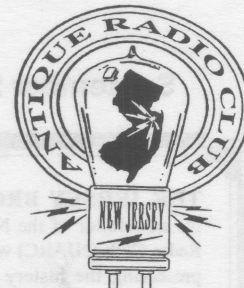


# The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

September 2002

Volume 8 Issue 9



## MEETING/ ACTIVITY NOTES

Reported by Marv Beeferman

Over 30 members attended the August meeting at our new meeting location in the American Legion Hall in East Brunswick. It wasn't a bad turnout for what seems to be the traditional low point of the year when summer vacations...how shall I put it... "interfere" with radio collecting activities. I've included the same directions to the hall from the previous month's *Broadcaster* in case they were (heaven forbid) misplaced. Keep in mind that the September meeting has been moved to the 6th of the month to accommodate those members who will be attending the Kutztown meet advertised in this issue.

President Phil Vourtsis said that September will be a busy month for activities associated with the club's exhibit at Olde Towne in Middlesex County. Ray Chase will be giving his History of Radio talk on the 18th at 7:00 PM and it would be nice if the club made a good showing; it will also give you a chance to see a really excellent exhibit with themes spread out among three rooms of the exhibition building. September 21st is the date of our repair session at the Piscataway Administration Building. The public is invited to this one and our repair skills will certainly be put to the test! Presently, our team of experts include Phil Vourtsis, Marv Beeferman, Al Klase, John Ruccolo, Marty Friedman, Nevell Greenough, Steve Goulart, Joe Serafin, Sal Brisindi, Walt Heskes and Gary D'Amico. If you'd like your name added, please contact Phil or Al Klase. In any event, if you plan to bring some radios to be worked on, contact Al Klase in advance so he can get an idea of the turnout



## MEETING NOTICE

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### IMPORTANT! NEW LOCATION/DATE CHANGE

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The next meeting of the NJARC will take place on Friday, September 6th at the American Legion Hall, 17 Emerson St. in East Brunswick NJ. The date change (this month only) is to accommodate those attending the Kutztown meet. Detailed directions are provided in this month's *Broadcaster*. The program for this month's meeting has not been firmed up yet but I'm sure that the Rochester meet will form the basis for much discussion. Start putting those final touches on your homebrew radio; contest judging will take place at the October meeting. Please direct any last minute questions to Technical Coordinator Al Klase (see the insert on the next page).

and perhaps pull some schematics in advance. Updates and directions to both events will be posted on the club website.

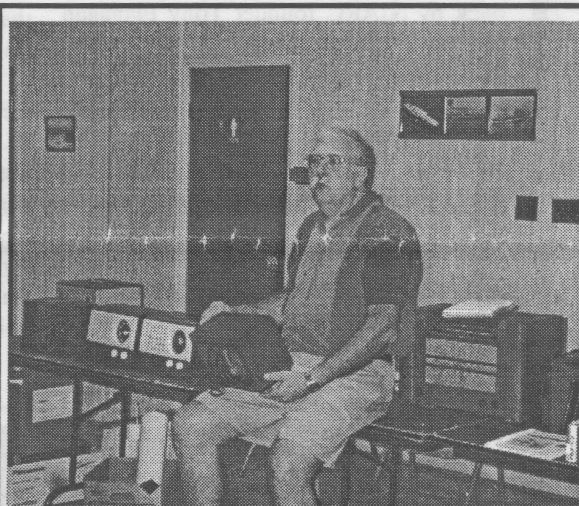
We also made plans for a tailgate party/picnic (club members only) on Octo-

put off. You'll also get a chance to see the Camp Evans site and check out our temporary digs for the Broadcaster's Hall of Fame.

Phil Vourtsis continued the meeting with an interesting comparison of his two model 510 Emerson 1946 table radios. Phil noticed that, although the model numbers are the same, there was a difference in dial swings (270 vs. 180 degrees), loop antennas (elliptical with a capacitor vs. square with no capacitor) and the knob location. To make matters more complicated, the second edition of *The Collector's Guide to Antique Radios* (by Marty and Sue Bunis) shows the 510 with a 7 by 9 matrix of round cutouts for the grill design compared to Phil's 5 by 6 matrix of square cutouts. It also shows that Emerson made a model 504 in 1946 which was a duplicate of the 510 but with a Lucite grill and using the same round cutout pattern shown in Bunis for the 510. Let's add one last wrinkle...the

model 520 two-tone Catalin version of the 510 uses the same grill as Phil's 510.

Solutions to the above inconsistencies may be as simple as "parts is parts"...Emerson used whatever was available on the shelf at the time to come up



NJARC president Phil Vourtsis discusses the fine points of cabinet revitalization.

ber 5th at InfoAge in lieu of the regular monthly meeting. The club's home-brew radio contest has also been moved to this date - a little extra time to put those finishing touches on your project or perhaps undertake building an entry you might have

**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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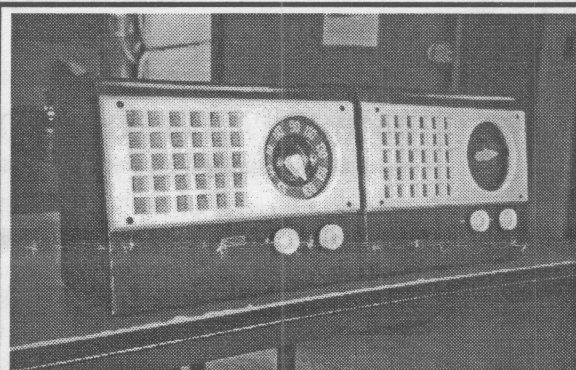
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with multiple variations on the same design. But another consideration may be the restoration process - many hybrids that the manufacturer never intended to produce have been created by the melding of two half-junkers. In any case, some further investigation may come up with the answer.



**Will the real Emerson 510 please stand up.**

For the remainder of the meeting, Phil teamed with Marty Friedman to give some quick restoration refreshers. Phil showed how such simple materials as 0000 steel wool, stain markers, carnauba wax and Novus #2 scratch remover can bring a tired radio finish back to some of its original splendor. Marty demonstrated a method that was described some years back by NJARC founder Tony Flanagan for restoring dial glasses. A balsa wood form is made to fit the interior of the bezel leaving a 1/4" gap around its edges. The form is wrapped in cloth to prevent scratches. The new "glass" is made from mylar packaging material cut to shape or a sheet of acetate of the appropriate thickness. By slowly applying heat with a heat gun and pressing the form against the mylar, using the opposite side of the bezel to form it, a nice result can be obtained.

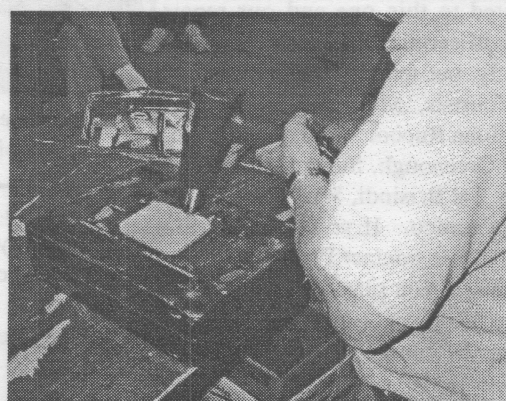
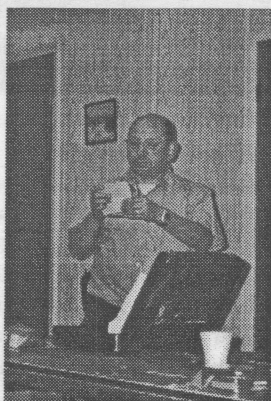
I was looking through my restoration notes and found that a source for round, domed glass used in many sets of the 30s (such as black-dial Zeniths, which run about 7 inches) can be obtained from clock parts distributors. Another variation of Marty's method is to use the rim of a can (tennis ball can for example) approxi-

mately the same size of the dial glass. The can is filled with water and heated until boiling. Then the rear of the bezel is pressed against the form material (acetate works best) over the top of the can to obtain the desired domed effect. This is a slower but more controlled process that may prevent imperfections in the reproduction.

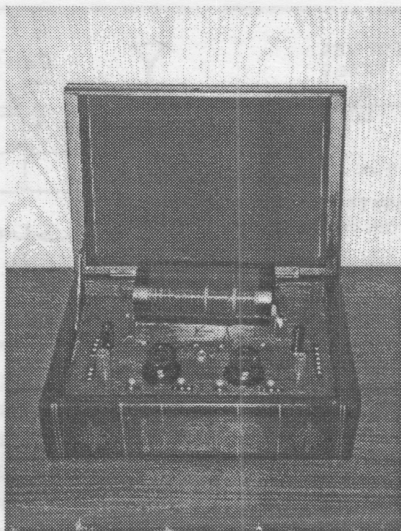
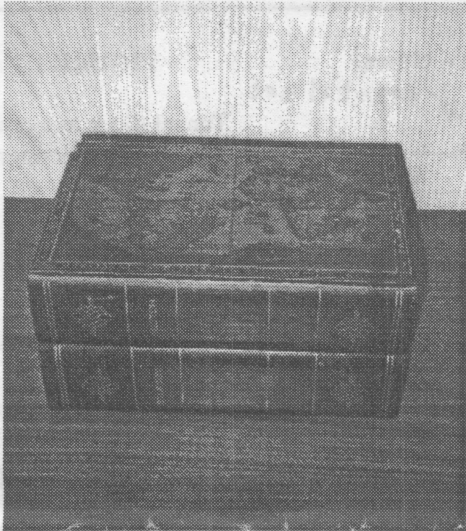
The Mid-Atlantic Antique Radio Club (MAARC) will be auctioning the Rodger Nye

collection on Sunday, October 20th to benefit their Radio-Television museum. The collection includes 1930s consoles and wood table models, 1940s/50s Bakelite and other plastic radios, novelty radios, test equipment, and more (but no high end audio gear or early 20s radios). The auction preview is at 10 a.m., starts at 11 and runs all afternoon. It is suggested that you eat lunch before you arrive or bring a bag lunch.

The auction takes place at the Davidsonville Family Recreation Center. From Rt. 50 between Annapolis and Washington, exit south on Rt. 424, Davidsonville Road. After about 3 miles, turn right on Rt. 214. After 0.7 miles, bear left at the fork on Queen Anne Bridge Road and watch for the first entrance in the chain link fence on your left.







Mario Volpe showed off this fine crystal set at the August meeting. The cabinet has a red felt liner and a world map on its top and appears to have been a storage chest for bourbon and scotch. I wonder if Mario chose it to give his creation a little extra kick?

## A WEIRD BUT DEDICATED LOT

By Marv Beeferman

Today's "crystal set" is more appropriately labeled a "free-power radio" since, with the development of modern electronics, it has evolved into a little more than a coil, crystal, cat whisker and pair of headphones. No doubt, many purists exist who persistently attempt to refine these four basics, but they still share a common bond with those experimenters who desire a more complex creation and end result ...that is, to suck from the ether every available milliwatt and produce a self-powered radio that rivals its tube-based big brother. Impossible you say?

Although I don't do much experimenting with free-power radios, my reading and web-browsing have led me to the conclusion that the guys that do are (respectfully) a weird but dedicated lot. I picture them still awake at three in the morning trying to figure out a new approach to that perfect or unique set. Here's an example (Figure 1) pulled from "With the Collectors" column of the OTB (Old Timer's Bulletin) by Don Rathke. John decided to experiment with a tunnel diode to convert a crystal set into a regenerative detector, thereby boosting its gain and selectivity. Although the 3.0 volt supply doesn't qualify it as a true free-power set, I thought the idea was interesting.

A tunnel diode exhibits a negative resistance (current decreases as voltage increases) between 0.2 to 0.4 volts of forward bias; this enables the diode to be used as an amplifier-oscillator. The rather odd-looking DC power supply shown in the schematic is of low impedance and well-regulated to prevent motor-boating. The 4 germanium or silicon diodes are forward biased and used as zeners. The 250 ohm variable resistor controls regeneration (or technically the tunnel diode's negative resistance threshold voltage). If you're interested in trying this circuit, the tunnel diode should have a high current capability such as a 1N3719 (10 mA), 1N3721 (22 mA), TD256A or TD266A (100 mA).

I found the article (copy available on request) "A Selective and Efficient Crystal Set" by Bud Bedker an excellent example of the attention to detail required to construct that perfect set, down to the exact placement of components. All brackets and spacers are made from bakelite. For efficiency, excess metal on the antenna capacitor is cut away and the rotor and stator plates are removed from its small section. A plastic rod is used to extend the tuning shaft to help eliminate hand capacity. Grooves are cut in the plastic coil forms at 56 and 72 threads per inch to accommodate exact spacing and placement of the coil wire.

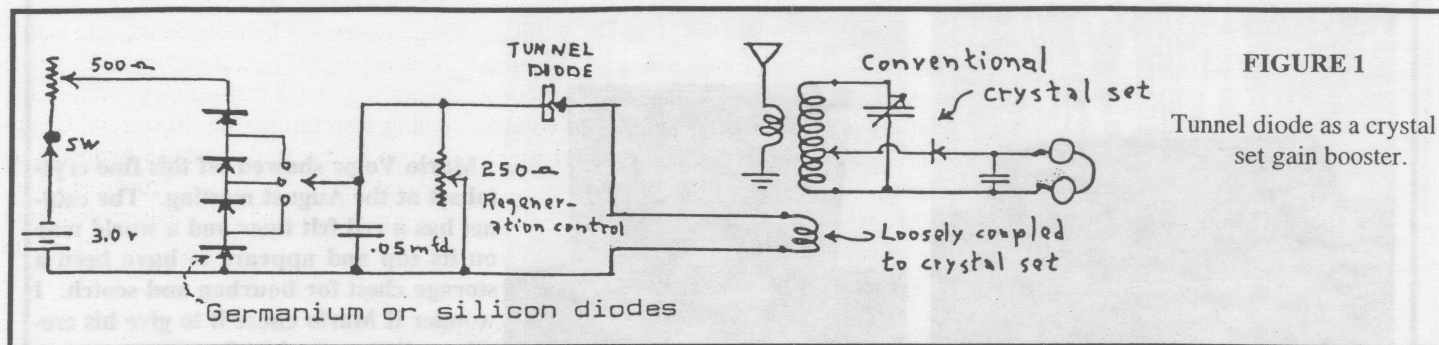
Bud cautions about any experimenting you might have in mind if you decided to build his set:

"Exact conformance with the instructions is necessary for best receiver performance.

Even small deviations may cause significant degradation. This cannot be overemphasized. Even little changes which you would think could not possibly change anything may result in a big drop in performance."

Shown next is what I call the mother of all free-power receivers (Figure 2). Another creation of Bud Bedker from the 1988 article "The Free Power Receiver", this beauty will develop an output of at least 6 volts, driving a horn speaker (RCA UZ-1325 is recommended) to fill a room. The built-in power supply operates off of RF energy and on a good day the rectified DC will peg a 1 mA meter and the voltage can be well over 16 volts! The receiver features a crystal detector followed by two stages of transistorized AF amplification.

Besides being an avid collector, recently deceased Ralph Muchow was a dedicated crystal set builder and experimenter. In a 1980 article in the ARCA Gazette titled "My 50 Years of Experimenting with Crystal Receivers," Ralph said that up to this point, he had built some 500 different sets! In describing the construction of a set that he calls "the culmination of all my previous efforts," you might think that he was talking about a vacuum tube radio. It can drive a 12" Magnavox PM speaker, has "perfect" selectivity, and features a volume control, a tone control and an LED panel light/tuning indicator. Although the circuit looks relatively simple (see Figure 3 on page 8), construction details reflect years of experimentation to find just the right characteristics for high performance.



ground and best antenna available and suggest that the spectacular results that they are able to obtain totally depend on these two critical components. As Ralph Muchow said: "If you cannot set up a good antenna and ground system, it would be better not to go into crystal set construction as you will be disappointed with the results." Some years back, I remember reading about the buried radiator trick that serious builders used in the 20's and 30's to obtain a good ground but I doubted if many actually went to this extreme. Well, it appears that the idea still carried over to at least the 80's and who knows how many of these rigs still exist today in the backyards of those too embarrassed to admit otherwise? From Ralph Muchow's article:

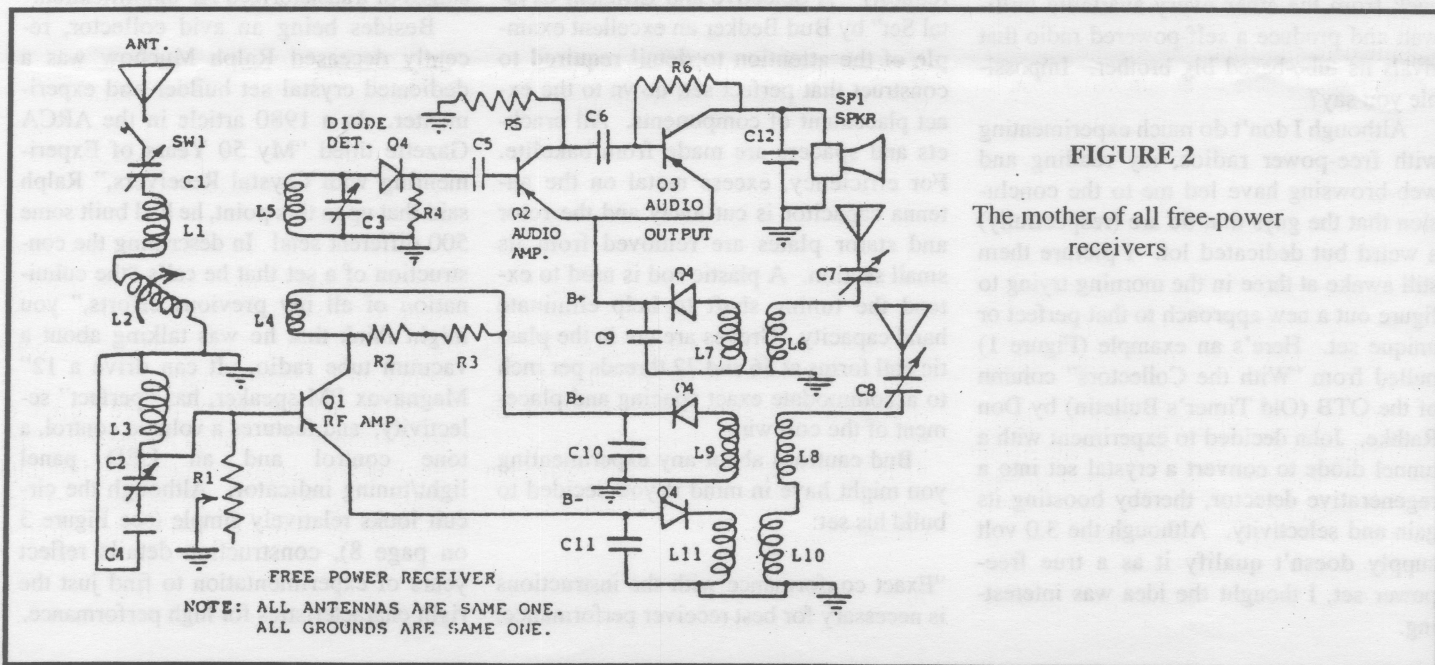
"First, I decided that the more ground I could get all connected together, the better would be my overall system. Then, since all grounds are better if moist, I devised a method of keeping my grounds wet whenever mother nature did not provide enough rain to do the job. This I did by securing from my local auto parts dealer an old copper automobile radiator. After fastening a pipe to the radiator, I punched a bunch of random holes in it. Then three #8 gauge wires were fastened to the radiator.

It then was time to dig a 5-foot hole outside the radio room and bury the radiator with the pipe and wires protruding out of the ground. To the pipe, a garden hose fitting was attached, a hose connected to the fitting and then to the outside faucet. I then drove 6 copper rods into the ground around the radiator, all connected together with more #8 gauge wires and then all wires brought to a common point to enter the house. Now you can see the wisdom of all this - turning on the outside faucet keeps the grounds moist and really doing their job."

Seems a little extreme if you ask me. But perhaps I'm a little jealous; here in South Jersey, the soil is so sandy that moisture content and conductivity are negative variables when it comes to the issue of effective grounds. There's a lot to be said for good drainage, but not if your depending on mother nature for a signal return path.

But I do live right across the road from a cedar-water lake with such high acidity it could dissolve a 40's Buick in no time flat. Naaah! There's no way I could make contact with the lake with the road separating it from my house. But wait a minute...I still kept my well pump hooked up after they brought in municipal water. If the line to the pump is metallic, I could possibly connect to the lake via the ground water. Hmmm...

Well, you'll have to excuse me now since I'm getting a little inspired to try it out. And if it works, move over you crystal set weirdo's...here I come!





## CONSTRUCTING A SIMPLE FREE-POWER RADIO

Edited by Marv Beeferman

The following project is a good starting point for those interested in getting their feet wet in the rewarding aspects of building a slightly more sophisticated "free-power radio." You might want to try it as an entry into our upcoming construction contest scheduled for October. Although simple, it offers many possibilities for improvements and experimentation and it offers the advantage for beginners of not having to wind your own coils. However, one of its drawbacks is that it requires two independent antennas, but even that limitation can be overcome with a little imagination. Also, tuning of the high and low ends of the broadcast band takes a little adjustment. Construction is based on an article that was found in the July 1965 issue of *Electronics Illustrated* (no author cited).

### How it Works

This radio is actually two radios in one and combines the past with the present. The "signal" receiver uses a transistor that acts as a detector and amplifier at the same time. The other "power" receiver is of the same design as early crystal sets. It snags the signal from a powerful local broadcast station and converts the power to DC. The DC is applied to the transistor in the signal receiver which acts as an amplifier resulting in much greater earphone volume.

Looking at the schematic of our "free-power" radio (page 6), coil L1 and variable capacitor C1 provide station tuning. The rf signal is coupled to transistor Q1 which acts as a detector, leaving only audio. So far, the action of the transistor is similar to that of a crystal and cat whisker or their more modern equivalent, the semiconductor diode.

But the transistor can be made to amplify the signal by providing it with operating power which is obtained and supplied by the other circuit at the bottom of the schematic. The L2-C4 coil-capacitor combination forms a resonant circuit which is tuned to a strong local station. The signal is

fed to diode D1, which rectifies it to DC. A large electrolytic capacitor, C5, filters out the audio modulation to produce a steady negative DC voltage which appears at point A in the schematic. The voltage is applied through the phones to Q1 which now acts as an amplifier.

### Construction

Although more creative layouts are possible, the simplest way to build this radio is on a wood panel or other non-metallic material. Not readily apparent in the pictorial is a connection from lug 3 on coils L1 and L2 to their mounting brackets. Make sure these connections are made!

Tuning capacitors C1 and C4 are mounted on the board by means of the threaded holes in the underside of their frame. It's easy to locate the points for the holes in the board for the capacitors' mounting screws. First, screw 6-32 screws into the holes. Then press the screw heads into the wood; the marks are where you drill the holes. Don't use long mounting screws or you'll short the capacitor plates to the frame when the screws are tightened. Note, too, that each capacitor frame is grounded. Solder wires directly to the capacitor frames.

Connect the 4-lug terminal strips and the Fahnestock clips to the board with wood screws, putting a solder lug under each clip's mounting screw. Avoid excess heat when soldering D1 and Q1 to the terminal strip lugs.

It's possible to save a few bucks if you have a couple of basket-case AC/DC table radios around. Remove the tuning capacitors and use the large sections for C1 and C4.

### Operation

The most important requirement for top performance is a good antenna system and a good ground. You should use at least 100 feet of wire for each antenna and mount them as high as possible. Radio signals must be strong, especially for the power receiver. You'll be able to hear stations located as far as 60 miles away, but only if operating power is obtained from a strong local station.

To calibrate the receiver, use a 1.5 volt flashlight battery as a temporary source of power. Connect the battery's positive end

to the ground terminal and connect its negative end to point A on the schematic. Now set signal tuning capacitor C1 so its plates are about half-meshed. While listening, start turning the slug on coil L1 until you hear a station whose frequency is around the center of the broadcast band. By going back and forth between coil and capacitor, you should be able to pick up the station at the approximate correct position of the tuning capacitor. Stations of lower frequency should be heard as the plates close.

Since full coverage of the broadcast band is not possible at one setting of L1, it will be necessary to readjust the coil to get the tuning capacitor to tune the low and high ends of the band. Going from low to high is just a matter of turning the coil slug several turns. Now disconnect the battery and be sure to leave C1 tuned to the same station.

Next thing to do is to tune in power. Adjustments to C4 and to L2 are made in the same way as they were to C1 and L1, only now it is very important that a strong local station is found. Since you can't hear the local station on the power receiver, listen to the same or another station on the signal receiver. When you tune in a strong local station with C4, the sound should get louder. Then adjust L2 so volume is greatest when the plates of power-tuning capacitor C4 are nearly fully meshed. Using a voltmeter, you can tune the power section precisely for maximum voltage between A(-) and ground (+). The voltage should be 0.1V or higher.

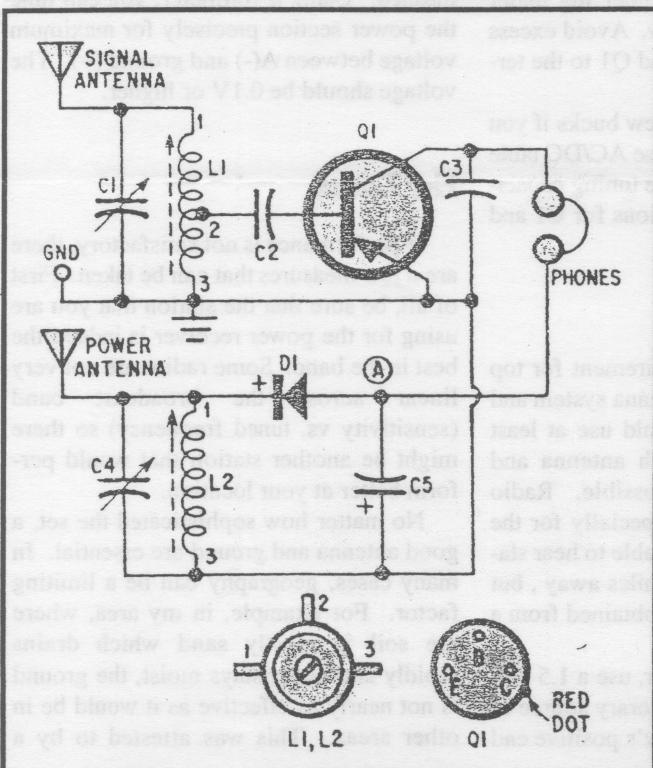
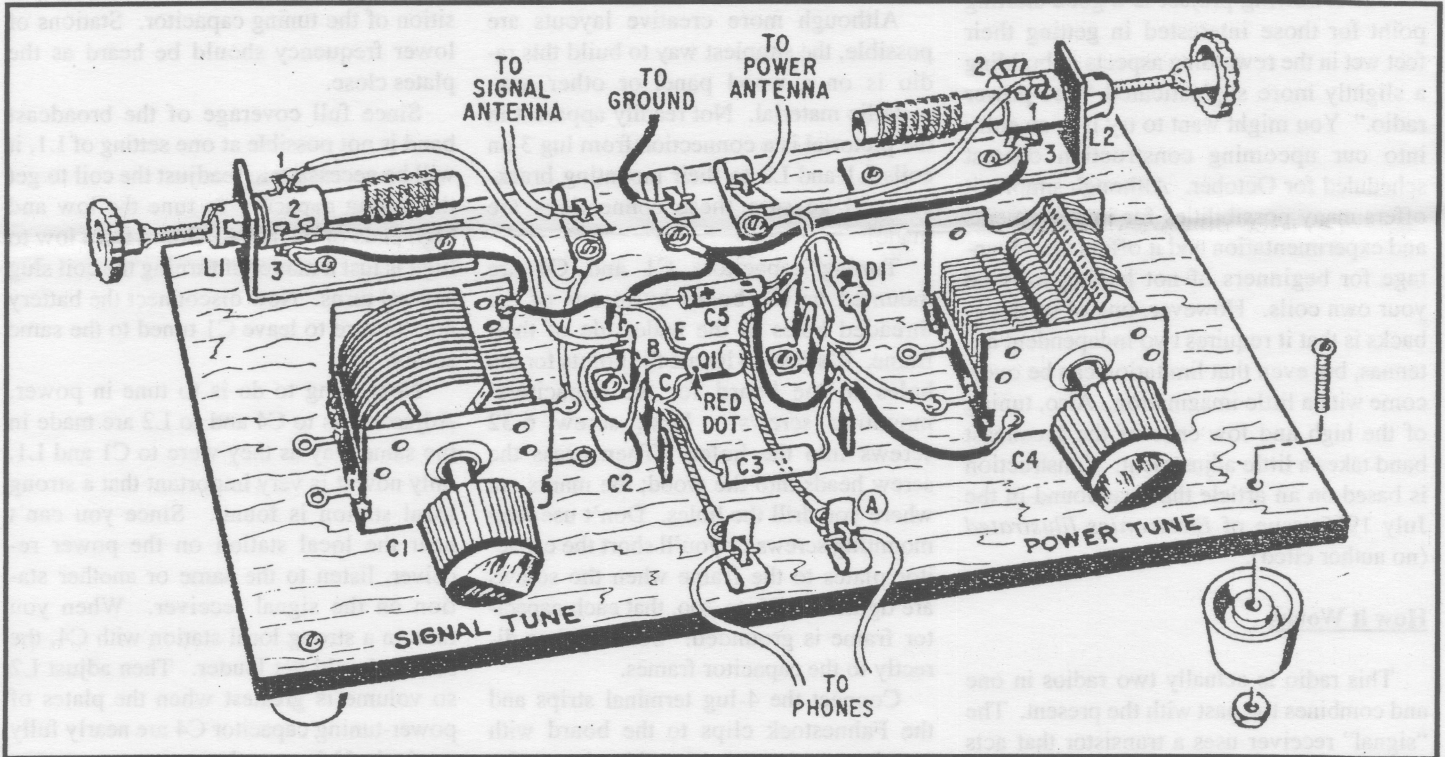
### Fine Tuning

If performance is not satisfactory, there are a few measures that can be taken. First of all, be sure that the station that you are using for the power receiver is indeed the best in the band. Some radios are not very linear across the broadcast band (sensitivity vs. tuned frequency) so there might be another station that would perform better at your location.

No matter how sophisticated the set, a good antenna and ground are essential. In many cases, geography can be a limiting factor. For example, in my area, where the soil is mostly sand which drains rapidly and never stays moist, the ground is not nearly as effective as it would be in other areas. This was attested to by a

JCP&L lineman who was re-routing my service some years back and who related some horror stories regarding the ground that some homeowners thought they had to protect them. This is a condition that you might just have to live with.

If your location limits your ability to string an antenna or limits its length and height (and you're too much of a purist to consider an active antenna), you might want to consider an indoor antenna located in an attic. Because height plays a much more important role than length, I wouldn't consider an indoor antenna in anything less than a two-story house. A typical indoor antenna consists of five lengths of seven strand antenna wire, each 25 feet in length and mounted in parallel lengths spaced 2 feet apart. The far ends are left open ended, supported by glass insulators. The near ends are connected to the lead-in. The added parallel wires increase pick up, a valuable feature where space is limited.



#### PARTS LIST

- C1, C4—10-365 mmf variable capacitor (Lafayette 32 G 1103 or equiv.)
- C2—.2 mf, 10 V ceramic disc capacitor (Centralab UK10-204 or equiv.)
- C3—.005 mf, tubular or 75 V miniature ceramic capacitor (Lafayette 99 G 6062 or equiv.)
- C5—10 mf, 6 V electrolytic capacitor
- D1—1N34 diode
- L1, L2—Loopstick antenna (Superex VLT-240: Allied Radio 91 C 286)
- Q1—2N2613 transistor
- PHONES—Dual headphones, 2,000 ohms (Allied 86 S 083)
- Misc.—Fahnestock clips, 200-foot No. 20 enameled wire, 4-lug terminal strips, rubber feet, mounting board



**Directions to NJARC Meeting  
American Legion Hall - 17 Emerson St. East Brunswick, NJ 08816**

**From North Jersey, Staten Island, or Northwest NJ**

Take rt. 440 or rt. 22, 78, to rt. 287 to NJ Turnpike or take Garden State Parkway exit 129 to NJ Turnpike. Go south on Turnpike to exit #9 and follow directions below from NJ Turnpike.

**From Trenton / Camden Area**

Take NJ Turnpike north to exit 9, and follow directions below from NJ Turnpike.

**From NJ Turnpike**

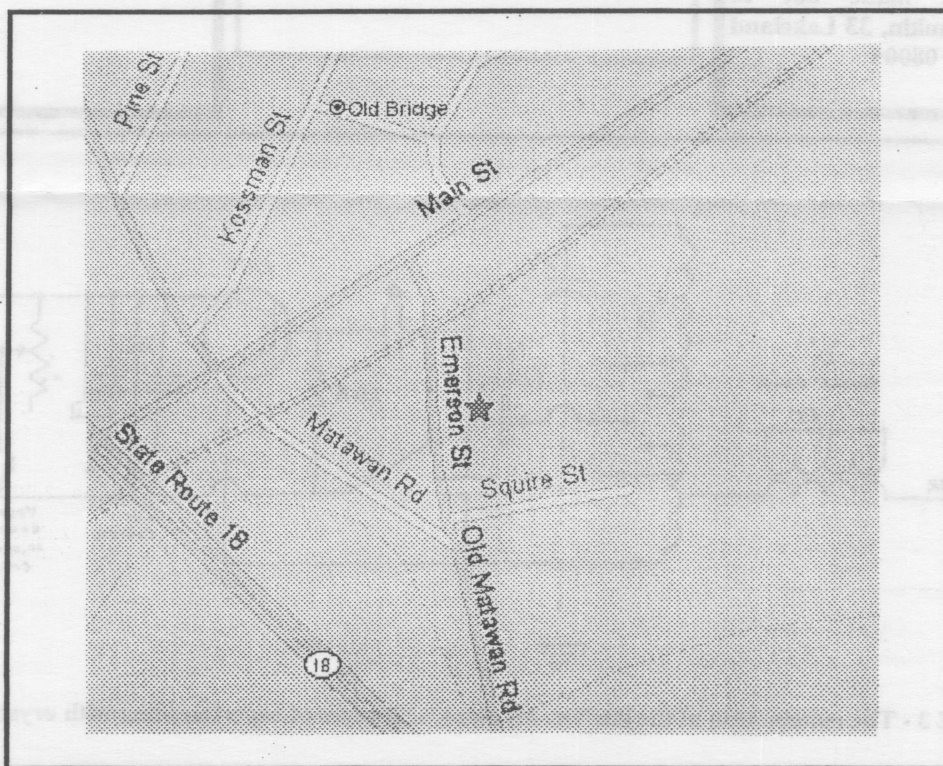
Take exit #9 (New Brunswick) and bear left out of toll booth to get on route 18 south (East Brunswick). Proceed on Rt. 18 for approx 5 miles. After passing the Brunswick Square Mall (JC Penny, Barnes and Noble, Macys and Olive Garden), you will go down a large hill. Pass Open Road Acura / Honda and Seville diner and light at Hillsdale Place. After this light, the right lane becomes your exit lane for rt. 527, Main Street, Amboys, Spotswood. Take the ramp to the bottom and turn left to go under rt.18. Turn right at the first light (Old Bridge Turnpike / Old Matawan Rd). The hall is on your left as soon as you cross the railroad tracks.

**From Rts. 9 and 18 in Old Bridge**

Take rt.18 north approx 4 miles. After going under a pedestrian footbridge you will go up a large hill. Take the exit on the hill for rt 527 south, / Main St / Old Bridge Turnpike. Follow ramp to the bottom of the hill, pass thru the light and cross the railroad tracks. The hall is immediately on your left.

**From South NJ Shore Area**

Take Parkway north to exit 98 ( rt.195 / 138 /34). Follow signs for rt. 34 north. Take rt. 34 thru the EARLE military facility to rt.18 north. Drive approx 8 miles to pass route 9. Then follow directions "From rts. 9 and 18 in Old Bridge."



## 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.

## FOR SALE

Check out NJARC's capacitor program for those most commonly needed replacements. Contact John Ruccolo at any club meeting or call him at home (609)-426-4568 to find out what's available. All proceeds go to the club.

**For trade only...**repair clinics, savings on swapmeet tables, tubes and capacitors, 12 issues of this year's *Broadcaster*, mini-auctions, technical presentations, contests, parties, fellowship of sharing a common interest with friends...\$15 check made out to NJARC. Marsha Simkin, 33 Lakeland Drive, Barnegat, NJ 08005

From non-member: Radiola 18 in an upright floor model Victrola cabinet, AR-744C. Nice cabinet with swinging doors, record player (electric) is above the radio but the turntable is missing. No reasonable offer refused. Mr. Kim Huron, Nutly, NJ. 973-697-8506.

The NJARC tube program offers clean, tested, boxed tubes at very reasonable prices with availability at any club meeting (no dealers, please...not for resale). Proceeds go to the club. Of course, donations of radio-type tubes in any condition are welcome. See Gary D'Amico at the next meeting.

New index to AWA publications (*Old Timer's Bulletin*, *AWA Review*, misc.), 1960 through Aug. 1999. Formatted like the earlier version but with new "Author" section. Has 63 pages, 8-1/2" X 11" size. Gives 7000+ citations. \$12 postpaid anywhere. Make check/MO payable to: Ludwell Sibley, 102 McDonough Rd., Gold Hill, OR 97525.

Philco console, circa 1940, needs minor repairs. \$60 or will take best offer. Tom Musocchio, 609-448-0787.

Supplement 3 to Ludwell Sibley's *Tube Lore* is now available. At 24 pages, it replaces the 1997 8-page supplement. Included is an expanded index, new details on early Western Electric tubes, info on Western Electric tube sockets, fuller material (a page-plus) on Rogers tubes, pinouts for post-1948 Western Electric tubes (published for the first time ever!), the date code for RCA '50s-'70s receiving tubes and the 200 "most-often-needed" basing diagrams covering 1300+ tubes found in everything from an All-American 5 to a Trans-Oceanic. To order, mail your name and address, printed clearly, with six 34-cent stamps to:

Ludwell Sibley  
102 McDonough Rd.  
Gold Hill, OR 975-9626

## WANTED

Nice old signal RF/AF signal tracer in good condition. Lisa Starnes, (973)-410-0373 (evenings). lisa.starnes@att.net

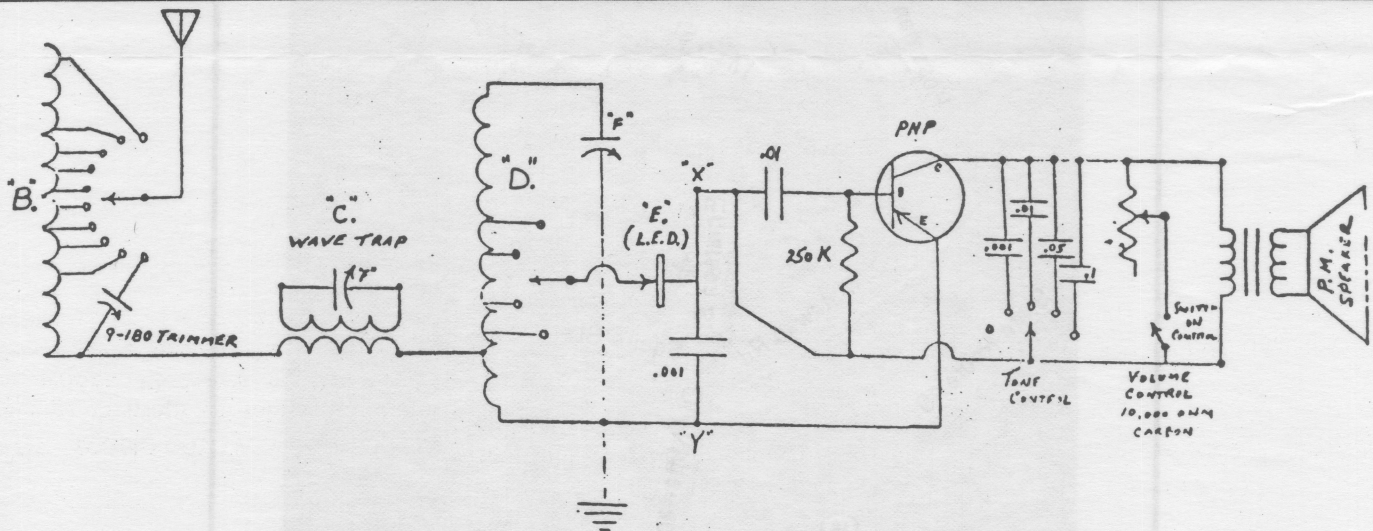


FIGURE 3 - The culmination of the late Dr. Muchow's 50 years of experimenting with crystal radios.