

BOLAND AMATEUR RADIO KLUB

November 2016



CQ BOLAND

VAN DIE VOORSITTER

Ons laaste ledevergadering van die jaar vind plaas op 10 Desember 2016 by die Voortrekkerterrein te Wellington. Die vergadering word oudergewoonte gevolg deur 'n bring en braai en ek sien uit om u by die geleentheid te sien.

Baie dankie aan almal wie hierdie jaar betrokke was by BARK se bedrywighede. U teenwoordigheid by vergaderings en ander aangeleenthede word waardeer.

Ons ledetal staan tans op 89 en ek doen 'n beroep op u om nuwe lede, veral jonger lede, vir die klub en natuurlik ook vir amateurradio te werf.

Soos julle seker weet is ons webwerf onlangs gekaap (as dit die regte woord vir 'hacked' is). Dankie aan Deon ZS1G and Fabian ZS1FQ wie besig is om die webwerf te herstel. Daar word ook oorweeg om die @bark.org.za epos to verander na Gmail om sodoende toekomstige aanvalle sover moontlik te bekamp.

Onthou dat u op hoogte kan bly deur BARK se Facebook blad [facebook.com/bolandamateurradioklub](https://www.facebook.com/bolandamateurradioklub).

'n Geseënde Kersfees en 'n voorspoedige Nuwejaar aan u en u gesin.

73

Conradt

Van die Redaksie

In die vorige uitgawe van CQ Boland het ons melding gemaak van enkele ander stokperdjies.

In ag genome die ryke militêre geskiedenis van hierdie land, is dit insiggewend om kennis te neem van die werksaamhede van die "CANNON ASSOCIATION OF SOUTH AFRICA" (www.caosa.org.za)

Hierdie is 'n klein groepie entoesiaste wat hulle ten doel gestel het om die verval en verlies van voorlaaier geskut te bewaar en by talle geleenthede die werking daarvan te demonstreer.



AMSAT SA het onlangs 'n SDR besprekingsgroep gestig met die doel om ondersoek in te stel na die ontwikkeling van 'n herhaler hoofsaaklik vir nano satelliet toepassings. SDR is natuurlik 'n tegnologie wat al 'n paar jaar met ons is, maar op amateur radio gebied was die gebruik daarvan tot nou hoofsaaklik vir ontvangers.

Ons plaas dan ook 'n interessante artikel deur Jon Hudson van SDR Play, een van die stelsels wat tans vir amateur radio beskikbaar is.

Daarbenewens was daar ook onlangs 'n werkwinkel by NARC waar die werking van so 'n stesel deur Anton Janovsky ZR6AIC en Cor Rademeyer

ZS6CR verduidelik en gedemonstreer is.

Besoek gerus www.amsatsa.org.za

Where are all the new RF engineers? SDR to the rescue

Jon Hudson (SDR Play)

Fifty years ago, amateur radio (a.k.a. ham radio) was a very popular entry point for youngsters to discover the magic of electronics. It went beyond the self-contained satisfaction to be had from building a guitar amp or a hi-fi system, because of the communication element. With radio, your finished project, however limited, provided endless fun chasing those elusive signals from around the world - where the state of the ionosphere, distance, frequency and time of day added to the technical challenges of the performance of the radio and antenna hardware. The impulse to constantly improve on the status quo was compulsive.

Forty years ago and the silicon chip was making an impact and the early home computers were starting to emerge. From then on, computing became more and more popular as an attractive techie hobby - suddenly there was software to write – this provided the challenge to achieve as much as possible with the processing power and memory limitations of the day. Winding forward in time; once the internet got going (culminating in Skype providing free global voice and picture communications), it appeared ham radio as a hobby had frozen in time, and was a thing of the past.

The result of this is that many of the people who really understand RF from a hands-on point of view, are an ageing bunch getting close to retirement. So how to revive interest in radio as a hobby?

Well, there is a growing recognition that maybe the internet isn't as free and uncontrolled as it promised to be, and that wireless infrastructure has patchy coverage and can be fragile in times of emergency - so maybe it is becoming cool again to be able to 'do your own thing' with radio - but most powerful is the availability of low cost SDR (Software Defined Radio) technology - where your existing host computer can do all the hard work of demodulating and decoding the streams of data collected by this new breed of front-end radio receiver hardware.

The RTL-SDR Dongle

Recently, people have been using cheap 'RTL-SDR' dongles (designed originally so that PCs could decode digital TV transmissions) as SDR hardware. Freely available software such as 'SDR#', 'HSDR' and 'SDR Console' together with a USB driver which can control the dongle and accept the stream of I/Q data are needed. It is then possible to tune across a wide range of frequencies (typically from 24MHz up to over 1GHz).

You can read more about RTL-SDR dongles here. (<http://www.rtl-sdr.com/about-rtl-sdr/>)

Which signals you select, and what you do with them is up to the user. Suddenly the software-savvy youngster with a PC can get into the driving seat of a universal radio.

Interestingly, once you have the ability to easily find and receive new and interesting frequencies, then you discover the fantastic work done by an ongoing core of dedicated hams and others. They have made accessible the demodulation, decode and computer interaction with every combination of analog and digital, data, voice and picture, satellite or terrestrial transmissions you could imagine. Affordable SDR is bridging those parallel universes of radio and computing and the result must be more innovation in the future.



IARU AWARDS THE IARU DIAMOND AWARD TO ZS6AKV

The President of the International Amateur Radio Union has awarded the IARU Diamond Award to Hans van de Groenendaal ZS6AKV for his many years of service. The citation on the award reads "Presented to Hans van de Groenendaal, ZS6AKV in grateful appreciation for many years of outstanding dedication and diligence as IARU Satellite Adviser."

In 1994 the IARU Administrative Council appointed an Ad Hoc committee under chairmanship of the late Thomas Atkins VE3CDM. Other members of the committee were Michael Owen VK3KI, David Wardlow, VK3ADW and Hans van de Groenendaal, ZS6AKV. The brief of the committee was to report on various aspects of the amateur satellite service and canvass the views of the satellite community in all three regions on the role the IARU should play. The committee consulted widely and sent out over 60 questionnaires to canvas the opinion of various interested AMSAT and other satellite interest groups. The committee submitted one interim report and its final report in November 1994. The committee recommended the appointment of an IARU Satellite Adviser with the function to keep the IARU Administrative Council informed on all technical and operational aspects of the amateur satellite service and to provide advice and assistance to enable the Council to adopt appropriate policies, and to better inform the satellite community of the IARU. ZS6AKV was appointed to that position. He retired from as IARU Satellite Adviser in 2016 after 22 year of service.

Over the years the amateur satellite scene expanded considerably and the Satellite Adviser appointed and advisory committee representative of all 3 IARU regions. Hans has been succeeded by Hans Blondeel Timmerman, PB2T, past IARU Region 1 President.

VHF Activities

By Mike Kellett ZS1TAF

Since I became a “Windgat” ZR6ABM in the late 1980’s, my interest has always been focused on the VHF bands. Still being at school it was always difficult to save up for equipment to establish my own station. But eventually, I managed to get my first 6m all mode rig in time for Sporadic E season.



We are busy entering into an interesting, and a definite “Alive” VHF period – Sporadic E Season.

Sporadic E or **E_s** is an unusual form of radio propagation which is effective in the Ionosphere. Sporadic E propagation bounces signals off smaller "clouds" of unusually ionized atmospheric gas in the lower E region (located at altitudes of approx. 90 to 160 km). This occasionally allows for long-distance communication at VHF frequencies not usually well-suited to such communication.

Communication distances of 800–2200 km can occur using a single Es cloud. This will vary in distance, depending on cloud height and density. MUF also varies widely, but most commonly falls in the 28–144MHz Amateur Bands.

Sporadic E is an abnormal event, not usual conditions, but can happen at almost any time. It does however, have a seasonal pattern. Sporadic E activity peaks predictably in the summer time in both hemispheres. In the Northern Hemisphere, the peak is most noticeable in mid-to-late June, trailing off through July and into August. A much smaller peak is seen around the winter solstice. Activity usually begins in December in the Southern Hemisphere, with the days immediately after Christmas being the most active period up until end of January and trailing into February.

Although polarisation shift can occur, single-hop Sporadic E signals tend to remain in the original transmitted polarisation. A Long single-hop is generally between 1,400–2,400KM. Signals tend to be more stable on these distances with low QSB. Shorter-skip 640–1,290KM signals are recognised by “Ghosting” of the VHF Tv Channels. Signal-strength attenuation increases with each subsequent Sporadic E hop.

No conclusive theory has yet been formulated as to the origin of Sporadic E. It cannot be predicted when an opening will occur. There is also no proof that Sporadic E follows the eleven-year Sunspot cycle.

For those that have the facility to operate VHF, whether it is 50, 70 or 144MHz, a Horizontally polarised antenna is recommended.

A Tx power of 100watts or more is advisable – I however, have worked from my old QTH in Johannesburg, to Walvis Bay using a 3-Element beam with 10watts on 50.200MHz SSB.

Here are some useful frequencies to add to your “Scan” list on your radio :

- 50.110MHz – International DX Call SSB
- 50.200MHz – Local SSB Call
- 50.235MHz – Digital (JT6M)
- 50.245MHz – Digital (FSK441)
- 51.510MHz – FM Call
- 50.007MHz CW – Beacon :Jamestown (St Helena Island)
- 50.044MHz CW – Beacon :Polokwane
- 50.050MHz CW – Beacon :West Rand (Krugersdorp)
- 50.080MHz AFSK – Beacon :Bellville
- 50.300MHz CW – Beacon :Rosh Pinah (Namibia)
- 70.200MHz – CW & SSB call
- 70.260MHz – FM call
- 70.005MHz CW – Beacon :Rosh Pinah (Namibia)
- 70.010MHz CW – Beacon :West Rand (Krugersdorp)
- 70.025MHz CW – Beacon :Polokwane
- 144.300MHz – SSB call
- 144.370MHz – FSK441
- 144.400MHz – FM call – Horizontal
- 145.500MHz – FM call
- 144.414.5MHz CW – Beacon :Bloemfontein
- 144.415MHz CW – Beacon :Bredasdorp
- 144.429MHz CW – Beacon :Rosh Pinah (Namibia)
- 144.434MHz CW – Beacon :Cape Town
- 144.460MHz CW – Beacon :West Rand (Krugersdorp)

There are currently two local VHF nets :

- Tuesday Evenings 20H00 SAST - 50.200MHz SSB
- Thursday Evenings 19H00 SAST – 144.300MHz SSB

Another way to be alerted for Es is by leaving one of your rusty old Citizen Band Radio’s monitoring 27.275MHz – There is still a number of CB broadcasters around the country side. As soon as you may hear a station around our borders or even maybe beyond, it can be a sign that the VHF bands have also opened up.

73de Mike ZS1TAF

A gateway to science and technology.

The theme for the South African Radio League this year is “A gateway to science.” Nico van Rensburg, ZS6QL, who was elected president on July 30 2016 said he believes that this theme should remain the overarching theme for the next few years and direct the activities of the SARL in taking amateur radio forward to 2020 and beyond.

According to van Rensburg, amateur radio has long-standing traditions which have guided the activity ever since the formation of the International Amateur Radio Union and locally the SARL since 1925. These include communicating with the world and technical experimentation and development. He states that the way these traditions are put into practice must adapt at the same pace as technology expands and reinvents itself.

From a communications point of view so much depends on the status of the eleven year solar cycle. Currently the cycle is on a downward trend and will reach its minimum in the next few years before slowly recovering. This will affect the way radio amateurs communicate, participate in contests and other activities that rely on good propagation conditions. But instead of putting this on hold, radio amateurs are presented with ideal opportunities to experiment with new antenna designs for lower frequencies which will still offer international communication.

The SARL will continue with its 5 MHz propagation studies on 5290 khz and has requested the Independent Communications Authority of South Africa to make this frequency permanently available to continue the work that was started several years ago. According to van Rensburg, there is also a great opportunity for radio amateurs to add to the body of knowledge on propagation on 1,8MHz, a frequency band that hovers between shortwave and medium wave. Setting up a number of beacons around South Africa and collaborating with radio amateurs in other parts of the world should provide some very interesting information, says van Rensburg. While propagation is slowing down, radio amateurs have more opportunities to focus on local competitions and sharpen their operating skills, expand on their technical knowledge, and rekindle local friendships.

One should not forget that on the VHF/UHF front long distance communication is also an attractive field for those who would like to expand their knowledge and expertise with research and active participation in groups currently active on these bands. Meteor scatter communication, trans equatorial propagation (TEP), moon bounce communication (EME) and weak signal communication such as WJT offers many opportunities for experimentation. The SARL sponsors meet annually at the Africa All Mode International DX Contest with the objective of stimulating contesting in Africa. This year it will take place on 17 and 18 September, and will be an ideal opportunity to test antennas on lower frequencies.

Van Rensburg believes that the SARL should provide more support to local clubs and specialist organisations like AMSAT SA by becoming more involved. AMSAT SA is building an amateur radio CubeSat that will provide VHF/UHF channels for communication across South Africa and provide opportunities for school science projects to operate from space. During 2017 a geostationary satellite will be launched that will cover all of Europe, Africa and the Middle East. Van Rensburg

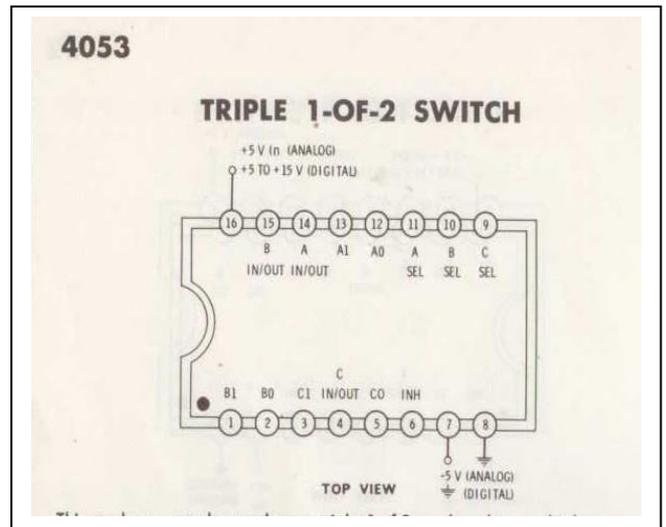
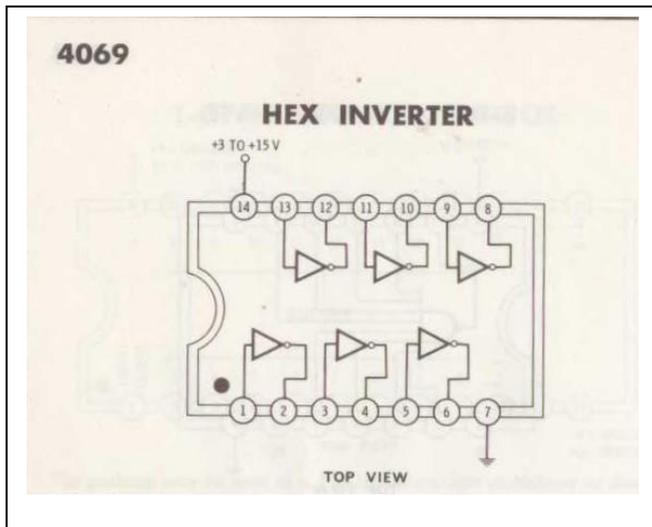
thinks that the SARL should join forces with AMSAT SA to help develop equipment that is easily constructed and at an affordable price for all radio amateurs. The SARL disaster communication division, Hamnet, remains ready to provide communication where all else fails in the event of a possible disaster and to sharpen their skills by providing communication during sporting events as they do with the Comrades and Two Oceans marathons to name a few. There is also a great opportunity to develop more effective antennas, particularly for portable operations.

According to van Rensburg, a major sub theme for this year will be “Amateur radio – leading the youth through science and technology.” He says they have come a small way with the development of three “hammies” clubs, dedicated to training young people to embrace the magic of amateur radio communication. The three clubs are in Johannesburg, Vryheid in KZN and Port Elizabeth. Van Rensburg believes that these initiatives should be expanded to create opportunities for young people – using amateur radio to develop their keen interest in science and technology on a path to a future career. From a young age the hammies are taught to build antennas, simple radio equipment including electronic gadgets and learn how to use these to communicate with their peers.

Van Rensburg said that the future of the country lies with young people and this is also true for amateur radio. “We have this duty to engage them and show them the way to science and technology to create a knowledge economy in South Africa, but doing this in an exciting and fun way.”

This is a transcript of an article by Hans van de Groenendaal which appeared in the September 2016 issue of EngineerIT

Circuits & Signals



Integrated circuits have become part of virtually every piece of electronic equipment. Today we will have a closer look at two of these which have been in use for more than two decades.

4069 Hex Inverter

This chip contains six inverters which can be used independently.

On any inverter, a **low** input provides a **high** output, and vice versa.

4053 Triple 1-of-2 Switch

This package may be used as a triple 1-of-2 analog data multiplexer or as a triple 1-of-2 digital selector or distributor. The three sections may be independently controlled, but they share a common inhibit terminal.

In the analog mode, -5V is applied to pin 7, and digital control signals of **low** = ground and **high** = +5V are applied to the INH and the A, B, and C terminals.

If INH is high, no channels are selected.

If INH is low, the channels selected depends on the A, B and C SEL inputs.

For instance, if A SEL is low, A0 is connected to A IN/OUT; if A SEL is high, A1 is connected to A IN/OUT, and similarly for the B and C channels.

In the digital mode, pin 7 is grounded, and digital control signals of **low** = ground and **high** = pin 16 voltage are applied to the A, B, C and INH terminals. If INH is high, no channels are selected. If INH is low, the channels selected depends on the A, B and C SEL inputs.

For instance, if A SEL is low, A0 is connected to A IN/OUT; if A SEL is high, A1 is connected to A IN/OUT, and similarly for the B and C channels.

In either mode, the OFF state is an open circuit, and the ON state is a 120 Ohm resistor. Not more than 25 mA can be routed through the switches.

Application circuit.

Alternate action Push Button

&

Multiple output

