



AWA Newsletter

Issue 37

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Antique Wireless Association of Southern Africa

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AWA Committee:

- * President—Rad ZS6RAD
- * Technical—Don ZS5DR
- * Net Controller—Willem ZS6ALL
- * Newsletter/PRO—Andy ZS6ADY

Something To Look Forward To:

Here's to the start of a New Year and one that we hope will be fruitful for you all in terms of being healthy, wealthy and wise. I cannot understand why it is that wisdom is always at the bottom of the list here, as I would have thought it should be given a bit more of a priority.

May you be wise enough to discern the difference between a good boatanchor and a modern plug and play.

May you be wise enough to see the potential in restoring an old boatanchor instead of discarding it in the closest junk pile.

May you be wise enough to store those old valves or give them to someone who will store them for the future, instead of letting your grandchildren use

them for target practice.

May you be wise enough to know that you cannot pick up an old boatanchor and move it around at your leisure. (That helps in the health side of things).

May you be wise enough to remember that you are playing with "voltage", and lots of it. (Could also be detrimental to your health).

I am sure there could be many more pearls of wisdom that one could apply to life with your boatanchor, that would put wisdom at the top of the list.

Then of course one could also argue that to be an owner of botanchors, one has to have some semblance of good health, and also a few pennies in the pocket in order to keep

them going. But then that's what friends are for. Need to move your rig, phone a friend. Need to repair your rig, phone a friend.

So it would seem then that one needs to have all three of these criteria finely tuned and applied in good measure in order to be a collector of boatanchors.

May your year be filled with the dull glow of valve radio, the pleasant crackle of AM and the key clicks of CW. (Oh all right, and the ducky sound of SSB when you slightly off frequency).

We look forward to hearing you all in the New Year as the bands improve and so does propagation.

Best 73

De Andy ZS6ADY

Stan Zway ZS6SDZ



Richard ZS6TF (left) visited Om Stan ZS6SDZ at his home in Pretoria. Stan has a fine collection of old rigs all lovingly restored to original beauty. We feature some of them in this edition.

CW Net:

Well there is a definite improvement in 40m these days and there is no excuse to not be out there trying to get some contacts on CW. I read with interest on the SARL forum, that Om Hans ZS6KR is looking for CW contacts on all bands. There has got to be more CW operators out there.

Remember the AWA CW activity day which will be early in February. It's going to be run over a 24 hour period starting from mid-day on Saturday 07th Feb and run until mid-day on Sunday 08th Feb. The object of course to make as many CW contacts as you can over as many bands as you can in that 24 hour period.

So you still have time to put in some practice and get the bugs out of your CW or get the bug in to your CW, whichever way you prefer.

Straight keys, bugs, paddles, no matter what you have. Dust it off, get in some practice and come join us over the weekend. It might just be what you are looking for to get back in to some CW again.

Like most hobbies, I believe that ham radio is also cyclical. We seem to go through these periods when we lose interest in some of the aspects of Amateur radio. Some even stop using their equipment totally. But inevitably there is something that draws us back to the areas that do interest us and once again we can pick up the pieces and get going again.

Set yourself a goal to at least come up on a few of the AWA CW nets held throughout the year. After all, it's not just the preservation of the rigs that count, but also the preservation of the modes they operate in,



This Finely restored Collins 51J4 receiver from around 1957 of Stan ZS6SDZ

and CW is such a fine mode.

Ian Macquillan always signs himself off with these few words, "CW, the Gentleman's art of communication".

73

De ZS0AWA/CW-

SSB activity:

40m Has certainly come to life again over the last month and conditions have improved drastically. The band opens up nicely in the mornings with good propagation to Div 2 to start off with and then gradually opens up to div 5 a short while later.

Even in the late afternoon, conditions are pretty good right up after 17:00, with good 5/9 reports being received.

There is, on the odd occasion still a bit of short skip, but that can always be solved by using 80m for the closer stations.

Once again we need to ask, that if you cannot hear the net controller on 40m, then try the

80m relay. There is good propagation on 80m in the mornings for the short skip problems being encountered on 40m and the relay is working well these days.

Hopefully now with conditions improving, we may start to hear more of the old stations calling in on the net again.

It has been a long time since we have heard any of the Div1 stations coming through with good reports, but at least we can hear them these days. Bernie ZS1TYL was coming through with a good Q5 signal and Om Dick ZS1AQD is also a lot easier on the ear these days.

In general, the bands are looking good, lets hope they continue to improve.



Another of Stans finely restored rigs, Racal RA17

AM:

AM conditions are still looking pretty dismal with the storms being experienced all around the country, but Saturday mornings still give good conditions for AM.

The only problem is, the D layer starts to fade a lot earlier than during the winter months and so the Div 5 stations start to go out a lot earlier. So, the answer to this problem is to rise and shine a bit earlier on Saturday mornings and the net now starts anywhere from around 05:30 with some pretty good propagation.

We've always said that AM is not for the faint hearted, and this is really proving to be the case these days.

The afternoon and evening nets are plagued with QRN from the afternoon storms, especially here on the Highveld, with noise being experienced at +20 to 30 Db at times. Which makes AM virtually impossible. When that is the case, we have sometimes reverted to SSB, just for a short chat, or in the case of Friday's, 40m SSB.

What do we have to look forward to? The winter months of course when the bands are quieter and conditions are still pretty good.



Stan's early 1940's HRO by National

USA AMATEUR RADIO HISTORY AND LICENSING



Day One Mother Nature sends static crashes and lightning crashes around the world - but no one is around to hear them!!! Either audibly or by radio - DX will be!!

DX is an early telephone term for distant exchange. It is also defined in Funk & Wagnall's as Distance. The term DX appears in many math formulas as distance of x. [See Origin of DX](#). At any rate, for Amateur Radio, it is the sending of messages over long distances.

EARLY COMMUNICATIONS

The Greeks were the first to discover electricity about 2500 years ago. They noticed that when an amber was rubbed with other materials it became charged with an unknown force that had the power to attract objects such as dried leaves, feathers, bits of cloth, or other lightweight materials. The Greeks called amber *electron*. The word *electric* was derived from it and meant "to be like amber," or to have the ability to attract other objects.

1200 BC In the Iliad, Homer tells of a chain of beacon fires prearranged to signal the return of Agamemnon's fleet to Mycenae and, thus, gave Clytemnestra and Aegisthus time to arrange the assassination of Agamemnon.²³

522 BC Persian Army employs a relay system where soldiers positioned on hilltops shout and relay military messages 30 times faster than by runner. Accounts of flags, mirrors and smoke signals appear in early history.

490 B.C Greek runner Pheidippides, Athenian courier is sent to Sparta to request help when the Persians landed at Marathon - runs 150 miles in two days. At the conclusion of the battle, he returns to Athens, where he reportedly shouted "Rejoice! We conquer!" and then died of exhaustion.

Early On - Mirrors are used to signal across visible distances - the heliograph

1206 Genghis Khan is denied importing of radio gear, so develops a "pony express" to keep tabs on his empire -- pony stations at about 25 miles apart.

1500 -1800's Early discoveries of [Electricity and Magnetism](#) can be found in the annals of history, names such as Gilbert, Von Guericke, Volta, Oersted, Wheatstone, Cooke, Faraday, Ampere, Ohm, Davy, all contribute to the ultimate development of wireless.

1610 - Galileo observes sunspots through his telescope. He also experiments extensively in the fields of mechanics, astronomy, the microscope, thermometry, and magnetism.

1749-1755 ["First" solar cycle](#) observed in Zurich, Switzerland. [Solar Cycle 1700-2000](#)

1823 In England, Sir Francis Ronalds builds a 'telegraph' in his garden; no one is interested.²³

1831 - 1903. [Early Pioneers and Inventors](#) include, Maxwell, Marconi, Loomis, Edison, Henry, Hertz, Feddersen, Von Bezold, Hughes, Stokes, Tesla, Henry, Bell, Preece, Hertz, Branly, Dodge, Braun, Lodge, and Popoff all lay the foundation of wireless¹⁴

1835 [Samuel F. B. Morse](#) formulates the elements of a relay system. By 1837 the system is improved and was demonstrated using 'lightning wires' and 'Morse code,' an electronic alphabet that could carry messages. The patent was applied for in 1840. A line was constructed between Baltimore and Washington and the first message, sent on May 24, 1844, was 'What hath God wrought!'

1861 The two coasts of the United States were linked by telegraph. The operating procedures, codes and protocols of the telegraph were carried over to the new age of "wireless". Indeed many wireless operators came from the telegraph ranks.

1861 - 1865 During the [US Civil War, Telegraph](#) is used extensively using existing commercial systems, and building and operating more than fifteen thousand miles of lines for military purposes only.

THE BIRTH OF WIRELESS

The term wireless was a natural extension of less wired or the telegraph. Not until 1906 did the term Radio begin to appear.

1850 - By 1850 most of the basic electrical phenomena had been investigated. However, James Clerk Maxwell (1831-1879), Professor of Experimental Physics at Cambridge then came up with something entirely new. By some elegant mathematics he had shown the probable existence of electromagnetic waves of radiation. But it was twenty four years later (eight years after Maxwell's death) that Heinrich Hertz (1857-1894) in Germany gave a practical demonstration of the accuracy of this theory. He generated and detected electromagnetic waves across the length of his laboratory on a wavelength of approximately one metre.¹⁶

1864 [Mahlon Loomis](#)¹ proposes a vertical top-capacity loaded aerial with a keying device and an indicator, all in series to ground. DX Might Be!

1865 Using 2 kites, Mahlon Loomis² transmits wireless messages between two mountains 18 miles apart in Virginia. Son Of A Gun - DX IS. The first Dxpedition???

1865 - On 17 May 1865 the first International Telegraph Convention was signed by the 20 participating countries and the International Telegraph Union (later ITU) was set up to enable subsequent amendments to this initial agreement to be agreed upon¹³

1870 Mahlon Loomis successfully transmitted wireless telegraphic signals between two ships which were two miles apart on the Chesapeake Bay. The U. S. Navy sponsored those experiments.

1883 Edison demonstrated that an electric current could pass between a heated filament and a cold plate in a vacuum.

1886 Heinrich Hertz proved that electromagnetic waves could be sent through space.

1887 Heinrich Hertz experiments with parabolic dishes - produces waves at about 30cm - 1 GHz!!!

1896 - First practical wireless by Marconi, 'Hertzian Waves' over two miles! DX Will Be! When he read about the experiments of Heinrich Hertz and about Popov's suggestion, he saw the possibility of using these waves as a means of signaling. Marconi realized that his signaling system would be most useful to shipping.

1898 -- In January, British Leslie Miller³ publishes an article in the British hobby magazine "The Model Engineer and Amateur Electrician". Here he contributed a superbly written article titled "The New Wireless Telegraphy" encouraging experimenters in the new field of "Wireless".

1898 - US Navy establishes coastal stations and begins to outfit the fleet with wireless communications.

1898 - 1912, experimenters begin transmitting and DX is anything over 10 miles. Early Amateur Radio in the UK can be seen at [Dawn Of Radio](#) in the UK and Europe¹⁶

1899 Marconi sends a signal over the English Channel - 32 miles. QSL's are in order.

1901 Marconi bridges the Atlantic, a feat which caught the world's attention and fueled the imagination of thousands of potential amateurs, who took their first steps into wireless. His transatlantic triumph came on the 12th December 1901 when the morse letter 'S' was transmitted from Poldhu, in Cornwall and received by Marconi himself at St. John's, Newfoundland, who recorded the historic event in his pocket book simply "Sigs at 12.20, 1.10 & 2.20".

Marconi's original transmitters used high voltage spark gaps to generate 'Hertzian Waves'. The first experimental sets used induction coils with vibrating contact current interrupters to generate the high voltages.

In the way of development after Marconi's high voltage spark gap came the use of high voltage transformers to generate the spark gap voltage. The ultimate came in the powerful transmitters such as those at the U.S. Navy's station at Arlington, Virginia. Here a 500 Hz generator, a step up transformer, and a rotary spark gap was used to create the high voltage. Some of these produced a deafening noise created by the spark. Spark transmitters were often placed in acoustically insulated rooms to deaden the sound.

Around 1900 [William Duddell](#) discovered the principle of negative resistance in connection with a carbon arc. By adding a resonant circuit to the arc it would oscillate at a frequency determined by the LC constants. Duddell's arc would only oscillate at audio frequencies, audible to human hearing, and it was dubbed the "singing arc."

In 1902 [Valdemar Poulsen](#), succeeded in making the arc oscillate at the higher frequencies by using electrodes operating in a sealed chamber, with hydrocarbon vapor, and a strong magnetic field. The arc became the first transmitter capable of generating pure, undamped waves. Arc transmitters were widely used at both shore stations and on ships. They were complicated to operate and were infamous for exploding when an operator introduced too much alcohol into the chamber. Arc transmitters were brought to the United States in 1909.

One of the more powerful arc transmitters constructed were the 1,000 watt units built for the U.S. Navy at Bordeaux, France, during World War I. In Java, a unit was rated at 3,000 W, the antenna was suspended over a mountain gorge. By gradually scaling up the equipment Federal Telegraph finally produced a 30 kW unit that outperformed a powerful rotary spark transmitter at the Navy's Arlington station. The navy wanted still more power and Elwell thought he could build a 60 kW unit by merely scaling up the parts again. But it didn't work. Arc transmitters were gradually eliminated when the new vacuum tube transmitters came into use. However, many were used up to World War II. Perhaps the last to be in operation on land were the stations operated by the Mackay Radio and Telegraph Company between cities on the Pacific coast.

A [synchronous rotary](#) had the spark electrodes mounted on the shaft of the motor generator which feeds a HV step up transformer. In this way, the spark would discharge the capacitor synchronously with the peak in the AC waveform. In a non-synchronous gap, the discharge could occur anywhere within the cycle. Buzzers were sometimes used to supply the voltage to an induction coil in early spark coil sets, since they had a higher "tone" than what some other interrupters could produce. Buzzers were used early on as a way to get ICW (interrupted CW) signals in early vacuum tube transmitters. The buzzer would interrupt the CW at an audio rate, thus modulating the CW carrier. You could detect the signal with a non-oscillating detector.¹⁰ Also see [Fessenden](#) and the Early History of Radio Science where the concept of an HF Alternator is discussed²⁰

1902 - [Nathan Stubblefield](#) Kentucky farmer invents wireless telephone! [But was it radio?](#) Facts and folklore about Nathan Stubblefield by Bob Lochte²⁴.

1902 [Oliver Heaviside](#) predicted that there was an conducting layer in the atmosphere which allowed radio waves to follow the Earth's curvature. This layer in the atmosphere, the Heaviside layer, is named after him. Its existence was proved in 1923 when radio pulses were transmitted vertically upward and the returning pulses from the reflecting layer were received. [Propagation](#) has always been the life blood

of long distant radio communications and from the early days, Amateurs carefully watched propagation conditions as they do today. Early wireless codes was The American Morse code, International code and U. S. Navy code¹¹

1904 Sir John Ambrose Fleming worked to develop the first rectifier and in 1904, while working for the Marconi Company, he was faced with the problem of detecting weak wireless signals. He was inspired by his work with Edison's lamps back in 1889 and decided to try inserting one of the lamps in an oscillatory circuit containing a galvanometer. He had found the solution to the problem of rectifying high frequency wireless circuits.

1904 One of the first companies to sell radio equipment to experimenters and amateurs was the Electro Importing Company of New York City, set up in 1904 by Hugo Gernsback.

1905 Guglielmo Marconi patented his directive horizontal antenna.²³ (A Beam Antenna!!)

1905 Horace G. Martin introduces the The [Vibroplex](#) semi-automatic telegraph key, commonly called a "bug". The Use of 500 kHz as the International Distress Frequency is common.

1906 First wireless communication of human speech (and music) on December 24, 1906. Fessenden spoke and broadcasted music by radio from Brant Rock, Massachusetts, to ships in the Atlantic Ocean using a two kilowatt (100 kHz) alternator developed by Alexanderson. Fessenden modulates continuous wave.²³

1906 November 3. The "Berlin International Wireless Telegraph Convention" ⁴ defined call letters, operating procedures and signals for Coastal Stations and ships at sea. The committee decided that henceforth the term "Radio" would better describe wireless. **Radio** is derived from the Latin radius (ray or beam of light). The term wireless lingered for many years, but by 1912 the term Radio was used in legislation. Some countries even today are fond of the word wireless. **Radio Shack** probably gets its name from maritime lore dating back to the invention of the radio at the turn of the century. At the time, wireless equipment aboard ships was generally housed above the bridge in a wooden structure that was called the "radio shack".

1906, Lee De Forest added a third electrode to the diode, the "triode" or "audion" tube could both rectify and amplify; and its greater control it meant that various electronic circuits would finally be commercially feasible.

1908 [Hugo Gernsback](#) published his first magazine, Modern Electrics (later to become Electrical Experimenter) which does much to foster and popularize Amateur Radio.

1909, On January 2, the first amateur radio club; The Junior Wireless Club, Limited, of New York City, was organized. Later the club name changed to [Radio Club Of America](#), and their history is a must read, don't miss it.

1909 Young radio amateurs are building receivers with whatever parts are available. Although headphones can be purchased...many public telephone booths become inoperative.²³ **N6AW** reports there are many examples of home brew receivers at the Antique Wireless Association museum in Bloomfield, NY dating to prior to 1909. It seems that very early on the young experimenters figured out that given a little wire for a coil & antenna, a home-made detector described in Modern Electrics or Hugo Gernsback's catalogue and a pair of headphones (some were homemade) they were all set. Don Wallace was first on the air in 1909 with a self-assigned call and working his buddy a block away with a spark coil from a Ford.

1910 Oct 5. The first Cat's Whisker Detector invented by B. F. Miessner who received "The De Forest Audion Award in 1963." This patent was sold to John Firth for "a magnificent sum of \$200". From the "On the Early History of Radio Guidance". Library of Congress Card # is 64-2115.

1910 Senator Depew introduces a bill virtually prohibiting amateur experimenting. The Junior Wireless Club organizes a committee to plead the cause of the amateur before Congress. The bill is squashed and again DX IS!¹⁷

1910 First Callbook issued - The Wireless Blue Book From the [WayBack Time Machine](#)⁵ By Bill Continelli, W2XOY. Today many [Amateur Radio Callbooks](#) are on the web.

1910 [THE POULSEN SYSTEM](#) OF WIRELESS TELEPHONY AND TELEGRAPHY

Pre 1912 - Before the advent of [Vacuum Tubes](#)¹⁴ - various forms of detectors were used including: The Coherer, Lodge Muirhead Coherer, Electrolytic Detector, Carborundum Detector, Fleming Valve, Thermo Electric Detector, and Magnetic Detectors. See [World Of Wireless](#)¹⁴ Also see [Crystal Sets](#)¹⁴

1912 - [Edwin H. Armstrong](#)⁶ uses feedback in an Audion - amplifiers and oscillators now practical.

1912 - April 12, [RMS Titanic](#) sinks after encountering an iceberg, the tragic loss of life prompts new international radio laws which also affect Amateur Radio, including frequency restrictions and operating procedures. See the Bill Continelli's [History of Amateur Radio](#).⁵ Also see excellent article on Radio Aspects of the Titanic Disaster and the [Transcript Of The Actual Radio Distress Traffic of the Titanic](#). Before 1912, call signs were just made up by the aspiring Amateur and it wasn't until the Radio Act of 1912 that the first licenses were issued. An HTML version of [Early Radio Laws](#)⁴ is on-line. Very interesting reading as it defines DE, CQ, Operating Procedures, Morse Code of the day, and many Q Signals we still use. In 1911, Hiram Percy Maxim's assumed call was SNY. In 1912, [Irving Vermilya, IZE](#),⁶ received Skill Certificate No. 1, thus considered as the first licensed Amateur Radio Operator. Some sources indicate the code requirement was 5 wpm (how things go around and come around - 5 wpm now in the year 2000!!!). Written exams included essay type questions -- making a diagram of

transmitting and receiving apparatus and how they worked! Also of course International and US Law questions.

For opinions on the origins of Q-signals, Z-codes, X-codes, R-codes, and S-codes, DE, CQ, 33, 73, ham, lid, SOS, mayday, pan-pan, RST system, S-meter, prosigns, roger, wilco, boatanchor -- See [Origins](#). Also each human endeavor seems to develop its own jargon, ham jargon is almost incomprehensible to others and has a rich history -- see [Jargon and abbreviations](#).

1913 Amateurs using Audions in their receivers discovered that distances of up to 350 miles were now possible on 200 meters.

1913 - [Radio Call Letter Policies](#)⁴ issued by the Department Of Commerce listed the USA with call letters of KDA to KZZ - United States, N - All to the United States, W - All to the United States. This document shows other countries as well. However, for Amateurs, "The call letters for amateur stations in the United States will be awarded by radio inspectors, each for his own district, respectively according to the following system: (a) The call will consist of three items; number of radio district; followed by two letters of the alphabet. Thus, the call of all amateur stations in New England (which comprises the first district) will be the figure "one" in Continental Morse, followed by two letters; in California (in the sixth district) the figure "six" followed by two letters; in South Carolina the figure "four" followed by two letters; in Missouri the figure "nine" followed by two letters, etc. The letters X, Y, Z, must not be used as the first of the two letters". Examples, 1AW, 6OI, 2MN.

Here is a possible explanation as to how the USA got W and K, no documentation on this but sounds plausible. The USA had unofficially used N for North America (e.g., NBZ, Boston), also A for America. The letter "N" in morse is dah dit, adding a dah to N gives dah dit dah which is "K". Letter "A" in morse is dit dah, adding a dah to A gives dit dah dah which is "W".

Somewhere in this era, an informal system of prefixes evolved and Amateurs used A for Australia, B for Belgium, C for Canada, etc. This single-letter system worked until Amateur Radio spread around the world and there were too many countries for the system to accommodate. Thus, in 1927, a new system took effect using two-letters with the first letter indicating the continent (E for Europe, A for Asia, N for North America, F for Africa, etc.) and the second letter indicating the country. Stations in the 48 United States used an NU call. These were called "Intermediate Prefixes".

With the advent of the Radio Act of 1912, the first Amateur Radio License is issued. The call letters assigned to the United States were [NAA - NZZ, WAA - WZZ, and KDA to KZZ \(KAA-KCZ](#) was assigned to Germany and was not given to the United States until 1929). The somewhat puzzling Amateur calls like 1AW, 6OI, 2MN, etc. is explained by the fact that Amateur stations did not qualify for international call signs. At that time, the USA was divided into nine Radio Districts so Amateurs were **granted calls consisting of their district number followed by letters, the first letter was from A through W, for example, 1AW, 1TS. Recognition was given to certain land stations, X as the first letter for Experimental licenses (e.g. 1XE), Y for School licenses (e.g. 9YY), and Z for Special Amateur licenses (e.g. 8ZZ). 1x3 calls (like 1AAA) was issued to Amateurs beginning in 1914. For a list of early X, Y, Z callsign issues -- see [U.S. Special Land Stations: 1913-1921](#).⁴ It was not until October 1, 1928, that the W and K prefixes were assigned to Amateurs.**

(Compiled from numerous sources by Rod Dinkins AC6V. Visit his website for a complete listing of this interesting history which continues for another 30 odd pages : <http://www.ac6v.com>)



Barry ZS2H, sent us some pics of his shack. He has restored a few Eddystone receivers, above. EC10 (top rack, grey front). EC10 MkII (Top). 680X (top right) and a 680/2 (I think) on the bottom right.

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**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 yester-days radio transmitters and receivers. 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:

KWM2-A Raffle:

This fine rig is still up for grabs and we have decided to do the draw at the Open Day in April at the Rand Airport. Donations for this draw are R50 and should you want a chance to own this 100% valve rig made by Collins, then you need to send your money, either wrapped in a plain piece of paper via snail mail, address at top of this page, (this works well and I have never lost any money yet, but do wrap it in a plain piece of A4 paper) or deposit it to my Savings account using the reference area for your "call sign" and "KWM" :

Andy Cairns
Standard Bank Benoni
Branch code 01 30 42 40
Savings Account
Acc #: 225334119

We will acknowledge receipt of all donations either by email or snail mail.

Technical Tip from our Technical Advisor:

Resistors

A common fault with Antique Equipment is the Resistors going High, Cracking, or even burning out without visual evidence of this having happened.

When the Resistors go High you have a greater potential drop across the resistor which can cause problems in lower voltage to the valves or lower signals to the next stage of the Radio.

You also get situations where the Resistor actually reads correctly when the equipment is turned off but when power is applied and the circuit is under load the values change.

If you are having problems with a certain stage in a rig try measuring the anode and screen voltages, if they are low and the supply voltage is OK, then if the tube is not faulty, the dropping resistor may be the cause. Sometimes there is a filter capacitor or maybe even a coupling capacitor that has shorted with the resultant lack of anode or screen voltage, change the resistors of that stage and see if there is any improvement you may be pleasantly surprised and that favourite rig comes to life again.