SoundWaves

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VRPS Spring 2018

From the President

This has already been a busy year…for the organization and for me as an ambassador for the organization. In February my wife and I made the trek to Houston to help that organization celebrate their 40th anniversary. I can report that they are indeed a healthy and active organization. I can also report that their fearless leader, Bill Werzner, was not in the best of health during our visit and had to miss the convention in its entirety. However, I have had conversations with Bill on a few occasions since, and he is well on his way to a complete recovery.

The third week of February, B and I were again on the road, this time to Tulsa. I had been asked to speak at their monthly meeting. What a delightful time we had seeing old friends and making new ones. Both of the Oklahoma clubs are healthy and vibrant. All of this gives me great hope for the future of our hobby.

Our annual Spring auction was well attended, and we picked four new members…to go along with the other two new members since the first of January. Please help me welcome Bill Brim, Nickolas Morris, Mark Blackwood, David Hennen, Patrick Curran and Nick Interrante. Welcome guys!!

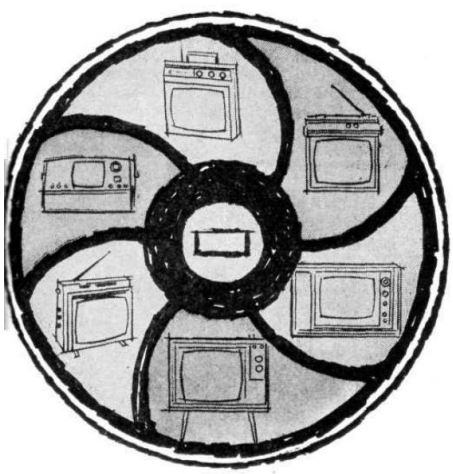
Again, we will count on these six new faces to be active in our organization and hobby as a whole. That is what keeps us, and all our other sister organizations, healthy and active.

The willingness of all our members to volunteer to help with the various functions, i.e. conventions and auctions, really makes my job a lot easier. Thanks for all you do. See you at the April meeting …and invite a friend!

--Jim

Notes from the January 20, 2018 Meeting

Our meeting opened with our usual announcing of our names and towns. Our program director Larry Lindsay presented the Smartest Man (or woman) In The Room (SMITR) puzzle. He slowly uncovered the four letters of the name FADA and asked whose name it represents. The name of the person who immediately had the answer has been "lost to history" somehow. (If you know that person, please give Larry their name, so they can receive their SMITR Certificate. Answer: Frank Angelo D'Andrea.



By Al Sicherman

ADD COLOR TO ANY TV SET..

Our January meeting topic was "Early Color Television", presented by the author. The idea was to discuss, primarily, the time when we had practical TV with nationwide broadcasting of color programs, with some coverage of the previous development of practical schemes to make that happen. Of course there were much earlier demonstrations of color TV broadcasts using the mechanical scanning process, but the pictures were already so poor, that adding color was "gilding the lily". Also, the methods developed were crude and obvious approaches. In the battle to be first to develop practical working schemes, the field settled to two competitive organizations – RCA and CBS. CBS was first to develop a scheme of broadcast and reception of color TV programming. Although their scheme worked, it had a number of shortcomings, not the least of which was its incompatibility with black-and-white picture reception. The race to develop a working scheme for color broadcasting took place during the time that more and more millions of people were buying and enjoying black-and-white sets. Because those sets were a substantial household investment, there was an incentive to make any color broadcast system compatible with existing sets, able to receive pictures and programs from either a color or black-and-white broadcast signal. CBS managed to get approval from the FCC to establish its system as the technical standard for all to follow in color TV broadcasting. Their scheme required different scan rates (to avoid flicker) and extensive modifications to convert any black-and-white receiver or its design. The broadcast transmitters would also need to carry more bandwidth. The most practical receiver employed a spinning wheel with color filters to sequentially display the three color components of the picture.

CBS invested very large amounts of money in designing, developing and marketing its scheme, including the required broadcast and receiving apparatus – they also spent development effort for high-power UHF transmitting equipment. Meanwhile, RCA drew on its large assets to continue research and development in a quest for a better scheme. Soon, RCA developed both its broadcast scheme and a color cathode ray tube (CRT) that worked together – producing a practical scheme that allows black-and-white sets to receive color program material, displaying it in black-and-white. They created a new technical standard and worked with the FCC to replace the CBS standard. They designed the necessary supporting equipment (e.g. cameras, lighting) for the broadcasting process and began the marketing process. The receivers were expensive to produce, so RCA made them at a slight loss, to promote the TV industry to broadcast and advertise in color. Only very clever engineering had made possible a compatible system that could be afforded by the broadcast industry and the public. The new NTSC standard (National Television Standards Committee) became what the TV industry has used (in the USA) until the recent changeover to digital TV broadcasting. The author was privy to a ceremony in downtown Fort Worth in 1954 featuring David Sarnoff and Amon Carter, Sr. throwing a switch to initiate the first color TV broadcast from WBAP-TV. This was also the first color TV broadcast in the Southwest.

About 1956, there appeared an advertisement in Electronics magazine for a kit to make possible reception of color TV on a black-and-white set. It was trade-named the Colordapter. It involved the building of a chassis, a wheel similar to a CBS color wheel, and a motor drive for the wheel, and also making a few modifications to the TV set itself. (The adapter chassis has 11 tubes - plus two more must be added to the TV). I bought an abbreviated parts kit and built my own chassis, wheel, etc. Over a period of about two years, I got it all working very well. My family watched it for about three years. The colors were notably better than those produced by an RCA set (their CRT red phosphor was actually orange-red). Many years later, our (late) member Bob Olinger bought my Colordapter chassis, and he and his brother put it into operation on an old RCA 630TS. They found that one of the big challenges was (and is) construction of the wheel and its drive systems. They got it working again and demonstrated it at one of our annual conventions. It is now in the possession of another of our members. There is an operational commercially made color-wheel receiver in the Olden Year Musical Museum, for which the curator is our member Rick Wilkins.

The RCA NTSC scheme added a reference signal during the horizontal retrace time that could be used to decode the three colors in the video based on the phase relation to the reference, while black-and-white sets ignore the reference signal or any phase relationships of the video information. The Colordapter and its competitors' chassis circuits used the NTSC information and the instantaneous position of the wheel to convert the video to three sequential scans of only one color each – red, blue, and green. The circuitry also locked the wheel to the vertical sweep by adjusting the wheel drive motor power, assuring that the proper color filter is in position over the part of the screen that is being scanned.

While the RCA system, including the 3-gun dot-matrix CRT, provided us with color TV for many years, there was a constant effort to improve performance, lower cost, and provide larger and larger images. The problem of getting convergence of the three electron beams was always there, and many hours were spent trying to get the perfection that you could never achieve. The convergence problem placed a size limit on the TV image, which was addressed by the creation of expensive projection systems having three CRT's, liquid-filled lenses and color distortion and viewing point problems. Consequently, others were striving to eliminate the 3-gun dot matrix tube, somehow or other.

In the early-to-mid '50s, Ernest Lawrence (see Author's Note) invented a scheme to make a multi-color CRT having a single electron gun. His idea revolved around the use of a grid of parallel wires inside the face of the CRT and a matching set of red, green and blue phosphors inside the face. The single beam can either pass straight between two wires, hitting one color phosphor, or be made to deflect to one side or the other by placing a voltage between the grid wires of one polarity or the other. This scheme caught the interest of (movie industry) Paramount, and they acquired the rights to it. They developed their "Chromatron" CRT – dubbed "the Lawrence tube". It worked very well, but it was fragile, with arcing between the wires under vibration and FCC certification problems produced by the large wire grid radiating 3.59 MHz interference. Paramount gave up on it for practical reasons and sold the rights to Litton Industries. It was pursued by Litton Industries for a time. For an airborne application for a small two-color CRT, the author was in a group visiting a Litton laboratory in New York City. In that laboratory they were also working with a large 16 inch Lawrence tube TV set. They demonstrated it side-by-side with a new RCA set. The difference was remarkable – the experimental set had a much sharper, brighter picture with no convergence problem whatsoever. Eventually, the rights were sold to Sony, who added their technical "twists" to get rid of the practical problems and thus created the Trinitron single-gun CRT. The Trinitron provided us with good quality color TV for many years. It made possible large (e.g. 36 inch), short-necked CRTs with only slight horizontal face curvature or even flat faces.

The advent of digital signal processing made it possible to improve picture quality – color, resolution, aspect ratio, etc. to such a degree that the days of analog TV came to an end. The receiving equipment could not handle any of these improvements and was already being made obsolete by new display technologies such as LED. Plasma and

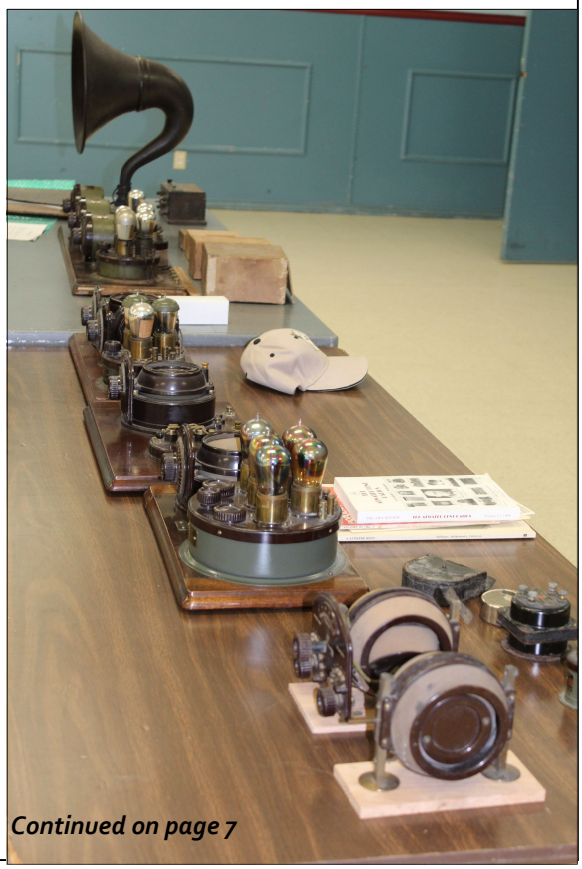
others that no longer needed a scanning spot to produce a picture. The CRT went by the wayside.

Author's Note: I learned only recently that Ernest Lawrence was the famous man whose name was applied to the Lawrence Livermore National Laboratory in Berkeley, California. He was a professor at the University of California Berkeley. Some of his achievements were: Invented the cyclotron (won Nobel Prize in Physics); invented a color picture CRT; was a key member of the Manhattan project team - developing the first atomic bomb; guided the development of large particle accelerators, and super-colliders leading up to the Large Hadron Collider (LHC) in Europe; promoted a number of projects considered to be "Big Science".

--Bill McKeown

Notes from the February 17, 2018 Meeting

Larry Lindsey opened our meeting, calling for us to announce our names and towns all around. Our good turnout included three guests. He presented the Smartest Man (or woman) In The Room (SMITR) puzzle, and Steve Nance turned out to be the SMITR of the day. The question was "who shot out street lights on Chicago's Michigan Avenue? Answer: Two hunting buddies, Powel Crosley and Gene McDonald (eventually president and CEO of Zenith Radio) had been celebrating something too much and shot out street lights from the top of a building. Larry then turned the meeting over to club president Jim Sargent, who was our presenter for his topic "Atwater Kent – from 1875 forward". First, Jim announced an event to be occurring in partnership with the Vintage Radio & Phonograph Society, Inc. The Heritage Farmstead Museum has been debuting its new spring exhibit, titled 'The Golden Age of Radio in Texas: from the humble crystal sets on the farm to the birth of the transistor at Texas Instruments,' which features an amazing display of antique radios and memorabilia. It can be visited until May 11. The farmstead museum is in Plano near at 1900 West 15th street; phone no. is 972-881-0140. Website: www.heritagefarmstead.org.



Jim emphasized that his discussion would include Kent's period of activity related to radio production, but he mentioned that Kent went to Worchester Polytechnic for his education. His first business venture began in 1905 with his patented battery meter made for checking telephone lines. He also developed and sold automobile accessory parts to auto parts stores, thus setting up a market place for his later radio products. His radio products business began in 1921, introducing a line of parts for people to use in making their own radios. He became very good at making Bakelite parts and metal stampings. With these capabilities, the quality of his parts was outstanding. At a glance, his variometers, tube mountings, coils, etc. were obviously the best to be had. His first board-radio, Model 1, had two tubes on a cluster-island. Jim showed a Model 2 from his extensive personal collection. (He brought and displayed an impressive number of items to support his presentation). Atwater Kent (AK) was adamant about avoiding the payment of royalties or license fees to anyone. Owners of patents related to regenerative circuits or superhet designs were quick to sue anyone for infringement. But he avoided lawsuits by manufacturing the parts needed to build your own radios. His first board radio was made with an appropriate open, reserved, space available to mount the regenerative coil unit, but the coil unit was sold as a separate part

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The Golden Age of Radio in Texas
At the Heritage Farmstead Museum

Email: patty@heritagefarmstead.org
http://www.heritagefarmstead.org

Open Tuesdays - Sundays @ 1:30
Phone (972) 881-0140

Curator Patty Shore encourages us to visit the exhibit, which will be open until June 11th. Several VRPS members have loaned radios for the exhibit.

Patty Shore and Ashley Bluhm pictured in exhibit

1930s

The Case of The Stormy Night Detective
By Mike Grimes

It was a dark and stormy night, well, not too stormy, you know Texas weather. Nevertheless, there was not much on TV so I decided to tackle an "easy" radio repair job sitting on my bench. It only needed electolytics replaced and should be good to go, according to the owner. It was a Western Auto Truetone model D910 (Riders 13-19 if you are more than curious). It was playing, but not too well. Low volume and hum were the main symptoms. Upon inspection someone had previously replaced the paper caps (capacitors) with nice looking Olsen brand which appeared to be polyester sealed (You remember Olsen Electronics from the '50s and '60s?). Just a little "reforming" needed there.

With the electrolytics replaced, I powered up the radio with my usual low voltage to be cautious and reform any lazy marginal caps. Starting at low voltage on my handy isolated- variable Heathkit power supply; my usual *modus operandi* is to raise voltage slowly to about 90 vac and stop and wait for the b+ to catch up. All seems well; current draw normal, good volume, sensitivity of local stations loud and clear, selectivity good. This one is going to be easy! I let it idle for a while at 90 vac and increased the power to 115 vac. Good response of volume and sensitivity.

About one minute later, volume and sensitivity drops off about 6 db. Volume control adjusted to full open, no better. Ok, now what? Return the input power back to 90 vac; volume and sensitivity recover, near normal performance. Repeat several times. Same result. Oh, great, this should not happen.

Could be a tube? Tubes have been known to act this way. Tubes had been checked previously but you never know. Tubes check ok. Next, look in the power supply. Did I cause a problem? B+ looks normal at electrolytics to ground; both at 90 and 115 volt power input test. Ok, let's see what it's doing at the audio power amp (amplifier) plate (6AC5). Spec is +222 vdc. At the 90 vac input, it is near spec—247 +vdc. Watch what happens at the 115 vac power input setting. The plate voltage of the audio power amp increases to about 300 +vdc and within a minute drops back to 153 +vdc, well below spec.

Aha, must be something in the power supply to the power output tube plate. Backing up the power source: output transformer, speaker field coil, resistors and caps, anything to ground leaking? No clue there.

Perhaps something is making the power amp tube draw more current? Cathode goes to ground. Nothing there. Power amp grid calls for 11.5 volts +dc. Measures 47 vdc+. Why? What could be causing that? The grid current of the audio amp comes from the 6P5 audio driver amplifier tube as a cathode follower. Resistor to ground, 25k ohms, is ok. Problem must lie with the driver audio amp 6P5. Plate voltage of the 6P5 tracks closely to that of the 6AC5. But both are drawing too much current and plate voltage is too low relative to the spec at the power input voltage of 115 vac. Next check the grid voltage at the 6P5. Spec is near 0 volts. It reads about 18+ vdc to ground. If the input power is reduced to 90 vac, the voltage returns to near 0. At power input of 115 vac, the grid looks normal at 0 volts at first then rises to 18+ dc. So the culprit must be the coupling capacitor C20 between the detector 6Q7 and the 6P5 leaking plate voltage to the grid of the 6P5. This causes the 6P5 saturate or draw too much current. I replaced the coupling capacitor C20 and, wal-la the radio performed as designed with normal expected variation between the input power at 90 and 115 vac. All voltages within spec and no fading after one minute.

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number. This avoided infringement on the Armstrong patent. In the fall of 1923 a five tube "Radiodyne" TRF was introduced - produced in quantities of about 1000 per week. There were labels on the coils that created a patent infringement problem, and about 150 of them got out before they could be removed. The model name was changed to "Model 10", (part number 4340). All products were assigned a catalog part number as well as a model number. There were several versions of the Model 10 as time went on; with minor production changes (the 10A no longer had knurled nuts). All parts were made in-house, except tubes.

In 1929 the radio manufacturers took RCA to court and won the right to buy licenses instead of paying large royalties. In 1930 AK introduced the superhet Model 70H – models 70A through 70G had been TRF's. AK never made a complete crystal set, but they made the parts needed to build one. They made two automobile radios. By 1928 they had made more radios than any other company. By 1929, Crosley had made even more, but they were much less expensive to produce. The AK line fit the middle class market, with many floor model sets in stylish cabinets.

During the '30s the workers at the factory asked for a 10% wage increase, which Kent agreed to, but in '36 they asked for yet another increase. His response was to close the factory and retire the business. He moved to California, where he became quite a social figure and enjoyed life until he died of a virus infection at age76.

There is an extensive photo gallery of many AK models at website www.atwaterkentradio.com

--Bill McKeown

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Conclusion. The leaking coupling cap C20 leaked enough at a higher B+ voltage through the coupling cap to raise the grid voltage of the driver amp audio tube. It did not leak badly at the lower input voltage setting (90). The driver audio amp tube in turn drew more current and upset the grid voltage of the power audio tube by way of the cathode follower. The cap C20 was not shorted but leaked just enough to upset the entire chain. It would have been difficult to find were it not for testing at two different input power voltages. These Olsen caps were not terribly old compared to '50s components, but do not judge caps by their appearance. If I had just wholesale replaced those (caps) before testing the set, this would not have been observed and I would not have burdened you with this narrative. Also, it could have saved me a lot of time. But I would have missed such fun. I replaced all the caps and went bed at midnight listening to the stormy rain.

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MONTHLY MEETING PROGRAMS 2018

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.

April 21 -- George Potter -- Rare Books -- Senter East -- 2 PM

May 19 -- Tail Gate Trade Day -- Senter East -- 8 AM

June 16 -- Mike Grimes & Dave Seymour -- Chemicals in Restoration -- Senter East -- 2 PM

July 21 -- Annual Repair Session -- Senter East -- 8 AM

August 18 -- Mike McCarty -- The Use of the Oscillascope -- Senter East -- 2 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.**.