

The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

December 2003

Volume 9 Issue 12



MEETING/ ACTIVITY NOTES

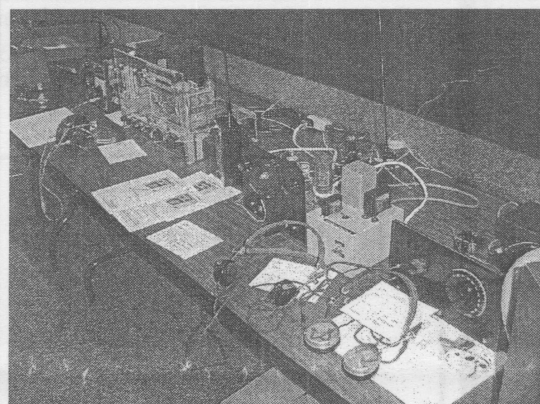
Reported by Marv Beeferman

According to NJARC treasurer Sal Brisindi, I missed a "terrific" meeting last month which included the judging of our annual home-brew contest and a well-received mini-auction. Perhaps I'll have to plan my Florida vacations a little more carefully next year. No doubt, my "Toilet Talker" 1-tube radio would have taken a prize had I been at the meeting to talk it up and "smooze" the judges a little. A photo essay of the 12 contest entries are included in this month's *Broadcaster* with winners happily receiving their \$25 gift certificates to Antique Electronic Supply. It would have been nice if my "reporters" had also recorded a few details about each entry, but I guess the excitement of the contest allowed only photo credits, which were gratefully received from Al Klase and Sal Brisindi. If you are interested in more substantial information, I can easily put you in touch with the builders.

Membership secretary Marsha Simkin reports nearly 90 reservations for our upcoming holiday party on Saturday, December 13th. Our host, Sarnoff Library Director Alex Magoun, has graciously offered use of the library for the 5:00-6:00 PM social hour (snacks and soda) preceding the buffet in the auditorium. A final reminder...unlike previous years, there will be no radio scavenger hunt and you don't need to bring a dessert. However, to participate in the Mystery Grab Bag, you'll need a wrapped, radio-related gift (new or used/\$15-\$20 value). Here's how it works...

Each participant's name will be placed in a hat. Two gifts will be chosen at random and marked "Do Not Open." The first per-

son whose name is drawn will select an unopened gift, unwrap it and show it to all players. A second person's name is then drawn and a gift is selected but it is not opened! This person has a choice to either exchange it unseen with the first player's



Some of the entries in our home-brew contest.

item or keep it. If the item is kept, it is then unwrapped and displayed to the rest of the players. If the item is exchanged, the first player unwraps his new gift.

Play progresses with each new player having the opportunity to "steal" any unwrapped item in the "pot" in exchange for a wrapped item that was chosen. To add a little spice to the game, the two gifts marked "Do Not Open" may be chosen or stolen, but cannot be unwrapped until the game is over (all names have been se-

lected). This is the one time of the year where a member's standard good nature can be abandoned for an hour and exchanged for spite, malice, ill-will, malignity, retaliation, revenge and reprisal.

David Sarnoff Library executive director Alex Magoun reports that the library is now selling "David Sarnoff Center: From RCA Labs to Sarnoff Corporation," a 128-page photohistory that he compiled and captioned for Arcadia Publishing's Images of America series. This book covers research and development over 60 years at the Princeton/West Windsor facility and features over 200 photographs in 5 chapters. To tempt your interest, here's the back cover write-up:

"Color television, transistors, lasers, digital memory, computers, liquid-crystal displays, medical electronics, and digital video - these technologies define modern civilization.

David Sarnoff Research Center: RCA Labs to Sarnoff Corporation tells the story of their invention or innovation at the research facility in Princeton, New Jersey. Its engineers, physicists, chemists, technicians, and shop workers developed radar, sonar, and TV-guided missiles during World War II. In 1951, RCA renamed the labs for its visionary leader, David Sarnoff, and the center continued its groundbreaking work for RCA's product divisions and patent licensing department. General

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 \$15 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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Electric Company bought RCA in 1986 and donated the David Sarnoff Research Center to SRI International, a nonprofit research institute. Ten years later, the center became Sarnoff Corporation, which provides innovative client solutions, licenses patents, starts companies and sells products.

David Sarnoff Research Center: RCA Labs to Sarnoff Corporation celebrates the fascinating process of research and development with stunning photos selected from thirty thousand stills in RCA's collections now deposited at the David Sarnoff Library. Masterfully framed and lighted, these rare images reflect American confidence in the promise of science and engineering at its twentieth-century peak, and illustrate a sometimes unusual world within a social life of awards, gardens, picnics, and sports teams."

The book is on sale from Arcadia's website for \$19.99 (plus \$5 shipping and handling), or from the Library for \$19.99 (plus \$4 shipping and handling). Please send a check made out to the David Sarnoff Collection, Inc. or pay through Paypal.com (adding \$0.88 to cover Paypal's fee and use amagoun@davidsarnoff.org as the email address). Hopefully, we can convince Alex to bring copies for sale at future meetings.

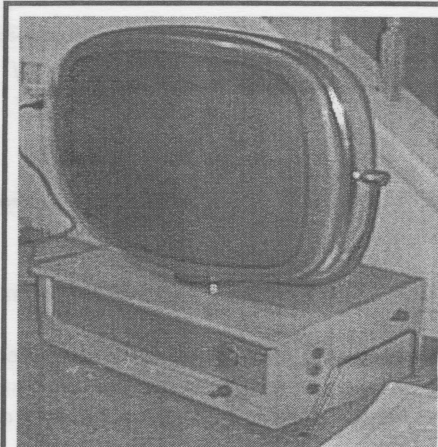
A Predictable Predicta

By Scott Marshall

"That's the set TV repair people hate more than any other set," said NJARC member Dave Sica, "and it always has been."

The Philco Predicta has the most widely admired vintage television designs on the outside, but its electronics have been considered, from the time it first came off the assembly line, among the worst. Realizing this after accepting one to fix from NJARC member John Garri-son had me sweating bullets. It turned out

the problems encountered were familiar to other Predicta servicers. After noting the symptoms and making some painful studies of the chassis, I pulled over to asked for directions.



The patient arrives.

Symptoms

The owner's complaint was that the picture would not sync, neither vertically or horizontally. The set showed a dim raster only an inch tall. Sound was fine, video appeared to be present, but there was no sign of any synchronization.

Diagnosis

Lacking a power transformer in the set or an isolation transformer on the bench meant it was not safe to view any signals with an oscilloscope. John loaned me the Riders service notes, which listed the resistance values to ground or B+ to every tube pin. The vertical circuit of this set is a single, two-section vacuum tube and its collection of resistors and capacitors. It's a simple multivibrator with the output of the vertical sync integrator connected straight to the plate of the vertical oscillator. A check of the resistances to these tube pins led me to the first defective component – an open vertical linearity potentiometer.

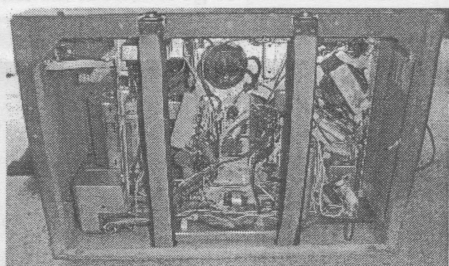
The controls on this set are unusual. On the front of the cabinet are the usual channel and fine-tuning knobs, and on/off/volume and contrast knobs. On the right side are three small knobs: brightness, vertical hold, and horizontal hold. There appear to be no controls inside or outside for vertical height or linearity, but they are in fact hidden inside the external

controls. Remove the brightness knob and insert a small screwdriver in its hollow shaft, and you reach the vertical linearity trimmer. Inside the vertical hold control is hidden the vertical size trimmer, and inside the horizontal hold control is another horizontal hold control! (The internal one is for coarse adjustment.)

The vertical linearity control is a 1K, 1-watt pot that carries all of the current to the cathode of the vertical output tube. No doubt, years of intense heat and power consumption had burned out this item – but where to find an exact replacement? While I searched for a source, I inserted a fixed resistor of $\frac{1}{2}$ the value of the pot so I could continue diagnosing the set.

This temporary fix resulted in a full height picture, but sync was still scrambled. Adjusting the coarse horizontal hold brought a good horizontal lock. Attempts to lock the vertical resulted in a double picture – two half-height squeezed pictures, one on top of the other, with a vertical interval in the middle of the screen. This meant the vertical oscillator was running at half-speed, or 30 cycles per second instead of the normal 60.

A complete recap had not been suggested. The assignment was to fix the problem, not overhaul the set for long-term reliability. All those black beauties and wax-dipped paper capacitors were suspect, as were the electrolytics in the vertical section. The task seemed daunting because the sync/video circuit board is soldered to the steel chassis and offers no access to its solder side. Tidy capacitor replacement would have been very labor intensive.



Tidy capacitor replacement would have been very labor intensive.

After running the set for a few minutes, I gave the paper caps a “finger test” to see if any became warm. Capacitors have little significant heat-producing resistance, so a capacitor that warms up is almost certainly one with significant electrical leakage. One

capacitor in the vertical section, a 1000 volt 0.05 uf oil-filled black beauty, was warming up so I snipped it off the board. There turned out to be a slick of oil under it; it was not just leaking electricity but oil. Luckily, I had an orange drop of appropriate value in stock, so I soldered it to the leftover pig tails, and the vertical section started acting normal for the first time.

A Parts Disappointment

A search on google for “Predicta Parts” found a fellow near Los Angeles running a Predicta repair and parts business. Email exchanges resulted in a promise to send an old pot from a “junkie” for \$20 plus Priority Mail shipping. Two weeks and one postal money order later, I had another brightness/vertical linearity pot in my hands, but a check with an ohmmeter revealed it to have precisely the same defect as the bad one. I resolved, with John’s approval, to implement a kludge. Antique Electronic Supply sold a 1000 ohm 5 watt pot, which I ordered along with another batch of orange-drop caps.

The “horizontal width” control on this set is a pot on a tab that reaches up from the chassis (it’s in reality a horizontal drive control). Right next to it was a similar but unused tab, perfect for mounting a trimmer pot. I drilled a hole in it and mounted the new one, wired it to the vertical circuit, and now we had a working internal vertical linearity adjustment which ended up looking almost factory-made!

Linearity Out Of Range

Vertical linearity was not in the range of the control, so I did a complete recap of the vertical section with no resulting improvement. Then, on a hunch, I substituted the vertical tube, and linearity came into range! Later, I found out that this was another known Predicta problem: Vertical linearity cannot be achieved with certain brands of tubes ... even new ones!

Dots at the Top

Now I had an excellent looking test pattern, but when connected to a commercial VHS tape, some white dots of retrace lines appeared near the top of the picture. These were from the digital information broadcasters and editors insert into the vertical interval right after the sync pulse

that carries digital time code and other information. Its presence in the Predicta’s retrace indicated that vertical blanking was failing to suppress it.

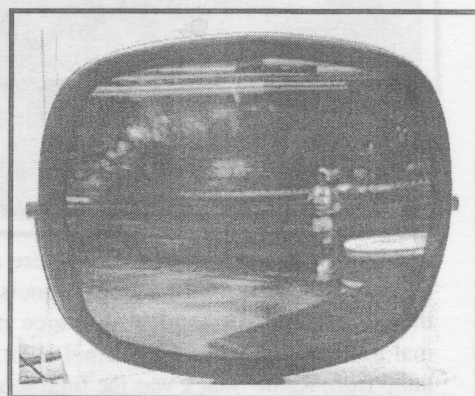


What next!

Attached to the vertical deflection coil in this set is an RC network integrated as a single part labeled “retrace suppression” on the schematic. Could paper caps in this item have gone bad? The fellow in L.A. mentioned that he built replacements for these circuits, creating them with discrete components, dipping them in epoxy, and then painting them brown. He offered them for \$9 each.

I first wanted to find out if it was the source of our problem, so I built a replacement RC network with parts on hand (the schematics showed the internal parts in these). The set performed exactly the same – the original and my handmade replacement dimmed the white spots but did not eliminate them.

A check with the radio-phono Usenet group was helpful. The dots were not in television signals in the 1950’s when the set was made...engineers didn’t predict them for their Predictas. John and I decided to leave it in its original state, sometimes showing retrace dots, rather than to engineer improvements.



Burn-in Reveals a New Problem

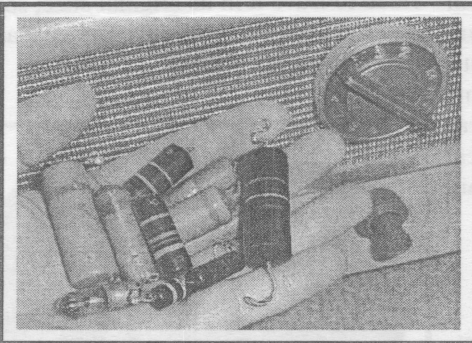
After the set was back together, I ran it every time I watched TV to keep an eye on it for reliability. The set showed a new problem: the picture slowly became darker only minutes after turning it on, until within a half hour, it was too dark to watch. After yanking it open again, I tested the paper caps in the video section by finger, and sure enough, the last coupling capacitor, a black beauty connecting video out to the CRT, was warm. Replacing it with an orange drop resulted in a severely contrasty picture with extremely unstable sync. Now what?

Stupid Predicta AGC Tricks

It turns out that the front panel contrast control is really an AGC (Automatic Gain Control) adjustment. Turning it indirectly changes the size and shape of the sync pulses (and even affects the sound). There is also a "local/fringe" slide switch on the back by the antenna inputs that is in fact a coarse AGC adjustment. The switch was on "fringe" and moving it to "local" brought the contrast and sync back to normal.

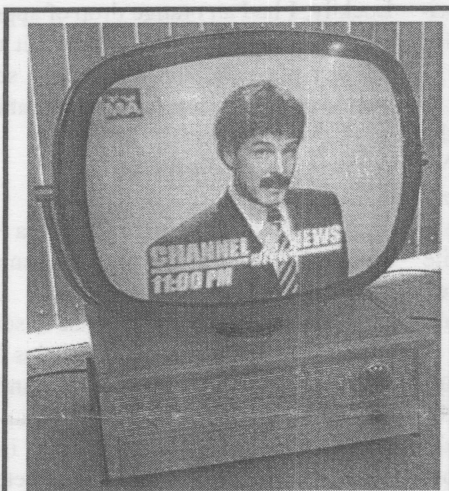
Final Adjustments

For good measure, every paper capacitor that seemed to be warming up was replaced. My experience with this set confirmed the prevailing wisdom that paper caps of that vintage should all be replaced even if they seem OK. Finding and changing only the bad ones can be more time consuming, and the ones that seem good can be considered ticking time bombs ready to ruin the expensive or irreplaceable parts they are wired to.



Horizontal and vertical widths were set, and adjustment of the centering magnets by the deflection yoke resulted in a nice normal picture. A new #44 channel selector lamp from Radio Shack was the final touch. John was happy to get his set delivered and

working nearly like new, at which time I got to see his incredible collection of blue ribbon antique radios, TVs, Hi Fi's and test equipment. That made it all worthwhile!



The finished product.

Variac Basics

By Marv Beeferman

"Variac" is the trade name for a variable AC transformer or autotransformer. But unlike the standard transformer, it has only one winding instead of two. It consists of a toroidal iron core through which is wound a single layer of copper wire. The AC line is connected to the ends of the winding and a movable tap is arranged so that it may be rotated around the outside of the coil winding and connect to any turn.

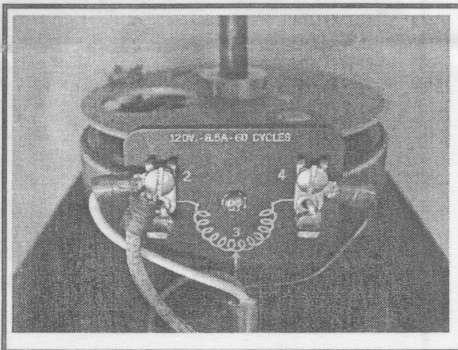
The Variac is a very handy device to use in radio repair. It can slowly bring up the voltage on a set that has not been used for a long time, reducing the stress on older components and aid in the reforming of electrolytic capacitors. It can also be used to run a set at the original listed voltage which is often lower than the voltage available in today's households or used to provide a higher than normal voltage to help bring out intermittents.

The addition of an output voltmeter and ammeter is a simple way to add to the Variac's troubleshooting capabilities. Most radios will draw from 0.3 to about 0.8 amps at 117 volts. If the radio draws

no current, it usually means an open tube filament in an AC/DC radio or possibly an open power transformer primary in an AC only radio. If an AC radio shows very high current (more than 1 amp), at low voltage, it generally means that one of the power transformer windings is shorted. If the radio works but draws excessive current, it could indicate a leaky coupling capacitor to the grid of the audio output tube which causes it to draw excessive current.

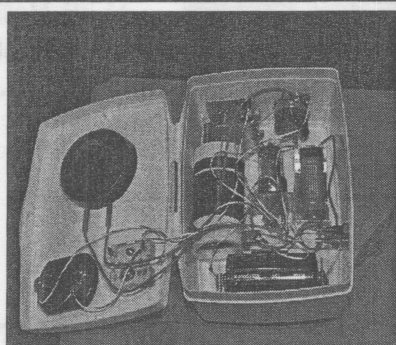
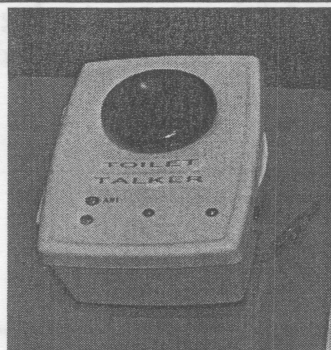
Although a Variac with a 3 amp rating is sufficient for most work, I decided to upgrade my aging unit to a NOS General Radio type W5LM with a 7 amp rating; it had been sitting on my workbench way too long and just begged for attention. Without giving the hook-up much thought (what could be difficult, it's just a potentiometer on steroids), I found that my initial smoke test really produced smoke. Without going into the embarrassing details, let me share my learning curve on the CORRECT way to hook up a Variac.

Most Variacs are marked with the low (common) end of the coil as "2", the movable tap as "3" and the high end as "4". If the low end is unmarked, orient the Variac with the shaft facing you and turn the knob all the way left, just like turning down a volume control; this is the low end of the coil. Now, connect the green ground wire of both the input and output cords to the metal frame or case. Connect the white wire from both the input and output plugs to the low end ("2") of the coil, both to the same pin. Connect the black input wire to the high end ("4") of the Variac and the black output wire to the arm ("3"). You should be ready to go...without the smoke.

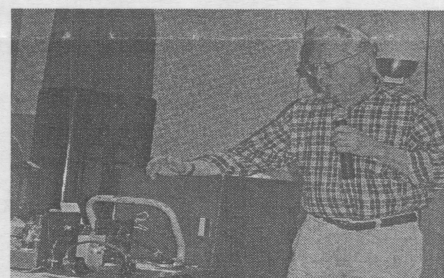
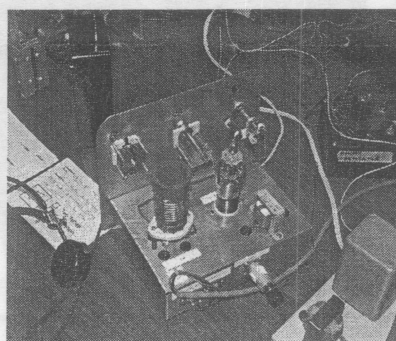
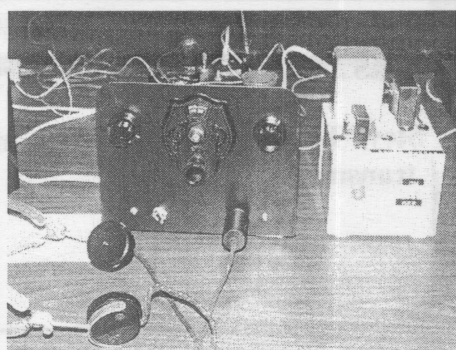


Although the Variac is called a variable AC "transformer", it provides no protection from shock...it is not an isolation transformer. Plug the Variac into an isolation transformer and the set into the Variac to afford essential protection when working with AC/DC sets.

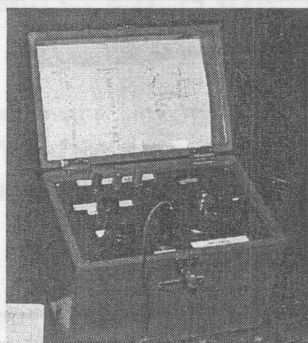
HOME-BREW CONTEST



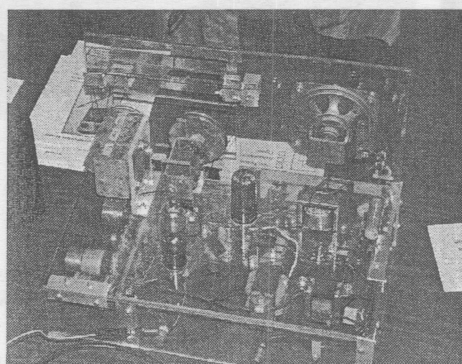
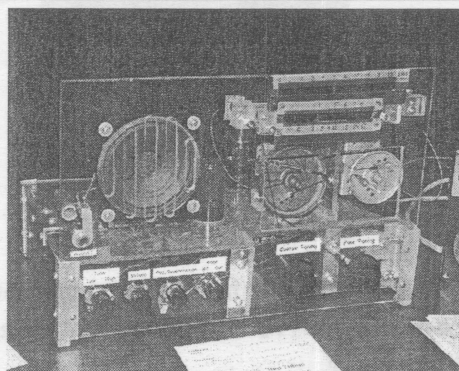
Marv Beeferman's single tube "toilet talker."
(An extremely nice entry.)



Marty Drift's shortwave regen.

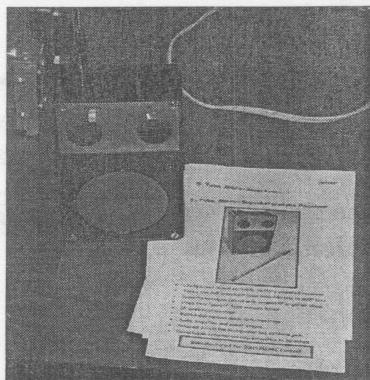


Gary D'Amico's crystal receiver.

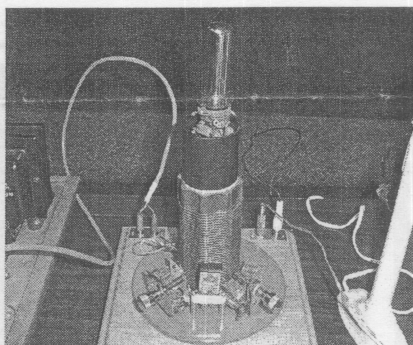
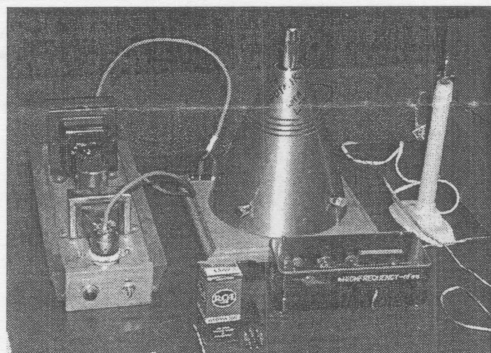


FRST PLACE - 2 tubes or less

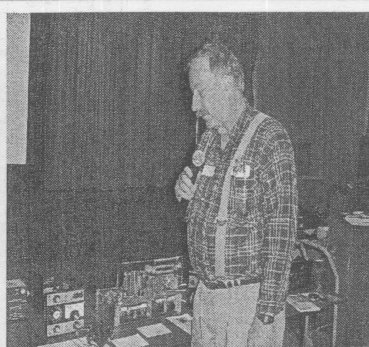
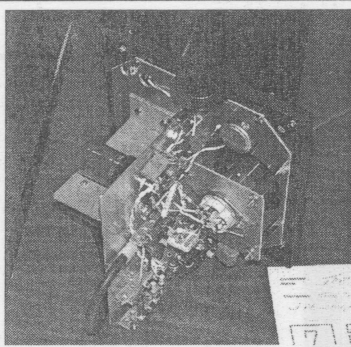
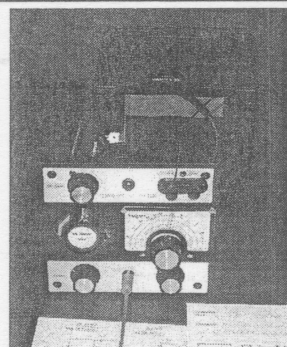
Walt Heskes' 2-tube cathode regen set with a 1N34A diode detector, audio output via a 117N7 and rf via a 6F7.



Walt Heskes' 5-tube superhet using subminiature tubes and 1N34A diode detection.

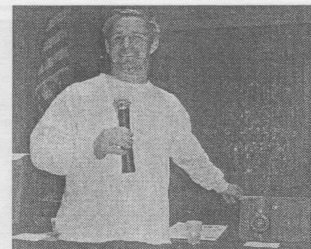
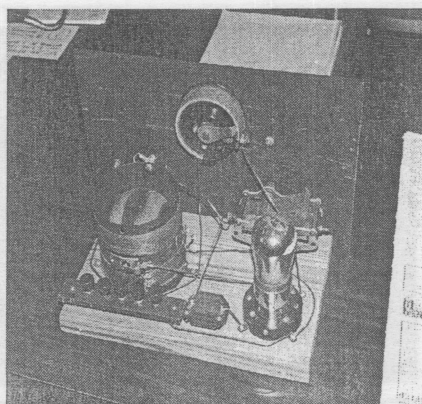
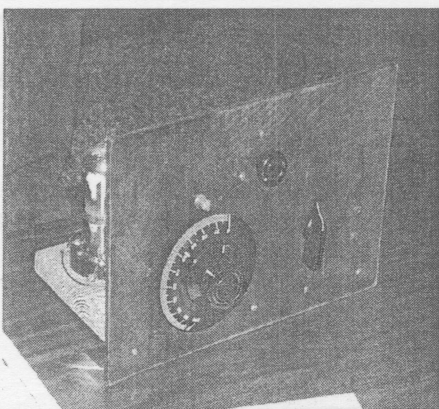


FIRST PLACE - Open category
Steve Tetorka's 3-watt CW ham transmitter

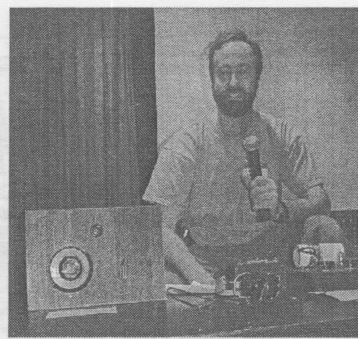
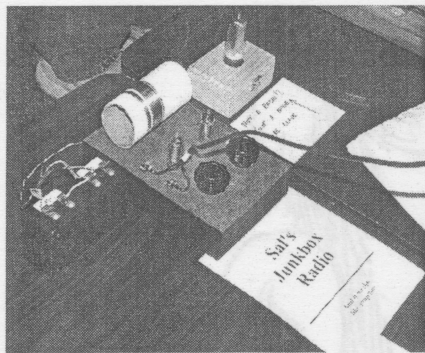


2ND PLACE - 2 tubes or less

Tom Provost's two twin-triode regen with RF stage/detector + 2 stages of audio



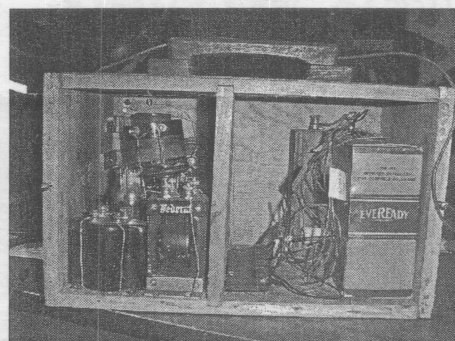
Rob Flory's 1-tube (01A) regen built from a 1924 NY Herald Radio Magazine article.



**Sal Brisindi's
"Junkbox"
radio (with an
optional nixie
tube clock).**



**Steve Calandra's
HiFi amp with a
45RPM turntable.**



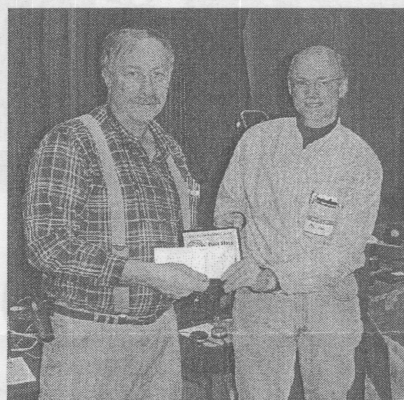
**Richard Lee's
1920s 2-tube
homebrew res-
toration.**

THE WINNERS

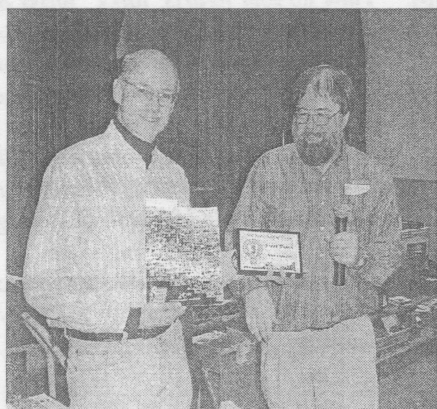
**Walt Heskes
Two tubes or less
FIRST PLACE**



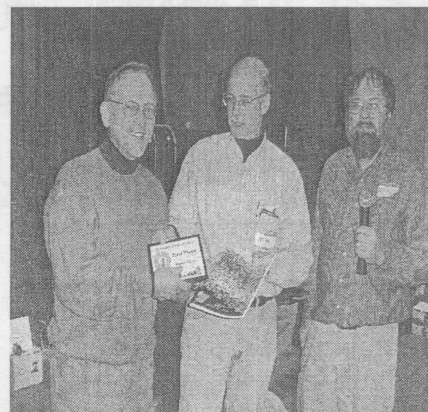
**Tom Provost
Two tubes or less
SECOND PLACE**



**Richard Lee
Restoration
FIRST PLACE**



**Steve Tetorka
Open category
FIRST PLACE**





CHRISTMAS, 1924

By Charles H. Van Housen

Up in his shop in the Land of Snows
 Santa is building ra-di-ohs!
 Jolly and merry and ruddy and quaint -
 Up-to-date, old-fashioned, modernized Saint!
 Thousands of "plexes" and "flexes" and "dynes"
 Built along fancy and fashionable lines!
 Cute little crystal sets - jim-dandy toys
 Made by Saint Nich 'las for good girls and boys!
 Sets by the dozen and sets by the score -
 Ten tubes and one tube and three tubes and four!
 Piled in his store-room in gala array,
 Tagged: "Do Not Open Before Christmas Day!"
 Cabinets, batteries, panels and wire -
 Anything, everything fans could desire!
 Rheostats, sockets and soldering-lugs,
 Ground-clamps, condensers, transformers and plugs!
 Wave-traps and meters and tool chests and books
 Tucked away safe in the corners and nooks
 Of that jolly big workshop 'way up in the snows
 Where Santa is building our ra-di-ohs!
 Tune up your hearts, folks, 'most any night -
 Sweet from his mansion so glist'ning and white
 Comes the announcement: "Station North Pole!
 Santa Claus speaking! To every good soul
 My very best wishes! I'm glad you believe
 In Santa! Just look for me next Christmas Eve!
 I'm not used to talking. Please pardon this cough!
 God bless all the kiddies! S.C. 'signing off!"

The above poem and illustration is courtesy of "The Radio" section Philadelphia's *Evening Public Ledger* for Saturday, November 29, 1924...Ed.