THE INFOAGE
# MARCONIGRAPH

NEWSLETTER OF THE INFORMATION AGE SCIENCE HISTORY CENTER AND MUSEUMS

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# PRESERVATION new jersey

## PRESERVATION NEW JERSEY ANNOUNCES 2018 NJ HISTORIC PRESERVATION AWARDS

Statewide non-profit organization recognizes achievements in historic preservation

PATERSON, NJ - Preservation New Jersey (PNJ), along with the New Jersey Historic Preservation Office and Historic Sites Council celebrated individuals, organizations, and agencies that have made a major or sustained impact within the field of history and historic preservation in New Jersey at an awards ceremony on Thursday at Passaic County Community College's historic Hamilton Club during the 2018 New Jersey History and Historic Preservation Conference.

"Every year, we are more and more impressed by the dedication and creativity of both the volunteer and professional preservation community in their efforts to save, restore, and promote NJ's historic resources," PNJ's Executive Director, Courtenay Mercer said. "We are privileged and honored to recognize these efforts through the annual NJ Historic Preservation Awards.

Photos from the NJ Historic Preservation Awards ceremony and opening reception of the 2018 New Jersey History and Historic Preservation Conference can be viewed at Flickr.

Detailed descriptions of the Leadership Awards can be found at Preservation New Jersey 's website.

www.preservationnj.org

**PNJ presented a Leadership Award to:**

**Fred Carl – Founder, Director and COO InfoAge Science History Center**

Fred Carl received the Sarah B. Fiske Legacy Award, which is a lifetime achievement award recognizing important and sustained contributions to the understanding and promotion of historic preservation and history in New Jersey.

Fred Carl has been a champion of Camp Evans since 1993, when its closing under base realignment and closure (BRAC) was announced. With the backing of Wall Township, Mr. Carl researched the creation of a science center that was added to the the Marconi Reuse Plan in 1995. Mr. Carl built a consortium to preserve Camp Evans that incorporated in 1998 as a not-for-profit known as the InfoAge Science-History Center. With support from Wall Township and Monmouth County, the InfoAge Science-History Center replaced the roofs, installed heat, and added air conditioning to five buildings. In addition, nine restrooms were restored to service. InfoAge repainted the exteriors of the WW2 and satellite era buildings, and the entire interiors of seven buildings. Mr. Carl and his fellow volunteers continue the work of restoration as they raise funds and establish educational science-history programs.

*The Board of Directors, Staff and volunteers wish to congratulate Fred on his award and thank him for his on-going efforts to preserve and restore Camp Evans and make it a home for young and old to learn NJ History.*

# Internet Archeology

By Ray F. Chase – New Jersey Antique Radio Club

As a WWII living memorial site and a designated National Landmark based on our radar history, it behooves us to preserve and display early radar artifacts. But where does one get them? At the end of WWII, there was a mass rush to scrap out all thats now useless mostly obsolete stuff. For the U.S. Navy, there were those who wanted to preserve some of the ships and thus there are many museum ships around the country and possibly some of their radars were saved. For communications equipment, there were legions of Amateur Radio Operators who purchased radio equipment from the many surplus stores that sprung up, (remember radio row on Cortland St. in New York City). Besides, radios were usually much smaller and could be useful as basic communications equipment for tens of thousands of Hams. Radar equipment was big and heavy and had no comparable peacetime use so off it went to the breakers.

So, what do we do in the 21st century to preserve the artifacts derived from the labors of those countless early engineers, workers and innovators who produced the wonders of radar that did so much to win our victory in the 20th century? And how do we preserve and display the history of Camp Evans?

"Radio Rows" across the country are now gone, the last remaining major surplus radar source, Radio Research Instruments in CT is gone over five years ago; its 200,000 square feet of radar equipment sold for scrap. One can probably count no more than half a dozen Military museums with meaningful radar displays and another half dozen private collectors who have the energy and means to maintain private collections.

One useful answer is to use the power of the internet to ferret out bits and pieces of radar equipment that one way or another were accumulated in attics, barns or basements by WWII equipment collectors. This will not get us a complete system but enough bits and pieces to make a meaningful display. The on-line auction site E-Bay is a prime source but contact with other museums and internet reflector sites are other opportunities. Newer social media sites can be useful as well. It also helps to have friends scattered around the country as a few following examples will show.

Some years ago, while trolling on E-bay, I spied a BC-957-A indicator/receiver from the SCR-547 radar. This WWII set was often called the Mickey Mouse Radar because its two parabolic antennae looked like Mickey Mouse's ears.

Anyway, the item was in Oregon and was listed only for local pick-up due to its size and weight. The seller indicated that if there were no takers, it would go into the dumpster. That would be a nice item to have but Oregon is a long way off. Then I thought, our good friend Ludwell Sibley lives in Oregon so I contact him and turns out he was only about 20 miles from the seller. Lud offered to pick it up and when I contacted the seller to make a deal, he was thrilled that it was headed to a museum, so he donated it. But then how to get it from Oregon? Well, we have another local friend, Will Donzelli who wheels and deals in all sorts of vintage radars and computers and makes an annual U.S tour to pick-up or deliver results of his deals. While on a west coast leg of his trip he agreed to make a detour to Oregon and bring the unit back to New Jersey where it is now on display in the hotel. What a good friend!

*SCR-547 Indicator/Receiver from Oregon on Display in the Hotel*

I have a daughter and grandchildren in MD and have been fortunate to combine visits with them to include the acquisition of artifacts that were advertised on E-bay and local pick-up was either a condition of purchase or an option. As I indicated, WWII radar stuff was usually quite heavy. Looking at my records, I see that trips to MD have brought us a SCR-268 radar indicator, an APR-1 EW receiver and a PE-110-D communication radio power supply.

Probably the most significant find was a missing part for the SCR-268 radar transmitter that I was restoring after finding it in an old warehouse. This transmitter has three indicating meters mounted on large insulators because they are running at a very high voltage but one of the meter assemblies had been broken off and was missing. This bedeviled me as it would be difficult to reproduce and its omission from the unit would spoil its display. Then one day, "bingo" someone on e-bay had a complete meter assembly for sale. The odds of this item showing up were extremely slim indeed, but I jumped on it and got it for a reasonable price. I figured who else would need or want it but still there were a couple of other bidders.

*Meter Assembly for SCR-268 Restoration*

# Army in Space – The Early Years

**John T. Cervini – Vice Chairman InfoAge Board of Trustees**

### Operation Paperclip

Toward the end of WWII in Europe, Werner Von Braun and his staff surrendered to the Americans at Peenemunde and were taken to Fort Bliss, TX and ultimately Redstone Arsenal, AL to continue research on rockets based on the V-2 model. Many successful and unsuccessful launches took place there. But these were sub-orbital flights rather than "space" efforts. True space programs originated in the Army with the Signal Corps projects at Fort Monmouth and Camp Evans.

**Von Braun and Team at Peenemunde**

### Project Diana

The Signal Corps opened up the space age electronically by bouncing radio signals off the moon from its Diana radar at the Evans Signal Laboratory in Wall Township, N.J., on Jan. 10, 1946. The project was the first demonstration that artificially-created signals could penetrate the ionosphere, opening the possibility of radio communications beyond the Earth for space probes and human explorers.

**Diana Test Site with modified SCR-271 Antenna**

A large transmitter, receiver, and antenna array were constructed at the lab for the project. The transmitter, a highly modified World War II SCR-271 radar set, provided 3,000 watts at 111.5 MHz in quarter-second pulses, while the "bedspring" dipole array antenna provided 24 dB of gain. Reflected signals were received about 2.5 seconds later, with the receiver compensating for Doppler modulation of the reflected signal.

The ability to bounce radio waves off a sitting target like the moon, or later, an artificial satellite–would make it possible to maintain wireless communications even during solar flares or geomagnetic storms. There was also interest in using such a system to track radio signals from the Soviet Union and Eastern Europe early in the Cold War, when diplomatic relations with the US were becoming rather testy. Powerful radar receivers had already been picking up stray radio signals from Europe and Japan during World War II–a phenomenon referred to as "anomalous propagation."

Plans were made for a system designed to intercept Soviet radar signals by detecting the transmissions that bounced off the Moon. This program, codenamed "Joe," began making regular observations in August 1949. Within a year, "Joe" was made an official Navy intelligence program, the Passive Moon Relay (PAMOR).

### Sputnik Tracking

History changed on October 4, 1957, when the former Soviet Union successfully launched Sputnik I. Besides the bruising to national prestige it started the "Space Race". A part of the race was a push to 'catch-up' and exceed the Soviets in the fields of space science and science education.

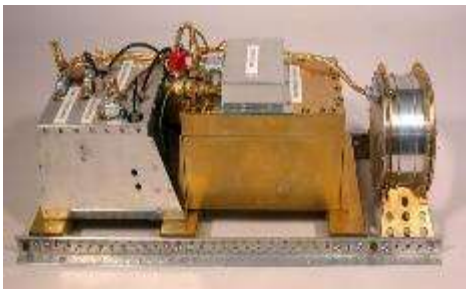
**Sputnik 1 Satellite**

To the U.S. Army Signal Corps scientists at Camp Evans in Wall Township and Deal Test site in Ocean Township, the launch was a very personal life changing event. For weeks they labored marathon hours tracking this 'invader' from the Soviet Union in TOP-SECRET. Using the tracking equipment at the Diana Site on Marconi Road and antennas at Deal, they characterized the Sputnik. Harold Jaffe and his team, including First Lieutenant Herb Hovey, operated special equipment from the Countermeasures Division (later the Electronic Warfare Laboratory) and became one of the first teams to track and verify that Sputnik was indeed successfully launched. They accomplished this by receiving the satellite's 40-Mhz beacon and reported the results to the Pentagon.

**Harold Jaffe and the VHF DF Antenna used to track Sputnik 1**

**Project Score (Signal Communications by Orbital Relay Equipment)**

A prototype of the first communications satellite, Project SCORE (Signal Communications via Orbiting Relay Experiment), was successfully launched Dec. 18, 1958, carrying from outer space President Dwight D. Eisenhower's Christmas message to people around the world.



**SCORE Communications Relay and Recorder**

The experiment effectively demonstrated the feasibility of world-wide communications in delayed and real time mode by means of relatively simple active satellite relays and provided valuable information for the design of later communications satellites. The overall project was conducted in such secrecy that only 88 people were aware of its existence. Before the date of the SCORE launch, 53 of the 88 people had been told the project had been canceled and they were not to mention to anyone that it had ever existed. That left only 35 people who knew of the mission of Atlas 10B with the rest of the engineering crew, including the launch crew, under the impression that they were working solely on a test launch of the rocket.

SCORE was an Advanced Research Project Agency (ARPA) project carried out by the Signal Corps with the Air Force providing the Atlas launching vehicle.

**VANGUARD**

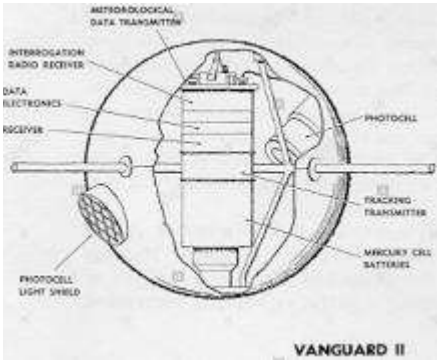
The first major satellite payload contribution was a demonstration of the feasibility of solar converters for satellites. That came with the launching of the Vanguard I on March 17, 1958. The Signal Research and Development Laboratory headquartered at Camp Evans developed solar power devices (i.e. the first use of solar cells) consisting of six cell clusters to power one of the two radio transmitters in the sphere. Vanguard's initial orbit time was 135 minutes.

**Vanguard 1 Satellite**

Three minutes after the Vanguard I was launched at Cape Canaveral, Fla. its signals were being picked up at the laboratory's Deal, N.J., test station. In its first three years, Vanguard I traveled 409,257,000 miles in 11,786 orbits. It proved itself invaluable in scientific computations.

**VANGUARD II**

The second major satellite payload contribution was the complete electronics payload for the Vanguard Cloud Cover Satellite, 1959 Alpha, launched on Feb. 17, 1959. Vanguard II, with infrared scanning devices to provide crude mapping of the earth's cloud cover and a tape recorder to store the information, operated perfectly during the entire 20-day life of the battery power source. It made 211 orbits and was successfully interrogated 155 times to release the stored information.




**Vanguard 2 Sketch**

The Signal Corps Research and Development Laboratory at Fort Monmouth and Camp Evans also contributed special components or subsystems to the payloads developed by other organizations, such as high-frequency control crystals, special batteries, and high efficiency, low voltage to high voltage transistor power converters.

**TIROS**

To televise cloud formations within belt several thousand miles wide around the earth and transmit a series of pictures back to special ground stations, the 270-pound TIROS (Television and Infra- Red Observation Satellite) was launched on April 1, 1960 by an Air Force vehicle. The first television-type satellite for world-wide cloud cover mapping was produced under Signal Corps technical supervision and NASA sponsorship.

Its two television cameras -- one a wide-angle lens photographing 800-mile squares of the earth's surface and the other shooting 30-mile squares, ranging between the latitudes of Montreal and New Zealand, were of different resolution for direct readout and tape storage. That represented the most intricate control so far used in a satellite. After calibration, the initial data was down-linked to the TLM-18 ground station at the Diana Site at Camp Evans.

**Tiros Antenna (left) and captured German WWII Antenna at Camp Evans**

The first orbit pictures were rushed to Washington on a new facsimile machine, also developed by the Signal Corps Research and Development Laboratory. It transmitted a high-quality picture to its destination in just four minutes. As a result, the first pictures from TIROS, and the first ever satellite weather images, were on the President Eisenhower's desk shortly after they were received, and he personally released the information to the world.

During its three months of operation, TIROS sent down more than 22,952 pictures of cloud formations, depicting the world as man had never seen it. Although it was only an experimental forerunner, TIROS I made some important discoveries and contributions to meteorological research.

TIROS II, launched Nov. 23, 1960, followed TIROS I to provide new and more comprehensive views of earth's ever-changing weather patterns from its vantage point some 400 miles in space. The new, more definitive pictures and data it gathered and returned to earth provided a ground work for new giant strides in meteorology and long-range weather forecasts. For the first time in history, meteorologists were able to observe and ultimately track devastating hurricanes, dramatically reducing the loss of life from these terrible storms.

Today, we take satellite communications for granted, and are spoiled by the latest weather satellite images we see on the nightly news. We need to remember the role the Army and its dedicated work force played in making these tremendous technical advances become every day occurrences that have enhanced our lives.

Our Satellite Dish as it looks today sitting outside out InfoAge Space Exploration Center (ISEC)

We encourage you to stop by for a visit during our normal museum hours or stop in for our monthly space presentation. This month will be ***Lunar Exploration Since Apollo.*** Our speaker is Frank O'Brien, our NASA ambassador. It will be held from 2-4PM and we ask for a $10.00 donation per person.

We also have a summer program for children. It is our Space Exploration Week. Children learn all about space, make projects and have fun at the same time. Our first session Starts July 23rd and runs through July 27th. If you are interested visit our website at www.infoage.org for more information and the application.

Hope to see you come out and support InfoAge!

**The Marconigraph** is the Newsletter of the Information Age Science History Learning Center and Museum which is a 501 C (3) Non-Profit Corporation dedicated to preservation of Camp Evans. Membership is $25 per year for an individual and $45 per family.



For more information about InfoAge and our Museums or to become a member or volunteer your time call 732-280-3000.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# InfoAge Display at IMS Philadelphia a Big Hit

By Ray F. Chase

The Institute of Electrical & Electronic Engineers (IEEE) organizes an annual International Microwave Symposium (IMS) in June. This year's event was held at the Pennsylvania Convention Center in Philadelphia from June 9th to June 16th. The program includes a Historical Exhibit that is coordinated by The National Electronics Museum (NEM) in MD. In 2009, InfoAge provided a historic display at IMS when it was held in Boston although our participation was quite modest. Last year we were offered the opportunity to exhibit at Philadelphia, but I was not then able to commit the time to it. I maintain a regular relationship with NEM and this January I was at NEM during a radio meet and discussed their anticipated program with the coordinator, Steve Stitzer. Steve wanted to highlight the 80th anniversary of the first demonstration of the SCR-268, the Army's first radar but said NEM only had two pieces of the radar, a receiver and an indicator and they were not in very presentable condition. I offered to send Steve a list of what was available at InfoAge between what I have and what has been accumulated by InfoAge. This is probably the largest collection of SCR-268 artifacts anywhere. Included from my own collection is the unique 16 tube Ring Oscillator transmitter which to my knowledge is the only one in existence. I have been intermittently working on its restoration for several years after finding it about ten years ago in an abandoned warehouse in Boonton, NJ.

Steve and I concluded that the only way to make the display work would be to use most of the pieces from InfoAge. To meet the June date a schedule had to be set up to complete the restoration of the transmitter unit, clean up and prepare the other units and get them ready for shipment. We also agreed that I would supply the VT-158, Zahl tube/TPS-3 display and the PPS-4 Ground Surveillance Radar. Steve would supply large poster board interpretive displays and I would supply individual artifact signage. The radar units weigh quite a bit and would need heavy duty supports. Fortunately, I had salvaged two aluminum HVAC support structures from 9010A when new HVAC systems were installed. The intent was to repurpose them as display tables for a future radar museum. These needed to be cleaned up and modified with table tops.

Help was provided, mostly by the Wednesday RTM work crew who pitched in. The transmitter unit was brought to the RTM repair shop from my garage and various people helped with the tube connection devices, the filament transformer restoration, clean-up of receivers plus other units and a major job of cleaning the HVAC frames and installing and painting table tops. Meanwhile, some missing parts of the transmitter were fabricated in my basement workshop. A missing modulator pulse network, part of the filament transformer assembly, was reproduced from vintage parts that I had or managed to scrounge up.

Problems popped up along the way, but they were deal with and by mid-May we were on schedule. A shipping crate was needed to protect the transmitter which Harry Klancer fabricated in a few days. I decided that a crate was needed for the Zahl tube display signage which I made at home along with shipping cartons for the smaller items. The heavier units being ruggedized for military field use were deemed strong enough to be shipped without crating or boxing. I completed my share of the signage in the first week of June.

Our Four Tables in the Center of the Exhibit Area

Ray Chase at the Exhibit

NEM coordinated the shipping with a professional show management company and my twenty items arrived at the convention center on Saturday June 9th. I did most of the set-up on Saturday and returned on Sunday to complete attaching the signage. I shared one display case with NEM where I displayed two very early magnetrons that I recently acquired along with some of my SCR-268 Tech Manuals. NEM had created about eight 2 x 3-foot poster boards relating to the SCR-268 and SCR-270 radars. These were set up on large display boards to "bookend" the table displays in the center of the room. Steve works for Northrop Grumman just down the road from NEM so has access to a professional graphic arts department. He is going to send me digital copies of the posters, so we can produce duplicates for InfoAge. The Historical Display section was in a public area just off the main corridor between registration /meeting rooms and the Industry Exhibit main floor. Seminars and workshop sessions were scheduled from Saturday the 9th straight thru to Friday the 15th so there was traffic through the historical exhibit for seven days. The main floor of 600 plus Industrial Exhibitors was open from Tuesday to Thursday and those days saw the heaviest traffic. Plenty of InfoAge and NJARC brochures along with RTM and InfoAge business cards were provided for visitors. The historical display was by design unattended and could be accessed by anyone, but it was on the second floor and security was always present. In all, I made five trips to Philadelphia to cover the set-up, tear down and spend some time touring the industrial exhibits.

Whenever I was in the Historical Display area I noted that the InfoAge exhibits garnered the most interest especially the transmitter unit. Occasionally I spoke with some of the guests to add insight to the displays.

In addition to our displays, The Sarnoff Collection from Ewing, NJ had a small display with Sarnoff artifacts and some 1920 RCA radios. NEM brought their standard cases of early microwave tubes and devices that are brought to all IMS events. This project did not cost InfoAge any funding and provided great exposure and prestige for us. We have established a very positive working relationship with NEM that puts us in league with the premier electronics museum in the country. Finally, upon return, the display items are finished and ready to install in our own radar museum when space is available. I am pleased that this endeavor went so well and could not have completed it without help from many NJARC members and Pat Flanagan.

*The BC-407-A Transmitter Display*

*The Zahl Tube Display*

**InfoAge Wish List**

**2 Golf Carts**
**Gator Carry All**
**Power Auger**
**Pallet Jack**
**Forklift**
**Lawn Mowers – Push & Riding**
**Snow Blowers**

## InfoAge Happenings

Commissioning a full-color tile is a great way to say thank you to a veteran or family member. The hall of Honor is located in the central hallway of the historic WW2 H-building complex, on the Camp Evans National Historic Landmark, the InfoAge Hall of Honor is an excellent place to display your custom tile. You supply the photos and text, and we'll create your unique custom tile. Take it home or allow us to display it in our Hall of Honor. The cost to commission a tile is $250, and additional copies can be made for $100 each. You will have the opportunity auto approve your tile's design.

Call 732-280-3000 today to reserve your tile or use this **Link for the Tile order form**

### New Jersey Antique Radio Club's

Summer Swap Meet – July 21st
8am – 12pm
$5.00 per person.

2201 Marconi Road
Wall, NJ 07719

Contact – Richard 914-589-3751

**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

**Spaceflight Lecture Series**
Last Sunday of Each Month
2300 Marconi Road
Wall, NJ 07719

**Space Exploration Week**
July 23rd – 27th
2300 Marconi Road
Wall, NJ 07719

**NJARC Summer Swap Meet**
July 21st 8am – 12pm
2201 Marconi Road
Wall NJ 07719

*For more information about these events, such as admission costs and times, call **732-280-3000** or visit us online at [www.infoage.org](http://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 State Department