SoundWaves

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VRPS Fall 2017

From the President

We are in the waning days of the Summer of 2017…and some of us would say good riddance. Funerals, hurricanes, and illnesses have played havoc the last few months on some of our members and families. But it is time to move on, as we are now in the last stages of planning for our annual convention. As you no doubt know by now, after 17 years at the Hampton Inn and Suites in Mesquite, we have decided to move north to Plano where the Comfort Inn and Suites has offered to host our convention. Actually, the change in venue gives us a chance to re-think how we do some of our fairly common activities; example - lunches on Friday and Saturday were historically handled by the hotel food management. The Comfort Inn, while it does have the typical breakfast for a Choice Hotel, does not offer food options for lunch and evening meals. Here is where we become creative. A member suggested food trucks…yep, the mobile cooking "cafes" will give us an opportunity to bring meals to the hotel so our members will not be forced to go in search of a local eating establishment. By the way, there are numerous such places within a mile radius of the hotel. The Saturday evening awards banquet will also be catered. That is actually good news for a lot of folks who do not like paying for the high-priced hotel banquet food. It is our intent to keep the price at or below $20 each so everyone can attend. Of course, we will have entertainment, so plan to join us. Oh, and not to downplay our contest and auctions…the staple of our convention, you will need spruce up your contest entries and show off your prized collectibles. If you want to send in photos of any auction highlights you will be bringing to sell, send them to Mike Grimes via email. He will see that the pics are posted on our website. I look forward to seeing each of you in November. Until then, good hunting.

— Jim

Pridham (L) and Jensen in the Napa lab, 1911

Convention Theme: Magnavox

History of Magnavox

Peter L. Jensen was born in 1886 in Denmark. He began working in the laboratory of Valdemar Poulsen soon after Poulsen's public demonstration of the telegraphone at the 1900 Paris Exhibition. Jensen helped Poulsen develop his continuous wave arc transmitter that made voice transmissions from a radio station at Lyngby near Copenhagen in 1905. Jensen came to America in 1909 to help develop the Poulsen Wireless Telephone and Telegraph Company financed by Pal Alto investor Cyril F. Elwell to compete with General Electric's system based on the Fessenden patent. While building a radio station in Sacramento, he met Edwin S. Pridham who had an electrical engineering degree from Stanford and was working for the Elwell company. Pridham helped Jensen learn English and American history. When the Elwell company was reorganized into the Poulsen Wireless Corp. and the Federal Telegraph Corp., Pridham and Jensen left and joined the new Commercial Wireless and Development Company of Richard O'Connor, supporter of Gov. Hiram Johnson. Jensen and Pridham moved to Napa Feb. 22, 1911, and began a small research laboratory. They experimented with Poulsen's arc radio transmitter, adding thicker wires connected to a diaphragm, and putting a coil of copper wire between magnets. They made a working model of what they called the "electro-dynamic principle" for voice reproduction, and applied for a patent.

However, the patent application was rejected Pridham's patent because the magnetic coil principle was already well-known. They were granted a patent on their specific mechanism, but were unable to attract interest from the big companies such as AT&T, Victor, or Columbia. Patent No. 1,448,279 was filed April 28, 1920, and granted March 13, 1923. At the suggestion of Jensen's wife's uncle, they decided to put a old gooseneck horn from an Edison phonograph on their device and sell it as a public address system. They called it a "Magnavox" rather than a loudspeaker and by 1915 had made improvements. They made their first public demonstration in Golden Gate Park Dec. 10, 1915, and another Dec. 25 playing music in front of San Francisco City Hall to a crowd of 100,000. On Dec. 30, they broadcast a speech by Gov. Johnson from his home to the San Francisco Civic auditorium. They gained rights to use the de Forest audion tube, but not the more powerful vacuum tube that AT&T would develop from the audion. It was this vacuum

With the developing line of products and after acquiring the Sonora Phonograph Distributing Company, The Magnavox Company was formed on July 5, 1917.

tube that made possible the international radio transmission between Paris and Virginia and Honolulu in 1915. Jensen and Pridham merged with the Sonora Phonograph Corp. and formed the Magnavox Company in San Francisco Aug. 3, 1917. In World War I, the company developed anti-noise and waterproof telephones for the military. In 1919, they provided loudspeakers for a speech by Woodrow Wilson in San Diego, and Magnavox gained national attention. Its speakers were used in the 1920 political conventions, by the campaigns of James Cox and Warren Harding, and at the March 4, 1921, Harding inauguration. But AT&T dominated public address system technology, especially after the 1921 Armistice Day demonstration, and Magnavox shifted its focus to radio and phonographs. Jensen left the company in 1925 and founded the Jensen Radio Manufacturing Co. in 1927, moved it to Chicago, and made improved loudspeakers with the help of engineer Hugh Knowles. He resigned in 1943 and later founded Jensen Industries.

Sources:

- Lewis, W. David, "Peter L. Jensen and the Amplification of Sound" in Carroll W. Pursell, Jr., ed. ***Technology in America: a History of Individuals and Ideas.*** 2nd ed. Cambridge, Mass.: MIT Press, 1990.
- Shepherd, Gerald A. "When the President Spoke at Balboa Stadium," *Journal of San Diego History* 32, No. 2 (Spring, 1986), 92-101.

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Radio Detective Mystery
The Case of the Weird Whatsit
By Mike McCarty

At the July Repair Session, Wayne Jones brought in a device, along with two questions about it. "What is this?" and "What does it do?", he asked, indicating a steel sloped front cabinet with a switch, a dial, two meters, and an AC outlet on top, and a row of twelve banana jacks in the lower front, the leftmost four being white and the other eight being red.

A quick scan of the front pretty quickly identified this as a metered variable autotransformer. These are commonly known as "variacs", due to a popular brand name for them. This is a device which allows one to plug it in, and dial a desired voltage. One of the meters was marked "VOLTS", indicating the voltage output, from 0 VAC to 150 VAC. The other was marked "AMPERES", indicating the current delivered to the load, from 0 amps to 50 amps AC. It was pretty clear that the unmarked switch was for ON/OFF, and the AC outlet (marked 0 - 150VAC) was obviously for plugging in the device to be powered by the autotransformer.

What was the row of banana jacks for? Why were they different colors?

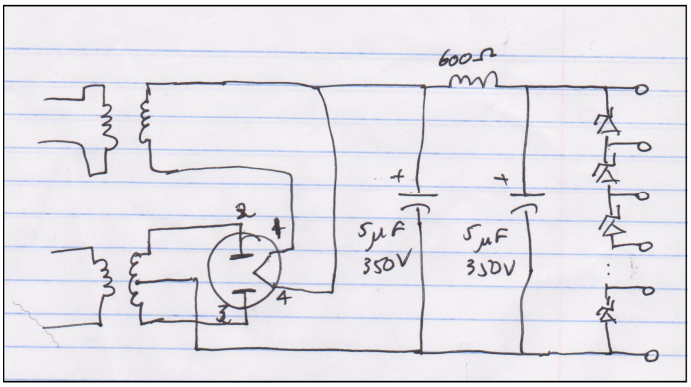
Oh, and the "ON/OFF" switch had three positions.

A quick look inside the case was not as informative as the one on the outside had been, at least not immediately. There seemed to be a completely independent circuit mounted in a little box, not secured to the case, connected to the power switch, with a couple of wires going to the end banana jacks. In between each pair of adjacent banana jacks was a small-ish glass encased two terminal device, sometimes two in series, connected to the two adjacent banana jacks.

Looking at the little box more closely, I saw what appeared to be two large transformers, a four prong socket, and two electrolytic capacitors, each marked 5 uF 350 V. This began to look like a high voltage power supply, using probably a type 80 rectifier, salvaged from some other piece of equipment, possibly a radio receiver. One set of wires from one of the putative power transformers ran over to the three position toggle switch. Another set of wires from the toggle switch ran to the autotransformer. Aha! The switch set in the up position supplied power to the autotransformer, in the middle position was off, and in the lower position supplied power to the add-on circuit.

The fog was beginning to clear a little bit.

Using an ohmmeter and with some guess work, I figured out the schematic for the little box. This was indeed a high voltage power supply, and there were not two transformers. There was one with a 5V winding and a center tapped high voltage winding, common for use with type 80 rectifiers. The pin connections were also correct for a type 80. The second "transformer" turned out to be a filter choke with a 600 ohm winding.



When I mentioned this to Wayne, he helpfully volunteered that he had removed a tube from the socket, and produced it. Voila! A type 80 rectifier!

I disconnected one of the wires going to the banana jacks, and applied power to the de-tubed circuit through an isolation transformer and a dim bulb with a 40W lamp, and noted that the lamp did not glow at all. Any glow in a 40W bulb going to an unloaded power transformer indicates a problem. In this case, either the transformer was open and

no good, or more likely a good transformer. It remained to discover which.

I powered down the device, and connected one probe of my AC meter to the center tap of the high voltage winding with a clip lead. I powered it back on, and after verifying that the bulb did not glow, set the dim bulb to full power. With one hand behind my back, I used the free probe to measure the voltage on each half of the winding. Measuring the full winding could potentially damage my meter, as well as powering on or off while both probes were connected. I measure the two half windings at 182.6 VAC and 182.7 VAC. This showed that the two halves were nicely balanced, and also indicated that the output voltage would be less than 250 VDC. This was nice, because I had brought along some 47uF 250VDC electrolytic capacitors which would do nicely in this circuit.

I measured the voltage on the putative 5VAC winding, and found 5.57VAC, just a tad high, but with no load, that's expected. It looked like this was a good power transformer.

There was still leakage to check, and the capacitors I brought along were purchased in 2007. Any electrolytic capacitor which has lain idle for two years or more needs reforming, for five minutes plus one minute per month of out of service time before being supplied full voltage. Ideally, these caps would be reformed for about two hours. I didn't want to take that time, and also knew that the output voltage was going to be in the 150VDC range. I also hadn't brought along anything to reform them with.

It turned out that Roland Gooch had brought along a very nicely restored Sprague TO-6A condenser checker, which he graciously consented to allow me to use (thanks Roland!). I set up the TO-6A to measure leakage, and one by one checked the transformer windings and the choke winding for leakage to the chassis. There was none.

I set up the TO-6A for reforming the 47uF 250V capacitors, and reformed them for about twenty minutes. They achieved "like new" leakage in that time, and I deemed them acceptable for use at reduced voltage. Wayne could let them finish reforming at home. I replaced the capacitors with the newly reformed ones, and re-installed the tube.

It remained to figure out what the banana jacks were for, and what the glass encased devices were. I had an idea I already knew. The devices looked like Zener diodes. I looked closely at one to get the number from it, and a fellow kibitzer who was standing nearby with his cell phone looked it up. It was a Zener diode.

A Zener diode is a solid state two terminal device which behaves similarly to a voltage regulator tube. In the forward direction it conducts like a normal solid state diode. In the reverse direction it conducts only leakage currents (micro amps) until a certain voltage, at which point it conducts heavily. By putting one in parallel with a load device, one can regulate the voltage applied to it by a power supply.

These Zener diodes were connected in series across the output of the DC power supply, with the banana jacks providing taps at specified and regulated voltages. I suspected that the white jacks were for negative voltages, and the red were for positive voltages, to give the C- and B+ needed for a battery operated set.

I reconnected the Zener string and powered up. The total output of the supply was 164.3 VDC, well within the rating of the 250V capacitors I used.

Measuring the voltages output on the jacks gave these regulated voltages, from left to right:

0, 6, 12, 18, 30, 40, 90, 100, 120, 130, 150, and 160 VDC

Using the first red jack as the reference, gave these voltages:

-30, -24, -18, -12, 0, +10, +60, +70, +90, +100, +120, and +130

again, regulated, a very nice assortment, indeed.

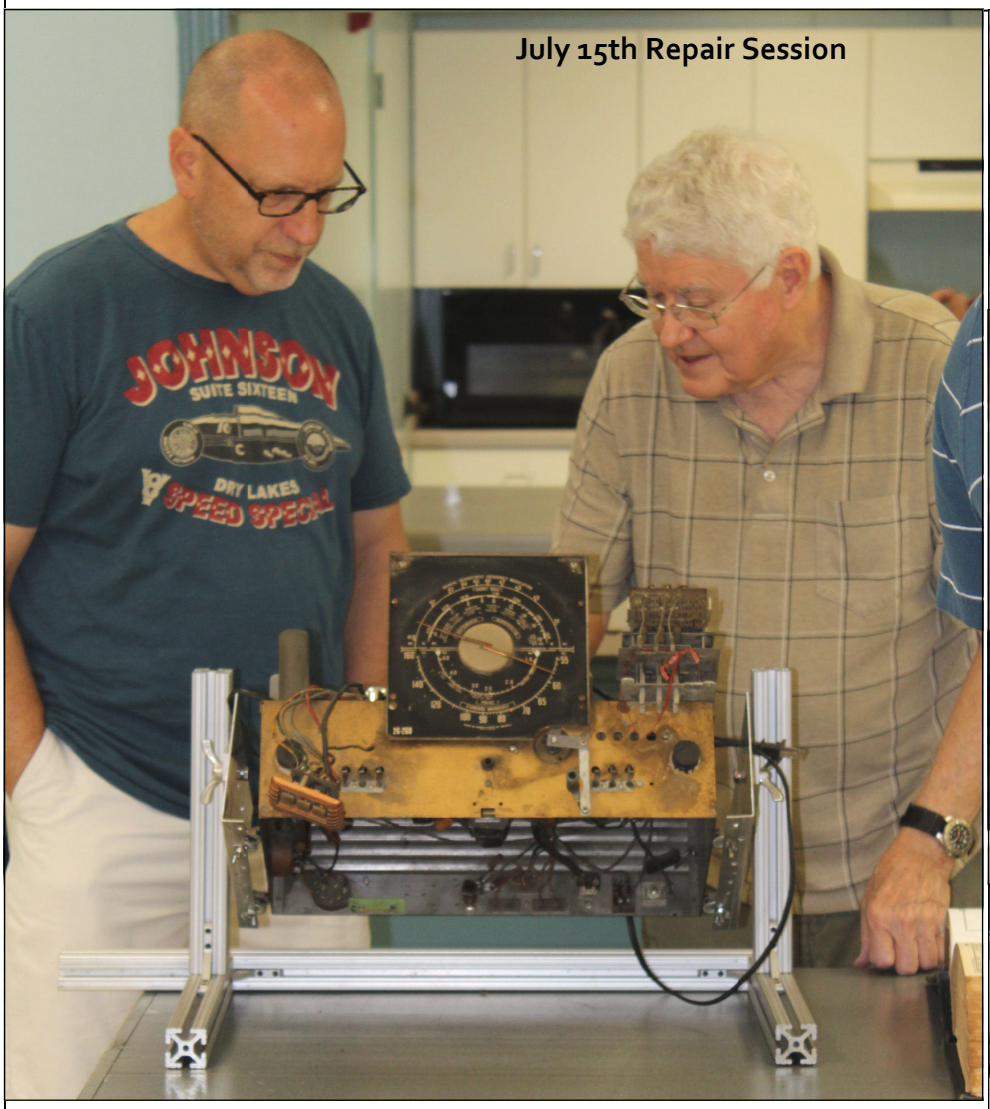
Using the lamp from the dim bulb as a load, and switching to the autotransformer mode of operation, showed that the volt meter was working, but the ammeter was not. A quick check showed that the meter shunt was good, but the meter itself was bad. Our club president Jim Sargent came over to see what was going on, and suggested that a 50 A meter was more than would be useful for our members use' in any case, and volunteered a 3 A meter which would fit the hole in the case (thanks Jim!). I suggest that at the time the meter is installed, the little inner case should be secured to the outer one. Some Dymo labels on the jacks would be a nice touch, also.

So, now we know what it is, and what it does, and it has been restored to service.

Case Closed!

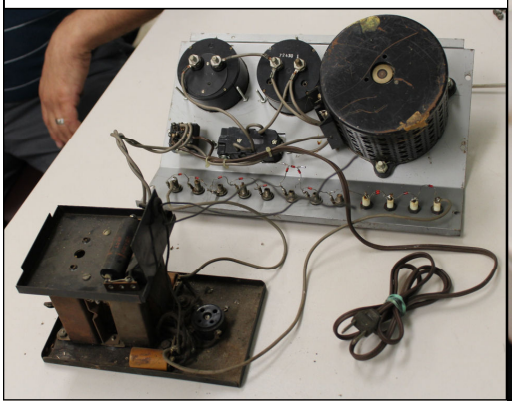
[see picture of device on page 6]

July 15th Repair Session



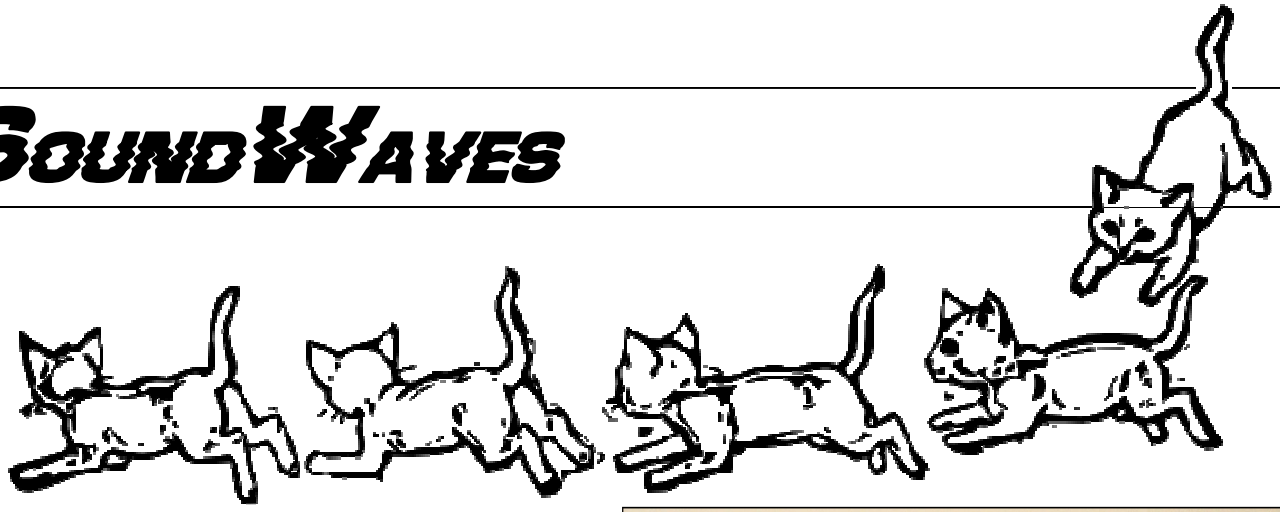
Dave Young and Scott Roja are examining a Zenith chassis. The chassis mount is an invention of Larry Lindsey.

At right is the ***Weird Whatsit*** from this month's Radio Detective Mystery.



August 19th Field Trip to Kilgore Broadcast Museum

Below, Ed Janssen is making a weather forecast.



Cats on Radios
At right, we see ***Mike Grime***'s cat, ***Spunky***, enjoying a Walton radio.

Send a picture of your cat or dog on/in a radio to the editor (email on p. 3).

MONTHLY MEETING PROGRAMS 2017

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, www.VRPS.org 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.

- **October 21 — Collection Radio-related Books & Magazines — Senter East — 2 PM**
- **November 17, 18, 19 — 2017 Annual Convention—Comfort Inn East, Plano, TX**
- **December 9 — Annual Christmas Party --- Senter East -- note new time:1 PM-5 PM**

Programs are subject to change, contingent on scheduling conflicts. As always, your suggestions for programs/content are welcome. If the programs do not fit your needs and you want something different, let me know. I need volunteers to organize other programs, so consider presenting a program yourself.
Call anytime or send an email: **Larry Lindsey email: pipilindsey@tx.rr.com telephone: 817-312-8761.**.