



WATTS

03-2016
Year 86 + 3m

Monthly Newsletter of the Pretoria Amateur Radio Club
Maandelikse Nuusbrieff van die Pretoria Amateur Radio Klub

PARC, PO Box 73696, Lynnwood Ridge 0040, RSA
<http://www.parc.org.za> @ zs6pta@zs6pta.org.za



Bulletins : 145.725 MHz on Sundays / Sondag at 08:45
 Relays: 1.840, 3.700, 7.066, 10.135, 14.235, 51.400, 438.825, 1297MHz
 Activated frequencies are announced prior to bulletins
Swopshop : 2m and 7.066 MHz live on-air after bulletins
 Bulletin repeats on Mondays / herhalings op Maandae : 2m 19:45



With the February PARC Club Meeting on the 6th, Jaco Cronje ZR6CMG brought along an extendable mast which he donated to PARC. Busy untying and unloading the mast are Thobile Koni ZS6TKO, Johann van den Bergh ZS6ETA, Pierre Holtzhausen ZS6PJH, Hans Gürtel ZR6HVG, Craig Symington ZS6RH, Ryan Gibson ZS6GGR and Jaco. More on the PARC February Club Meeting on page 3.

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Club Meetings / Klub Vergaderings

Club Social Meeting :

Saturday 4th of March 2016 after
the Flea Market at POMC

Committee Meeting :

Thursday 17th of March 2016
from 19h00 at SAM

The Radio Amateur is :

CONSIDERATE... *He/[She] never knowingly operates in such a way as to lessen the pleasure of others.*

LOYAL... *He/[She] offers loyalty, encouragement and support to other amateurs, local clubs, the IARU Radio Society in his/[her] country, through which Amateur Radio in his/[her] country is represented nationally and internationally.*

PARC Committee Members / Komiteelede : 2015 - 2016

Elected Members

Chairman, Social & Rallies	Johan de Bruyn	ZS6JHB	zs6jhb@gmail.com	012-803-7385	079-333-4107
Vice Chairman, Contests	Pierre Holtzhausen	ZS6PJH	zs6pjh@telkomsa.net	012-655-0726	082-575-5799
Treasurer	Andre van Tonder	ZS6BRC	andre.vtonder@absamail.co.za	012-361-3292	082-467-0287
Secretary, Bulletin Coordinator	Jean de Villiers	ZS6ARA	zs6ara@webmail.co.za		083-627-2506
Public Relations, RAE, Bulletins	Etienne Naude	ZS6EFN	etienne@afrigrid.com		082-553-0542
Web co-ordination	Graham Reid	ZR6GJR	greid@wol.co.za		083-701-0511
Repeaters	Craig Symington	ZS6RH	zs6rh@hotmail.co.za		081-334-6817
Competitions	Jaco Cronje	ZR6CMG	jacocronje@yahoo.com		081-474-2220
Clubhouse & Contests	Whitey Joubert	ZS6JJJ	zs6jji@gmail.com		072-120-4516
Technical, Web & Repeaters	Gawie Marais	ZS6GJM	zs6gjm@gmail.com		083-663-2222
Repeaters	Andre Coetzee	ZS6GCA	Johncoetzee@absamail.co.za		082-772-5811
WATTS, RAE & Clubhouse	Louis de Wet	ZS6SK	louis.zs6sk@gmail.com	012-349-1044	072-140-9893
<u>Co-Opted Members</u>					
Fleamarkets	Alméro Dupisani	ZS6LDP	almero.dupisani@up.ac.za		083-938-8955
Auditor	Tony Crowder	ZS6CRO	tcrowder@telkomsa.net	011-672-3311	
Historian, Archives, Awards	Tjerk Lammers	ZS6P	zs6p@iafrica.com	012-809-0006	083-976-4387

Birthdays – March / Verjaarsdae – Maart

01 Francois, seun van Karin en Sarel ZS6EK	02 Jozua, seun van Erna en Whitey Joubert ZS6JJJ
22 Julian Boutell ZS6AOU	22 Ivan Jancuska ZS6CCW (Hon Mem)
25 Doréén de Bruyn ZR6DDB	27 Sarel Stapelberg ZS6EK
28 Liezel en Le Clue, dogter en seun van Elma en Gawie Basson ZS6GJJ	

Spouse's Birthdays – March / Maart

19 Ria, eggenoot van Henk Stuivenberg ZS6CS
 21 Martie, eggenoot van JB de Beer ZR6YV
 25 Doréén, eggenoot van Johan de Bruyn ZS6JHB
 31 Annatjie, eggenoot van Pieter Fourie ZS6CN

Anniversaries / Herdenkings – March / Maart

26 Louis ZS6SK en Sharmaine de Wet
 27 Etienne ZS6EFN en Fiona Naude

Aquamarine:

The birthday stone for March. Aquamarine is believed to keep the wearer healthy and free of disease. You love peace and serenity, but when required, you are extremely courageous and have a fighting



Please Note : If your Club fees are not paid up to date, birthday details cannot be displayed in Watts

Contests and Diary of Events – March 2016 / Kompetisies en Dagboek van Gebeure – Maart 2016 (UTC Times)

04 – 05	Goldfields Rally, Welkom.
05	PARC Fleamarket, Pioneer Museum, Silverton Pretoria
05 – 06	ARRL International DX Contest, SSB : 00h00 – 24h00
06	DARC 10-Meter digital contest : 11h00 – 17h00
06	SARL Hamnet 40m Simulated Emergency Contest : 12h00 – 14h00
12 – 13	RSGB Commonwealth Contest : 10h00 – 10h00
19 – 21	SARL VHF/UHF Analogue / Digital Contest : 10h00 – 10h00
19 – 20	Russian DX Contest : 12h00 – 12h00
26 – 27	CQ WW WPX Contest : 00h00 – 23h59

PARC SUBS / LEDEGELD FROM / VAN 31-10-2015

Bank	First National Bank	Ordinary Members / Gewone Lede : R150 Spouses / Pensioners : R50	Your call sign must appear as statement text!
Branch Code	25 20 45		
Account No	546 000 426 73		
Please remit your subs in time to our Treasurer, or pay per transfer into the PARC account Betaal asb. u ledegelde betyds aan ons Tesourier, of betaal per oorplasing in die PARC rekening			

PARC Fleamarkets for 2016 are scheduled for the following dates:

5 March ; 28 May ; 27 August ; 5 November

Please do contact Alméro du Pisani ZS6LDP (almero.dupisani@up.ac.za 083-938-8955) for more information or to book a table, or if you wish to donate any old equipment to PARC

History of the Cubical Quad : By Jaco Cronje ZR6CMG

As reported by W6SAI and W2LX in "All about Cubical Quad Antennas", Radio Publications Inc. 1972.

In the year 1939 a group of radio engineers from the United States travelled to the South American republic of Ecuador to install and maintain the Missionary Radio Station HCJB, at Quito, high in the Andes Mountains. Designed to operate in the 25 meter short-wave broadcast band with a carrier power of 10,000 modulated watts, the mission of HCJB was to transmit the Gospel to the Northern Hemisphere, and to tell of the missionary work in the wilds of Ecuador. To insure the best possible reception of HCJB in the United States a gigantic four element parasitic beam was designed, built and erected with great effort and centered upon the heartland of North America.

The enthusiasm of the engineers that greeted the first transmission of Radio HCJB was dampened after a few days of operation of the station when it became apparent that the four element beam was slowly being destroyed by an unusual combination of circumstances that were not under the control of the worried staff of the station. It was true that the big beam imparted a real "punch" to the signal of HCJB and that listener reports in the path of the beam were high in praise of the signal from Quito. This result had been expected. Totally unexpected, however, was the effect of operating the high-Q beam antenna in the thin evening air of Quito. Situated at 10,000 feet altitude in the Andes, the beam antenna reacted in a strange way to the mountain atmosphere. Gigantic corona discharges sprang full-blown from the tips of the driven element and directors, standing out in mid-air and burning with a wicked hiss and crackle. The heavy industrial aluminum tubing used for the elements of the doomed beam glowed with the heat of the arc and turned incandescent at the tips. Large molten chunks of aluminum dropped to the ground as the inexorable fire slowly consumed the antenna.

The corona discharges were so loud and so intense that they could be seen and heard singing and burning a quarter-mile away from the station. The music and programs of HCJB could be clearly heard through the quiet night air of the city as the r-f energy gave fuel to the crowns of fire clinging to the tips of the antenna elements. The joyful tones of studio music were transformed into a dirge of doom for the station unless an immediate solution to the problem could be found.

It fell to the lot of Clarence C. Moore, W9LZX, one of the engineers of HCJB to tackle this problem. It was obvious to him that the easily ionized air at the two mile elevation of Quito could not withstand the high voltage potentials developed at the tips of the beam elements. The awe-inspiring (to the natives) corona discharges would probably disappear if it were possible to operate HCJB at a sea level location. This, however, was impossible. The die was cast, and HCJB was permanently settled in Quito.

What to do? Moore attacked the problem with his usual energy. He achieved a partial solution by placing six-inch diameter copper balls obtained from sewage flush tanks on the tips of each element. An immediate reduction in corona trouble was noted, but the copper orbs detuned the beam, and still permitted a nasty corona to spring forth on the element tips in damp weather. Clearly the solution to the problem lay in some new, different approach to the antenna installation. The whole future of HCJB and the Evangelistic effort seemed to hinge upon the solution of the antenna problem. The station could not be moved, and the use of a high-gain beam antenna to battle the interference in the crowded 25 meter international short-wave broadcast band was mandatory. It was distressingly apparent to Moore that the crux of the matter was at hand.



2m 8 element Quad



6m 4 element Quad



7 element Cubical Quad

In the words of W9LZX, the idea of the Quad antenna slowly unfolded to him, almost as a Divine inspiration. "We took about one hundred pounds of engineering reference books with us on our short vacation to Posoraja, Ecuador during the summer of 1942, determined that with the help of God we could solve our problem. There on the floor of our bamboo cottage we spread open all the reference books we had brought with us and worked for hours on basic antenna design. Our prayers must have been answered, for gradually as we worked the vision of a quad-shaped antenna gradually grew with the new concept of a loop antenna having no ends to the elements, and combining relatively high transmitting impedance and high gain."

A Quad antenna with reflector was hastily built and erected at HCJB in the place of the charred four element beam. Warily, the crew of tired builders watched the new antenna through the long operating hours of the station. The vigil continued during the evening hours as the jungle exhaled its moisture collected during the hot daylight hours. The tension of the onlookers grew as a film of dew collected on the antenna wires and structure, but not once did the new Quad antenna flash over or break into a deadly corona flame, even with the full modulated power of the Missionary station applied to the wires. The problem of corona discharge seemed to be solved for all time.

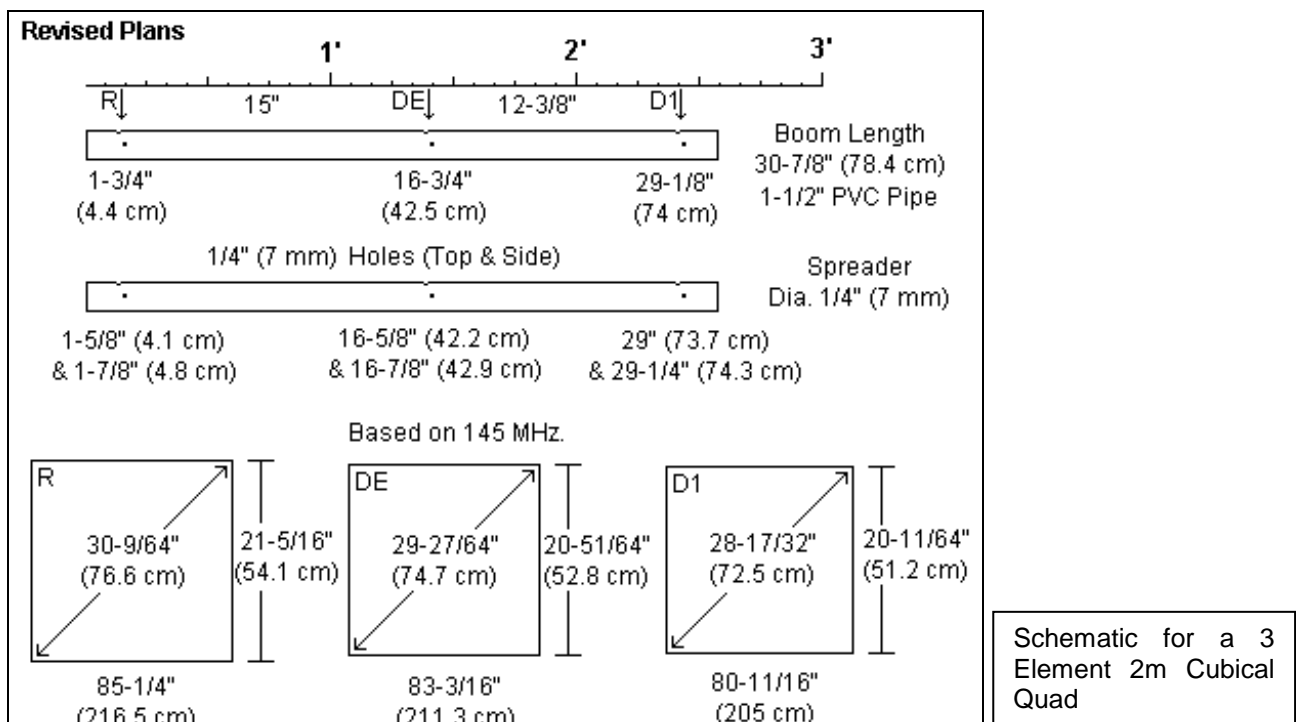
The new Quad antenna distinguished itself in a short time with the listeners of HCJB. Reports flooded the station, attesting to the efficiency of the simple antenna and the strength of the signal. In his spare time, Moore built a second Quad antenna, this one to be used in the 20 meter band at his ham station, HC1JB, in Quito.

At a later date, after Moore had returned to the United States, he applied for a patent covering the new antenna. The fact that the Quad-type antenna radiated perpendicular to the plane of the loop was deemed by the Patent Office to be of sufficient importance to permit the issuance of a patent to Clarence C. Moore covering the so-called Cubical Quad antenna. To understand the characteristics of the antenna, it is convenient to borrow the description of the Quad element given by W9LZX - "a pulled-open folded dipole."

This interesting account is taken from William I. Orr's book, "All about Cubical Quad Antennas". In it, technical details are addressed at length. However, there are only two pages devoted to the four elements, full sized quad. Orr calls it the "Monster Quad". We know why.

The Quad antenna is a development of several inventions:

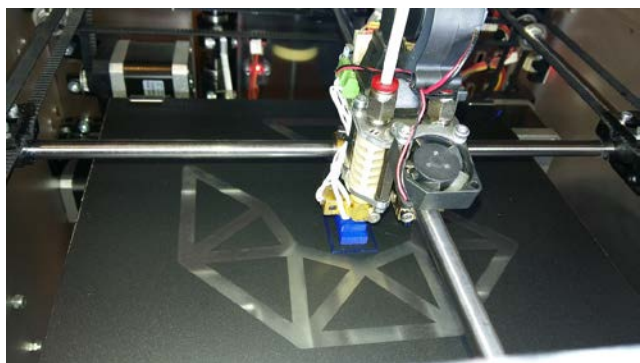
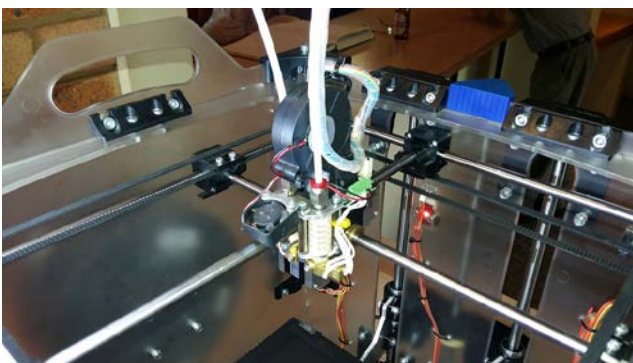
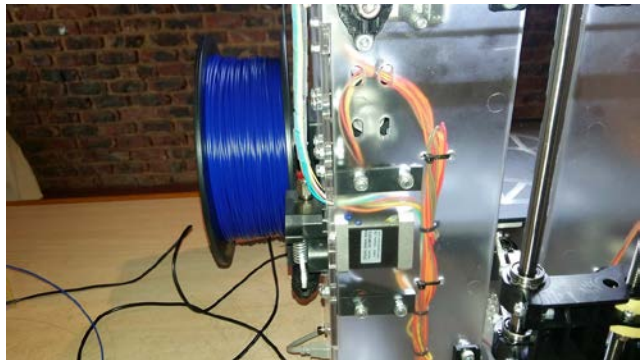
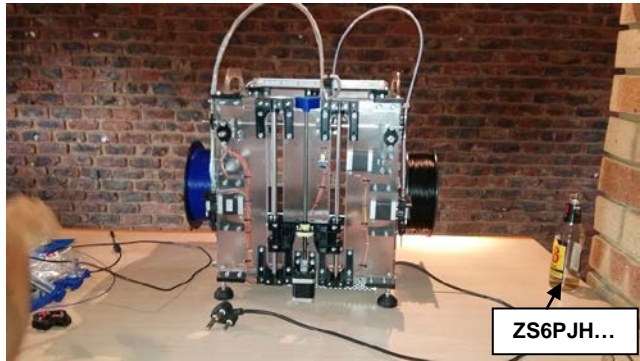
- 1924: Moses Jacobson patented a loop antenna with a rhombic shape.
- 1938: George Brown *et al.*, patented a loop antenna with a rhombic shape and quarter wave sides
- 1951: Clarence C. Moore, W9LZX, a Christian Missionary and Engineer at HCJB (a shortwave missionary radio station high in the Andean Mountains) developed and patented a two-turn loop antenna that he called a "quad".
- 1957: James Sherriff Mc Caig patented what we know as a "cubical" (two-element) multi-band quad antenna.
- 1960: Rudolf Baumgartner patented the Swiss Quad.



PARC Club Meeting : 6 February 2016

The PARC Club Meeting for February was well attended with Theo Bresler ZS6TVB giving a most interesting presentation and demonstration on 3D printing. Theo showed the features and capabilities of the Vertex Velleman K8400 3D printer, and exhibited a large variety of items he has already printed, with unlimited shapes and applications (see photos below).

A demonstration was also provided of how a 3D-object is printed, and the printing "head" can be seen in clear detail in the photographs. It is of course always so fascinating to admire the accuracy of stepper motors, and in this case with the x-y-z positioning system of the printer head, it was sincerely a pleasure to observe. More details of this printer can be found on www.vertex3dprinter.eu/, and Theo Bresler can be contacted should you wish to obtain more information. Thank you very much Theo for this most informative lecture and demonstration.



World Amateur Radio Day : By Johan de Bruyn ZS6JHB

World Amateur Radio Day takes place on April 18 each year, when radio amateurs worldwide take to the airwaves to celebrate the formation of the International Amateur Radio Union in Paris on that day in 1925.

Amateur radio experimenters were the first to discover that the short wave spectrum, far from being a wasteland, could support worldwide propagation. However, once they had discovered that it could be useful, the commercial companies became interested in the spectrum, and the amateurs were in danger of being squeezed out, so the Amateur Radio Union was set up to look after the rights of all amateurs worldwide.

When you consider the contribution they have made to the field of modern day communication, it was just as well the union was formed. As most of the modern day technical advances were first discovered by amateurs in their sheds, even Marconi could not conceive the use of voice for communication. He thought the only practical use of radio was for Morse Code.



While there is a slight dispute on who was the first to broadcast their voice over the airwaves, one thing is for sure, it was probably a radio enthusiast working out of his shed.

Each year on 18 April, radio amateurs celebrate World Amateur Radio Day. On that day in 1925 the International Amateur Radio Union (IARU) was founded. In 2010, the theme of the event is **"Amateur Radio: Combining communication experience with modern digital techniques."**

Amateur radio has truly entered the 21st Century. In less than 100 years amateur radio communications has evolved from crude spark-gap technology to digital signal processing and software-defined radios. The amateur's HF choice between voice and CW has been expanded to a broad range of communication choices from television to spread spectrum. Amateur digital communications has evolved. At the end of World War II until the early 1980's, radioteletype, also known as RTTY, was the only HF digital mode available to amateurs. In the 1980's, AMTOR made its debut along with the increased popularity and availability of personal computers.

AMTOR was the first amateur digital communication mode to offer error-free text transmission. From the early 1980's, the rate of change increased dramatically. Packet Radio emerged and for a period of time was the most popular form of amateur digital communication. As microprocessor technology became more sophisticated, there was a rise in modes such as Clover, PACTOR, and G-TOR that were capable of error-free exchanges under marginal band conditions. In the late 1990's, there was an invention that harnessed personal computer technology to create PSK31.

In the VHF-UHF frequency ranges, Packet Radio had less activity at the close of the century than it did in the 1980's and 1990's.

However, Packet Radio was reborn as the popular Automatic Packet Reporting System (APRS) and traditional packet systems still exist to support public service activities with greatly enhanced functionality. Thanks to individual amateurs, hams now enjoy digital meteor scatter contacts and even moonbounce on VHF and UHF frequencies with modest stations. An ordinary computer sound device and software that can be downloaded free from the internet is all that is needed.

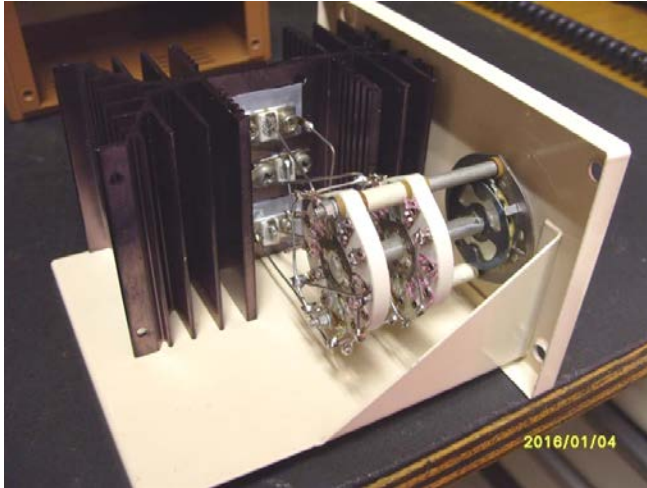
A SWR Simulator : By Hans ZS6KR

Rummaging amongst my small components I discovered some hybrid resistors that can be heatsink mounted and are surprisingly small for their power handling.

Having three in hand marked 150W 50 Ω (only 25x10mm!) I got fired up to design and make a variable RF dummy load for SWR=1, 2 and 3 which could be handy to check SWR indicators on radios and SWR meters as well as test radio and tuner behaviour when mismatched albeit of course only with a non-reactive load.

Drawing three blocks on paper with inputs and outputs it became obvious that it was an intricate switching exercise to connect them sequentially in parallel and then sequentially in series to create 16.6 Ω , 25 Ω , 50 Ω , 100 Ω and 150 Ω . That of course, with the minimum of switches and at the same time, have some sort of ergonomic arrangement of them. After much consideration I eventually stepped off the toggle switch idea and looked at how a two-wafer (4-pole 5-way) rotary switch could do it.

When having reduced my rubber considerably I could see a usable wiring scheme and that problem was out of the way. Since I wanted low and high Z it would necessitate two resistors to be insulated.



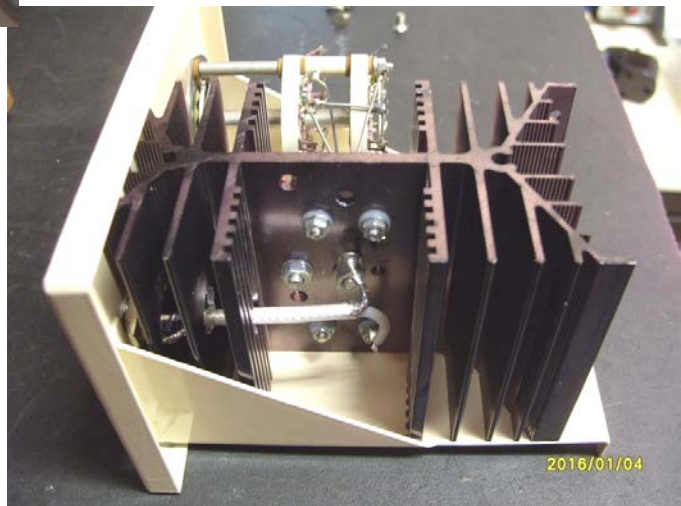
Mounting the resistors on a big enough heatsink would enable 100W input if needed for a reasonable measurement period. This I found in my heatsink collection together with a suitable metal box which admittedly was a new one (in the box). The switch emerged from my used switch box and was a suitable Centralab type with ceramic wafers.

As you can see, some tricks had to be used which cost a lot of time to make it all compatible. Since the switch only had a certain length,

some length had to be taken off the heatsink towards the front panel so that wiring to the resistors could be more direct.

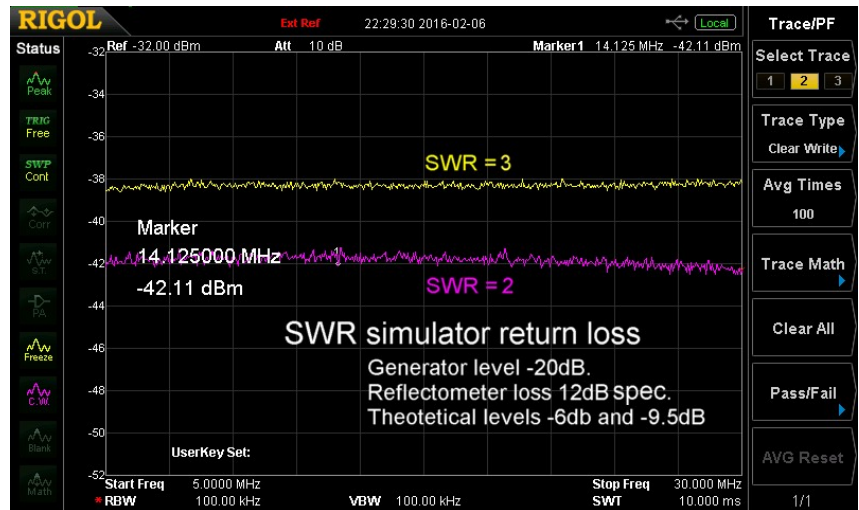
Also since there was no space for an input socket, the heatsink fins were drilled right through for the input coax.

Measuring return loss with a spectrum analyzer and relectometer showed some awful resonances due to wiring lengths and the insulated resistors - heatsink capacitances. It is however perfect up to 30MHz so the effort was not for nothing.



In retrospect my advice to anyone wishing to make something similar with much higher frequency capability it will be better to only make a parallel configuration (16.6Ω, 25Ω, 50Ω) so that each resistor can be mounted direct to a heatsink and a common ground.

Two toggle switches close by can do the SWR choice. For SWR=1 and 3 a single switch will suffice.

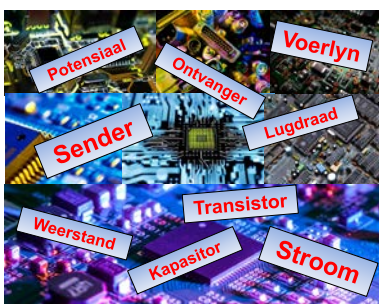


Projek LEXICON kry momentum : Deur Etienne Naude ZS6EFN

Projek Lexicon is in volle swang. Die beplanningsfase is nou voltooi en die projek span het in Januarie maand begin met die uitvoering van sekere take om die grondslag te lê vir die uitvoering van die res van die take en bereiking van belangrike mylpale. Die grondslag van die uitvoeringsfase is die finalisering van die Projek Lexicon se webtuiste, www.projeklexicon.co.za. Die doel van die webtuiste is om 'n gesentraliseerde enkel skakeling te wees om die vertalingsproses te fasiliteer en om die vertaalde woorde in 'n SQL databasis te huisves. Ryan, ZS6GGR, is die webtuiste bestuurder wat ook verantwoordelik is vir die funksionele ontwerp en werksvloei agter die geïntegreerde vertalingsproses.

Besoek gerus die webtuiste en stuur jou kommentaar en voorstelle aan Ryan by zs6ggr@gmail.com, jou deelname om die webtuiste te finaliseer sal hoog op prys gestel word. Cobus, ZS1DJR, het ook die eerste voorstel van die uitleg, inhoudsopgawe en formaat van die handleiding ter tafel gelê. Die projekspan moet die handleiding inhoud en uitleg nou finaliseer. Die projekspan het 3 belangrike mylpale om te behaal, 28 Maart is die amptelike operasionele bekendstelling van die webtuiste asook die begin van die vertalingsproses, einde September die finalisering van vertaling van die woordelys en einde November die eerste weergawe van die handleiding.

Etienne, ZS6EFN en Louis, ZS6SK, is ook besig met 'n voorlegging wat binnekort aan die Suid Afrikaanse Akademie vir Wetenskap en Kuns en die ATKV voorgelê gaan word. Wees op die uitkyk na nog verdere nuus en verwikkelings van die projek en word so deel van die samestelling van 'n eerste Afrikaanse Amateur Radio Handleiding. Vir meer inligting kan Etienne Naude, ZS6EFN gekontak word by etienne@afriqrid.com of Ryan Gibson, ZS6GGR by zs6ggr@gmail.com. Die projekspan vir die Afrikaanse Radio Amateur Terminologie Woordeboek (projek LEXIKON) is soos volg:



Pine Pienaar ZS6GST	Etienne Naude ZS6EFN
Cobus Rabe ZS1DJR	Louis de Wet ZS6SK
Ryan Gibson ZS6GGR	Fritz Sutherland ZS6SF
Johan du Bruyn ZS6JHB	Jan Pieper PE1PMO
Chris Meyer ZS1M	

Lag 'n bietjie...

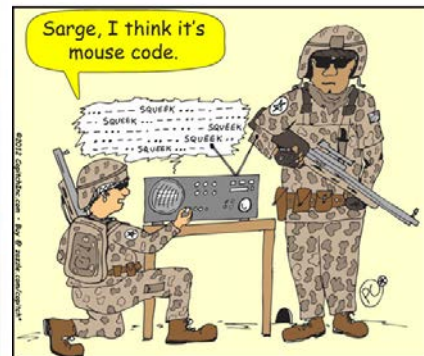


HAM QUIPS "Key To The City"



capitch.com/free_cartoons

Number: 0299



Waarom jy nie met 'n Radio Amateur moet trou nie...

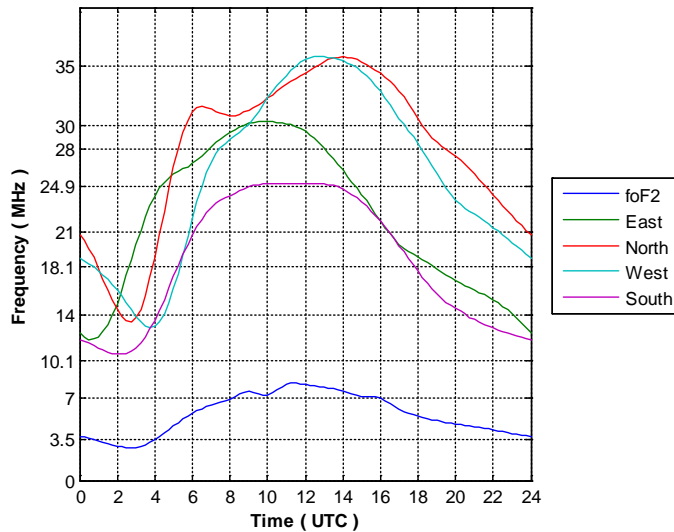
T-hemde en denims is hulle formele drag.
'n Warmbrak en 'n ses-pak is vir hulle 'n sewe-gang maaltyd.
Om op die lug te wees, is hulle hele sosiale lewe.
Hulle werk DX van 6 in die oggend tot 23 uur in die aand – geen oggendsoentjies of aandwandelings nie
Hy vat meer dikwels aan sy radio's as aan jou.
Hulle praat in akronieme en Q-kodes.
Hy antwoord net op sy roepsein, nie op sy naam nie.
Hy sal 'n egskeiding begin as jy met hom probeer praat gedurende 'n kompetisie.
'n Antenne-plaas is hulle idee van 'n tuin.
Jy kan nie met hulle gesels as jy nie tenminste 150 Q-kodes ken nie.
Wanneer jy dit regkry om 'n ernstige gesprek met hom te hê, verwag hy van jou 'n QSL-kaart.
Hulle glo die Dilbert strokies is 'n dokumentêre rekord.
Niks is die waarheid as dit nie in die Radio Amateur's Handbook staan nie.

Waarom is dit beter om 'n radio te he as 'n vrou?

Radio's word nooit swanger nie.
Jy kan die radio enige dag van die maand gebruik.
'n Radio het nie 'n ma om mee rekening te hou nie.
Radio's skreeu en raas net as daar rêrig iets fout is.
Jy kan 'n vriend se radio gebruik.
'n Radio gee nie om hoeveel ander radio's jy het nie.
As jou radio rook kan jy dit laat regmaak.
Radio's gee nie om as jy ander radio's gebruik nie.
Jou radio gee nie om as jy radiotydskrifte koop nie.
Jy kan bier drink terwyl jy jou radio gebruik.
As jy verkeerde ding vir jou radio sê hoef jy nie verskoning te vra voor jy dit weer kan gebruik nie.
Jou radio sal jou nie beledig as jy dit verkeerd gebruik nie.
Die radio gee nie om as jy laat is nie.
Jy hoef nie te stort voor jy die radio gebruik nie.
As jy 'n nuwe radio kry, hoef jy nie elke maand geld vir ou radio te stuur nie.

Enige besware aangaande bogenoemde waarhede(??) kan aan Fritz Sutherland ZS6SF gerig word. Die Redaksie van Watts (ZS6SK) neem geen verantwoordelikheid vir enige gevolglike huismoles nie... 😊

Pretoria Critical Frequency and 4000 km MUF - March 2016



Long Term HF Propagation for March 2016

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 F-layer frequency for short range communications.

See also the Propagation tab at <http://www.parc.org.za/>

Courtesy Vincent ZS6BTY

C/O NELSPOORT & 801 MALMESBURY STR, WINGATE PARK, PRETORIA [S25.49.36 & E28.16.07]

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 - 30A DC Anderson Power Poles
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 - Plug-in triple sequential industrial timers
- Contact Hans at 012-333-2612 or 072-204-3991

International Radio Ham Conventions : 2016

HAM RADIO June 24 - 26, 2016
Ham Radio
Messe Friedrichshafen

The International Amateur Radio Exhibition HAM RADIO will open its doors from Friday, 24 to Sunday, 26 June 2016. This year the motto is called "Amateur Radio: On the ground, on the water and always on the air.". For more information, please visit the exhibition website at <http://www.hamradio-friedrichshafen.de/ham-en/>

Dayton Hamvention 2016
 May 20, 21 & 22, 2016

The Dayton Hamvention 2016 will be held 20 – 22 May 2016 at the Hara Arena Complex in Dayton, Ohio. For more information please visit the Hamvention 2016 website at <http://hamvention.org/>