WATTS

12- 2009

Year 79 +12m

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.parc.org.za mail: zs6pta@zs6pta.org.za

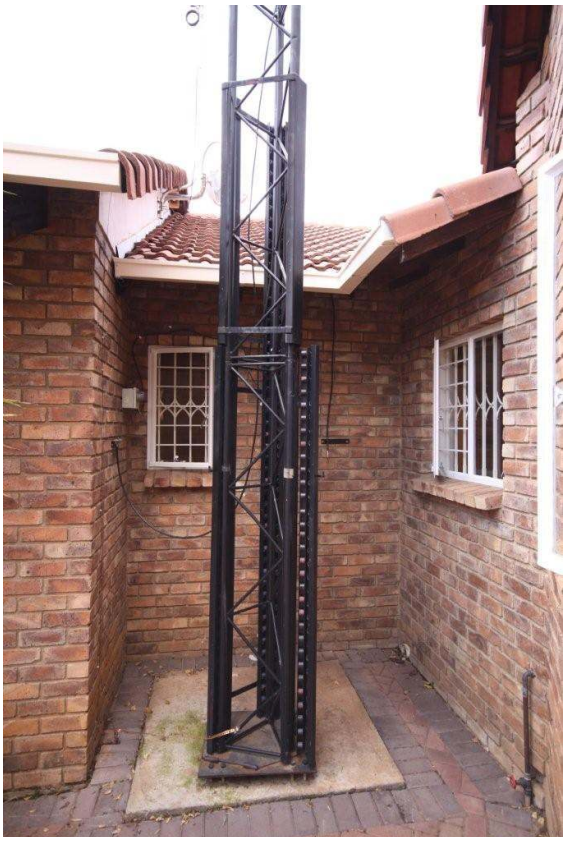
Bulletins: 145,725 MHz 08:45Sundays / Sondae
Relays: 1.840, 3.700, 7.066, 10.135, 14.235, 51.400, 438.825, 1297 MHz
Activated frequencies are announced prior to bulletins
Swapshop: 2m and 7.066 MHz Live on-air after bulletins
Bulletin repeats Mondays | herhalings : Maandae 2m 19:45

ZR6FD logo

Drukwerk printing ZS6JPL

Papier / Paper ZS6JPL

Roger ZS6RJ constructs a tower with an interesting concept – p.5



In this issue

In hierdie uitgawe

Next Meeting
11 Dec 2009

Time: 13:30 for 14:00
PMC
Keunig str
Silverton

PARC Management team / Bestuurspan Aug. 2009 - Aug. 2010

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Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 11 Nov 2009

Welcome: The chairman welcomed all present.
Present: See register, 12 members.
Apologies: 6 as per register.
Joys & Sorrows: Jack ZS6QA has had a knee joint replacement and is still in hospital. Pierre ZS6PJH is improving well. Edwin ZR6ESP is engaged to Nina. Chrissie ZS6JX, sw of Dave ZS6JW, became silent key after a long illness.
Minutes: The minutes of the previous meeting were in Watts, no-one could remember and they are to be approved at the next meeting.
Matters Arising: None.
Finances: The balance in the current account is now R6625.28.
Membership: There are 110 paid up members of the total of 139.

Activities

Rallies: The end of year function will be announced. The next season starts in February. There were 10 events in total and Johan ZS6JHB thanked all who assisted. Next week end there is a rally sprint at Rallystar, entrance fee R30. Gordon Brown, usually sweep, has achieved his amateur licence. Overdue certificates for Roy ZS6XN and Pierre ZS6PJH were presented.
Flea Market: The next PARC flea market is proposed for end February and will be confirmed.
Technical: A request from the floor was noted for back up for Craig ZS6RH.
Contests: Pierre ZS6PJH reported that the HF field day would be 21-22 November at a site about 50 Km north of Pretoria at Vee-Kraal. The award from ZS4SRK was returned and arrangements have been mad for redelivery.
General: Andre ZS6BRC requires assistance to help set up mast and equipment for Jack ZS6QA.
Next meeting: The next meeting will be on Wednesday 11 November 2009 at about 20:00.
The meeting closed at 21:00.

From the Editor and Management

A Blessed Christmas

It is difficult at the time of writing to realize that the Festive Season is soon upon us. The January issue of Watts will probably appear after Christmas. **The Management Team of PARC will now take the opportunity to wish you and your loved ones a Blessed Christmas and Happy New Year.** May there be new inspiration for the future through the Message and real meaning of Christmas for all. We also wish our Jewish members a happy **Chanukah.**

Vanaf die Redaksie en Bestuur

'n Geseënde Kersfees

Dit is moeilik om nou ten tye van hierdie skrywe te besef te dat die Feesgety alreeds baie naby is. Die Januarie uitgawe van WATTS sal waarskynlik eers na Kersfees verskyn. **Die Bestuurspan van PARK wil nou van hierdie geleentheid gebruik maak om u en u geliefdes 'n geseënde Kersfees en Gelukkige Nuwe Jaar toe te wens.** Mag daar nuwe inspirasie vir die toekoms deur die Boodskap en ware betekenis van Kersfees vir u almal wees.

Birthdays Dec. Verjaarsdae

02 Antoinette ZS6D, sw of Danny ZS6AW
05 Tanya, Daughter of Rita and Sarel ZS6AC
05 Hanlie, dogter van Susan en Freddie ZS6JC
05 Angelique, kleindogter van Erna en Whitey ZS6JJJ
06 Sylvia, LV van Tjerk ZS6P
07 Hansie ZS6AIK
08 Hans ZS6KR
08 Magda ZS6MVW, LV van Pieter ZS6PVW
12 Sarel ZS6AC
12 Charl, seun van Karin en Sarel ZS6EK
15 Don ZS6AQS
15 Alméro ZS6LDP
17 Dominic, son of Adele and Hans ZR6HVG
21 Retha, sw of Roy ZS6XN
22 Steven, son of Bill ZS6KO
23 Niel ZR6AUK, son of Marieta and Roy ZS6MI
28 Allan ZS6AVC, son of Frances ZR6AUT
29 Ricky, son of Rita and Vitor ZS6VG
30 Rika, sw of Errol ZR6VDR
30 Corrie, LV van Bridge ZS6BJM
30 Henk ZS6CS

Anniversaries Des. Herdenkings

17 Leanne and Allan ZS6AVC (15)
19 Ceciel en Flip ZS6BSO (45)
22 Rita and Vitor ZS6VG (30)
29 Molly ZR6MOL and Richard ZS6UK (33)

Joys and Sorrows | Lief en Leed

Edwin ZR6ESP 's engagement to Nina de Winter was recently announced.
Andre ZS6GCA and family will appear on e-TV somewhere between 7 and 8pm on 30 November after his son having won a prize for the New Hope School in an essay competition. The school benefits with 50 laptops. Well done!
Viv ZS6BZS was delivered a parcel of necessities donated by PARC by way of the chairman Johan ZS6JHB on Sunday 22 November.
Pieter ZR6AHT is nou ZS6PA na sy opgradering – geluk Pieter!
Craig ZS6RH had a long bout of the sniffles and brochitis and his sw and son measles all at the same time...

Diary | Dagboek (UTC times)

Dec.	04-06	ARRL 160m Contest 22:00-16:00
	05-06	ARRL EME Contest 00:00-23:59
	12-13	ARRL 10m Contest 00:00-24:00
	18	Russian 160m Contest 00:00-24:00
	19	OK DX RTTY Contest 00:00-24:00
	19-20	Croatian CW Contest 14:00-14:00

Snippets | Brokkies

Moon activity: Pine ZS6OB reports regularly on Sunday morning bulletins on his moonbounce DX activities. Currently studies and data is being collected regarding returned signal polarization. Thus far it has been found that vertical polarization is dominant but data needs to be collected over many more months to be accurate and to determine time of year effects if any. There is also a useful moon beacon transmission from Europe on 143,049MHz that can be monitored for similar purposes.

Satellites: Roy ZS6MI reports regularly on this activity and made around a hundred contacts in a recent contest.

Lightning strike: Craig ZS6RH had a surprise visit from above damaging his X7000 antenna, 2 TV's, DVD, UPS and rotator control and a protection mains plug. Fortunately no radios were affected due to good precaution and protection practice.

Remember our **Desert Island Trophy** and **HF and VHF Constructors' Trophy** are up for grabs at our December meeting at PMC

SARL HF Field Day:

A field station was set up 30km N of Brits at Veekraal with a good turnout of members and visitors. ZS6PA (ex ZR6AHT), ZR6LHT, ZS6PJH, ZS6HVG, ZS6KCS, ZS6EK, ZS6JJJ all helped setting up and visitors ZS6BTY, ZS6CCJ and ZS6OI also came to have a look.

In excess of 200 contacts were made various bands. However conditions on the second day proved to be less favourable to several parts of the country.
Antennas used were a Windom on a 12m Clarke mast and a 160m and 80m dipole on a 12m aluminium pole.
The power source was a set of batteries with capacity in excess of 400Ah.

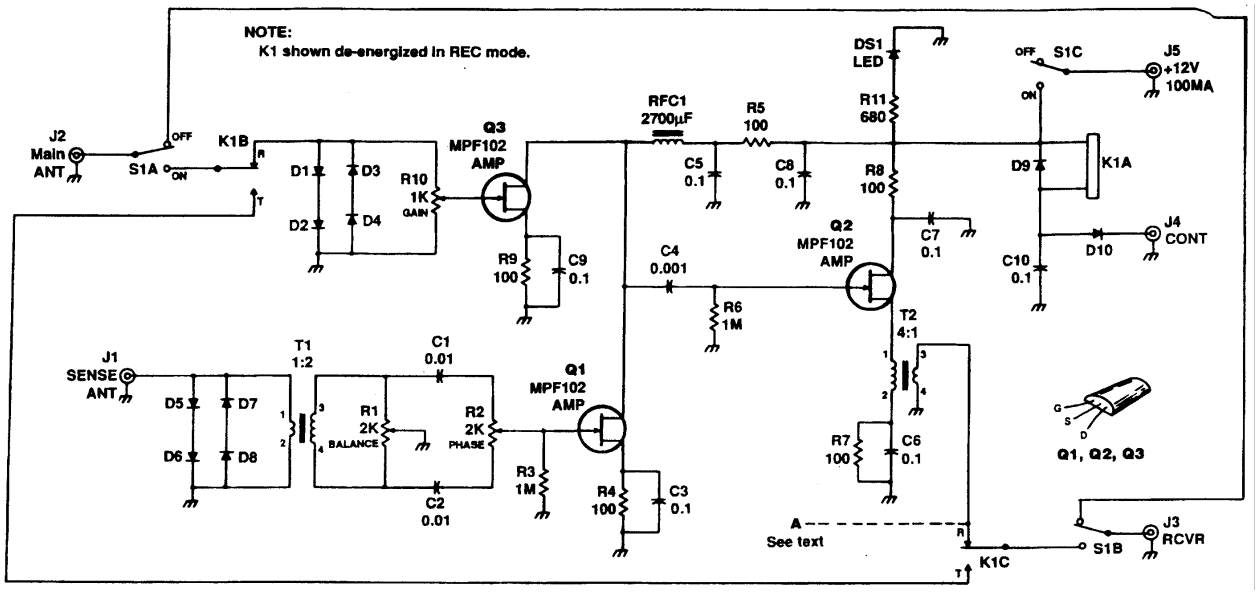
Kallie ZS6KCS and Pierre ZS6PJH in action.

Pieter het 'n vlaggetjie gekry om sy nuwe roepsein ZS6PA te vier. Dit was by tye egter nogal koud!

Some of the gang caught in deep thought on what to do next.

Build a QRN Squasher

from CQ Magazine by Doug de Maw (SK) W1FB



This circuit can cancel up to 50dB of local man-made noise with minimal or no reduction in received signal strength.

Apart from your normal antenna, it requires a relatively short sense antenna. The two noise signals are balanced in amplitude with R10 but since the transformer T1 inverts the phase, addition of the two output signals should result in almost complete cancellation at the input of amplifier Q2. Balance and phase of the sense signal are adjusted with R1 and R2.

The transmit–receive relay K1 (2A contacts) allows operation up to 100W. J4 is connected to the radio control line to achieve this. Each input circuit has protection diodes at J1 and J2 to ensure that Q1 and Q3 are not damaged by RF energy leakage across the contacts of K1B, or if the sense antenna might have excessive RF voltage on it. At point A another 4 diodes can be connected to protect Q2. T2 matches the Q2 source impedance to the 50 ohm input of the receiver via J3.
The circuit bandwidth is 100 kHz-60 MHz. The MPF102 devices can also be replaced with slightly better 2N4416 types.

Why does it not kill the wanted signal also?
Local noise is of relatively constant amplitude and phase. Incoming amateur signals vary in phase due to atmospheric refraction. The sense antenna does not respond to incoming signals in an identical manner to the main antenna, especially if one is vertical and the other horizontal. The sense antenna should favour the noise source and be about 5m long if used down to the 80m band.

Adjustment requires tuning in a moderately strong signal with S1=OFF. Next with S1=ON adjust R10 for signal reduction of roughly 6dB (2x). Then tune the receiver to a clear frequency near to that of the desired signal. Alternatively adjust R1 and R2 to remove the man-made noise. Advance R10 and repeat the nulling procedure until a complete null cannot be obtained. Back down R10 until where a complete null occurs. Careful adjustments are needed for complete nulls as there is interaction between the controls and practice will make perfect. It also works on atmospheric white noise such as found on 160m before daylight. In a man-made noise environment you can only eliminate one noise source at the time.
(a PCB layout was published in CQ Magazine June 1996)

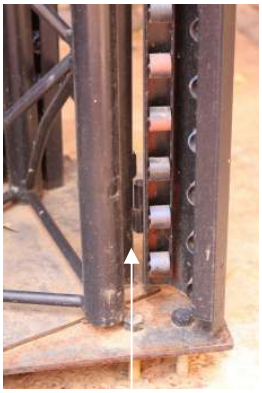
Homebrew Tower Erecting for Confined Spaces
by Roger, ZS6RJ

This idea was born out of desperation when the XYL laid down the law about where she'd allow the tower to be sited at the new QTH! Essentially I had the real estate, but not right at the bottom of the tower. In other words, no space for tilt-over or cantilever arrangements.

As you'll see from the photographs, there was a pretty useless service area space surrounded on three sides by house walls, but which was conveniently situated in the centre of the property. The trick was how to raise and lower a tower here. Hence the idea of a "tower-loader" took shape.

A normal foundation was laid (6 foot hole with rebar cage filled with concrete etc.) The tower itself is a standard triangular lattice arrangement, welded up in 2m bolt-together sections. This is homebrew – in my case from aluminium, but steel will work just as well. Each tower section has 12cm long nested round bar sections sticking out of the top of the legs, allowing the next section to be placed on top. Bolts through the legs of the tower section into these inner nested connecting pieces keep the next tower section in place.

The tower-loader is 3m high and fabricated from steel. It is welded onto a base-plate (hinged in my case to tilt forwards, but doesn't have to be). At the front are two doors that open outward. The tower-loader replicates the triangular tower section shape and fits snugly on the outside of the actual tower sections. The inner of this loader has strips of nylon rollers attached, (used in warehouse applications for moving boxes around) located for the tower section legs to run against.



hinge

A tower section is loaded in through the doors, the doors are closed (held in place with a bar placed over spuds) and the section is pushed or winched up (simply by hooking a common block and tackle for removing car engines etc. to the top of the tower loader). When the section is elevated 2m, it is held in place by inserting an iron bar under it, resting on the cross sections of the tower-loader. The next 2m section is then fed in through the doors and bolted onto the one above.

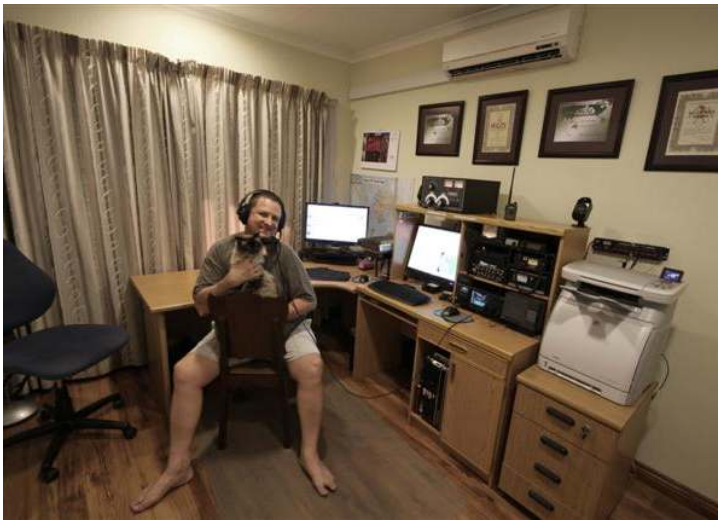
The entire process is then repeated. Simple, and you can make the tower as high as you want. Mine is a 7 section (46 foot) tower with a 2m mast on top. I'm currently fabricating two more 2m sections to get it up to 60 feet in anticipation of installing a 40m hexbeam.

Another advantage is that this tower can be completely isolated from ground (it is held in place by the nylon rollers inside the grounded tower-loader). The bottom section could rest on a section of weather-protected marine ply. In this way, it will be extremely simple to load your isolated tower as a 40/80/160 m vertical if you feel so inclined. Antennas on top will give you some extra capacitance, which is a bonus. My tower is isolated, with an earth strap I connect during periods of bad weather or when I don't need to use the tower structure as an antenna.

Just a note – in my case, the aluminium tower sections are so light, two people can push the whole tower up and block it with ease – I don't even need to use a block and tackle. Steel tower sections would of course require this assistance after loading a couple of sections. When I need to work on the antenna, I simply lower and remove all sections except the last one containing the rotator and mast, stand on the roof and do whatever needs doing. The tower is also strong enough to climb if you wish.

The XYL's ultimatum regarding where the tower could go turned out to be a blessing in disguise! Although I think she was secretly hoping I'd give up on a tower when she showed me the "tiny" space she'd approved!

Roger's shack: This is where it all happens. The shack has two cats who jockey for position on top of the linear in winter. It's actually ridiculous- they are spoilt to death - it's got to the point where I leave it on in standby just to keep them warm..."



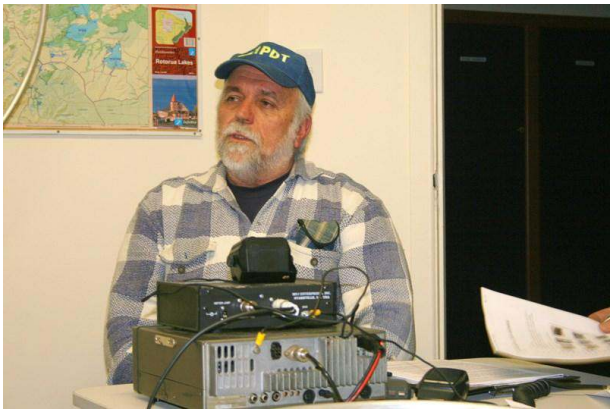
He says that hex-beams are amazing: " I have been using them for several years. They outperform commercial three element tri-banders with ease, and are only an s point or so behind a 3 ele Steppir, (and R 30 000 cheaper in ZS land!) which I was considering at one point. The trick is no traps or baluns, which gives them an edge. I'm actually amazed that some enterprising ham hasn't started building them locally. I've thought about it, but just don't have the time available due to my saltmine activities. What I can tell you is that you can build a 6 band hex for around R1700 that will last in any storm and give you 2 element monobander performance on every band with instant transmit ability (no tuning)".

SMALL MAGNETIC LOOP ANTENNAS

Pieter DuToit, ZL1PDT

Excerpt from *the Rotorua Amateur Radio Club* November meeting presentation. **(Pieter is often heard on our repeater IRLP)**

Pieter had brought with him two working loops, one mounted on a short fiberglass support pole with mounting foot and the other a small version. The larger one is the loop he normally uses.
As he demonstrated, the received signal strength on the smaller loop was noticeably down on that produced by the larger version. It was a pity that the noise level within the club meeting room was so high, probably because of the many fluorescent lights within the building. Rotating the loop did tend to null and reduce the noise but not as much as Pieter would have liked.
The reference to the larger loop may be a little misleading, as it is still under a meter in diameter! The coupling loop feed from the transceiver is 1/5 (20%) of the diameter of the main tubular loop and consists of a single turn of 50ohm coax. This feed loop is attached inside the main loop at the bottom, but there is no electrical coupling whatsoever between the two. This coupling presents a 50ohm load to the transmitter. The main, single turn, tubular loop, is cut leaving a small insulated gap at the top, with a variable capacitor bridging the gap. As most Hams are aware, with antennas, one can have any two of the following three parameters:
(a) Small size, (b) Efficiency, (c) Broad bandwidth.
One cannot have all three! Magnetic loops sacrifice bandwidth for small size and high efficiency.



They can be mounted as low as a meter above the ground, whilst their efficiency approaches that of a dipole mounted at the recommended height for the band it is cut for. At his home QTH, Pieter uses his loop mainly at QRP power levels, mostly on 20m, but it can be tuned to 40m at reduced efficiency. He has it set-up inside a metal clad and roofed garage, in the roof truss space, about 300mm below the roofing iron and its performance is similar to being set-up outside!
At the present stage of development, Pieter showed members present, but has yet to fit, a vertical, tubular, trombone type tuning capacitor to replace the present broadcast receiver type.

As was pointed out, the tuning capacitor is better controlled remotely, where one's body does not influence the loop. Doing so will also avoid the very real risk of an R.F. burn and shock. Published literature quotes voltage figures of several tens of kilovolts on the top of the loop; transmitting at the 100w level.

For Hams who might wish to become acquainted with small (under ¼ wave circumference) magnetic loop antennas, typing **'Magnetic Loop Antennas'** into Google will raise a huge no. of links, many of which list other links. Be however careful in that some is outmoded and incorrect. The best and most up to date overview I found, is a professional paper presented by Leigh Turner, VK5KLT, on www.qsl.net/.../small__loop__antennas-Main%20Index.htm. Then follow it up by looking at further dialogue he has with a friend on the subject by clicking: www.qsl.net/.../**Leigh's**%20docs/**Leigh**s_Wrap-up_Conclusions.htm
Happy experimenting!

EVALUATING FERRITE BEAD CHOKES **From Tim, KT8K...** **Contributed by Ivan ZS6IL**

Here's a test procedure to test the ferrite-bead chokes you buy at hamfests or Radio Shack.

Ferrite chokes are widely used to reduce or supporess RFI in electronic and electrical equipment. Many computer cables, in general, have lumps in them which are built-in ferrite beads. Of the many split-bead ferrite choke types, mix 43 is generally accepted as the best choice for stopping RF from getting through your power and audio cables. Other mixes are not much help in amateur radio applications.

The cool thing about this technique, is that now I can evaluate the chokes I consider buying at swaps before I spend my money. In the past I just bought them and installed them and hoped that they were helping. Using this procedure I can be sure of what I'm getting.

The following procedure is adapted from - and courtesy of - Alan Applegate, K0BG.

To do the test, you will need an antenna analyzer, such as the MFJ-259, and some #22hookup wire.

Test Procedure

1. Wind 5 turns of 22 ga. hookup wire through the bead to be tested and connect the ends to the center and shield connection on the antenna analyzer.

2. Set the frequency to 2 Mhz, and measure the reactance. If it is mix 43, the inductive reactance will be approximately 500 ohms.

3. Push the mode button three times to bring up the inductance menu. If your bead was made with mix 43, the inductance will be about 40uH. A lower reading may indicate that the ferrite is not mix 43, and it may not work properly. If the reading is higher, that's fine to a point, but double these figures may indicate mix 77 (ui=1800), which is better suited for 160-meter suppression.

Note: the 259B hasn't enough range to check mix 43 at much more than 2.5 Mhz unless you reduce the number of turns.

Long Term HF Propagation Prediction for Dec 2009

courtesy ZS6BTY

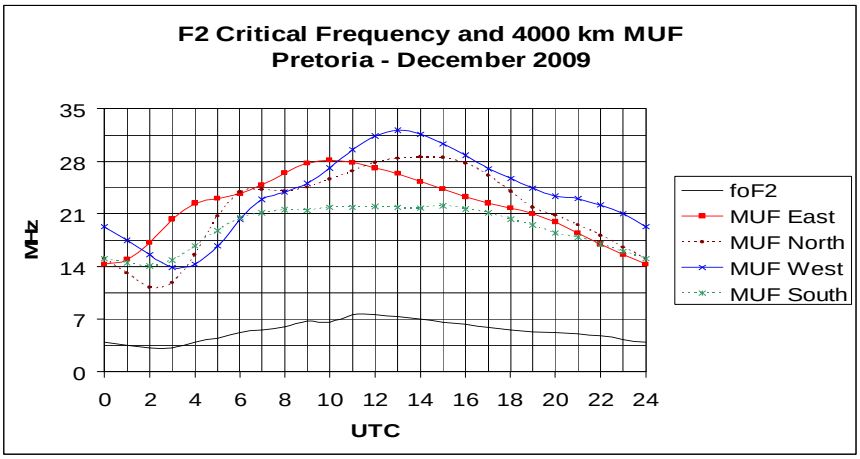
(see also our website propagation tab)

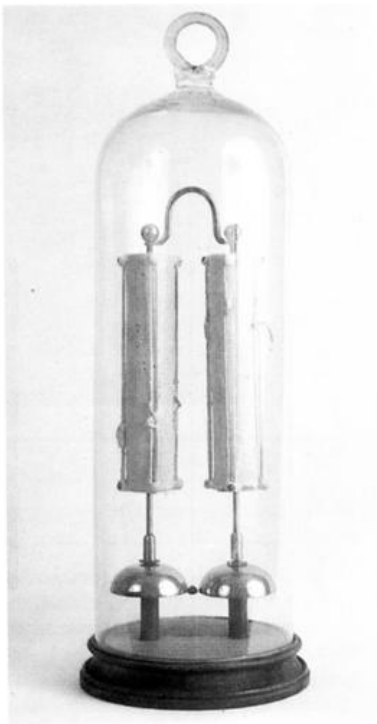
DX Operating

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.





The bell that has rung for more than a century

Since 1840 a small metal striker on this apparently self-powered device has been swinging continuously between two bell cups to make them chime several times a second. The device was bought in 1840 – the year in which it was set up – by the Reverend Robert Walker in a London instrument-maker's shop. He took it to Oxford University, where he was Reader in Experimental Philosophy, and it has been kept in the university's Clarendon Laboratory ever since.

There is no visible source of energy to account for the continuous movement of the metal striker, dangling from a thread strung between two pillars. But each pillar consists of some 2,000 pairs of zinc foil and paper discs impregnated with manganese dioxide. Together they produce about 2,000 volts at a very low current. The long-lasting batteries are connected to the bells so that these carry opposite electrostatic charges. The striker is positively charged by the positive bell and is then attracted to the negative bell to receive a negative charge.

Due to the low current, the bells will continue to chime until the batteries run out, possibly well into the next century.

Why, oh Why..

Why do people order double cheeseburgers, large fries, and a *diet* coke.

Why is lemon juice made with artificial flavor, and dishwashing liquid made with real lemons?

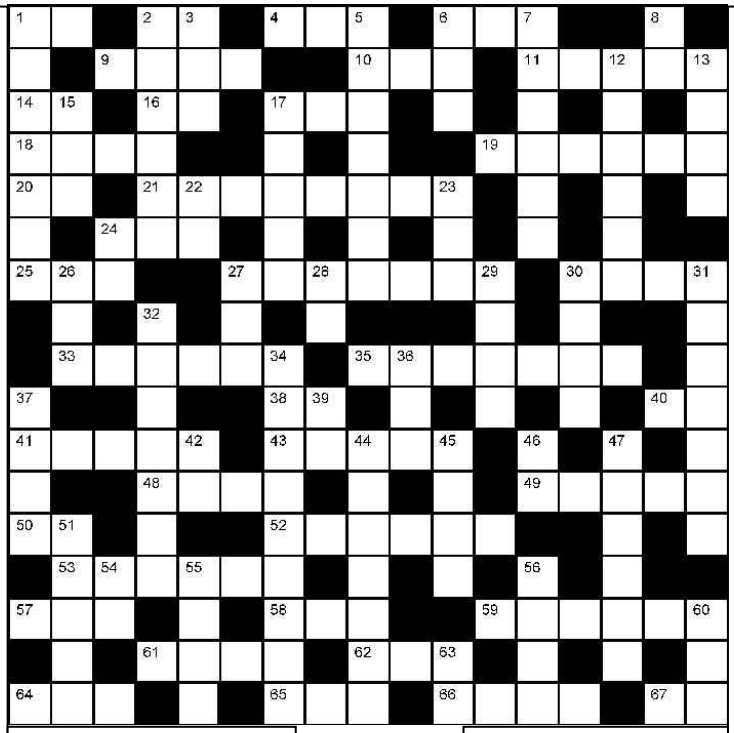
Why is the man who invests all your money called a broker?

Why is the time of day with the slowest traffic called rush hour?

Why isn't there mouse- flavored cat food?

Why do they sterilize the needle for lethal injections?

If flying is so safe, why do they call the airport the terminal?



Across

1. Weather (abbr.)
2. Unlicensed radio service
4. Complement to a tap
6. Plastic pipe (abbr.)
9. To lose one's hold
10. A periodic antenna
11. Sequences of parts
14. Bandwidth (abbr.)
16. Chemical symbol for the best conductor
17. Command to make a horse turn right
18. Runs down Yagi center
19. To move apart
20. Move closer
21. These guys are happy with metal antennas
24. Popular HF phone mode
25. Type of quad or stone
27. Spatial distribution of energy
30. Also called hairpin match
33. At zero potential
35. To reverse a wave's direction
38. Measure of intelligence
40. One micro km
41. Three of something
43. A measure of proportion
48. Non-magnetic north
49. Desired radiation direction
50. After signature on letter
52. Oxidized joint becomes…
53. Force along an axis
57. Distant radiation field
58. Operators (abbr.)
59. These prevent current on coax shields
61. Sharp metal edges left after drilling
62. What hears the signal
64. Last and first contest of the year (abbr.)
65. These shut down HF propagation (abbr.)
66. This surface is a measure of antenna area
67. A small weight or a British car

A
NØAX
H.Ward
Silver
puzzle

47. Twisting force
51. More than one antenna on a mast
54. Ham Radio (abbr.)
55. Coax-to-coax impedance transformer
56. More radiation than a reference
60. Droop
63. CDs that can be read and written

Down

1. Form of nylon used for lifting or tying
2. These hold together
3. Not small
5. Radiating antena parts
6. Height above ground
7. Angular wire antenna
8. Someone who's been around a while
12. Concentric tube
13. At right angles to the main antenna axis
15. To have had top score
17. Unbalanced match
22. Measure of weight
23. Measure of relative Z
24. Scandinavian country prefix
26. Round insulator style
27. Hold two tubes together with a fastener
28. Transmitter (abbr.)
29. Point of min radiation
30. Opposite of 49 across
31. Direction in the horizontal plane
32. It turns the antennas
34. These guide energy in the right direction
36. Interference from radiated signals (abbr.)
37. This uses tower rungs
39. Quality Assurance
42. Fall off and you'll need one of these (abbr.)
44. Held by supporting cables
45. Decides
46. Antennas radiate this (abbr.)