

# SOUND WAVES

## VRPS Summer 2015



### *From the President*

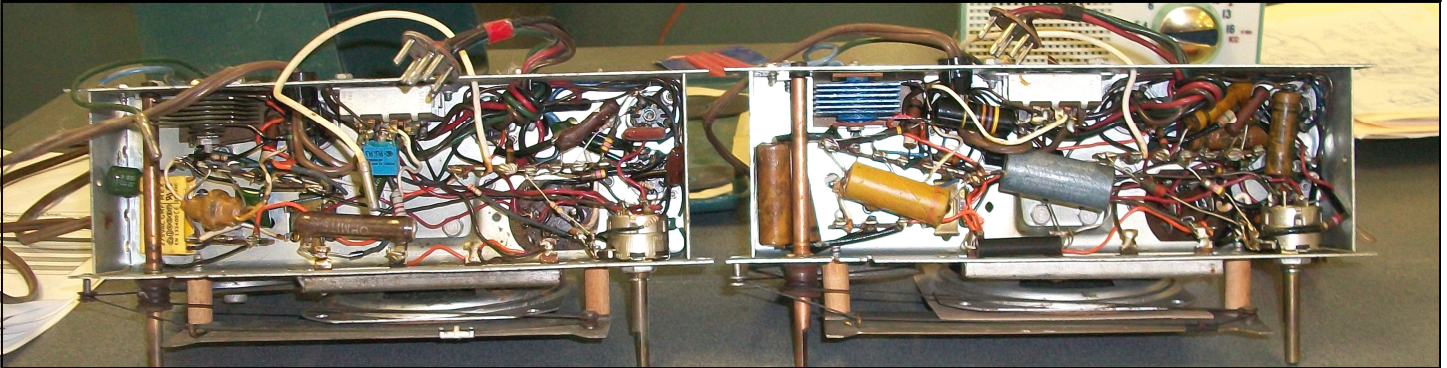
I am sure I say this way too often, but boy, time surely does fly. By the time you read this it will be July, and half of 2015 is already in the history books. Our spring auction and May swap meet were both success stories. Lots of neat collectibles found new homes. We all have busy schedules, but with a little effort, we can usually find ways to enjoy our hobby within those schedules. Between the March Spring auction and the May swap meet, my wife and I and our cohorts and friends, Randy and Jeannine James,

took off cross-country to a small town north of Sacramento, California. I had been contracted to sell a sizeable collection of radios at auction....in Texas.

Three weeks after returning to the metroplex, we held the auction in Garland. One week later, my wife and I took off on a 2000 mile cross country trip to Seattle....yep, Washington!! We hopped on a cruise ship and set off for the last frontier...no, not space, Alaska (bucket list)!! A week later we were back in Seattle. From there we headed north to Bellingham. I had been told if I ever get in the area, it would be worth my while to visit the Sparks Museum. Wow! I will not go into the details of the museum visit here - you can read about it elsewhere in this issue of the SoundWaves. We took another week to get home, making our way to Yellowstone (another bucket list item), then to Colorado. Unlike our best laid plans to visit Blake Dietze while in Washington, we were able to meet up with our long time friends Bill and Virginia Harris when we got to Colorado Springs. Bill was a long time VRPS member from the metroplex before moving 13 years ago to Colorado to be closer to kids and grandkids. Seeing his collection and experiencing their warm hospitality is always a treat.

We got home just in time to see the rain stop and the heat make a strong statement for what could be expected this summer. Since time does not stand still, neither can I. We have an auction planned in early July. Then it will be off to Chicago to attend the Antique Radio Club of Illinois Radiofest. As in prior years, I will be calling their opening auction. That will get me through summer, and I will not bore you with the details of my already full schedule for the third quarter of 2015. As in the past, I want to encourage you to get out of the city. Take a trip...hunt radios in new areas. Visit a museum, radio or otherwise. But, if you can swing it, make it to Chicago for this large gathering of radio collectors. Take care and be thinking about our Fall Convention.

—Jim



## Notes from the April 18, 2015 Meeting

Our new program organizer Larry Lindsey conducted our meeting, citing the fact our president and VP were off acquiring a big haul of about 400 radios to be up for auction in May. He reminded us that on May 21 we would be having only a swap meet, starting about 7 AM and running to about noon, with the usual club-donation auction at the end of the get-together. Larry then introduced Mike McCarty, our program presenter. Mike had prepared a presentation "Intro to Electronic Restoration" – one of a series designed to help people get started in restoring their own radios, regardless of their experience levels.

Mike had previously offered a free download of the presentation material, available from the club website link "Technical Information Center". Some members had brought their downloads with them for reference during Mike's talk. Mike quickly reminded everyone that there is no need for any knowledge of electronics in order to repair a radio. Only the mechanics of the process need to be known, while the detailed technical aspects of a radio can be left a mystery. He stressed the need for safety precautions since potentially lethal voltages are going to be present in the process. One should preferably start out with a simple 5 or 6 tube AC/DC radio. To guarantee success, all of the capacitors (with the possible exception of mica types) should be replaced as a sweeping event. This can eliminate the situation of having to troubleshoot the radio later, when you still do not have troubleshooting experience. Besides, old capacitors may fail sooner or later. The resistors should also be tested, and any that are out of tolerance should be replaced. While you are doing the parts replacement you should close the plates of the tuning capacitor, which are vulnerable to being bent. Another good idea is to cut a circular piece from a cardboard box and to tape it over the speaker to keep holes from accidentally being punched in its cone. You should keep magnetic materials away from the speaker magnet, e.g. steel wool. Use the abrasive pads sold for kitchen use, instead. (It's good for miniature tube pin cleanup.) Use heat-shrink or plastic tape to re-insulate component wires, as needed.

Once the radio is re-capped, it is time to (safely) try it out. Your outlet should be tested to be sure it is properly wired (Outlet testers are available at any hardware store). An isolation transformer will help assure your safety. Mike displayed a box that contains a lamp, switches and an outlet, for getting a radio powered up for its initial trial. (It's also useful in many ways for troubleshooting). It places the lamp in series with the outlet to limit the current to the radio to a safe level, preventing serious results (i.e. smoke) from shorts or miswiring. It is easy to construct such a box from parts available at any hardware store. One switch is ON/OFF; the other bypasses the lamp for full output. The lamp can be changed to different wattage ratings to modify the limiting current. The brightness of the lamp indicates how much current is being drawn by the radio. A really bright lamp indicates the radio is drawing too much current, whereas most radios will actually play with a 100 watt bulb, which barely glows if at all.

Mike displayed two identical radios, one of which had been restored, and the other not. The new capacitors really stand out. He reminded everyone to make sketches, take pictures, make notes as to what was done, and when, and keep a folder for the radio. He also stated that a tube tester is not needed as other members can do the testing, or you can buy tubes that are known to be tested. Also, if a tube tester indicates that a tube is BAD, it probably is, but the tube will not necessarily work in a radio if it tests GOOD.

Authors Note: The Intro to Electronic Restoration download goes into much more detail, and previous presentation materials are also on the club website, including a discussion about radio components.

Bill McKeown

## May 16th Swap Meet



05/16/2015



**Convention Update** — Book by **November 6th** to reserve your room! Reservation link available on   
 VRPS webpage ([www.vrps.org](http://www.vrps.org)). Check-in dates are November 19th –22nd. Rates are the same as last   
 year, that is:

- |  |  |
|--|--|
| <input type="checkbox"/> Double Suite, Non-smoking from \$106        | <input type="checkbox"/> 1 DBL MOB/HEAR ACC W/Tub NS from \$86 |
| <input type="checkbox"/> 1 King 1 BDRM Suite, Non-smoking from \$106 | <input type="checkbox"/> 1 DBL ACC W/Roll-in SHWR NS from \$86 |
| <input type="checkbox"/> 1 King Bed, Non-smoking from \$86           | <input type="checkbox"/> 2 Double Beds Non-Smoking from \$86   |



SOUNDWAVES IS PUBLISHED QUARTERLY BY THE VINTAGE RADIO AND PHONOGRAPH SOCIETY, INC.

PRESIDENT—JIM SARGENT (972) 742-8085 BSARGENT@SWBELL.NET

VICE PRESIDENT—RANDY JAMES (817) 292-7435 RANDY-JEANNINE@SBCGLOBAL.NET

NEWSLETTER EDITOR—MARY ANN CARUTH MCARUTH@ATT.NET

WEBMASTER—MIKE GRIMES K5MLG@VERIZON.NET

VRPS WEBSITE [WWW.VRPS.ORG](http://WWW.VRPS.ORG).

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## Notes from the June 20, 2015 Meeting

Our club president Jim Sargent conducted our meeting. He reminded us that our July 18 Repair Session will be at a different time than usual, from 1 to 5 PM - because of a facilities conflict. He also mentioned his upcoming Sargent Auction Services auction on July 11. Jim then introduced our program organizer Larry Lindsey. Larry passed out another "IQ test" with multiple-choice questions for members to answer and hand in. He then introduced our program presenter Mike McCarty for another session in his series "Intro to Electronic Restoration".

Mike stressed the issue of safety, and how to help insure it, recommending that the first set you restore should be an AC/DC set having an isolated (non-chassis) ground. Mike's program emphasis was providing guidelines to see if a radio has any "show-stopper" problems, before investing your time and money. Prior to purchase, a few simple tests can be done to see if major components might need to be replaced, e.g. power transformer, output transformer or loudspeaker. A 9 volt battery and a simple multimeter (such as one you got from Harbor Freight) will allow you to do these tests, assuming you can get permission to slide the chassis out. First, the meter will let you do an ohmmeter test between the power cord pins, with the power switch turned ON. Mike had brought an AC radio and its replaced power transformer to demonstrate meter readings while projecting an image of his multimeter on a projection screen. The displayed values for the radio and the transformer primary windings were 9.4 and 8.2 ohms. These values fall within the normal 5 to 20 ohm range for a radio power transformer. (For an AC/DC radio, the filament string resistance is typically 60 ohms or more, assuming the radio does not have a tube with an open filament).

If the radio has a speaker plug, some tests can reveal a number of things. Searching between the pins of the plug, the output transformer resistance will be around 600 ohms, or 1000 ohms for a push/pull output stage. For a push/pull output transformer there will be three pins that show conductivity, with one reading adding up to the sum of the other two. If the speaker has a field coil, it will read from around 1000 to as much as 10,000 ohms. Using the 9 volt battery and some clip leads, you can touch the 9 volts to the primary connections for the output transformer, or to the voice coil itself. A click should be heard, even from a speaker that has a field coil, since there is always some residual magnetic field in the iron. These tests will have checked the output transformer, the voice coil and the field coil for an open-circuit condition.

If you have gotten to this point and have purchased the radio, the next step is to carefully apply power in a controlled and safe manner, first to find out if the power transformer produces high voltage (around 700 volts or so). First remove all tubes and pilot lamps. Be sure to clip your meter leads to the test points *before* applying power, so you can keep one hand safely behind your back. Connect one lead to ground and one to the rectifier tube pin that is wired to the high voltage winding of the transformer. Mike's demonstration setup included a Variac (optional) and a series light bulb box (described in a previous session). He demonstrated that a 40 watt bulb would glow dimly as the Variac voltage was brought up to full voltage, and a 100 watt bulb was just barely warm. The same test on the replaced power transformer showed a dramatic difference with either lamp glowing quite brightly. It has shorted turns, no doubt – probably in the high voltage winding.

*continued on page 7*



## Exploring the Catacombs of RCA

by Larry Lindsey

I bought a 1927 RCA Radiola 32 console a couple of years ago. It was a huge piece of furniture that was 52 inches tall and 37 inches wide. They only made 7000 of these radios which cost a whopping \$895.00 (\$11,700 in today's money). At the time, you could buy a new Model T Ford Roadster for \$260.00.

I repaired all four onion shaped lower feet, which had missing pieces that had separated at the glue joints, as they always do. I now had a new piece of furniture but the radio didn't play so I started checking and found that the speaker, which weighed over 40 lbs., was open. I was able to rewind the speaker and get it working but the radio was still silent, even with good 199 tubes.

This radio had, what RCA called, a catacomb. I learned that it was a box full of coils and transformers that were entombed in wax from the factory and the top had a lead seal. The entire purpose was to keep wannabe repairmen, like me, from going any further and just order a new one from RCA. If that lead seal was broken, whatever warranties existed, went out the window. Today, the chances of getting a new catacomb from RCA are about the same as getting a new Model T from a Ford Dealership, so I had a problem to solve.

Sometime earlier, Jim Sargent had given me a large stack of old Antique Radio Classified magazines. I had cut out all the interesting articles and filed them for future reference. I remembered an article on how to check out catacombs by checking the 13 wires that led to the box. I found the article, started making the continuity checks according to the directions, and the results weren't good. I had several open circuits. I found another article on how to repair catacombs so I began to try and expose the long buried components.

After carefully marking the wires and making a diagram, I unsoldered all the wires. I then removed the metal box from the radio and used a narrow putty knife to separate the box from the wax. To my surprise, I was able to remove the box from the block of wax and it's components. I hung the assembly in a large oven that I use for

powder coating and placed a shallow aluminum pan underneath to catch the drippings. I ran the temperature up to 400 degrees, let it cool and opened the doors to find that it had done an excellent job of wax removal. The remaining components were completely exposed with only a small film of residual wax remaining. Don't try this on Atwater Kents' version of a catacomb because they use a tar-like potting material that melts at a much higher temperature than the 250 degree Radiola wax.

The next step was to repair the opens, but as hard as I tried, I could not find an open in any of the components. The only logical explanation was that the troubleshooting chart was wrong or that chart didn't match my radio. The bad news--I had done all that work for nothing. The good news--There were no opens.

I reinstalled the catacomb, checked a bunch of other things but soon realized my skills had run out and I needed professional help (no comments please). Since the chassis and other components were all built into the cabinet and would be a nightmare to remove and take to someone, I asked Dick Morgan if he could take the whole radio and have a look. He agreed and I delivered the radio.

The worst words any electrical or electronic repair shop can hear from the customer are "I've been working on it and it still won't work". Who knows what has been changed or altered. Sure enough, Dick found that I had made a wiring error when I re-installed the catacomb and then went on to find I had some resistor problems and a few other things that needed fixing. The bottom line is, I now have a playing radio that I'm proud of.

I had some successes and I had some failures on this radio but I ended up smarter than when I began. Henry Ford once said "failure gives us the opportunity to begin again more intelligently" and he should know because he failed two times, in the automobile business, before the Model T. Dick Morgan must have failed a lot.

An advertisement for a "Dick Tracy Wrist Radio". On the left is a black and white illustration of a man in a trench coat and fedora, holding a wrist radio. The text on the right says: "DICK TRACY WRIST RADIO! NO BATTERIES! NO TUBES! NO ELECTRIC! IMAGINE A RADIO you strap around your wrist! That's the DICK TRACY RADIO, designed for complete enjoyment of your favorite radio shows, sports, music, etc. Built especially to end forever the need for batteries, tubes, electric. Follow simple instructions. Everything you need included. Order your DICK TRACY WRIST RADIO today. Only \$1.98, plus 25¢ for postage &amp; handling. Captain Company, Dept. MW-5 Box 6573, Philadelphia, Pa. 19138".

## A Visit to the Spark Museum of Electrical Invention by Jim Sargent

If you consider yourself a true collector of early electronics or mechanical musical apparatus', you probably already know I am a strong proponent of visiting places outside of your own home where others have gathered similar collections. That includes flea markets, personal collections open to viewing, radio and phonograph shows or conventions, and museums, which have significant displays of these artifacts. I have been fortunate to be able to travel to both coasts over recent years, visiting all of the above mentioned hideouts of radio and phonos and even early mechanical "stuff". My latest opportunity came when my wife and I decided to drive to Seattle to embark on a cruise to Alaska. Driving allows us the opportunity to see this beautiful country, stop at flea markets and antique malls as they appear on the roadside (or internet search), and visit local museums.

One such museum I had been given "must see" instructions to attend by fellow collector, Dave Moore, was in Bellingham, Washington. Now granted, Bellingham in relation to Texas is not a short hop down the road...even by Texas standards. However, Dave has traveled widely and has never given me bad advice on such locations. The Spark: Museum of Electrical Invention was a wonderful experience. We took copious pictures, some of which are included here. This is a good-sized professional museum, but, at the same time, it has the flavor of a small hometown museum. I know that seems like an oxymoron. There are several on-site workers and volunteer docents to show you around, or you are welcome to browse on your own. Picture taking was welcomed. We were there on a Friday afternoon for several hours, and it would have been nice to spend several more....but time is so fleeting. I was fortunate to meet and spend an inordinate amount of (his) time with one of the museum founders and curator, Jonathan Winter. What an enjoyable and pleasant man! His passion for the hobby was evident from the get-go. This multi-floor building housed electrical artifacts spanning centuries of inventions and developments leading to the electrical world we live in today.

You can see very early telegraph from Morse and Vail, an Edison's stock ticker, and even the very rare stock "transmitter" that was used to send out the quotes. Plenty of the stock tickers are available for viewing in collections, but it is rare to see the other end of the "quote". Radio collectors would equate it to having a house full of broadcast radios nicely displayed and maybe one (if they are lucky) professional broadcast microphone on display. My interest in radios is the early development of the science. This museum is full of items that I have only seen in pictures or previously in other museums. Like the 1909 Collins transmitter and the custom designed horn speaker owned by David Sarnoff, I saw several items that were originally

a part of the Dr. Ralph Muchow collection. This collection was sold at auction in the year 2000. I attended that auction and saw them sell...now I know where they call home.

Many of the very fragile and rare items are under glass....many are not! That is what I guess impressed me the very most was the hands on encouragement visitors were given. Of course, if taking smaller kids to view this outstanding collection, some caution should be exercised when handling things like the hundreds of early tubes on open display. Wind-up phonographs were present and accessible to visitors to hear sounds recorded over a century ago...like the speech by Theodore Roosevelt from 1902. This was not a copy but an original cylinder record. How cool is that! Another aspect of this museum that impressed me is that this is a teaching museum. School groups are encouraged to attend and sit in a classroom environment and "learn" by seeing, touching, and even making their own small motor or crystal radio. A working ham radio station, complete with early and modern working equipment, was accessible to licensed operators.

Jonathan and his co-curator, John Jenkins, started the museum several years ago in a smaller location, finally settling on this main street location in Bellingham. Their combined collections formed the original basis for the museum, but donations and purchased of items over the years have expanded far beyond that. For example, the replica layout showing the radio room of the Titanic is awesome. I have only seen such a great replicated display at the AWA museum outside Rochester, New York.

If you are going that direction, plan your time to be there around a weekend. On Saturday and Sunday, the museum has a special treat for visitors when museum workers fire off The MegaZapper. This is one of the largest Tesla coil "lightning machines" in the country. Adult visitors (18 years of age and older) can enter the Lightning Cage and get up close and personal with 4 million volts of loose electricity!! Sadly we were not able to hang around the extra day to catch the show. We did see smaller (but impressive) RF generations of electricity, i.e. a Jacobs ladder, in operation.

I encourage you to plan on spending at least 3+ hours if you ever get the opportunity to visit his exciting and educational museum. You can read more about the Spark museum at their website, [www.sparkmuseum.org](http://www.sparkmuseum.org)

*[Editor's Note: The link above would not open for me, but there is an interesting article about the museum on Wikipedia at [https://en.wikipedia.org/wiki/SPARK\\_Museum\\_of\\_Electrical\\_Invention](https://en.wikipedia.org/wiki/SPARK_Museum_of_Electrical_Invention)]*

*continued on page 7*

Photograph from Spark Museum



## Notes from the June 20, 2015 Meeting (continued)

Next, measure the various filament winding voltages, expecting them to be somewhat higher than when the transformer is actually loaded, with the tubes installed. Measure the high voltage winding, but check it only  $\frac{1}{2}$  at a time. This will reduce the stress on your meter and will be safer. The high voltage readings were 339 and 340 volts for the demonstration radio. Record all voltages, the test conditions (e.g. line voltages, tubes removed) and add them to your folder for the radio, with the date.

Next, replace all caps and out-of-tolerance resistors before installing the tubes and powering-up the radio. Connect the bulb box with a 40 watt bulb and (optionally) Variac, switch on the radio, and bring up the voltage over a couple of seconds. (A Variac lets you observe the warm-up process better). As Mike demonstrated, the light bulb starts out bright, because of the cold filaments and filter caps, gets dimmer and then brighter again as the tubes warm up and start drawing plate current. An AC/DC radio causes the bulb to start bright and grow very dim as it warms up. The result will vary, and low current radios such as AC/DC/Battery sets will not cause the bulb to glow at all. Most radios will actually play with the 100 watt bulb in series.

Authors Notes: The VRPS website downloads go into much more detail, and include previous presentation materials. It is interesting that the bulb box regulates the power division between the light bulb and the connected load. The tungsten filament of the lamp changes resistance over a wide range (about 15/1) depending on the voltage across the lamp. So the total power varies with the load and the lamp wattage rating, but is always about  $\frac{2}{3}$  to the load and  $\frac{1}{3}$  to the lamp.

—Bill McKeown

VRPS, INC.  
P.O. BOX 165345  
IRVING, TX 75016

# SOUND WAVES

## MONTHLY MEETING PROGRAMS 2015

**NOTE:** Programs will be held at various locations in Irving, Texas. Make note of the location as they may change from time to time. Senter East, 228 Chamberlain St.; or Garden and Arts, 906 S Senter Rd. Maps are located on the WEB site, EVENTS page. Programs start at 2pm. unless otherwise noted. Call us on the cell tellie if you get lost: 972-898-7251 or 972-742-8085.

July 18, 2015 Senter East Building note time start of 1pm.  
Annual repair session. Bring your troublesome projects for expert help.

August 15, 2015 1pm to 5pm Senter East Building, Live Demonstration of 3D printing by Mike Moussa, PE of PartSnap in Irving Texas. Please bring items to let him examine and see if they can be reproduced.

September 19, 2015 8am to Noon Senter East Building, Swap Meet

October 17, 2015 1pm to 5pm Woodturners of North Texas will bring two lathes and demonstrate turning techniques. Bring your console legs, knobs, and any other objects to be reproduced.

November 20,21, & 22, 2015 Annual VRPS Convention @ The Hampton Inn Suites (see page 3 for details).

Programs are subject to change, contingent on scheduling conflicts. If programs do not fit your needs and you want something different, let us know. We need volunteers to organize other programs, so consider presenting a program yourself. Call anytime or send an email: Larry Lindsey 817-312-8761 to discuss.