The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

April 2014 Volume 20 Issue 4

MEETING/ ACTIVITY NOTES

Reported by
Marv Beeferman

MEETING NOTICE

The next NJARC meeting will take place on Friday, April 11 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's program will feature our Technical Coordinator Al Klase who will talk about "The History of Short Wave." In addition, we'll be auctioning some items from the estate of Angelo Pepe of Port Richmond (tubes, books, parts, military items) and a nice donation of boat anchor radios from member Joe Connor.

The ON-LINE Broadcaster

The New Jersey Broadcaster is now on -line. To date, over 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.

At the regular March meeting, the NJARC had the honor of enjoying a presentation by radio astronomer and physicist Joe Taylor. Mr. Taylor, along with Russell Hulse, is corecipient of the 1993 Nobel Prize for Physics for their joint discovery of the first binary pulsar. Also in attendance was InfoAge Director Fred Carl, NMARC secretary Jeff Harshman and members of the Garden State Amateur Radio Club.

Mr. Taylor is well known in the field of amateur radio weak signal communication. His talk went into the details of several computer programs and communications protocols that he has written in this area, including WSJT. This package utilizes computer-generated messages in conjunction with radio transceivers to communicate over long distances with other amateur radio operators. WSJT is useful for passing short messages via non-traditional radio communications methods, such as moonbounce and meteor scatter and other low signal-to-noise ratio paths. It is also useful for extremely long-distance contacts using very low power transmissions.

Mr. Taylor also discussed his other open-source programs such as MAP65, WSPR and WSJT-X. Information on these programs may be found at http://physics.princeton.edu/pulsar/K1JT.

President Richard Lee presents Mr. Taylor with his official NJARC club cap.

With the April issue of "QST," an announcement was made that NJARC member John Dilks (K2TQN) was retiring from editing his "Vintage Radio" column. Tube Collector Association president and NJARC honorary member Ludwell Sibley could not have put it better: "Some rest would be in order after his being on monthly deadline for 15 years. John originated the idea for the column and made it happen. The diversity of topics in it has been remarkable: famous early hams, important early commercial operators, significant early amateur stations, major wireless installations, the "Titanic" episode, favorite tube-era rigs, on and on."

What is billed as a "huge antique radio sale" is scheduled for Saturday and Sunday, May 3rd and May 4th, at 143 Main Street, Madison NJ, 07940. The location is an old diner where a long-time radio collector is selling what he describes as a "huge assortment" of 30s, 40s, and 50s radios. The sale includes table radios, consoles, phonographs, tape decks, speakers, parts, and audio items - all "priced to sell." Note that this is **not** an auction so the time period is between 9AM to 5 PM with no early buyers! For further information, call 862-324-6275.

With a concentrated effort by a group of NJARC volunteers, the contents of our Radio Technology Museum storage cage, along with tubes stored in an adjacent washroom, were moved to their new home to ultimately wait for new museum quarters. Member Harry Klancer gave special kudos to president Richard Lee and the boys: "Rich is definitely a DOIN' president. He spent the whole day, from start to finish, really putting his back into it, packing, unpacking and moving stuff. Thanks to him and the other NJARC members; we got done what seemed like an impossible job."

Upcoming Events

May 2nd - Monthly meeting at InfoAge building 9032A (Note date change to avoid conflict with Kutztown.)
May 8 to 10th - Kutztown radio swapmeet
June 13th - Monthly meeting at Princeton's Bowen Hall; Hazeltine talk by Joe Molnar
June 21st - Repair Clinic at InfoAge building 9032A
July 11th - Monthly meeting at Princeton's Bowen Hall (program TBA); homebrew equipment contest and basket case restoration contest judging
July 26th - Annual tailgate swapmeet at InfoAge

THE JERSEY BROADCASTER is the newsletter of the New Jersey Antique Radio Club (NJARC) which is dedicated to preserving the history and enhancing the knowledge of radio and related disciplines. Dues are $25 per year and meetings are held the second Friday of each month. The Editor or NJARC is not liable for any other use of the contents of this publication.

A UNIQUE DONATION TO THE RTM: SCR-583 RADIO SET

By
Marv Beeferman

When members Al Klase and Ray Chase can't recognize a military radio, it must be somewhat unique. This is just what happened when one recently showed up as a donation to the NJARC RTM (Radio Technology Museum). Flipping through the unit's technical manual, Ray found the following surprising entry:

Radio Set SCR-583 is designed to provide two-way communication between:

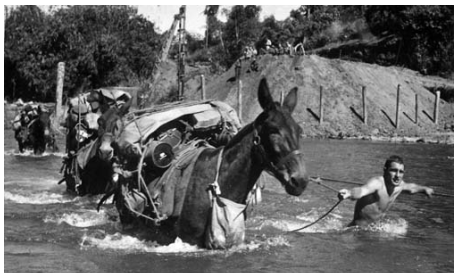
- cavalry units
- units of horse artillery
- cavalry and horse artillery units
- motor vehicles
- armored cars

What! Cavalry units? Horse artillery? For a manual dated April, 1944?

Let's start with a little history. Although World War II was the first highly mechanized war, with vivid images of tanks, long convoys of trucks and jeeps and masses of bombers, there was still a large number of horses and mules employed as cavalry (in the early years of the war), field artillery draft animals, and in supply trains. They also carried communication equipment such as the SCR-583.

In Sicily and Italy, horses were used to overcome terrain that stymied mechanized units. General Truscott pressed into service hundreds of horses and mules captured on his drive to Palermo and used them in his drive to Messina. He then shipped them to Italy when the fighting moved there. After D-Day, horses proved essential in the rugged Apennine mountains, north of Rome.

Mules continued to be used throughout World War II in certain circumstances for their ability to negotiate rugged terrain inaccessible by vehicles. Mules could negotiate jungle or mountainous terrain that no horse or vehicle could traverse, carrying machine guns, mortars, ammunition and yes, communication equipment. In North Africa, the mountains of Italy and jungles of Burma, mules made a significant contribution.



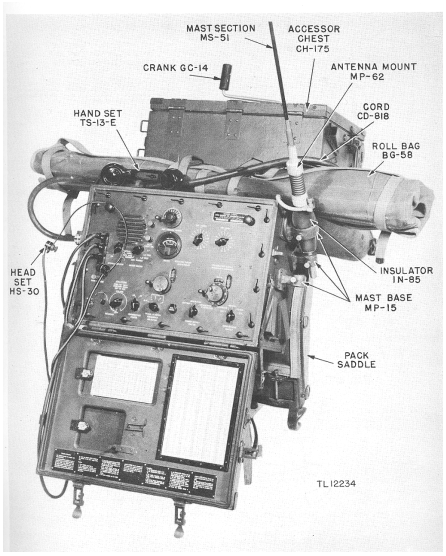
QM pack troops ("mule skinners") lead mules through a swift river that impeded their progress in Burma (November 1944).

On the technical side, the SCR-583 radio set consists of four major components: a BC-1209 receiver and transmitter, a PE-152 power unit, a PE-154 power converter, and a CH-175 accessory chest (antenna, battery, GN-54 hand generator, filter unit, key, handset and spare parts). It has a frequency range of 2.2 to 4.6 MHz, operates in cw or voice, uses a.m. modulation and, depending on the type of operation and power, has a range of 10 to 80 miles (8 to 40 watts). The receiver is of the superheterodyne type with an IF of 455 KHz.

In order to protect the equipment against moisture penetration, elaborate precautions were taken to seal components with gaskets and caps. Thus, the equipment could be operated in a driving rain and the chest containing the receiver and transmitter, when closed, could be immersed completely in water for a short time.

For pack saddle operation, the receiver/transmitter chest, the accessory chest and a roll bag were mounted on a Phillips cavalry type pack saddle.

BC-1209 receiver/transmitter.



The SCR-583 mounted for pack saddle operation. Total weight (less pack saddle) was approximately 165 pounds.

Unfortunately, we presently own just the BC-1209 receiver/transmitter. However, I'm sure Ray Chase (and hopefully the NJARC membership) will be on the lookout for additional components. But the main component itself will make an interesting display, especially when linked to a unique and little known aspect of WW II.

HOMEBREW EQUIPMENT CONTEST

"BASKET CASE" RESTORATION CONTEST

Now that the BCB DX contest is over, it's time to consider two additional challenges scheduled for 2014 - a homebrew equipment contest and a "basket case" radio restoration contest.

The objective of the homebrew equipment contest is to preserve the tradition of building your own electronic equipment. Judging will be at the regular July meeting.

Category 1 - Primitive Receivers
The signal path of the radio may use no more than two tube functions or two discrete transistors. Solid-state diodes may be used for detection as in a crystal set or reflex circuit. Any convenient power supply may be used, and may contain additional vacuum tubes or semiconductors.

Category 2 - Beginner
Same rules as Category 1. Contestant has never made a serious attempt at building a radio from scratch.

Category 3 - Open
Any recently constructed homebrew radio receiver or transmitter.

Category 4 - Vintage Reproduction
Faithful reproduction of a 1920 to 1939 homebrew radio.

Category 5 - Tube Audio Equipment

General Contest Rules:

1. The contest is open to NJARC members only.
2. Entries are limited to "scratch-built" radios as opposed to kits or modified production sets.
3. Entries must have been recently constructed by the contestant. Receivers must be capable of receiving at least one station.
4. Contestants should be prepared to demonstrate their creation and say a few words about the design and construction of the radio.
5. The membership in attendance will vote for the best entries in each category. Prizes and certificates shall be awarded to the winners.

Basket Case Restoration Contest

This contest was suggested by president Richard Lee and was featured at the 2011 Antique Wireless Association Convention. It may not be everyone's cup of tea, but it's worth a try.

The contest was first established nine years ago by the SQCRA based in Quebec, Canada. Members of this enthusiastic group of collectors take a basket case radio and in a one year period restore it cosmetically and functionally to its former glory. Our contest will run for a shorter period and the final "due" date may be extended if required.

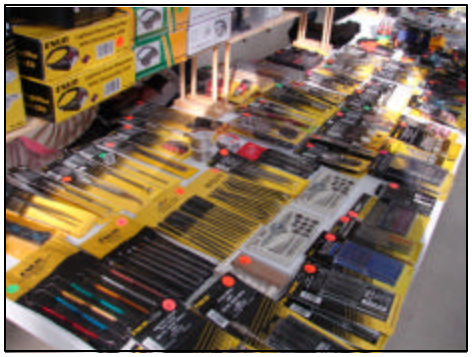
General Contest Rules

1. A minimum of three photos of the "before" condition will be provided - an exterior cabinet view, a rear chassis view and an under chassis view.
2. The restorer shall provide a short, written description of the radio's original condition and challenges faced during the restoration. The more complete the description, the better a chance of a higher rating.
3. Photos of the "after" condition of the areas of the radio that are not observable (i.e., under the chassis) shall be provided.
4. The radio shall be operational.
5. Since the entries are not expected to all be at the same level of disrepair, consideration will be given for the level of difficulty. For example, if a mouse has chewed the oscillator coil and it has to be rewound, this represents a level of difficulty higher than simply replacing capacitors to return the circuit to operation. This is why good documentation is important.

PARSIPPANY SWAPMEET WELCOMES SPRING

By
Marv Beeferman

Another sold out NJARC swapmeet welcomed Spring on March 22nd at the Parsippany PAL. President Richard Lee reports that buyer attendance was brisk and we should wind up well in the black. Thanks to Richard and all the volunteers who made the swapmeet a success. As usual, member Bob Bennett has provided a five minute video of the activities at his "Radiowild" website on YouTube. Bob noted that "the NJARC swapmeet was just what the meteorologist needed to warm things up." You can also get the flavor of the day from the following photo journal.









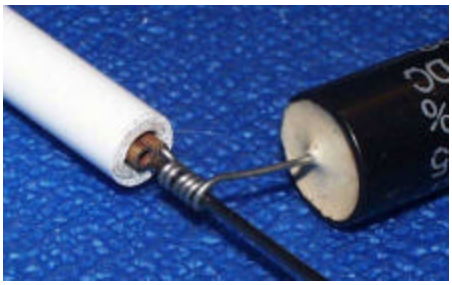



TECH TIPS

By
Marv Beeferman

In the March issue of the *Broadcaster*, I discussed the work I would have to tackle in restoring a Hallicrafters T-505 television. Among the considerations was the replacement of 35 paper capacitors. For most of us, capacitor replacement is pretty straightforward. The old capacitor is cut out, leaving the original leads as long as possible. Then, the new capacitor leads are wrapped around the original connections and soldered in place. This is usually the best method to avoid the mess associated with desoldering the capacitor from its termination points and also prevents heat damage to nearby components.

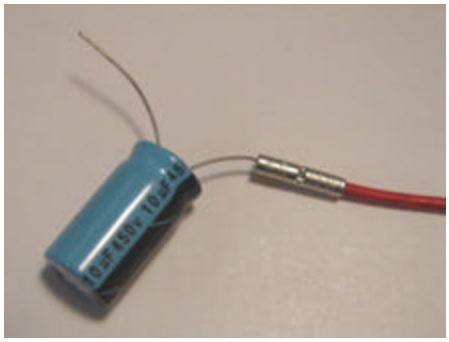
Other methods are described by NJARC Technical Coordinator Al Klase at http://www.skywaves.ar88.net/. (Select RADIO/MAINTENANCE/Component Replacement). One method is described by Al's instructions for constructing a tool once offered by a major capacitor manufacturer many years ago that forms spiral pigtails on the leads of the replacement capacitor.



Al Klase's pigtail tool.

However, another method I am considering is to use uninsulated butt connectors, which take solder very well, to join the lead ends. This would also avoid overheating original components and wiring while trying to desolder old connections. Uninsulated butt connectors are available almost anywhere; I found a 20 pack, ten 22-16 and ten 16-14 gauge at RadioShack (P/N 6403036).

An interesting side note in the "great minds think alike" category was the restoration of a Meissner set by well-known writer Marc Ellis in the December 2011 *Monitoring Times*. I came across the article about two weeks **after** I thought about the butt splice idea (honest!). Marc used the same method to replace capacitors in his restoration and is a common practice in much of his work.



Using an uninsulated butt connector for capacitor replacement. No crimping is required; the connector takes solder very well and provides a very clean look.

In tight spaces that contain a jumble of uninsulated leads, you might consider deferring to insulated butt connectors to avoid possible shorts. In these cases, it becomes almost impossible to insulate exposed leads and solder the connections to the replacement at the same time. The only drawback is to have enough space available for use of a crimping tool.

Insulated butt connectors offer another possible solution.

I can't take any credit for the next tip, but I thought it was worth passing on. I found it in the "Hints & Kinks" section of the September 2001 issue of *QST* and submitted by Michael Tracy.

Michael had become very frustrated with currently available desoldering tools. He noted that desoldering braid works reasonably well most of the time, but doesn't always get all the solder out of a plated-through hole. "Solder-suckers" provide plenty of vacuum, but you must either remove the iron before applying the suction (so the solder cools some) or put the iron and suction device on opposite sides of a circuit board.

Another common method is a "bulb" type desolderer. These come in two varieties - just the bulb by itself and a version using a hollow-tip pencil soldering iron with a bulb attached. Unfortunately, these do not produce very much vacuum, so they don't always get all the solder out of the "nooks and crannies." The second type however does get heat and vacuum to the same point.

Some common "solder-suckers."

One of nicest pieces of equipment is a desoldering station that has a pencil with a heated hollow tip and a motorized vacuum pump. In lieu of this expensive alternative, Michael came up with a reasonably-priced solution that he says works quite well. He took a bulb-type desoldering iron, removed the bulb and replaced it with a solder-sucker connected via some flexible, 1/4-inch plastic tubing.

Your editor's "improved" solder-sucker. I used 1/4" ID clear vinyl tubing. For a more permanent connection, stainless steel hose clamps could be used to hold the tubing in place.

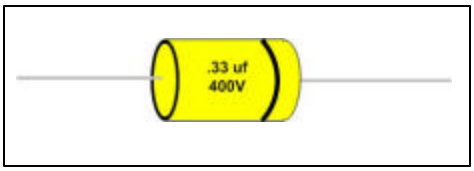
After trying it out in a few "test" applications, I must agree that this improved version does work quite well. Mr. Tracy admits that the result looks a little weird and also makes desoldering a two-handed job. However, to make the process a little less cumbersome, I found it best to mount the solder sucker in a heavy frame which limits its movement and makes it a lot easier to reset it after each use.

Finally, while on the subject of capacitors, although not exactly a "tech-tip," I thought that I might address a posting by one of our members, Louis Shirley, regarding polarized capacitors. Louis wrote:

" I've replaced the caps on my Philco 38-12 and she now works just fine. But the issue of the black band on the old caps has me curious. Does correctly placing the outside foil on the ground or low impedance side of the circuit actually reduce hum in the circuit with the caps we have available these days?"

Modern, non-electrolytic capacitors (mica, film, ceramic, etc.) are non-polar and you don't have to worry about which end to connect when replacing old paper capacitors, even if they have a black band. The black band indeed indicated the foil side which acted as a shield. When connected to ground (or lowest voltage), it helped the capacitor last longer since paper capacitors were very susceptible to damage from voltage fluctuations.

Today, polarized, non-electrolytic capacitors are primarily used in critical solid state and high-end amplifier circuits. In amplifiers, when used correctly, they can cut down noise generated internally in the amplifier by preventing interference from other components. As far as any noise considerations in the radios of yesteryear, "forget about it."



One of the better guides to capacitor replacement for the beginner may be found at the "Just Radios" website (http://www.justradios.com/captips.html). It provides, in non-technical language, guidance on how to choose capacitors and install them in tube radios. Any other input from our membership on the above topic is certainly welcome.

THE E.S. RITCHIE LOOP ANTENNA

By
Ray Chase

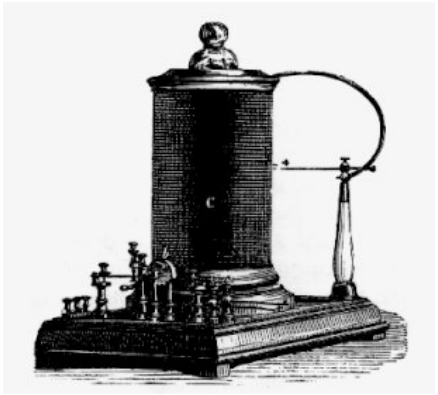
Last year, InfoAge received a batch of items and documents as a donation from an elderly gentleman who was downsizing. Included was a disassembled loop antenna. When reassembled, it turned out to be a quite large commercial loop that I had never seen before. The rectangular loop stands 60 inches high when mounted in its heavy, cast iron base. It measures 36 inches wide by 50 inches high.

The gentleman who donated the antenna had worked in radio and electronic instrumentation and had been a DX enthusiast but he said he never used the loop; it was used by his father and handed down to him. It has a brass plate on it with the name E.S. Ritchie & Sons, Brookline Mass. A little research into this company turned up a very interesting story.

Edward Samuel Ritchie (1814-1895), an American inventor and physicist, is considered to be the most innovative instrument maker in 19th century America, making important contributions to both science and navigation. In the early 1850s, he examined an example of an electric induction coil made by German instrument maker Heinrich Daniel Ruhmkorff. The coil produced a small, two-inch spark when energized.

Ritchie perceived that it could be made more efficient and produce a larger spark by redesigning and improving its secondary insulation. His first induction coil produced a spark 10 inches in length; a later, perfected model produced a bolt two feet or longer.

In 1857, one of Ritchie's induction coils was exhibited in Dublin, Ireland and later at the University of Edinburgh in Scotland. Intrigued, Ruhmkorff procured a sample of the Ritchie coil and used it as a basis for revising his own design. The German inventor was later awarded a scientific prize by Napolean III. Disappointed in not receiving recognition for his improvements, Ritchie turned his attention to navigational instruments.



Ritchie's improved Ruhmkorff spark coil.

Ritchie began making marine bearing compasses for the U.S. Navy before the Civil War and went on to patent the first successful and practicable liquid-filled marine compass. His company, specializing in manufacturing nautical equipment moved to Brookline in 1866. Following Ritchie's death, it was incorporated as E.S. Ritchie & Sons in 1939 and continues operation to the present day as Ritchie Navigation in Pembroke, Mass.

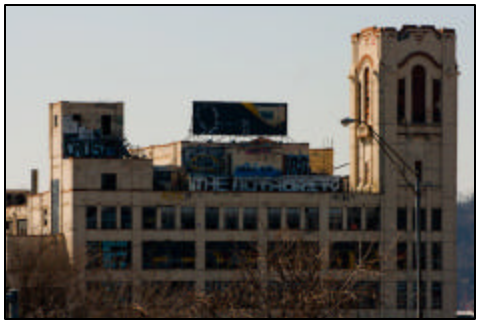
My speculation is that during the radio craze of the 1920s, the company made an attempt to manufacture radio accessories but did not stay in this aspect of the business long - I have never seen a Ritchie radio product nor associated advertising. I had the loop at the November club meeting last year but did not get a chance to try it out. It will be a nice addition to our Radio Technology Museum when we get to expand into new quarters.

CROSLEY - THE END OF AN ERA

Suggested by Ray Chase

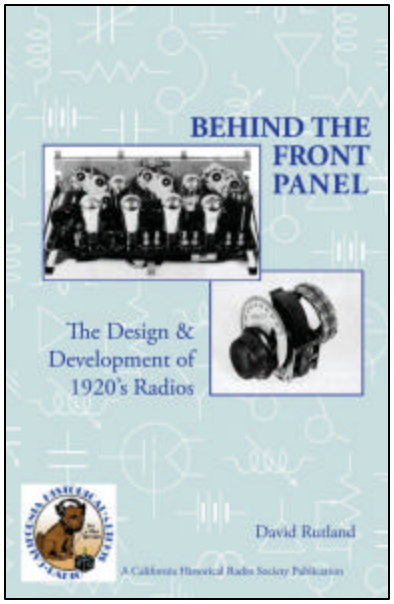
Pre-WWII, there were few Midwesterners more industrious and successful than the Crosley brothers, building an empire including everything from radio to refrigeration, professional baseball, and automobiles. Their headquarters, the Crosley Building, is a ten story light industrial facility located in the Camp Washington neighborhood of Cincinnati, Ohio. Today, the headquarters sits in a state of decay. A Cincinnati photographer, Zach Fein, has preserved what is left on film. The ornamentation of the Crosley Building is based upon the art deco style, a very new and trendy style in the late 1920's. This detailing is visible on what is left of the street level façade, as well as on the tower.

The studios of WLW and a handful of other broadcasting stations owned by the Crosley Corp. were housed on the top floors of the building. The lower floors of the building originally served as manufacturing and production facilities for Crosley radios and other appliances. The future of the building seems unsure; there are talks of redevelopment and even urban farming, but as of now, it sits in disrepair.



RECENT READING

By Marv Beeferman



This book by David Rutland was first published in 1994; it has been reissued by the California Historical Radio Society following the author's death. I obtained my copy from the Antique Radio Classified bookstore; it's also available through Amazon. Quoting the back cover: "This book is your guide to the old radio designs and the parts that made them possible. It will give you a greater appreciation for the parts and circuits inside the radios you see and collect."

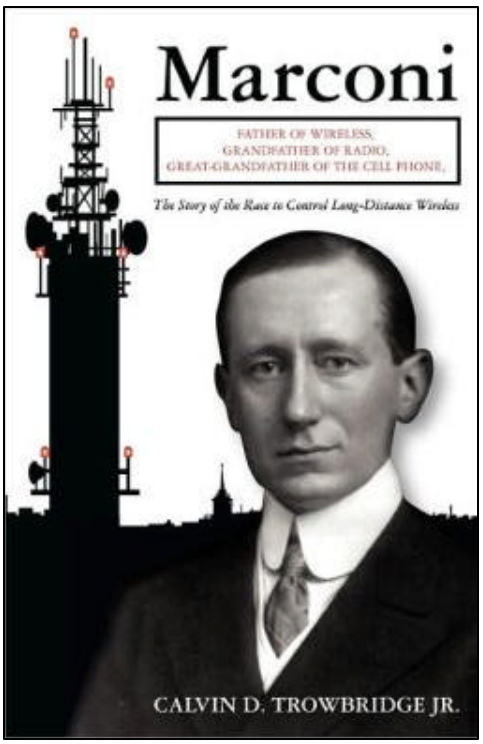
In his preface to the original edition, the author noted that, as an electronics engineer, he began to wonder how the antique radios that he was collecting differed, not from external appearance, but from the electronics inside. Unlike many of his fellow collectors, he looked more closely at the "innards" than at the cabinet. He quickly found that each radio had its own unique circuit and component layout and his curiosity was raised sufficiently to start on a research program as to the how and why of the circuits.

There are many reasons why I recommend this little book. One would have to read through numerous resources to obtain the design information of the many types of 1920's radios packed into 158 pages. Through simplified descriptions and illustrations that are supplemented by 25 photographs of actual radio component parts, we learn about the workings of crystal sets, neutrodynes, TRF's, special TRF's, shielded TRF's, reflex circuits and the superheterodyne. There are also interesting chapters on the mechanics and electronics of one-knob control, audio frequency amplifiers, and the replacement of batteries by AC.

I also appreciated the fact that Mr. Rutland took his design examples from over 45 actual radios manufactured in the decade, many in my own collection. Here we see the Radiola III, the Grebe CR-13, the Tuska Superdyne, the Browning-Drake, the Grebe Synchrophase, the Crosley Trirdyn and the Radiola AR812.

Another advantage for collectors that do not have an extensive electronics background is that the schematics in the book are simplified, emphasizing the flow of signals through the circuit but neglecting less important aspects. For example, the batteries and circuits that provide power to filaments are not shown. Another degree of clarity is obtained by showing separate batteries for each tube whereas, in a radio with more than one tube, a practical circuit would combine these into a single battery. Finally, circuits are arranged in order from the more basic up to the complete radio, going from the simple to the more complex.

This book comes highly recommended by your editor; it is well worth its modest price.



This book was recommended by member Ray Chase in a recent posting. He found it written very much like a novel, not very technical and including a lot of information about Marconi's personal life. Ray says it gave him a different "insight" into the man. One reviewer wrote: "It wasn't the money that beckoned and urged him to work so hard. It was the delight he took in the repetitive trials, the incremental advances, and the constant edge of discovery that drove him."

The same reviewer notes that although Trowbridge's narrative is dense with detail, "his style remains engaging and a delight to read." Besides the usual historic details about connections to WW I, the Edwardian era, involvement in Italian politics, the sinking of the Titanic and confrontation with the U.S. Navy, this well written book weaves threads of suspense into every chapter. In the back of my mind, I kept seeing visions of Bill Gates and Steve Jobs.

Some readers may be disappointed by the book's lack of photographs and illustrations; for me, it didn't seem to matter.

I learned about this book in a review by Ludwell Sibley in the April 2014 (Vol. 16 No. 2) edition of the *Tube Collector* (bulletin of the Tube Collectors Association). The author warns the reader that it is not a step-by-step instruction book and that its contents are basically meant to serve as inspiration for anyone who is interested in designing and building practical tube testers and useful tube equipment.

For anyone who is interested, I can provide the full version of Ludwell's review. But for the time being, here are the high points:

- Appreciable space is devoted to basic tube theory, but with a more insightful and visual approach than that of classical textbooks.
- Considerable attention is given to construction techniques for building gear of all types with present-day parts and tooling...Numerous crisp photos depict gear built with expert parts layout and wiring.
- As for the featured tube-test fixture, the market for TV-7D/Us is in no danger. As far as tester history goes, the new book nicely supplements, but hardly replaces Alan Douglas' *Tube Testers and Classic Electronic Test Gear.* It goes into old-time testing methods and testers (the Hickok line, General Radio bridge, Heathkit, "drugstore," etc.).
- A goodly part of the book covers the design and construction of variable/regulated power supplies for use with the test jig.
- *Make Your Own*...is not the crispest possible presentation of the contents, being freighted with quotations from non-electronic sources (John Keats, Mark Twain, et al.) and other philosophy. Still, it is a useful contribution to the "literature" of tubes.

At a price of $35, I can reasonably speculate that most members would not be interested in this book. However, if you look at it from the standpoint that you won't be building any of the projects it contains (definitely not for neophytes) and are willing to pick through the information it offers, you can gain a much better insight into vacuum tube theory and what tube testers actually measure. There's also a very nice section on construction techniques like making holes in aluminum and stainless steel chassis, working with acrylic and polycarbonate plastics, producing graphics, etc.

DECIPHERING THE BLACK BEAUTY

The following information was found in "Popular Communications" for September 2012. It was included in Peter Bertini's article on restoring an SX-101A receiver...Ed

Restorers normally use a radio's schematic and manual to verify parts values. However, in some cases, engineering changes are not documented and finding a schematic that precisely matches a particular chassis may be difficult. In many cases, like Hallicrafter products, this may be troublesome with regard to *Black Beauty* capacitors. Therefore, it is important to crosscheck replacement values prior to installation.

The color code used for *Black Beauty* capacitors is very similar to that used to mark resistors and other electronic components. The capacitor will show five to six bands, depending on voltage rating. (If the capacitor's voltage rating is more than 1,000 volts, two "voltage bands" are needed.) Black bands appear as dark gray to show up more clearly on the black capacitor body. The small solder nub at the end of the body indicates the outside foil but does not indicate the direction for the color codes...the nub can be on either end of the shell.

See if you can use the below table to come up with 0.22 uFd capacitor with a 20% tolerance and 200 volt rating that has the following bands: red, red, yellow, black (gray), red.

Color	1st Digit	2nd Digit	Multiplier	Tolerance	Voltage Bands Hundreds of Volts
BLACK	0	0	0	20%	
BROWN	1	1	10		1
RED	2	2	100		2
ORANGE	3	3	1000	30%	3
YELLOW	4	4	10,000	40%	4
GREEN	5	5	100,000	5%	5
BLUE	6	6	1,000,00		6
VIOLET	7	7			7
GREY	8	8			8
WHITE	9	9			9