



# The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

April 2017

Volume 23 Issue 4



## MEETING/ ACTIVITY NOTES

Reported by  
Marv Beeferman

### The ON-LINE Broadcaster

The *Jersey Broadcaster* is now on-line. Over 150 of your fellow NJARC members have already subscribed, saving the club a significant amount of money and your editor extra work. Interested? Send your e-mail address to [mbeeferman@verizon.net](mailto:mbeeferman@verizon.net). Be sure to include your full name.

Unfortunately, I was unable to attend the March meeting nor follow it on the internet. However, the feedback from members who had the opportunity to enjoy member Charles Blanding's talk on the history of New York FM radio was very positive and I'm sorry I missed it.

On Sunday, April 9th, from 1 p.m. to 5 p.m., InfoAge will celebrate the 100th anniversary of WW I. A series of presentations by technical experts will emphasize the role that New Jersey played that led to ultimate victory in the "Great War." The day will also include a display of WW I artifacts, dramatic WW I dioramas, and a book signing by Richard Connors of his "New Jersey and the Great War." Admission is \$5.00 per person.

InfoAge will also hold a Veterans and Armed Forces Appreciation Day on Saturday, May 20th from 12:00 (Noon) to 8:00 PM that includes beer, food, wine and live bands. The day will feature access to all exhibits including military vehicles, vintage WW II military equipment, shipwreck artifacts, a miniature train show, models of historic WW II battles and, of course, vintage radios. A 5K Race is also scheduled. A \$5.00 (children \$2.50) donation is requested and active and retired military with ID's enter free.

Recently, a working WW II, General Stuart M3 tank was donated and delivered to the Military Technology Museum of NJ at InfoAge. The M3 tank was originally supplied to British and Commonwealth



## MEETING NOTICE

The next NJARC meeting will take place on Friday, April 14th at 7:30 PM at InfoAge. Directions may be found at the club's website (<http://njarc.org>). Technical Coordinator Al Klase describes his topic for this month, "Radio Through the Teens," as follows: "In 1912 we had a relatively mature radio telegraph technology based on sparks and rocks. By 1920, we had CW telegraphy, AM radio telephone and long-distance telephony supported by a sophisticated vacuum tube industry. What happened? (Hint: WW I)" The meeting will also feature an auction of communication receivers which includes a vintage Hammarlund SP-600.

forces under lend-lease prior to the entry of the U.S. into the war. Thereafter, it was used by U.S. and allied forces until the end of the war. The name "Stuart" comes from the American Civil War Confederate General J. E. B. Stuart. Stuarts were the first American-crewed tanks in WW II to engage the enemy in tank versus tank combat.

The tank will leave the museum for a short time for further refurbishment and insignia installation.



A typical M3 Stuart.

Member Ray Chase reports that a new addition to the museum is a beautiful, 1952 vintage AMI D-80 juke box on loan by NJARC member Kevin McDermott. It plays eighty 45 RPM records with an AMI 300 changer and is in working condition. We plan to do some recapping and cleanup of the mechanism to ensure good operation and then add it to our new museum section on "Recorded Sound."

The jukebox came with four records but we are depending on our "45 RPM guru" Phil Vourtsis to hopefully supply a full complement of recordings. Phil is

active in planning the new display area. Many thanks to Kevin for this addition to the RTM...it is an artifact that we have been looking forward to for some time.



### Upcoming Events

- April 9th - WW I, 100th Anniversary Celebration at InfoAge.
- May 6th - Spring Repair Clinic at InfoAge
- May 19th - Monthly meeting at InfoAge; Radio Scavenger Hunt
- May 20th - Veterans and Armed Forces Appreciation Day at InfoAge
- June 9th - Monthly meeting at Princeton; Show & Tell, Hints and Kinks
- July 14 - Monthly meeting at Princeton; topic TBA
- July 22nd - Summer Tailgate at InfoAge

**THE JERSEY BROADCASTER** is the newsletter of the New Jersey Antique Radio Club (NJARC) which is dedicated to preserving the history and enhancing the knowledge of radio and related disciplines. Dues are \$25 per year and meetings are held the second Friday of each month at InfoAge or Princeton University.

The Editor or NJARC is not liable for any other use of the contents of this publication.

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## WHERE HAVE ALL THE BONEYARD RADIOS GONE?

By  
Robert Forte

Last November, I spent about ten days in Tucson, Arizona, the home of sun, cactus, great Mexican food and a few of my relatives. I bought a mobile home in the state and used the place for the last seven years as a winter retreat from the cold winter climate of the upstate New York Adirondack mountains. During this last visit, one person I was determined to see was Frank Zavada who I located on a MRCA (Military Radio Collectors Association) blurb. There he was, surrounded by about 150 BC455's and ARC-5 radios piled one on top of the other. Perhaps he was interested in letting go of an ARC-5/R-24 (a broadcast band receiver)?

Frank is located just north of Tucson and he was very receptive to meeting me. Although Frank is very congenial, he is still sort of a private guy. His background is off limits to discussion, except to say that he has led a varied and interesting life. He has an E.E. degree, was a pilot in the military and is now retired from his own manufacturing business. He repairs old military gear and often visits aircraft "boneyards," scouring them for boat anchors and other parts.

An aircraft boneyard (or "aircraft graveyard" as it is known in the United Kingdom) is a storage area for aircraft that are retired from service. Most aircraft at boneyards are either kept in storage or have their parts removed for reuse or resale and are then scrapped. Deserts, such as those in the Southwestern United States, are good locations for boneyards since the dry conditions reduce corrosion and the hard ground does not have to be paved.

When I visited Frank's workshop, it didn't seem all that extensive but one piece of equipment that caught my eye was a service monitor that consisted of a scope, signal generator, audio generator, spectrum analyzer, and an HP ionized rhodium gas oscillator. This oscillator can generate a signal up to 15 MHz within one cycle/second. Rhodium, like its cousin Cesium (used in the atomic clock in Fort Collins, Colorado), will decay predictably and accurately and the stand-

ard will power up in three seconds to align MARS (Military Auxiliary Radio System), national brands, ham and marine equipment.

During my discussion with Frank, I learned some depressing information about the direction aircraft boneyards have taken. Post WW II, aircraft military radios were literally "tossed to the ground" and discarded as junk. Buyers were primarily interested in the connecting cables for their copper value; radios had little salvageable copper.

Later on, military surplus houses began buying new radios that were never installed and they became full of them. The warehouses had so many radios (and other surplus parts) that they almost gave them away, selling them by the boxcar load. (This is the reason why so many surplus houses were located near a railroad siding.) Originally, no one wanted the radios that were being removed from aircraft and the scrappers were holding on to them with the hopes that someday, someone would want them. After a time, they just gave up as the pile of radios became just too big to deal with. For example, Frank said that between around 2008 and 2010, he saw at least six large wooden pallets of ART-13 transmitters at least 7 to 8 feet high sitting out in the sun, unprotected for years.

As far as the airplanes themselves, about once a month, they were offered for bidding by scrappers and recyclers. The buyers would then tow these airplanes to their own sites, usually around Tucson. From there, the plane would either be refurbished and refitted if it was originally a cargo type or, if a bomber or fighter, transformed into a cargo plane and then sold. Most of the aircraft were of the "amphibian" or "C-130" types and offered to foreign governments. Others would be chopped up and sold for scrap or salvaged for their parts and radios. However, there was still little interest for the radios themselves.

After 9/11, everything changed drastically. With new "ITAR" (International Traffic in Arms Regulations) guidelines, bidding limitations were put into place. ITAR controls the export and import of defense-related articles and services on the United States Munitions List (USML) and that now included radios. So in effect, military radios were lumped in with cruise missiles! As a result, all surplus gear (including radios) is now sold to a shredding company who sells the metal to a smelter. A non-commissioned officer actually stands by observing the shredding operation to certify it is completely carried

out. (Most modern day "green" military radios like the PRC-150 have encryption built into the mother boards so you could not use them on the ham bands even if you could get them.)

Within the last two years, military surplus houses that sell to US customers have to get a disclosure form filled out from the buyer before he can take possession of modern military gear. What really killed the surplus aircraft gear market was a change in the rules that prohibits a US citizen from bidding on surplus military aircraft; only a registered aircraft dealer can bid. If you want to buy a plane as an individual citizen, you must buy it through a broker.

By controlling who could register as a dealer (one requirement seemed to be having possession of a shredding machine and smelter), many mom and pop aircraft scrappers around the Tucson area were left "holding the bag" and the majority are gone today. As a result, only radios that were already in the boneyards became available for surplus sales - nothing after 9/11 - and that is why such radios are getting scarcer and harder to find.

Today, there are four boneyards in Tucson, two in Phoenix and seven in the rest of Arizona. Frank is a constant visitor to all of them. Because of all the leaking plane fluids, they are considered hazardous waste sites and, in many cases, the land is a liability. These boneyards are a dying breed and slowly closing down.

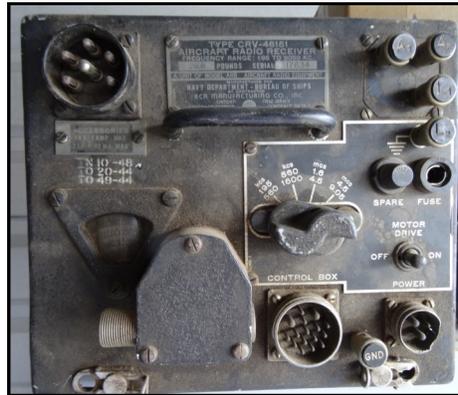
With Frank as my guide, I spent a morning going through a boneyard in Tucson near Davis-Monthan Air Force base. It was both nostalgic and scary climbing through old planes and going through the warehouse while avoiding scorpions and rattlesnakes. From the standpoint of location, the land is quite valuable but in reality it is a toxic dump.

But somehow, some vintage military radios are still getting out to the public. With all the restrictions, how could this be? Frank explained that if a military contractor received an order for say 1000 radios, he would actually manufacture 1100. If, during the checkout process, some do not come up to specifications, the company could draw from the surplus 100 as substitutes rather than spending the time and energy to troubleshoot and repair the defective units. These leftovers are then sold to military surplus houses to avoid the tax consequences of carrying a surplus inventory. But individual buyers are usually left out of the mix - so as for the 150 or so ARC-5's I had my eye on, they were all sold as one unit to a single buyer!

In discussing the future of collecting

vintage military radios, Frank had the following warning:

"If you're into military radios and you see one that you would like to have in your collection, given the fact that many of them are going to the land fill and the rest being ground up for their precious metals, you better go after it no matter what the cost, because you may never see another one."



**A type CRV-46151 Aircraft Radio Receiver..."Scarcer and harder to find..."**



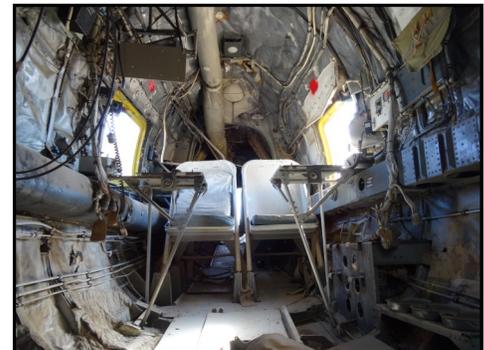
**Just one small section of a boneyard warehouse.**



**"Post WW II, aircraft military radios were literally tossed to the ground and discarded as junk. Buyers were primarily interested in the connecting cables for their copper value; radios had little salvageable copper."**



**"When I visited Frank's workshop, it didn't seem all that extensive, but one piece of equipment that caught my eye was a service monitor."**



**"It was both nostalgic and scary, climbing through old planes and going through the warehouse while avoiding scorpions and rattlesnakes."**

## OUR WINTER REPAIR CLINIC

By  
Marv Beeferman

We're always pleased to welcome both member and non-member challengers to our repair expertise and the February repair clinic attracted a nice mix of both. As usual, there were some successes and some head scratchers, but morning bagels and coffee, an afternoon pizza high, a little good natured kibitzing, and most importantly good fellowship, took the edge off any disappointments. If you never attended one of our repair clinics, try to get to the one scheduled for May 6th; even if you don't have anything to work on just now, you'll have a lot of fun just being an observer and you might just have some pointers for the rest of us.

Here's a summary of some of the projects that were worked on as a way of giving a "hats off" to our volunteer experts and as an indication of what you might expect to find on your next visit:

- Nevell Greenough worked on a Firestone S-7426-6, a nice 1939 AM tabletop in a plastic case brought in by a non-member couple. The radio exhibited low volume and typical hum. After replacement of the filter capacitors and output stage grid capacitor, and volume control repair, the radio was returned to its owners in working condition.

Nevell also worked on an RCA Model R17M, 1933 metal-cased tabletop radio owned by member Matt Reynolds. He described its initial condition as "smoking." A bad connection and shorted #37 triode (used as a rectifier by design) were the culprits and the radio now works.

- Member Pete Danilo brought in an 8-tube Brandes TRF set which had been previously worked on by Ray Chase. Harry Klancer, Vince Lobosco, Al Klase and Tom Sedergran teamed up to finish the job. A broken power supply lead was re-soldered and two open grid resistors on the 1st and 3rd RF stages were replaced. The radio is now operational and Pete is proud to display it in its original cabinet.

- Charles Blanding and Rich Phoenix tackled a Majestic 59 owned by member Bob Masterson. Initially, the radio "crackled" and had no sound. Replacement of open power supply filter capacitors restored the audio but it was still weak and distorted. After replacement of additional capacitors, the audio still sounded fuzzy so the speaker voice coil

position was adjusted; this resulted in a clear sound. The dial calibration was aligned and the antenna trimmer was peaked. The radio now gets most stations clearly with no hum or static. It was recommended that a 25-50 foot outdoor antenna and good ground would reduce RF interference.

- Your editor and Ed Krusheski worked on Jerry Dowgin's Atwater Kent 627. Jerry had previously worked on this radio but numerous wiring and parts problems were still located. The radio had no output, a high B+ and exhibited a low hum that was intermittent with the movement of internal wiring.

- Chuck Paci and Kevin McDermott worked on Kevin's RCA Model 9-EY-3 45 record player which was dead on arrival. It required a replacement power cord and recap. A terminal strip was added to mount the new filter capacitors. After being put back together, it worked fine and the dead amplifier was alive again.

- Phil Vourtsis and Kevin McDermott attacked a Voice of Music record player that belonged to member Kasia Sadowsky. It was in fairly good condition but had a few problems that were all corrected including a bad dropping mechanism, broken needle, inoperative record size sensor and loose speaker cover.

Phil also worked on a non-functional RCA J3 45 player owned by member Max Theis and a non-cycling 45EY1 owned by Matt Reynolds. After power cord replacement, new grease, lubrication and a new cartridge, the J3 player was restored. A cycling adjustment left the 45EY1 in working condition.

- Len Newman and Paul Hart worked on a Zenith H500, replacing a bad selenium rectifier, wire wound resistor and bad electrolytics. The final condition was not noted. The same can be said for Rick Weingarten's Magnovox 1SC230G stereo with only one working channel and a "tinny" sound. It was recapped by Phil Vourtsis and Tom Cawley.

- John Ruccolo and Bob Bennett worked on a Hallicrafters SX-24 owned by non-member Bill Dripps, Jr. The radio had already been recapped with "Orange Drop" capacitors and new electrolytics. Initial conditions were a weak 6K8 converter, a weak 6SK7 RF amp and low sensitivity on band 2. Replaced tubes and bandswitch cleaning helped considerably. The radio was left with good reception on the AM broadcast band and bands 3 & 4. Band 2 was still questionable and a future alignment and calibration was suggested.





## DON'T STASH YOUR CASH IN AN ELECTRONIC MATTRESS

By  
Marv Beeferman

A recent news report of "found" money was a flashback to a similar occurrence experienced by the NJARC in 2006, confirming the adage that there is nothing new under the sun.

The CTV Network, a CNN partner, reported that more than \$100,000 in four stacks of \$50 bills was found inside a television that was being processed at an Ontario recycling plant this January. The money was found inside a cash box, stashed into the TV console. Along with the money were documents that led police to the unidentified 68-year old owner of the TV who told investigators that he gave the set to a friend 30 years ago. He had apparently forgotten that the money was inside.

The original owner of the TV planned to give the money to family members as an inheritance. The friend finally got rid of the TV, not knowing that his trash would turn out to be a friend's treasure. The owner has been reunited with his cash and the employee who turned it over was praised for being honest and turning the box over to authorities.

A "cheaper" version of this story occurred some ten years ago and is now documented at the NJARC website. It might be a good idea to repeat it for our new members.

In early June 2006, the club helped dispose of a large collection of radios from the estate of a New Jersey collector. The club was asked if we would be interested in auctioning the entire collection of over 80 pieces for the estate, including many nice examples dating back to the 1920s. A team was dispatched to pick up the radios. The collection filled two vans, and was transported to our then cottage museum (across the street from the present Radio Technology Museum) for inspection and cataloging.

Upon opening one of the radios, an unusual "Crawford" model, club trustee Ray Chase discovered something wrapped up in paper towels inside. Unwrapped, the bundle revealed it's contents: ten thousand dollars in cash! As Ray called out "Hey, I need a witness over here!" others dropped what they were doing to see what all the commotion was about.

Stunned, the members passed the enve-

lope around "to see what it felt like to hold \$10,000" and then immediately called the owner to inform her of the situation.

The donor's brother, who had recently died, was known for keeping money around the house. But he apparently stopped keeping money inside a dresser drawer after a robbery.

Ray drove many miles to return the money the next day. He accepted a small reward as a further donation to the club's efforts in appreciation of our honesty. The deceased donor's sister said it didn't surprise her too awfully much to discover her brother's "stash."

What is now affectionately labelled "The \$10,000 Radio" can be seen in the Radio Technology Museum. CBS video news coverage of the story featuring NJARC member Phil Vourtsis can be found at the club's website "Home Page" ([www.njarc.org](http://www.njarc.org)).



The \$10,000 radio.

### FAKE NEWS OF "WEATHER EVENT" DOESN'T DAMPEN SPRING SWAPMEET

By Marv Beeferman

As the result of a weather forecast that did not materialize, turnout at our Spring Swapmeet was a little light but the event was still an overall success. Paid attendance was only down by about 10 from last fall (\$50) and table income was down by about \$200 from the last two meets. However, we were able to run a profit of about \$500 and we re-signed 10 members for 2017.

President Richard Lee would like to thank all volunteers who helped the event to run seamlessly considering some unforeseen obstacles. Thanks go out especially to Frank Eder and Bob Scheps for helping Richard shovel out the rear entrance to the PAL building.





## SHOP TALK

By  
Marv Beeferman

*This month starts a new feature in the Broadcaster that I'm calling "Shop Talk." From time to time, I'll keep you updated on projects that are being worked on in our new workshop adjacent to the Radio Technology Museum at InfoAge. Most of these projects will consist of restorations destined to be displayed in the museum but occasionally I'll include personal projects that our members are working on. I'll also try to include tips and techniques that relate to these projects or general "kinks" that will perhaps help your own repair and restoration work go a little easier. Contributions are welcome!*

### The Williamson Amplifier

*This article includes information contributed by Rick Cordasco...Ed*

Recently, a "do it yourself" modified Williamson audio amplifier (i.e., ultra linear amplifier) was donated to the club by the family of Frank Frega. Member Rick Cordasco was asked to check it out and perform necessary repairs in anticipation of displaying it in our "Hi-Fi" area of our Radio Technology Museum.

A Williamson amplifier refers to a type of vacuum tube amplifier whose circuit design uses the same principles as a design published by D.T.N. Williamson. Williamson proposed the standard which became generally accepted as the target figure for high-quality audio power amplifiers for less than 0.1% total harmonic distortion at full rated power.

Williamson's initial design was first published in the April and May 1947 issues of the British *Wireless World* magazine. The amplifier used a symmetric push-pull circuit, negative feedback and a specially designed output transformer to produce lower levels of distortion than

previous designs. It also used triodes as phase inverters and drivers. The original output stages used British, triode-connected, KT66 tetrodes. 6L6's, with a slightly lower output, could be used as direct replacements by reducing total current.



Another notable characteristic of the design was the use of a negative feedback loop enclosing the whole amplifier, including the output transformer, rather than separate feedback around individual stages.

Earlier amplifier designs used transformers to couple the output signal from one stage to the next. However, transformers are a source of distortion; if the transformers are not included in the feedback loop, this distortion is not corrected. Williamson eliminated all transformers, except the output transformer, by using capacitor coupling between stages and a split-load voltage amplifier stage ("phase splitter"), again capacitor-coupled, to provide antiphase signal inputs to the symmetrical push-pull output stages.

Throughout the years, numerous magazine articles provided directions for building amplifiers based on the Williamson design and manufacturers such as Dynaco, UTC, Heath and others offered their own versions.

Rick said he started with a very structured approach to his restoration which included:

- Maintaining a notebook/diary of all work.
- Gathering background research using internet sources and collecting part information, schematics, layout, etc.
- Creating diagrams, marking parts and components on the chassis and schematics and recording important observations.
- Testing tubes.
- Replacing safety components (3-wire line cord, frayed wiring, adding a fuse, etc.).
- Checking for shorts or low resistance paths in the power transformer circuit.
- Hooking up a light bulb load and variac for initial testing.

Rick started by hooking up a high quality audio signal generator via coaxial cable and a good connector to the amplifier input. A good quality audio speaker of the proper impedance and wattage was connected to the output (the amplifier has 16, 8 and 4-ohm taps at its ARCO TO-300 output audio transformer). As Rick continues:

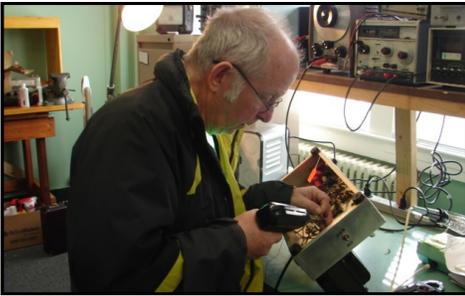
"Everything went as expected for a non-functional audio amplifier...typical 60 Hz hum and no audio. I then replaced the power supply filter electrolytics, powered up the unit and experienced a 'transient event.' I blew out several fuses and did what I should not have done...put in bigger fuses and waited for the smoke!

Another transient and the 5Y3 arced."

"In retrospect, I ignored two additional parallel electrolytics connected to the 807 output tubes that were not part of the power supply and difficult to remove. Before I succumbed to the obvious, I broke the power supply circuit and measured the resistance...it was high. I then measured the power supply draw with an ammeter a found high current."

"Well, to make a long story short (time as well as electrical), I replaced the difficult to get to electrolytics. I fired up the amplifier and it worked."

"I plan to expand on the project by, using static loads and varying the input, making accurate distortion measurements. I would also like to compare this amplifier to a modern 'S' class example that I own. This will involve analyzing and simulating the circuit design, varying components and looking at circuit configurations. Lastly, I plan to do a behavioral analysis with my beloved Matlab, Simulink and Octave for android."



**Rick at work on a Williamson "wannabe."**

Additional projects being worked on at our repair shop include:

- Paul Hart with help from Len Newman are completing work on the museum's Zenith 10S-549. It required a tone control cable replacement and complete recap. By the beginning of this month, it should be ready to be reinstalled in the museum.

- Al Klase, Rick Cordasco and our college volunteer Jacie Thorpe have recently completed work on restoring the museum's "secretary" radio (Philco 49-901). All functions of this unique radio are operated with one control. A large, splined cylinder serves as an on/off switch, volume control and tuning control. The cylinder rotates for on/off, volume and is pushed downward to change stations. Six station pre-sets are adjusted from the underside of the radio.

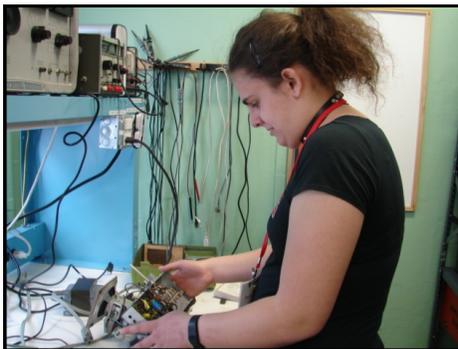
Repair involved cleaning tube sockets and contacts, repairing a shorted cable and removing a redundant wire. The radio was recently returned to the museum.

- Harry Klancer is working on a unique update to a console radio that is destined to be located in our upcoming WW II replica living room. The radio will have a touch screen that duplicates the original faceplate where visitors will be able to select their favorite stations of the era

- Your editor is working on the restoration of a Crosley 124 "Play-Time" grandfather clock radio. Two chassis and two speakers are available. One of the chassis has undergone quite extensive restoration work but after comparing it to the schematic, many of the "repairs" just don't make any sense. Therefore, I decided to start anew on the unrestored chassis and come back to the one that was worked on for needed parts.



**Paul Hart and Len Newman work on a Zenith 10S-549.**



**Student volunteer Jacie Thorpe repairs a Philco 49-901.**



**Touch screen created by Harry Klancer that will be used in our replica WW II living room.**

## INFOAGE HONORS "HIDDEN FIGURES" HEROES

*The following is based on a February 20th article in the Asbury Park Press by Susanne Cervenka...Ed*

On February 19, InfoAge formally dedicated the Dr. Walter McAfee African American History room. The event was highlighted by a special lecture and viewing of a documentary that highlighted the contributions of black scientists who served at Camp Evans and Fort Monmouth during WW II and the Korean War. The new exhibit room comes at a time when movie-goers are viewing the film "Hidden Figures" which highlights the role of black women mathematicians in calculating flight trajectories for some of the first NASA missions.

Mathematician and astrophysicist Walter S. McAfee completed the calculations that led to some of America's finest scientific accomplishments like space travel, satellite communications and missile guidance systems. But McAfee's skill had almost been missed. His resume - and required photograph that revealed he was black - had been rejected for numerous federal positions before he was hired at Camp Evans (presently InfoAge) and then known as the Evan's Signal Laboratory.

The Dr. Walter S. McAfee African American History Room was established to guarantee that the accomplishments of McAfee and a panel of black Camp Evans scientists, known as the "Black Brain Trust," are never forgotten. InfoAge COO Fred Carl described the scientists featured in the new exhibit as Monmouth County's "own 'Hidden Figures' heroes."