

The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

October 2012

Volume 18 Issue 10



Reported by
Marv Beeferman

The ON-LINE Broadcaster

The New Jersey Broadcaster is now on-line. To date, nearly 120 of your fellow NJARC members have subscribed, saving the club and your editor a significant amount of money and work. Interested? Send your e-mail address to mbeeferman@verizon.net. Be sure to include your full name.

The September meeting's show & tell brought some very nice artifacts to light, especially a unique, bright red Russian radio shown by new member Dan Schwartzman. It can be fully appreciated if you're receiving the *Broadcaster* on-line where it can be viewed in living color.

I saw the usual NJARC suspects at Kutztown on Friday and included a few representative shots in this month's newsletter. I didn't find much in the early battery category and, based on my discussions with a few of the vendors and what they sold, it appears that "Thursday creep" is slowly setting in for the best choices. We'll probably get some other comments at the Friday meeting, including the auction results. As usual, member Bob Bennett offers a 6-minute video of the event that can be found on both our club website and on YouTube at "Radiowild."

Although some of our usual "experts" were attending the Maker Faire on the 29th, our repair clinic at InfoAge turned out to be an enjoyable event with some nice radios showing up from non-members. We'll have a full report and photos in next month's *Broadcaster* that includes Sal Brisindi's story of a little old lady's Emerson that was only played on Sundays.



MEETING NOTICE

The next NJARC meeting will take place on Friday, October 12th 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>). This month we'll hear from Mr. Henry Morse whose interest in radio will fill us in on "the rest of the story" of Orson Welles' famous Halloween broadcast of the adaptation of H. G. Wells' 1898 novel "The War of the Worlds."

As president Richard Lee noted at the September meeting, "reality dictates" that club dues be raised from \$20 to \$25. We have held the \$20 line for quite a number of years. The increase will be voted on at the upcoming October meeting where, by our Constitution, a 20% quorum is required.

The "Base of Terror" returns to InfoAge this Halloween under more capable hands and our club is again sponsoring the "Mad Scientist Laboratory." This has gotten to be one of the more popular "exhibits" and your help in participating would be greatly appreciated. Contact Ray Chase at 908-757-9741 or raydio862@verizon.net. If you're planning to attend, the zombies and ghouls are on the move on October 6, 12, 13, 19, 20, 26 & 27 from 7PM to 11PM. Cost is \$12.50 per person which supports the renovation of buildings and the expansion of InfoAge displays and museums.

Tony Flanagan Award

As part of the club's 20th anniversary celebration, we will again be accepting nominations for the Tony Flanagan Memorial Award. Tony Flanagan was the club's founder and first president and the award was established to honor his contributions. The award is presented for supporting the following:

- The promotion of the antique radio hobby.
- The preservation of radio and electronic communication history and the history of their associated disciplines through artifacts and documentation.

- The promotion of the public awareness of radio development and history through books, articles and exhibitions.

It is important to note that the primary emphasis of the nomination should be based on the above considerations and not necessarily an individual "who has done the most for the club." Previous winners have been John Dilks (1999), Ludwell Sibley (2001) and Ray Chase (2009). Your nomination does not have to be very extensive or "flowery," but it should at least summarize the relationship between the nominee's credentials and the spirit of the award. To get an idea of what we are looking for, Ludwell Sibley's certificate of presentation will be published on the Reflector and the club web site.

For presentation purposes, your nomination may be edited. The final selection will be made by a vote of the NJARC board. Please send your nominations to Marv Beeferman at mbeeferman@verizon.net no later than November 12th.

Upcoming Events:

- 10/21: MAARC Radio Fall-Fest, Davidsonville, Md
- 11/3: Tube Party at InfoAge
- 11/9: Monthly meeting at InfoAge; Joseph Taylor's (Nobel prize winner) "Moon Bounce" experiences
- 11/17: NJARC Swapmeet at PAL, Parsippany
- 12/8: Holiday Party at InfoAge; NJARC 20th anniversary celebration

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 \$20 per year and meetings are held the second Friday of each month. The Editor or NJARC is not liable for any other use of the contents of this publication.

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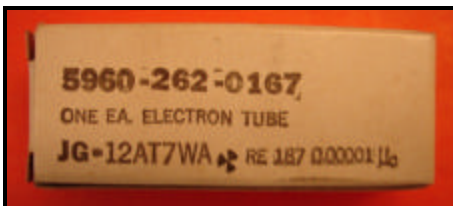
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DANGEROUS TUBES? (PART II)

By
Marv Beeferman

Last month, we discussed mercury-vapor tubes and the potential dangers they might present if the glass envelope is compromised. We also talked about the various radioactive sources found in a wide variety of tubes and some estimated doses based on NUREG-1717. Also discussed was the question of health problems, if any, posed by tubes with thoriated filaments.

From my own tube inventory, I own a military JG-12AT7WA duotriode where the box indicates that the tube contains 0.0001 μ Ci of RE (Rhenium)-187. Rhenium is one of the rarest elements in the Earth's crust; in 2008, it was priced at over \$10,000 per kg. Naturally occurring rhenium is 37.4% of the stable isotope Re-185 and 62.6% of the unstable, radioactive isotope Re-187 (a beta emitter).



Rhenium improves the properties of tungsten, although I was unable to find information regarding the specific purpose for its use in the 12AT7WA. Generally, tungsten-rhenium alloys are more ductile at low temperature, allowing them to be less brittle than tungsten alone and more easily machined. The resulting increased resistance of the alloy allows for thicker (and thus mechanically stronger) filaments. High temperature stability is also improved along with stability against prolonged electron impact. Rhenium also prevents the reaction of tungsten with moisture and does not suffer from a mechanism called "sputtering" (loss of material resulting from the bombardment by positive ions).

I presently have no information on the effects of exposure to Re-187 and it ap-

pears that it was only used in the military version of the 12AT7. With Rhenium being a beta emitter and its low concentration of 0.0001 μ Ci, it probably presents a very low risk. However, with a half-life (the time required for half the nuclei in a sample of a specific isotopic species to undergo radioactive decay) of 4.4×10^{10} years, ingestion might result in some chronic problems if it stayed in the body for a long enough period of time.

While we're on the subject of half-life, Ludwell Sibley, author of *Tube Lore*, noted the following in reviewing this article: "Many of these cases are of only modest concern. A TR tube that held a couple of microcuries of Co-60 (half-life of 5.3 years) 40 years ago has now lost 99.7% of its dosage. By contrast, there are a fair number of 1B24A TR tubes left over from wartime. This type is quite easy to break, potentially releasing some 'eternal' radium (half-life of 1600 years). It is no way clear why Pm-147 (found in a BTR-692 TR tube and with a half-life of only 2.6 years), with its here-today-gone tomorrow half-life, was used."

Ludwell also notes that tube manufacturers became much more radiation-conscious in the early '60s. He says that he was once tasked with putting half a dozen new RCA 6166 thoriated-filament power tubes into storage. The cartons carried a warning against placing tubes within six inches of each other. Ludwell notes that it "gave an eerie feeling, as if stacking them closely would lead to a blue glow and evacuating the building!"

Interestingly enough, I came across some similar information in NAVSHIPS 900, 171. The directive states that tests of 2800 radioactive tubes packed in individual cartons, with 100 packed in turn in corrugated cartons, indicated intensities which would not be dangerous according to AEC (the Atomic Energy Commission, precursor to the NRC) tolerance levels, even if personnel were in bodily contact with it for eight hours. (Note: Standards are much more restrictive today.) However, if 100 such tubes were piled together without cartons, it would present danger to personnel. NAVSHIPS notes that although most activities will not be required to stow such large numbers of these tubes, it is important that they still be stored in their individual cartons.

From all that I have read, it appears that radioactive tubes, as such, pose no

health threat to the user or collector. However, there is one aspect that I have not touched upon. Radioactive material can be a health threat if it is ingested and stays in the body for a long time. In its gaseous form, it is usually expelled from the lungs in a short period of time. I'm not saying that people are prone to having a tube or two for breakfast, but it is very important that breakage be dealt with immediately and that the residue is not allowed to enter the body via cuts or by breathing in particulate matter.

If you happen to break a radioactive tube, it is suggest that you pick up any large pieces with forceps or tweezers; use protective gloves. Try not to use a vacuum cleaner unless you want it to get contaminated and possibly fill the room with unwanted exhaust. Then, use a wet cloth to wipe across the area as follows: Make one swipe at a time, folding the cloth in half after each swipe and keeping the clean half out at all times. Do not eat, drink or smoke in the contaminated area. If you are cut by broken glass, remove glass fragments, if any, and allow or induce free bleeding to cleanse the wound. Then, wash with soap and large amounts of water.

Disposal of debris is up to you. Landfills are probably loaded with this stuff and a little more probably won't hurt. If you really want to get fancy, you might want to sink it at sea the next time you go fishing.

When I came across a CRC-2X2A with the radioactive trefoil marked on both its box and base, I thought I had another example for this article. However, I could find no reference indicating that the tube contained a radioactive isotope. However, what I did find was quite interesting.



Note the radiation trefoil.

The 2X2A was a HV rectifier used in CRT and radar power supplies. It operated at a PIV of 12.5KV at 7.5 mA. Most importantly, it has a bit of a reputation of generating significant X-radiation when operated at high voltages...thus the radiation warning imprinted on the tube. X-radiation, composed of X-rays, is a form of electromagnetic radiation. A search on the web found that experimenting with X-rays has quite a following by some individuals and the 2X2A is a favorite. One "experimenter" even took some X-ray pictures of a preserved frog. Here's a little of the chatter:

"Have you ever wanted an X-ray machine of your own, but don't have the \$10,000+ to buy a commercial machine? This page will show you how to build your own machine for less than \$200!"

"At only 20-30 kV and a few hundred μ A in cold-cathode mode, the X-ray radiation pours out, making the end-window Geiger counter scream from more than a meter away."

Claims of the X-radiation produced by an operating 2X2A seem to vary from experimenter to experimenter. One individual (<http://www.dangerouslaboratories.org/xray1.html>) warns "Never energize a tube with high voltage without 1/4" lead shielding. If you are anywhere close to the tube when it is energized, you run the risk of getting severe radiation burns!" However, another experimenter (<http://www.vk2zay.net/article/222>) who estimated a dose of 200μ Sv, noted "In more useful terms, that is about a week's worth of background radiation around here – not a significant risk compared to a dental Orthopantomogram I had earlier this year."

Whatever the case, tubes like the 2X2A pose no health threat either intact or broken. I doubt that you'll find them in any equipment most collectors would be interested in...but one never knows. If by chance, you get to work with high voltage circuits that utilize such tubes (and that includes any high voltage circuits), I suggest that you become somewhat knowledgeable of the possible dangers that might exist from long-term exposure. X-rays can be produced whenever there is high voltage present, especially if vacuum tubes are involved. X-rays can be produced (although at low

energy) by simply placing an 01A or 866A on top of a tesla coil. If you ever get the opportunity to work with such "toys," it might be a good idea to invest in a surplus Geiger-Mueller counter to determine actual radiation levels and safe distances.

Finally, we'll talk about tubes utilizing uranium glass, i.e. a glass mix that has had uranium dioxide added before melting. It was once made into tableware and household items because of its yellow to green color. The most typical color, pale yellowish-green, led to the nickname "Vaseline glass" in the 1920s based on a resemblance to the appearance of the petroleum jelly sold at that time.

Uranium glass saw significant use in metal-to-glass seals for tubes of all kinds. Its coefficient of expansion more closely matched metal electrodes than the regular soda glass of the tube package. Uranium glass fluoresces bright green under ultraviolet (black) light and this is one way of identifying a tube that utilizes it. In some cases, however, the yellow-green color is visible without exposing the tube to UV light.



Tubes utilizing uranium glass can register above background radiation on a sufficiently sensitive Geiger counter, although most examples are considered to be harmless and negligibly radioactive. In a 2003 study by the UK's National Radiological Protection Board, it was confirmed that radiation levels of uranium glass products from many manufacturers and time periods were low and quite safe with normal use. This included large pieces such as decorative bowls and trays as compared to the small amount used just as

seals in vacuum tubes. However, the grinding or abrasive polishing of uranium glass cannot be classified as "normal use" as the dust and residue can be toxic if inhaled or ingested.

Some typical examples of tubes manufactured using uranium glass include the VT-127A, 4D21, 4-65A, 100TH, 35T, 3C24, VT-218, and 15E and may be viewed at the website <http://uranglass.gooside.com/vacuumtube/vacumetubeEng.htm>. They were Eitel-McCullough products of the mid-'30s to mid-'40s but there were lots more, with Eimac being the most active user of uranium glass. Ludwell says that his Eimac display cabinet is spectacular in the dark with a UV flashlight.

In closing, one might want to consider legal limitations of possessing or selling radioactive or mercury-containing tubes. Ludwell Sibley has brought to my attention a lawsuit that has been circulating on the web recently. It is against 21 defendants asking for \$75,000 from each over the issue of mercury poisoning. The defendants range from one-person NOS tube vendors, Ebay, Richardson Electronics, Antique Radio (tubesandmore) and Cascade Surplus to large corporate manufac-

turers like Technicolor, RCA and GE. The plaintiff alleges that he has gotten mercury poisoning from the use of vacuum tubes. You can follow the status of the lawsuit on the web.

So what are the limitations on selling potentially dangerous tubes? With regard to mercury, although you may be open to the possibility of litigation as noted above, there are only a limited number of laws preventing its sale by an individual, but none specific to tubes. However, regulations associated with mercury use in commerce impose costs, conditions, and/or restrictions associated with obtaining, selling, using, or transporting mercury. Also remember that mercury is a hazardous substance and subject to packaging, shipping and transportation rules for hazardous materials.

Currently, only Minnesota has a use-restriction law providing that mercury sold in the state will be used for medical, dental, instructional, research, or manufacturing purposes. Sellers must provide buyers with a material safety data sheet and have the buyer sign a statement of proper use and disposal. In addition, approximately 12 states have restricted the sale of mercury-added products such as antique barometers.

In regard to radioactive tubes, the guidelines are much clearer. According to NUREG-1717, Section 30.15, individuals may receive, possess, use, transfer, own or acquire radioactive electron tubes as long as they contain no greater than the following quantities of specified isotopes:

- 1) 150 millicuries of tritium per microwave receiver protector tube or 10 millicuries of tritium per any other electron tube.
- 2) 1 microcurie of cobalt-60
- 3) 5 microcuries of nickel-63
- 4) 30 microcuries of krypton-85
- 5) 5 microcuries of cesium-137
- 6) 30 microcuries of promethium-147

In addition, levels of radiation from each tube cannot exceed 1 millirad per hour at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber. "Electron tubes" include spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pickup tubes, radiation detection tubes, and any other completely sealed tube that is designed to conduct or control electrical current.

SHOW & TELL



Robert Forte showed a group of "hand-crafted" crystal sets sold by the Bisbee Wireless Apparatus Co. of Bisbee Arizona. The use of vintage parts and stained wood cabinet and base gives these radios a true "old time" look.



Just south of Marsha and Jerry Simkins' home in Barnegat is Mystic Island, home to the famous Tuckerton wireless station. It was built by the Germans in 1912, taken over by the Navy in 1914 and eventually sold to RCA. Marsha described an original 1917 napkin from Thanksgiving dinner at the Tuckerton Naval Station offering such favorites as oyster soup and oyster dressing.



For many years, the NJARC was invited to support a recreation of the Orson Welles' 1938 War of the Worlds radio broadcast at the David Sarnoff Library. Darren Hoffman recorded actual record transcriptions of the event, helped with sound effects and contributed vintage props. Darren showed us a typical microphone of the era fitted with a replica "CBS" logo used at one of the performances.



Marv Beeferman showed some typical radioactive and uranium glass tubes, the basis of this month's *Broadcaster* article.



Richard Lee discusses the status of his rare and award-winning E.H. Scott Special.



Walt Heskes talked about his 1948 Globe Model 454 "camera" AC/DC radio. For DC, it operates off 67.5V and 3V batteries.



A beautiful Russian radio of 1954 vintage described by Dan Schwartzman.



Ray Chase talked about the limitations of 3tube radios. His Hallicrafters S-119 Sky Buddy did not perform (or sell) as well as its 5-T and S-19 brothers. His Air Queen model 50 lacked both selectivity and sensitivity.



Al Klase discussed various examples of radiation monitors. Included was a Victoreen CDV-700, a Tracelab SULH survey meter and a Sears Tower 6157 Geiger counter.

Truth in Advertising

I found the similarities between these two tube boxes quite striking, both in color and wording. The tube in the United box was stamped in blue with "UNITED NATIONAL, PATERSON N.J." and "12AU7." The stamping covered the other designation for the 12AU7 in white, "5814." A web search found no information for United National but it might be worth some research to discover the particulars for this GE wannabe. (M. Beeferman)



Goin' to the Movies
by Bob Schenck, N2OO
(Courtesy of John Dilks, printed with permission.)

Have you ever gotten an email that you thought might be a spoof? Well, on August 5th, I got this one.

Bob,
I'm working with a property manager for a new movie with Harrison Ford, where he is a ham. Initially they wanted vintage radios, now this morning I hear they also want a new high end radio. Sorry to say I don't have these. Do you have something new and high end that would look good in a movie? They will need it for a couple of days mid month. They are shooting near Philadelphia.

Now, I checked to be sure this wasn't coming from a SPAM house in Nigeria. Nope. Not even close. It was from John K2TQN! This is real?!

What followed was a surreal experience for myself, John, and John's son Jeff. I will give an overview of what happened. But John is expected to write a full story for QST at a later date. And I also plan to write a similar story from my own point of view for another magazine. But we don't want to step on any toes right now. We agreed not to photograph any of the actors, and of course none of the actual "scenes". We did not. And we are holding off on publishing anything specific until we can work things out with the movie people. But they did allow us to photograph other things, so I thought I would share some with you here.

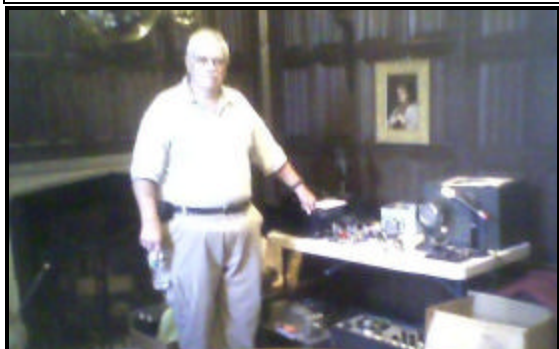
We did get to meet Harrison Ford. He was very genuine with us. More on the short discussion we had with him another time. We also got to see Liam Hemsworth and Gary Oldman as well as the director Robert Luketic. The movie is titled "PARANOIA". It will be released in September, 2013. Yes, we all have to wait another year. We did get to watch the scene with amateur radio highlighted. It comprised about 5 hours of takes, all for a scene about 4 minutes in length. By the end, I probably could have recited the entire script. Anyway, it was a VERY surreal experience. One that deserves a longer article than this one. Standby.



K2TQN in the director's chair!



FTDX5000 provided by Yaesu.

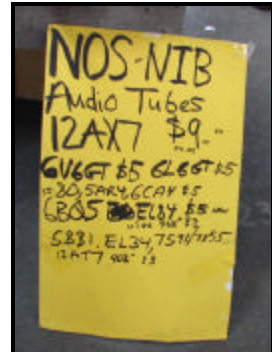


N2OO at our radio storage table inside the mansion.



The mansion set where the scene took place.

A DAY AT KUTZTOWN

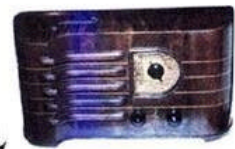




New Jersey Antique Radio Club's **Fall Swap Meet**



Parsippany PAL Building
Smith Field
Route 46 & 33 Baldwin Road
Parsippany, New Jersey 07054



Saturday November 17th 2012

**Walk around auction
starts at 11:30 am.
Bring in your attic
treasures for free
appraisal!**



**Expert Antique Radio
Repair Available.
Refreshments Available.
Easy ground level access.**

Open to the Public

8 AM to 12 noon

Vendor setup at 7:15 AM

\$5.00 ENTRANCE FEE

CLUB DONATION

**(70) 8 ft. Tables
\$20.00 for members
\$25.00 for non-members**

Reserved Additional Tables \$15.00

At the Door \$20.00

FOR DIRECTIONS

VISIT OUR WEBSITE: WWW.NJARC.ORG

OR MAPQUEST.

(33 Baldwin Rd., Parsippany, NJ 07054)

Vendors Make Your Reservations Now!

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