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# WATTS

09-2013

Year 83 + 9m

Monthly newsletter of the Pretoria Amateur Radio Club  
Maandelikse nuusbrieff van die Pretoria Amateur Radio Klub.

✉ PARC, PO Box 73696, Lynnwood Ridge 0040, RSA

web <http://www.parc.org.za> mail: [zs6pta@zs6pta.org.za](mailto:zs6pta@zs6pta.org.za)

Bulletins: 145,725 MHz 08:45 Sundays/Sondae  
Relays: 1.840, 3.700, 7.066, 10.135, 14.235, 51.400, 438.825, 1297 MHz  
Activated frequencies are announced prior to bulletins

Swapshop: 2m and 7.066 MHz Live on-air after bulletins  
Bulletin repeats Mondays | herhalings : Maandae 2m 19:45

PARC AGM

2013-08-10

PARK AJV



Pierre ZS6PJH (chairman) and Jean ZS6ARA (secretary) conducting and monitoring proceedings.

Only a few pictures can be published in this publication and members not shown can request by email.

Larger pictures available from Pine ZS6OB. See a short AGM summary on p 2. More pictures on p 4.

## In this issue

- Member news and activities Lede-nuus en Aktiwiteite  
AGM report and pictures
- Technical | PIN diode RF switch circuit |  
SD ElectroStatic Discharge Tutorial |
- Page eight -- Bladsy agt

## In hierdie uitgawe

### Next club events

Fleamarkets at PMC

Sat 7 Dec

Club social at U.P.

Thursday 5 Sept. 7pm

Club committee meeting  
Thursday 19 Sept. 7pm

# PARC Management team / Bestuurspan Aug. 2013 – Aug. 2014

## Committee members

<b>Chairman, Contests, Liason</b>	Pierre Holtzhausen	ZS6PJH	<a href="mailto:zs6pjh@telkomsa.net">zs6pjh@telkomsa.net</a>	012-655-0726	082-575-5799
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<b>Secretary</b>	Jean de Villiers	ZS6ARA	<a href="mailto:zs6ara@webmail.co.za">zs6ara@webmail.co.za</a>	012-663-6554	083-627-2506
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<b>Clubhouse</b>	Pieter Fourie	ZS6CN	<a href="mailto:pieter2@vodamail.co.za">pieter2@vodamail.co.za</a>	012-804-7417	083-573-7048
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## Co-opted/Geko-opteer:

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<b>Historian, Archives, Awards</b>	Tjerk Lammers	ZS6P	<a href="mailto:zs6p@iafrica.com">zs6p@iafrica.com</a>	012-809-0006	
<b>Digital, photographer,sound</b>	Theo Bresler	ZS6TVB	<a href="mailto:theo@bresler.co.za">theo@bresler.co.za</a>		082-698-1742



9 of the 15 members listed above

## PARC 83<sup>rd</sup> AGM (short report – not the official minutes)

The AGM started off approximately 11:30 on Saturday 10 August after the fleamarket was cleared from the floor at PMC. The usual procedures of welcoming the members and guests, chairman's report, approval of the previous minutes and approval of the financial report were dealt with without a hitch.

There were no motions received and a short discussion evolved regarding a change to our logo where the incorporation of the SARR logo has to be removed but nevertheless our affiliation has to show in some manner. Members were requested to submit proposals in the coming days.

Certificates were then handed to a dozen or more deserving members for their hard and unselfish dedication to club activities.

11 nominations of members willing to be appointed to the new committee were then made public and all were accepted to serve on the committee for 2013-2014. There were two candidates ZS6PJH and ZS6JHB for chairman and by member vote in their absence Pierre ZS6PJH was inaugurated as chairman.

To end the proceedings Louis Pieterse from ICASA informed us about digital TV and the "white space" spectrum segments that would come free as soon as analog TV is shut down. Internet and educational players will certainly vie for the spectrum.

Finally all were treated to a fine lunch.

All office holders and their functions have been allocated during the last committee meeting and are as listed above.



Sept

## Anniversaries Herdenkings

21 Johan ZS6JHB  
24 Estie ZS6CC  
26 Graham ZS6GJR

02 Lily and Harry ZS6AMP ( 57 )  
07 Gerda and Roger ZS6RJ ( 11 )  
28 Retha nad Roy ZS6XN ( 28 )  
29 Karin en Sarel ZS6EK ( 34 )  
30 Elma en Chris ZS6LOG ( )

### Lief en Leed | Joys and Sorrows

**Gerda and Roger ZS6RJ** are now the proud parents of a girl Haylee. (see below)  
**Sonja, daughter of Bertha and Hans ZS6KR** was amongst the top 15% academic achievers and invited by the Golden Key International Honour Society to receive Life Membership.  
**Riaan ZS6RXY** se arm is gebreek toe sy fiets 'n draai nie kon maak nie.

### Nuwe lede | New Members

'n hartlike welkom aan: a hearty welcome to:  
Pine Pienaar **ZS6GST**  
Riaan Venter **ZS6RXY**  
Jaun van Dyk **ZS6VDJ**

### Diary | Dagboek (UTC times)

Sept  
**05 Club social at UP.**  
07-08 All Asian DX Contest. Phone 00:00-24:00  
08 DARC Digital contest 11:00-17:00  
14-15 WAE Phone Contest 00:00-23:59  
**19 PARC committee meeting**  
28-29 CQWW RTTY DX Contest 00:00-24:00  
28-29 ARRL EME Contest 00:00-23:59

### Club social at UP. 5 Sept. 7pm

All welcome – please attend for an interesting talk by Pine ZS6GST on feeders, antennas and SWR.

Almal welkom – kom woon by luister na Pine ZS6GST se praatjie oor voerlyne, antennas en SWR

### Snippets | Brokkies

**Early start.** Roger ZS6RJ getting Haylee the feel of CW operation. Dahs come easily but the dits will take more practice....

**Swazi Dx-pedition.** Roger ZS6RJ is one of the co-leaders of the 3D0ET 12-man team to operate on 18-27 November. If you go to [www.swazidx.org](http://www.swazidx.org) you will see all the mugshots and their expertise. Also interesting are the wanted-mode survey results.

**Mozambique DX-pedition.** Tjerk ZS6P reports all systems go for C82DX to be activated from Xai-Xai on 15 – 22 October with a multi-national team of operators. All info on [www.C82DX.com](http://www.C82DX.com)

**Google outage reportedly caused big drop in global traffic.** For a very brief few minutes on Friday 16 August local ZS midnight Googlers may have noticed some Google services, notably search, appeared to be down. If not, maybe you noticed the ensuing [freak-out](http://freak-out) across Twitter and the rest of the www.

As it turned out, Google's downtime had global, measurable repercussions, according to analytics firm [GoSquared](http://GoSquared), which estimates that it caused a 40% drop in global traffic during the 5 min. window.

**From HAMNET REPORT 18 August 2013** ( by Francois Botha ZS6BUU )

Google have introduced some new features to their web which after playing around with, found them extremely useful. Google Maps and Google Alerts!

Although the Tom Tom and Garmin are very useful tools and used by many of us, pre planning a route with Google Maps becomes an interesting experience. You type in or enter your home address as fully as possible and then type in where wish to go to – right down to the street number if applicable. And... you can print it out!

It could be around the suburbs or to another Province or town. They plan your route and display it in seconds - with alternative routes, how much longer it is and how much extra time you will spend on the road on any route!

If you are not sure of what you are seeing, it will in infinite detail also take you through the route, tell you what road you are on, where to turn left or right – very comforting indeed!

So next time you get called out with a GPS location or coordinate, check out the various routes to that location, and decide which one is the better and quicker alternative! Garmin and others do sometimes take one all sorts of devious routes!





ESD tutorial includes:

- [ESD Tutorial](#)
- [Effects of ESD on electronics](#)
- [ESD protection](#)
- [EPA, ESD protected area](#)
- [ESD work bench and ESD mat](#)
- [ESD control process](#)
- [ESD design guidelines](#)

ElectroStatic Discharge or ESD awareness is particularly important for anyone associated with electronics.

As integrated circuits become more compact, and feature sizes shrink, active devices as well as some passive devices are becoming more prone to damage by the levels of static that exist in a normal environment.

To combat its effects, industry is spending very considerable sums of money to prevent damage to electronic components from the effects of static. Anti-static areas using protective antistatic workbenches, as well as measures for ensuring people are not carrying static are all used. Using what are termed EPAs or Electrostatic Discharge Protected Areas, the destructive effects of static on electronics equipment during manufacture can be virtually removed.



In view of the fact that ESD is so important electronics manufacturing and development companies go to significant lengths to overcome the effects of ESD. Specially protected areas using a variety of ESD products including anti-static mats, ESD benches, ESD bags and packaging, ESD wrist straps, soldering irons adapted to absorb static, and much more are all implemented. These ESD precautions enable the effects of static to be overcome, and ensure the long term reliability of the products being developed and manufactured.

## ESD overview

Although awareness has grown considerably in recent years, the problem has existed for a long time. The effects of ESD were noted in military applications where its effects could have devastating effects on munitions and especially gunpowder. However later, around the mid-1800s paper mills installed basic grounding systems and they also used steam to reduce the effects of static which had been attributed to catastrophes where paper dust in these mills had been ignited. Today, many industries need to be aware of the effects of electrostatic discharge.

For the electronics industry, the drastic effects of ESD came to light in a major way with the introduction of the first MOSFET devices. In view of the very high gate impedances that existed it was found that they were easily damaged. Originally it was thought that only devices such as MOSFETs were at risk, but studies soon revealed that far more damage was being done than had been originally imagined. The problem of ESD became more acute as feature sizes on ICs dropped and they became more prone to damage.

## What is ESD?

Static electricity is a natural phenomenon which occurs as part of everyday life. Its effects can often be felt when touching a metal door handle having walked across a nylon carpet. Another effect can be seen when hair stands up after it has been combed. The most dramatic effect is lightning. Here the scale is many orders of magnitude greater than those seen in and around the home. Colossal powers are dissipated in every strike, and its effects can be heard for many miles around. This is a particularly impressive form of ESD.

Static is created when there is movement. When objects rub together there is friction and this causes the surfaces to interact. An excess of electrons appears on one surface while there will be a deficiency on the other. The surface with the excess of electrons becomes negatively charged, whereas the surface with the deficit becomes positively charged.

These charges will try to flow and neutralise the charge difference. They may leak away slowly, or the discharge may take place more quickly. However as many substances exhibit a very high resistance these charges can remain in place for a very long time and wait until a suitable path is created for the discharge to take place. When charges find a path through an electronic circuit, the high instantaneous currents can give rise to damage. As a result ESD is of great importance.

## ESD and the tribo-electric series:

The size of the charge which is generated is determined by a variety of different factors. One is obviously the conductivity of the two materials and also whether the charge between them can leak away. However one of the major influences is the materials themselves and their position of the two materials in what is called the tribo-electric series. The position of the two materials which are in rubbing against one another in this series governs the size of the charge and the relative polarities. The further apart they are in the series, then the greater the charge. The material that is higher up the series will receive the positive charge, whereas the one lower in the series will receive the negative charge. Materials such as human hair, skin, and other natural fibres are higher up the

series and tend to receive positive charges, whereas man-made fibres together with materials like polythene, PVC and even silicon are towards the negative end. This means that when combing hair with a man-made plastic comb, the hair will receive a positive charge and the comb will become negative.

### positive charge

skin  
hair  
wool  
silk  
paper  
cotton  
wood  
rubber  
rayon  
polyester  
polythene  
pvc  
teflon

### negative charge

#### Practical examples of ESD

One of the most commonly visible examples of generating charge is when walking across a room. Even this everyday occurrence can generate some surprisingly high voltages. The actual voltages vary considerably dependent upon a variety of factors, but estimates can be given to illustrate the extent of the problem.

To illustrate the extent of the problem, a variety of instances are detailed in the table below:

#### Likely ESD voltages caused by everyday actions

Cause of charge generation	Likely voltage generated (kV)*
Walking across a carpet	30
Picking up a polythene bag	20
Walking on a vinyl tiled surface	15
Working at a bench	5

\* These are approximate figures and assume a relative humidity of up to 25%. As the humidity rises, so these levels fall: with humidity of around 75%, the static levels can fall by a factor of **very** roughly 25 or more. All these figures are very approximate, because they are very dependent upon the particular conditions, but they give an order of magnitude guide to the ESD levels to be expected.

Although the resulting from ESD appear very high, they usually pass unnoticed. The smallest electrostatic discharge that can be felt is around 5kV, and even then this magnitude of discharge may only be felt on occasions. The reason is that even though the resulting peak currents may be very high, they only last for a very short time and the body does not detect them because the charge behind them is relatively small. Voltages of this magnitude from electronic or electrical equipment where the more current can be source and for much longer will have a much greater effect and can be very dangerous.

#### ESD effects on electronics

With most electronics ICs and components being designed to operate at voltage of 5 V or less, it is hardly surprising that electrostatic discharges can cause damage. As a result ESD is of major importance to all who are involved in the electronics industry. For any electronics area manufacturing, repairing, maintaining, or working on electronics equipment in any way, it is imperative that the effects of ESD are taken seriously. To this end ESD measures ranging from full ESD protected areas using ESD workbenches, ESD flooring, ESD clothing, ESD wrist straps and the like are used.

Further pages in this ESD tutorial will detail different aspects of ESD, electrostatic discharge and how to combat its effects for electronics equipment.

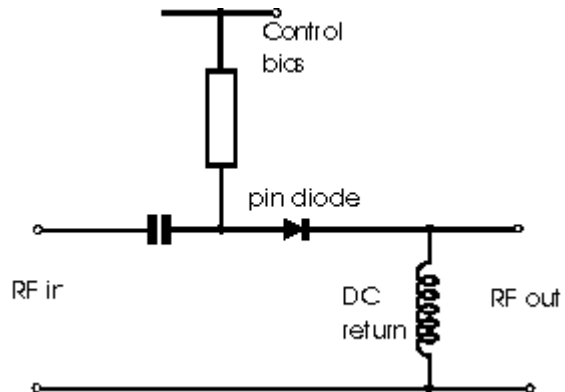
# PIN diode RF switch circuit

By [Ian Poole](#)

This circuit shows a very simple but effective design for an RF switch using a single PIN diode. The RF switch circuit is simple to design and can be used in applications where the ultimate performance is not required. The RF switch circuit shown only requires a few components and is very simple to implement. Nevertheless it is able to act as an RF switch for radio frequency or RF applications and is adequate for many applications.

## RF switch circuit description

The RF switch circuit comprises a single PIN diode, an RF inductor or choke, a current limiting resistor and a DC block capacitor. In operation, when a positive potential is applied to the control point current, this forward biases the diode and as a result the radio frequency signal is able to pass through the circuit. When a negative bias is applied to the circuit, the diode become reverse biased and is effectively switched off. Under these conditions the depletion layer in the diode becomes wide and does not allow signal to pass.



## Simple PIN diode attenuator and switch

Although in theory any diode could be used in this position, PIN diodes have a number of advantages as switches. In the first place they are more linear than ordinary PN junction diodes. This means that in their action as a radio frequency switch they do not create as many spurious products. Secondly when reverse biased and switched off, the depletion layer is wider than with an ordinary diode and this provides for greater isolation when switching.

By varying the amount of bias on the PIN diode it is possible to vary the level of attenuation provided. In this way the circuit can be used as a very simple RF attenuator. Although the circuit can be used as an RF attenuator, more effective RF attenuator circuits are available for more demanding applications.

## Circuit precautions

When using the RF switch, circuit layout is obviously important. Care should be taken to keep the input and output as separate as possible and then signal cannot leak around the circuit. Also leads should be kept as short as possible. In addition to this the supply should be well regulated and decoupled to prevent the RF signal from being modulated by any hum or other products on the line.

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## Long Term HF Propagation Prediction for Sept. 2013

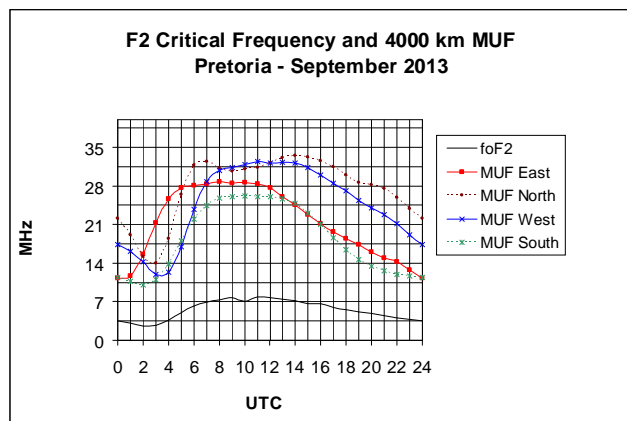
Courtesy ZS6BTY  
 (see also our website propagation tab)

### DX Operating

The graph shows the 4000 km maximum useable frequency (MUF) to the East, North, West and South from Pretoria for the first hop using the F2 layer.

### Local Operating

The F2 critical frequency (foF2) is the maximum frequency that will reflect when you transmit straight up. E-layer reflection is not shown.

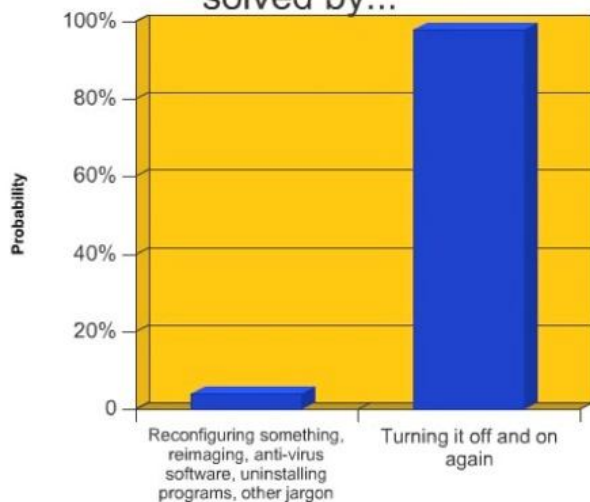


**ORGANIZED PEOPLE  
ARE JUST TOO LAZY TO  
LOOK FOR THINGS**



- In a Podiatrist's office:** "Time wounds all heels."
- On a Septic Tank Truck:** "Yesterday's Meals on Wheels"
- On a Plumber's truck:** "We repair what your husband fixed."
- On another Plumber's truck:** "Don't sleep with a drip. Call your plumber."
- On a Church's Bill board:** "7 days without God makes one weak."
- At a Tyre Store:** "Invite us to your next blow-out."
- On an Electrician's truck:** "Let us remove your shorts."
- In a Non-smoking Area:** "If we see smoke, we will assume you are on fire and take appropriate action."
- On a Maternity Room door:** "Push. Push. Push."
- At an Optometry's Office:** "If you don't see what you're looking for, you've come to the right place."
- On a Taxidermist's window:** "We really know our stuff."
- On a Fence:** "Salesmen welcome! Dog food is expensive!"
- At a Car Dealership:** "The best way to get back on your feet - miss a car payment."
- Outside a Car Exhaust Store:** "No appointment necessary. We hear you coming."
- In a Vet's waiting room:** "Be back in 5 minutes. Sit! Stay!"
- In the front yard of a Funeral Home:** "Drive carefully. We'll wait."
- Sign at a Radiator shop:** "Best place in town to take a leak."
- Another Septic Tank Truck:** "Caution - This Truck is full of Political Promises"

### Likelihood of a computer issue being solved by...



### Usage of a Home Gym



### Things I Learned From Watching CSI

