Andy Ikin of Wellbrook Communications (**sales@wellbrook.uk.com**), submitted his own test of the KAZ antenna to the Flag and Pennant Antennas group (info at http://www.egroups.com/group/FlagandPennantAntennas), and his comments are reproduced with his permission:

Approximately two weeks ago I decided to give the KAZ Delta loop a try to see if there was any improvement over my existing K9AY.

The KAZ Delta loop E-W (10 foot by 40 foot) was set up near to my K9AY E-W loop. The base of the KAZ was 1 foot off the ground, with one end connected to 20:1 impedance matching transformer, the other end was connected with a Perkins/Elmer VLTC4 Vactrol to provide remote controlled termination. Testing was conducted between 10 am and 3pm local time.

On LW, both Allouis 162 kHz and Europe No 1 183kHz yielded 17.5dB front to back ratio (F/B), whilst RTL 234kHz and Kalundborg 243kHz provided 12.5 dB F/B.

Medium wave F/B varied from 17.5dB for Paris 864kHz and Belgium 621/540kHz to 30dB for Lille 1377kHz and Flevoland 1008kHz (Flevoland 747kHz F/B was 20dB). 13dB of pre-amplification at the receiver was used to raise the signal above the receiver noise floor so that the F/B could be measured. Without pre-amplification, the low gain degraded the reception quality of a significant number of weaker stations. The average F/B for LW was 15dB and MW was 23dB. The use of a common mode feeder isolation choke next to the matching transformer made no difference to the F/B.

Comparing the above without pre-amplification to Gary Breed's K9AY (un-amplified) with remote controlled termination. The K9AY provided about 3 dB higher F/B for RTL and Kalundborg and the same F/B for Allouis and Europe No 1. The K9AY gain was typically 10dB higher on LW and 15dB higher on MW. On MW, using the K9AY the F/B varied from 20 to 40dB. The average F/B for LW was 15.8dB and MW was 30dB.

I also tried the K9AY using a KAZ size loop. On LW the F/B was the same as the ("regular") K9AY. For MW the F/B was typically 7db lower. At 19:00 hours using the K9AY I was able to null Flevoland (400kW) to provide useable reception of Cadiz (10kW). The K9AY (KAZ) null was not deep enough to provide a useable signal from Cadiz. The gain difference between the two K9AYs was about +7dB in favour of the Gary Breed K9AY. However, I don't see the performance difference between the two K9AYs as a problem, but something to be expected from two loop shapes.

My real concern was the poor F/B performance of the KAZ on MW, so was I doing something wrong or was some other factor affecting the performance? I did not compare the KAZ to another Pennant. So it would be unfair to say that the problem was just with the KAZ.

My first thoughts were just to dismiss this exercise as another failure. However, I decided to do some more experimentation; first was to increase the antenna gain by placing an amplifier directly to the loop. This would provide reverse isolation of the feeder to the antenna and so prevent any feeder induced signal degrading the F/B. The Amplifier I used was a DATONG AD270 Active Dipole Head Unit. This resulted in increasing the average LW F/B to 19dB and the MW F/B to 27dB. The down side to using the DATONG AD270 was too much gain on LW resulting in RX overload with Broadcast Stations. Next, I had the idea of using an amplifier/Vactrol combination at each end of the antenna to provide a remote control of the antenna direction together with remote termination control and feeder isolation. Unfortunately, I didn't have another AD 270, so I built two Hi impedance input Amplifiers using VMOSFETS in a differential/push-pull configuration (antenna connects directly to the FET gates via coupling caps). Using Hi impedance input Amplifiers allows for the Amplifier to shunt the Vactrol with only a minor reduction in the F/B. Each amplifier feeder and the Vactrol control line was brought back to a Control box next to the Rx. The antenna direction was achieved by simply switching one of the Amplifiers to the Rx and controlling the Vactrol at the opposite end of the antenna. This Reversible KAZ provided an average LW F/B of 18dB and the MW F/B of 28dB. Unfortunately, I didn't slug the HF gain of the VMOS amplifier, thus I did experience some intermod on MW. However, I considered that this antenna design was a success, as I had integrated four improvements to KAZ/Flag/Pennant; 20dB gain, Remote Reversibility, Remote Termination and Reverse Feeder Isolation.

Later, I abandoned the VMOS FET Antenna Amplifier in favour of a Bipolar design (a 20dB gain version used in some Wellbrook K9AYs). This Amplifier was used with a 20:1 input transformer and a DPDT relay to switch the antenna to either the Vactrol or the amplifier. With no power (12volts via the feeder) applied to the Amplifier, the Vactrol would terminate the antenna. Applying power to the Amplifier, the relay is energised to isolated Vactrol and connects the Amplifier to the antenna.

The remote Vactrol termination is controlled via a separate single wire from the Control Box, the control voltage return path is via the feeder screen. Thus, by just selecting (powering up) the amplifier, remote beam reversal is achieved. This amplifier configuration provided the same performance to the VMOS version, with an average LW F/B of 18dB and the MW F/B of 28dB without any intermod problems. This Antenna amplifier system could be expanded to several antennas with the Vactrol control line being daisy changed to the amplifiers.

A single pole multi-way switch in the Control Box is just required to select the required antenna amplifier. Alternatively, a relay box could be used at the 'Antenna Farm' to reduce the number of feeder cables coming back to the antenna control box.

An interesting feature of this antenna design is the possibility of its use with the EWE antenna and the Delta and Diamond variants of the Pennant/Flag.

To summarise;

20dB gain, Remote Reversibility, Remote Termination and Reverse feeder isolation is achievable in one design.

Although this antenna configuration is more complicated than the K9AY, I am pleased that it achieved the same performance.

Finally, I think that one issue with the Flag/Pennant antenna needs further investigation: Is reverse isolation of the feeder a key factor in achieving a good F/B? (a 20:1 transformer does not provide any reverse isolation, it only reduces capacitive coupling). Or is simply increasing the gain of the antenna before the feeder improving the F/B? If either is the case, then placing the amplifier next to or very near to the antenna may be a necessary design feature!

(ed. note) Mark Connelly has compared a Pennant antenna with a KAZ antenna, and the results can be found at the following address: **http://members.aol.com/DXerCapeCod/pennant_v_kaz.htm**.

Mark's site, **http://www.qsl.net/wa1ion/index.html** has a number of good articles and links to articles of interest to the technically inclined MW DXer.

John Bryant's Tech column articles are now available on my website: "AUDIO SWITCHING NETWORK" can be found at **http://www3.telus.net/7dxr/ircatech/audioswitch.pdf** "Is Your Coaxial Lead-In Actually an Antenna??" can be found at: **http://www3.telus.net/7dxr/ircatech/snake.pdf**