



AWA Newsletter

104

September 2014

A Member of the SARL



Antique Wireless Association of Southern Africa

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Reflections:

So the Winter solstice has come and gone, the summer solstice is fast on its way to reaching its maximum and it feels like we have hardly started the year and its nearly over.

I can remember the days when I was still in High School and used to wish the days and months away. They always took so long to go by. Life dragged along at a snails pace and just never seemed to end.

These days I find myself wishing I had more time to do things in because it just flies buy without regard to anybody or anything.

There are still so many projects that I wanted to get going on and so many things I wanted to do, but it looks like they will certainly not reach maturity at all this year.

I wonder if there is some sleepy hollow that one can retire to where 24 hours actually takes 48 hours to finish ?

Where there is enough time to get your teeth in to a project and still have more than enough time to finish it without wondering if you would actually do it.

Where the sun rises and seems to stick in the middle of the day so you can still have an afternoon nap with enough time to then carry on for the rest of the afternoon to get finished what you had planned to do.

What a wonderful world that would be, or would it ?

You see, what some of us desire, may not be what the others are looking for.

Some may find it an absolute bind and still wish their days away.

Will we ever be able to reach a point where we can satisfy most of the people most of the time ?

Roll on happy days. Who knows I may just lose my mind and then it wont matter how long a day takes.

Whatever it is and whichever way it works for you, make the most of what you have. You may not have it for very long, but then you may have it forever.

Now if many of you are confused about what I have written here, just imagine how I must feel having written it. But wouldn't it be nice if it could be a reality and we could get time to stand still at times.

Best 73

DE Andy ZS6ADY

AWA Committee:

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- * Technical Advisor—Rad ZS6RAD
- * Secretary/PRO—Andy ZS6ADY
- * Western Cape—John ZS1WJ
- * KZN—Don ZS5DR

WIKIPEDIA

In telecommunications, a **carrier signal**, **carrier wave**, or just **carrier**, is a waveform (usually sinusoidal) that is modulated (modified) with an input signal for the purpose of conveying information. This carrier wave is usually a much higher frequency than the input signal. The purpose of the carrier is usually either to transmit the information through space as an electromagnetic wave (as in radio communication), or to allow several carriers at different frequencies to share a common physical transmission medium by frequency division multiplexing (as, for example, a cable television system). The term is also used for an unmodulated emission in the absence of any modulating signal.

Frequency modulation (FM) and amplitude modulation (AM) are common modes of modulating the carrier. In the case of single-sideband modulation (SSB), the carrier is suppressed (and in some forms of SSB, eliminated). The carrier must be reintroduced at the receiver by a beat frequency oscillator (BFO). The frequency of a radio or television station is actually the carrier wave's center frequency.

Newer forms of radio communication (such as spread spectrum and ultra-wideband) do not use a conventional sinusoidal carrier wave, nor does OFDM (which is used in DSL and in the European standard for HDTV).

- OFDM may be thought of as an array of symmetrical carrier waves. The rules governing carrier-wave propagation affect OFDM differently from 8VSB.

- Some forms of spread spectrum transmission (and most forms of ultra-wideband) are mathematically defined as being devoid of carrier waves. Transmitter implementations typically produce residual carriers which may (or may not) be detectable or transmitted.

Carrier leakage is interference caused by cross-talk or a DC offset. It is present as an unmodulated sine wave within the signal's bandwidth, whose amplitude is independent of the signal's amplitude. See frequency mixers, to read further about carrier leakage or local oscillator feedthrough.

CW Activity:

CW activity has been rather slow this past month. Ever since returning from the UK, I have found it difficult to get out into the shack and o what I love best.

It's been a time of birthdays, flea markets and open days that always seem to take place on a Saturday afternoon.

Be that as it may, I still have spent some time playing with the paddle and getting the old mind back up to speed after the long rest from any kind of activity at all.

Listening again on the DX bands, there is still such a lot of activity, and surprisingly enough, the SARL CW contest that was held recently seemed to attract a whole lot of entrants. Something which hasn't been seen for a while on the bands in SA.

Of course the ideal situation would be to see some of that enthusiasm drifting down and

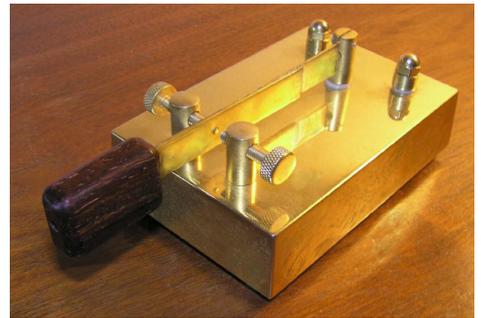
hearing many more stations on the local frequencies.

There are of course, still those who believe that CW is dead and gone, but there are still many enthusiasts out there who will do their best to make sure it never dies.

"CW is not dead" You are so right. I go on to 20m each day and work about

10 DX stations each afternoon. Yesterday I worked 27 stations and that was after I had to stop many times due to large pile ups. ZL's are popular stations and I am convinced that a ZS station would be even more popular - a real pile up maker! I have worked 97 different countries on CW this year alone. So CW is very much alive! Bear in mind that my antennas are all wire windoms. Nothing fancy! However I now make a point of having ragchews on 80m in the evening. Most last an hour or so. I have a

sked with a station each evening and we work at about 19 wpm which is the speed with which he is comfortable. We alternate between paddle and straight key. Mostly using 5 watts but I have managed to go right down to 100mW and still have a good long ragchew. So I can keep QRP and QRPP alive as well as straight key usage.—Ian ZL1IAN



The Golden Cootie

SSB activity:

Noise. It seems this is becoming progressively worse on the bands these days.

For a while now, we have been hearing complaints of many in the built up areas about noise levels peaking at S9 for most of the day. So what does one do ?

Do we get out our DF equipment and go on the hunt to discover the source of the noise or just lay a complaint with ICASA and hope they will investigate it ?

Maybe there are those who have been through this process and can offer advice.

I know, Om Don ZS5DR had a similar problem in his previous QTH and traced the noise to a telephone junction box down

the road from his house. After laying a complaint with ICASA, and Telkom, a technician was sent to investigate. The source of the noise was traced back from the junction to his neighbours DSL modem, and that is where it ended.

If we are to continue working on SSB on the frequencies we have, then surely those frequencies must be protected at all costs ?

I know I am asking a lot of questions, but I am hesitant to offer any thoughts of solutions to these problems, because I am not sure how far or to what extent we can push these matters.

Fortunately, conditions have been good enough recently for the majority of sta-

tions on our net to be heard without any major problems, but how long will it last for, I am not sure.

Lets make the most of what we have, while we have it.



AM:

Conditions on AM seem to vary quite a bit as they tend to do at this time of the year.

Saturday mornings, if you want to get through to Div5, then you need to be up and on frequency early. I mean really early. Any time from 05:00 the band is open through to Div 5, but not so great for local stations.

As the time wears on, so conditions change and Div 5 drops in to the noise as the local stations get stronger. There is of course a point where all stations come through evenly, but it does not last for long before it starts to change.

It's really quite pleasing to hear how many stations come up on the AM nets, and it's good to know there are still stations out there working at getting some real AM go-

ing, not to satisfy others, but themselves.

Wednesday evening have been a bit up and down and one can never guarantee any kind of results, except you get out there and try and see what is happening.

More often than not, the bands are quite forgiving and one can hear most stations, but then the band will either die, or improve. Sometimes as it improves, so does the noise with it.

Please remember when working AM, to leave a suitable pause between transmissions to allow any breakers to take the gap. If you try to break in while someone is transmitting, all people will hear is a second squeal as the carrier gets laid on top of the one being transmitted. If you want to be heard, take the

gap between the transmissions to call in.

Don't be like cowboy Bob !



Homebrew AM

ICONIC RADIOS and the AR88: by Richard ZS6TF AWA Historian

There is no definition of what is an iconic radio but most radio amateurs know which they are by popular acclaim and this is reflected in the supply and demand and therefore what one has to pay to acquire a good example. To illustrate the point, when one mentions the wartime R1155, SX28, HRO, and AR88 or the post war DX100, KWM2A, 51S-1 or the RA17, these evoke immediate acknowledgement by collectors as being desirable. Yet many of these iconic radios are not so user friendly or even good performers, but somehow better radios produced in the same period often receive less attention.

Like any consumer/collector item, soft issues such as, brand identity, history, provenance, and folk lore are stacked up with the hard issues of performance, mass, appearance, quality of engineering, condition, and usability .

Everything anybody needs to know about the AR88 and its versions and derivatives is available on the website <http://www.radioblvd.com/ar88.htm> , a really comprehensive resource. I will use the AR88 as the example of a radio which ticks most of the right boxes when compared to contemporary receivers and presents the right combination of challenge and charisma to appeal to an antique wireless operator (who may be a senior himself!)

RCA began designs for their "cost no object," highly reliable military/commercial receiver the AR-88 in 1939 as war loomed and was in full production in early 1941. It is a 14 tube conventional superhet covering 540kHz to 32MHz in six ranges, with outstanding sensitivity throughout, excellent frequency stability , hi fi audio, along with better reliability and serviceability of any contemporary receivers.

Most of the early AR-88's produced in WWII were sent to Great Britain and the allies through the Lend-Lease scheme and this why we are fortunate enough to have many in South Africa, yet they are very scarce in the USA.



A near mint AR88 owned by John ZS1WJ

Most famously the AR-88 was a cornerstone of the "Y" interception service centred on Bletchley Park and also was used to receive the encoded German high command teletype signals in the latter part of the war.

The number of units produced was under 25,000 for the AR88 and all its derivatives compared to the R1155 for example which exceeded 80000. Vast numbers were simply destroyed at the end of the war. As a measure of its quality it is estimated it would cost \$20K per unit to produce today.

If you are not bothered by a mass of 96 lb and the shack desk space for a 19 inch standard cabinet, the rest is mostly good news.

The AR-88 has a large main tuning gear reduction with sprung pairs of anti-backlash gears resulting in high repeatability for tuning in stations when used in conjunction with the logging scale. Because it covers large segments of the spectrum in each range, direct reading of the absolute frequency on the dial is imprecise. In its period when the received frequency had to be set or known accurately it was measured with a heterodyne frequency meter such as the BC221, which were bought up in quantity by radio amateurs when they were released onto the surplus market post war. Interpolation of nearby frequencies was easy due to the Vernier like accuracy of the 2 logging dials. AWA AM operators can easily and accurately spot sked frequencies with their transmitter if they have taken the trouble to log the dial settings on the AR88.



The AR-88 has a double tuned RF stage, five degrees of selectivity, 3 of which utilise a crystal filter, and three stagger tuned IF amplification stages at 455kHz. Happily for us all the coils and RF transformers were wound on low loss polystyrene formers, giving renowned high frequency sensitivity all the way up to 30 MHz. and they are so stable that AR88's seldom require realignment if undisturbed. A seminal article on the peaking of the AR88's performance from the April 1953 issue of Short Wave magazine, downloadable from the AWA website, is worth consulting.

AR-88 has a clipper-type noise limiter and a high frequency cut tone control. The audio output is 2.5 watts of power from a single 6K6 to a 2.5 ohm speaker output and a 600 ohm phone jack is provided. AR88's with a carrier level meter are scarce due to a shortage of meters that occurred during WWII. These are difficult to find to retrofit as quirkily they have a right-hand zero. The on-chassis power supply includes a neon regulated +150vdc for the local oscillator and BFO anodes and for the RF/IF screen grids to improve stability and reduce drift.

SSB signals can be easily resolved on an unmodified AR-88 by turning off the AVC, increasing the AF gain to near maximum and then reducing the RF gain by about 25%. Tune in an SSB signal with the BFO on until the voice sounds normal but over-driven. Then slowly reduce the RF gain until the audio is clean. RCA changed the AR-88 design after WWII and installed a crystal filter phasing control on the front panel. These later receivers were designated CR88 and had a "carrier level" meter.



AR88, CR88, and matching RCA 2.5 ohm table speaker owned by the author.

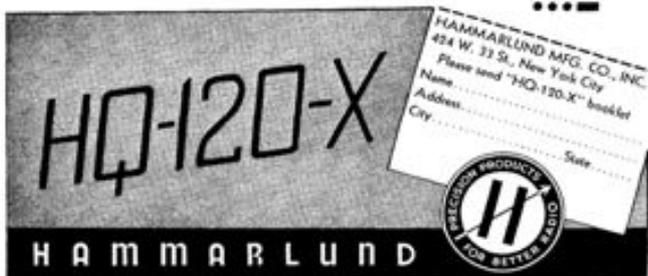


The CR88A was extensively used in air traffic control until the 1960's. This example depicted on the American Radioboulevard site is owned by Jacques ZS6JPS.

The spec of the AR88 was unmatched by any volume manufacturer for a decade after launch but represented the zenith of their communication receiver production as other more agile competitors such as Collins eroded their pre-eminent position aided by a raft of American anti-trust legislation which forced the break-up of RCA. It ranked 43rd among United States corporations in the value of wartime military production contracts and post war it was just too diverse to survive intact, diverting huge resources to develop television, broadcasting, entertainment technologies, computing, and white goods. RCA was a major producer of vacuum tubes with the volume brand Radiotron in the US. They were co-developers with General Electric of the octal base metal tubes before WWII, their swansong was the Nuvistor, a same sized tube competitor to the transistor. By 1975, the company had completely switched from tubes to solid-state devices except for CRT's. Today the only vestige of RCA is branding rights for some Sony products.



THERE are a number of reasons why the "HQ-120-X" has won such universal approval among leading amateurs. From start to finish it was designed with one thought in mind—performance. Six bands are used to provide low C tuning circuits with maximum gain and uniform sensitivity. The antenna compensator provides maximum signal-to-noise ratio with a given antenna system. A Hammarlund patented variable selectivity crystal filter provides just the right degree of selectivity at all times. High stability is maintained with voltage regulation and drift compensation. There are, of course, a number of other features such as calibrated band spread dial, automatic noise-limiter, and the usual beat oscillator, send-receive switch, phone jack, etc. There is nothing fancy about the "HQ"—it's all receiver.



Wireless in the Trenches: The tale of BFJ Schonland OBE (mil.), a colonial wireless officer



No Corps of Signals existed in those days. Signalling was very much the province of the Royal Engineers and specifically its Telegraph Battalion and it was they who attempted to use wireless for the first time in a military conflict during the Boer War in South Africa. But it was not equal to the task and it was left to the Royal Navy to show the way. And show it they did during the blockade operation they were mounting in Delagoa Bay, Portuguese East Africa. Wireless proved itself at sea; it was still to do so on land.

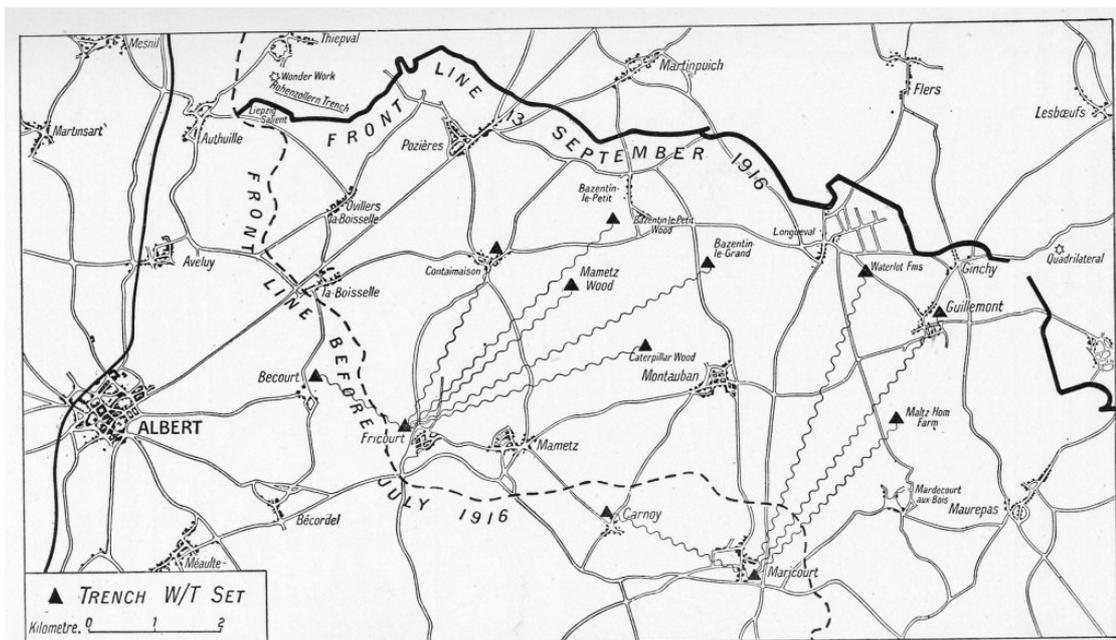
In 1908 the Royal Engineer Signal Service came into being and it was this body of men, plus their horses, cable carts and much other paraphernalia of war that provided the British Army with its signalling capability during the conflict that broke out in 1914.

By now wireless equipment suitable for use by soldiers and rugged enough to be hauled about on carts and on the backs of men was slowly becoming part of the Army's inventory of equipment. And the officers and men were being trained to use it. Amongst that group was a young South African by the name of Basil Schonland. During the summer of 1915 he completed Part 1 of the Mathematical Tripos at Cambridge and immediately set his sights on serving his adopted country. Even whilst a schoolboy, and then an undergraduate in his home town of Grahamstown in South Africa's Eastern Cape province, Schonland was a loyal subject of the King and, along with many of his fellow

South Africans, he saw it as his duty to fight for King and Country.

Schonland was commissioned as a second lieutenant in August 1915 and immediately began training at the Signal Depot in Bletchley. In October he was given command of 43 Airline Section with 40 men, their horses and their cable carts and in January 1916 he led them into France where they joined the Fourth Army then being formed under Sir Henry Rawlinson.

It was the Battle of the Somme that saw wireless equipment pressed into service in earnest. Though hundreds of miles of telephone and telegraph cables had been laid only those buried at considerable depth had any hope of surviving the onslaught of almost incessant artillery barrages. Visual signalling by flag, heliograph and lamp was perilous in the extreme for the operator who raised himself mere inches above the parapet of a trench: wireless became almost obligatory. And Schonland, whose skills had already been noted, was soon to become a W/T officer in the Cavalry Corps. None was more enthusiastic.



Map showing the deployment of the wireless sets near the front line in September 1916. Image available in the public domain.

This new technology caught the imagination of a young man for whom science, and especially physics, was of almost overwhelming interest. He threw himself into mastering the wireless equipment and of passing on his knowledge to his men. The three trench sets with which Schonland became so familiar were the BF Set, the Wilson Set and the Loop Set. The 'BF' presumably meant "British Field" but to those who used it in earnest its eponymous letters had another meaning entirely! Like most of the equipment in use at that time the BF set had a spark transmitter and carborundum crystal detector. It radiated signals over a band of frequencies between about 540 and 860 kHz at a power of some 50 watts. The Wilson set was more powerful and used a more sophisticated method of generating its spark. The frequencies (or wavelengths in those days) that it covered were similar to the BF Set. Both were used extensively from within the trenches during First Battle of the Somme in September 1916.

In 1917 a new wireless set was introduced. Called the W/T Set Forward Spark 20 Watt B it soon became rather more familiar by the less wordy name of the Loop Set. The loop in question was its peculiar aerial (or antenna) which consisted of a square loop of brass tubing 1m per side that was mounted vertically on a bayonet stuck into ground. The Loop Set's other great claim to fame was that it was extremely simple to use even for an inexperienced operator. Morse code was the mode of transmission and that skill was fundamental to all who served in the R.E. Signal Service, officers included. Of particular importance, especially to the technically-minded such as Schonland, was the much higher frequency on which the Loop Set worked. It could be tuned to transmit and receive between 3.8 and 4.6 MHz and was claimed to have an effective range of 2000 yards. And though the transmitter still used a spark, the receiver contained two thermionic valves – an astounding technological leap at that time.

By then Schonland had left the front line and was instructing at the GHQ Central Wireless School at Montreux where

he was also promoted to lieutenant. It was there that he and another South African by the name of Spencer Humby conducted their own 'researches into wireless' which they published in a scientific journal soon after the end of the war. "The wavelengths radiated by oscillating valve circuits" became an important paper in the field of wireless communications that flowered in the 1920s.

But Schonland was not only a competent physicist; he also wielded an educated pen and his most lasting contribution to wireless communications during WW1 was his four-part series of articles published in 1919 in *The Wireless World*. They appeared under the title of this article and described the use of wireless in the trenches and were possibly the first such articles to tell how wireless was used during the war by the R.E. Signals Section. *The Boy's Own Paper* had nothing on them for verve and excitement! Take this passage in which the young Schonland describes an attack during the battle of Arras in which a key hilltop position had been captured by the British Army. However, the enemy was re-grouping below and a counter-attack was imminent.

Owing, however, to the speed of their advance our troops were out of touch with the higher command, and the guns behind them. Out of touch, did I say? What is this queer mast affair some sappers are rigging up in the garden of what was once a pretty cottage? Up go the small steel masts in spite of the shells streaming into the village ... The aerial up, it is not long before they have installed their tiny set in the cellar and are 'through'. R9 signals each way. Just in time too, for the Boche at the foot of the hill shows signs of counter-attack. "Get at the guns, Sparks, get at the guns!". And Sparks bends to his key ...

By the war's end Basil Schonland had been promoted captain and was in charge of all wireless communications of the British First Army. Under him he had thirty officers and more than 900 hundred men, along with over 300 wireless sets. And soon, after the end of hostilities, strenuous efforts were made to retain his services as Chief Instructor in Wireless in the British Army. But Schonland was intent on following a career as a scientist and he returned to Cambridge to work under Lord Rutherford at the famous Cavendish Laboratory. However he was not lost entirely to the colours for a mere twenty years later he was back in uniform and served throughout the second great conflict with distinction, ultimately as scientific adviser to Field Marshal Montgomery's 21st Army Group.

This article was sent to us by Brian Austin whom many will remember as ZS6BKW and was published on the web-site <http://blogs.mhs.ox.ac.uk/innovatingincombat/about/>
Hi,

I've just read the interesting article about wireless in World War 1 in the latest AWA Newsletter. You may be interested in one I wrote recently for a special web site here in England dedicated to wireless during that war.

Of particular interest to South Africans is that it's about the activities of the young Basil Schonland, a South African from Grahamstown who went to England in 1914 to both continue his physics education at Cambridge and to enlist in the British Army.

Schonland served as a signals officer in the Royal Engineers Telegraph Battalion (this was before the Royal Corps of Signals existed) and by the war's end he was in charge of all wireless communications in the British First Army. Notwithstanding the horrors of that war, it could be said that Schonland had a 'good war'. He served again in the next conflict when, at the behest of General Smuts, he established the Special Signals Services (SSS), which was part of the South African Corps of Signals. The SSS was based at Wits University where they designed and built South Africa's own radar system based on the scantiest of information provided by the British. Schonland went to England in 1941 and became superintendent of the Army Operational Research Group and then in 1944, after being promoted to brigadier, he became scientific adviser to General Bernard Montgomery's 21st Army Group during the invasion of northwest Europe.

Recalled to South Africa after the war by Smuts Schonland founded the CSIR and became its first President. He returned to England in 1954 to become the Director of the Atomic Energy Research Establishment at Harwell. He retired in 1960 and was knighted by the queen for his services to the British atomic energy research programme..

I wrote his biography, called Schonland - Scientist and Soldier. It was published by Wits University press in 2001.

This short piece tells of his activities during WW1

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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'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:**

Saturday 06:00—AM Net—3615
Saturday 07:15—Western Cape SSB Net— 3630
Saturday 08:30— National SSB Net— 7140; relayed on 14140
Saturday 14:00— CW Net—7020
Wednesday 19:00— AM Net—3615, band conditions permitting.

AWA Website is operational;

Visit the website at : <http://awasa.org.za/> and register on the site.

AWA Valve QSO Party AM and SSB:

This is a phone contest held over 2 sessions on Saturday 11 and Sunday 12 Sept 2014.

On Saturday afternoon 11 Sept, 15:00 to 19:00 SAST the AM section will be held with Contacts on both the 40m and 80m bands for points.

On Sunday 12 Sept from 15:00 to 19:00 SAST the SSB section will be held with contacts on both the 40m and 80m bands for points.

Frequencies - 40 metres: 7,053 to 7,100 MHz and 80 metres: 3,603 to 3650 MHz

Exchange - Call sign, RS and consecutive serial numbers starting at 001, plus type of radio used, eg HT37 Tx.

Points scoring: All valve radio - 3 points per contact; Hybrid (valve & solid state) - 2 points per contact; Solid State Radio - 1 point per contact.

Multiplier - All valve radio - 3 points per contact;
Hybrid (valve & solid state) - 2 points per contact;
Solid State Radio - 1 point per contact

KARTS Flea Market and AWA AGM

Kempton amateur club are having another fleamarket and have invited the AWA to display once again on this day.

We will also be using their facilities to have our AGM at the same time.

Bring your extra goodies along and any display items you may have to the same venue as before on **01 November**. The Impala Voortrekker centre. Visit the KARTS website for directions. www.zs6kts.co.za