

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: ??th February 2015(**Sunday**)

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

QTH: Tentatively at the QTH of Andrew ZS5AND, in Empangeni

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 in February **2015**. The venue will tentatively be at the QTH of Andrew ZS5AND in Empangeni. 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:



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

Yes, it is almost time for the second leg of the South African Radio League National Field event, and the South African Radio League VHF/UHF contest. Remember, we did this in February.

The second leg of the SARL National Field Day & SARL VHF/UHF Contest is taking place from 12:00 to 12:00 CAT on the 15th and 16th November 2014.

This can be a GREAT Club activity – A 6 sleeper cabin has tentatively been booked for the 14th 15th & 16th at Tattenham Resort There is also place to park caravans, and pitch tents for the weekend. Start on the Friday afternoon setting up camp with a braai for dinner! Saturday morning set-up the station and antennas (after a breakfast of eggs, bacon & toast and ice cream). Saturday afternoon get the braai going while the guys and girls work the world. Sunday morning breakfast (scrambled eggs bacon, sausage, Brinjal & toast with honey drizzled over) and then work those last stations before starting to dismantle the antennas and the station. Start the potjiekos early so that it is ready by lunch time. So far Warren, ZS5WOZ, and Jo ZS5PO will be taking part, and Gerald ZS5GS is thinking about it, and Andrew ZS5AND, will be arriving on Sunday morning to work a few stations before we pack up at midday.

80 Mtr QSL Party

The October leg of the South African Radio League 80 meter QSO Party was held on Thursday evening 2nd 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 only club member who took part was Dawn, ZS5ME. Conditions left a lot to be desired, as propagation was not too bright, and high QRN did also not help matters either. Anyway, Dawn managed to make 12 contacts, among whom was only one club member, Jo ZS5PO, house sitting over at the home of Warren ZS5WOZ, who was away from home for a few days. To date we have not heard what the final outcome of the compo was.

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 4

Part 2

Antenna SWR

Have you ever measured the SWR of a simple antenna?

It should NOT have been 1:1

Lots of people think that a good antenna should have a 1:1 SWR as measured by an antenna analyzer. That is just not true, and this article will explain why.

We need to look at what SWR means, and how an "antenna system" is different from a simple antenna.

Unfortunately, we need some 6th grade mathematics for this explanation. I will do the math, you can just read. OK, you can do the math with me if you like.

One way to find SWR is to convert the coax and load impedance into a fraction. There are other ways that work well also, but this is really simple.

SWR is really a simple fraction that puts the larger impedance in the top of the fraction, and the smaller impedance in the bottom of the fraction.

It is done this way so the answer is always equal to, or greater than, 1.

Let's try this to see what I mean. Assume that you have a 50 ohm coax and a 72 ohm dipole antenna as a load. Write the larger number on top, which in this case is the 72 ohms.

$SWR = 72/50 = 1.44$ which means the SWR is 1.44:1

Let's try this again using a 36 ohm vertical antenna with at least three un-grounded radials.

Remember to put the 50 ohms on top this time. (50 is larger than 36)

$SWR = 50/36 = 1.389$ which means the SWR is 1.389:1

OK, let's stop right here and look at the results. Both answers are almost 1.4:1 but notice that neither answer is 1.0 :1. This is the whole point of this article. Antennas DO NOT HAVE a SWR of 1:1.

Since you now know the whole point of this article, you might think, "Why should I read the rest of this article?" The reason is to learn more, and see how to use this information.

The numbers that I picked for the characteristic impedance for the two types of antennas are actually real, and correct numbers that are found with these types of antennas. Nearly every single wire resonant dipole has an impedance of 72 ohms. Nearly every resonant vertical antenna with 3 or more un-grounded radials has 36 ohms.

The conclusion here is that these antennas have an SWR of 1.4:1 when correctly made.

Let me say that again....they do NOT have a SWR of 1:1. They are NOT supposed to have an SWR of 1:1. They ARE supposed to have an SWR of 1.4 :1.

Does it seem to you that I am getting really excited about this? Yes, I am.

Why do I make such a big deal out of this?

Because many amateurs think they have heard that antennas should have an SWR of 1:1.

What they have most likely heard is that an antenna system should have an SWR of 1:1.

I will deal with the idea of the antenna system in a minute, but before I do, it seems like a good place to tell you that there is a type of antenna that has a characteristic impedance of 50 ohms. The ground plane vertical antenna with 3 or more drooping (at 45 degrees) un-grounded radials can have a characteristic impedance of 50 ohms, BUT that is only true for the one frequency where that antenna is resonant. If you ever change frequency, the impedance of that antenna will also change, and it will change that SWR from 1:1 to some higher value.

Antenna systems (Remember these words!)

It is true that an "**antenna system**" should have a 1:1 SWR. An antenna system includes all the stuff that goes between the output of the rig, and the tips of the antenna. Usually that includes the short coax that leaves the rig, the SWR meter, the antenna tuner, the long coax that goes up to the antenna, and the antenna itself.

That 1:1 SWR is measured just after the signal leaves the rig, so the 1:1 SWR is located in that short coax between the rig and the SWR meter. The antenna tuner is responsible for making the antenna system resonant and creates a 50 ohm impedance at the connection at the rig.

That short coax is the only place where the SWR is 1:1, and it is the only place where it needs to be 1:1. That is the place where the 50 ohm rig attaches to the 50 ohm coax. All the rest of the antenna system will have a higher SWR.

Please remember that the impedance of the long coax will not match the impedance of the antenna. The connection between the long coax and the antenna will NOT have a SWR of 1:1.

Where can I use this information?

The place where this is most useful is for amateurs who use vertical antennas with grounded radials. I have heard several hams say "I only need 2 radials for a 1:1 SWR on my grounded vertical antenna!"

First, please note that a 1:1 SWR means the antenna has 50 ohms of impedance. A vertical is supposed to have 36 ohms of impedance.

Here are some questions that need to be asked.....

Where did those extra 14 ohms come from?

The most likely place is in the ground system where only 2 radials are working.

What effect do those extra 14 ohms have on the signal?

The 100 Watts of power that are delivered to the antenna system will be divided among each individual impedance.

How much power will the antenna get?

The total impedance is 50 ohms and the antenna impedance is 36 ohms so the antenna will receive the fraction of $36/50$ times the full 100 Watts.

$36/50$ times 100 Watts = 72 Watts

How much power will the ground get?

The ground system will have 14 ohms in it, so the ground will receive $14/50$ times the full 100 Watts.

$14/50$ times 100 Watts = 28 Watts.

Please notice that 28 Watts is being used to heat the ground. The worms may thank you for this kind gesture, but it seems like a waste to me. I would add some radials to this antenna to reduce the impedance. Let those worms wear coats to stay warm.

A grounded vertical antenna needs all the help it can get to be a good antenna. Eight radials is not too many.

My choice would be to have the full 100 Watts be delivered through an antenna tuner into a 36 ohm antenna with a good ground system (meaning at least 8 radials). Adding more radials will reduce the impedance, and increase the SWR of the antenna, but that can be tuned away with an antenna tuner so the whole system is resonant and will have 50 ohms of system impedance right where the rig connects to the short coax.

Knowing what the antenna impedance should be (without having your antenna tuner on) is valuable so you will know if the impedance is wrong. You can find out if the impedance is wrong by temporarily removing the antenna tuner and measuring the antenna impedance with an antenna analyzer.

Now you know

- 1) Why an antenna should not have a 1:1 SWR.
- 2) Why it is important to know what the antenna impedance is.
- 3) That the system impedance should have a 1:1 SWR.
- 4) And while it was not the purpose of this article, now you know that a vertical antenna with grounded radials needs lots of radials.
- 5) Actually, I have never seen worms wear coats.

73, Steve, WC7I August 2009 for Hamuniverse.com

Feel free to visit wc7i.com for even more simple antenna ideas.

End of part 2!

Now you know the answers to these questions:

Questions:

1. Will a high SWR blow up my transmitter?
2. What should the SWR of a simple antenna be?

Answers:

1. It should NOT have been 1:1
2. You will not blow up your transmitter!

NOW FIGURE OUT WHICH ANSWER GOES WITH THE QUESTIONS ABOVE!
(If you can't, you need to start over... and this time, read each word slower.
Stop skimming it as if your transmitter was about to blow up! It will wait for you!)

More good reading about SWR from QST:

"The SWR Obsession"

by Steve Ford, WB8IMY

QST Editor and Publications Manager of the ARRL (Get it here: http://www.qsl.net/4/4z4tl/pub/swr_obsession.pdf)
(This is a pdf file download) You'll need Adobe reader.

More info on SWR [here](http://www.hamuniverse.com/swr.html). (<http://www.hamuniverse.com/swr.html>)

A note from N4UJW at Hamuniverse.com:

In Steve's excellent, very informative article, there is lots of mention of the terms "antenna system", tuners, coax loss, etc.

*In my opinion, I don't believe his intention is to get you to run out and get a tuner at all costs just to get rid of that last little bit of SWR. This article, in simple words, for those who still do not understand, means that as long as your radio is working into a properly tuned "**antenna system**" **designed for the output load requirements of the radio**, you should not worry about getting that unrealistic "perfect" 1:1 SWR that you have heard so much about.*

*If you do show a "high" SWR at the **output** of the radio, greater than it can handle, either your connectors, feedline, or **anything and everything** between the SWR meter and **including the antenna and it's surroundings** should be completely checked. This includes the inputs of your linear. If one or more of the parts of the total **antenna system** is "showing" the radio more or less than a 50 ohm load, then your modern transmitter will not put out it's maximum power! You will never get that "perfect" 1:1 SWR unless you use a tuner due to losses in that non-perfect feed line that is 20 years old OR in that new coax due to small losses remember the "antenna system" performing at or near 100% efficiency **is your goal and..... your station!***

I also have never seen a worm wearing a coat, but here is proof of one wearing an apple!



"What is worse than finding a worm in your apple? Finding half a worm! WC7I"

**Now go build yourself a good "[antenna system](#)"
and leave the worms alone!!!!.....**

THE END

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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