WATTS 01 - 2009

Year 79 +1m

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 :145,725MHz 08:45 Sundays / Sondae
Relays : 1840, 3700, 7066, 10135, 14235, 51400, 438825, 1297000kHz
Activated frequencies are announced prior to bulletins
Swapshop:Live on-air after bulletin 2m and 40m
Bulletin repeats | herhalings : Mondays 19:45 on 145,725 MHz

ZR6FD logo

Drukwerk printing ZS6JPL

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VHF/UHF Antenna systems for Namibia DX-pedition – see page 4

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Next Meeting
14 Jan 2009

Time: 13:30 for 14:00
PARC Clubhouse
South Campus
University of Pretoria
SE cnr University and
Lynnwood roads

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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 6 Dec. 2008

Welcome: The chairman welcomed all present.

Present: See register; 9 members and 3 visitors. A special welcome to Sue ZS6SUE.

Apologies: 3 as per register

Personal: Ivan ZS6AUT is not well, Mike ZS6AFG is recuperating at home, Molly ZR6MOL is in Vista clinic and Brian ZR6BJS is suffering from sinus problems. Welcome back from holiday to Alméro ZS6LDP and Louise.

Minutes: The minutes of the previous meeting were accepted. Proposed by Alméro ZS6LDP and seconded by Johan ZS6JHB.

Matters Arising: None.

Correspondence: Email received from Vlasta and Ivan who are now two weeks in Kiev in the Ukraine.

Finances: Detailed report was not available due to a power failure this morning. R260 was received from subs, R200 donation from ZS6RJ, Trailer licenses at R222 and the postbox at R270 were paid during the month.

Rallies: Johan ZS6JHB reported that a major sponsorship from Total had been lost.

Fox Hunts: The fox hunt will now be held on a Sunday during January.

Flea Market: The next PARC flea market will be the end of February, and will possibly be held at PMC.

Social: The social will be after this meeting. Doréén ZR6DDB did the salads.

Talks: Signer ZS6SIG will talk on software defined radio at the February meeting.

Next meeting: The next meeting will be Wednesday, January 14, 2009. The Constructors' Awards and the Desert Island Trophy will be presented in January.

General: The meeting closed at 14:45 and the social bring-and-braai followed.

The Editor and management of PARC wish every member a happy and prosperous New Year. May you enjoy good health and your New Year resolutions come true. May your shacks be enriched with new equipment and sunspots ionize your atmosphere!

Die Redakteur en bestuur van PARC wens elke lid 'n gelukkige en voorspoedige Nuwe Jaar. Mag u goeie gesondheid geniet en u Nuwe Jaar voornemens bewaarheid word. Mag u ARKe met nuwe toerusting verryk word en sonvlekke u atmosfeer ioniseer!

Birthdays Jan
Verjaarsdae

02 Alf ZS6ABA
03 Stan ZS6SDZ
04 Mike ZS6AFG
05 Pierre ZS6PJH
06 Carmyn, daughter of Gary ZR6GK
06 Brendan ZS6BW, Son of Peter ZS6PJ
08 Darren ZR6TY, son of Selma and Joe ZS6TB
20 Errol ZR6VDR
20 Rita, lv van Sarel ZS6AC
20 Theresa, dogter van Magriet en Tobie ZS6ZX
25 Magriet, lv van Tobie ZS6ZX

Jan Anniversaries
Herdenkings

03 Magriet en Tobie ZS6ZX
07 Doreen ZR6DDB and Johan ZS6JHB (31)
09 Rita en Sarel ZS6AC (38)

Joys and Sorrows | Lief en Leed

- **Ivan ZS6AUT** is very ill and reportedly not improving
- **Doppies ZS6BAQ** is recovering at home after a successful bypass operation in ZA Hospital on 3 December.
- **Henk ZS6CS** also unexpectedly underwent a bypass operation on 15 December in Wilgers Hospital and is also back home.
- **Molly ZR6MOL** was in hospital for a while.

Diary | Dagboek (UTC times)

Jan **04** **V/UHF get-together at the QTH of Pine ZS6OB**
10-11 Hunting Lions on the Air
11 DARC 10m Contest CW/SSB 09:00-10:59
14 **PARC Wednesday evening meeting**
16-18 PEARS V/UHF Contest
17-18 Hungarian DX Contest CW/SSB 12:00-11:59
24 SARL Youth for Amateur Radio (phone) 07:00-11:00
24-25 REF Contest CW 06:00-18:00
24-25 UBA DX Contest SSB 13:00-13:00
31 Last day to submit motions or agenda items for SARL 2009 AGM

ZS6BTY holiday antenna – see p.5

Snippets | Brokkies

- **Liam, son of Vince ZS6BTY(14) passed the RAE** and obtained the call sign ZR6RAF – congratulations.
- Our **10m repeater** should be operational soon. RX is at MRK site and TX at Wonderboom. Courtesy Johan ZS6JPL.
- **Heritage Day Blockhouse Sprint :** PARC came second with 176 points. (see WATTS 10-2008 front page)
- **Sarel ZS6AC** het op 7 Desember met vakansie na die Seychelles vertrek en as S79AC die ruitverwysing LI75VP geaktiveer met 'n handstel en 'n 2-band antenna.
- **The V51 V/UHF DX-pedition** will also attempt a 2m trans-Atlantic attempt to South America - More on p.4

Email from Ivan and Vlasta:
Now we are in Kiev - Ukraine and often thinking about South Africa, ZS6PTA guys, weather and so, especialy when outside is frost. We have all info what is going on in Pretoria from Watts on ZS6PTA website.TNX a lot!
Here are results from Russian DX Contest - one of the most popular CW contest over the world. So I am proudly SA CW Operator :-)

Entry: SOSB-21 Single operator - 21 Mc Africa

Station	Claimed results:					Confirmed results:					%	%
	QSOs	Points	DXCC	Obl	Total	QSOs	Points	DXCC	Obl	Total	Pnlts	CrsChk	Unics
1 ZS6CCW	420	2594	50	41	236054	388	2262	49	40	201318	219	88	0.4
2 ZS9Z	148	970	36	26	60140	139	850	32	26	49300	75	84	1.3
3 CT3/DL3KWF	166	915	29	7	32940	152	795	28	7	27825	60	90	0
4 J28JA	101	538	26	11	19906	86	273	25	9	9282	210	80	4.9

I dont have my RIG here yet, but I believe that I will be active as UT/OK1LL very soon, but unfortunately DX propagation is not good now, specially on my favorite band - 15m. We have got new friends from Kiev Radioclub...
Best wishes to XMAS holiday and Happy New Year for You and all our friends ZS6PTA !
Ivan and Vlasta UT/OK1LL(ex ZS6CCW) ***

EME for Africa project, satellite, meteor scatter and tropo activity

Daar is al heelwat op bulletins en ons nuusbriewe gemeld oor die V51 V/UHF Dx-expedisie wat vroeg Januarie gaan plaasvind en die volgende inligting is deur Pine ZS6OB en Hal ZS6WB verskaf om lesers volledig in te lig:

"Die groep bestaan uit lede van verskillende klubs en is 'n belange groep wat dit ten doel stel om Amateur radio op BHF/UHF, ses meter TEP, meteoorstrooi, satelliet en maan-kaats aktiwiteite bevorder lokaal en internasionaal.
Beide die SARL en die klubs se belange word bevorder deur elke individu van elke betrokke klub.
Die EME for AFRICA PROJEK het deur Hal ZS6WB se toedoen sy ontstaan gehad hy het die aanvanklike projek geloots met informele Dx-ekspedisies deur Hannes ZS6JDE vanuit Malawi. Zambie en Mosambiek.
Later het Hal self vanaf Swaziland 'n formele Dx expedisie geloods Verlede jaar het Hal myself en Dick ZS6BUN 'n Dx ekspedisie na Botswana onderneem wat gereken was as die 4 e beste BHF/UHF DX ekspedisie interbasionaal.
Verskeie donasies vanuit die VSA en Europa en enkele individue lokaal het die projek gestuur tot op die vlak waar dit tans is"

The launch of an elaborate professional V/UHF DX-pedition and the participation of foreign hams is a first for RSA and southern hemisphere – and all done on a shoestring budget.
All gear belongs to the project and was accumulated over 3 years by hard work and dedication by a handful of local hams and some foreign donations.
Pine designed the trailer and was responsible for the whole mechanical infrastructure, towers, feedlines, harnesses, testing etc which he estimated took 900 man-hours mostly by himself and his helper Moses. Antennas systems built are 8x 12ele 432MHz antennas on own tower, 4x 9el 144MHz antennas on trailer tower, phasing harnesses and 1296 MHz equipment from Switzerland by HB9Q who will also participate. Another mobile tower was recently brought in by Daniel ZS6JR.
Meticulous care has been taken in the calibration and tuning of all systems.
No one has to date contributed so much to promote amateur radio locally and abroad as this handful of enthusiastic amateurs viz Pine ZS6OB, Hal ZS6WB, Wynand ZS6ARF, Sarel ZS6AC, Dan HB9Q, Dave N7BHC and not to forget generous donations and loans by Dick ZS6BUN (contributor to trailer cost), SARL, PARC, Johan ZS6JHB, Multisource, Glenn ZS2GK, American donations and Dan HB9Q. Due to various circumstances only ZS6WB, ZS6OB, ZS6AC, ZS6JR, and HB9Q will travel to Namibia.

To keep up-to-date with all VHF/UHF matters, bookmark the following ZSVHF Digest URL:
http://mailman.qth.net:80/mailman/listinfo/zsvhf

The latest expedition update received from Hal ZS6WB reads:

With the departure date for Namibia now close enough that we can count off the days on our fingers, ZS6BUN has been forced to drop out to make an emergency trip to England. Dick has been a key member of the team from the start of the planning for the VHF DXpedition and his presence in Luderitz will be sorely missed. Fortunately at the same time that Dick is dropping out, we are being joined by Daniel, ZS6JR who is a seasoned veteran of a number of HF and VHF DXpeditions to the neighbouring countries. Daniel will be taking one of his mobile towers which will be used to support the VHF antennas being used for the 144 MHz trans-Atlantic tropo attempt.

Other team members include Dan HB9CRQ (Team Leader), Dave N7BHC (Tropo Project Manager), Sarel ZS6AC (Satellite Operations), Pine ZS6OB (Antennas & EME Operations) and Hal ZS6WB. ZS6JR will also work with ZS6OB on antennas and also operate EME.

The 4 x 9 element 144 MHz EME array has been checked out on the trailer and everything is checked out and ready to go. Thanks to American generosity we were able to fit the trailer array with an azimuth/elevation rotator which will be a great help with the limited operating staff we have available. The 8 x 13 element 432 MHz EME array has been mounted on a small portable tower and will require manual azimuth rotation but an actuator has been installed for elevation control. HB9Q has shipped down the 1296 MHz EME station from Switzerland and the equipment has been placed on top of the growing pile of equipment in Pretoria waiting to be loaded for the trip. We expect to have 6M5 and 6M7JHV Yagis for 50 MHz with us for MS and hopefully EME attempts on 6m.

Dan, HB9CRQ (& Head of HB9Q) flies to South Africa on December 26th and the team forms up around 03 January. Dave, N7BHC will also be arriving on January 2nd. Current plans are to complete packing on 04 January and depart on 05 January with the trip to Luderitz anticipated to take two days of travel followed by another day to assemble the station for operation. We expect to start disassembling the station around the 15th and arrive back in Pretoria on the 18th.

We plan to operate EME primarily on 144, 432 and 1296 MHz and if time and workload permits 50 MHz. Operation on 50 & 144 MHz meteor scatter is also expected to be restricted by our available operator man-hours. We also plan to run a breakable beacon on 50.200 with an omni directional antenna in the event of a Sporadic-E opening. N7BHC will be working with several groups in South America towards a first ever trans-Atlantic QSO on 144 MHz tropo. Several stations on the east coast of South America will be taking part in this attempt including some portable operations installed in locations specifically for this purpose. Sarel, ZS6AC will be concentrating on the satellite operations. With our position on the coast we will have the opportunity to make satellite contacts into South America with stations that would not often be able to contact the African continent. Angelo, PY1UNU is helping to coordinate the satellite effort on that end.

We expect to have internet communication during the trip and provided it is available we will be using ZS-SAT and ZS VHF Digests to circulate operating schedules. Our goal is to give VHF operators all over the world the opportunity to contact a new DXCC entity and/or grid square. If many stations are calling we will keep QSO's to the minimum required, but will chat when we have the opportunity. We hope to see more African callsigns on the log on this trip. Good luck to all.

A Lightweight Mast and Antenna

Vincent Harrison ZS6BTY

This article presents the construction details of a lightweight mast with full size dipole antennas for 40 m and 80 m for use on field days and holidays. The concept is based on the American military AS-2259 tactical dipole.
The tactical dipole consists of two crossed dipoles with a common feed point on a single supporting mast in the centre.
The wires of the dipoles are laid out in a cross and they also act as guy wires for the mast. No additional stays are required.

The ends of the dipoles are tied off with light nylon rope to any convenient point like a tree, pole or part of a building. Ideally the 80 m dipole should be at right angles to the 40 m dipole, but there is plenty of leeway to fit in with what is available.

Of course the dipoles can be cut for any bands you choose. You could also use traps to increase the number of bands available to you. However, this is a lightweight construction. Too much wire in the air will buckle the mast!

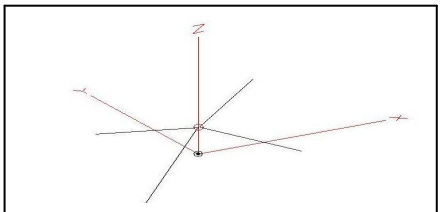


Figure1: Tactical dipole

Mast Construction
The mast is made up of six or seven sections that stack on top of each other to a total height of 6 m. The length of each section is dependent on how much space you have available for packing.
The mast sections are made of telescoping aluminium tubing. The larger tube has a diameter of 22 mm and a wall thickness of 1.2 mm. (The wall thickness is important. If it is too thick, the tubes will not fit together properly).
The inner tube has a diameter of 19 mm and it slides easily into the larger tube. You will need a 6 m length of each. The tubing is available from Eurosteel in Waltloo. You can use larger diameter tubing if you want a more sturdy construction, but you will have to check that they telescope properly. If the fit is too tight you will have problems with dirt jamming the sections together.

Before cutting the tubing work out how long the sections of the mast must be. If you use 6 sections the length per section will be about 125 cm and 7 sections will be 110 cm. Make sure that the tubes are cut the same length. If you don't, then the sections will not stack properly. Cut the 22 mm tube into 6 or 7 equal lengths. In my case there were 6 of 95 cm each. Cut the 19 mm tubes about 2 cm shorter than the 22 mm tubes.

To assemble the sections of the mast, slide a 19 mm tube into a 22 mm tube so that 20 to 30 cm protrudes. The length of 19 mm tube that protrudes must be equal for all the sections or they will not stack properly.
Use pop rivets to fix the two tubes together (The feed point).

Figure 1: Assembly of a Mast Section

The feed point
The feed point for the dipoles fits on top of the mast and is made up from made up from electrical conduit and a light box. length of 25 mm conduit slides over the top section of the
A short length of 15 mm conduit is telescoped inside the thicker 25 mm conduit, to attach it to the light box.

The PVC cement used for electrical conduit is used to glue the assembly together.The shackles are for attaching the legs of the dipoles to the eye-bolts and make for quick assembly and disassembly. There are no connections to the eye-bolts – they are only anchor points.
Banana sockets are provided for the dipoles to plug into and a BNC socket is for the coaxial cable.

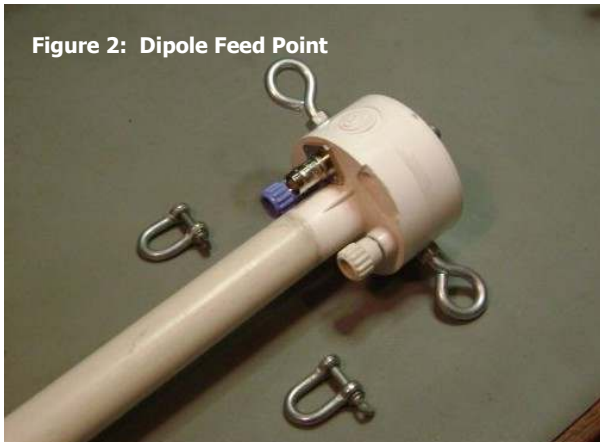


Figure 2: Dipole Feed Point

The Balun
The light box houses a 1:1 balun, which consists of thirteen turns on a 23 mm Philips 4C6 toroid core.

Figure3: The Balun

Final Assembly
To assemble the mast, lay the dipoles out on the ground and attach the centres to the feed point. Tie off the ends of the dipoles loosely to convenient anchor points.
It is important not to pull the dipoles tight at this stage.

Fit the coaxial cable to the feed point. It is good practice to support the coax with a piece of rope attached to the feed point to prevent any strain on the coax connector.
Now fit one section of the mast at a time under the feed point. There is no need to walk up the mast, just lift the bottom section and fit in another one. The dipole wires will prevent the mast from falling over.
If you find that you have pulled the dipoles too tight, then stop and slacken them off a little.
Then carry on and fit the remaining sections of the mast.
Bring the coax straight down the mast for some distance before leading it off to the rig.
Finally tighten up any slack in the dipoles and bring the foot of the mast directly below the feed point.

Bonding

Condensed from the mobiling website of K0BG - www.k0bg.com

When making connections to the bodies and frames of vehicles, you *should not* sand the finish to bare metal! There is a very good reason not to. The bodies and frames of modern vehicles are dipped in a zinc compound to retard rusting. This zinc compound is self-healing. When it is exposed to air, it oxidizes and seals scratches in its surface.

As pointed out below, there is good reason to use star washers. When properly installed, they bite through the various finish layers, and into the base metal below. Once exposed, the zinc compound seals the connection. The use on NoOx® and similar compounds really isn't necessary, but they do retard rust and oxidation of the mounting hardware. In any case, do not use these compounds under star washers, and between the mount and the vehicle's structure.

Basics

Bonding, sometimes referred to as strapping, is one of the three most important aspects of mobile radio. Antennas and wiring the others. There are several reasons for this. First is noise abatement. Bonding minimizes the leakage of RFI into (ingress) and out of (egress) the various bolted on parts of the vehicle. The exhaust and tail pipes are good examples of RFI egress. It is not uncommon to see a 20 to 30 dB drop in received noise levels once they're properly grounded.

The best mobile antenna money can buy, isn't any better than the ground plane it is mounted over. Maximizing the available ground plane is what bonding is all about. On the HF bands, our vehicles act more like a capacitance to ground, rather than a ground plane. The bonding doors and trunk lids has a lesser effect on noise, but does aid in maximizing the ground plane.

If you doubt this reasoning, here's a little experiment you can try:
Install your antenna first and use an MFJ 259B or similar antenna analyzer to measure the on-resonance input impedance of your antenna. Then follow the suggestions below and once you're done, measure it again. The resonant point will drop slightly and the input impedance will drop perhaps as much as 25 percent. This occurs because bonding lessens the ground losses which are reflected in the input impedance. The better the quality of the antenna, the more noticeable the change will be.

Here is a money saving tip. If you don't intend to properly bond your vehicle, you can save a lot of money by buying a cheap antenna. The basis behind this is simple. If ground losses are high, it doesn't make much difference how good the antenna is, because ground losses will be the largest factor in determining efficiency. If ground losses are low, the difference in efficiency between a cheap antenna, and a good one become very apparent.

Ground Straps

One of the most misunderstood concepts is the difference between DC and RF ground (neither one can be considered a ground plane). A ground strap may work perfectly as a DC ground, but at some frequency that same ground strap will make a perfect antenna! We all know that an inductor can provide a good DC ground, but look like an open circuit to RF. And that a capacitor can provide a good RF path to ground, but not a DC path. Our ground strap, like any piece of wire, has both inductive and capacitive reactances. These reactances change as the frequency changes. For any given value of reactance, as the frequency goes up, inductive reactance also goes up, but capacitive reactance goes down. When inductive reactance and capacitive reactance in any given piece of wire are equal, that wire will become an antenna, and ceases to be an RF ground. There are a few things we can do to assure both a good RF and DC ground.

One of these is to use braided wire. Not just any braided wire mind you, but one which is flat and wide. RF flows at the surface rather than through the wire, and flat braid has more surface area for any given current carrying capacity. Thus it provides less resistance to RF than an equivalent round wire. It also has more capacitive reactance which increases the self resonant point. Flat braid is also much more flexible and less likely to fail due to repeated flexing.
The shield from RG8 works well if the length of the strap is short (under 10 inches or so). Just take care when you strip off the outer jacket that you don't cut through the shield itself. Discard any that is corroded or discolored. Flatten it out by pulling it over a rounded surface. A large, round screwdriver shaft works well for this purpose.

For longer lengths, one inch wide braid is a better choice. In any case, the requisite length shouldn't exceed 2 feet. If it has to be longer, then heavy copper flashing, like that used by roofing companies, is the material of choice. Remember, the ground strap must present a low impedance connection to effectively shunt RF to ground. This is especially true if you're using an auto-tuner, as the ground side connection must have a much lower impedance than the radiating element.

Good connections are also important to provide both a DC and RF ground path. Crimping and soldering are mandatory. Crimping provides a good mechanical connection, and soldering a good electrical one. Good quality lugs and connectors are a must too, as the cheap ones do not solder well. Where applicable, connections should have heat shrink applied over them. Although not strictly necessary, it gives a finished and professional look to your installation.

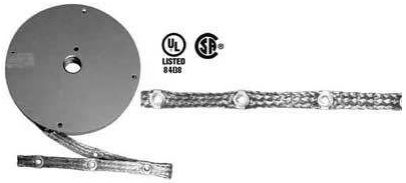
How to Make and Attach Them

There are few caveats to be aware of before you start drilling, and screwing ground straps hither and yon.
Modern vehicles have dozens of wire looms placed throughout the superstructure. This includes the A, B, and C pillars, under both door sills, inside the doors, under the carpet, and behind almost every piece of trim. *If in doubt, find out* before you drill or screw. When bonding the tail pipe for example, there are usually strengthening members, or existing mounting bolts which can be utilized. The bottom edge seam of the rocker panels is also a safe bet. Some vehicles have predrilled and tapped holes for accessories and/or for assembly purposes. They're usually metric which will necessitate a trip to the hardware store. What's more, they're safer than drilling into panels unless you know for certain, nothing is behind them.

While you're at the hardware store, pick up a supply of star (serrated) lock washers. The preferred type have both internal and external teeth, but are not always available in the smaller sizes. Standard lock washers (the split type) aren't worth the effort.

I typically use two sizes of lugs; ones with a 1/4 inch bolt hole, and ones with a #10 screw hole. I use the lugs with a 1/4 hole when I'm attaching to an existing bolt, and the #10 ones for everything else. If you can find them, use lugs with built in star washers. Some versions have an embossed serration rather than an actual star washer design, and are easier to find. The actual screw type is up to you. I use several different types. Number 10 self-tapping sheet metal screws work well if the material is 12 gauge or less. Self-drilling ones work better for thicker material. Phillips head and hex head both work well. In any case, I wouldn't buy any longer that 1/2 inch, and 3/8 is a better choice. Longer isn't going to hold better, and just might run into something you can't see.

I usually make up several 6" long straps for the doors, 10" long ones for both sides of the engine, both hinges of the hood and trunk, and at least three for the exhaust and tail pipes. Remember to crimp and solder them as crimping alone allows moisture to seep into the connection with predictable results. If the strap is subject to abrasion, cover it with heat shrink tubing.



If you're not into making your own, you might want to look at the various styles of strapping braid made by Electric motion. That's their EM2080 product in the photo. The braid is preassembled with grommets every three inches or so. A 25 foot roll is about $50 which sounds expensive, but you don't have to solder it. Simply a sheet metal screw and star washer is all you need to make a good bond.

Where to Put Them

Caution is also needed when bonding the doors, hood and trunk. You don't want to end up drilling through the lid, or into a wiring harness underneath! Keep straps away from away from hinges, door stops, and weather seals. Hoods and trunks should be strapped across both hinges.

Almost without exception nowadays, exhaust systems are made of a good grade of stainless steel. Wire brushing a small area for the lug to bite into and using stainless steel hose clamps to secure the lug has always worked for me. I have never had one come loose or need retightening. The opposite end should be attached to the underframe or unibody strut work. If the car is undercoated you may have to clean a small area. A wire wheel works well for this operation.

If your vehicle is body on frame you'll need a bunch of straps to go between the body and frame. As an example, four separate straps (one on each corner) work well for a pickup bed. Incidentally, don't rely on any factory strap to provide a good RF ground. They're meant solely for DC grounding tail lights etc. and are just inadequate for RF grounding needs. The same can be said for factory engine strapping.

Depending on the vehicle, there can be several dozen other places where ground straps will provide a benefit. These include, but are not limited to, bumpers, bumper backing plates, suspension parts, rear axles, tailgates, or virtually any bolted-on piece of hardware.

Engines are overlooked because most of them have visible ground straps (right photo). They're for DC of course, so adding wider ones can help curb ignition noise. For example, after the requisite copper foil shielding of the COP units, I still had S3 ignition noise on two bands. A short 4 inch strap attached to an unused, threaded boss in the rear head, to a firewall header bracket reduced the level to near zero.

There is an old cliché that says an ounce of prevention is worth a pound of cure. If you'll just take the time to do your bonding correctly, you'll be amply rewarded. Short cut it and the results won't be worth the effort. I spent some eight hours making and installing the straps on my vehicle. If it takes you much less, you probably didn't do it right.

Odds & Ends

There is one more aspect of bonding that merits mentioning. As stated above, even seasoned amateurs confuse DC and RF grounds. Adding insult, some amateurs believe a good DC ground is a substitute for a ground plane. Think about this for a moment. A 1/4 wave vertical antenna (loaded or not) is one half of a dipole. When used as a base station antenna, a vertical must have a number of radials under it. These radials act as the missing half of the dipole. In the case of a mobile antenna, the missing half is supplied by the vehicle, and its capacitance to the ground underneath the vehicle. Since ground loss is the single biggest factor with respect to efficiency for any vertical (especially a mobile one), maximizing the ground plane is essential. As with the number of radials, the more you have, the better. However, as the number of radials increases, the less effect each one has. This is true of bonding too, but I have to say, I've yet to find the limit.

Long Term HF Propagation Prediction for Jan. 2009

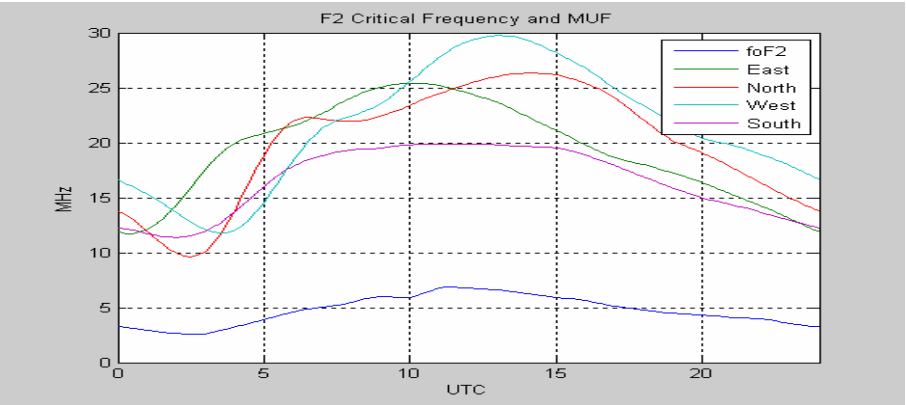
courtesy ZS6BTY

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

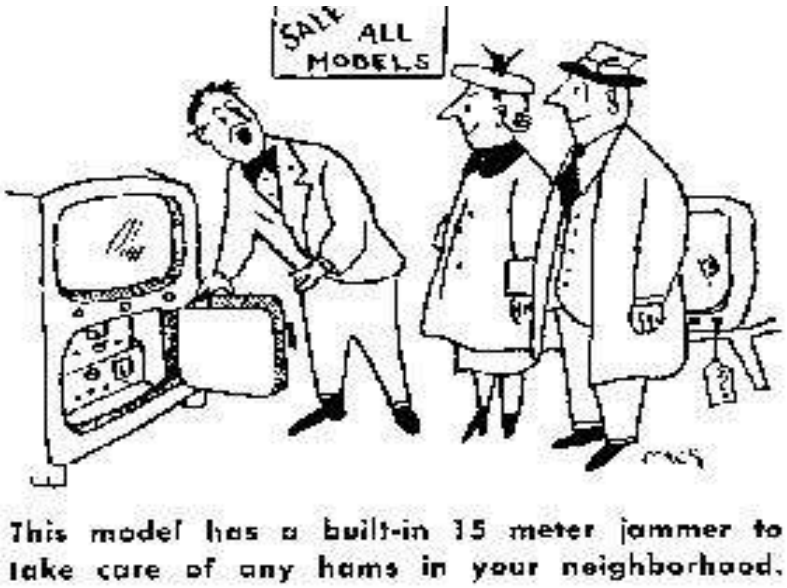
The F2 critical frequency (foF2) is the maximum frequency that will reflect when you transmit straight up. E-layer reflection is not shown.



Europe abandons fixed telco lines

According to a recent European Commission report, around a quarter of Eu households have mobile phones but no fixed line.
There are now more mobile phones than people in Europe (112 phones for every 100 people) and the EC found that the average fixed line bill was higher than the average monthly prepaid mobile package.
With cheaper cross-network calls and increasingly sophisticated handsets, businesses are also able to get by using only mobile phones.

A professor of chemistry wanted to teach his 9th grade class a lesson about the evils of liquor, so he produced an experiment that involved a glass of water, a glass of whiskey, and two worms.
"Now, class. Observe closely the worms," said the professor putting a worm first into the water. The worm in the water writhed about, happy as a worm in water could be.
The second worm, he put into the whiskey. It writhed painfully, and quickly sank to the bottom, dead as a doornail.
"Now, what lesson can we derive from this experiment?" the professor asked.
Scott, who naturally sits in back, raised his hand and wisely, responded, "Drink whiskey and you won't get worms."



Scientists at NASA have developed a gun built specifically to launch dead chickens at the windshields of airliners, military jets and the space shuttle, all traveling at maximum velocity.
The idea is to simulate the frequent incidents of collisions with airborne fowl to test the strength of the windshields.
British engineers heard about the gun and were eager to test it on the windshields of their new high speed trains. Arrangements were made.
But when the gun was fired, the engineers stood shocked as the chicken hurtled out of the barrel, crashed into the shatterproof shield, smashed it to smithereens, crashed through the control console, snapped the engineer's backrest in two and embedded itself in the back wall of the cabin.
Horrified Britons sent NASA the disastrous results of the experiment, along with the designs of the windshield, and begged the US scientists for suggestions.
NASA's response was just one sentence, "Thaw the chicken."