WATTS

02 - 2004

Year 69

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

PARC, PO Box 73696 Lynnwood Ridge 0040, RSA

web http://www.qsl.net/zs6pta

Bulletins : 145,725MHz 08:45 Sundays / Sondae
Relays : 1840, 3700, 7066, 10135, 14,200 MHz
depending on season
Swapshop: After bulletin 2m and 40m (also on-line)

ZR6FD logo

drukwerk papier / paper
printing ZS6KR
ZS6BAQ ZR6FD

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In this issue

in hierdie uitgawe

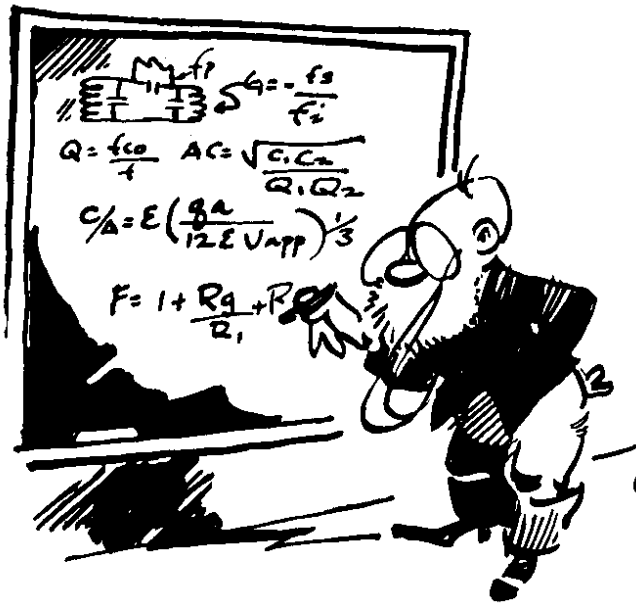
Next meeting

Date: 12-02-2004
Time: 19:30 for 20:00
PARC Clubhouse,
South Campus,
University of Pretoria.
SE cnr University and
Lynnwood roads.

Editorial

Do you have New Year's resolutions for Amateur Radio? Will you be making some changes and do something new? Surely some of the current technology must look interesting. Since our traditional overseas monthly magazines have become too expensive for most of our fraternity, we have long stopped buying them and have in general terms become isolated from progress in the hobby. A percentage of us do not even have PC's or internet.

Economic circumstances have prevented many of us to modernize on radio hardware and miss out on exciting built-in features. All the more reason to stay close to your club where you can pick up knowledge and associate with members that are experimenting with or applying current technology. Wonderful software makes it so easy. Make time to attend to technical discussions and presentations – make your hobby a dynamic hobby by being participative and adventurous.



Club members have on many occasions spent time, effort and their own money to bring pearls of wisdom from their personal experience…

Presentation at our next meeting:

Renier Dreyer from Poynting Antennas will be introducing the SuperNEC antenna simulation program.

Klublede het op baie geleenthede tyd, moeite en hulle eie geld gespandeer om pêrels van wysheid uit hulle eie ondervinding aan te bied…

Redaksioneel

Het jy nuwejaarsvoornemens vir Amateur Radio? Gaan jy 'n paar veranderings maak en iets nuuts doen? Party van die huidige tegnologie moet tog interessant lyk. Sedert ons tradisionele oorsese maandblaaie so duur geword het vir die meeste van ons gemeenskap, het ons lankal opgehou om hulle te koop en in algemene terme begin geisoleerd raak van vooruitgang in die stokperdjie. 'n Persentasie van ons het nie eers 'n persoonlike rekenaar of internet.

Ekonomiese omstandighede het ook verhoed dat baie van ons radio toerusting kon moderniseer en dus opwindende ingeboude nuwighede misloop. Al hoe meer rede om naby jou klub te bly waar jy kennis kan opdoen en assosieer met lede wat met huidige tegnologie eksperimenteer of dit toepas. Wonderlike sagteware maak dit so maklik. Maak tyd om tegniese besprekings en aanbiedings by te woon – maak jou stokperdjie 'n dinamiese stokperdjie deur middel van aktiewe deelname en 'n bietjie avontuurlustigheid.

APRS

Ons se dankie aan Johan ZR6ANF vir sy onlangse aanbieding oor APRS (Automatic Position Reporting System) - Met 'n 2m radio - TNC of klankkaart - en persoonlike rekenaar is dit moontlik om landswyd (en wereldwyd) der honderde bakenstasies van aller aard te vertoon op landkaarte. Amateur stasies, lughawens en bewegende bakens in voertuie is enkele voorbeelde. Baie bakens vertoon weersomstandighede en ander nuttige informasie. Boodskappe van baken-baken is ook moontlik.

Die volgende webwerwe verskaf alle nodige sagteware:

MS DOS APRS -	ftp://ftp.tapr.org/aprssig/dosstuff/APRSdos
Windows APRS -	http://www.ui-view.com/index.shtml
Apple MAC APRS -	ftp://ftp.tapr.org/aprssig/macstuff/MacAPRS
Palm APRS -	ftp://ftp.tapr.org/aprssig/palmstuff
Linux APRS -	http://www.winaprs.org/xaprs.html

Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 08 Jan. 2004

1a) **Welcome**: Hans ZS6KR declared the meeting open and welcomed all who attended the meeting.

1b) **Attendance**: The meeting was attended by 28 members and 1 visitor.

1c) **Apologies**: Apologies were received from Doreen ZR6DDB, Edwin ZR6ESP and Hilary ZR6HAP.

1d) **Personal Matters**: Callie ZS2CWP is back in Knysna after been in hospital in Pretoria for a number of weeks.

1e) **Minutes** of the previous meeting: The minutes of the previous meeting as published in Watts were approved. Proposed by Brian ZR6BJS and seconded by Pine ZS6OB.

1f) **Matters arising** from previous minutes: None.

2) **Club activities**.

2a) **DF Hunt**: The next DF Hunt will be on 17th January 2004 and will start at the Botanical Gardens in Silverton at 14h00.

2b) **Fleamarket**: Almero ZR6RY reported that the next Fleamarket at the club is scheduled for 28 February 2004 at the club's premises. More detail to follow.

2c) **Rallies**: Johan ZR6JHB reported that the first Rally of 2004 will be the Belfast Rally which is scheduled for 21 February. Only 5 mobile stations will be required. This event will be followed by a event at Kyalami on 28 February 2004 which of course is a track event. Johan also reported that they are in need of Radio Marshals to assist at Kyalami. Interested members can contact Johan on 0824923689.
Soos verlede jaar sal lede van die klub en ander klubs weer betrokke wees by 10 tydrenne en 4 baanrenne op Kyalami.

2d) **Sosiaal**: Wille ZR6WGR het berig dat daar vir die huidige geen sosiale byeenkomste gereel is nie.

2e) **Financial Report**: Richard ZR6CK reported on the club's finances.

3) **Ham Diary**.

Jan 08	HF awards submission PARC
Jan 10-11	Hunting Lions On the Air - SSB/CW 0000 - 2400
Jan 18	SARL Intecnet
Jan 23-25	Pears VHF/UHF contest.

Feb: Why not prepare for the SARL Field Day part1 and SARL VHF contest part 1. Diarise 13-14 and 20-21 March for participation.

4) **Algemeen**: Pine ZS6OB het n tuisgemaakte T - Match 6m antenna vertoon.

5) **Presentation:** Johan ZR6ANF gave a interesting talk on APRS (Automatic Position Reporting System)

6) **Closing**: The meeting closed at 21h15.

ZR6JHB

PARC shop

We still have a number of **caps** with the PARC logo available at R25 each.
PARC **shirts** are out of stock but orders are awaited from members – an order of 20-25 will be the minimum – get your name on the list!
Magnetic callsign-stickers approximately 160x40mm are also subject to a minimum order.

PARK winkel

Ons het nog 'n aantal **pette** met die PARK logo teen R25 beskikbaar.
PARK **hemde** is uit voorraad maar ons wag vir u bestellings – 'n bestelling van 20-25 sal die minimum wees – plaas u naam op die lys!
Magnetiese roepsein-plakkers ong. 160x 40mm is ook onderhewig aan 'n minimum bestelling.

Birthdays Februarie Verjaarsdae

February Anniversaries Herdenkings

03 Alletta, lv van Alf ZR6ABA
03 Willie ZR6WGR
06 Ellen, lv van Joe ZS6AIC
07 Victoria, dogter van Louie ZR6LVW
08 Andre, son of Andre ZS6GCA
08 Melvyn ZS5MF
09 David, son of Joe ZS6AIC
09 Kenny ZS6KMM
10 Paddy, sw of Kenny ZS6KMM
11 Leanne, sw of Allan ZR6AHL
12 Yvette, daughter of Errol ZR6VDR
12 Hennie ZS6HD
13 Sander ZR6SW
15 Philippe, son of Robert ZS6ARC
16 Pat ZR6AVC, sw of Frank ZS6GE
17 Freddie ZS6JC
23 Nic ZR6DVS
23 Arrie ZS6IRA
24 Daniel, son of Robert ZS6ARC
24 Claire, daughter of Jac ZS6QA
24 Petro, lv van Gert ZS6ZB
28 Spider ZS6SO

06 Lucilla and Carlos ZS6AJW
12 Agnes ZS6BAV and Ivan ZS6AUT
13 Claire and Robert ZS6ARC
18 Sarina en Willie ZR6WGR
27 Paddy and Kenny ZS6KMM
28 Marty en 'JB' ZR6YV

New Members

Stuart Liddle (going for RAE)
Arnold Jones (going for RAE)
Jan ZS2LJ (ex ZS2JU)

Current membership: 123 (70 on e-mail)
2 year fallout: 17 who will not be reading this!

Sick Parade

Malcolm ZS1ML is seriously ill.

Krukkelys

Prof Callie is terug in Pretoria
Sarina, lv van Willie ZR6WGR, herstel na 'n operasie

Ham diary // Dagboek

Jan	23-25	PEARS VHF/UHF Contest – 6pm Fri – 6pm Sunday
	23	CQWW 160m CW contest
	30	SARL Tinus Lange Awards call for submissions?
Feb	**12**	**PARC Club meeting 19:30 for 20:00**
	14	SARL kids' day
	14-15	RSGB 160m CW contest
	21-22	ARRL international CW contest
	28	**PARC Fleamarket at our premises 9:00 AM**
	29	SARL President's net

Diarize 13-14 Feb and 20-21 March for the SARL HF field day and VHF contests!

Bring-en-Braai

Diarize Sunday, 28 March at the PMC premises, Pioneer Park, Siverton. Braaipacks, pap en sous will be supplied by the Club. You bring the rest.

GET YOUR NAME ON THE LIST!

Snippets // Brokkies

Bill ZS6KO scooped up the PARC HF Best Operator Award for 2003-2004. There were no other entries!

- Roy ZS6MI now produces a regular month-end newsletter called "PRCMag" on packet – have a look. The format is pdf in about four files. He will appreciate any feedback and suitable material to publish.
- Die familie Gurtel (Adele en Hans ZR6HVG) het 'n dogter ryker geword laas Desember.

MOTORSPORT NUUS.

Ons staan aan die begin van 'n nuwe jaar en soos verlede jaar gaan ons weer lekker bedrywig wees aan die motorsport front en glo ek dat ons soos in die verlede weer 'n sukses daarvan gaan maak.
Tydens ons jaareinde funksie wat plaasgevind het by Pretoria Motor Club (PMC) in Silverton op 7 Desember 2003 het ons afskeid geneem van Bernie ZS6ANU .
Bernie het laat blyk dat hy nie meer betrokke kan wees by tydrenne nie aangesien hy nie meer lang tye van die huis kan wees nie daar hulle geteister word deur inbrake. Bernie was vir ongeveer 40 jaar betrokke by tydrenne en ons wil vir hom en Anne-Marie baie dankie sê vir hul bydrae oor die jare heen en ons hoop dat julle nog tenminste by die Sasol tydren in Nelspruit betrokke sal wees.

Vanjaar sal ons by 4 byeenkomste by Kyalami betrokke wees naamlik op **28 Februarie 2004**
1 Mei 2004
31 Julie 2004
6 November 2004

Ons benodig 6 amateurs om ons te help met kommunikasie op verskeie draaie op Kyalami.
Soos julle kan sien is daar slegs 4 byeenkomste waar ons dienste benodig sal word en sien ons daarna uit om 'n paar nuwe gesigte daar te sien.
Belangstellendes kan my kontak op 082-492-3689 gedurende kantoorure of op 012-803-7385 saans.

TYDRENNE.
Wat tydrenne betref sal ons weer soos verlede jaar by minstens tien byeenkomste betrokke wees naamlik:

21/02	**2004**	Belfast Tydren (Streeks)
20/03	**2004**	Middelburg Tydren (Streeks)
07-08/05	**2004**	Total Tydren (Nasionaal)
29/05	**2004**	Tzaneen Tydren (Streeks) Slegs beheer stasie word hier benodig.
18-19/06	**2004**	Sasol Tydren (Nasionaal)
10/07	**2004**	East Rand Tydren (Streeks)
04/09	**2004**	TMCC Tydren (Streeks)
02/10	**2004**	PMC All Tar Tydren (Streeks)
15-16/10	**2004**	Great North Tydren (Nasionaal)
23/10	**2004**	Sam Off-Road Event.

Ons vertrou dat die bogemelde program julle in staat sal stel om julle jaar deeglik te beplan .
Kontak gerus vir 'JB' ZR6YV of myself as julle belangstel om komminukasie te doen tydens die byeenkomste. Beide ons kontaknommers is op WATTS se voorblad.

Vir eers genoeg van my kant af. Hou gerus WATTS dop vir meer nuus vorentoe.

73's Johan ZR6JHB

The Weston Cell – An age-old reliable voltage reference.

ZS6KR

Weston invented and patented the saturated cadmium cell in 1893. It had the advantage of being less temperature sensitive than the previous standard, the Clark cell. It also had the advantage of producing a voltage very near to one volt: 1.0183 V. In 1911 the Weston Saturated Cadmium Cell became the International Standard for electromotive force.
An electrolyte couples two bulbs; one with cadmium amalgam and the other with cadmium sulphate.
Its e.m.f. in the standard form is 1.0190 volts, and it has the great advantage of having practically no variation with temperature. Some references mention these cells to be 1,0186 V.
No appreciable current should be taken from a standard cell, as the accompanying chemical actions cause more or less permanent changes in the cell and its e.m.f.
Weston waived his patent rights shortly afterwards so anyone was allowed to manufacture it. Early contemporary descriptions of the features of the standard cell and its use are provided below:
Duff: Standard Cells for E.M.F. Determinations from A Text-Book of Physics (1921)
The Eppley Laboratory Standards of Electromotive Force. (c.1922)

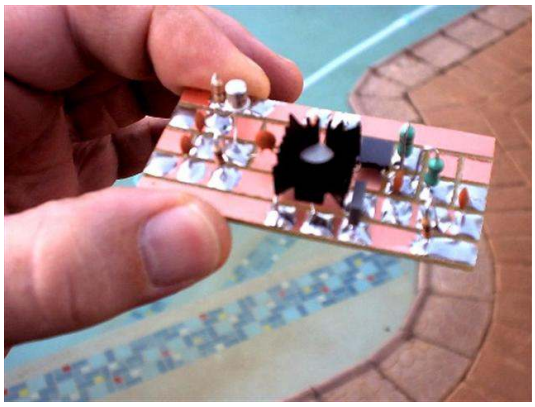
Salvaged Eplab Weston cell dated 1946 monitored for output. (The instrument calibration is unknown) Two inscriptions on its card state 1,0191 and 1,0187 volts. The second inscription was probably a calibration at a later stage in its life. Ageing over its current 57 years could well now be -0,9mV.

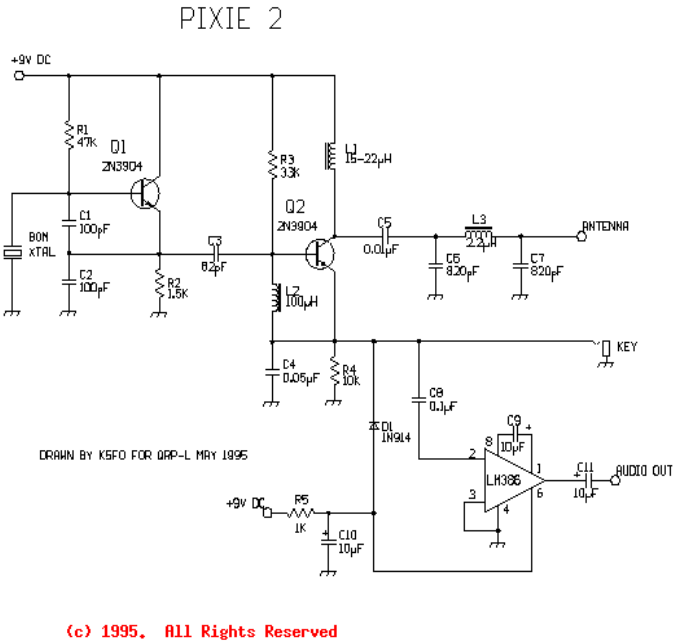
Home Brew: Try this one from Lichtenburg (Several presently in use)

Hi Hans,
I enjoy PARC's "Watts"... .....What do you think of the packet radio idea "Packet ZS"?

Thanks for all you do for amateur
radio Hans
Very best 73's de Eddie ZS6BNE

PS: Here is a picture of my half-built **PIXIE QRP Transceiver:**





Advertisement for older analogue HP oscilloscope:
"…. uses non-volatile memory technology"
"…. never forgets the last setting"
"…. configuration update possible with no power supplied"
Ed: makes you wonder if software and on-screen menus favour the user or the manufacturer

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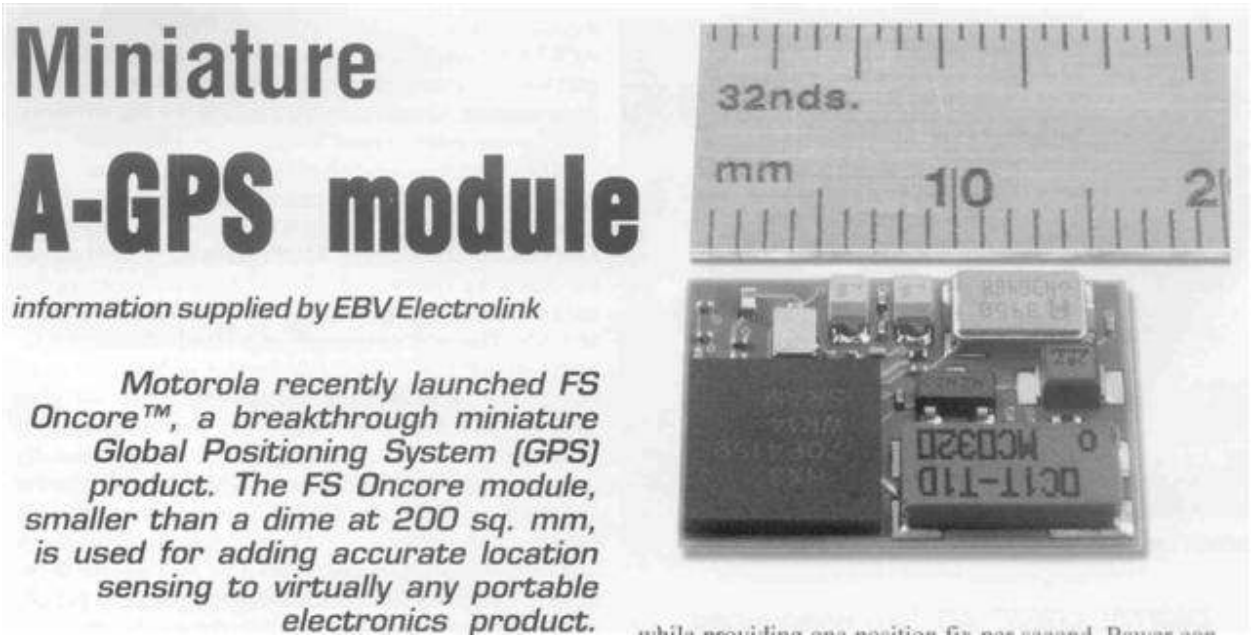
Small enough?



Time synchronization via GPS

Extract from *Quantum* July 1997 pp 27-29

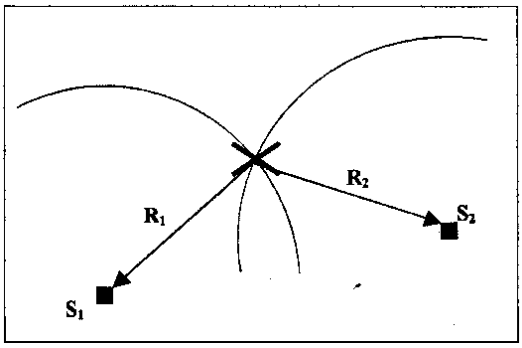
The GPS was developed and deployed by the US Department of Defense at an original cost of $12 billion. The satellite constellation orbits the earth twice a day, transmitting precise timing information in addition to latitude, longitude, altitude and other parameters. These transmissions can be processed by any GPS receiver at no charge and users the world over are able to determine the correct time with an extremely high degree of accuracy.

The system comprises six orbits of satellites, each at a height of 17300km (half that of a geosynchronous satellite) Each satellite orbits the earth twice a day. Any location on earth is able to see a minimum of four satellites at any time.

Each satellite continuously broadcasts two signals. The first is provided for world-wide civilian use whie the second, more accurate signal, is for US military use only. Each of the 24 satellites carry an ensemble of atomic clocks.

A GPS receiver has its own on-board clock but is nowhere near as accurate. After switch-on, the receiver goes through an iterative process to synchronize its clock. As with the calculation of position, trigonometry is employed.

The difference between the time at which the signal was sent from the satellite and the time at which the signal was received is calculated. Multiplied by the speed of light (taking into account errors introduced by the ionosphere and the atmosphere), the time difference yields the distance between the receiver and a particular satellite.



Each satellite is associated with a surrounding sphere, on which the receiver's location on earth may be found. The intersections between the different satellite spheres produces the location such as illustrated by X in Figure 1:

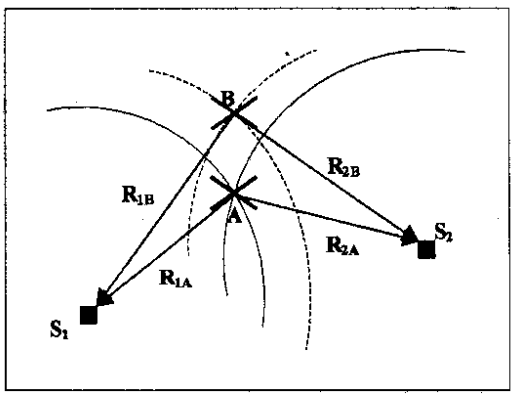
Four satellites are needed to obtain a precise position. A problem originates from the fact that the GPS receiver uses its on-board clock to determine the time at which signal was received and is thus prone to errors. **An error of 1 nanosecond produces an error of hundreds of meters.**

The receiver, however, is able to detect this error as the intersections of the spheres do not coincide. Instead, a number of intersections are obtained yielding several different possible solutions as shown in the next figure. (with two satellites for the sake of simplicity)

The dotted lines show the spheres as determined by the as yet unsynchronized on-board GPS clocks. Thus two different positions A and B may be calculated. The accuracy of time and position now incorporates an amount of uncertainty which may invalidate the readings for a particular application.

The receiver eliminates the synchronization error by implementing a series of algorithms which adjusts the GPS receiver time until only one unique intersection or position on earth is obtained.

Thus, the GPS receiver has synchronized its clock to that of the satellite. These calculations are performed continuously in order to maintain system accuracy.



In order to prevent civilian GPS signals being used for military purposes, the US government can randomly activate or de-activate Selective Availability, decreasing the accuracy of the system. However, techniques such as Differential GPS are often incorporated into GPS receiver design in order to compensate for these effects. **Time accuracy obtainable from a GPS output is in the order of $1x10^{-11}$ (ten parts per billion)** Many laboratory instruments today also rely on this free-of-charge time reference and can serve to synchronize data equipment, time-stamp recorded events in process control and discipline oscillators for frequency (read: time) reference purposes.

The Spirit has landed
The NASA Mars Exploration Rover named Spirit has been sending information back to Earth since 3 January. Daily pictures and atmospheric analysis data can be seen on various websites:
http://www.jpl.nasa.gov/mer2004/rover-images/images.html
http://spaceflightnow.com
http://antwrp.gsfc.nasa.gov/apod/astropix.html
http://www.cnn.com

BBC NEWS | World | Americas | **Hackers heckle drive-in diners**
http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/americas/3385743.stm
Published: 2004/01/10 15:17:58 GMT (Ed: shortened version published here)

US police are hunting hackers who tapped into the radio at a fast food drive-through and insulted customers. The offenders are reportedly tapping into the wireless frequency at the Burger King restaurant in Troy, Michigan, AP news agency reported. One customer who placed an order was told: "You don't need a couple of Whoppers. You are too fat. Pull ahead."
Police said the pranksters could face misdemeanour charges carrying up to three months in jail plus fines. Police suspect that calls are being made using a radio transmitter or walkie-talkie near the restaurant.
The owner of the affected Burger King franchise, Tony Versace, said: "We apologise to customers who've been insulted by the use of this drive-through speaker." Police said the culprits were probably watching and broadcasting from close range and could be charged if caught.

Restaurant eienaar maak 'n plan (onttrek uit die Britse amateur nuusgroep: uk.radio.amateur)

.....Ek gaan toe na 'n restaurant wat deur 'n Indiër bedryf word om te ondersoek waarom sy 2,4GHz sekuriteitsstelsel skielik snaakse gedrag begin vertoon het.
'n Deel van die alarmstelsel was ongeveer 2 voet vanaf hulle "easy access" Sharp industriele mikrogolf oond.
Die eienaar het 'n gat in die oond se deur gesny sodat die staf dit nog kon gebruik terwyl hulle al meer as 'n dag vir 'n dienspersoon gewag het, om die deur wat skynbaar onwrikbaar vasgesit het, te kom loskry.

1940 applied electrotechnics