



The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

June 2011

Volume 17 Issue 6



Reported by
Marv Beeferman

The ON-LINE Broadcaster

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If you're wondering why you didn't receive the May *Broadcaster* (or perhaps you're not), there's a simple explanation; there wasn't anything to report. As usual, promises of articles did not materialize. A good example is this month's photo spread of the Kutztown swapmeet which was supposed to be supplemented by commentaries from at least two members; the information never showed up. Upon discussion with the Board, it was decided to remedy the same situation in the future by throwing a few pages together so at least something is delivered. As usual, future content is still dependent on a membership of close to 200 (yes, that's 200 radio collectors!)

At the May meeting, member Richard Hurff gave a well-received presentation on wood finishes and refinishing. Richard covered such topics as cabinet preparation, waxes, shellac, drying oils, lacquer, varnish and polyurethane. He used many examples from his personal experiences, some humorous, and demonstrated his techniques on a finished cabinet. A hand-out was also provided that included sources of refinishing materials and a "what went wrong?" section. For exam-



MEETING NOTICE

The next NJARC meeting will take place on Friday, June 10th, at 7:30 PM at Princeton's Bowen Hall (70 Prospect Ave.). Directions may be found at the club's website (<http://www.njarc.org>). Clean up some of those old (or new) radio relics and curiosities from your collection that have been gathering dust and show them the light of day at our "Show and Tell" scheduled for this month. Add a little story and perhaps a few laughs and your fellow NJARC members will greatly appreciate it. In addition, Darren Hoffman will be screening a short, 1951 film titled "Independent Radio Station" which profiles a day in the operation of New York's WMCA. It promises great shots of studios, transmitters, radios and other station equipment.

ple, after waxing, if the finish is still not glossy, you probably have too much wax and not enough elbow grease. You have to *burnish* the wax as a final step, not just rub it around.



Member Matt Reynolds has been working with NJARC webmaster Dave Sica to update the club's website. They have been evaluating various features and methods for a while, and will continue to do so. They have reached a point where their first efforts are now live; if you go to <http://www.njarc.org/>, you'll find a link to "preview the new Photo Gallery."



From the NJARC gallery: Jim (former NJARC president) and Ruth Whartenby's "radio trailer" at a past Kutztown meet.

This gallery is still in its infancy, but there are some pictures from various events, some pictures "from the vaults," and some videos. Matt and Dave will continue to add more to the gallery as well as improving its appearance and functionality. Feel free to browse and enjoy; no user account is needed.

Member Ray Chase has been working hard in preparing for our next major radio/electronics auction, tentatively scheduled for Saturday, September 10th at InfoAge. This is a week before Kutztown. Famed auctioneer Richard Estes has put the date on his calendar and is looking forward to attending with other members of his family. A food concession is also scheduled to provide breakfast and lunch. Ray has single-handedly tagged and cataloged almost 150 items, with still more showing up in the nooks and crannies ("happens when you leave things untended with the lights out").

Over the years, the NJARC tube inventory has grown to unmanageable size. In the early years, starting with *Tube Lore* author Ludwell Sibley and continuing under the able direction of Gary D'Amico, it was relatively easy to support our tube program from a central location. However, over time, available space has required that our inventory take residence at both InfoAge and at individual member attics, garages and assorted storage spaces. Thus, it has become extremely difficult to sort out exactly what we had to support the tube program and reduce the

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amount of our tubes to a reasonable and sensible amount for the future.

I am happy to report that an excellent solution is nearing completion - the "tube building" at InfoAge. With the generous support of InfoAge Director Fred Carl and the hard work of NJARC members and non-members, a small building for storing and sorting our tubes is in its final stages of work.

The building was originally a support facility for the Camp Evans tube laboratory. Over the years, following turnover of the site from the Army, the building fell into disrepair and would require quite a bit of work to bring it back up to standards. With the proper permits in hand and support from Ray Chase, NJARC members Al Klase, Harry Klancer and Bob Pilcher went to work.

Al and Harry removed the remaining junk from the building and stripped it of the pressboard inside walls, vines, wasp nests and mice nests. Harry noted that "the vines were so thick, I thought they were power wires." Harry went on to patch the roof, and install insulation, dry-



The tube building was originally a support facility for the Camp Evans tube laboratory.

wall, lights and receptacles. Bob Pilcher installed the electrical feed to the building. A non-member, Ron Beisiada, painted the inside.

With the paint dry, we'll soon be installing shelving donated by the Jim Troe estate and perhaps some small work tables. We'll also be calling on members to join in a few "tube parties" for moving our tube inventory into its new home and to participate in the sorting and testing process.



Inside the building. Non-member Ron Beisiada adds the finishing touches.

Upcoming Events

- June 10th: NJARC monthly meeting at Princeton
- June 11th: Repair Clinic at InfoAge
- July 8th: NJARC monthly meeting at Princeton (Topic: Basic vintage Hi Fi restoration.)
- July 23rd: Tailgate swapmeet at InfoAge
- August 12th: NJARC monthly meeting at Princeton (Radio "scavenger hunt;" information in July *Broadcaster*)
- Sept. 9th: NJARC monthly meeting at Princeton
- Sept. 10th: Major auction at InfoAge (tentative)
- Sept. 24th: Repair Clinic at InfoAge
- Oct. 14th: NJARC monthly meeting at Princeton
- Nov. 11th: NJARC monthly meeting at InfoAge (Member's Auction)
- Nov. 19th: Fall swapmeet at Parsippany
- Dec. 10th: Holiday Party at InfoAge

**RADIO
AS ART**

**By
Marv Beeferman**

I recently spent a very enjoyable day at Grounds For Sculpture in Hamilton, New Jersey. If you aren't familiar with this state treasure, I highly recommend a visit. At its core are more than 270 sculptures, some serious, some whimsical, by renowned and emerging contemporary artists. They are positioned (and sometimes "hidden") on 35 acres of landscaped parklands full of thousands of exotic trees and flowers, paved terraces, pergolas, courtyards, ponds and groves of bamboo. Many of the sculptures may be touched to enhance the viewer's experience. (Note: Some of the art works may be of a challenging, sensitive, and/or mature nature.)

On view in the Domestic Arts Building (May 1 through September 25) are the amazing sculptural works of artist and inventor Daniel Henderson, who describes his art as exploring "the viral allure of technology and its unintended consequences." His sculptural simulations try to memorialize the impact that art and technology have on humanity.



A typical example of Henderson's work is shown above. *The Brick* is an oversized version of the original Motorola DynaTAC 800X. Considered a technological marvel, it was the first easily rechargeable mobile telephone that

could be carried by the user and could connect with the telephone network without the assistance of a mobile operator. *The Brick* is meant to amplify the clunky nature of the original phone and invites the viewer to contemplate how our supposedly "miniature" portable devices will appear in the future. It also questions what affects the advent of increased mobility and the decline in face-to-face communication have had on our connections with one another.

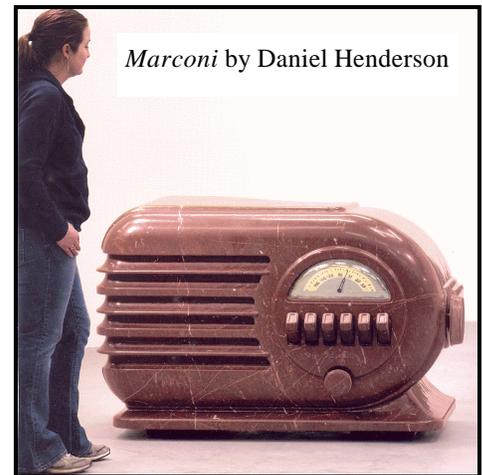
Apart from art, Daniel Henderson is a very interesting individual in his own right. He was an assistant to the late Japanese inventor Dr. Kazuo Hashimoto, who held more than one thousand patents, most of them related to telephone answering machines and caller ID. Following his mentor, Henderson now has twenty-six U.S. patents of his own, most notably in video and photo messaging for digital cell phones. He is also the president of several companies. He has lectured, developed academic courses, created a patent fund, and endowed a graduate fellowship at the New Jersey Institute of Technology.

Of course, for obvious reasons, I was immediately drawn to the sculpture titled *Marconi* that I also recognized as a replica of a radio in my personal collection. It is made from French Rouge du Roi marble, cast glass, bronze, brass, and silk-screened elements and weighs 5000 lbs. *Marconi* is an enlarged re-creation of a radio of the late 1940s, using an unusually rich and subtly streaked brown marble to represent the original Bakelite material. Henderson says:

"I wanted to sculpt the Marconi because it marries form and function lacking in so much of today's technology. I tried to capture that beauty in the many design details, such as the graceful scallops that wrap around the edges, the soft rounded corners, and the warm glow of the Bakelite."

The artist's allusion to the original glow of the radio's surface evokes the golden age of radio and asks us to consider how we are connected today. Observers might also find that the "air-resistant" details in the design of the radio suggest a sense of speed that is exaggerated by the repeated slat-like design elements and the row of piston-like toggle switches. These are sometimes referred to as Art Moderne machine motifs.

Marconi is a brown version of the

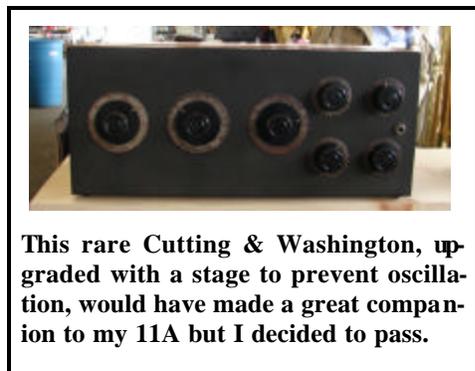


A Belmont model 6D120 "Marconi" from the author's collection.

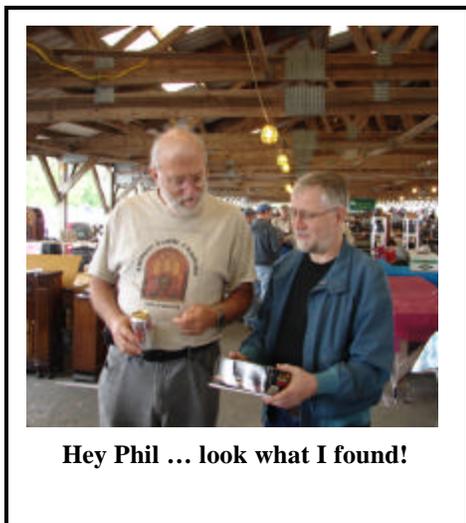
author's cream colored Belmont 6D120 that was made for Delco by Belmont. The sculpture itself is embossed with "DELCO" below its pushbuttons. Small radio makers would sometimes buy ready-made cabinets from molders to fit their electronics, so the same design might be found for different brands of radios. In these cases, decals were used for logos. However, since the Delco logo on the sculpture was embossed in the marble and "Belmont" was embossed on my radio, it may be assumed that the *Marconi* "model" used for the sculpture was manufactured directly for Delco under contract by Belmont.

References: Scheider Museum of Art, *The Art of Invention, Sculpture by Daniel A. Henderson*, 2010.

A DAY AT KUTZTOWN



This rare Cutting & Washington, upgraded with a stage to prevent oscillation, would have made a great companion to my 11A but I decided to pass.



Hey Phil ... look what I found!



Right up my alley ... old test equipment from the prestigious James W. Queen & Co. of Philadelphia.



A 1926 Neutrowound "Super Six." These were made in various colors with black being the most common. They are seen less and less at swapmeets.



With a \$1200 price tag for this SABA radio, no wonder the seller requests hands off!



This Zenith plays as nice as it looks and at a very reasonable price.



My traveling companions Phil Vourtsis and friend Dan discuss the insides of a 45 player modified for battery operation.



A nice jukebox up for raffle.



Glass radio ... some were manufactured, but many were homemade or came as kits. On this model, the wiring was not exposed.



Phil Vourtsis examines the console cabinets to be sacrificed to the radio gods later in the evening.



Darren Hoffman positions the first candidate.



Smoke gets in your eyes.



Dave Sica documents the night's festivities.

Some of your editor's buys: The RCA "Radio Battery Tester" to the right is not a piece of test equipment; it has a hook on its rear to hang next to a store's battery display. It has switch positions for 1.5, 4.5, 6, 7.5, 9, 45, 67.5, 75 and 90 volt ranges and reads out in percent of rated voltage and "REPLACE" "USEABLE" or "GOOD." It will look nice in our museum.



THE MYSTERIOUS RADIO ADVENTURE

By
Doug Leathem

The following article was recommended by NJARC member Doug Poray. He found it on the Jameco Electronics website. See if you can figure out the problem before it's revealed...Ed

As a young boy, I was always tinkering with electronic devices. One of my first prize possessions was a vacuum tube AM table radio. In the interest of obtaining maximum reception, I ran a long copper wire out of the window of my bedroom, connecting it to the antenna of the radio. My spirits soared when I was able to receive station WWL in New Orleans from my suburban Philadelphia location.

One night, I was listening to a "Lone Ranger" episode in the midst of a large thunderstorm. There was a nearby clap of thunder, and I thought I saw a brief flash of light from my radio. Nevertheless, the radio continued to play, and I thought nothing more of it. Half an hour later, the storm had subsided and I turned the radio's dial to another station to listen to "The Shadow," as I recall. To my amazement, no amount of knob turning would change the station.

I was solidly locked on one frequency! My curiosity mounted as I rotated the volume control to turn the radio off. Imagine my consternation when the radio continued to play, even after I had turned it off. I began to wonder if some ghostly spirit had taken full control of my radio.

What happened to Doug's radio?

With some degree of apprehension, I pulled the plug from the wall outlet. The radio finally stopped playing! Now it was time to determine just what the cause of this bizarre behavior could be.

Peering inside the back of the radio, I discovered the problem. The radio had a traditional air tuning condenser consisting of large, interleaved metal plates. My homemade antenna had been touching this tuner. When lightning struck nearby, an electrical charge traveled down the antenna and into my radio, firmly welding

the two sets of metal plates together. Thus, my tuning mechanism continued to work but was mechanically frozen in one position. At the same time, the welded antenna wire bypassed the power switch on the volume control. A simple flick of the small weld with my finger and my radio returned to completely normal operation.

Now, whenever I read about Ben Franklin's lightning experiments, I think about my own very risky behavior!

ELECTRON TUBE "ANALYZERS"

By
Marv Beeferman

There are a few tube testers at a level of sophistication, sometimes called laboratory type, that might be more appropriately named "tube analyzers." However, for day-to-day work, a tube tester by any major manufacturer, whether emission or mutual conductance type, in good condition and well cared-for, will probably serve most purposes. According to Alan Douglas (*Tube Testers and Classic Electronic Test Gear*):

"Emission testers are simpler, more common, cheaper and good enough for most purposes, since tubes generally fail from lack of cathode emission. Not all tubes with good emission will amplify, however, so the preferable test is for mutual conductance, Gm. (If you need to match output tubes, an emission tester won't be of any use.)"

On my bench, a military TV-7D/U and a Hickok model 752 get the most use. I particularly like the "reserve life test" of the Hickok which reduces the filament voltage applied to the tube under test to determine cathode efficiency and help "forecast" the future life of the tube.

However, there are times when one might want to consider more than the standard test functions of mutual conductance/emission, leakage (shorts) and gas. You might also want the capability to test tubes by connecting directly to their pins where appropriate sockets or setup instructions are not provided. If you are truly technically minded and care to do some of your own research, you also might want a device that provides curve

tracing capabilities or provides operating voltages of a circuit of specific design to determine the performance of a tube.

On the practical side, if you are blessed with an abundance of scarcer and more valuable tubes that are sold to others, the more test data that is provided will make you a more reliable (and perhaps more popular) seller. If you are an audiophile, a device with more expanded functions makes tube matching easier and more reliable. Or, if you are like me, out of "electronic curiosity," you might just want to experiment with the interesting functions that different pieces of test equipment offer or compare the capabilities of various tubes.

My first experience with a "tube analyzer" came some years ago when I purchased an RCA WT-100A "electron tube micromhometer." Originally offered in mid-1950, it was intended to supplant the Weston 686 which had been an industry standard for twenty years. The designer and manufacturer was Electronic Test Equipment Mfg. Co. in Lancaster PA, not RCA itself. The original version sold for \$785; I own a later version with a schematic dated May, 1961.



The WT-100A is supplied with four, interchangeable multiple-socket plug-in units than can accommodate up to 14 base-pin connections.

The WT-100A is designed to measure tube characteristics under operating voltage and current conditions with an accuracy approaching that of the tube manufacturer's equipment. This model was reportedly used, at times, on the production line at RCA in Harrison, New Jersey.

The instrument can be used to measure true transconductance, both control-grid-to-plate and suppressor-grid-to-plate, up to 100,000 micromhos. It can also measure electrode currents - plate, screen grid, suppressor grid and control grid; ac heater current; and the voltage drop of vacuum and gas tubes, disc rectifiers and crystal diodes. A shorts test is also provided for up to 14 pins with a neon indication of leakage resistance up to two megohms.

The WT-100A may also be used to measure screen-to-plate transconductance (an added test to help select balanced tubes, such as those used in balanced amplifiers), contact (retarding) potential, interelectrode leakage currents, and currents due to primary grid emission, gas and leakage (reverse grid current). Plate resistance and amplification factor of triodes may also be calculated from measurements made with the WT-100A.

Test voltages are set to the desired values by means of individual controls for the filament or heater voltage, plate voltage, screen-grid voltage, suppressor-grid voltage, and the control-grid supply voltage. Cathode and control-grid resistors can also be adjusted to desired values. This range of control voltages, which are read on the instrument's meter for accuracy, provides a means of measuring tube characteristics so that a direct comparison with tube manufacturers published data is possible.

Electronically, the WT-110A offers an regulated power supply and overload-proof electronic metering. The power supply has an effective impedance of less than 0.1 ohm at the test frequency which results in negligible errors due to power supply impedance regardless of the plate resistance of the tube under test. The ac filament or heater voltage is variable from 0 to 117 volts and can be adjusted precisely with a fine adjust knob; a dc filament voltage from 0 to 3 volts up to 250 mA is also provided.

The transconductance measuring circuit utilizes a high-frequency oscillator operating at 45 kHz and a transconductance amplifier. Amplifier specifications are such to eliminate the effects of power-

supply ripple and to accurately measure transconductance regardless of plate resistance. A calibrate control is available to calibrate the transconductance measuring circuit before use.

Alan Douglas says that the WT-100A does have its quirks:

"Switching between calibration, Gm ranges, and plate current is tedious; a second meter for simultaneous current measurement would have been valuable. The element voltages do stay constant, so only need to be checked once. The neon-lamp shorts and leakage test is rather primitive. The plate regulator tube is severely overloaded (three times rated plate dissipation) under some conditions."

After believing that I owned the most versatile tube tester manufactured, at least in regard to its capabilities, I was recently introduced to what was described as the "king" of all testers. The CA-1630 Electron Tube Analyzer was made for the Civil Aeronautics Administration by Daystrom in 1957 and sold for \$896. Only 360 were made and I am now the proud owner of serial number 322.



The CA-1630 will perform all of the functions of RCA's WT-100A so I won't repeat them here. Except for the use of tube socket adapters to accommodate various tube bases (on the CA-1630, three adapters are stored in the unit's lid), similarities end. However, only nine pins of the adapter's tube socket may be selected as opposed to 14 for the WT-100A.

The unit has three meters as compared with single meter for the WT-100A. One is used to measure the ac line voltage and the heater/filament voltage applied to the tube under test. A second, electronically protected by its voltage-amplifier

circuit, is used for measuring applied electrode voltages and transconductance. A third d-c current meter, which is also electronically protected by its current-amplifier circuit, is used for measuring electrode currents and interelectrode leakage. A "meter check circuit" is provided to accurately adjust the meter zero points and check meter accuracy at full-scale readings.

The CA-1630 employs two meters connected so that emission current and plate voltage are measure simultaneously while the plate voltage is being adjusted to the desired value. This is not only time-saving, but also enables the momentary use of higher emission currents without damaging the tube.

In addition to standard tube tests, the analyzer provides a means for performing a number of more complex tests for analyzing, designing tube circuits and curve tracing. Twenty-four jacks located on top of the unit can be used to extend the capabilities of the analyzer by connecting external power supplies, pulse generators, meters and other test equipment.

Test features of the CA-1630 not found in the WT-100A include the following:

1. The leakage current between each electrode and all other electrodes of a tube under test can be read directly on a meter to levels below 10 microamperes.
2. The unit's master control switch has a "preadjust" position which sets up conditions for pre-adjusting the voltage applied to the plate of screen-grid tubes before any voltage is applied to the screen grid. This is necessary since the application of screen-grid voltage before plate voltage may cause damage to the tube.
3. A cut-off and gas test circuit is provided for a rapid check for excessive negative control grid current and to determine the control-grid bias voltage at which plate current is reduced to the cut-off value of the tube under test.
4. It is not feasible to actually measure the degree of vacuum in tubes. There are, however, several methods of comparing the degree of vacuum in individual tubes of the same type. The CA-1630 analyzer uses the grid-current method for this purpose because it is the only method that enables a direct comparison to be made of

CONNECTIONS

Free exposure for buyers and sellers! Unless requested otherwise, each ad will run for two months in both the *Jersey Broadcaster* and the *Delaware Valley Oscillator*. All buying and selling transactions are the responsibility of the parties involved. **Send your ad to mbeeferman@verizon.net**

Are you aware that NJARC now has a resistor program which includes many commonly needed replacements? Contact Walt Heskes at any club meeting for details.

gas density at normal operating voltages and temperatures. The test is performed with circuits of the CA-1630 used to measure control-grid current.

5. The transconductance measurement circuit can be calibrated from the unit's front panel before measurements are made. (Transconductance is measured using a 10.5 kHz signal as compared with the WT-110A's 45 kHz.)

6. A heater activity test for emission properties is available similar to the Hickok "reserve life test." In performing this test, heater voltage is reduced by 10%. Then, transconductance is measured and compared with that obtained with full heater voltage.

7. The unit offers a unique, visual noise

Check out NJARC's capacitor program for those most commonly needed replacements. Contact John Tyminski at any club meeting or call him at home (609)-947-9071 to find out what's available. All proceeds go to the club.

FOR SALE/TRADE

For Trade: Heathkit GR-81 tube regen receiver, serial # 550 7704. Physically in fair shape with some dents and scratches; all tubes light up. Receives broadcast and shortwave bands (did not check all SW bands). Looking for a 5V CT filament transformer @ 10 amps min. or a xfmr with a 5V CT, 10 amp min. winding with HV. Need for a project involving 15E triodes. Papson_e@comcast.net

WANTED

RCA 45 RPM record changers. I will buy all amplified models in good, original condition. John Tyminski, 609-947-9071, tubeularElectronics@gmail.com

test. No signal voltage is applied to the tube under test. The tube is then gently tapped by use of a soft rubber mallet or pencil with a large eraser. If the tube has loose electrodes (microphonic noises) or intermittent shorts, the gentle tapping will produce an a-c component in the output of the tube which appears on the unit's d-c meter as a small, momentary deflection. If the electrodes of the tube vibrate excessively, a similar tap will cause a momentary off-scale meter deflection.

8. The CA-1630 is designed to enable the detection of very slow rates of increase in gas current. This arrangement enables the detection of gassy tubes at comparatively low electrode voltages and

currents without extending the time or increasing the complexity of the procedure normally required for testing tubes.

For all but a very few tube types, the CA-1630 appears that it will provide all the tests required to determine whether the characteristics of a tube are within the limits established by manufacturer's and industry standards. My unit is extremely clean but will not be energized until all electrolytics are checked so as not to endanger the power supplies and test circuits. With this accomplished, I'm looking forward to put this "tube analyzer" through its paces.

NJARC AT THE NJ HISTORY FAIR

By Rob Flory

Al Klase and I represented InfoAge/MRCA/NJARC at the NJ History Fair on May 7th. We ran 2-way contacts on EE-8 field telephones, TBX to DAV, DAV to BC-611 on 3.885Mc and PRC-77 to PRC-77 on 51Mc. Al also ran a PRC-104 on 55Mc on the Moose and Squirrel net at noon.

A good crowd of up to 1000 people

showed up with "force protection" provided by young private Flory with his M-16. He also showed quite a few kids how to operate the EE-8 field telephones.

