WATTS

01-2012

Year 82 + 1m

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

PARC, PO Box 12602, Die Hoewes, 0163, RSA

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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

ZR6FD logo

Drukwerk printing ZS6JPL

Papier / Paper ZS6JPL

APRS talk attendees

see also p. 2

In this issue

In hierdie uitgawe

Next fleamarkets and socials 2012

25 Feb
2 June
1 Sept
8 Dec

Venue: PMC, Silverton

PARC Management team / Bestuurspan Aug. 2011 - Aug. 2012

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Club Meeting – Automatic Position Reporting System (APRS) Talk

report by Fritz ZS6SF

On Saturday 29 October, right after the last flea market, PARC club members and also some other amateurs listened to a most interesting talk on APRS. This was a welcome improvement on the old style club meeting – it was interesting in that it was technical, it was current, it gave some indication on trends in our hobby and it is all about happenings in our own region. That it is about developments driven by amateurs that we all know, made it very credible.

The rather informal talk was presented by Koos, ZS6JPY and Leon ZS6LMG. After first giving some general information of APRS, how it works and what it is used for, they gave some very interesting information on specific instances where APRS was used.

The most interesting part started when Leon showed some of the equipment they developed for use by amateurs, very modern compact stuff, compatible with existing amateur transceivers.

The equipment that they developed makes use of surface mount technology. To make it easy for those of us already past the home-construction stage when the surface mount technology appeared, they offer some training in addition to designs, boards, components etc. that are needed to construct the APRS system.

To get the APRS off the ground in our region, there will be a course and a kit-building day early in 2012. The cost will be quite reasonable and the venue for both the training session and the kit-building session are organized by PARC. Details have been given in the club bulletins on Sunday mornings.

The social after the talk was made even more interesting in that there was a lot of new information to discuss and the speakers stayed on for the occasion, answering questions and giving specific information.

Personally, I found this to be one of the most interesting and rewarding club gatherings I have ever been to and if future talks are going to be this interesting and productive of new development, I will never willingly miss one. Do attend, it will keep you and your station up-to-date, widen your knowledge and skills and IT IS FUN.

SMD solder course and the making of APRS units – see more detail on page 3.

Date: 21 January 2012. Depending on attendance already booked, there may be some spaces open for members to attend. The venue is the training centre named Nkonka in Centurion and arrangements can be made with Fritz ZS6SF (contact info above).

From the management of PARC and your editor

!

Birthdays Jan. Verjaarsdae

05 Pierre ZS6PJH
06 Carmyn, daughter of Gary ZR6GK
06 Brendan ZS6BW, son of Peter ZS6PJ
08 Darren ZR6TY, son of Selma and Joe ZS6TB
20 Errol ZR6VDR
20 Theresa, Dogter van Magriet en Tobie ZS6ZX
23 Mark ZS6USA
25 Magriet, lv van Tobie ZS6ZX

Anniversaries Jan. Herdenkings

03 Magriet en Tobie ZS6ZX
05 Louise en Alm,ro ZS6LDP (21)
07 Doree,n ZR6DDB and Johan ZS6JHB (23)
20 Helga en Hans-Peter ZS6AJS (50)
25 Marilize ZS6MUD en Rudi ZS6RVD

Joys and Sorrows | Lief en Leed

Tjerk ZS6P het sy moeder verloor gedurende Desember.

Diary | Dagboek (UTC times)

Jan.
07-08 Eu CW 160m Contest 20:00-07:00
08 DARC 10m Contest 09:00:10:59
--- PEARS VHF/UHF Contest
14-15 Hunting Lions on the Air 00:00-24:00
21 SMD soldering and APRS construction courses. See p4.
21 LZ open Contest 00:00-06:00
21-22 Hungarian DX Contest 12:00-12:00
28-29 REF CW Contest
28-29 UBA SSB DX Contest 13:00-13:00
--- SARL Youth Day Sprint 07:00-11:00
31 Last day for submission of nominations of Council members and motions for the 2012 SARL AGM.
31 Last day for submission of nominations for SARL Awards

Snippets | Brokkies

Boom in Amateur Radio licenses in the United States.

They say Ham Radio first took the nation by storm nearly a hundred years ago. Last month the FCC logged 700,314 licenses, with nearly 40,000 new ones in the last five years. Compare that with 2005 when only 662,600 people hammed it up and you'll see why the American Radio Relay League -- the authority on all things ham -- is calling it a "golden age."

Please note : updated email addresses of our management team are now on page 2.

Please note : members are invited to sit in at committee meetings as observers any third Thursday of the month at UP.

Still true? The PARC held its 75th anniversary in January 2005. The call sign ZS75PTA was used during 2005 during various special occasions and international contests. See our picture gallery for some old-time photos. Many reproductions from old publications pertaining to the Club's activities and people have been reproduced in our newsletter Watts of which all electronic issues are available on this site. **Today the PARC is the largest ARC in South Africa.**

ZS6PTA came 5th over all in the **SARL 2011 HF field day.** This is the result of the first leg only. The November leg was skipped due to bad weather.

APRS Project This project involves some preliminary training in surface mount technology and thereafter the construction of an APRS system comprising a GPRS module and a tracker board. The printed circuit boards, components and other training material will all be provided. The planned time and date for this session is 21 January 2012 at 14:00.
The estimated cost is around R500-00, payment options will be communicated later.
The NKONKA training centre in Centurion will be used for this training. Twelve persons can be accommodated. To date the following club members are listed as participants:

Johan de BruynZS6JHB
Fritz Sutherland ZS6SF
Sarel Stapelberg ZS6EK
Whitey Joubert ZS6JJJ
Kenny Martin ZS6KMM
Pierre Holthausen ZS6PJH and Thobile ZS6TKO

Members of other clubs are welcome to take part.
To get more information or to register as a participant, contact Fritz ZS6SF at 012 811 3875, 083 304 0028 or fritzs@icon.co.za

Please help?

To keep amateur radio alive it is essential to attract new people to the hobby, especially younger people. One thing that can contribute to this objective is RAE courses. To this end, PARC has instituted a training programme consisting of two courses each year, to coincide with the two RAE exams. It is with the presentation of these courses that the club needs some help.

There are three aspects to the presentation of the lecture series. The first, the technical part of the RAE course is covered fairly well, although more volunteer technical lecturers will be very welcome.

The part of the RAE that covers operating practices and regulations, needs a lecturer. The regulations and other study materials are available on the SARL website; what is needed is a licensed amateur to present two lectures on this subject, probably in the form of discussions. It will be necessary to show the students how amateurs interpret the regulations, point out the important and frequently encountered regulations, Q-codes and abbreviations and give some help with elementary operationg practices.

Although not part of the lectures, there is a need for a volunteer to undertake the 'public relations' part of the course. This involves advertising the course through the public media and the amateur channels; newspapers, radio stations, SARL and club bulletins, etc.. Other channels of communication would be schools, colleges and universities. This is most important; the same effort is expended in training two students as in training twenty. Training more candidates per course is more effective. Although this aspect does not involve any direct contact with the students or any lecturing, it is an essential part of the project. This job does not involve a rigid schedule and can be done from home.

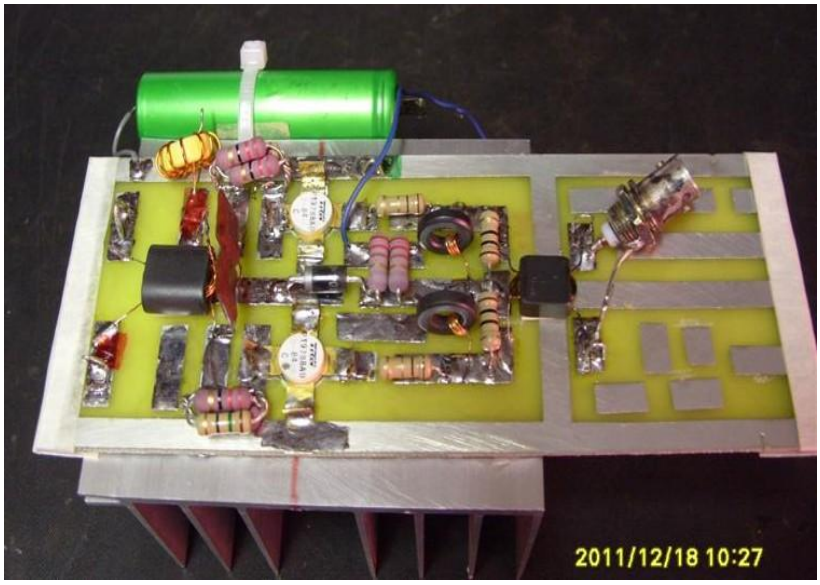
If you can contribute to this effort, please contact the training coordinator, Fritz Sutherland ZS6ASF. He can be reached at fritzs@icon.co.za and on 012 811 3875 or 083 304 0028. Your help will be much appreciated. The next training course starts in January 2012, probably in the first or second week of the school term, but please respond now. There is work to do before the course starts.

Some member activities.

A pic from ZS6SPY: Brinette ZS6MZA busy installing antennas after moving to Denysville →

Ed ZS6UT put up a borrowed R6000 at his temporary QTH

Ivor ZS6ICS →
kept himself out of mischief during December by building a QRP? HF amplifier project. 1,5W in gave 10W out at 12V supply and double that at 20W with 24V using 28V transistors.



Well done!

Field Strength vs. Radiated Power

1. Explanation of terms

G: antenna gain [dB]
d: distance from antenna [m]
ERP: effective radiated power [W]
e: electric field strength [V/m]

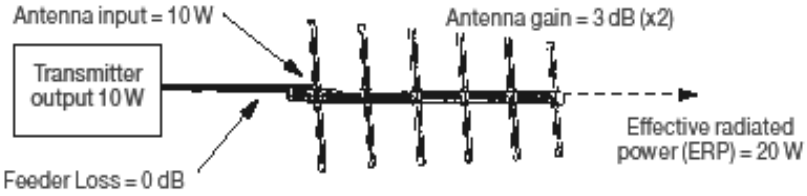
2. ERP – Effective Radiated Power:

The effective radiated power represents the power that you would have to put into an antenna in order to obtain the same field strength. An antenna with a gain of 3 dB concentrates the radiated power in a given direction so that the power density in this direction is 3 dB higher than it would have been using an dipole antenna. As a power increase of 3 dB is equal to the power being doubled, the effective radiated power for a 3 dB antenna is two times the power input to the antenna.
Effective radiated power vs. antenna gain and input power is given in below scheme.

ERP — **GAIN (dB)**

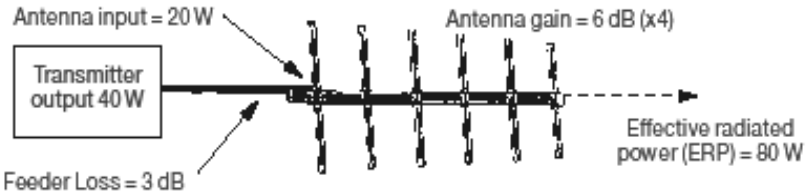
Power Input / Factor	0 (1)	3 (2)	6 (4)	10 (10)	13 (20)	16 (40)	20 (100)
1 W	1	2	4	10	20	40	100
10 W	10	20	40	100	200	400	1000
100 W	100	200	400	1000	2000	4000	10000

Example 1



All of the power leaving the transmitter arrives at the antenna input (10 W). This antenna has a gain of 3 dB (x2) so, the effective radiated power will be 20 W (in the direction of maximum radiation).

Example 2



Due to feeder loss, only half of the power leaving the transmitter arrives at the antenna input (20 W). This antenna has a gain of 6 dB (x4) so, the effective radiated power will be 80 W (in the direction of maximum radiation).

02.2004

WD-40: Mighty useful stuff!

The anonymous compiler of this article, received by e-mail, was alerted to WD-40's usefulness when vandals sprayed a neighbour's new white SUV with red paint. Another neighbour told him to get some WD-40 and clean it off. It removed the unwanted paint beautifully and did not harm the paint that was on the van.

Some research brought up the following information.

'Water Dispersant No.40' was the most successful product in a search for rust preventive solvent and degreaser to protect missile parts, found in 1953 by the San Diego Rocket Chemical Company.

Here are some uses, most of which stem from the material's tendency to cling so strongly to solid surfaces that it removes any other liquids that might have been on the surface when WD-40 is applied:

01. Protects silver from tarnishing.
02. Removes road tar and grime from cars.
03. Cleans and lubricates guitar strings.
04. Gives floors a 'just-waxed' sheen without making them slippery.
05. Keeps flies off cows.
06. Restores and cleans blackboards.
07. Removes lipstick stains.
08. Loosens stubborn zips.
09. Untangles jewellery chains.
10. Removes stains from "stainless steel" sinks.
11. Removes dirt and grime from a barbecue grill.
12. Keeps ceramic/terra cotta garden pots from oxidizing. (Wot?)
13. Removes tomato stains from clothing.
14. Keeps glass shower screens free of water spots.
15. Camouflages scratches in ceramic and marble floors.
16. Keeps scissors working smoothly.
17. Lubricates noisy door hinges on vehicles and doors in homes.
18. Removes black scuff marks from tile floors.
19. Removes the purple stains caused by jacaranda blossoms from cars (but you must act fairly quickly before the stain has dried).
20. Gives a children's playground gym slide a shine for a super-fast slide.
21. Removes crayon from walls. Spray on the mark and wipe with a clean rag.
22. Removes the lipstick stains from clothing washed and dried together with a tube of lipstick (!) Just saturate the lipstick spots with WD-40 and rewash. Presto! The lipstick is gone!
23. Lubricates tracks on sticking home windows and makes them easier to open.
24. Eases the action of a folding umbrella.
25. Restores and cleans padded leather dashboards in vehicles, as well as vinyl bumpers.
26. Restores and cleans roof racks on vehicles.
27. Lubricates and stops squeaks in electric fans.
28. Lubricates wheel sprockets on tricycles, wagons, and bicycles without creating oily build-up.
29. Lubricates fan belts on washers and dryers and keeps them running smoothly.
30. Keeps rust from forming on saws and saw blades, and other tools. (This was the original intention, of course!)
31. Removes splattered grease on stoves.
32. Keeps bathroom mirrors from fogging.
33. Lubricates prosthetic limbs without staining clothing.
34. Keeps pigeons off balconies. (The material is basically fluorinated fish oil, and pigeons seem to dislike the smell).
35. Removes all traces of duct tape.
36. Eases the discomfort of insect bites.

French telecommunications regulator ARCEP looks as if it is ready to permit French radio amateurs to use modern means of communication such as D-STAR. On December 14th several French ham radio groups received a draft amendment from ARCEP regarding new laws to govern amateur and amateur satellite services.

Holders of the Advanced Licence, the highest amateur radio licence available in Australia, will be able to apply for use of up to one-thousand watts PEP under a restrictive permit system that begins in March. The change follows renewed representation by the Wireless Institute of Australia and the recent development in nearby New Zealand, where 1kW is now to be allowed, up from 500w PEP.

Spooky action at a distance

(a phrase coined by Einstein)

Super computers in the offing? **Info condensed from various www science postings**

In physics, ***action at a distance is the interaction of two objects which are separated in space with no known mediator of the interaction.***
This term was used most often in the context of early theories of gravity and electromagnetism to describe how an object responds to the influence of distant massive or charged bodies. More generally "Action at a distance" describes the break between human intuition where objects have to touch to interact, and physical theory.
The exploration and resolution of this problematic phenomenon lead to significant developments in physics by Newton, Maxwell and Einstein but even in his time some phenomenae could not be accurately described by existing theory.

Newton in 1687 published his *Principia* which contains his laws of Mechanics and his law of gravity. According to his law of gravity every object in the universe attracts every other object in the universe. This attraction acts directly and instantaneously. If the sun should suddenly break apart, the Earth's orbit would be affected instantaneously. He was however not happy with the fact that through a vacuum, without the mediation of anything else, force can be conveyed from one to the other.

Maxwell formulated *his Theory of Electromagnetism* in 1864. According to his theory all electromagnetic waves travel at the speed of light. There is no action at a distance in his theory. If the sun should break apart, we would only *see* it happen 8 minutes later.

Einstein published his special theory of relativity in 1905. It is the theory of space and time. It brought Newton's theory of gravity into dispute. This conflict was intolerable to Einstein. In 1915 he published his general theory of relativity. This was a theory of gravity more accurate than Newton's. Gravitational influences travel at the speed of light. Instantaneous action at a distance was thus eliminated from physics. If the sun should break apart, the earths orbit would, not be affected until 8 minutes later.

The birth of *Quantum Theory* by **Heisenberg, Schrodinger, Born and Dirac** in 1925 would rock the boat.
Quantum theory (mechanics) is the theory of atomic and subatomic phenomena.
Einstein was never happy with it as his physics could not describe it. In 1935 with **Podolsky and Rosen** (EPR) it was argued that the theory is incomplete and that quantum theory does not describe everything in the atomic world. Atomic and subatomic particles appear to violate accepted principles when two or more particles become *entangled.* (Particles which are *entangled* (coming from the same source and are eventually in different places) are connected in a mysterious way that seems impossible)
In fact, it was stated that "no reasonable definition of *reality* could be expected to permit this".
Opinions differed amongst the scientific elite. When asked whether the algorithm of quantum mechanics could be considered as somehow mirroring an underlying quantum world, a comment by **Bohr** was: "There is no quantum world. There is only an abstract quantum physical description. It is wrong to think that the task of physics is to find out how nature is. Physics concerns what we can say about nature."

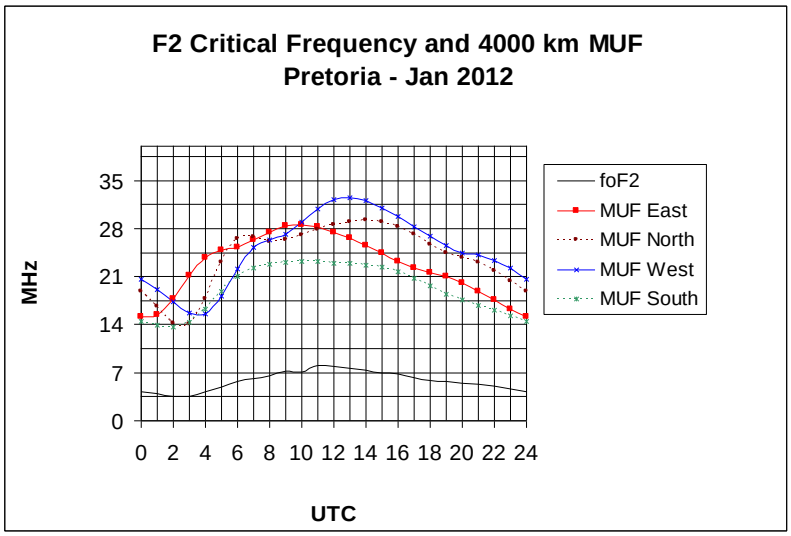
Entanglement is a fascinating property connecting quantum systems. This bizarre coupling can link particles, even if they are located on opposite sides of the galaxy.
One could instead argue that an entangled object releases an unknown particle or some other signal at high speeds (ie: 10000x the speed of light) to influence its partner, giving the illusion of a simultaneous reaction.
Physicist **John Stewart Bell** put forward "Bell's Interconnectedness Theorem" in 1964. Bell's theorem has been called by physicist Henry Stapp "the most profound discovery of Science." It is profound because it shows that the universe has the property of non-locality: two particles can be light years apart, yet they are linked to each other instantaneously. How instantaneously? Recent experiments have shown that this phenomenon occurs more than 10,000 times the speed of light! In order to show that the universe is non-local, Bell showed that a certain simple and obvious inequality – Bell's inequality – is violated.
Here is an amazing fact: his kind of simple mathematics was missed in the results of Quantum Mechanics for 30 or more years by all the world's greatest physicists *including Einstein and Bohr* until it was unearthed by Bell. That's a truly sobering yet inspiring thought. Who knows, there may be fundamental discoveries that are just waiting for someone to think deeper.

Entanglement is forbidden by pre-quantum physics and impossible to understand from Newton, Maxwell or Einstein.
The creators of quantum theory were not aware of entanglement as they created the theory; it was not "put" into the theory. Rather it was "discovered" in the mathematics of the theory decades before it was actually observed experimentally

Experiments since 1989 have borne out that entanglement is a reality. Recently scientists at Geneva in Switzerland began with entangled pairs of photons, or packets of light. These pairs were then split up and sent over fiber optic cables provided by Swisscom to stations at two Swiss villages some 11 miles (18 kilometers) apart from each other. The stations confirmed that each pair of photons had remained entangled — by analyzing one, scientists could predict aspects of its partner. For any hidden signal to travel from one station to the other in just 300 trillionths of a second — the rapidity at which the stations could accurately detect the photons — any such x-factor had to go at least 10,000 times the speed of light.
As much as Einstein might have disliked the notion of quantum entanglement, he also revealed that signals could not get transmitted faster than light. Any faster-than-light "spooky action at a distance" is therefore implausible, said researcher **Nicolas Gisin**, a physicist at the University of Geneva. Instead, "what's fascinating here is that we see that nature is able to produce events that can manifest themselves at several locations," he said.

These "connections" auger well for promising quantum computers- the dream machines capable of quick and efficient computations.

Entanglement is crucial to the emerging technologies of quantum communication, cryptography and computing. No computer today uses entanglement. This opens the possiblity that quantum computers could do things that today's computers cannot.
Numbers of 200 digits length can be factored. This is important because coding schemes used to provide security for digital info are often based on our inability to efficiently factor large numbers. *For example security features in your web browser are based on this.*
The competition between code makers and code breakers has been never ending. In 2000 three groups of researchers showed prototype encoding and decoding devices using entanglement. It has been proved mathematically that the codes cannot be broken.



Long Term HF Propagation Prediction for Jan 2012

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.

PSE QSL