The Grid Leak

October, November, December — 2020

IN THIS ISSUE

HOUSTON VINTAGE RADIO ASSOCIATION

Beginning on November 16, 1978, twenty-two men met in the basement of the Houston Museum of Natural Science to organize a club dedicated to the preservation of vintage radio and phonograph equipment.
Over the years the Houston Vintage Radio Association has become a dynamic organization including members living locally and in many other states.

Our members very in background and experience but are brought together by a common interest in electronics. Many interests represented in our organization include: preservation and restoration of vintage electronics including radios, TVs, phonographs, telephones, telegraph equipment, HAM radios, amplifiers, relevant literature, recordings, etc.

The Houston Vintage Radio Association (HVRA) communicates with its membership across several media portals,

- **The Grid Leak is the official Newsletter, currently published quarterly, distributed primarily by email (and by USPS as necessary).**
- **HVRA maintains a websites, HVRA.org, used for information regarding future events, current activities, contact and operations information, and historical data including photo libraries and past newsletters. Additionally, HVRA information and activity descriptions can be found on Facebook.**
- **Our normal means of face to face communication is through monthly Board of Directors' meetings and monthly General Membership meetings located at the Bayland Park Community Center; however, given restrictions due to the Covid 19 pandemic, we have also used Zoom sessions from home (as necessary) and offsite swap meets at alternative locations.**

DISCLAIMER

The sharing of information pertaining to restoration and repairs, of any items, appearing in any form, contained in any of the HVRA communication methods, is contributed by members hoping to help and/or assist others in efforts to advance the education of the collecting of vintage electronics. Therefore, the reader or listener is advised to contact the contributor for a full understanding of the electronic, mechanical, and chemical risks involved in the information of interest. HVRA is not responsible for the accuracy and safety of any repair or restoration topic presented in any format.

MEMBERSHIP

Annual Dues: $20.00 Payable prior to the HVRA Annual Convention
Membership Applications available at General Membership Meeting or on HVRA.org

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PRESIDENT'S PAGE

By Bill Werzner

Twenty members were present for HVRA ANNUAL MEETING and ELECTIONS Saturday morning September 26 at Bayland Park Community Center. Due to our Secretary's absence, no minutes from the preceding general meeting were read. Following club announcements and plans for fall activities, two proposed items were presented to those present to be voted on as per HVRA Bylaws procedure.

- **A vote to amend the HVRA Bylaws and expand the Board of Directors to include an AT LARGE POSITION III. A motion was made, seconded and, with no further discussion, was voted yea by unanimous approval.**
- **A Board proposal to amend the HVRA Bylaws and expand the Board of Directors to include an AT Large Position IV was announced to the members. Voting to accept or reject this amendment and accept nominations, if approved, will be held during a future regular meeting.**

The two year terms for President, Treasurer, Historian, At Large Position I, and At Large Position III were next open for nominations.

- **With no candidates nominated for the positions of President, Treasurer, and Historian, all were re-elected by acclamation.**
- **For At Large Position I, long time member and veteran officer Reid Shipp was nominated along with another long time member Derek Ross. By a show of hands, Derek Ross was elected to At Large Position I.**
- **Steve Truch was nominated for the new At Large Position III and with no other nominations was elected to fill this new position for a two year term.**

In summary, HVRA Officers elected in 2020 include: President: Bill Werzner; Treasurer: Richard Slater; Historian: Steven Pena; At Large Position I: Derek Ross; At Large Position III: Steve Truch. On a personal note, we owe Reid Shipp a round of applause for having served a number of years in position #1 which included countless hours managing convention auctions, manning security at those events, and assisting in more events than I can readily recall. KUDOS Reid for a job well done and please continue your presence during our monthly Board of Directors ZOOM meetings; we need your expertise and advice.

GENERAL MEETING PROGRAMS

- **Steve Truch gave the first program - a most informative one about phonograph records that included: how to select, store, clean, and preserve vintage records which we often find in radio collections. His cleaning methods and techniques were a real education for many of us, especially with his record bath and self engineered phonograph record brush cleaning assembly. He also included the dos and don'ts in preserving records that was something I'm sure a lot of us wish we had known years ago.**
- **Derek Ross followed with his fascinating program about radio station WOAI that went on the air in San Antonio back in 1922. Derek shared his collection of vintage WOAI photographs that were saved thanks to HVRA member Mike Payne. WOAI is still on the air after all these years and you can listen in to them at 1200 on your AM dial. At night WOAI came in loud and clear in the Evansville, IN area and Southern Illinois where I grew up. Their country western music back then made them one of my favorite stations. I still recall studying for a high school history exam with WOAI playing softly on our old GE radio across from the kitchen table, listening to my favorite of all time; "Ghost Riders In The Sky" one dark evening, now so long, long ago.**

HVRA welcomes new Texas members: Ruben Rosa Houston

Bob Ruth Deer Park

IMPORTANT NOTICE

During the September 26, 2020 Annual Meeting, President Bill Werzner proposed that the 2020 membership be extended until the next Convention, currently scheduled for September 26, 2021, at which time members will then pay their 2021 dues in order to maintain an active status until the 2022 Convention. This will apply to all members who have paid their 2020 dues as of January 31, 2021. Treasurer Ric Slater seconded the proposal.

Discussion:

Due to the Covid 19 pandemic, the HVRA Board of Directors decided that the social distancing and government mandated restrictions curtailed HVRA's ability to offer members the meetings, auctions and swap meets which the membership should expect in return annual dues. In order to maintain a uniform member expiration date we will continue scheduling the HVRA Annual Convention as the beginning of the new membership year. Technically, the members will still pay their dues for 2021, but the payment will not be due until the 2021 Convention and will expire just before the 2022 Convention. Our Insurance Policy and our IRS status require all HVRA participants must be active members. We also do not pro-rate anymore based on the time they renew or join.

NEW BOARD POSITION AVAILABLE

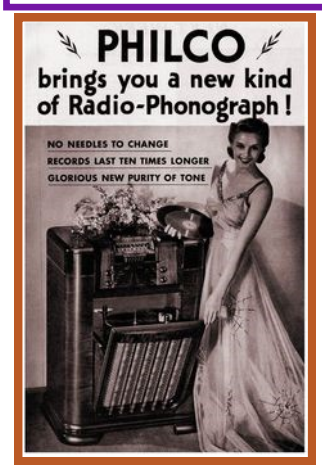
As a result of estate sales during HVRA's scheduled auctions over the past several years, the Board has an appreciation for the complexities of efficiently coordinating several estates to the benefit of both the Estate Owner and HVRA. We are currently in possession or in discussions with several estates which, pending Covid restrictions, will be offered at future auction events. In order to efficiently coordinate all objectives, the Board feels that an additional At Large Position IV should be created and be designated as The Estate Management Representative.

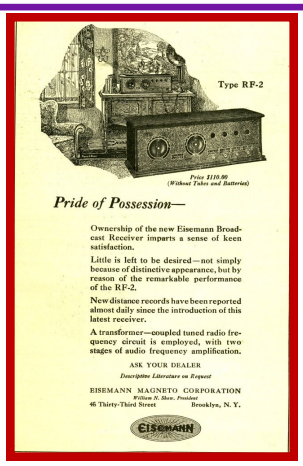
During the September 26, 2020, Annual Meeting, President Bill Werzner proposed to the General Membership that the HVRA Bylaws be amended to include the additional Board Position of At Large Position IV, Estate Management Representative. Treasurer Ric Slater seconded this proposal. This Proposal will be published for 30 days on the HVRA website prior to requesting membership approval.

Members interested for consideration to this Position should contact Bill Werzner with any questions. The description for the At Large Position IV is:

Estate Management Representative

- **Shall be responsible for working with the assessment, coordination and inventorying of estates that HVRA will assist with liquidation.**
- **Shall maintain the HVRA policy for terms and condition that HVRA will enter into with estates. Said terms and conditions shall be voted on for approval by the Board of Directors.**
- **Shall seek assistance from board members and other club members in the execution of their duties.**





HVRA Event Schedule: October, 2020 — January, 2021

Check our web site often for schedule changes and special announcements.
Directors' meetings are open to all Members, sharing ideas, suggestions, or expressing concerns to our officers. Although General Membership meetings are for the benefit of active members in good standing, we encourage guests to attend and acquaint themselves with HVRA's activities. Members can participate in announced contests, presentations and auctions during these meetings.

October

13, Tuesday 7 PM Board of Directors' Virtual Meeting, Via Zoom
17, Saturday **Swap meet, monthly meeting, and barbecue at Mike's Icehouse**. Swap meet will open with the ringing of the bell at 10 AM in the beer garden near the parking lot. Here is your chance to swap or sell all those extra items you have been storing all summer during the shutdown. A barbecue including brisket, chicken, sausage, along with baked beans and all the trimmings will be served for $12.00. A program will be presented using a "breadboard" working AM transmitter with a circuit copied from a late 1930's phonograph designed to transmit music to your home radio. Time permitting we will hold the first of its kind – a beer garden auction among the picnic tables. We need a head count no later than Oct. 12. Call Bill W. at (713) 820 1778 or E Mail: werz1943@gmail.com for reservations. Observe safe distances, wear your masks, and hand sanitizer will be available Participants must be members of HVRA (our insurance policy requires this). New members may join on site, $20.00 for one year membership fee. All attendees must wear a mask, practice social distancing and use on=site hand sanitizer.
31, Saturday beginning at 8 AM: Annual Alvin Swap Meet at Mike Payne's Electro Junk Inc. Located at 307 Dumble, Alvin. Gates open at 8 AM.

November

10, Tuesday 7PM Board of Directors' Virtual Meeting, Via Zoom
14, Saturday **Watch our web site for this next one:** we will again return to Mike's Ice House for a monthly meeting and large auction. Konrad Werzner, KG5IMI, will have a load of HAM and electronic gear from the Molina Estate to be auctioned to the highest bidder. We stored these items with the intention of selling them during the annual Texas City Ham Fest last July, which was cancelled. These items will be published with photos, via AUCTION MANIFEST on our web site in the coming weeks so stay tuned as more are added. A chili lunch with side dishes will be served for $12.00 . A head count will be needed no later Nov. 9th. Call Bill W. at (713) 820-1778 or E Mail: werz1943@gmail.com for reservations. Participants must be members of HVRA (our insurance policy requires this). New members may join on site, $20.00 for one year membership fee. All attendees must wear a mask, practice social distancing and use on=site hand sanitizer.

December

8, Tuesday 6 PM-8:30 PM: Combined Monthly Board Meeting and General Membership Meeting, including Program (Large Display Board of Transmitter Setup) and Auction.

NOTE FOR JANUARY, 2021
SORRY FOLKS, BUT DUE TO COVID RESTRICTIONS, THE ANNUAL POST HOLIDAY PARTY WILL NOT BE HELD.
12, Tuesday 7 PM Board of Directors' Virtual Meeting, Via Zoom
23, Saturday Place and Time to be announced in November

Mike's Ice House, 8746 Lipan Road, Houston, TX 77063.
Located just off Fondren Rd, a few blocks south of Westheimer, it is on the corner directly EPO (Electronic Parts Outlet) at the intersection of Crossview Dr. and Lipan Rd . Take Lipan Rd, turn into the back parking lot where the swap meet will be held. **See their web site at: mikesicehouse.com.** Indoor and outdoor facilities, picnic tables, beer garden, and plenty of parking are available. The meals I have eaten there were great. You certainly won't go away hungry if you fancy cheeseburgers with all the trimmings. Take a look at their menu, you may want to stay there for lunch and shoot some pool. I think you will be impressed with Mike's and its convenient location. Bring along a list of any electronic parts or supplies you may need, cross the street and then you're in the EPO rear parking lot!

WE'RE "SWAPPIN AND MEETIN"

After Covid 19 restrictions and Hurricane Hanna, on August 1st were finally able to get out in the fresh air and attempt to have an HVRA swap meet and General Meeting. Yes, "attempt". After an early start of opening tailgates at Mike's Icehouse, the sky decided to open up and shorten our swap meet to only a one hour event. But thanks to Mike's Icehouse, those who stayed around were able to have a "socially distant", masked and legal gathering while enjoying some of Mike's delicious food.

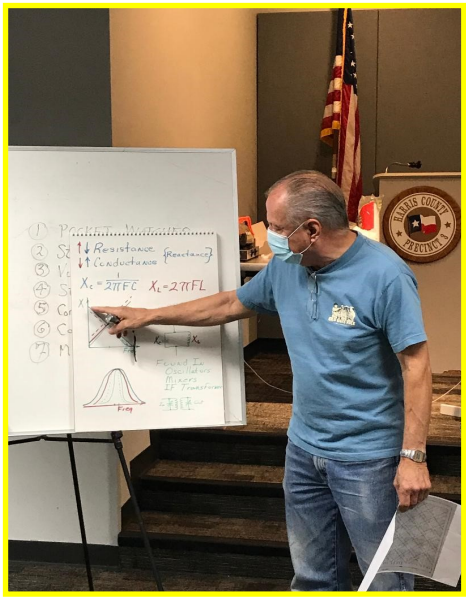
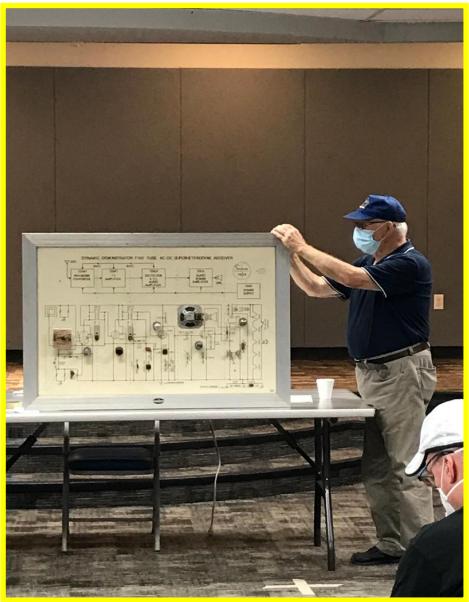
Thanks to Steve Scheel and Steven Pena for sharing their photos.





AUGUST 22, 2020 GENERAL MEMBERSHIP MEETING

Tom Taylor provided general information about superhetrodyne radios as they evolved from Tuned Radio Frequency (TRF) designs. Fundamentals of parallel inductor capacitor tuned circuits were illustrated as it relates to radio selectivity as well as the benefits of an RF amplifier and the gain stages that follow. Photos by Steven Pena.


2021 ANNUAL CONVENTION UPDATE
Vice President Lewis Brittain

Well, looks like we were all set to hold the convention at the Wyndham when I was contacted and advised that as of October 1 the hotel was shutting down. Fortunately I hadn't burned any bridges at the Marriott, so our welcome was still intact. I contacted the gentleman who had been after me to sign the contract and we met. After discussing our requirements he prepared a new contract. For the most part it was at the same terms and prices as this year's, with a couple of bonuses added to make up for the banquet fiasco.

I have received the contract and signed it, and we've put down the first deposit, so we're about as set as we can be under the circumstances. I do have a reservations link which I plan to provide in a future GL, as well as send out in email blasts as the event date approaches. Next step is to line up a speaker and a technical session presenter. Any suggestions for a banquet speaker would be welcome, especially if it is someone the suggestor has easy access to. Some names have been thrown around, but for me at this point it would require blind reaching out.

The date of the convention is from Friday, October 1 to Sunday, October 3, 2021, so you can now safely mark your calendars.

A RAINY SATURDAY, HALF A LIFETIME AGO

BY DAVE HERLINGER

I just came back from the garage, rummaging around in file drawers full of old tubes, wires, transformers, and buried deep inside, I found something I hadn't seen since retiring from teaching high school physics 6 years ago. A bunch of rusty nails, a couple of pieces of scrap iron, and a roll of enameled magnet wire were the raw materials used to make this device 36 years ago. It happened on a rainy Saturday in Spring Branch, inside a cluttered, disorganized (to the unfamiliar eye) workshop attached to a cozy home. I was half of my present 72 years of age and I was in the company of a man who, along with his wife Bettie, would become lifelong friends to me, my wife and daughters.

The workshop belonged to Jack James. Some of you long time members may remember him from the early days of the club. Jack recently passed away shortly after his family and friends celebrated his 97th birthday, far from his native Texas. A sudden increase in blood pressure sent him to a V.A. hospital when he developed a fever, and after a short time in a hospice facility, Jack, the former K5JWH and HVRA member, became a "Silent Key".

Jack was one of the first of many interesting folks I met 40 years ago after attending my first HVRA meeting in a museum basement. The club was only two years old. I had grown up fascinated by my grandparents' 1940 Sears Silvertone Console. By the time I started hooking up a wire antenna to listen to Hams and overseas broadcasts, the old clunky beast had been stuffed away in Grandma's basement, and when I came back to visit some years later, Grandpa had given the Silvertone away. My first HVRA meeting came about because I had bought an AK 40 from an antique shop in Ohio. I needed advice, and someone at City Electronics told me about a club of vintage radio collectors.

At one of those meetings, Jack James had brought a one hundred-pound (fact!) radio to the auction. The "skyscraper" was a 1931 Westinghouse Columnaire, a true Art Deco piece that was in excellent condition and was working. It didn't bring the minimum bid he had listed, and when I saw Jack struggle to lug this beast back to his truck, I gave him a hand. Before we hoisted it into his truck, I decided to make him an offer. He accepted, and it went into my '76 Dodge instead. Until Hurricane Harvey, this beautiful set graced my living room. I was able to save every other console and all other sets by putting them on other furniture or hauling them out to the garage as the unending rains began. Unfortunately, I could not get this heavy piece up onto a table or blocks before the waters began coming in. Just a couple of months ago, I took it out to the garage and began to figure out a way to replace the bottom eight inches or so of veneer. That's when I stuck it on a bathroom scale and measured it at 102 pounds!

After my purchase of the Westinghouse, Jack invited me to come visit his shop. Jack used to restore furniture and wooden radio cabinets. He had hundreds of stains, solvents, pigment sticks, test equipment, rolls of wire, and boxes of everything electrical. Space was tight, but not being a neat freak myself, I wasn't bothered. Jack knew where everything was, and that was all that mattered. It didn't take long for it to become somewhat a common thing for me to spend a Saturday morning in Jack's shop. Jack was the editor of the Grid Leak back then, but he cleverly talked me into taking it over, a position which I held for 4 years, pecking away at the Grid Leak on an IBM Selectric typewriter, and enlisting my wife and kids to label and fold all those newsletters before toting them to the post office.

One day, Jack found a pair of 2000 ohm phones that appeared to have lost their magnetism. I suggested that we make a powerful electromagnet and try to re-magnetize the phones. An hour later, after many wraps of wire around nails we had heated and annealed to make them soft (and less likely to remain permanently magnetized), we had a powerful electromagnet. It drew 10 amps from my 12-volt truck battery, and got warm quickly! What's more, I could barely pull it off the steel fender of the Dodge! It was a fun day, and each year in the electricity unit of my physics classes, kids were amazed at the strength of that electromagnet, and how it could suck the scanning lines of the classroom CRT color television set into a black hole! I got in hot water at after doing that demonstration in another school at a teacher workshop. Apparently the TV's automatic degaussing circuit wasn't strong enough to remove some residual chassis magnetism and the set's colors were never the same!

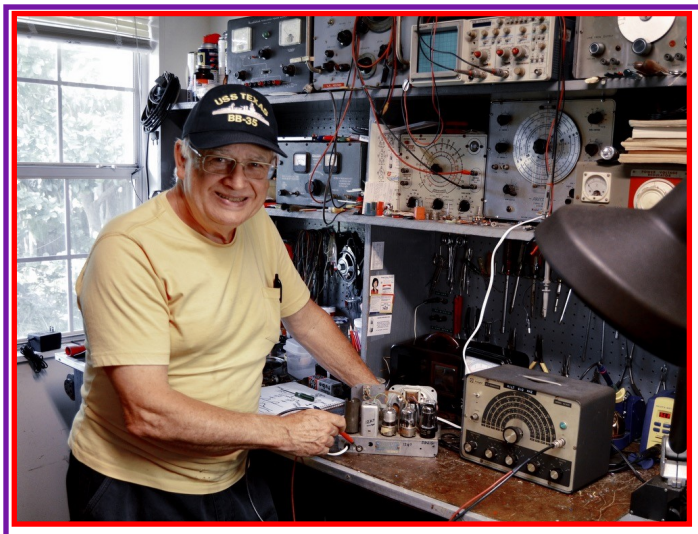
After Jack and Bettie sold their Spring Branch home, they moved to Hillsboro, Texas not long after their 50-year anniversary. It was near where Jack had grown up. After Bettie passed away a few years later, Jack was living alone in that small town. His daughter Teresa built him a small one-room home in her back yard near Los Angeles and moved Jack into his own tiny house. The V.A. paid for a powered lift as he started having trouble climbing to what he called his "aerie" perched on the hill.

We kept in touch via phone, and 10 years ago my wife and I rode our motorcycle out to visit Jack. His daughter Teresa took us out to visit Vasquez Rocks, a well-known movie location. For any Trekkies out there, it was where Captain Kirk fought the Gorn! Jack was still walking pretty well then, and we came upon a B-grade Sci-Fi movie being filmed with a green screen with costumes, and it was the highlight of the day!

Just before he passed away, I found out that Jack had been taught to fly a crop duster before WWII, and when war broke out, that skill was enough to help the Army, after initial training in Louisiana, send him to a B-24 Liberator pilot training and maintenance facility in Liberal, Kansas. He spent the war years upgrading these aircraft, changing engines and other critical equipment, and informing new pilots of mechanical changes to help them successfully fly those iconic heavy bombers.

Pulling that electromagnet out of the drawer took me back to those fun days in Jack's shop long ago. Times when Jack helped me restore my Radiola III box, sitting around in his kitchen with our wives sipping on lemonade, listening to Jack playing a guitar and watching him building an Appalachian dulcimer: those literally were the good old days.

Jack you were a good friend. I am glad you had a long life. I won't forget you. Somewhere around 36 light-years away, a CW tone is still racing through the universe at the speed of light: *K5JWH calling CQ, CQ, CQ. K5JWH calling CQ.*



The Trouble Shooter #46 & #47 Pentode Output Tubes by Bill Werzner

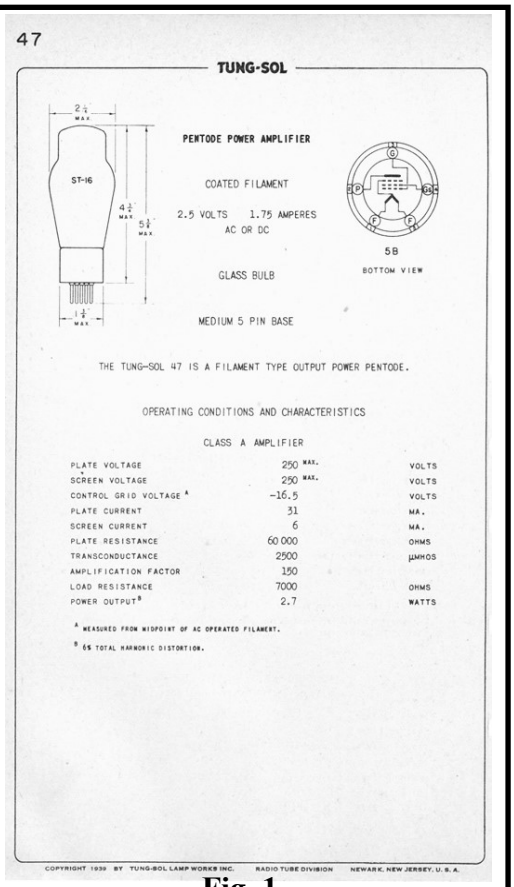
In my previous Trouble Shooter articles I dealt with the evolution of the triode output power audio amplifier tubes such as the 71A, 45, and 50. The push was on to develop ever more powerful audio amplifiers especially with the advent of "talkies" (sound motion pictures). The need for more powerful tubes was evident and research was going full speed to develop not only more powerful tubes, but more efficient tubes as well. Tetrode (four element) tubes were becoming common place in the late 1920s as their increased amplification, using a positively charged screen grid between the control grid and plate, was well established. However, a problem was encountered with early tetrode vacuum tubes in that they were not suitable for audio power amplification. The problem stemmed from secondary electrons bouncing back from the tube plate and being attracted to the positive tube screen.

This was not a problem with tetrode tubes used as RF amplifiers such as the #24A etc. Now the effort was to somehow deflect these spurious electrons away from hitting the screen. Thus, the pentode (a five element tube) was developed in 1926 by two Dutch researchers, Holst and Tellegen, working for Phillips. Due to a snafu in issuing a patent for this invention, no patent was actually issued, so anyone in Holland could manufacture them. To safeguard this invention however, Phillips did acquire patents in eighteen other countries. In 1927, the Phillips B443 tube came into production and was followed by Mullard in the U.K. producing additional pentodes in 1928. The American market was a couple of years behind the Europeans, so it was not until June 1931 that RCA produced their first power pentode, the Radiotron 247, that became commonly known as the #47 (see tube info fig. 1). This tube became a landmark as a powerful output tube in home radios and was soon followed by the smaller 6.3 volt filament #38, which was used in early automobile radios. During the early years of the depression, the 2.5 Volt 47 was commonly used in compact, less expensive radios of that era including the cathedral style table top radios. One thing that made the 47 outstanding was its tapped filament whereby B- voltage was supplied to the suppressor grid via grounded transformer filament connection. Now it was possible to deflect secondary electrons away from the screen grid by a negatively charged suppressor grid between it and the plate (see diagram fig. 3).

Another power five pin output tube of that era is the five pin, 2.5 filament volt #46, power tetrode output tube (fig. 2). Though not as popular as the 47, it was used in some of the higher quality console radios where a pair was wired in push pull arrangement. For output comparison as class A1 amplifiers, the 46 was rated at 1.25 watts vs. the 47 at 2.7 watts. The #38 came in close with 2.5 watts and was contained in a much smaller glass envelope. I was unable to find information on the #46 regarding secondary electron emissions, but examining the schematic of an RCA model RE 81, I found two 46s wired in push pull with the grids of each tube connected in parallel, now a triode arrangement!

So technology begot technology, triode to tetrode, to pentode, on and on it progressed. The 1930's saw a revolution in vacuum tube technology like never before. Following the development of the #38 power pentode, came the 41, 42, 6F6, 6V6, 6L6 and so many more power pentodes that are still being manufactured and used today. The 6550, KT 88, 6BQ5, 50EH5, and a number of others are modern offshoots of the power pentodes that originated in the 1930s. – an interesting history indeed**!**

(Continued)



47

TUNG-SOL

PENTODE POWER AMPLIFIER

COATED FILAMENT

2.5 VOLTS 1.75 AMPERES AC OR DC

GLASS BULB

MEDIUM 5 PIN BASE

ST-16

5B

BOTTOM VIEW

THE TUNG-SOL 47 IS A FILAMENT TYPE OUTPUT POWER PENTODE.

OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A AMPLIFIER

PLATE VOLTAGE	250 MAX.	VOLTS
SCREEN VOLTAGE	250 MAX.	VOLTS
CONTROL GRID VOLTAGE [A]	-16.5	VOLTS
PLATE CURRENT	31	MA.
SCREEN CURRENT	6	MA.
PLATE RESISTANCE	60 000	OHMS
TRANSCONDUCTANCE	2500	μMHOS
AMPLIFICATION FACTOR	150	
LOAD RESISTANCE	7000	OHMS
POWER OUTPUT [B]	2.7	WATTS

[A] MEASURED FROM MIDPOINT OF AC OPERATED FILAMENT.

[B] 6% TOTAL HARMONIC DISTORTION.

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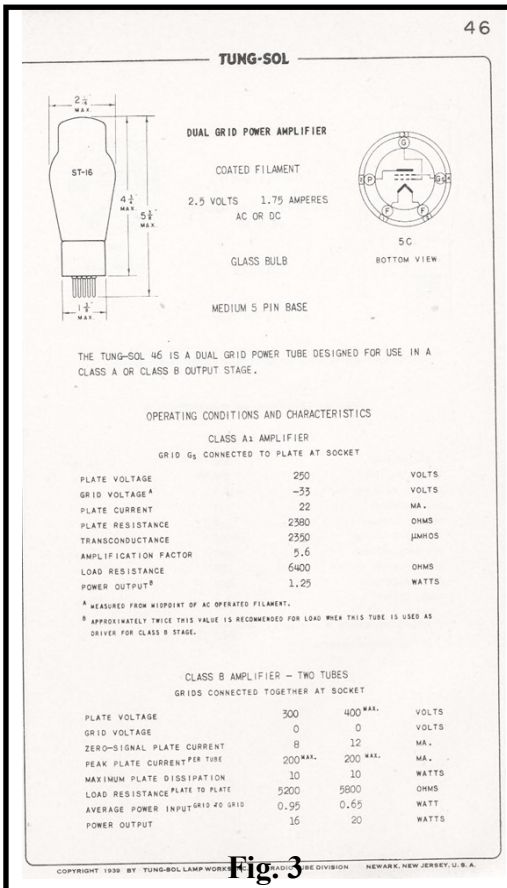
Fig. 1

Notice in the bottom view of the #47 how the suppressor grid, located between the screen grid and plate, is connected internally to the 2.5 volt tube filament winding.



46

TUNG-SOL

DUAL GRID POWER AMPLIFIER

COATED FILAMENT

2.5 VOLTS 1.75 AMPERES AC OR DC

GLASS BULB

MEDIUM 5 PIN BASE

ST-16

5C

BOTTOM VIEW

THE TUNG-SOL 46 IS A DUAL GRID POWER TUBE DESIGNED FOR USE IN A CLASS A OR CLASS B OUTPUT STAGE.

OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A1 AMPLIFIER

GRID G3 CONNECTED TO PLATE AT SOCKET

PLATE VOLTAGE	250	VOLTS
GRID VOLTAGE [A]	-33	VOLTS
PLATE CURRENT	22	MA.
PLATE RESISTANCE	2380	OHMS
TRANSCONDUCTANCE	2350	μMHOS
AMPLIFICATION FACTOR	5.6	
LOAD RESISTANCE	6400	OHMS
POWER OUTPUT [B]	1.25	WATTS

[A] MEASURED FROM MIDPOINT OF AC OPERATED FILAMENT.

[B] APPROXIMATELY TWICE THIS VALUE IS RECOMMENDED FOR LOAD WHEN THIS TUBE IS USED AS DRIVER FOR CLASS B STAGE.

CLASS B AMPLIFIER – TWO TUBES

GRIDS CONNECTED TOGETHER AT SOCKET

PLATE VOLTAGE	300	400 MAX.	VOLTS
GRID VOLTAGE	0	0	VOLTS
ZERO-SIGNAL PLATE CURRENT	8	12	MA.
PEAK PLATE CURRENT PER TUBE	200 MAX.	200 MAX.	MA.
MAXIMUM PLATE DISSIPATION	10	10	WATTS
LOAD RESISTANCE PLATE TO PLATE	5200	5800	OHMS
AVERAGE POWER INPUT GRID TO GRID	0.95	0.65	WATT
POWER OUTPUT	16	20	WATTS

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Fig. 3

This is the tube information for the #46 tetrode power output tube. In some schematics the two grids are connected together externally at the socket lugs and in others, the screen grid is connected to the plate – both resulting in a triode tube configuration.

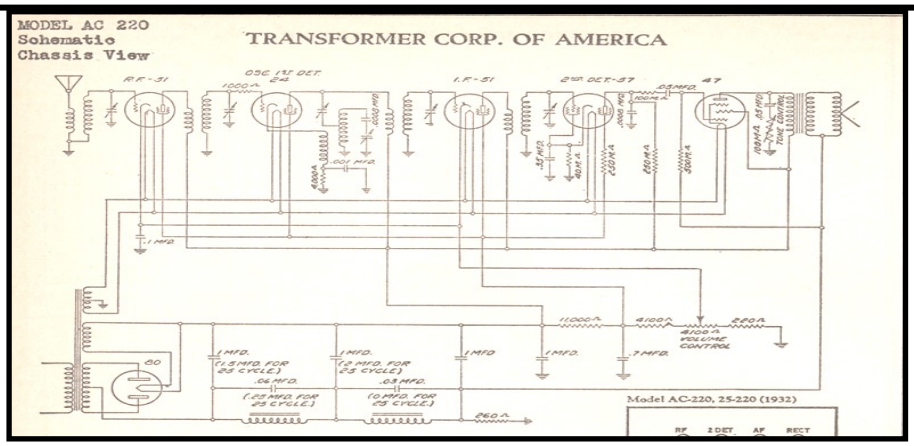


Fig. 2

This schematic typifies an early to mid 1930's radio using the #47 power pentode output tube. Notice how B- voltage is supplied to the suppressor grid via the tapped power transformer filament winding to ground. In this radio the audio level is adjusted via the 4100 Ohm volume control that varies the cathode current of the two #51 tubes.

A Trouble Shooter Heads Up – Corrosive Solder Flux Warning!

By Bill Werzner

A few years ago I purchased a 2 oz. bottle of GC Electronics liquid Solder Flux. The majority of restoration and repair work I do is on vintage electronic equipment and radios that often have corroded solder joints and connections. I read the label on the bottle stating it contained Ammonium Chloride, Zinc Chloride, and probably other components that were not listed on the label. Not having an MSDS (Material Safety Data Sheet) on hand when purchased, and relying on the label alone that the stuff was corrosive, toxic, and to avoid fumes; there was no mention about not using it in electronic work. I found this flux was the best that I had ever used in prepping surfaces for soldering, and was great when dabbed on old oxidized solder for easy melting and removal. About two years ago, I began rebuilding a vintage Atwater Kent chassis from a radio that had caught fire – one that required complete rebuilding from front to back. I installed several new five lug terminal strips during the rebuild, applied the liquid flux to the slightly oxidized lugs, and soldered in the new components. The radio was put aside for about a year and a half (long story) while I searched for tuner parts and a detailed schematic to try and finish the job.

When I returned the very large chassis to my work bench for additional work, I noticed the terminal lugs appeared to be badly rusted! The wiring was intact and the solder junctions looked like they had just been done. The exposed copper wires were also in good shape. It appears the flux penetrated the lug coatings (Zinc?) and attacked the steel lug internal structure, nearly corroding away one of the lugs entirely. I have replaced all of the five lug terminals, but used a soldering paste I bought on E Bay (below to right) that has a neutral Ph 7 +/- 0.3 called ADVANVED QUALITY Z J-18. This product works extremely well when dabbed on to surfaces to be soldered. The cost was $4.59 for 80 grams and is imported from China. If you use the GC liquid solder flux where corrosion is an issue when replacing parts try brushing on a little baking soda as a paste when you finish soldering and rinse or dab it away with some water if possible. Just keep in mind be careful, that liquid flux is great stuff, but it is corrosive, and in time, will corrode the hell out of iron or steel. Be careful with this stuff!

Above is a photo of GC liquid solder flux corrosion following application to five lug terminal strip less than two years ago and removed from circuitry – note serious corrosion that resulted. Below is a terminal strip from the same storage box that is new and unused. Now from MSDS Sheet Section 10 <u>STABILITY AND REACTIVITY :</u> Incompatibility (materials to avoid): strong bases & acids, oxidizers, sulfides, halogens. Hazardous Decomposition or Byproducts (incomplete combustion): Hydrochloric acid, zinc oxide, *Produces HCl so any wonder now why it corrodes iron and steel?*

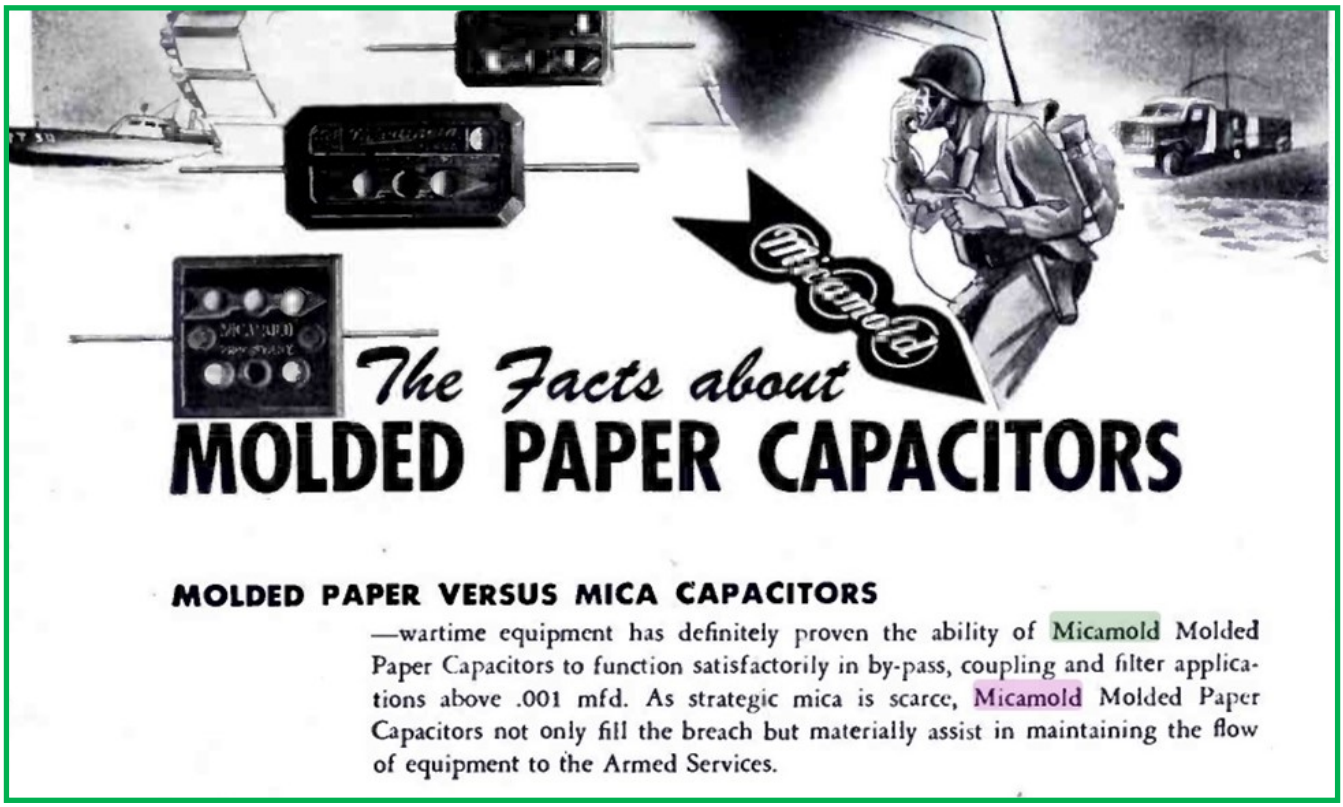
When a Mica Capacitor is not.

By Steve Scheel

Don't be fooled. When recapping your set, Mica capacitors tend to be fairly reliable where as paper capacitors should be replaced by rule, if you want a reliable set. There are Paper capacitors trying to pass themselves off is mica. There may be other brands but "MicaMold" branded capacitors may be mica or "molded" paper capacitors. And they can further be Wax or Oil impregnated. I learned this restoring a pre-war oscilloscope. The timing capacitors were a series of molded "Micamold" capacitors. Half of them were Mica the other half was paper. I had assumed they were all Mica but the Scope would not function on the higher period sweep setting whereas the lower period setting worked fine.

These are all Paper capacitors and were bad.

Even this "precision" 6 Dot capacitor is a paper capacitor from a Magnavox tone circuit and had high Leakage. Sometimes the service literature will accurately reflect the "type" of capacitor in the set? The below is the capacitor (item 49) in shown above in the Maggie I was working on.



AND WHY THE 455 KHz ANYWAY by Tom Taylor

A look into some of our antique books on radio will tell you that Intermediate Frequencies, IF, have been all over the place, from below 90 KHz up to untold heights well above the 10.7 MHz used for today's Frequency Modulated, FM, radios. So, what are the influences for selecting an IF? Although 455 KHz has become the primary choice, it is based on the fact that most radios we listen to cover the same band segments, the Broadcast Band, BCB, up through the lower end of the High Frequency, HF, shortwave band. In order to keep this article reasonably short, it is hoped the reader has at least heard many of the terms used. As with other things in this life, a compromise between two influences leads to selection of a middle ground for IF frequency.

Consider the following example where two Amplitude Modulated, AM, BCB stations are separated by the FCC allowable minimum of 10 KHz as with example stations on 1000 KHz and 1010 KHz. Perhaps you can recall a time when such adjacent stations would influence one another to cause a distant whistling when you tune across them. What you heard was a heterodyne frequency and you needed good design to separate one station from the other particularly if the station you wanted was the weaker of the two. Keeping offending signals and images to a minimum is a radio circuit design objective and the first line of defense is the mixer stage. It is here where a parallel inductor-capacitor pair, ie. LC, provides tuned selection of our desired signal while attenuating frequencies on either side of that choice. That selection comes from the attribute of a parallel inductor-capacitor where the impedance across the pair goes up abruptly at resonance and it falls markedly on either side of that resonance. As you would expect lower impedances placed across the output of amplifier stages shunt to ground more of the undesired signals while their higher impedance resonant state offers little to no attenuation. This is exactly what we need to allow passage of a single frequency and progressive attenuation of those on either side. With a bit of math we see that there is only a 1% difference between those example signals where it is so much easier to find a stronger one swamping the other.

{(1010Kc -1000Kc)/1000Kc = <u>1%</u>

In early years this separation challenge to crystal radios or the smaller TRF radios was formidable if not impossible. Keep in mind that the better of these may have had only three tuned inductor-capacitor, LC, circuits and only one detector. Radio developers took note of the fact that tubes, and adjacent wires had the trait of a capacitor in that their frequency response dropped off with increasing frequency according to the capacitor reactance formula Xc = 1/(2PiFC). This is probably the strongest reason why we never saw reasonable shortwave radios with such simple circuits using tubes of the time. The tubes themselves had high internal capacitances between conductors which acted like frequency shunts. Edwin Armstrong observed that if we kept with a fixed lower frequency amplifier stage and included more tuned circuits we could reduce the inherent component frequency limitation and improve our signal separation opportunities in a stage that amplifies. Enter heterodyning which shifts all incoming signals towards just one lower frequency where lower losses could be attained. In the first detector, also known by servicemen as a mixer, where this heterodyning takes place, there is a section of the main tuning capacitor which peaks our signal choice while the oscillator in synchronization uses another section of that same tuning capacitor to produce the oscillator signal. That oscillator mixes with the frequency favored by the mixer to obtain two additional signals only one of which will pass well through the following IF stage. Those two mixer output signals are the sum and the difference of its two inputs, ie. the station of interest and the oscillator. The majority of circuit designs utilize an oscillator running frequency higher than the signal of interest, ie. the sum, where multiband radios may carefully take advantage of the other opportunity. Lets' do the math again using an IF of 455 KHz>

((1010Kc – 455Kc) – (1000 – 455Kc))/455 = <u>2.2%</u>

Now after frequency shifting we have a higher percentage of separation between those same stations making it far easier to filter one from the other. As noted in chapter 4 of a book by John F. Rider called Servicing Superhetrodynes (the source for this article) we enjoy an increasing benefit as we select lower IFs. In that chapter we see an IF selection of 260 KHz gives 3.8% increase in channel selectivity while one at 175 KHz provides 5.7% and one at 130 KHz provides 7.6%. In each case it was the denominator of the formula above that changed. The numerator remained 10 KHz just as it was before signal shifting. This is of particular value at higher BCB frequencies were the percent separation between signals gets smaller (still allowed a 10 KHz separation) making earlier radios less capable of separating them. The superhetrodynes on the other hand are less affected as seen in the formula just above where the denominator becomes the lesser IF instead of a reference BCB frequency. However, as stated earlier, there is a tradeoff that favors higher frequencies for an IF choice. **(Continued)**

On the upper end of the IF consideration, the underlying driver for a increasing IF selection is determined by our dislike of images; those signals when offset by the IF frequency that find their way through the mixer and into the IF stage for subsequent detection. The IF stage that follows cascades amplifiers separated with LC paired coupling (AKA IF transformers) where we pick up additive signal rejection. Radios with superior selection will have at least two such IF stages. In the minimal example, one amplifying stage has a pair of LC tuned pairs on its input and a pair on its output for a total of four more frequency filters.

Recall the mixer-oscillator combination selects what is presented to the IF. It turns out that if an oscillator runs above or below the station of interest by an amount equal to the IF we see two signals that match the math criteria for the IF frequency. Therefore, if one of those signals was outside mixer LC bandwidth yet the stronger of the two, it could plow through to the IF. Consider this mathematical example. An oscillator at 1455 KHz might allow us to hear the station on 1000 KHz and a station on 1910 KHz both of which meet the 455 KHz offset criteria. We now see from this example that the difference between those two stations is twice the IF frequency, the prerequisite for an image. However, if we simply raise the IF we will increase the spread between the desired and undesired stations thereby making filtered removal of the offender much easier. This is the reason you pay attention to mixer peaking during your alignment steps and station separation is the reason why you pay attention to IF signal peaking. If you arbitrarily peak the IF without the benefit of a signal generator you should be able to attain the separation, but the dial readings will be offset by your IF center frequency alignment error. The fact that common radios adopted IF frequencies close to and either side of 455 KHz suggests that there was no definitive computation for only one of those frequencies. Truth be told the designers knew that it made no substantive difference to vary much either side of our example as long as the surrounding design supported the choice. The selected frequency appears to have been the designer's personal touch that took advantage of existing IF transformers easily adjusted to their final choice. As an aside there appears to be a lot of latitude for low power use in that portion of the frequency spectrum which is today allocated to a large band segment for Aeronautical Radionavigation and Maritime Mobile.

If I have failed to improve your understanding or have simply whet your appetite, the book I referenced is a red hard bound volume about 5 ¼ X 7 ½ inches and every one of them should be read and saved.

<u>If you have ever wondered about abbreviated designations for that old time wire insulation made of cotton or silk, here it is.</u>

- **Single Cotton Covered S. C. C. or SCC**
- **Double Cotton Covered D. C. C. or DCC**
- **Single Silk Covered S. S. C. or SSC**
- **Double Silk Covered D. S. C. or DSC**
- **Single Silk— Cotton Covered S. S. C. C. or SSCC**
- **Double Silk = Cotton Covered D. S. C. C. or DSCC**

Tom Taylor

Turn Table Hard Knocks
by Tom Taylor

So you have a couple of rough repairs under your belt and your feeling good about yourself THEN along comes a customer's '55 RCA record player (changer) packaged in a mini console with what forums say is cherry colored mahogany. You take it because it seems manageable and the owner believes in you based on a recommendation and there are FEW or NO other KNOWN options for their refurbishment task. After a brief look inside the cabinet and under the turn table you recognize quality, a pair of 50C5s in push pull and you're thinking how much of a challenge can that old mechanism be, right?

Stand Up Step one was to replace all 11 capacitors including the leaky speaker crossover capacitor and all four tubes to attain a powered amp test. WE GOOD HERE. Step two is to run LP records and see what doesn't work right on this 65 year old changer. At this point I should have heard trucks or an incoming mortar round while staring at the usual evidence of dried up grease, you know, the underlying cause for items that don't move like they should. Thought it was arthritis didn't you. This state of affairs is better defined as an incorrect operating speed for 33 RPM, a conspicuous absence of normal changer actions like a dysfunctional tone arm, failures to recognize record drop, no automatic turn off, etc. It was also at this time I noticed the sound would degrade then drop out periodically just to go completely west after no more than four albums. Took a few frets and tests at cartridge connections to realize the issue was the cartridge NOT the amplifier AND IF you magnify the needle on mounting axis you could see that it was dull and had rotated about 20 degrees in its plastic attachment explaining the tone arm's willingness to start skating across the record towards the center (other than the occasional lint build up that elevated the needle).

Stand UP Lets first get rotations 'up to speed' by addressing top and bottom motor bushings with light oil, then using alcohol, remove all evidence of oil on the drive capstan, the speed interface wheels, the idler wheel and the inside of the platter. THEN, use mineral spirits (AKA charcoal lighter fluid) to dissolve congealed lubricant at EVERY flipper pivot you can find under there, and they are everywhere. You know, in the software world these flippers might be considered IF THEN statements and in the hardware world they might be considered logic gates. Then, lube other linkage pivots ONLY with very fine oil ONLY where needed to attain total freedom of movement. Follow that by wiping off excess grease that tends to accumulate at the end of mechanism travel and replace with fine oil where things move against one another. NOW, reinstall the changer and check for an improved performance. Not good yet. Oh, and about here the platter speed starts to vary while rotating begging the question 'is it a low speed motor or is it the slippage we just addressed'. ON the good side our member in Alvin had a handsome stock of cartridges and needles one of which was chosen to provide clear music albeit at a lower level. Another trip to and from our friend to obtain that same day a solid state preamp that only needed two electrolytics due to age. It was first required to confirm suspicions and then retained rather than order something else on line and adapt that one days later.

Stand Up Remove that changer and recheck for overlooked and reluctant flippers as well as areas of movement about the tone arm mount and of course check all areas previously serviced. Treat those as needed and reinstall the changer. Not good yet. HHMMM IF the platter speed is too low there must be slippage somewhere so back with the alcohol and this time you find the idler wheel rubber seems hard which will cause slippage on the inside of the platter, ie a slower record speed. After finding that Phono Non-Slip from GC Electronics does nothing for this slippage condition I took to removing all that Phono Non-Slip with alcohol and began to sweat. What are the chances of a '55 RCA idler wheel being found for sale, ANYWHERE? Although I soon found a candidate on line for $50 it hit my estimate of total repair pretty hard, particularly after labor and four tubes, 11 capacitors, one resistor, one cartridge, a needle and a preamp. But wait. There are fluids that attack and soften rubber on an idler wheel such that it might provide the needed grip at a platter surface. A bit of research leads me to the product at EPO on Westpark disguised as Rubber Renue 408A by MG Chemicals. A trip to and from Houston's far side and THAT speed irregularity problem becomes history but now our beloved target performs smooth but most certainly slower than 33 RPM. This awareness leads to a condition called weak knees leaving but one option, to move ahead now even if more slowly than before.

(Continued)

Turn Table Hard Knocks (Continued)

Stand UP. But wait! IF there is no slippage remaining the issue must be that motor, you know, the same motor that ran so well after fine oil treatment early on. Yep, This time with my newest best friend mineral spirits the schmuetz in those bushings appears to be dissolved and we have at last some good down home country oldies, time after time after time after…..

Bruised and numb, I am just not sure I am cut out for these fights anymore. I may need some of that self confidence just to get up each day.

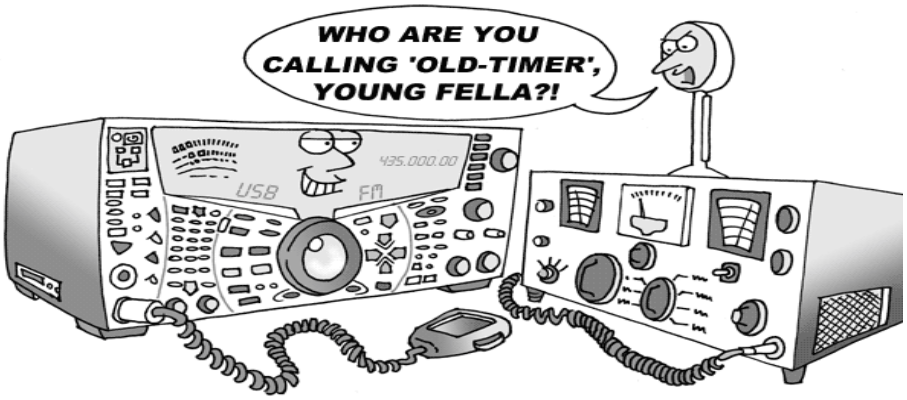


PHOTO FROM THE PAST

David Moore and Gilbert Hedge preparing for the Bob Wood Estate Auction

TANGENT COLLECTING

By: Michael Payne

For many of us that collect antique radios there is an interesting story how we acquired our first old radio. A deeper reflection will reveal those moments in our lives that shaped our later interests of these old technologies. To some, it may be a memory from that weekend at grandmas house and the attention she put on listening to her old radio. To others it might have been a visit to the ham operator down the street with the tall tower. The wonder of finally getting to see that Frankenradio gear at the other end of the metal obelisk signaling CQ, CQ, CQDX. It might even be reliving the past through something we couldn't afford in our youth.

Along the way most of us move off on tangents whether by chance or focused direction to culminate in some interesting accompaniments to the boxes we collect. We all pick up extra tubes that would pass for a tube collection, others like ephemera that surround the objects they possess. I know one guy that went from TV sets to slot cars and now crystal radios. I used to joke about bottle cap collectors as well as the single magazine page sellers on eBay. At one point in time I believe one could sell Western Electric used toilet paper if you had a certificate of authenticity.

I call this "Tangent Collecting". Point is, there are all kinds of things to collect and the story behind how each of us personally got here would make interesting commentary about us as individuals. A previous HVRA competition on non-radio collections proves the point. In the course of several decades of acquisitions and junk scrounging I have stumbled into old nameplates. Some I have even removed myself but mostly they are from loose boxes of parts. I'm sure many reading this have a few kicking around their collection as well. The pathway trip into your junk box could be an interesting yarn in itself if you know its history, but usually we do not. One takeaway from collecting nameplates is that the piece existed at one point in time. For some reason it doesn't now. More importantly, the badge once prominently displayed on a piece of handcrafted valuable equipment is now reduced to a haunting reminder of something that doesn't exist anymore. Here are a few of my favorites…

Pandemic Projects

By Gilbert Hedge

When the Covid-19 epidemic first hit I had the time to attack some of those projects that I had been putting off for years. A few years ago I acquired very rare Zenith 31 battery receiver, which was the last battery set that Zenith manufactured in 1928. I restored it but it was missing the back door and I wasn't sure what it should look like, so I put it on the shelf and thought I would address that later. As a result of the Pandemic I now had time to research and reproduce a back door for the 31. I found out that the door was just like the screen door on the Zenith 33. I contacted Jeff Heller, who had a 33, and he was kind enough to provide me with some pictures and drawings of the door. I built the door and it looks pretty good.

1928 Zenith 31 with new back door

The next project that I attempted was a Radiola IV that had been in my attic for years. It was missing many parts and I had no idea what they were or how I could reproduce them. Wendell Wyborny loaned me his complete Radiola IV so that I could reproduce the missing parts: top cross bar on cabinet, 'B' battery bracket, 'A' battery bracket, 'C' battery contacts, and antenna and ground plugs. The cabinet was in very bad shape, so it was stripped, stained and added several coats of semi-gloss lacquer. Grill cloth was acquired from the Radiola Guy.

1923 Radiola IV

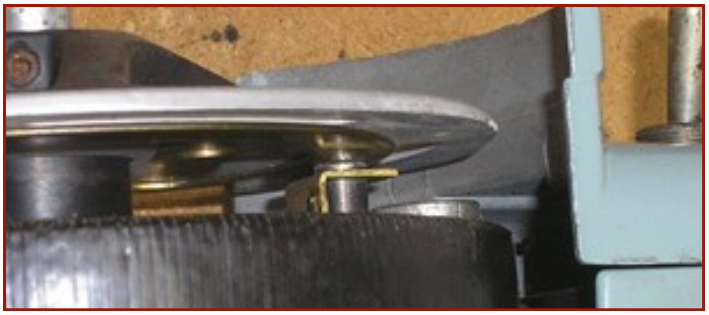
I recently acquired a lighted Philco clock sign that was missing some parts and was not working. The first thing I did was to take it apart and replace the power cord. Now the lights worked but the clock did not. I removed the cover of the clock mechanism and gave the wheel a push and it started working. The whole thing was thoroughly cleaned. The second hand is missing part of the pointer and there is a plastic piece that covers the whole face of the clock that is missing.

(Continued)

I obtained an ERLA battery set, with Balloon Circloid coils, from a Sargent Internet Auction and the cabinet was in horrible shape. The laminates on the top and sides was partly missing. I obtained some Mahogany laminate from the Wood Crafter store on the South Loop. I painstakingly glued the missing portions, trying to match grain, to the missing areas. The cabinet was then stripped, stained and I applied two coats of semi-gloss lacquer.

I also recently obtained about 30 pounds of radio and TV knobs. I separated, what I think were the radio knobs, probably about 10 percent of the total, from the TV knobs. The radio knobs were washed and dried and then sorted into similar groups. Divided containers were bought so it would be easier to locate a particular knob. The 28 pounds of TV knobs are for sale.

One item I have and thought I would probably throw away at some point is a Variac that does not work. Knowing how simple they are I thought that a winding was probably open; but I checked it out anyway. The fuse was open so I replaced it and, to my surprise, it worked but was erratic as the knob was rotated. I checked the windings and none were open. I tested it with a light bulb load and it was still erratic. I removed the knob and case and cleaned the contact and windings. Tested again and it was still erratic. I disassembled it again and noticed there was a slip ring under the bottom of the plate, so I cleaned the contact and slip ring with tuner cleaner. That worked.



Browsing the Antique Shops in Galveston on a Sunday Afternoon

By Ric Slater

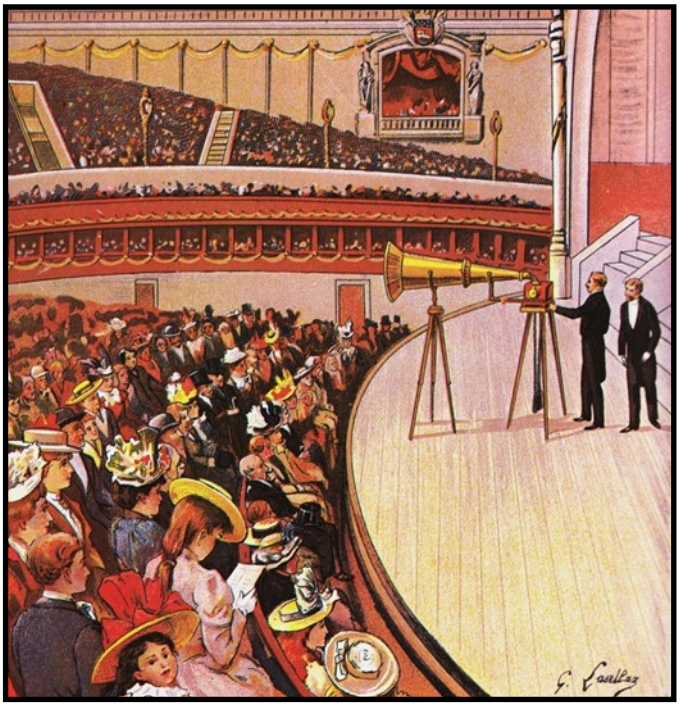
My wife wanted to get out of the house one afternoon in August, which is something we haven't really done since March. We went to an Antique shop that we like to go to that never has more than 2 or 3 customers at a time. That day was no exception. So, we donned our masks and went treasure hunting. I stumbled onto a great find on the History of Phonographs. I also paid more than I ever pay for a used book, but it was something I have never seen before. It was called, "The Illustrated History of Phonographs by Daniel Marty". It went into who developed the technology and had a great assortment of photos of many of the manufacturers. The real surprise was how well he discussed how the technology evolved including how it was used, promoted, and recorded. Here are a just a few of the photos that struck me a fascinating.

The first photo was a real surprise. I thought the first talking doll "Chatty Cathy" was invented in the 60's and it turns out these talking dolls date back to 1889 or earlier. The one below was made by a well-known French watch and clockmaker, Henri Lioret, who saw a talking doll at the 1889 Paris Exposition Universelle, and came up with the idea to begin manufacturing phonographs and items like the talking dolls you see below. The dolls below were brought to market in 1893.

(Continued)

Browsing the Antique Shops in Galveston on a Sunday Afternoon (Continued)

The next photos show one of Henri Lioret's phonographs, after he began to design, manufacture and promote them. The first photo is of his Lioretgraphs, which was weight-driven and lasted 4 minutes. Henri was considered one of the best clock makers in Paris. I can only imagine that it was this skill that made it possible to design a phonograph that ran using weights. The second photo is a print of Henri promoting his phonograph at the Paris Trocadero in 1897. Interestingly, he made a good deal of money putting on these exhibitions and the sound was considered quite good by the audience



The last photos were interesting because they showed how recording was done on cylinders and multiple people listening to one of Edison's phonographs at a demo. The first shows the effort that was required to record piano music. The last photo is at Edison's exhibit at the 1889 Paris Exhibition Universelle, showing how many people could listen to a single cylinder.

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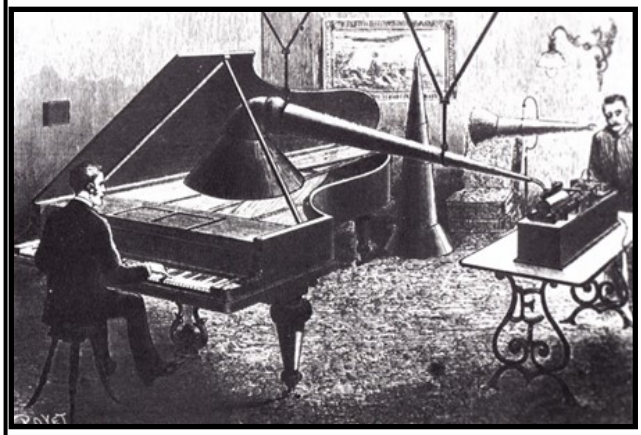
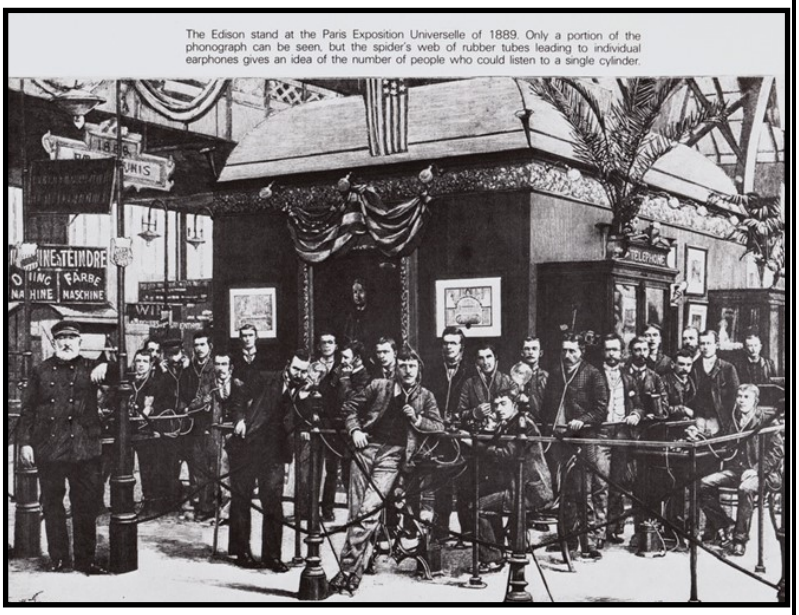




Do Aliens Use CW ? ***By your Historian – S. Peña***

I can remember well that as an overly curious stripling in the late 1970's one of my favorite pastimes was to snoop around my father's extensive library. He was a surgeon (and still practices medicine today) and we kids (5 of us) all knew there was that one section we were to stay out of, which prohibition was prompted by a sibling having stumbled across *Deformities and Diseases of the Genitalia*, a volume copiously illustrated and one apt to leave a 12 year-old mind scarred for life. But then there was the general reading section, the one we were allowed in, and this is where I discovered Fred Hoyle's marvelous little *The Black Cloud*. In the 1950's Hoyle was Britain's Astronomer Royal, and despite the fact that by the middle of the decade he had become the world's most famous astronomer (though today he is probably most well remembered for having coined the term, "Big Bang"), he somehow found time to write fiction, science fiction, and *The Black Cloud* was one of his most engaging works.

Though Hoyle was writing in 1957, the work begins with a letter, supposedly written in the Summer of 2020, after the world had gone into lock-down and stay-at-home orders have been issued around the globe (yes, that's right, I couldn't make this up). But it wasn't exactly a pandemic that brings this about in Hoyle's eerily prescient tale. Instead, the Mt. Palomar Observatory at CalTech has discovered that a great cloud of gas, of which there are many in our galaxy, is fast approaching our solar system, and that it is on course, in a little less than a year, to come between the Earth and the Sun. The Cloud is about 112 million miles in diameter, and when it comes perfectly between Earth and Sun we will find that the temperature of our planet will drop far below zero Fahrenheit, we will all be plunged into darkness, and that the survivors (700 million will perish, a third of the world's population) will be forced to shelter in place for a prolonged lock-down. For one to go outside means death (similar to the 2004 movie, "The Day After Tomorrow"). Landline communication has become useless, as no lines can be maintained. Unknown to the rest of the world, however, a group of scientists, all astronomers, has holed up in the British countryside with a truckload of communications receivers, transmitters and power generators. Their plan is to save the world by becoming the world's information clearinghouse through the use of CW transmission. They communicate with all the governments of the world by means of messages prerecorded via CW pulses on magnetic tape. They have devised means of getting as much as a million pulses per second (roughly a hundred thousand words) onto the tape, and can transmit at wave-lengths as short as one centimeter. Of course a wave-length that is too short will see the signal penetrate the atmosphere and be lost to space. On the other hand, the shorter the wave-length the more information a signal can carry. It seems, however, that the Cloud's presence has raised the ionization of the atmosphere, and as every HVRA member knows, for every increase in ionization there is a consequent increase in "reflection" of radio signals back to Earth. The astronomers use "an electronic computer" (which uses vacuum tubes) to calculate the ideal wave-length, which is 25 centimeters. But then something strange happens; the astronomers realize the Cloud is manipulating the ionization level, that the Cloud is----an alien intelligence. The astronomers now begin to communicate with the intelligence using CW transmission. They manage to connect a television camera directly to a transmitter, and, making use of their 1-centimeter transmission ability, to send images in a manner similar to radioteletype, improving on what at the time was 450 line imagery to 20,000 lines. In return they take the Cloud's CW transmission and feed it into a punch card system that then converts it into sound---so they hear the Cloud "talking." Eventually the U.S. government manages to set up 1-centimeter receivers and transmitters and attempts to break the monopoly the astronomers in hiding have on Cloud-communication. But once the Cloud-astronomers link had been established they narrowed the bandwidth and greatly lowered the power of their transmissions, and finally added a code that precedes every message to authenticate it. At last the Cloud reveals that it has come to our Sun as a pit-stop to soak up energy, before it continues its journey to a distant galaxy. It is in search of a transmission source. Twice in the history of the universe an intelligence has figured out the whole "god question," that is, the question of a Supreme Intelligence. Once was 2 billion years ago when a being similar to the Cloud announced it had discovered the Answer. The other time was 400 million years ago. Both times the messenger was snuffed out or simply disappeared without a trace. Now it has happened once again---some intelligence has figured out the greatest mystery of all and the Cloud is on its way to learn about it before the discoverer disappears.

Hoyle uses the volume to speculate on whether there is a god, on why telepathy is utter nonsense,[1] why high intelligence cannot evolve on the surface of a planet, and how communication works. Tantalizingly, the Epilogue of the book is a letter dated January 17, 2021. In the estate of one of the deceased astronomers has been found the original punch-code tape with the code needed to contact the Cloud. With radio waves propagating at the speed of light he suggests it may still be possible to contact the great intelligence that once visited the Earth. You can imagine how exciting this was to this young man's mind in 1978. So here we all are in lockdown or partial lockdown in the Summer of 2020, exactly as the book described back in 1957; with all this time on your hands you could do worse than get a copy of Hoyle's classic, *The Black Cloud,* and then see if that old Hallicrafters can manage 1 centimeter.

[1]The reason bears consideration: the extremely minute electrical power generated by brain-waves is D.C., whereas to propagate over distance would require A.C. This reminds me a bit of the reason Albert Einstein gave for his own rejection of telepathy, ESP and similar ghostly notions of mystical communication: all known forces diminish over distance, he pointed out; telepathy, as promoted by its practitioners' claims, would violate that principle, which in turn is, *a fortiori,* a violation of the Principle of the Uniformity of Nature.

Buy, Sell, Trade, & Services Offered

Vintage Sounds Named Best Antique Store in Houston June 2020.
Vintage Sounds celebrated their thirty-fifth year in business in February. Now located in the Market Place Antique Center, 10910 Katy Freeway, Houston, they service and repair vintage phonographs, radios, telephones, in addition to selling phonograph records, radios, phonographs, telephones, vacuum tubes, books, light bulbs, parts, and so much more. Open Friday, Saturday, and Sunday 10 AM - 6 PM. HVRA members 10% discount on radio items. (713) 468-4911 www.vintagesoundshouston.com

Borden Radio Company website: http://www.xtalman.com Antique Radio Schematic Service included in web-site. Crystal radio kits for sale. (281) 620 – 6692

Sargent Auction Service: www.sargentauction.com, Jims@sargentauction.com Jim Sargent, WA5QBR, Auctioneer, TX license 16135 Location: 200 Thomas Road, Granbury TX 76049

Allen Speaker Service: Speaker re-coning and repair, 919 W.19th St. Houston, (713) 862- 2747.

Tom Granger Restorations, radio and phono cabinets. (281) 338 - 8277.
www.tomgranger@mac.com

Local Sources for Radio and Electronic Parts

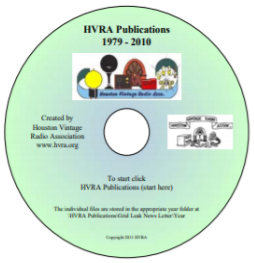
EPO (Electronic Parts Outlet), 3753 Fondren Rd., Houston 77063 (713) 784 – 0140
ACE Electronics, 3210 Antoine Dr., Houston 77092 (713) 688-8114

Sitting at home with nothing to do? Are all of your restoration projects completed? Do you still have questions about difficult electrical repairs to your prized radio(s)?

Well, fear not Mr. Collector. The HVRA CD - ROM awaits your attention. Indexed for easy use and filled with 31 years of HVRA Grid Leak articles your answers and vast amounts of general vintage radio information is just a small investment away.

Please fill out the attached form or print one out from our website (hvra.org) and you will be rewarded with more information than one man should ever know.

For additional CD information, contact Steven Pena, HVRA Historian.



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This DVD captures 32 years of HVRA and radio related historical information that may be used for research, finding technical or how to articles, or just reminiscing about old friends or past HVRA sponsored activities.

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Other Radio Related Activities

Texas Broadcast Museum: This museum is located at 416 E. Main Street in Kilgore, TX, phone 903-984-8115. There are hundreds of pieces of vintage paraphernalia related to radio and TV broadcasting. Admission is $6.00 ($5.00 for seniors and military vets).

Edington Family Museum of Atwater-Kent Radios: Jimmy Edington, long-time collector and original HVRA member, has re-purposed a beautifully restored hotel to display his out standing collection of Atwater-Kent radios and related products. It is located in Silsbee, TX, about 80 miles east of Houston. See his website, www.atwaterkentsrus.com. If you would like to visit, please contact Jimmy in advance, 337-476-4328 or atwaterkentsrus@gmail.com

More Radio Clubs

Delaware Valley Historic Radio Club www.dvhrc.com

Oklahoma Vintage Radio Collectors President: Jim Collings, PO Box 50625, Midwest City, OK jcradio@cox.net; $15 annual dues. Monthly meetings, annual show.

Antique Radio Club of Illinois, www.clubinfo@vintage-radio.org

Collins Radio Association (CRA). David Knepper, PO Box 34, Sidman, PA 15955. No dues. www.collinsra.com

Louisiana & Gulf Coast Antique Radio Club. Phil Boydston, 750 Moore St., Baton Rouge, LA 70806.

Michigan Antique Radio Club (MARC). Don Colbert, MARC, Pub: The Michigan Antique Radio Chronicle, quarterly. Dues: $20. membership@michiganantiqueradio.org. Annual Extravaganza and other quarterly meets. www.michiganantiqueradio.org .

New Mexico Radio Collectors Club (NMRCC). Monthly newsletter and members meeting (with flea market, auction and theme program). Dues: $20. For more information contact John Anthes, jpanthes@comcast.net Club website: http://newmexicoradiocollectorsclub.com

Texas Antique Radio Club, Doug Wright, Canyon Lake, TX. wrightdouglas70@yahoo.com

Vintage Radio and Phonograph Society (VRPS), Dallas / Ft. Worth, TX. George Potter vrps@sbcglobal.net, website: www.vrps.org

Texas Panhandle Vintage Radio Society (TPVRS). Contact: Elroy A. Heras, 4086 Business Park Dr., Amarillo,TX 79110