

Zululand Amateur Radio Club News

The newsletter for the discerning Ham

September 2014

ZARC Committee

Chairman: Andrew Jansen ZS5AND

Vice Chairman: Warren Snyders ZS5WOZ

Treasurer: Willie Axford ZS5WI

Secretary: Dawn Snyders ZS5ME

Ham Net: Jo Snyders ZS5PO

Editor: Jo Snyders ZS5PO

Member: Anne Griffiths ZS5FAB

Member: Gerald Scrooby ZS5GS

Webmaster: Chantel

Club Repeaters

Ntumeni 145.675 MHz

Empangeni 145.700

Club Packet Digipeater/Mail-drop & APRS Digipeater

Ntumeni 144.625 (ZS5ZLB Mail, ZS5ZLB-2 Digipeat, ZS5ZLB-7 KA-Node) PBBS: ZS5AND

Club Nets

ZS5PO & ZS6AE Have A Sched On Thursdays Between 17:30 and 18:45
On 7.175 Or 3.645 Depending on propagation
ALL are more than welcome to join us for a "rag chew"

SARL News

08h30 - Sundays - 145.650, 7.066 MHz

NEXT ZARC MEETING

DATE: 12th October 2014 (**Sunday**)

TIME: Meeting will take place ± 13:30, after the customary Braai at 12:00

QTH: At Tattenham Resort on the R102 near Gingindhlovu

E-Mail: dawnjo@telkomsa.net (Secretary)

Club Web site: <http://zs5zlb.zs5and.co.za/>

Editor, Q.R.L.



Greetings & Salutations fellow members, I trust that this news letter finds you all in good health. The next club meeting will be on **12th October 2014**. The venue will be at Tattenham Resort. The meeting will take place at \pm **13:30**,. Please make a note in your day books and diaries. The time for the customary braai will be at **12:00**, giving everybody a chance to get there after Sunday morning commitments.

**Have you bought insurance to continue enjoying your hobby yet? SARL membership IS that insurance!!!
Is your hobby worth R1.09 per day to you? YES?! Then join the SARL, it's the RIGHT thing to do!!!**

The radical opinions, and rantings of the Editor, are not necessarily the opinions of, or supported by, the ZARC Committee, or it's members.

Wots Potting In The ZARC

Birthday Greetings Go To:



September: Ian, spouse of Chris, ZS6RI, on the 12th, Chris, ZS6RI, on the 17th.

October: Willie, ZS5WI, on the 2nd, Mike, ZS5MB, on the 6th, Kiana, daughter of John, ZS5J, on the 31st.

December: Belinda, spouse of Warren, ZS5WOZ, on the 17th.

Many happy returns to all of you, and may you be spared for many more years.
(If your birthday wishes do not appear here, it is because you have not informed me of your birth date).

Get Well Soon



I have not heard of anyone who has been doctor bothering lately,

Club Happenings

PLEASE NOTE THAT SUBS ARE NOW DUE!! PLEASE PAY ASAP IF YOU HAVE NOT DONE SO YET!!

If you have NOT paid your subs yet, then this will be the last news letter and other notifications that you will be receiving. This, because, according to the constitution, you have resigned from the club.

Account name **Z.A.R.C.**
A/c number **602 194 201 50**
A/C Type **Savings**
Bank **FNB**
Branch **Eshowe**
Code **22 02 30**

Please quote your call sign/s and first name in the reference section.

Please E-mail proof of payment to zs5wi@telkomsa.net.

80 Mtr QSL Party

The October leg of the South African Radio League 80 meter QSO Party will be held on Thursday evening 2 October from 17:00 to 20:00 UTC with activity between 3 603 and 3 650 kHz and 3 700 to 3 800 kHz. The exchange is the call signs of each station, a signal report and the operator's names. A QSO with a South African station counts 10 points and a QSO with a station outside South Africa counts 15 points. Submit your log by 11 October to zs5lp@vodamail.co.za

Packet

On the packet Mail-Drop scene. The TNC is beaconing out. The coax on this set-up still has to be renewed, and the antenna moved to the east side of the tower

APRS

Your path to any stations in RSA, (or anywhere in the world via the I-Gate on 144.625) will be **ZS5ZLB-2, RELAY4-4**. The I-Gate should be available between the hours of about **09:00** and **22:00**, WHEN I AM AT HOME. People in the Richards Bay/Empangeni area can get into the PMB I-Gate on 144.800.

For those of you Zululanders who have Internet, go and look on the www.aprs.fi web site, and type your call sign into the slot at the top of the column on the right, and press search, and see if your station appears on the map.

Repeaters

145.675: This repeater was replaced after the Xmas meeting & lunch, and the old Storno is working well.

145.700: This repeater is now a DEAD puppy, and needs LOTS of TLC. STILL waiting for ESKOM to open up for us to get into this site.

“SWAP SHOP”



If you have any items you want to get rid of, or if you are looking for something, Please let the Editor know and he will advertise it in the swap column for you.

1 X **Neutec SM-1645** 16 channel 2Mtr VHF radio for sale.
Service, user and reprogramming instruction manuals available.

Reason for selling: Surplus to requirements

Please contact Gerald, ZS5GS on: **071-143 5433**



NB This picture of the radio was found on the internet, and is NOT a picture taken of the actual radio that is for sale

Please contact me if you are looking for a **Hy-Gain TH-MK4** beam antenna, The price being asked is **R4500**, and this one is in very good condition. Brand new they go for around **R9500**.

Home Brewers Hoekie



The Real SWR Pages

Used with the kind permission of Stephen C Ward WC7I www.wc7i.com

This article was written in two parts.

Part 1. Where the energy goes in an antenna system, will a high SWR blow up my transmitter??

(NO, it will not, but POOR TUNING can)

PART 2. Antenna SWR Should NOT measure 1:1 in simple antennas!!

Although this article was written in two parts, it has been serialised by the Editor, over four news letters, as it is too large to be placed in one news letter.

Episode 3

**That's a lot of information. What is the actual result ?
What's the Score?**

Input Power - - - - -	100 W
Loss of power going up the Coax- - - - -	8.55 W
Power reaching the Antenna - - - - -	91.46 W
Power Radiated by the Antenna- - - - -	88.91 W
Reflected Power returned to the Coax- - - - -	-2.54 W
Loss of Power going back down the Coax - - - - -	0.217 W

Power that arrives at the Tuner - - - - - 2.32 W
 Radiated power eventually evens out to? - - - - - 91 W.
 (after about 5 cycles)

This shows where the power is lost, and what is radiated. This is far too much information, but it is necessary to tell the whole story truthfully.

As you know, this is only the first cycle.

Make a diagram of all this information so you can see where all these numbers fit in. That will help you understand this.

The power that is still in the coax (and tuner) will add to the generator power which will add a little to the output and add to the losses. This will continue for a few cycles until the system settles out to finally produce 91 Watts radiated power.

Finally, take a look at what happens when the SWR is high and what happens when the coax loss is great.

First, lets look at what happens when the SWR is high (SWR = 3) compared to low, 1.4 in the chart below. This uses the same 50 ohm coax as before.

	SWR = 1.4	SWR = 3.0
Input Power	100W	100 W
Loss of power going up Coax	8.55W	8.55W
Power reaching Antenna	91.46W	91.46W
Power Radiated by Antenna	88.91W	68.59W
Reflected Power returned to coax	2.6W	22.86W
Loss of Power back down coax	0.217W	1.95W
Power that arrives at tuner	2.32W	20.9W
Radiated power eventually settles out at >	91W	86.7W

Even when there is a high SWR as in the chart above, the final power output is nearly the same.

- **SWR is not a killer at all.**

This example below uses the same SWR = 1.4, as in the example above, but the COAX now has a loss of 2.5 dB using (Belden 8216) which is Rg - 174 compared with much better Belden 9913

	Belden 9913	Belden 8216
	Coax loss = .388 dB	Coax loss = 2.5dB
Input Power- - - - -	100 W	100 W
Loss of power going up the Coax- - - - -	8.55 W	43.7 W
Power reaching the Antenna - - - - -	91.46 W	56.2 W
Power Radiated by the Antenna- - - - -	88.91 W	54.6 W
Reflected Power returned to the Coax- - - - -	2.54 W	1.56 W
Loss of Power going back down the Coax- - - - -	0.217 W	0.68 W
Power that arrives at the Tuner- - - - -	2.32 W	.87 W
Radiated power eventually settles out at- - - - -	91 W	55.1 W

These losses are terrible! The coax losses have ruined the output power!!

- Finally we have come to the very last subject on this page.

So, why do people think they can blow up their rigs or linear amplifiers when there is a high SWR on the antenna?

Because that can happen, but it is not due to the reflected power!
 There is a totally different reason.

A high SWR on an antenna probably means that the antenna is not tuned to the frequency that is being used. This, in turn, means that the antenna has some inductive or capacitive reactance that is de-tuning the final amplifier. De-tuned final amplifiers draw far too much current and can burn up. The rig or linear amplifier will have to be re-tuned to avoid creating too much heat.

Many linears and nearly all tube amplifiers have some tuning knobs that allow you to "dip the plate current" or adjust the SWR by adjusting something on the front of the device.

Transistor rigs usually do not have any tuning adjustments. To avoid the extra heat created when running a de-tuned amplifier, there is a protection circuit that will significantly reduce the output power if the SWR is high.

How much power will be radiated by the antenna?

The antenna will radiate 88.921 Watts into space.

This number will get slightly larger after the reflected power is returned to the antenna, but for now, during the first cycle, only 88.921 Watts are transmitted.

How much power is headed toward the tuner?

Only 91.461 Watts was available at the antenna - coax connection, and 2.75 percent of that will be reflected back down the coax toward the tuner.

(91.461 Watts times 2.75% = 2.54 Watts) 2.54 Watts will be returned to the coax to go back to the tuner.

How much power gets to the tuner? <http://www.ocarc.ca/coax.htm>

We must use the calculator again. Put 2.54 Watts in the place of the 100 Watts just above the "calculate" button. Press the "calculate" button.

Do it now please.

Notice that 2.323 Watts gets to the tuner and the rest was lost to heat and leakage.

5) How much power is re-reflected at the tuner?

100 % of the reflected power that gets to the tuner will be re-reflected. In this case, the power that is re-reflected is 2.323 Watts. This 2.323 Watts now starts its way back to the antenna.

6) The re-reflected energy will be in phase with the generator so the two signals will add. [Note: If the two signals were not exactly in phase, the addition still happens, but the method is messy, and the result is not the same. This would be the case if the antenna was not exactly tuned to the operating frequency as it is in this example or if an antenna tuner was not correctly adjusted.]

The generator is producing 100 Watts and now it will have an additional 2.323 Watts added to it, for a total of 102.323 Watts heading for the antenna.

- This is the official end of the first cycle of the generator. This first cycle started with a 100 Watt signal leaving the generator, but only 88.921 Watts was transmitted. The total loss so far due to heating and leakage was (100W - 91.46 W = 8.55W) 8.55 Watts on the trip up to the antenna, and (2.54 W - 2.32 W = 0.217 W) 0.217 Watts loss on the way back down the coax.

This makes a total of (8.55 W + 0.217 W = 8.76 W) 8.76 Watts actually lost in the form of heat and leakage.

There are still 2.32 Watts stored in the coax(and tuner) about to be added to the generator power.

All the power is accounted for. This is important because it helps you realize this explanation is correct.

To Be Continued

If you would like to contribute to your Club newsletter, or to contact me for any reason, please use the address / Phone numbers below.		
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