

# ANODE

**Inside this issue:**

Editor's Comments	1
The Great Conveyor Belt	1
Ham-Comp Project Revised aims & intentions	7

## Editor's Comments

### Volume 7 Issue 7 - March 2007

Please note that next months Anode will arrive early...

#### Jackal Hunt

Yesterdays "Jackal Hunt" was a lot of fun. It took just on an hour for OM Keith to find the 'Jackal', using his null finder antenna. It then took me 20 minutes to find the transmitter in the grass, much to the amusement of the club. Placed as it was on a relatively high spot overlooking the club house its signal reached over a wide area. We also came to the conclusion that the transmitter is mainly

amplitude modulated and only slightly frequency modulated. This is a twenty plus year old design and was never tested for modulation. I shall test it some time soon and let you know what it really does.

{—}

Don't forget that there will be a 'boot sale' on the 5th May at the Club House. At the usual time of 12:00.

In next month's Anode, we will have an article about the TTFD antenna by OM Bob ZS6RZ. For those of you in cluster houses this will be of special interest.

*(continued on page 5)*

## The great conveyer belt

If somebody told me some years ago that inside the sun are conveyer belts I would have recommended the person to get some psychiatric treatment, but after reading the articles on the internet I like to share the following information with you.

The Great Conveyor Belt is apparently, by NASA's solar physicist David Hathaway, a massive circulating current of fire (hot plasma) within the Sun. It has two branches, north and south, each taking about 40 years to perform one complete circuit. Researchers believe the turning of the belt controls the sun-spot cycle, and that's why the slow-down is important.

"Normally, the conveyor belt moves about 1 meter per second-walking pace," says Hathaway. "That's how it has been since the late 19th century." In recent years, however, the belt has decelerated to 0.75 m/s in the north and 0.35 m/s in the south. "We've never seen speeds so low."

The Sun's Great Conveyor Belt has slowed to a record-low crawl, according to research by NASA solar physicist David Hathaway. "It's off the bottom of the charts," he says. "This has important repercussions for future solar activity."

According to theory and observation, the speed of the belt foretells the in-

*(continued on page 2)*

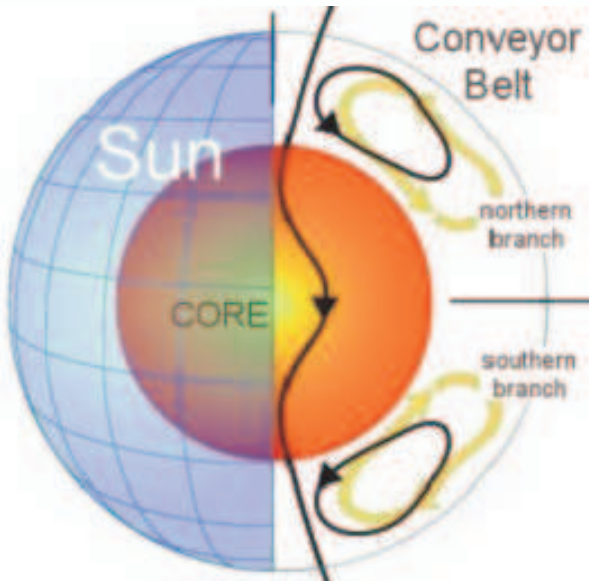
**Special points of interest:**

- Contact details on back page (updated)

## The great conveyer belt

(continued from page 1)

tensity of sunspot activity ~20 years in the future. A slow belt means lower solar activity; a fast belt means stronger activity.



The reasons for this are explained in the Science@NASA story Solar Storm Warning.

"The slowdown we see now means that Solar Cycle 25, peaking around the year 2022, could be one of the weakest in centuries," says Hathaway.

This is interesting news for astronauts. Solar Cycle 25 is when the Vision for Space Exploration should be in full flower, with men and women back on the Moon preparing to go to Mars. A weak solar cycle means they won't have to worry so much about solar flares and radiation storms.

However they will have to worry more about cosmic rays. Cosmic rays are high-energy particles from deep space; they penetrate metal, plastic, flesh and bone. Astronauts exposed to cosmic rays develop an increased risk of cancer, cataracts and other maladies. Ironically, solar explosions, which produce their own deadly radiation, sweep away the even deadlier cosmic rays. As flares subside, cosmic rays intensify

Well as Radio amateurs we are foremost interested in cycle 24, but it is always interesting to see what will happen in the future and also what happened in the past. At the moment one can safely assume that we are at the bottom end of cycle 23 and the start of cycle 24. The conditions are lousy but it is still worthwhile to check the bands regularly because you never know when a sudden opening of a band will happen.

Hathaway's prediction should not be confused with another recent forecast a little further down this compilation: A team led by physicist Mausumi Dikpata of National Centre for Atmospheric Research (NCAR) has predicted that Cycle 24, peaking in 2011 or 2012, will be intense.

Hathaway agrees: "Cycle 24 will be strong. Cycle 25 will be weak. Both of these predictions are based on the observed behaviour of the conveyor belt."

How do you observe a belt that plunges 200,000 km below the surface of the sun?

"We do it using sunspots," Hathaway explains. Sunspots are magnetic knots that bubble up from the base of the conveyor belt, eventually popping through the surface of the sun. Astronomers have long known that sunspots have a tendency to drift from mid solar latitudes toward the sun's equator. According to current thinking, this drift is caused by the motion of the conveyor belt. "By measuring the drift of sunspot groups," says Hathaway, "we indirectly measure the speed of the belt."

Right: Hathaway monitors the speed of the Conveyor Belt by plotting the drift of sunspot groups from high to low solar latitude. This plot is called "the Butterfly Diagram." The tilts of the wings reveal the speed of the Conveyor Belt.

For me it is difficult to see which pair of wings is more tilted than the other but I think that the pair above the year 2000 is more tilted towards the equator line thus less sunspot numbers and a

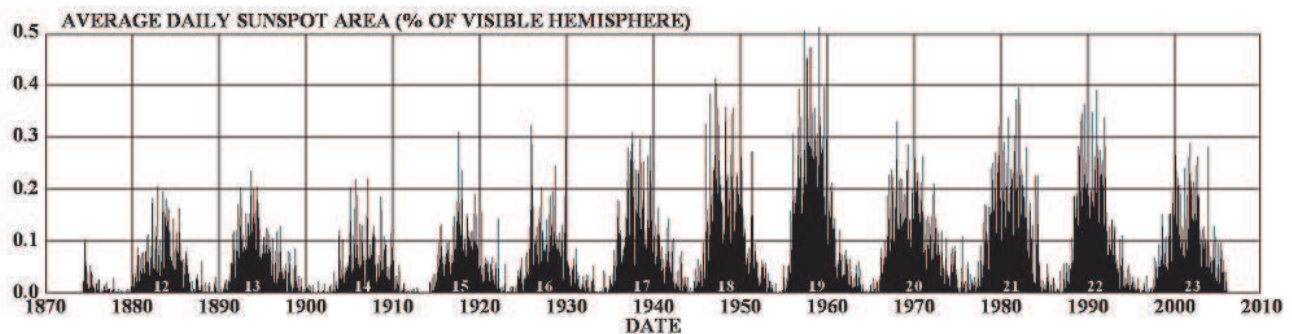
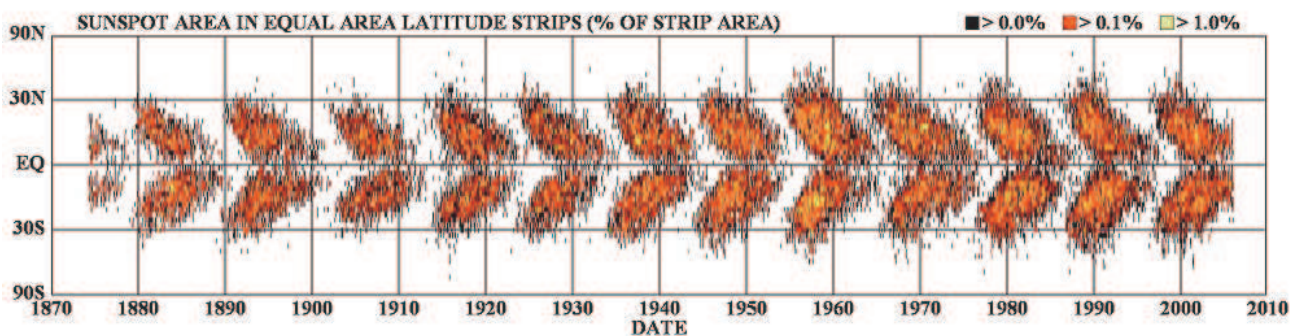
(Continued on page 3)

## The great conveyor belt

(Continued from page 2)  
slower conveyor belt.

active bouts of solar storms, which can slow satellite orbits, disrupt communications, and bring

### DAILY SUNSPOT AREA AVERAGED OVER INDIVIDUAL SOLAR ROTATIONS



<http://science.msfc.nasa.gov/ssl/pad/solar/images/bfly.gif>

NASA/NSSIC/HATHAWAY 2006/03

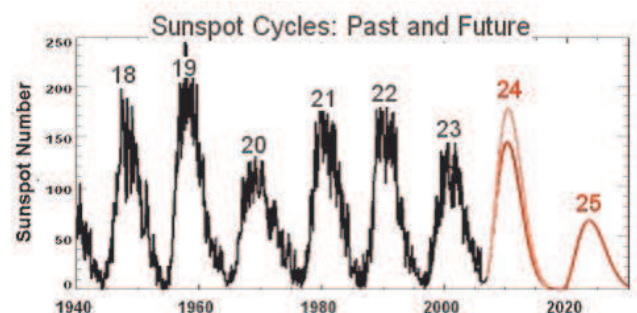
Using historical sunspot records, Hathaway has succeeded in clocking the conveyor belt as far back as 1890. The numbers are compelling: For more than a century, "the speed of the belt has been a good predictor of future solar activity." If the trend holds, Solar Cycle 25 in 2022 could be, like the belt itself, "off the bottom of the charts."

In an article from (NCAR) the scientists do come to the same conclusion by using a computer model of solar dynamics developed by their scientist.

BOULDER USA-The next sunspot cycle will be 30-50% stronger than the last one and begin as much as a year late, according to a breakthrough forecast using a computer model of solar dynamics developed by scientists at the (NCAR). Predicting the Sun's cycles accurately, years in advance, will help societies plan for

down power systems.

The scientists have confidence in the forecast because, in a series of test runs, the newly developed model simulated the strength of the past eight solar cycles with more than 98% accuracy. The forecasts are generated, in part, by tracking the subsurface movements of the sunspot remnants of the previous two solar cycles.



(continued on page 4)

## The great conveyor belt

(continued from page 3)

The team is publishing its forecast in the current issue of *Geophysical Research Letters*.

Above: In red, David Hathaway's predictions for the next two solar cycles and, in pink, Mausumi Dikpati's prediction for cycle 24.

### Understanding the cycles

The Sun goes through approximately 11-year cycles, from peak storm activity to quiet and back again. Solar scientists have tracked them for some time without being able to predict their relative intensity or timing.

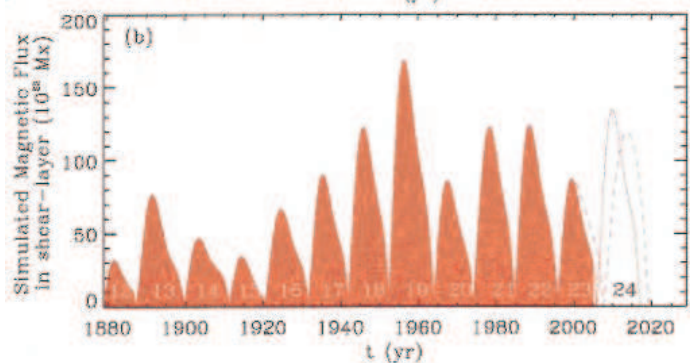
Forecasting the cycle may help society anticipate solar storms, which can disrupt communications and power systems and affect the orbits of satellites. The storms are linked to twisted magnetic fields in the Sun that suddenly snap and release tremendous amounts of energy. They tend to occur near dark regions of concentrated magnetic fields, known as sunspots.

The NCAR team's computer model, known as the Predictive Flux-transport Dynamo Model, draws on research by NCAR scientists indicating that the evolution of sunspots is caused by a current of plasma, or electrified gas, that circulates between the Sun's equator and its poles over a period of 17 to 22 years. This current acts like a conveyor belt of sunspots.

The sunspot process begins with tightly concentrated magnetic field lines in the solar convection zone (the outermost layer of the Sun's interior). The field lines rise to the surface at low latitudes and form bipolar sunspots, which are regions of concentrated magnetic fields. When these sunspots decay, they imprint the moving plasma with a type of magnetic signature. As the plasma nears the poles, it sinks about 200,000 kilometres (124,000 miles) back into the convection

zone and starts returning toward the equator at a speed of about one meter (three feet) per second or slower. The increasingly concentrated fields become stretched and twisted by the internal rotation of the Sun as they near the equator, gradually becoming less stable than the surrounding plasma. This eventually causes coiled-up magnetic field lines to rise up, tear through the Sun's surface, and create new sunspots.

The subsurface plasma flow used in the model has been verified with the relatively new technique of helioseismology, based on observations from both NSF- and NASA-supported instruments. This technique tracks sound waves reverberating inside the Sun to reveal details about the interior, much as a doctor might use an ultrasound to see inside a patient.



### Predicting Cycle 24

The Predictive Flux-transport Dynamo Model is enabling NCAR scientists to predict that the next solar cycle, known as Cycle 24, will produce sunspots across an area slightly larger than 2.5% of the visible surface of the Sun. The scientists expect the cycle to begin in late 2007 or early 2008, which is about 6 to 12 months later than a cycle would normally start. Cycle 24 is likely to reach its peak about 2012.

By analyzing recent solar cycles, the scientists also hope to forecast sunspot activity two solar cycles, or 22 years, into the future. The NCAR team is planning in the next year to issue a forecast of Cy-

(Continued on page 5)

## The great conveyer belt

(Continued from page 4)  
 cle 25, which will peak in the early 2020s.

"This is a significant breakthrough with important applications, especially for satellite-

## Editor's Comments

(Continued from page 1)

### Getting started with SSTV? Try:

<http://www.arrl.org/tis/info/pdf/99753.pdf> (original pdf file from ARRL)

Also take a look at:

<http://cobalt.junct.com/ramon/>

Unfortunately the Linux Ham-HowTo has nothing on the page of SSTV.

However a search found :

<http://users.telenet.be/on4qz/>

Where he has QSSTV for Linux.

### RF ID Tags - smallest ever!

<http://news.bbc.co.uk/1/hi/technology/6389581.stm>

{—}

### Blonde Joke

On a flight to Montreal a stunningly beautiful blond lady gets up from the back of the economy section, walks to First Class and makes herself very comfortable.

The chief stewardess watches this and goes to the lady and says " I am sorry madam but you can not sit here you and must return to your seat in economy."

"I am Blond, good looking and I am staying here." Is the reply.

The stewardess goes to the flight deck and asks the co-Pilot to deal with the situation but

dependent sectors of society," explains NCAR scientist Peter Gilman.

Compiled by Joop, ZS6C

Credit to: Science@NASA and NCAR

he gets exactly the same response as the stewardess and the blond stays in First Class.

The Co-pilot and Stewardess explain the situation to the Pilot as they are concerned she may be planning to hijack the Plane. The Pilot says "She's blond is she. I will deal with this as I am married to one and I speak blond." The Pilot goes to the young lady and after 30 seconds the blond gets up and returns to her seat in economy.

Intrigued the other crew members want to know the Pilot's secret. "Oh I told her First Class does not go to Montreal!"

{—}

Because I keep seeing these web pages where someone rants about how bad it is to be in South Africa, I have decided to re-print this page here:

For those of you unfortunate not to have won God's Lottery and being born British, this is why we are so proud to be one of God's Chosen People.....

Being British is about driving in a German car to an Irish pub for a Belgian beer, then traveling home, grabbing an Indian curry or a Turkish kebab on the way, to sit on Swedish furniture and watch American shows on a Japanese TV.

And the most British thing of all? Suspicion of anything foreign.

Oh and.....

☞ Only in Britain... can a pizza get to your house faster than an ambulance.

(continued on page 6)



# Editor's Comments

(continued from page 5)

- ☐ Only in Britain... do supermarkets make sick people walk all the way to the back of the shop to get their prescriptions while healthy people can buy cigarettes at the front.
- ☐ Only in Britain... do people order double cheeseburgers, large fries and a DIET coke.
- ☐ Only in Britain... do banks leave both doors open and chain the pens to the counters.
- ☐ Only in Britain... do we leave cars worth thousands of pounds on the drive and lock our junk and cheap lawn mower in the garage.

- ☐ Only in Britain... do we use answering machines to screen calls and then have call waiting so we won't miss a call from someone we didn't want to talk to in the first place.
- ☐ Only in Britain... are there disabled parking places in front of a Skating rink.

## NOT TO MENTION...

3 of us Brits die each year testing if a 9v battery works on their tongue.  
 142 Brits were injured in 2005 by not removing all pins from new shirts!

(Continued on page 7)

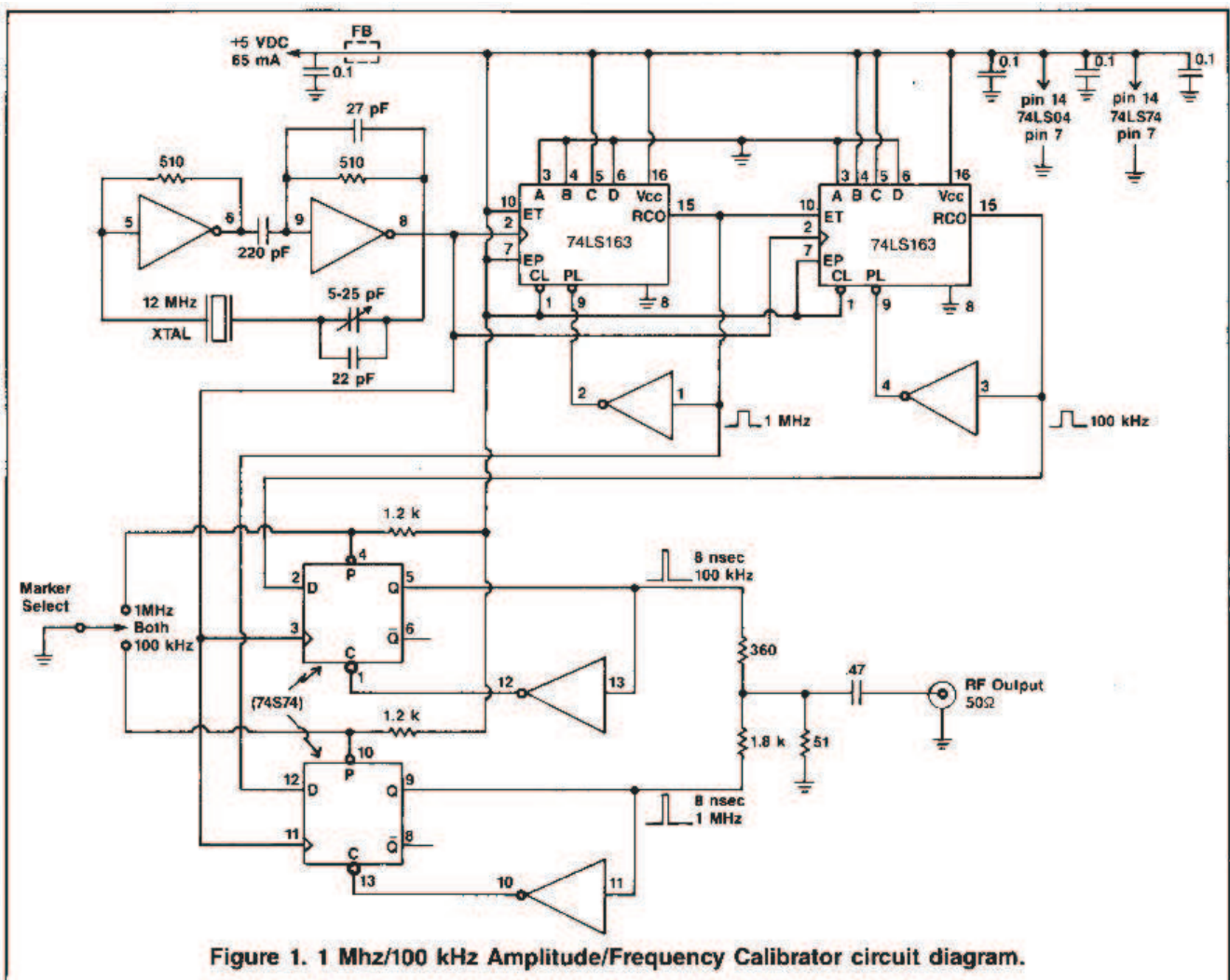


Figure 1. 1 Mhz/100 kHz Amplitude/Frequency Calibrator circuit diagram.

## Ham-Comp revised aims - January 2007

**Aims** - To provide 'the club' with computers for Radio Amateur use.

### Applications

1. Packet Radio using sound card
2. Morse reception and transmission using sound card
3. Radio Teletype (RTTY) using sound card
4. PSK31 using sound card
5. Slow Scan TV (SSTV) using sound card

Antenna rotator control - using the parallel port. Methods and how to achieve.  
Logging (Automatic) - manual type / serial input.

### Also desired

Test equipment - sound card and dedicated input.  
In circuit and workbench software.  
Printed circuit board / CAD - layout and design programs / software.  
Development software.

### Procedure

1. Setup 10pc's individually using boot-rom technology.
2. Install software applications.
3. Distribute to club members - the member undertakes to test, evaluated and report on software and hardware etc.
4. Logbook for each pc. (Suggested by Ron BHH)

**The next Ham-Comp meeting will be on March 17th at 13:00 at the Club house.**

## Editor's Comments

*(Continued from page 6)*

58 Brits are injured each year by using sharp knives instead of screwdrivers.

31 Brits have died since 2003 by watering their Christmas tree while the fairy lights were plugged in.

19 Brits have died in the last 3 years believing that Christmas decorations were chocolate.

British Hospitals reported 4 broken arms last year after cracker pulling accidents.

101 people since 2005 have had broken parts of plastic toys pulled out of the soles of their feet.

18 Brits had serious burns in 2005 trying on a new jumper with a lit cigarette in their mouth.

A massive 543 Brits were admitted to A&E in

the last two years after opening bottles of beer with their teeth.

5 Brits were injured last year in accidents involving out of control Scalextric cars.

And finally.....

In 2005 eight Brits cracked their skull whilst throwing up into the toilet.

That's why I am proud to be British.

{—}

JB 2007

**The West Rand Amateur Radio Club**  
26.14122 South - 27.91870 East

P.O. Box 562  
Roodepoort  
1725

Phone: +27 11 475 0566

Email: [zs6wrmail@mweb.co.za](mailto:zs6wrmail@mweb.co.za)

**Bulletins** (Sundays at ...)  
11h15 Start of call in of stations  
11h30 Main bulletin start

**Frequencies**  
439.000MHz 7.6MHz split  
Input: 431.4MHz (West Rand Repeater)  
145,625 MHz (West Rand Repeater)  
10,135 MHz (HF Relay)

**Radio Amateurs do it with more frequency!**

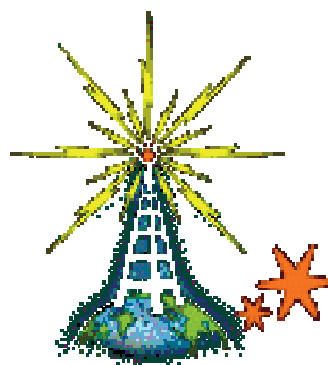
Chairman/Treasurer	Dave	ZR6AOC	475 0566 (H)	<a href="mailto:zr6aoc@mweb.co.za">zr6aoc@mweb.co.za</a>
Vice Chairman	Ron	ZR6RON		<a href="mailto:zr6ron@webmail.co.za">zr6ron@webmail.co.za</a>
Member	Keith	ZS6AGF	675 1604 (H)	<a href="mailto:zs6agf@polka.co.za">zs6agf@polka.co.za</a>
Secretary	John	ZS6FJ	672 4359 (A/H)	
Digital Communications	Stuart	ZS6OUN	082 573 3359	<a href="mailto:sbaynes@iafrica.com">sbaynes@iafrica.com</a>
Technical	Phillip	ZS6PVT	083 267 3835	<a href="mailto:phillipvt@sse.co.za">phillipvt@sse.co.za</a>
Member (Anode)	John	'PieRat'	011 768 1626(H)	<a href="mailto:brockjk@gmail.com">brockjk@gmail.com</a>
Member	Craig	ZS6CRW	795 1550 (H)	<a href="mailto:craig.woods@absamail.co.za">craig.woods@absamail.co.za</a>
Member	Willem	ZR6WWJ	082 890 5776	<a href="mailto:marie.w@absamail.co.za">marie.w@absamail.co.za</a>

## West Rand members - we need your input!

To make this the best ham radio magazine in South Africa we need your input. Please submit articles, comments, suggestions etc.

Please send plain text with no formatting to the email address below.

In July 2003, we re-published an Anode Compendium on CD. It has the issues from July 2000 until June 2005. This included the new Adobe reader. It has been updated, check with the chairman for details.



**We need your input! Email us articles, comments and suggestions please.**  
[brockjk@gmail.com](mailto:brockjk@gmail.com)