Dxers Unlimited middle of the week edition for Tuesday May 17 2016

By Arnie Coro

Hola amigos radioaficionados all around the world welcome to this edition of Dxers Unlimited a program that is now celebrating our 26 years on the air, always helping to promote this wonderful hobby that you and I enjoy so much: RADIO: Solar update… solar activity is LOW, and there is a BIG but quiet sunspot in sight that may become active as is moves along the solar disc…

You and I enjoy radio, we may have a wonderful time by traveling and spending a nice vacation at a remote island operating our low power amateur radio station using the Sun as the only power source or maybe, just after listening to this show, you are now getting ready to solder the last parts to the circuit board that will soon be connected to its
power supply, antenna and loudspeaker ready to bring in that magical moment of the first station heard on a homebrew radio…

Yes amigos there are more than ninety one ways that you and I can make use of our spare time and

enjoy the radio hobby… Here is now one of them that is winning more and more interest due to the challenges that it involves.

Yes, I insist on talking about operating your own amateur station using a low power transmitter, never to exceed five WATTS when operating on CW Morse Code radiotelegraphy or using one of the really amazing digital communications modes…. Or 10 WATTS when using single side band voice mode….

QRP stands for low power operation , and as I just said it is attracting a lot of attention worldwide to the extent that QRP operators have achieved really amazing results even when using simple low cost antennas and home built radios…

Let me give you a recent example…

Not too long ago I was testing a short wire antenna for the 20 meters band at the request of a ham radio friend that has very little space available to install his antennas. The antenna is just 6 meters or just 20 feet long, and fed using a nine to one broadband transformer plus a quarter wave radial ground system.

His favorite band is 20 meters , so he challenged me to design , build and test a half size wire antenna. Half size meant in this particular case, that the antenna's overall length could not exceed 6 meters… the actual length of the active element, separated with insulators by 50 centimeters from the support masts…

The antenna design called a highly efficient nine to one impedance transformation RF transformer located at the high end of the sloping wire … This antenna is fed by the already mentioned nine to one transformer , to prevent the outer part of the coaxial feed line from radiating and thus distorting the vertical radiation pattern…

Once completed, the prototype antenna was set up between two five meters high masts and carefully tested on the frequency of 14 point one megaHertz , using my PI network universal antenna tuner and standing wave ratio meter, because my friend wanted it to provide optimum performance at the low end of the 20 meters band where he operates on CW and Digital Modes.

Using advanced antenna modeling software, it was possible to estimate that this about half size antenna was down by about minus three to four decibels when compared with a full size dipole at the same height above average terrain…

Well, it then took just a few minutes to connect my 5 Watt CW rig and start calling CQ on 14060 kiloHertz the QRP calling frequencies ,and was nice to hear not one but actually three stations coming back to my call.

Later I also reviewed the Reverse Beacon Network Internet site and found out that my CQ calls were picked up by several of the skimmers stations that monitor 20 meters.

Taking a look at the power and standing wave ratio meter, I was happy to see four WATTS going to the antenna and a one point two to one standing wave ratio after tweaking the antenna tuners three knobs...

So after exchanging signal reports with the three stations, I decided to go QRT, and call my friend to tell him that his antenna was ready to be taken down from its provisional installation at my station and taken to his home to be installed.

Enrique now has two compact wire antennas, one for the 40 and 15 meters band and the new one that I built for him that works nicely on 20 but that we soon found out that by tweaking the controls on his PI

network antenna tuner , it was possible to make the new 6 meters overall length antenna to operate also on the 17 meters band…

Standby now for a few seconds…. Keep listening to Dxers Unlimited.. it will continue after a short break for a station ID… I am your host Arnie Coro , radio amateur CO2KK …

This is Radio Havana Cuba, the name of the show is Dxers Unlimited and this special edition devoted to compact antennas now continues….

Enrique the now happy owner of the new compact antenna that make possible for him to operate not only on 20 meters but also on the , 17, 15 , 12 and 10 meters bands..

He added that his other compact antenna, that is just an eleven meters long wire dipole with its two well built loading coils, also loads quite well on the 30 meters band by using his PI network antenna tuner…….

He added that by using high Q factor loading coils, it is possible to achieve good efficiency, with the antennas behaving just at a minus 3 to 4 decibels below the radiation efficiency of full size half wave dipoles….

And he underscored the fact that 3 decibels is half of an S unit, something that is extremely difficult to measure in actual practice while communicating via the ionosphere, where fading of the signals can span to one, two and even three of four S Units.

Arnie, he said, a deep fade that sends he received signal down by three S units means an eighteen decibels signal loss….so if I am using my minus three decibels gain antenna , no one can really tell the difference between it and he full size half wave dipole….

Now a bit more about the high Q factor loading coils used for center loading the half wave dipole elements… The original ones were made using two very nice 50 millimeters diameter glazed ceramic coil forms wound with the calculated number of turns to reach the required inductance…

In order to optimize the Q factor the windings were done leaving the spacing of one wire diameter between turns, something that was easily and neatly done by winding two wires in parallel and then slowly and carefully unwinding one of them…

Those two coils were used on the 40 meters band short antenna, and in order to protect them from our tropical weather, we used two layers of vinyl electricians tape, and two coats of automobile white enamel paint .

I must add that the original coils of the prototype antenna measured exactly the same inductance when the antenna was taken down to do some roofing work about a year ago…

This demonstrated that the use of PVC tape and two dips into the one gallon can of automobile enamel paint really protects the coils from the weather.

But unfortunately the glazed ceramic coil forms used in our prototype antenna were no longer found … so we had to wind new coils for making more antennas, and they had to be wound on different coil forms….

Taking a look at the characteristics of several available options, we decided to build several identical coils, using different materials that included PVC white plastic pipe of 25 millimeters and 50 millimeters diameter, polyethylene pipe of the same diameters and we also wound test coils using the polyethylene core of the RG17 heavy duty coaxial cable, that we had to heat in order to remove the center

rigid copper conductor.

After many tests using a standardized procedure, we came to the conclusion that when running transmitters with power output in the 100 Watts class and below, there was practically no difference between PVC and Polyethylene pipe sections, and also agreed that the readily available RG17 coaxial cable short ends were ideal for making high Q
coil with a good length to diameter ratio.

I would like to share with you amateur radio operators all the information compiled from our experiments, so that you can make your own short, about half size , wire dipole antennas that when properly tuned make possible to operate at locations where full size dipoles are impossible to set up.

Send your request for the SHORT HAM ANTENNAS INFORMATION PACKAGE, to inforhc at enet dot cu , or via air mail to Arnie Coro, Radio Havana Cuba, Havana , Cuba… and remember to tune in to our upcoming edition of Dxers Unlimited , your favorite radio hobby program.

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Radio Habana Cuba