AWA Newsletter

#83

December 2012

Affiliated to the SARL

Antique Wireless Association of Southern Africa

Inside this issue:

AWA Committee:

* President—Richard ZS6TF
* Technical Advisor—Rad ZS6RAD
* Secretary/PRO—Andy ZS6ADY
* Western Cape—John ZS1WJ

Reflections:

So another year has passed by before we even realised it and we are in to the start of another one.

New Year resolutions will be made and forgotten about. We will promise to do more in the coming months in many different areas of life, whether it be to keeping our spouses happy or children, or working harder, or making changes in our lives that will affect those around us.

Whatever it may be, make time for yourself too. Any shrink will tell you, its always good to have some "you" time. The latest talk is around "man caves", where one can chill out and do "man" things.

Even KFC has been getting on to the "man" thing with their adverts.

Whatever it is that you promise yourself or want to do this coming year, make a go of it and really set yourself some targets to achieve, because come the end of the year, we will be looking back and saying that we had so many good things planned and did not achieve any of them, again.

Often I think of things I need to do at home and in my shack. Then when I have time on my hands to do them, I cant remember what it was I wanted to do. So one of the things I have started doing is making a "To Do" list, which at the moment is so long, it looks like a grocery shopping list for a children's home.

But that's fine. Every time I think of something I need to do, I add it to the list.

Now I don't know if I'm going to get to all of these things right now, but then I'm going to prioritise them and take one at a time. The priorities are not cast in concrete either, so I'm going to be flexible about them n case something might change.

In a few months time I will review my list and see how I have managed. Who knows, I may just make a success of it all.

To all of you, may this be a truly prosperous year for you.

"May love and laughter light your days, and warm your heart and home. May good and faithful friends be yours, wherever you may roam. May peace and plenty bless your world with joy that long endures. May all life's passing seasons bring the best to you and yours "

Best 73

DE Andy ZS6ADY

WIKIPEDIA

In 1832, James Lindsay gave a classroom demonstration of wireless telegraphy to his students. By 1854, he was able to demonstrate a transmission across the Firth of Tay from Dundee to Woodhaven, a distance of two miles (3 km), using water as the transmission medium.

Addressing the Franklin Institute in 1893, Nikola Tesla described and demonstrated in detail the principles of wireless telegraphy. The apparatus that he used contained all the elements that were incorporated into radio systems before the development of the vacuum tube. However it was not until 1900 that Reginald Fessenden was able to wirelessly transmit a human voice. In December 1901, Guglielmo Marconi established wireless communication between Britain and Newfoundland, earning him the Nobel Prize in physics in 1909 (which he shared with Karl Braun).

On March 25, 1925, Scottish inventor John Logie Baird publicly demonstrated the transmission of moving silhouette pictures at the London department store Selfridges. In October 1925, Baird was successful in obtaining moving pictures with halftone shades, which were by most accounts the first true television pictures. This led to a public demonstration of the improved device on 26 January 1926 again at Selfridges. Baird's first devices relied upon the Nipkow disk and thus became known as the mechanical television. It formed the basis of semi-experimental broadcasts done by the BBC beginning September 30, 1929.

CW Net:

I am amazed at the response I have had for CW over this last month. Articles that have been sent to me as well as people who have contacted me and there certainly seems to still be a fair amount of CW fists out there operating on a regular basis.

I said I was going to spend a bit more time on CW in the future and I have been pleasantly surprised with a few that have come back to my plaintive calls on 7020. Mostly I will call early mornings from about 07:00 on 7020 and then in the afternoon around 16:00 to 16:30.

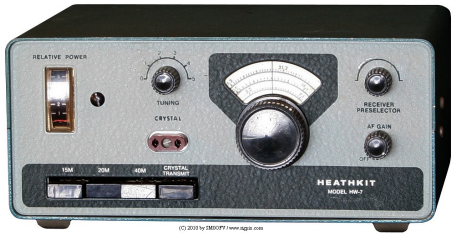
On weekends I have been calling at odd times after nets, just to see who has been around, if any at all.

If you want to play some CW come up at these times or let me know when you are available and set up a sked, I am more than willing to try at most times.

Of course, the DX bands are still full of CW. My only problem there of course is reading most of them. If I want to get my CW up to speed, then I need the practice and this is what I am trying to do.

Surely there must be a number of guys out there who are still wanting to play on CW? Surely there must be many out there who are old CW operators, wanting to try their hand again at it ?

I want to encourage you to get back on your keys, paddles, bugs, whatever it is you prefer to use and call on the bands. The more people we can get calling, the more activity its going to generate. This will in turn encourage more to pick up where they left off and get back to trying their hand at some CW again.



Heathkit HW7

We don't all have to be Hi-speed operators to enjoy CW. 12-15 wpm is quite fair, and if you are still slower than that, then all the more reason to encourage you to practice.'

The more we practice …….

SSB activity:

There has been a tremendous amount of activity on SSB over the past month. I don't know whether it is just because people are all on leave and have a bit more time on their hands, but it certainly is encouraging to hear the amount of people occupying the bands these days.

The SSB net has also been affected by this influx of people on to the bands and we have had an increase of callers to the net as well as a few more people wanting to join the AWA as a result of this.

Band conditions certainly have not been that great, so we cant really attribute it to changing conditions, but it really is encouraging to hear all the activity.

Over the last few weeks most people have been experiencing quite a bit of noise on the band in the form almost of a "static rain" which seems to vary in intensity at times. No doubt this is because of the storm activity being experienced right across the country at the moment.

Inevitably, this will dissipate as the storms do and the bands will hopefully return to some form of normality.

Sunspot figures have not been that great and it seems this has again been one of the low cycles we have been experiencing. Lets hope this does not become too much of a trend.

Looking forward to hearing many more of

Heathkit HW12A

AM:

The AM nets have also been quite encouraging this last while. Saturday mornings seems to attract a fair number of stations calling in these days and conditions are pretty good early morning on 80m.

For the div5 stations, it really has to be an early day if they want to get through to div6 as the band starts to fade from around 06:00. The result is that we have to get going as close as possible to sunrise in order to get the most out of the band. Now not many of you may know that the sun rises shortly after 05:00 in the mornings, so it does mean an early start, which has its own inherent problems of course. To drag your body out of bed so early on a Saturday morning is really not a pleasure, but this can be offset by the pleasure of being able to have good comms on AM.

The Wednesday evening nets have been few, because of the prevalent summer storms causing a great deal of QRN on 80m, but there have still been a few occasions when running an AM net has been possible. You never know what conditions are going to be like until you switch on and try listening to the other station.

It is also promising to hear of people who are looking for AM rigs and others who are busy restoring AM rigs. It gives a bit of added incentive to dragging yourself out of bed to play some radio.

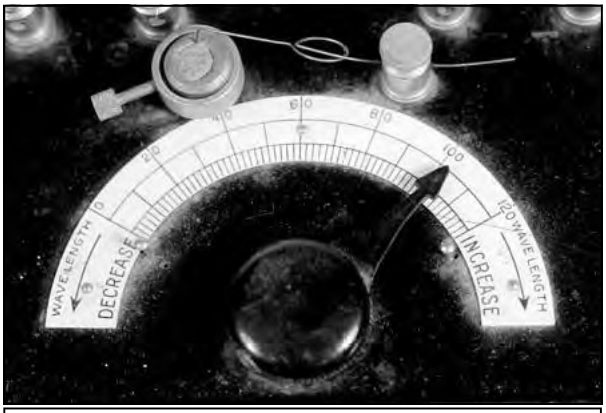
If you are looking for help or information on restoring an old rig to its former glory, there are many in the AWA who are there to lend a helping hand. Try them out, you'll see.

Heathkit DX40

Evolution of the Broadcast Receiver

By Marc F. Ellis, N9EWJ

Crystal and Regenerative Sets



The galena (lead ore) and "cat's whisker" detector employed in early crystal sets probably represents the first use of semiconductors

Curiously enough, very early radio receiver design was based on solid-state technology. A semiconductor -device, in the form of a chunk of lead ore (otherwise known as galena), was the most widely used detector of radio signals until made obsolete by introduction of the much more efficient vacuum tube in the early 1920s. Of course, as we all know, the tables were turned in the 1960s, when semiconductors in the form of transistors and diodes all but totally replaced vacuum tubes in receiver circuitry. You'll recognize a crystal set when you find one by the little chunk of galena ore which is embedded in a small metal cup and contacted by a fine, springy wire known as the "cat's whisker." At the start of a listening session, the tip of the wire was moved to different spots on the surface of the galena to find the location where signals were loudest. You'd have to be very lucky indeed to come across a vintage crystal receiver at a local flea market or garage sale. By the time radio broadcasting had become well enough established to create a mass market in receivers, crystal sets had been replaced by tube models. Hence, there just weren't that many serious crystal radios made. Your best chance for acquiring a crystal set dating from the early days of broadcasting would be by purchasing it from another collector. Keep your eyes open at antique radio swap meets and check the classified ads in newspapers and other publications. Expect to pay a good buck for your set, but be sure it's truly an early '20s model before shelling out. Crystal sets have fascinated electronics enthusiasts for years because of their simplicity, and the fact that they operate without a power source. Novelty, or toy, versions of these sets (such as the units made by Philmore) were readily available well into the 1960s and maybe later.

REGENERATIVE SETS

Despite the "free-power" advantage of the crystal set and its simplicity of operation, most serious listening during the decade of the 1920s was done with tube radios operated by dry and/or storage batteries. Since tubes had the capacity to amplify signals as well as detect them, these radios were much more sensitive than crystal sets and could deliver much louder signals. To obtain maximum efficiency in a regenerative set, the amount of feedback had to be carefully regulated. A large percentage of the tube radios in use during this period were of regenerative design. The regenerative set was a product of the fertile mind of legendary radio inventor Edwin Armstrong. It squeezed so much performance from a single tube that few regens had more than two.

"Regen" sets could squeeze amazing performance out of one tube. Note pancake coils in feedback circuitry of a Crosley 50. The rear one is adjustable.

The regenerative tube did double duty, functioning both as an amplifier and a detector of radio signals. But the real secret of its astonishing performance lay in its feedback circuitry. Part of the amplifier's output was coupled back into the input. The result was that the received signal could be amplified over and over again, resulting in tremendous gain. This was usually handled through changing the relative position of two coils—one in the output circuit and one in the input. The closer together the two coils, the greater the feedback. With the coils too close together, the tube would go into oscillation—emitting a radio signal that would interfere with other radios in the neighbourhood, creating an ear-splitting howl in the headphones. The idea was to reduce the feedback until it was just below this point, resulting in maximum amplification of the received signal.

Among the common small "regen" receivers of the early 20s are the one-tube Crosley 50 and the two-tube RCA Radiola III. The RCA set's extra tube was an audio amplifier, providing more volume in the headphones. The less-common Crosley 51 also sported an extra tube for audio amplification. RCA sold an accessory two-tube "balanced amplifier" that could be added to the Radiola III to obtain speaker volume.

The Crosley 50 was probably the most widely sold single-tube regenerative receiver of the early 1920s.

The minimalist design made possible by regenerative circuitry was a very attractive option, so earphone-only regens were very popular. These smaller regenerative radios used tubes such as the types 11 and 12, which had filaments that could be powered by disposable dry batteries. Plate and, when necessary grid bias, voltages were also supplied by dry batteries. One mark of identification for regenerative sets of all sizes is the simplicity of their controls. Not considering the filament rheostats (sometimes one for each tube) found in battery sets of this vintage, there are usually not more than two: a regeneration control (may be marked "amplification") and a "station selector" or "tuning" control. Many Crosley sets, however, also incorporated multi-contact "bandswitches," probably because their odd leaf-type tuning capacitors didn't have enough range to cover the entire broadcast band.

The RCA Radiola III was more elegantly made than the Crosley 50 and boasted an additional tube that provided extra headphone volume.

ENTER THE TRF

The regenerative receiver probably would have been the dominant 1920s design if Edwin Armstrong had retained the patents. But, towards the middle of the decade, Westinghouse purchased the rights and held them very closely, making it very difficult for other manufacturers to obtain licenses. As a result, many companies wishing to enter the lucrative broadcast receiver market had to turn to less efficient circuitry. In fact, it took three tubes (two RF amplifiers and a detector) to provide the same performance as a single tube connected as a regenerative amplifier-detector. The two stages of RF amplification required three tuned Evolution of the Broadcast Receiver circuits (coil/variable capacitor combinations) for proper operation. That meant that there were three tuning dials to be manipulated in order to locate a station and tune it in at maximum volume. Such sets were called TRF (tuned radio frequency) receivers. We'll take a more detailed look at the TRF's evolution next month, when we continue our look at the development of radio receivers. In the meantime, good hunting and happy collecting!

The Radiola Balanced Amplifier was a desirable accessory for the Radiola III, enabling the little set to drive a loudspeaker.

Beside rheostats to control filament voltage, regenerative sets required only regeneration ("amplification") and tuning controls.

A No-Nonsense Guide to Vintage Radio Restoration

SERVICING AC POWER SUPPLIES

By Ken Owens
1932-2009

A WORD ABOUT SAFETY

Let's begin this topic by discussing safety. The Columbus, OH paper of July 19, 1994 reported the death of a man who was installing a stereo in his car. He had installed a second battery in the trunk in series with the car's battery for "extra power". He was electrocuted when he came in contact with the 24 volt output of the batteries. It took only 24 volts to kill this man, and AC sets have hundreds of volts under the chassis.

I could give you a long list of don'ts, but most are simply common sense. Treat that chassis like a nest of snakes and don't handle it or poke your fingers in it while it is operating.

Unplug the set when replacing components. Expect the unexpected because faults can put high voltage where it shouldn't be.

TRANSFORMER AND RESISTOR CHECKS

To begin servicing an AC set, first test the power transformer. Remove all tubes, plug the set into the lamp test rig you built last time and turn it on. The lamp should not glow at all. If it does, you probably have a shorted power transformer. You can stop here unless you have a replacement or can rewind transformers.

If the transformer is good, unplug the radio and check all the resistors in the power supply with your ohmmeter. Most of these old resistors were wirewound units. The bleeder was usually a single resistor with taps. If any resistors are open, replace them. It is safe to repair open bleeder sections by soldering the replacement across the bad section without disconnecting it. Strange values were used because there was no standardization in 1927. If the calculations called for a 1632□ ohm resistor, that's what they used. You can use the nearest standard value with no problems.

If the values of the bleeder sections or other resistors you may find open are not given on your schematic, they can be determined by experimentation. I'll be discussing this issue in a later column. Use only 10 watt resistors for replacing defective wirewound units. You can't check the center tapped resistors across the filament windings unless you disconnect them. The low resistance of the winding makes ohmmeter readings meaningless. We will check them later when we have the set going.

ESTABLISHING B+ VOLTAGE

For your second test, turn off the set, insert the 80 rectifier and turn the set on. If all is well, the lamp will not glow—or will glow very dimly if the set has a bleeder resistor. If the set passes this test, you should be able to detect B+ voltage at all the output points (see diagram in the September issue). The voltage to the 71A is typically 150- 180 V with all tubes in place. It and all other DC voltages will measure higher at this stage with no tubes in the set.

If the lamp glows half brightness or more in the above test, quickly turn off the set because there is a short in the power supply. One or more filter capacitors are probably shorted. This is common in old radios. I generally run this test only on sets with paper capacitors. If the set has electrolytic capacitors, they should be replaced on sight. In my experience, 50-60+ year old electrolytics are never good.

It is interesting that RCA paper capacitors are rarely bad whereas Atwater Kent units are rarely good. If any of the paper capacitors are bad, replace them all. You will have to use electrolytics because large paper capacitors are no longer made.

Modern electrolytics are superb and are excellent replacements for paper filter capacitors. Watch the polarity when installing them! If you wire them backwards, they will be destroyed when you turn on the set.

Early set manufacturers often put a group of capacitors in a metal box and filled it with tar. You should remove the box from the chassis, melt out the tar and put the replacements inside to preserve the original appearance.

Most old electrolytic capacitors dry out and become open rather than shorted. They will then have only a fraction of their original capacitance. The set will hum badly with this condition. Since such capacitors are not shorted, you may be tempted to wire replacements across their terminals without disconnecting them. Don't do it! The old capacitor may develop a short at any time. Disconnect it, but leave it on the chassis for appearance if it is the can type. Connect your replacement to the appropriate points under the chassis.

SECOND B+ TEST

We have now located and replaced all bad filter capacitors and resistors. Leaving the 80 rectifier in its socket, turn on the set again. You should now get B+ at all points. If some of the voltages are missing, one or more bypass capacitors (labeled "CB" on last issue's diagram) may be shorted. If any are bad, replace all of them. Typical values were 0.2-0.5 µF. I use 0.27 µF 600V Mylar" units for bypass replacements.

These capacitors may be potted into boxes and require melting out. If 600V capacitors are too large to fit the boxes, you can use 400V units. I use 600V units where possible for the added safety mar gin. Some bypass capacitors may be on the radio chassis instead of the power supply chassis. Be sure to check them as well.

On rare occasions, a filter choke is open. You can use modern replacements, but you may have to melt tar again. Repeat the test once more to make sure all B+ voltages are present. Don't worry about the actual value of the voltage now because we will fix any additional problems later.

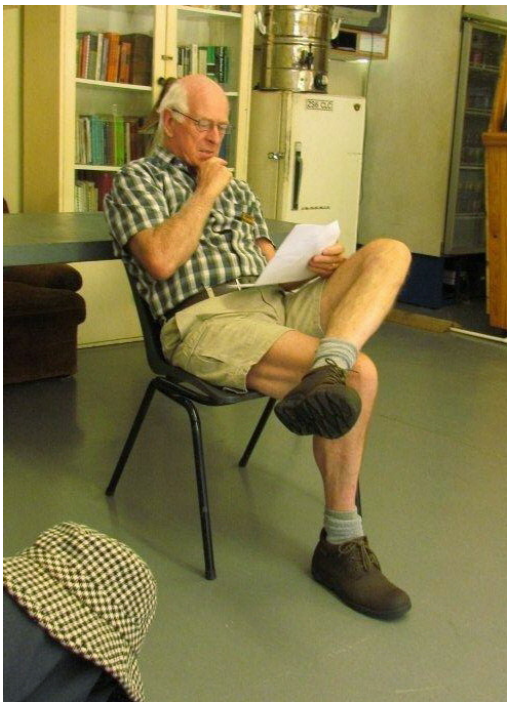
In sets using electrodynamic speakers, the speaker field coil replaces one of the chokes. We will discuss speaker problems next time, when we will power up our set.

ALWAYS REMEMBER, VALVE RIGS HAVE DANGEROUS HIGH VOLTAGE

PRESIDENT'S CORNER

By Richard ZS6TF

An AWA member is never alone.



By the time you will be reading this the Christmas celebrations will be receding and the next challenge is the new year 2013. I am not overly nostalgic by nature but I find at this time of the year I get a little preoccupied with thinking about what I am doing and why I am doing it. Prefacing the 1936 ARRL handbook , the 14th edition, is a page entitled "OUR CODE" which I summarise below.

The amateur is Gentlemanly
The amateur is Loyal
The amateur is progressive
The amateur is Friendly
The amateur is balanced
The amateur is patriotic

In a way, the AWA, with its mission statement orientated to ensuring the maintenance and preservation of our amateur heritage, transcends the mere finding, acquiring, fixing, and operating of yesterday's radios and associated equipment, and I venture to suggest that by doing this we are also preserving the core values established by wise amateurs before I was born, that have made amateur radio one of the greatest hobbies on earth. One of the recent changes we have introduced on the SSB net is the topic of the day, suggested by our PRO Andy to add interest to proceedings. We had no idea how popular this would become and from the superb contributions of late we would welcome suggestions for future topics by members to keep the ball rolling. Underlying its success is a sense of community with which the more "mature" segment of the ham community identifies easily because we have "been there, done that"! but in this process we must not overlook the more youthful members who are eager to earn the "T" shirt.

If I have to distil a new year message from all of this, it is to take sufficient time on the air, at club meetings, on the nets, and especially when eyeball QSO's take place where personal aspirations and projects are discussed and shared, to transfer the passion, interest and knowledge to the younger generation so that our amateur heritage is guaranteed to endure.

CONTACT US:

P.O. Box 12320
Benoryn
1504

Fax: 27 86 620 3291
Mobile: 082 448 4368
Email: andyzs6ady@vodamail.co.za

Get your backdated issues at
http://groups.yahoo.com/group/AWA_SA/

Antique Wireless Association of Southern Africa

Mission Statement

Our aim is to facilitate, generate and maintain an interest in the location, acquisition, repair and use of yesterdays radio's and associated equipment. To encourage all like minded amateurs to do the same thus ensuring the maintenance and preservation of our amateur heritage.

Membership of this group is free and by association.

Notices:

NET TIMES AND FREQUENCIES:
The following are times and frequencies for the AWA nets:

AM Net—Wednesday evenings from around 19:00, when band conditions allow.
Saturday mornings from around 05:30. Frequency—3615.

SSB Net—Western Cape net Saturday morning from 07:30. Frequency 7070
National net Saturday mornings from 08:30. Frequency —7070

CW Net—Saturday afternoon from 14:00. Frequency—7020.

(Times given are CAT or SAST)