had elapsed, it had become a tsunami which has not abated. Today surfing is acknowledged as one of the great sports, with millions of enthusiasts worldwide, and a following on all the Atlantic shores.

What enabled that growing flow in large measure was the improved science of materials for surfboards, plus of course the fact that surfing was fun, set styles, had popular offshoots like skateboarding, and lots of great background music from the Beach Boys and others. What an impact! Today we surf the Web!

The Atlantic Surfing Museum has exhibits and instructional guides to memorialize the history of the sport and the surfing lifestyle, with rich displays from the early days through the present. It is volunteer operated as a 501-3-C nonprofit (and in fact welcomes interns and volunteers to help staff and maintain the museum).

Surfing: – If you are interested in surfing and want to know more about where we are and how we got here, we hope you will join us at the InfoAge Science History Learning Center and Museum on Marconi Road in Wall, starting Sundays in August.

Here's some of what you will see:

Photography: - Great Atlantic surf photographs, both stills and videos.

Historical Presentations - Museum exhibits trace both social and technological innovation and developments as surfing spread east and then north and south.

Games and Educational materials – Have your picture snapped "in the curl," and see if you can navigate the surfing games without "wiping out."

To learn more, please visit the museum Website at: www.AtlanticSurfingMuseum.org and, of course, please come in and see us in the H Building, 2201 Marconi Road, Wall, NJ.

Best, and enjoy the summer waves!

Gail Kotowski, Ann Brown, Kathy Nelson, Mark Richardson, Ricky Arnold, Ron Pare, Tom Eadon and Will Somers, for the Atlantic Surfing Museum.

The Atlantic Surfing Museum Sign goes up! July 17, 2010

Field Day 2010

Ron Olender/President • OMARC • 732-367-3179 • Wa2hzt@aol.com

"The purpose of the event is to develop emergency communication skills. Amateurs operate their stations under adverse conditions to simulate actual emergency conditions."

On June 26/27, the Ocean Monmouth Amateur Radio Club participated in amateur radios premier operating event called field day. It was held at the Diana Site on Marconi Road in Wall. This event is sponsored by the American Radio Relay League, the national voice for amateurs in the U.S., which is located in Newington, Connecticut. Field Day is advertised as an exercise in emergency communications and thousands of ham radio operators throughout the United States and Canada, whether individually or in clubs, participate in this yearly event. It is estimated that over 35,000 amateurs will participate in this year's event. The purpose of the event is to develop emergency communication skills. Amateurs operate their stations under adverse conditions to simulate actual emergency conditions. Portable generators and even solar panels are used to power their stations and antennas are strung between supporting structures such as trees or other structures. The first field day took place in 1933 and since then has grown to be the most popular amateur radio event of the year. The event runs for 24 hours and is held annually on the last full week end in June. Points for contacts made with other amateurs are tabulated and used to determine a final score. Although not a true contest, many amateurs and clubs use these points for bragging purposes. Various modes are used to communicate, such as code, voice and digital methods such as psk (phase shift keying) and rtty (radio teletype).

OMARC started setting up for the event at 9am on Saturday morning of the 26th as the event officially got underway at 2pm local time. Many OMARC members were on hand to help set up the station. Generators were fired up and power cables were fed to the different stations. We were operating under class 4E meaning we could have 4 simultaneous transceivers on the air at any one time. Antenna feed line were also selected to match their appropriate radios. We also had plenty of food on hand to match the appetites of the helpers. Hot dogs and hamburgers with potato salad and other salads were on hand for lunch with enough to feed the crew for the evening meal. On Sunday morning we were treated to a delicious breakfast of blueberry pancakes with turkey bacon.

Our guests included fire chief Ed Megill from the Spring Lake FD and the Mayor of Wall Township, George Newberry who was very impressed with our operation. Points are not only tabulated from contacts made but also by accumulating various bonus points. Some of these bonus points included visitations by various elected officials and emergency personnel. Other bonus points that we took advantage of were solar panel contacts, newspaper submission, receipt of a morse code message sent by the American Radio Relay League and having 5 children under the age of 18 make supervised contacts.

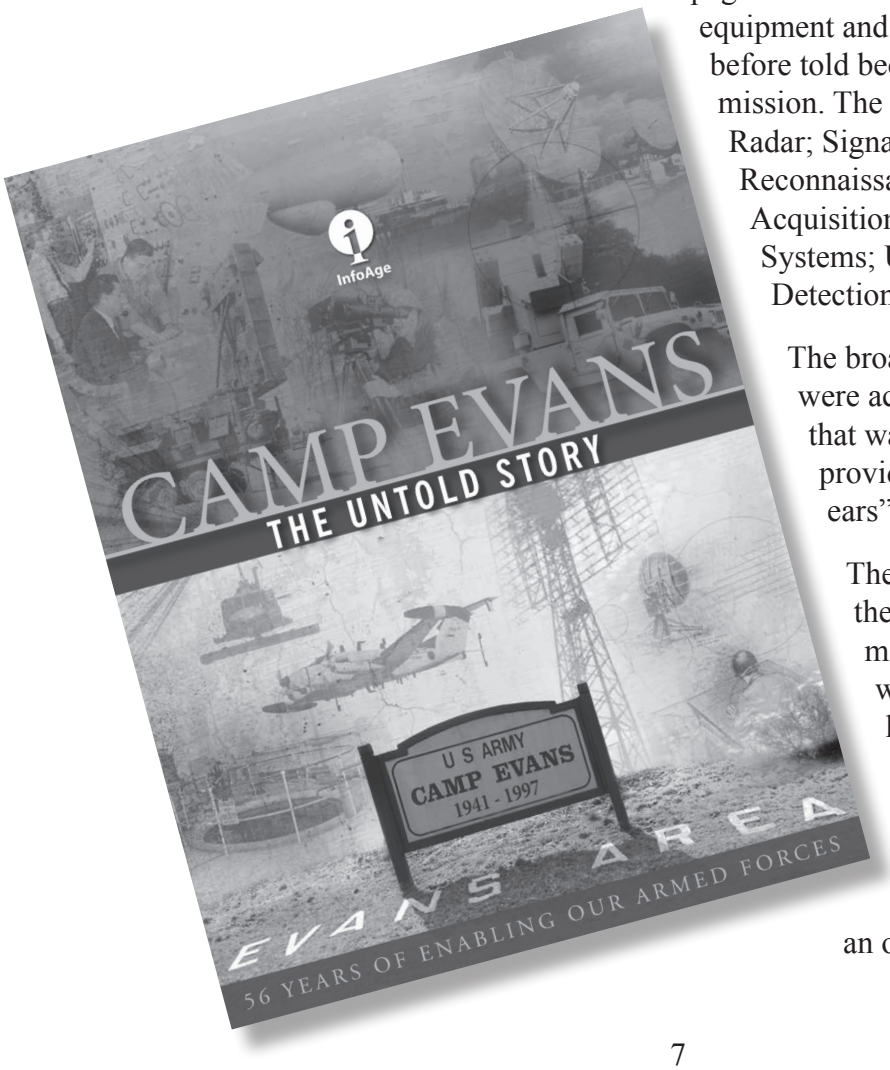
Our final score was 3400 points which included all of our bonus points. This is the highest score we have ever received while operating this event. This score included a total of 649 contacts made with other amateurs throughout the U.S and Canada. Most of the contacts we made were using digital forms of communications such as psk and rtty. Morse code communications came in second and voice (single sideband) was close behind in third place. We used many amateur bands such as 80, 40, 20, 15 and 6 meters. Propagation was surprisingly good on all bands as our current solar cycle has been in the doldrums. The format of making a contact was to send our classification which was 4E and our radio section which was NNJ for Northern New Jersey. We also had to copy the other stations information for the contact to be considered valid. The event ended at 2pm local time on Sunday and the clean up went very smoothly with all hands pitching in.

This event is a very popular radio event and I think our score will place us very high in our section. OMARC has participated in this event from its start back in 1978 and each year we try to do a little better than the year before. To all my fellow amateurs who came out to support this event, I thank them one and all and hope we will do it all again next year. The Ocean/Monmouth Amateur Radio Club, is a support organization of the Infoage Science History Learning Center and Museum.

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,

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

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The Newsletter of InfoAge

Inside this issue...

2010 Calendar of Events

August 15
First Annual WWII Symposium
1-5 PM

August 28
NJROTC Boosters Meet & Greet
7-9 PM

September 25
InfoAge Wall Of Honor Dinner and Ceremony
7-10 PM

October 2
OMARC Fall Hamfest

October 8-9
Haunted Hotel
Starts at 7 PM

October 15-16
Haunted Hotel
Starts at 7 PM

October 22-23
Haunted Hotel
Starts at 7 PM

October 29-30
Haunted Hotel
Starts at 7 PM

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