WELLBROOK ALA 100 LARGE APERTURE ACTIVE LOOP

User Review by Alan Gale, G4TMV.

This review originally appeared in "Medium Wave News", the publication of the Medium Wave Circle, and has been updated for the Beaconworld website as of late 2004. Many listeners will already be familiar with the Wellbrook products, and a number, like myself, also use the excellent ALA1530 1 Metre Diameter Loop. Having already had excellent results with this smaller loop I was naturally very keen to try out its 'big brother', the ALA100 Large Aperture Broadband Loop. As with the 1530, this covers a wide frequency range of approximately 150 kHz to 30 MHz (but will work down to 50 kHz), and I was particularly keen to see how well it performed at LF - especially on the Beacon frequencies. Over a period of six months or so I tried out a number of tests and configurations, and had a good opportunity to assess its performance during both daylight and darkness hours, and also at the height of the quiet Winter DX season, and the static filled summer months. This has given me a good idea of its performance abilities at MF & LF.

SPECIFICATION: First off though, let's take a look at the specification of the aerial: Unlike the ALA1530 which uses a 1 metre diameter circular aluminium Loop to feed signal to the built in amplifier housing, the ALA100 broadband balanced gain optimised amplifier comes housed in a small plastic box, which is approximately 7.5 x 5 x 3 cm in size. This has a BNC socket mounted at one end to connect to the feeder, and two screw terminals at the other end for connection to the wire loop. To further explain about the wire loop, this is generally a length of insulated stranded wire anywhere between 8 or 18 metres in circumference, which can be supported by a tree, or wooden poles at some point away from the house and its interference fields. If space permits this could also be mounted on a rotator by using a simple 2-metre x 2-metre bamboo frame to support it. In practice this gives great latitude in the choice of its location

The ALA100 has two modes of operation, at Medium and Low frequencies the antenna performs as a high efficiency broadband Loop, at high frequencies the response is similar to that of a longwire. It is primarily designed to reduce local interference, and is suited to listeners who don't have a lot of space to erect large wire antennas. Because of its broadband nature the loop can be mounted well away from the receiver in a location where interference pick up is much lower, and because the overall loop wire length is not particularly long, it can be squeezed into even a fairly small garden.

The ALA100 is an active antenna, and this solves the problem of impedance matching to the feeder. Being a balanced antenna it responds primarily to the Magnetic Field at Medium and Low frequencies, and this ensures a high rejection of nearby electric fields. The large aperture of the Loop improves the signal pickup and optimises the signal to noise ratio, thus helping to reduce fading at HF - a big advantage over many smaller active antennas. One of the key design features of the antenna is its second order intermodulation performance, and the unit has been designed to reduce intermodulation problems to a minimum. The second and third order products are typically +77dBm (IP2) and +43dBm (IP3) respectively, this means that the level of IM products are generally below atmospheric and man made noise levels.

The ALA100 is made up of a loop/amplifier head unit together with an antenna interface and a 12v regulated power supply. RG58 50 ohm coaxial cable is used to feed the signal from the head unit to the interface, and the DC voltage the other way from the interface to the head unit. This means that the PSU and interface can be mounted inside the shack close to the receiver, which will then receive its signal from the interface by means of a one-metre length of coaxial cable. These ensure that the antenna is kept balanced and isolated from mains ground, and avoid any feeder induced currents. The wire loop itself can be mounted in a variety of ways, and provided that it's kept at least 6 metres away from any nearby buildings, can even be mounted close to ground level - an important feature for many listeners who aren't able to string long wires high up, or all over the place due to local neighbour objections or planning restrictions.

Anyway, that's basically what the ALA100 unit is, so now let's look at how it performed in action, and under all manner of conditions encountered during the test period:

ERECTING THE ANTENNA: First task was of course to find a suitable location for the antenna, and since my G5RV was already occupying the space between my aerial masts, I decided to try something simpler. Erecting the wire loop as a 'square' or 'oblong' - the more conventional method - was tried out first, but due to the uphill/downhill slope of my garden this made it difficult to find suitable anchor points.

After a bit of thought I tried mounting it as an 'inverted triangle', with the longest side at the top, one end connected to the top of the mast at the far end of the garden via a halyard, with the 'near' end again connected to the top of a fence post via a short halyard. I initially tried it with an 18-metre circumference, so this meant 8 metres along the top and two legs of 5 metres each. At the bottom of the two 5 metre legs I connected the head unit, and after a little trial and error found that a short length of 'elasticated rope' attached around a stone and taped to the head unit provided a good anchor point, and some flexibility to allow for any strong winds. This wouldn't be necessary of course if it were mounted as a 'square', since halyards could just be attached at each corner. Anyway, this worked fine, and after I'd laid all the feeder cable back to the house and connected it to the interface unit I was ready to begin testing.

WE HAVE LIFT OFF: On first switching on the power supply I thought that something must have gone wrong, as instead of the usual jumble of buzzing noises and noisy background which is usually associated with the Marconi T, I was greeted by one of the local beacons 'MCH' at Manchester Airport on 428 kHz some 34 km to the south, booming in and without any sign of the usual TV Timebase noise accompanying It!

Satisfied that everything was working okay I switched off and awaited the coming darkness so that I could see how it performed when the band was wide open. Later that night I switched on for my first test run, and was keen to see how it performed against several of my other antennas; the Marconi T, my old Indoor LW Loop, and the outdoor ALA 1530.

What was immediately noticeable was that incoming signals were well down compared with the Marconi T, and the ALA100 was hardly moving the S meter in many cases. At first I thought this must be a problem, and it took me some time to get used to the idea that the strongest signal isn't necessarily the best one. I could hear very weak beacons on the ALA100 that were barely audible on the Marconi T, and this was mainly due to the much quieter background levels and lower pick up of electrical noise, such as Colour TV Timebases and computer noises (much of which was coming from my own QTH!). The indoor Loop had always been particularly bad in this respect, and seemed to pick up all kinds of noise from the mains wiring. Next a comparison was made against the ALA 1530, no mean performer in its own right. What was noticeable here was the noise level on the ALA100 was lower, and no doubt the higher input from the larger loop was responsible for the improvement in signal to noise ratio that I noted. I ended my first night's test with a number of first time loggings and decided that I would try a 'daylight' test during the middle of the following afternoon and see how the results from that would compare.

HIGH NOON: The period around midday/early afternoon is by far the 'noisiest' for lowband dxing, with just about every conceivable electrical gadget in the area being used. Having the antenna located well outside the interference zone meant that I was able to avoid timebase QRM from local TV watchers, and even hear many of the NDBs in the nearer mainland European countries. I also found this very useful for monitoring the 136 kHz band, where much activity seems to take place during daylight hours.

CONCLUSIONS:I have now used this antenna for the last seven months with both my W & G SPM3 Selective Level Meter (my main NDB receiver) and my Sony ICF2001D. With the SPM-3 I have made lots of new loggings, particularly in the NDB Band. I really enjoy using it now, and couldn't imagine not having it; my beacon dxing enjoyment has been greatly enhanced by its superb performance. As an experiment I decided to see what effect increasing the Loop's circumference would have and the original 10 metres was replaced by larger loops of some 25 and then 40 metres circumference. I was a bit wary of producing overload and greatly reducing the unit's IP performance by doing this, but in practice no problems were noted, even when trying to winkle out weak Canadian NDBs from within the Longwave Broadcast Band. I found the greater level of signal from this larger loop gave this the edge of all my other antennas and didn't detect any overload problems on the Long and Medium Wave Bands. I live around 30 miles from

the nearest high powered MW transmitter, and the use of a larger loop could cause problems if you happened to have one on your doorstep, reducing the loop to a smaller size would no doubt cure this though. I haven't tried it yet, but I reckon that it would be possible to use an even larger Loop (60 - 80 metres?) if some form of bandpass filter was added to the front end of the amplifier, particularly in the NDB band, where the adjacent broadcasters could be greatly attenuated allowing a larger loop to pull in more of the weaker NDB signals. Likewise, some form of wavetrap could probably be added before the amplifier input if greater sensitivity was required on Medium Wave, or you wanted to reduce overload from one of the local BC transmitters. Of course the unit is designed as a broadband unit, but dedicated dxers with a specific interest in one band might find lots of useful tricks to try out with this aerial.

MW AND LW BROADCAST RECEPTION: I also made a number of tests of its performance on the Medium and Longwave Broadcast Bands using my Sony ICF 2001D. Even with the 40 Metre Loop attached I never succeeded in overloading the amplifier, though I did have to make use of the 2001D's attenuator on a number of occasions. When I could tear myself away from the T/A beacon openings for long enough I even spent a bit of time tuning around the X-Band, and found its performance here to be very good too, with a number of East Coast MW stations heard at good strengths. A good test I usually found was to try it with Atlantic 252 and its powerhouse signal, which is just 200 miles to the west of here. Even with the loop pointing straight at it no sign of cross modulation was noted I'm pleased to say. Hopefully at some later date I shall try increasing the size of the loop again and see just what size I can get away with before problems do start to occur.

OTHER POSSIBILITIES: If the ALA100 is coupled with an APU100 Antenna Phasing Unit cardioid reception could offer great possibilities for transatlantic dxers. I would definitely recommend this aerial to anyone, and even if you are unable to rotate it, it's still small and unobtrusive enough to fit in most gardens, even when mounted close to the ground. I am fortunate in having a large back garden, but I can see that it could easily be located close to a wooden fence, or behind the garden shed, or garage if space or XYL/neighbour objections to long wires is a problem for you. Its wire loop is versatile enough to be mounted in a variety of ways, square, round, oblong or delta. Ideally I would like to mount it supported in the centre in a Delta configuration so that I could rotate the base if I fancied north/south instead of east/west. Definitely a big hit with me, and now my number one antenna for chasing NDBs and LF BC Stations!

2004 UPDATE: The above review was originally written in 1997 for my old "Beacons & Utes" column, but I'm still using my ALA100 of December 2004, and I thought some sort of follow up of how I've found it over a seven year period might be worth adding to my original review.

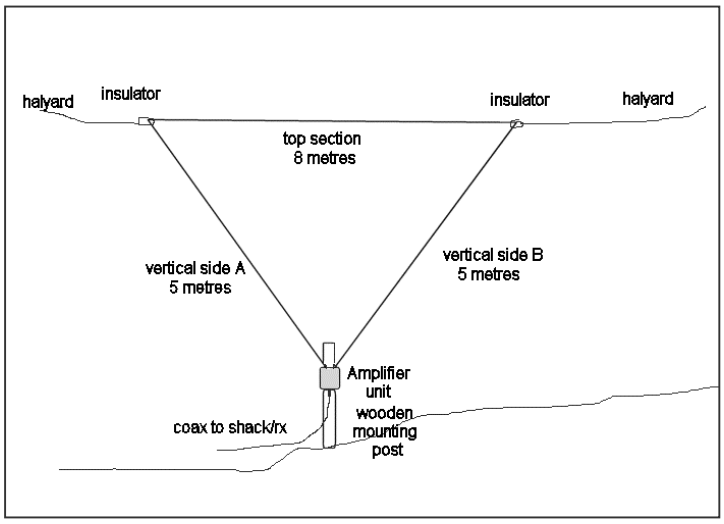
The original wire loop has been replaced a couple of time – I like to do this every few years, wire can deteriorate in our damp climate, and the elasticated rope and rock have now been replaced with a wooden stake, which has the unit taped to it with insulation tape. The top of the unit is protected from the elements by having an old plastic plant pot placed over it as a sort of hat to keep the rain water out and snow from piling up on top of it. The stake was added around 1999 after some of the local sheep decided to eat through one of the lower wires. The wooden stake now ensures these are slightly higher and less tempting to short sighted grass chewers!☺

I still think this is one of the best antennas I've ever used for NDB Dxing. When I originally installed it, we were on the upside of the last Solar Minimum, generally considered to be a prime time for LF Dxing. Throughout much of the latter years we have passed through the Maximum of Solar Cycle 23, and maxima are generally considered to be the worst times for LF enthusiasts, so I've been able to access it when the bands were at their best and worst. In spite of recent less favourable conditions I've regularly heard Canadian beacons throughout a good 9 to 10 months of the year, and the ALA100 has proved to be the best of all my aerials at receiving these. Admittedly, it is orientated at an angle of about 110/290 degrees, which makes it optimum for North America, but then again, if you install any kind of aerial which favours certain directions then this is the result you are looking to achieve, and I've certainly not been disappointed. To date I've logged some 39 Canadian, one US, and one Puerto Rican beacon on this aerial, and with the next solar minima rapidly approaching, I would expect to add quite a few more in the

coming years. A new receiver (AOR7030+) was added to the shack in 2002, and this works equally well with this loop, together they make a powerful DX chasing combination.

The ALA100 is an excellent antenna, and I doubt that I would have had such good results without it. I would certainly recommend acquiring one if you get the opportunity, and I don't think you will be disappointed with it. I like the flexibility of the wire loop, and I think with a bit of careful thought many users would find they could squeeze one in somewhere. As this is just a receiving antenna, very thin wire could be used in sensitive locations, and its very low visual impact makes it an attractive option to anyone not wanting to make a large visual impact with their aerials. When I first started using my ALA100 there where very few of them in use, but today a large number of LF Dxers in many parts of the world use them, and they are generally well thought of by their owners. ALA100s are regularly used by some of the top Canadian and US Dxers on the annual Miscou Dxpeditions in North America. Hopefully I will still be using my unit it another seven years time, and still be just as satisfied with it!

Below are some images of my ALA100 setup:



For further information about this antenna, or any of the other Wellbrook products such as the ALA 1530, UMB130, LFL1010, ALA330S, LA5030, ALA2000 or K9AY, you should contact Wellbrook at the following address, or check out their latest information at the Wellbrook website:

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