

# Radio ZS

Volume 62 No./Nr 6

November - December 2009

November - Desember 2009



*Vertical and Horizontal Antennas  
Building Baluns  
HF Amplifiers versus Antennas*

*Amateur Radio - Communication Technology in Action*



# South African Radio League Suid-Afrikaanse Radioliga

Founded in 1925 / Gestig in 1925

The National Body for Amateur Radio In South Africa

Die Nasionale Liggaam vir Amateurradio in Suid-Afrika

Member Society of the International Amateur Radio Union, Region 1

Ledevereniging van die Internasionale Amateur Radio-unie, Streek 1

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Suid-Afrikaanse Radioliga

Radio ZS

November - December 2009

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Afrikaanse Taalversorging - George Honiball, ZS6NE

2010 SARL National Convention  
23 to 25 April 2010 in Port Elizabeth



23 April 19:00: Welcoming Spitbraai at Italian Sporting Club, Harold Road, Charlo

24 April 07:00: Registration and SARL AGM at the Nelson Mandela Metropolitan University

24 April 14:00: PIC Programming course presented by John Willisroft, ZS6EF, or DXing Think Tank by Donovan van Loggerenberg, ZS2DL, or Visit to Seaview Game Park hosted by Glen, ZS2GV, or Visit to Hightech Automotive, the home of the AC Cobra

24 April 19:00: SARL Awards banquet at Italian Sporting Club, Harold Road, Charlo (Italian menu)

25 April: 08:30 Breakfast

Front Cover / Voorblad

CQ Hou Koers from the Northern Cape. Gerhard Schultz, ZS3G, with the Voortrekkers, Stefaans van der Walt and Janco Visser [17 October]

CQ Hou Koers vanuit die Noord-Kaap. Gerhard Schultz, ZS3G, saam met die Voortrekkers, Stefaans van der Walt en Janco Visser [17 Oktober]

Contributions to Radio ZS. Radio ZS is a forum for SARL members to share their amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or e-mail are especially welcome. Material can be submitted in rtf format. Material can be mailed to The Editor, Radio ZS, PO Box 12104, Brandhof, 9324 or by e-mail to radiozs@sarl.org.za. The SARL cannot be responsible for loss or damage to any material.

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### CQ de ZS1YT

**A**ll of you, dear League Members, have most probably already noticed that Father Time is calling the shots – the end of 2009 is in its death-throws and 2010 looms menacingly over the horizon. The printed media and local shopping malls are, with their ads and displays, gearing up for the end of the year festive season buying spree. I am convinced that many of our members will prepare and plan for this occasion. I sincerely hope that the warnings, which are printed in and voiced over the news media to adhere to safe, driving practices during this very road-congested season, find an attentive ear! Many of you will be driving to holiday destinations, near and far and some will most probably be mobile on the air. Those members staying at home, I am sure, will listen out and answer an “out-of-division” visitor’s call. You could assist with instructions to the closest garage, an address, a shopping mall or, heaven forbid, the nearest hospital! Alternatively, the driver could call to break the driving monotony – a quiet repeater is not a pleasant wel-

come!

‘n Terugblik op die afgelope jaar laat my dink aan verskeie prestasies op die amateurfront. Ek dink veral aan die afgelope RTA’s regeer die land, so ook aan die BACAR-projek en die lansering van Sumbandilisat in die onlangse verlede. Dit is hierdie tipe projekte wat nie sonder die ondersteuning van radio amateurs kan slaag en plaasvind nie. Baie dankie aan almal wat ‘n positiewe bydrae tot ons stokperdjie in 2009 gelewer het.

Best wishes for the festive season and may all your expectations for the future become a reality.

Beste wense vir die Kersgety en mag al julle verwagtinge vir die toekoms ‘n werklikheid word.

Groete van hok tot hok

Rassie, ZS1YT



# Ham Pride

## Our Legacies and Traditions

By Dave Ingram, K4TWJ

*Low on Funds? Think Vertical!*



A number of newer amateur radio friends tell us they are interested in pursuing HF DXing but they are not physically or financially able to install a fancy tower and Yagi-type antenna. Is there a less expensive alternative, they ask? Yes indeed: Use a vertical antenna. "But fellow amateurs say a vertical delivers less than ideal results," is a familiar reply. Sometimes that is true. Install a basic quarter wave vertical amidst a group of close-spaced homes or buildings with its single support post driven into the earth for a ground system and performance will be poor. Install that same quarter wave vertical atop a home or building, add four precisely cut quarter wave radials drooped down between 30 and 60 degrees and performance will be quite good. Replace that (quarter wave) vertical with one of the newer style  $\frac{3}{8}$  wave or  $\frac{1}{2}$  wave verticals (the taller verticals requiring only five or six foot "spokes" for counterpoise/radials), and performance will be even better. After three years of continuous in-QSO "A versus B" comparisons, in fact, I have found a  $\frac{3}{8}$  or  $\frac{1}{2}$  wave vertical typically outperforms a quarter wave and ground post mounted vertical by approximately six or seven dB - maybe

more. Performance of that same  $\frac{3}{8}$  or  $\frac{1}{2}$  wave vertical also consistently measures only 3 dB below popular three-element "triband" beams. Further, the superb AGC system in modern HF transceivers work miraculously in equalizing signal levels. Unless a distant station actually stares at his/her rig's S meter, a difference of three dB is seldom noticeable. Yes, you can be heard and you can work the world with a GOOD and PROPERLY INSTALLED vertical antenna - especially if you have a positive "can do" mindset and operate like a pro.

What is a properly installed vertical? If it is  $\frac{1}{4}$  wave tall and must be mounted at ground level, complement it with at least four-  $\frac{1}{4}$  wave radials for each band of operation (and more radials are always better). Position the radials at 90-degree points, extending out from the vertical's base. Consider using multi conductor (rotor) cable (with wires cut for each band) to simplify burying radials. Zigzag radials only if absolutely necessary to fit available space. Remember to install the vertical (and radials) in an open area so it has plenty of room ( $\frac{1}{4}$  wavelength or more) to freely radiate

*(Continued on page 6)*

*(Ham Pride from page 5)*

and receive signals. Adding a base impedance matching coil like exemplified in Figure 1 is highly encouraged. The coil is usually two or three inches in diameter and consists of eight to 12 turns but you move its clip-adjustable tap as necessary for lowest SWR, so any coil diameter usually works fine. The (30 to 60 degree) droop in radials on a roof mounted  $\frac{1}{4}$  wave vertical, incidentally, perform the base impedance matching function of our previously mentioned coil.

As previously mentioned,  $\frac{3}{8}$  and  $\frac{1}{2}$  wave verticals noticeably outperform  $\frac{1}{4}$  wave verticals. Their feed point impedance is much greater than 50 ohms, however, so they require a special broadband base-matching network like exemplified in Figure 2. Could a regular antenna tuner be substituted here? Doubtful, I would say. It must be mounted at the antenna's base, will require retuning over different band segments, will promote undesired feed line radiation and may thus "tune" the antenna for  $\frac{1}{4}$  wave rather than  $\frac{3}{8}$  or  $\frac{1}{2}$  wave performance.

Simply described, the base-matching network consists of a 4:1 balun and a 1:1 feed line isolation choke connected between the (50 ohm) coax cable feed line and the vertical radiator. Baluns match BAL-anced antennas to Unbalanced feed lines and a vertical is an unbalanced antenna, so this device is actually a 200 ohm-to-50 ohm transforming "Un Un" (Unbalanced input to Unbalanced output device). The second device is a bifilar wound isolation

choke. It prevents undesired RF radiation from the coax cable/transmission line (quite common with non-50 ohm antennas). Such radiation can cause RF "burns" and erratic meter readings in the shack, and may also detune the vertical radiator. An optional RF choke connected directly between the antenna and ground discharges static build-up and adds lightning protection.

You can home-assemble a  $\frac{3}{8}$  or  $\frac{1}{2}$  wave vertical antenna from aluminium tubing or (less expensive) electrical conduit like used for protecting electric wires. You can even use copper wire hidden inside plastic tubing to make an "invisible" vertical. For best "quick and easy" results cut the vertical radiator for a single band between 40 and 10 metre. Use it for one or two months so you are familiar with performance, then add parallel-connected radiators for other bands. This way, you can sense if single or multiband operation is best for you and your station.

Verticals and particularly  $\frac{3}{8}$  or  $\frac{1}{2}$  wave verticals make good (and economical!) antennas for both in country and DX operations. Give one a go and join the globe-spanning fun of HF communications. 73 and here is hoping we meet on 30 or 20 metres one evening soon! Dave, K4TWJ

Special Note: Toroids and/or ferrite cores plus heavy-duty capacitors, etc., to home-assemble base-matching units for verticals are available from [www.jabdog.com](http://www.jabdog.com) and other suppliers.

Figure 1

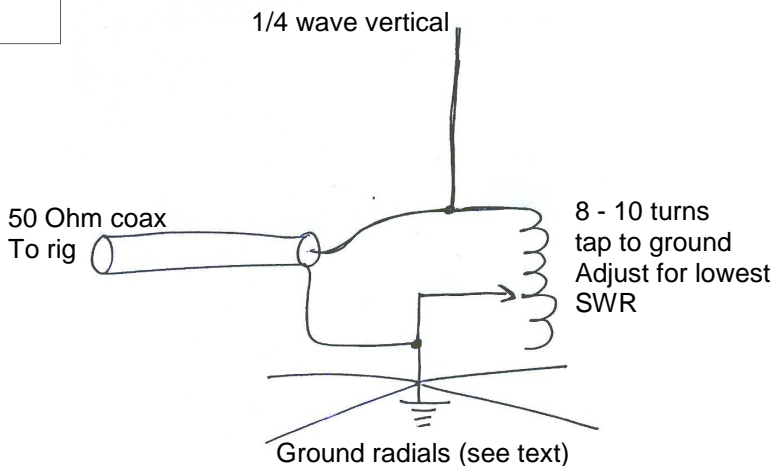
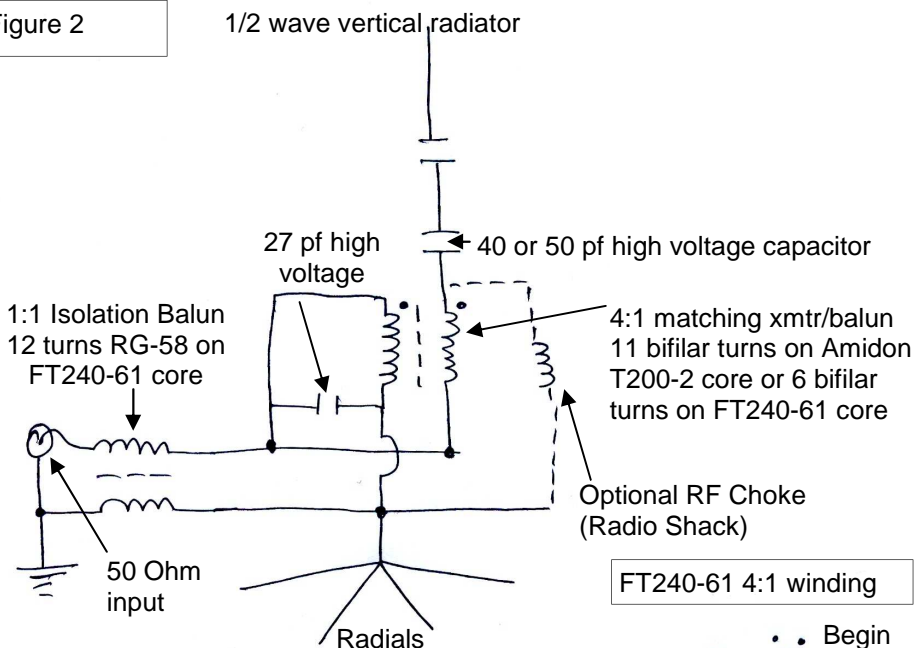
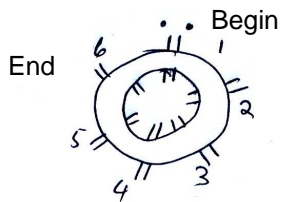


Figure 2



FT240-61 4:1 winding



# Vertical and Horizontal Antennas: A Performance Comparison

Vincent Harrison, ZS6BTY \*

**A** comment from a newly licensed ZS, about his vertical being noisy prompted a suggestion from me that he might be better off using a dipole if he could. There are a number of reasons for my comment, one of which was the reputation of verticals for picking up electrical noise.

Another reason was that although a vertical is reputed to have a low radiation angle (good for DXing), the reality is that this rarely occurs, because for that a vertical requires very good ground conductivity (like sea water) and very few verticals are mounted above sea water.

With normal soil, the radiation angle of a vertical is much higher

than over sea water and South Africa is reputed to have poor ground conductivity.

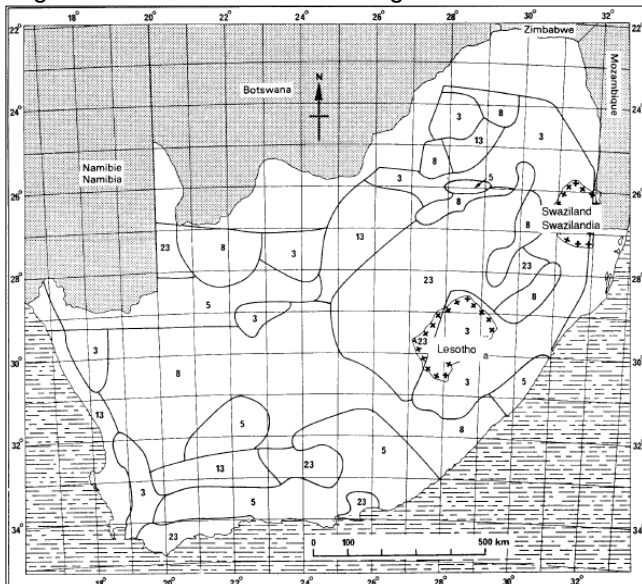
A vertical antenna has the great virtue of being omni-directional and it is often easy to disguise it where the property owner or the body corporate gets difficult about antenna installations. In such circumstances, a vertical may be the only option, but I wondered at what point it becomes worthwhile using a dipole if one is able to do so.

This article compares the low angle radiation of a typical quarter wave vertical with that of a horizontal dipole on 14 MHz by simulation with EZNEC antenna modelling software. EZNEC® is a registered trademark

of Roy Lewallen, W7EL.

The comparison of radiation angle is valid for all the HF bands when allowance is made for antenna height in wavelengths above ground. However, other issues are more important than radiation angle when it comes to the low bands. On the lower frequencies, a vertical will outperform a dipole.

*(Continued on page 9)*



Conductivity (mS/m)	Dielectric Constant	Ground Description
1	3	Extremely Poor - Cities
1	5	Very Poor - Cities, industrial
2	10	Sandy, dry
2	13	Poor: rocky, mountainous
5	13	Average: pastoral, heavy clay
6	13	Pastoral, medium hills and forestation
10	14	Pastoral rich soil
30	20	Very good: Pastoral, rich
10	80	Fresh water
5000	81	Salt water

*(Verticals vs Horizontals from page 8)*

For that reason, this article is primarily aimed at the higher frequency HF bands – 14 to 30 MHz.

### Ground Properties

To start with, one needs the ground conductivity in the area around the antenna. The ground directly under the antenna is not important. It is the area in the surrounding 2 or 3 km that matters.

What is the ground like in South Africa and around Pretoria in par-

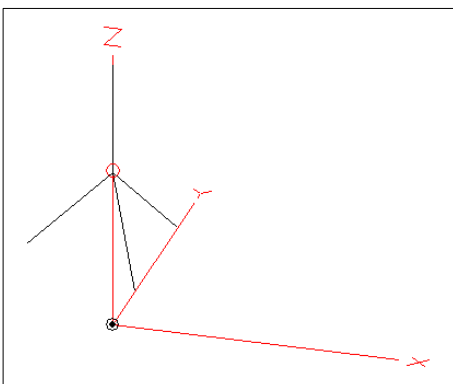
ticular? From the World Atlas of Ground Conductivity (ITU-Rec 832) comes the following map (Figure 1).

Much of Pretoria and its surroundings have a conductivity of between 3 and 5 mS/m. Table 1 shows ground properties obtained from Eznec. It seems that average might be a reasonable description of the soil in and around Pretoria.

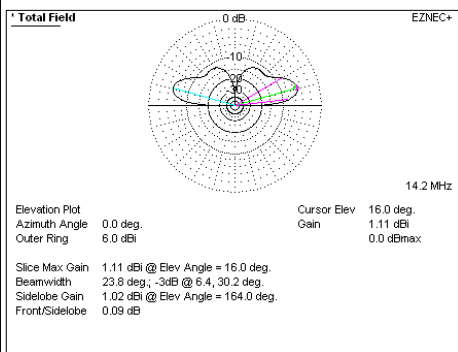
### Quarter Wave Vertical Performance

A quarter wave vertical with the base at 7 m above ground and three

*(Continued on page 10)*



**Figure 2:** Quarter Wave Vertical with three Radials



**Figure 3:** Vertical Antenna Elevation Pattern over Average Ground

(Verticals vs Horizontals from page 9)  
radials is shown in Figure 2.

Taking average ground properties in Table 1 as representative, the elevation pattern of a quarter wave vertical is shown Figure 3.

The angle of maximum radiation is  $16^\circ$  with a gain of 1,1 dBi.

Note: dBi means dB relative to an isotropic antenna. A half wave dipole has a gain of 2,1 dBi in free space.

Put the same antenna over sea water and you get the patterns of Figure 4. You can see where the vertical gets its reputation for low radiation angle, but it is only applicable over seawater. Even over good ground, the radiation angle is  $13^\circ$  with a gain of 1,4 dB.

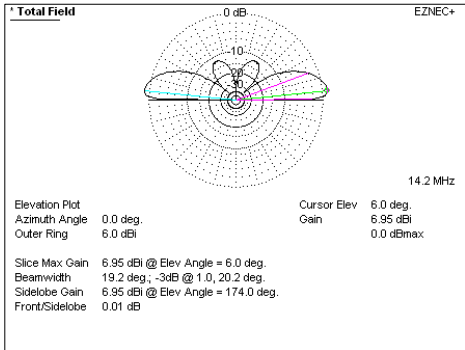


Figure 4: Vertical Antenna Elevation Pattern over Sea Water

zontal dipole at the same height as the base of the vertical has slightly better gain.

This comparison is not entirely fair to the vertical antenna however. Below  $16^\circ$  the vertical antenna's gain does not fall as rapidly as that of the dipole, so at very low angles, the vertical does in fact outperform the dipole!

Having said that, it should be noted that both are equally poor at very low angles. To improve the dipole's low angle performance it can be raised in height. This is

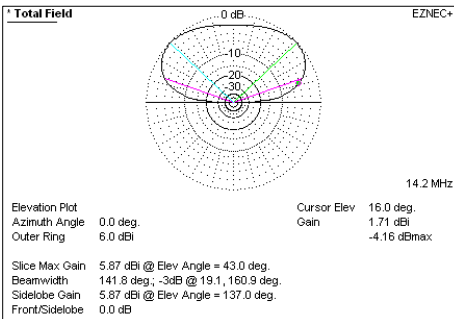


Figure 5: Horizontal Dipole at 7 m - Broadside Elevation Patterns

### Low Horizontal Dipole Performance

How does the vertical compare to a low horizontal dipole?

The elevation pattern of a dipole 7 m above ground is shown in Figure 5.

At  $16^\circ$  elevation, where the vertical has its maximum gain, the hori-

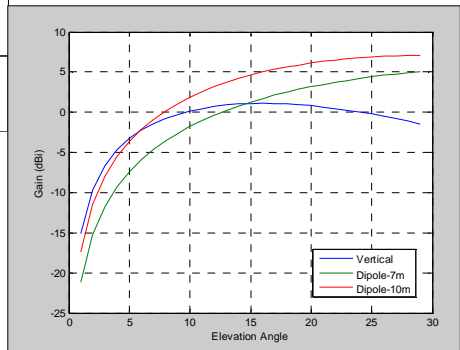


Figure 6: Low Angle Pattern Comparison

(Continued on page 11)

*(Verticals vs Horizontals from page 10)*

shown in Figure 6, where a dipole at 7 m and a dipole at 10 m above ground are compared to a vertical.

For a modest increase in height to 10 m, the dipole nearly equals the low angle performance of the vertical. It is essentially the same as the vertical at very low angles and exceeds the vertical for angles higher than 6°.

Can raising the vertical improve its performance?

The answer is “No, not significantly”.

Unlike horizontal antennas, raising the vertical higher above the ground has almost no effect. Taking the base up to 10 m, the peak radiation angle goes down to 14° and the low angle radiation improves by 1 dB.

For vertical antennas, the angle of maximum radiation is almost entirely determined by the ground properties, and not by the antenna geometry.

## Conclusion

The vertical antenna's reputation for low angle radiation is only deserved when it is mounted above seawater. Over land, the performance drops off significantly and a horizontal dipole at a relatively low height will outperform the vertical.

For the 20 m band, a dipole at a height of 7 m is better than the vertical at the peak radiation angle of from the vertical (16°). At very low angles, both are equally poor.

A modest increase in height to 10 m has the dipole only slightly worse off than the vertical at very low angles, and better than the vertical for angles above 6°.

The advantages of a vertical are that it is omni-directional and it can be mounted very close to the ground. It is also a quite easy to disguise in places that are unfriendly to antennas.

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# Amateur Radio – the most versatile hobby on earth

*Inclusive Amateur Radio  
By Victor P du Preez, ZS6EA \**

**“Amateur Radio – the most versatile hobby on earth”**, will surely have to be a hobby that is vibrant with different branches and facets, a hobby that will excite each and everyone: the young, old, blind, deaf, crippled, rich, poor, educated,

uneducated, famous and ordinary. In fact, the more obscure and remote you find yourself to be on earth, the more you will be sought after. This is the beauty of this hobby: the further away you are

*(Continued on page 12)*

*(Unified Amateur Radio from page 11)*

hiding, the more your fellow radio amateurs will hunt you down to bring you into the fold. You will not be able to hide - "Thou shalt never be alone or forsaken - ever".

I can assure you of this, and more, much more. This is the only hobby that I know of that will satisfy the abovementioned statement one hundred percent! To coin a phrase from the International Amateur Radio Union: *'Look no further, you have found the "Greatest of all Scientific Hobbies on Earth"'*. This hobby is so diverse, no one person will be able to do in one lifetime all that the hobby offers; unless of course, this lucky individual has all the financial resources and time in the world available to him. That would be paradise, heaven on earth I am sure.

Yet, the hobby is also so simple and ordinary, that one person can, as a lot of radio amateurs do, take one single branch of the hobby and spend a lifetime having fun just in that area. The intensity of the experimentation and the excitement with just that single specialty could become so engrossing that one single person could get by without knowing or caring what the remainder of the crowd are doing. I do not think there is any harm in this, however, the tendency to shoot down in flames all else that your fellow radio amateurs are enjoying and striving for, seems to get all the more real as you become more isolated in your safe little niche of the hobby.

With all the above said, and tak-

ing into account the vastness and scope available to each of us radio amateurs, how is it possible that there could ever be a lack of - *"Live and let live"*- between us? In fact, every radio amateur now in existence on this planet could have a fair share of the action, all at the same time, and this will not in the least have a compromising affect on this wonderful hobby. Actually, this is how it should be for radio amateur radio to grow to its full potential.

Exhibiting negativity, lack of respect, rudeness, selfishness and all the other evil tendencies that go hand in hand with the above (towards any one of the multitude of other lads or lasses in our hobby that is *"Doing not what I am doing"*), could only harm ourselves and indeed the hobby. This hobby is too inclusive to tolerate statements like, *"I have no place for these country chasers in my life - DXing what a farce," "I am going to drive these contesting Jack-Asses that sour my weekends, off the air."* The best one by far that I have heard, absurd but true *"Legal limit CW, punching through, the only way to go I tell you! These poor QRP clowns, no wonder CW is going down the drain!"* We are all on the same team - lose one, lose all.

We cannot afford to shy away from inclusiveness, this hobby demands of us to go out in our hordes and shout to the world: *"Come and join us! We are having the time of our lives; you do not know what you are missing! Please come over, you*

*(Continued on page 13)*

(Unified Amateur Radio from page 12)  
will be most welcome", and then we  
radio amateurs, all of us inclusive  
and as one entity, should go out and

live by our welcoming. #  
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<http://www.amateurradio.co.za/>

## Building Baluns for wire antennas and beams

by John Green, ZS1JHG \*

**B**aluns are easy to build and efficient if you build them well and use them correctly.

Building a 4:1 Balun (for an Off Centre Fed Dipole or twin feed - 300/600 ohm - antenna including some types of wire beams).

Take two equal lengths of copper wire about 300 mm long and bind them tightly together with black insulation tape. You do not want any gaps between the wires so bind very well. Hint use only new straight wire not old kinked copper wire.

For powers up to 400 Watts (PEP) use 1,8 mm or better 2,0 mm solid copper wire.

Wind the two (bifilar) copper wires 7 turns onto a round piece of ferrite rod about 90 mm long and 10 mm in diameter; connect as per the template overlay. Hint - mark both ends of one wire with masking tape.

An alternative mounting in a box is shown in the photo. This 4:1 balun has connectors for 300/450 ohm Window/Twin feed line.

The above type of Balun (1:1 ver-



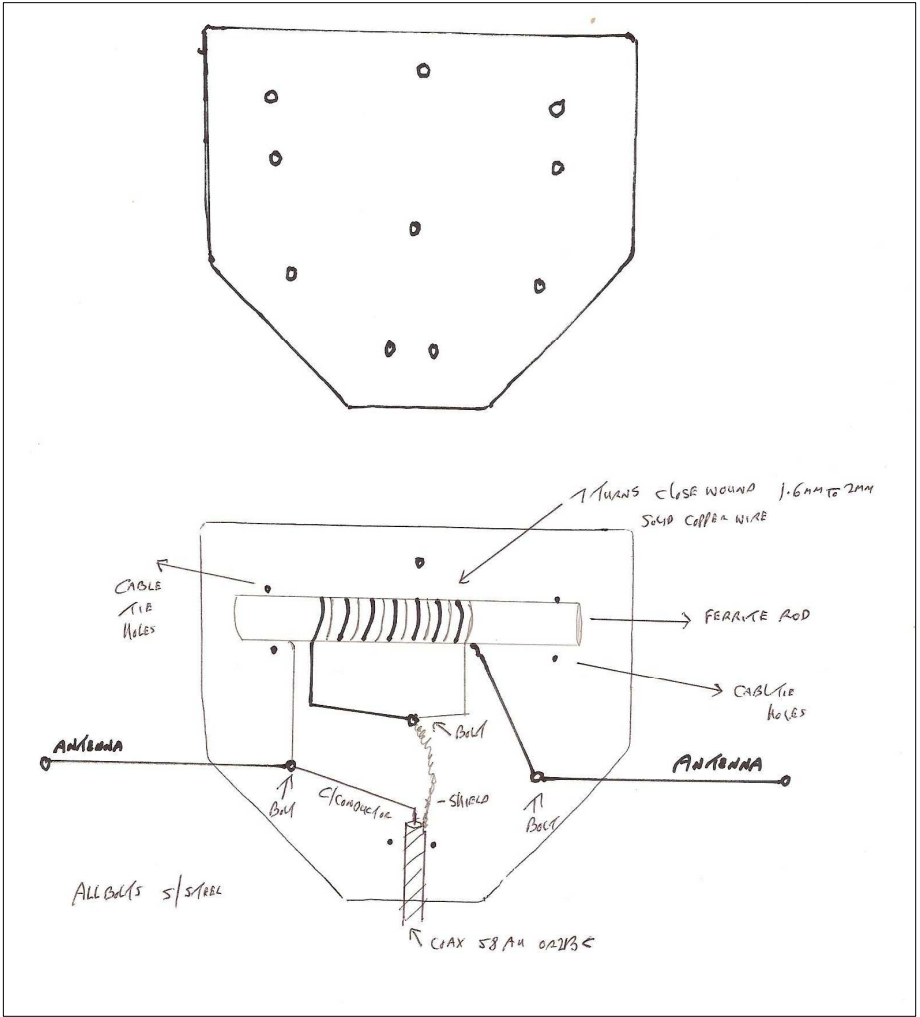
sion) recommended by Les Moxon, G6XN, in his book HF Antennas for All Locations is also used by a very well known antenna manufacturer on all its HF beams.

I have conducted tests between this balun and a commercial twin ferrite ring balun from 7 MHz to 28 MHz and got a lower SWR over the frequency range with the G6XN type balun. Recommended to keep your impedance to 25 to 300 ohm range.

To protect your balun tune up on low power and adjust your SWR first to the lowest possible reading of less than 2:1, then increase to full power.

Building a 1:1 Balun (for a Beam antenna or Dipole).

(Continued on page 14)



Template and overlay for building a combined 4:1 balun and centre connector for a wire antenna.

(Building Baluns from page 13)

The same method as for the 4:1 balun only 3 equal lengths (trifilar) of copper wire (recommended 1,8 to 2,0 mm diameter) about 300 mm long are bound tightly together with

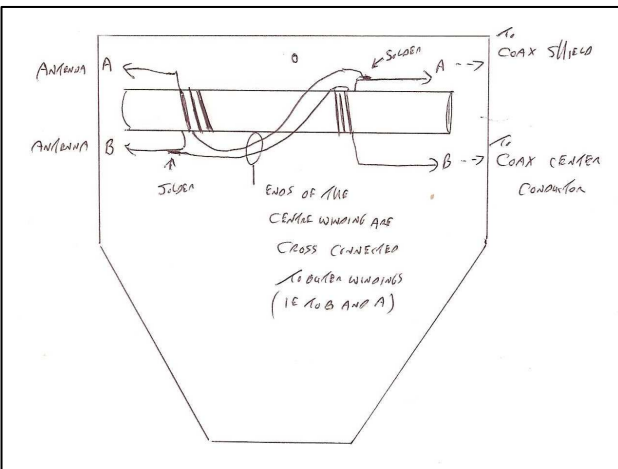
insulation tape.

Wind 7 turns onto a ferrite rod about 90 mm long (yes, it will be long enough if you close wind, see photo on page 15 of 4:1 balun, lots

(Continued on page 16)



4:1 Balun mounted in a metal enclosure with connectors for coax and 300/450 ohm Window Feed line. Note the use of plain veroboard for mounting. Plain glass fibre pcb board and or thin Perspex can also be used. The veroboard has been mounted on stand-off supports.



Template of 1:1 balun showing how the trifilar windings are connected. Note only two windings are shown, the first and the last windings.



Goodwill to all men!

(Building Baluns from page 14)  
of space left)

Just mark both ends of the three wires before you wind them onto the ferrite rod. Use masking tape and mark "A and A", "B and B", "C and C" (the centre winding).

Now close wind the three wires onto the rod 7 turns and secure the ends with insulating tape. The wire

marked "C" the centre winding is connected (soldered) to wire "B" at the beginning (turn 1) and to the wire "A" at the end (turn 7). That is to say, wires A and B are cross-connected by wire C (the centre winding).

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## Die Hallicrafters Storie [deel 2]

Ean Retief, ZS1PR,\* Boland ARK

### Die Goue Jare

Na die oorlog in 1945 het al die radiovervaardigers dit moeilik gevind om tot normale produksie en bemarking terug te keer.

'n Firma wat nie vinnig 'n produk gekry het wat goed verkoop het en dus die organisasie vir 'n tyd kon "dra" nie, het nie die mas opgekom nie. Collins is gedra deur 'n lug tot grond UHF-senderontvanger vir vliegtoe en het hulle groot mark op die ou end in die lugvaartindustrie gekry. Anders as wat meeste radio amateurs dink was Collins se amateur radio produkte nooit werklik 'n groot deel van die firma se produksie nie, terwyl hulle minimale wins daarmee gemaak het, maar dit was goeie publisiteit.

Collins was duur, en die gemiddelde VSA radioamateur het by een van die "groot drie" (Hallicrafters, Hammarlund of National) sy apparaat gekoop. In 1946 het Hal-

In this two-part series, Ean Retief, discusses the origin and history of the Hallicrafter radio's. Read about William ("Bill") Halligan, the man behind the Hallicrafters.

Here in South Africa, many a model S-20R, S-40B and S-28 were to be found in a radio shack.



licrafters 'n nuwe aanleg aan die westekant van Chicago geopen en ook die leuse "The Radio Man's Radio" begin gebruik.

In 1947 het die S-38, die "beginner se radio" verskyn. Dit was populêr as 'n goedkoop maar heel aanvaarbare radio vir 'n kortgolfluis-

(Na bladsy 17)

*(Hallicrafters vanaf bladsy 16)*

teraar en baie het in die vyftiger en sestiger jare gedien as die eerste ontvanger vir jong radio amateurs met 'n tekort aan fondse.

Die S-40A en S-40B het gevolg, wat goeie eenvoudige ontvangers was en in 1948 het die produksie van die SX-42 begin. Dit was 'n groot maar besonder mooi stel en het ook die "nuwe" 88 – 108 MHz FM-band gedek. Dit was 'n dubbel-doel stel, naamlik 'n goeie kortgolfontvanger maar ook 'n mediumgolf- en FM-radio vir huishoudelike gebruik.

Die volgende jaar het die SX-62 verskyn. Dit was 'n verbeterde SX-42 met 'n liniêre wyserplaat, eerder as die halfmaan van die SX-42. Die kabinet was ook mooier en het beter as die SX-42 in 'n woonvertrek gelyk.

Die SX-73 het in 1952 verskyn, gemik op die professionele kommersiële mark, as teenvoeter vir die Hammarlund SP-600 ("Super-Pro"). Dieselfde jaar het die HT-20 sender ook verskyn wat maklike skakeling tussen bande gehad het.

In 1954 verskyn die SX-88 wat beskou word as een van die beste ontvangers in die wêreld van daardie tyd. Dit was gemik op die gebruiker wat die beste wou hê ongeag die prys en is vandag nog gesog onder versamelaars.

Vanaf die laat veertiger tot laat vyftiger jare het Hallicrafters ook beeldradiostelle, hoëtrouapparaat en huishoudelike AM en FM-ontvangers vervaardig en bemark, maar dit was nie 'n groot sukses nie.

Nie dat die apparaat swak was nie; maar die naam was net nie buite "radiokrings" algemeen bekend nie, en VSA-kopers het geneig om eerder bekende huishoudelike name soos RCA en Zenith te koop.

Hier moet mens miskien net noem dat Bill Halligan se beleid altyd was dat die persoon wat 'n Hallicrafters radio koop, die hoogs moontlike gedeelte van die prys vir die radiokring moet betaal en nie vir die kabinet nie. Dus het Hallicrafters radios funksionele "blikbakke" gehad en niks meer nie. As mens na die advertensies vir sy huishoudelike eenhede kyk, wil hulle bietjie "goedkoop" voorkom, want hulle het meesal roomkleurige plastiekkabinette gehad, dus sou kopers, veral dames, seker meer geneig gewees het om 'n radio of TV te koop wat mooi in 'n pragtige houtkabinet vertoon. Meeste "huishoudelike" Hallicraftersprodukte is onder die naam Echophone verkoop.

Teen 1952 het Hallicrafters 2 500 werknemers gehad en is hulle ontvangers na 89 lande uitgevoer. In die verskillende aanlegte in Chicago het byna 22 000 net spoel vervaardig. Alle aanlegte was almal binne agt km van mekaar. In die vyftiger jare was die SX-101 ontvanger en die HT-32 sender die topverkopers. Bill se seun (William jr.) was toe ook op die bestuur en vermoedelik het ander familieleden ook aandeelhouing besit.

In 1958, toe hy 60 geword het, het Bill sr. gedink aan aftree en die firma verkoop. Die verkoop was vêr

*(Na bladsy 20)*

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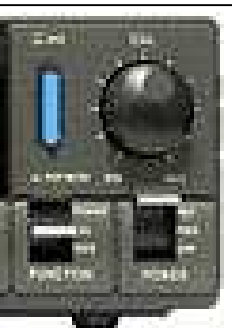
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*(Hallicrafters vanaf bladsy 17)*

gevorder toe dinge deur die mat geval het en die Halligans weer beheer oorgeneem het.

Collins was die pionier van praktiese suksesvolle klein enkelsybandtoerusting met hulle elektromeganiese filter, en het die eerste apparaat wat vir radio amateurs beskikbaar was op die mark gebring. Hallicrafters was egter nie vêr agter nie en kom in 1959 met die HT-37. Baie is vandag byna vyftig jaar later nog in gebruik, ook hier in Suid-Afrika. In Augustus vanjaar was daar in die "ruilhoeke" op die SARL-webwerf 'n SX-88/HT-37 paar aangebied.

Die laaste top ontvanger van Hallicrafters kom in 1961 op die mark. Dit was die SX-115 met sy reuse halfmaanwyserplaat. Ook vandag gesog onder versamelaars.

Veranderde Tegnologie en 'n Nuwe Eenaar

Drie jaar na Collins die KWM-1 senderontvanger die lig laat sien het en 'n jaar na die Collins KWM-2, het Hallicrafters in 1962 hulle eerste syband senderontvanger op die mark gebring, naamlik die SR-150. Vier jaar later het die 400 Watt PEP inset SR-2000 senderontvanger gevolg (Toets en beskrywing in QST van Mei 1967). Beide was goeie verkopers in die VSA, maar ek het nog nooit van 'n SR-2000 in Suider-Afrika gehoor nie. Daar was in die loop van die jaar 'n werkende SR-150 in die "ruilhoeke" aangebied.

Bill Halligan, toe reeds 67 jaar oud, het weer aan aftrede gedink.

Laat in 1966 word Hallicrafters aan Northrop Corporation verkoop en Bill se betrokkenheid (sowel as die res van die familie) by die firma kom tot 'n einde.

Northrop (hoofsaaklik 'n vliegtuigvervaardiger) het die firma verskuif na Rolling Meadows in Illinois en die firma se hoofdoel was nou om semimilitêre radios en elektroniese teenmaatreëltoerusting te vervaardig. Onder Bill Halligan se leiding was amateurradio die hooftekenmark, maar nou was dit 'n bysaak.

In 1967 het die eerste "Northrop" Hallicraftersprodukt vir die radioamateur verskyn, naamlik die SR-400 senderontvanger (QST Aug 1968). Die SR-400 stelle verhandel tans in werkende (maar ongestouerde) toestand in die VSA vir R1 800 tot R1 900. Kort na die SR-400 het die SX-133 ontvanger verskyn wat darem ook uit en uit op die radioamateurmark gemik was.

Die laaste Hallicraftersprodukt wat op groot skaal vervaardig en verkoop is was die FPM-300 senderontvanger wat in 1972 verskyn het (Beskrywing in QST van Augustus 1973). Dit was 'n transistorstel behalwe vir die finale sendstadium wat uit 'n 12BY7 drywer en twee 6KD6 buise bestaan het. Die FPM-300 was 'n goeie ontwerp maar verkope was nie so goed as wat verwag was nie.

Northrop het nou Hallicrafters na hulle Wilcox filiaal verskuif. Wilcox is veral bekend vir ongerigte radiobakens ("NDB") vir lugvaart.

*(Na bladsy 21)*

(Hallicrafters vanaf bladsy 20)



Op 4 Desember 1975 verkoop Wilcox die Hallicraftersmaatskappy aan Breaker Corporation van Texas. Hulle het produksie gestaak en die deure van Hallicrafters gesluit. Die rekords, toerusting en oorblywende onderdele is in veertien groot meubelwaens gelaai en na Grand Prairie in Texas verskuif.

Breaker het 'n klompie ou werknemers van Hallicrafters uit die sestiger en sewentiger jare aangestel, maar van dag een af was finansies 'n probleem. Die mark vir vervaardiging van amateurradioapparaat was nie meer die moeite werd nie weens die goeie pryse waarteen Japanese apparaat die land binnegekom het.

Breaker het toe probeer om die burgerbandmark te betree. Breaker het vir so vier jaar 'n klompie burgerbandstelle uit Japan en Taiwan onder die Hallicraftersnaam vervaardig, maar op 24 Augustus 1979 is Hallicrafters aan Clarence Long verkoop. Eintlik het hy net die naam en embleme gekoop.

Long het groot planne gehad. Hy het Hallicrafters na Miami verskuif en 'n groot perseel verkry. Heelwat mense is aangestel, insluitende 'n topingenieur van Bell Laboratoriums wat by die ontwikkeling van transistors betrokke was. Long se planne was gebaseer op 'n groot militêre

kontrak. Op die ou end was die VSA-weermag nie oortuig dat hulle die verlangde produk kon lewer nie en die kontrak is nooit gefinaliseer nie.

Op 1 Junie 1988, na 55 jaar, het Hallicrafters in likwidasie gegaan.

William Halligan? Wel Bill het 'n lang aftrede van meer as 25 jaar geniet. Hy het hom soos baie VSA-burgers wat aftree in die warm Floridaklimaat tuisgemaak en was gereeld op die lug en het byna legendariese status geniet. Hy is op 93 jarige leeftyd op 14 Julie 1992 in Miami Beach oorlede.

*Die fotos is deur Dennis, ZS4BS, geneem tydens sy besoek aan John Walker, ZL3IB, redakteur van "Break-In" die tydskrif van die Nieu-Seeland vereniging. John restoureer die radios.*

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# UK amateurs to take space into the classroom

Hans van de Groenendaal ZS6AKV \*

UK radio amateurs are planning a project that will take space science into the classroom with a project called FunCube. It is an educational project with the goal of enthusing and educating youngsters about radio, space, physics and electronics, by constructing and launching a small satellite, based on the CubeSat standard. The target audience consists of primary and secondary learners. An experienced team of radio amateurs and space engineering professionals, using off-the-shelf, space-qualified components and subsystems, thereby reducing project risk, schedule and cost, will build the satellite.

The CubeSat project was started by a partnership between the California Polytechnique University in San Luis Obispo and Stanford University in Palo Alto to develop a standardised space platform for academic satellite projects. It has since grown to become an international partnership of over 40 institutes that are developing Pico satellites containing scientific payloads. A standard CubeSat is a 10 cm cube with a mass of up to 1 kg.

The primary objective of FunSat is to provide an in-orbit tool for science education outreach and hands-on training in space, science and radio. This will be done through the provision of a telemetry system that is suitable for easy reception by

learners using extremely simple hand held VHF receive equipment connected to the USB port or soundcard of a computer, netbook or laptop. The satellite contains a materials science experiment, from which the learners will be able to receive telemetry data, which they can compare to the results they obtained from similar reference experiments in the classroom.

The secondary objective is to provide a linear amateur radio UHF to VHF transponder, which can be used by radio amateurs worldwide and can be used to demonstrate radio communications to learners and students of all ages.

Presently, interest in science and technology is declining among young people, a problem that we in South Africa are also acutely aware of. Most young people nowadays use radio in one of its many applications (often without knowing that they are actually using radio), but only a handful actually know about the physical fundamentals. These young people represent tomorrow's workforce, therefore, there exists an urgent need to spark interest among young people about science and technology.

The ability to track, receive telemetry information and communicate with the satellite allows for hands-on experience that will sow the seeds for a continued interest in

*(Continued on page 23)*

*(FunCube from page 22)*

all subjects science, technology, engineering and mathematics. The reason is quite simple, what we term a satellite, the educational establishment and students think of as a spacecraft and the fascination that this holds is worth every hour of effort.

Lesson plans with suitable graphics and videos are planned to help understand everything from the orbital mechanics involved and the construction techniques and materials that are required to achieve longevity in orbit.

FunSat will also include a simple but appealing payload. The objective of this materials science payload is to demonstrate the loss of heat energy by radiation from two materials with differing surface finishes.

In practice, as FunCube passes through the illuminated sector of its orbit, its surfaces will absorb energy from the sun. The amount of energy absorbed and the specific areas that experience the greatest temperature rise will depend on the surface coating but also the satellite's attitude and spin rate. When the satellite passes into eclipse, all of its surfaces will be in darkness and energy will be lost primarily due to the surface coatings. Therefore, the most accurate results from this experiment will be achieved as FunCube



The illustration shows the amateur radio caravan that is fully equipped with amateur radio equipment. The caravan is taken to schools around the UK to demonstrate how much fun amateur radio can be in learning more about science.

passes from eclipse through its 'sunrise' into full illumination.

As the orbit planned for the UK is close to the South African time zone, learners here will also be able to participate in some of the FunCube science projects.

Technical manager for the project, Graham Shirville, G3VZV, said that it is planned to have the satellite complete around October 2010. It is still early days to finalise a launch opportunity but he said, "I am confident that we will find a suitable

*(Continued on page 24)*

(FunCube from page 23)  
launch opportunity. If it comes to the point of having to pay for the launch we will raise funds by public subscription."

Currently there is at least one CubeSat project on the cards in South Africa.

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## Amateur Radio in Space

By Eddie Leighton, ZS6BNE \*

A lot has been happening on the satellite scene recently. SumbandilaSat was launched, tested various times by South African radio amateurs and released to different parts of the world on scheduled times. The "Drop out" problem has been experienced worldwide with various explanations for its causes. Many a recording has been made and shared amongst the international satellite community. Initially it was thought to be a deviation problem, then a power problem but there was not always concrete evidence to prove it beyond any doubt. The satellite would react differently under different conditions. The latest argument is that the CTCSS tones required to access the FM Transponder might be the cause. In a high QRM environment, which a busy pass most likely will, experience, the drop out problem seemed to be more prevalent. In a quieter, controlled environment with spaces between transmissions, i.e., the tail is allowed to end, the drop out problem is minimised. Still more tests need to be done.

In the meantime, the beacon

seems to have been "Lost" and has not been heard. The crew at the ground control station in Stellenbosch still have a lot of commissioning to do on the satellite and so amateur radio activities over South Africa are presently limited. Fortunately, access has been given to the satellite while out of range of South Africa, that international Radio Amateurs can get experience in using SumbandilaSat, OSCAR number SO-67! As far as I can gather there have only been a few tests done by South African radio amateurs on the parrot repeater. The access tone is different to that of the transponder. The quality on the parrot is exceptionally good and could possibly be accessible with the minimum of equipment. Not much opportunity was available recently to do much testing in this regard.

AO-7 has been providing a lot of excitement recently. All the practice and discussing "Half duplex" and Doppler paid dividends! Dean, ZD8DC, was calling, working half duplex from Ascension Island. We were all listening and scanning the downlink. Eddie, ZS6BNE, heard a

*(Continued on page 25)*

*(Amateur Radio in Space from page 24)*

faint SSB signal around 145,942 MHz and called Dean, it could only be him. He called giving Dean sufficient time to tune for the downlink and they made contact! Reports and 73's were exchanged. Pierre, ZS6BB, called and made a contact, then Andre, ZS2BK, two minutes later Andre, ZS2ACP, and then Keith, ZS6TW. Very professionally done!

Dean, ZD8DC



What is "Half Duplex?"

Pierre, ZS6BB, summed it up quite well. "Gents, we need to agree on a procedure whereby, we can work portable stations that are limited to using half duplex radios on the linear transponder satellites, without having to rely on the use of CAT control and still enabling the use of SSB and/or CW. The procedure needs to be simple yet effective. The half-duplex station must transmit on a fixed uplink frequency of 432,145 MHz at all times. Any frequency within the pass band could be used, but 432,145 MHz happens to be in

**November - December 2009**

the centre of the pass band. It is imperative that a half-duplex station calls "CQ" often and repeatedly, pausing only to tune the downlink, listening for replies. The portable station will have to tune from 145,940 to 145,960 MHz listening for replies. The half-duplex station must actively search for stations replying to his CQ, after contact has been made with the calling station only slight corrections of the downlink frequency will be required to correct for Doppler. It might be an idea to announce during the CQ that the station is "half duplex, fixed uplink" to alert the other users to the fact that they must track his downlink and not the last station as we normally do. All the other stations must find the calling half-duplex station's downlink and net on that frequency and thereafter remain locked to the half-duplex station's downlink. The first station to respond to the CQ will also have to give fairly long calls until contact has established thus giving enough time for the half duplex station to find the correct downlink, thereafter it should be easy, all stations must follow the half duplex station's downlink. I guess "Round Robin" QSOs are not a good idea, after each exchange, the over must go back to the half-duplex station so that he controls the frequency.

The above procedure can only work

*(Continued on page 26)*

(Continued from page 25)

if we understand that that all stations must follow and net on the half duplex stations down link frequency. Making blind calls to raise the half-duplex station must not be done as this will only create chaos and should be avoided. The half-duplex station is relying on a response to his CQ to determine his down link frequency. If anyone chooses to ignore this request they will spoil it for all the other stations wishing to work the half duplex station.”

What is Doppler?

Dean, ZD8DC, gave a good practical explanation and it deserves mention here. “There are 3 Doppler shifts: the UHF uplink, the VHF downlink and the Earth’s rotation. I have calculated the Doppler effect from the Earth’s rotation to be only about 500 Hz, and so it is negligible. For the others, if you have a Satellite tracking program, check the velocity of the Satellite. It is usually around 7,5 km/s. Taking 300 000 km/s for the speed of light/radio, the Doppler effect is  $7,5/300\ 000$  or 0,000 025, or about 10,8 kHz for 432,150, and 3,65 kHz for 145,950 (each side of the pass).

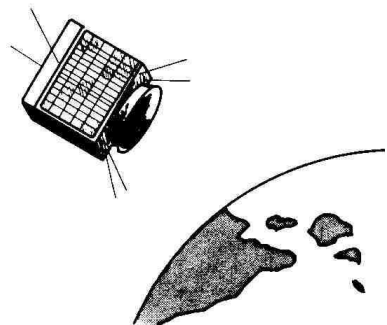
Now, if any of you are familiar with celestial navigation, the distance to the satellite is very similar to taking a celestial fix, and involves trigonometry functions. In other words, the satellite never comes straight at you, even on a 90-degree pass its distance varies with the sine of the angle to you. In addition, you do not

experience the full Doppler shift because of the angle and you will not get AOS until the Satellite is about a few degrees up.

The bottom line to all the maths I did, and verified by what I observed on our passes is that if the satellite is coming toward you, you can expect about a 7 kHz shift up on the downlink if I stay on 432,145, so you would find me around 145,957. If the satellite is moving away from you and toward me, you will have a shift of about 7 kHz down, or 145,943 kHz. As the Satellite is overhead, the shift is small, just a bit to correct for the Earth’s rotation, etc. However, we are attempting passes at opposite ends of a satellite footprint!

Therefore, I think the method of me sticking to a fixed 432,145 uplink will work. It is just a matter of knowing where to look for me on the pass...if you then tune on that spot, I should, in theory, be able to hear all of you on the same frequency (which will be different on my end) instead of different spots.

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# HF Amplifiers versus Antennas - One Radio

## Amateur's Opinion [Part 1]

By Kirk A. Kleinschmidt, NT0Z

**T**hink you need a shiny new linear amplifier to chase away your HF radio blues? Think again. What you probably need is a better antenna! Here is why....

Let us start by eliminating any thoughts of fairness and equality regarding this article's handling of the age-old philosophical struggle between amplifiers and antennas.

More than a few radio amateurs will take exception to my biased statements (common when trampling sacred cows and sneering at tradition), but if you are a typical beginning radio amateurs, you are probably wondering whether to buy an amplifier or improve your antenna system - or maybe both.

It is a logical question. You want to improve your station's signal quality, make more QSOs, work more DX stations, rack up higher contest scores and chat with others while enjoying armchair copy.

You want to know whether amplifiers are a good investment, whether they will require additional equipment and services, whether they will provide the boost in readability you have been desiring and so on.

By now you're thinking that I am an "antenna guy," and that I am here - through this article - to per-

sue you to improve your antenna system. You are right!

However, beyond the many nuts and bolts reasons detailed herein, I would like you to at least consider a few philosophical reasons to keep your power output at barefoot levels (or less!). Then, if you are not convinced, we will take a look at the cold, hard facts about amplifiers and antennas.

### Amateur Radio's Middle Path

Amateur Radio operation in the US is constituted as a radio service, with rules, regulations and goals that go beyond the interest of mere hobby operation. In becoming licensed radio amateurs, we agreed to play by those rules. One of the most important rules compels us to use the minimum transmitter power required to communicate.

That does not rule out the use of linear amplifiers, of course, but it does put a damper on their indiscriminate or habitual use. Powering your amplifier through your shack's light switch certainly violates the rule, as does running maximum legal output power when chatting with the gang across town (or when propagation clearly does not require it).

The minimum necessary power

*(Continued on page 28)*

*(Amplifier vs Antenna from page 27)*

rule is designed to protect us all. It promotes responsible, considerate operation. Try it sometime! Reduce your 100 W signal to 50 or 25 W. Thanks to years of low power operating; I know that you will maintain effective communication most of the time. You will also improve your operating skills, enjoy a greater sense of achievement and gain an intuitive sense of propagation.

By the way, the FCC's minimum necessary power rule is not suspended for contest operation, to work DXpeditions, etc. About the only open-and-shut case for the automatic use of maximum available power is for emergency communications. When someone's life is on the line, the more power the better. That kind of service is what the Amateur Radio Service is all about.

#### Skill versus Brute Force

Long before David and Goliath had their epic battle, skill has been tangling with brute force. I am sure you have your favourite analogy. Basically, it comes down to the fact that any idiot can fire up a water-cooled Voice of America-size transmitter and blurt out a whopping signal. I place radio amateurs who take this approach in the same category as the guys who screech the tires on their 1-ton pickups or water their lawns during drought emergencies. Both are equally impressive, I am sure.

On the other hand, if you align yourself with the David's of the

world, substituting skill and persistence for brute force, you will be in better company - and you will be upholding the tenets of the Amateur Radio Service.

#### The Golden Rule

Radio amateurs treading the Middle Path are concerned about others - radio amateurs, neighbours, family members, etc. They try to fit in, to get along, to accommodate a community of interests in addition to their own. They practice the Golden Rule Do unto others as you would have them do unto you (reasonable variations notwithstanding).

As radio amateurs who comprise a federally licensed emergency service, we enjoy certain protections from unreasonable local restriction. These privileges are welcome and necessary as a whole, but they can be easily abused.

Just because we can transmit a 1 500 W signal does not mean we should. Just because we can erect a 200-foot high antenna tower does not mean we should. Radio amateurs who follow the Golden Rule integrate their radio pursuits with the pursuits of others - not because they have to, but because they want to!

Governments cannot legislate common sense. That is up to us.

Okay, that is the end of my emotional pitch for restraint. If you are still tempted to reach for the power switch (the high power switch) or dig into your rainy day fund to purchase an amplifier, let us look at the facts.

*(Continued on page 29)*

*(Amplifier vs Antenna from page 28)*

### The Radio amateurs Next Door

To start, let us assume that you have a typical shack. A 100 W transceiver graces your operating desk and "talks" to a coax-fed dipole (or two) through a 300 W antenna tuner. Thanks to the tuner, your rig can happily put out full power regardless of actual antenna/feed line SWRs on the various bands you work.

You use the same setup as your "Elmer" and most of the guys in the local radio club. Uncounted thousands of radio amateurs have used similar setups over the years, so they must work pretty well, right?

Maybe. But maybe not. In fact, you might have noticed that working stations on some bands does not seem as easy as it should - especially DX stations. You might even be dreaming of solving your problem by cranking up the power. By adding a gleaming, glowing monster amp to your modest shack, you might think, those stations with once marginal copy will respond with ease.

It is a comforting image, but it is probably more fantasy than reality. Although you may not yet know it, you will likely get a lot more signal for a lot less money if you upgrade your antenna system before shelling out the bucks for an amplifier.

### The Price of Power

Let us boost our signal a step or two at a time and see how the deci-

bels stack up against the greenbacks.

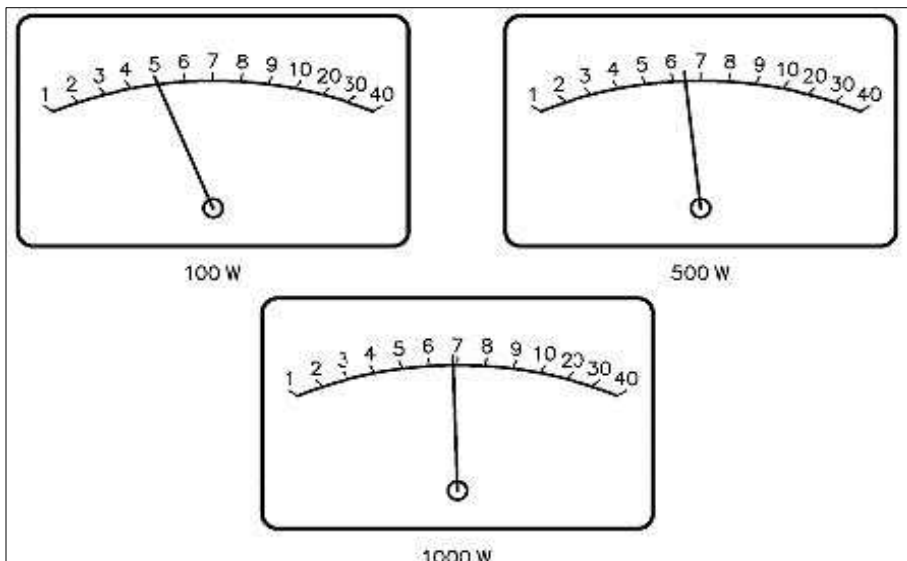
If your amplifier budget is modest, a small solid-state or single-tube amplifier will boost your 100 W barefoot signal to about 500 W. That is enough to be noticed, or so you think - but just how noticeable? Here is the law every amplifier has to measure up to. Every time you double your power output; stations that are receiving your signal hear a 3-dB increase in strength. That is half an S unit! To twitch the needle a full S unit you need to quadruple your power output (a 6-dB increase)!

The power output progression looks like this 100 W doubled to 200 W equals a 3-dB increase. Next, 200 W doubled to 400 W equals a 6-dB increase. Then, 400 W doubled to 800 W equals a 9-dB increase (exceeding the output power of our entry-level amplifier). Finally, 100 W times 10 equals 1 000 W, a 10-dB increase in power output.

Our 500 W output amplifier gives us a smidgen more than a one S-unit boost on the other end (see Figure 1). That is not much - especially when you consider the cost.

Figure 1. Spend a wad of cash on an RF power amplifier and what do you get? Let us assume that we have an average conversation in progress on a quiet band. Your current 100 W signal pushes an S meter on the receiving end to S5. In-

*(Continued on page 30)*



*(Amplifier vs Antenna from page 29)*

crease your output to 500 W and the other guy's meter might slide up to a tad more than S6 - a change he will not even notice. Turn on the 1 000 W afterburner and you will make his meter twitch almost to S7. Oh boy! Yes, he will probably notice a difference now, but he heard you well enough at S5, did he not?

### More Power

So, you want to run even more power. Using our calculations from before, boosting your signal to a kilowatt output provides a 10-dB shot in the arm. That's just under two S units on the other end - S3 to S5, S7 to S9, etc.

That is enough of a difference to be noticed, but still not enough to "burn down the barn." And by the way, the most affordable kilowatt

amplifiers cost about \$1 500. If you really go for the gusto and buy a legal-limit amplifier, your 1 500 W signal will be about 12-dB stronger than your "barefoot" transceiver. Because of the "price of power," 1 500 W is still only two S units stronger! And a legal-limit amplifier is hardly a casual purchase. It'll set your wallet back about \$2 500.

### Hidden Costs

Do not think you can get away with just an amplifier! The power output curve is often deceptive. For example, above 300 W output or so, you will need a beefier antenna tuner. Expect to spend up to \$500 for a good one.

And do not forget about the AC mains, either. You can probably get away with running a 500 W output

*(Continued on page 31)*

(Amplifier vs Antenna from page 30)

amplifier on 120 V AC, but beyond that, it is 240 V all the way. (Do not believe me? A 500 W output amplifier runs about 1 000 W input power. That is 8,5 A at 120 V. With your rig added in, that is more than 10 A. Believe me, the lights in your house will "jump" to the rhythm of your code key or your spoken words!)

Chances are good that you will not know how (or will not want to) install that 240 V line yourself, either. The materials and an electrician to install them likely will total \$300 to \$500. Many first-time amplifier users do not consider their beast's power supply requirements until they have set up the amplifier and started "browning out" the rest of their house! If this is you, you will be lucky if you do not trash your TV set or your home computer in the

process of "modulating" your 120 V power feed!

If you live in an urban setting, do not neglect the potential "public relations" costs of firing up a killer signal in the midst of all those consumer electronics devices. I know...you can legally stand on the solid rock of FCC-mandated power output limits - but be warned that it can be a lonely vigil.

To be continued ....

Used with acknowledgement to QST, November 1998.

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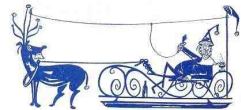


Image by Dr. QST - 7/1 in 88

## DIY Patch Box

By Peter Tottle, ZS2ABF\*

**A** practical Patch Box that works. The Patch box can be used to relay audio from one radio to another without having to use the microphone held next to a loudspeaker. I used an old Midland CB radio mike. This allows me to break in and talk or switch off the relayed signal and just talk without having to change plugs, etc. The VU meter monitors the audio in to the output part of the circuit, at the output of the step down transformer. If you are recording sounds from a radio in a computer and you



do not have enough audio output

(Continued on page 33)



*(DIY Patchbox from page 31)*

from this box, then just reverse the step down transformer. The position shown works ok for my setup. The meter, diode and potty circuit are not necessary, but can be added as a “Brag” feature. I am using this output in to a Kenwood, which has the Network type microphone socket. You may have to modify the output cable to attach a plug of the type to suit your personal equipment. The two variable pots are shown with a +- value and

can be substituted for an other suitable value that works for you. It is a nice easy to build project, and can be a useful gadget to have in your Shack.

Article used with acknowledgement to Ham-Mag 10, November 2009.

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## The Museum Piece

*Dave Gemmell, ZS6AAW, and the Old Timers*

52<sup>nd</sup> JOTA/JOTI Reports for World Report

A BIG PLEASE to all Clubs who operated JOTA stations this year. Please send in those reports of the happenings at the scout/guide station as soon as possible. The SA National Report MUST be in Geneva by 30 November 2009! Even if you only know of a station that was on the air, please give them a nudge. Just a short note is sufficient! It does not have to be a high school essay. I am actually trying to establish how many scout groups were active on 17 and 18 October 2009.

Another historical thought!

How many of you chaps recognised OM Marten, ZS6ZY, on TV? It was on Monday 2 November

**November - December 2009**



2009 at 19:30 on SABC 2 in the program entitled “South.” It was a documentary dealing with scientists and their work on the islands of Antarctica. The one, very brief, scene was OM Marten in the radio shack of SANAE Antarctic base in the 50’s. Come on Marten, how about a story or two? Especially, how the radio sonde balloons were tracked.

No kidding, dear Reader, many times technical history can “produce” a facet of radio/electronics such as an “experiment” which can be “repeated” or “performed” by any student (which means all of us!). Many times with simple or old equipment.

*(Continued on page 34)*

*(The Museum Piece from page 33)*

Secondly, the easier the experiment or project the more likely it is that some young student will try it out on their own!

Remember, experiments are the lifeblood of Amateur Radio. Learning history does not mean just memorising a whole lot of dates but includes the study of ancient methods and the comparison of them with the modern.

Resolutions?

My aim for 2010 is to complete my "One Transistor Marvel" QRP Project and make a few low power contacts [Dave Ingram, K4TWJ's transmitter in the Sept./Oct 2009 issue of Radio-ZS]. Please note this includes using a domestic portable radio with the transmitter doubling as the BFO.

My second resolution is to try and "do my bit" to have a monitoring or demonstration station on the air for special events such as science days and youth days. Anybody else to join me?

Have you made your New Year Resolutions yet! If not, how about making one to send the author of this Column some information of what is going on regarding Museums and Scouting events in your neck-of-the-woods?

My resolution for the 2010 is to try to keep Editor Dennis happy by getting this Column to him before the deadline!

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## *Silent Keys      Stil Sleutels*

They shall grow not old as we that are left grow old  
Age shall not weary them nor the years condemn  
At the going down of the sun and in the morning  
We will remember them."

Hulle word nie oud soos ons wat bly vergrys,  
Die jare sal hulle nie raak nog die tyd se eis  
En, soos die son sak of die more ontvou,  
Eer hul herinnering – ons sal onthou."

**Johannes (Jan) Gijzen ZR6ANB**

**Chrissy Williams, ZS6JX**

**Alan Martins, ZS6AUH**

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