

## JW's Feedback Forum

**John Wilson takes up reader issues raised in recent months by his no prisoners approach to receiver and accessory evaluation.**

short wave magazine

Every review I submit for your approval generates follow-up topics from readers, and recent articles of mine now have several 'tails' which require some feedback from me, so here is a miscellany of loose ends which you may find of interest.

### Labour Of Love

I wrote at the end of my review of the RA17 that I would probably ruffle a few feathers and this has proved to be the case. The most vocal supporter of the RA17 is undoubtedly Michael O'Beirne and he has advocated its cause very effectively.

The major point which Michael makes, and with which I totally agree, is that a good RA17 can be very good, but after such a long production run there are receivers around which are showing signs of incipient electronic arthritis and which need to be viewed with some caution - much the same as the very shiny 40 year old car which may hide dreadful secrets under its bonnet or back axle. Should you succumb to the desire to have an RA17 or any other elderly receiver, please keep in mind that skilled assistance will almost certainly be needed, supported by a battery of quite expensive test equipment and the knowledge of how to use it.

Michael and I (and many others like us) take delight in restoration of these elderly beauties just for the feeling of achievement when it all comes together at the end, but it would be impossible to place a commercial value on such restoration, particularly considering Michael's normal rates of pay at the top end of the legal profession, or my position running a UKAS accredited EMC test house. We do it for the love of the hobby alone. If you are the same, by all means start collecting and restoring.

### Staying with the Racal theme

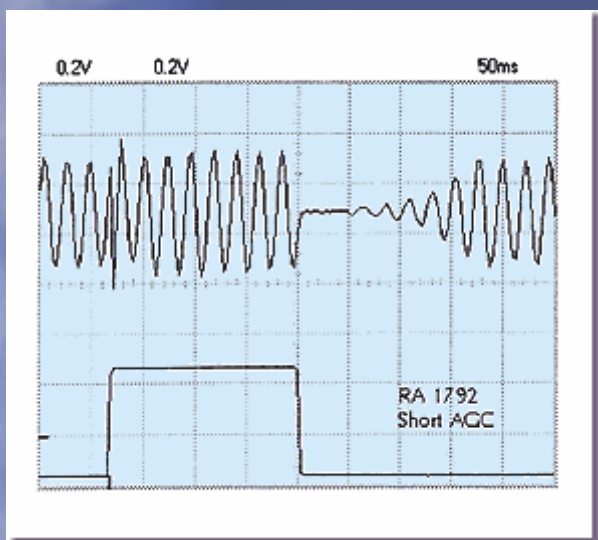
I have been fortunate to have a second loan of an RA1792 and am even more convinced that this was an outstanding piece of technology



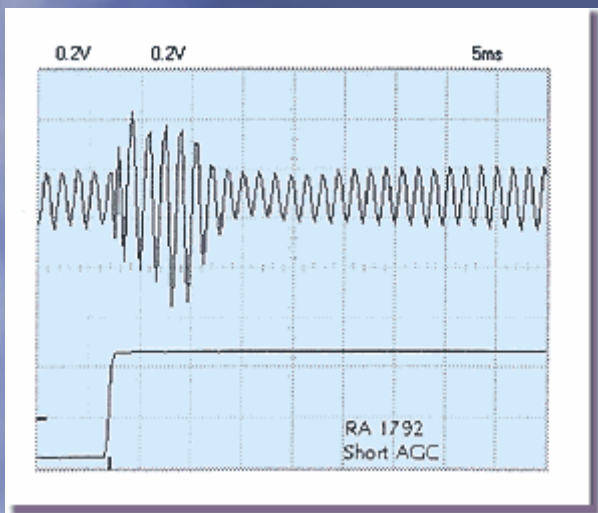
in its time, and a receiver that will show you what real h.f. performance and ergonomic design can mean. However, the stricture regarding support service applies with even more force should you acquire an RA1792 with hidden problems, and you had better be equipped with some digital data analysis capability should there be something amiss in the processor controlled functions. Bearing in mind the poor results shown by the RA17 a.g.c. system, I took the time to carry out the same tests on the RA1792, and there is a world of difference to report. There are three a.g.c. speeds selectable from the keypad, labelled 'short', 'med.' and 'long', but at first use they are very different. The short and medium decay characteristics are very similar, with a fast(ish) attack time and well controlled restoration of full gain, but when Racal use the term 'long', they mean very long indeed.

I was surprised to find when I went to locate my original review of the RA1792 that it was way back in the previous century (actually September 1998), prior to my using the a.g.c. tests I now carry out as a matter of course, so I thought I should check and see exactly how it compared to other receivers tested more recently.

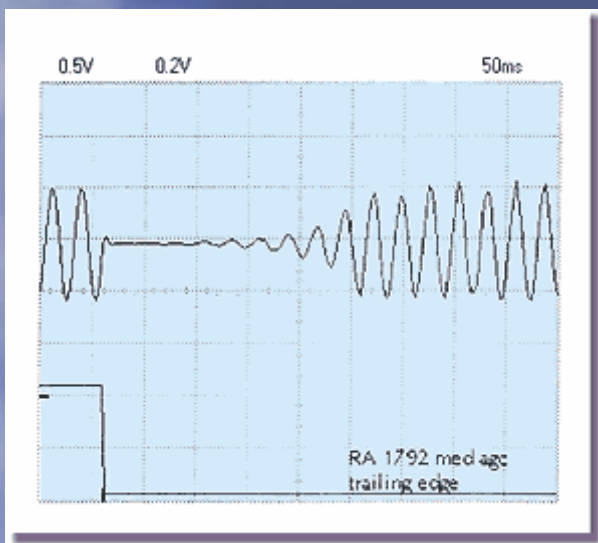
Look at **Fig. 1** and see the RA1792 audio performance using short a.g.c. decay, with near perfect gain control and smooth recovery after about 100ms of delay. However, note the 'spike' at the onset of the input burst which turned out to be the now familiar overload as shown in **Fig. 2**, the surprise being that the RA1792 behaves just like a classic valve receiver such as the 51S-1, rather than producing the usual semiconductor 'click'. **Fig. 3** shows the recovery time in the 'med.' a.g.c. setting, with about 200ms delay before the smooth gain restoration. In the 'long' a.g.c. setting Racal sneakily introduce a proper 'hang' system which keeps gain down for about 1.5s after the incoming signal ends before restoration at the same rate as seen in the 'med' setting. In real on-the-air action this long setting is just perfect for s.s.b. listening and is probably nicer than the Collins 51S-1 in this regard, hard though that is for me to confess. Racal certainly redeemed themselves after the disastrous a.g.c. in the RA17.



**Fig. 1: The RA1792 audio performance using short a.g.c. decay.**



**Fig. 2: RA1792 'spike' at the onset of the input burst.**



**Fig. 3: RA1792 recovery time in the 'med.' a.g.c. setting, with about 200ms delay.**

## Filters!

As a footnote to the 51S-1 review in which I mentioned that I was considering fitting a 6kHz Collins mechanical filter in place of the critically coupled i.f. transformers, I later learned from a friend from the olden days of a Collins enthusiasts web site [www.collinsradio.org/html/archives.html](http://www.collinsradio.org/html/archives.html) where much to my delight I found all the original service bulletins for the 51S-1, including one covering the official fitting of that very 6kHz filter with all the mounting and wiring instructions. This removed all my fears of 'unofficial' modification to my pride and joy, and as soon as I get my receiver back from the editor of SWM who has, understandably, taken a liking to it, I will carry out the modification and report to you in a later scribble. I have, incidentally, also received three seriously keen requests to 'let me know' should I ever wish to sell my 51S-1. I knew they were uncommon, but actually they seem to be quite rare in private hands and avidly sought after.

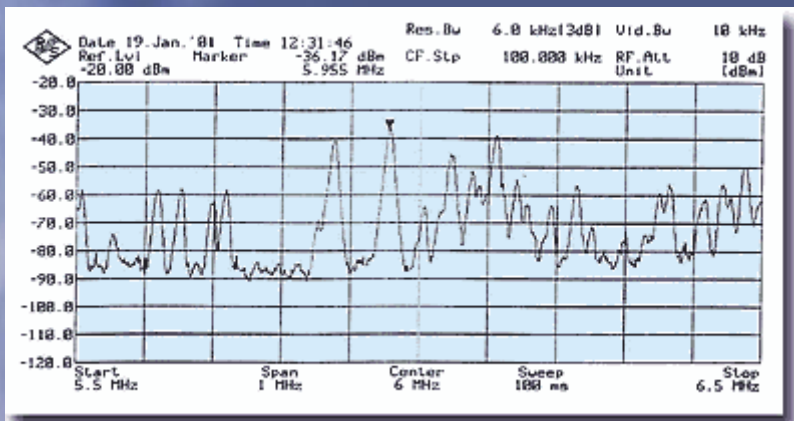
## Signal Or Noise?

Needless to say I was using the **Wellbrook ALA 1530 active loop**

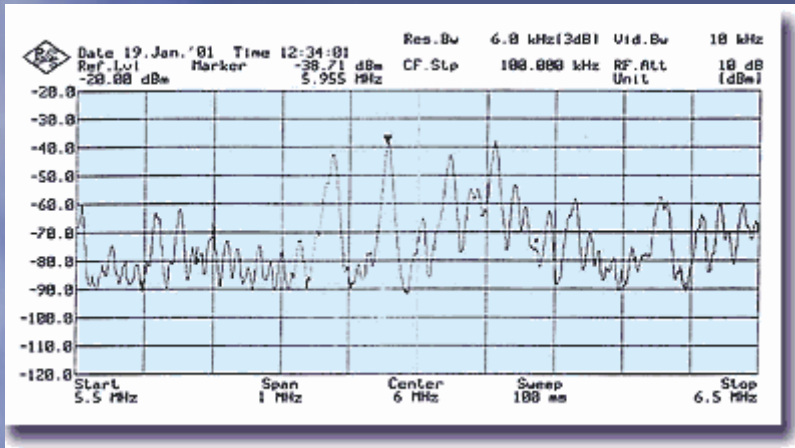
**antenna** with the RA1792, and this coincided with an E-mail from 'PeterSWL' in which Peter says "I think your article (on the Wellbrook loop) was very misleading, how could you say it was better than a 10 metre balun fed wire?".

However, Peter did say that he was comparing the ALA 1530 to his normal 23m long wire, but didn't tell me what frequencies he was listening on, nor any details of his receiver and/or any accessories, so it was difficult to give an instant answer. The comments did disturb me somewhat so I erected a new wire some 15m long in a SW to NE direction, connected my usual Martin Lynch balun at the end and started to compare results against the Wellbrook loop sitting at the end of my test bench indoors. I used the RA1792 with its antenna input connected in parallel with my Rohde & Schwarz spectrum analyser so that I could visually and audibly examine the signals to which I was listening and print the results for my (and your) information. I made dozens of measurements over a single day and could fill the rest of this magazine with pretty spectrum plots, but must limit them to just a few, but believe me, the results illustrated are consistent throughout h.f and m.f. bands.

The plots **Fig. 4** and **Fig. 5**, taken three minutes apart, show the spectrum centred on 6MHz and you can see the similarity in signal levels between the loop and the long wire. The wire gives a 3dB better signal on the marked station, but look at the noise floor and note that between signals the loop noise is at least 3dB lower than the wire, so the signals are cleaner in practice and easier to hear. The same results were obtained with spectra centred on 11 and 15MHz.

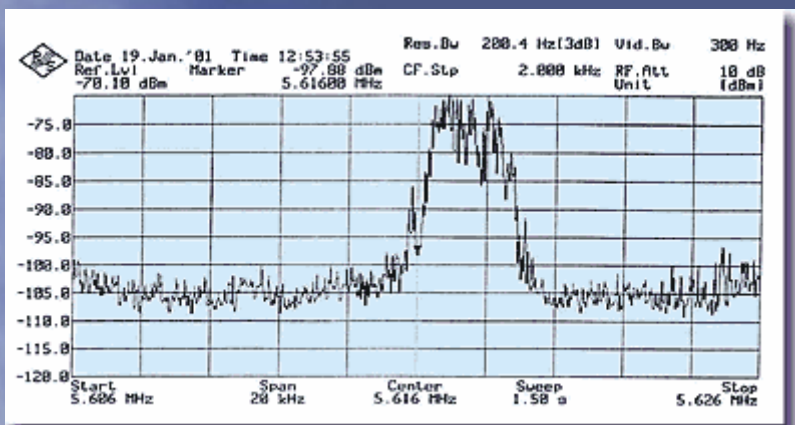


**Fig. 4: The spectrum centred on 6MHz with the 15m wire and un-un.**

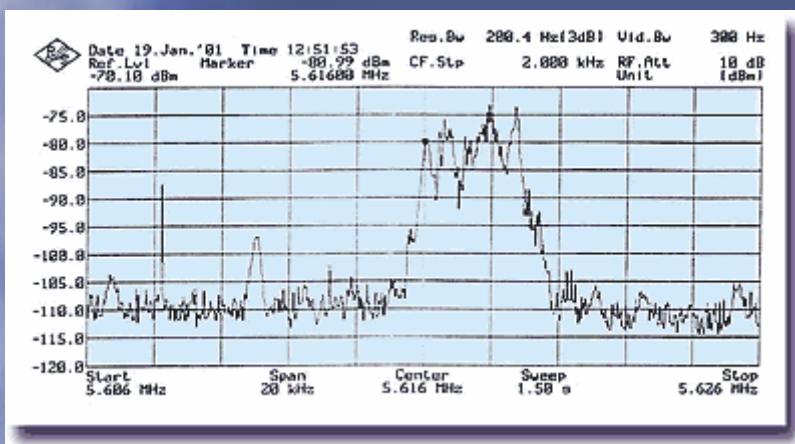


**Fig. 5: Three minutes later, the spectrum centred on 6MHz and you can see the similarity in signal levels using the ALA1530 loop.**

I regularly listen on 5.616MHz, **Fig. 6** and **Fig. 7** show the loop/wire comparison on that frequency. You can clearly see the u.s.b. signal of **Shanwick**, but take a close look at the space on each side of Shanwick. The noise level from the loop is at least 5dB lower and there are signals which the loop can hear which are buried in the noise from the wire antenna.



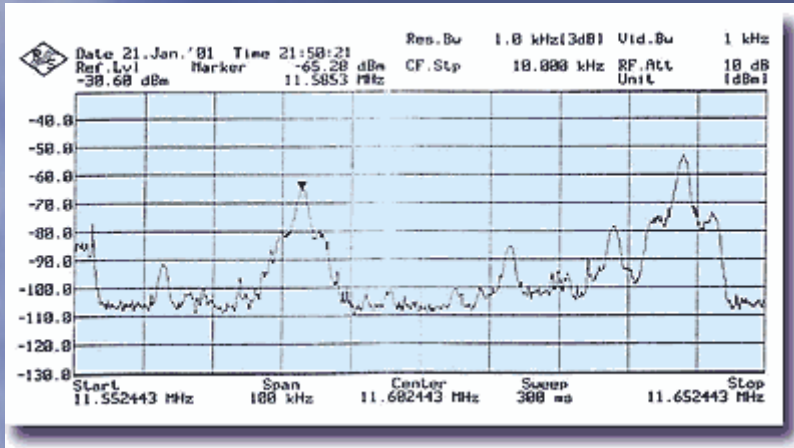
**Fig. 6: I regularly listen on 5.616MHz, here's the wire antenna's spectrum...**



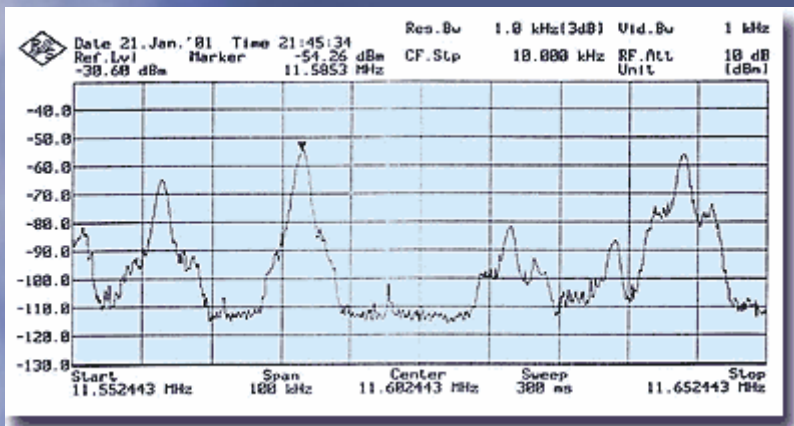
**Fig. 7: ...and here's the Wellbrook loop on 5.616MHz.**

Later in the day I took a look around 11MHz and recorded **Fig. 8** and **Fig. 9**, less than five minutes apart. You can see that in this example

the Wellbrook loop easily out-performed the long wire, and once again the lower noise level from the loop is in evidence.



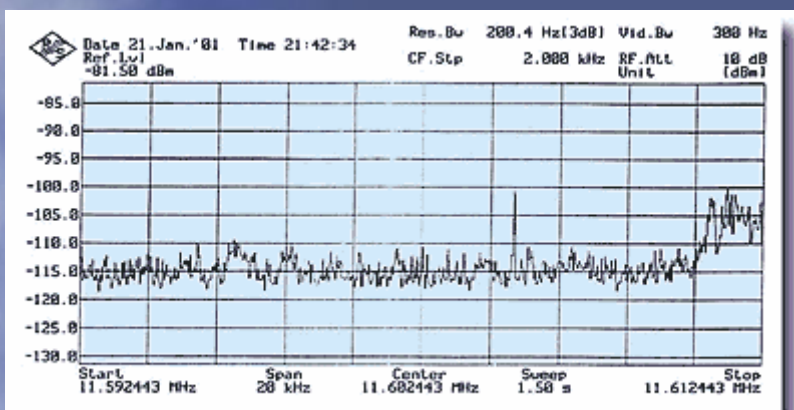
**Fig. 8: Later in the day, I took a look around 11MHz and recorded this plot.**



**Fig. 9: Less than five minutes later, you can see that in this example the Wellbrook loop easily out-performed the long wire.**

Finally to hammer home the noise level argument I tuned to the quiet 20kHz segment at the centre of the last sweeps and the results are shown in Fig. 10 and Fig.11.

Just compare the noise floor of the loop and whip and it is obvious that the loop wins hands down, and in addition to the low noise, the signal at the right hand edge of the sweep stands out above the noise much better in the loop. I rest my case M'Lud.



**Fig. 10: Initially to hammer home the noise level argument I tuned to the**

quiet 20kHz segment at the centre of the last sweeps, this is the wire.

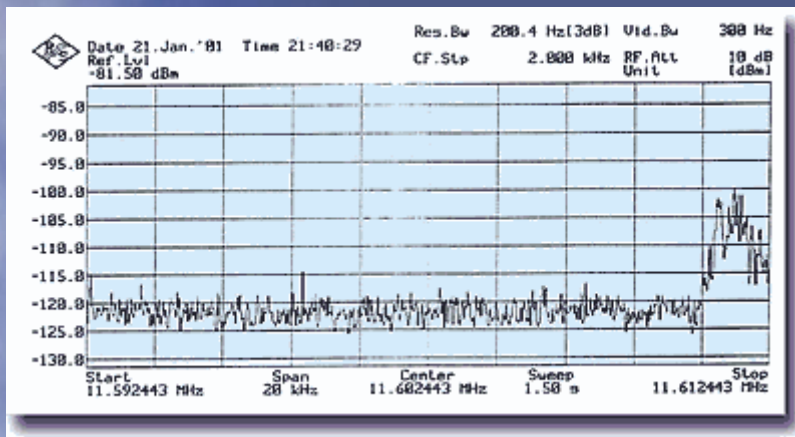


Fig. 11: The loop results here show that it is obvious that it wins hands down.

I have no doubt that Peter's long wire will provide an apparently higher signal strength on some frequencies, but the longer the wire, the higher the noise level, and this is not the same as getting a better signal to noise ratio. In any case, I was comparing the Wellbrook active loop with a typical (at £3,500?) active whip, and I only threw in the comment about the loop being better than my 10m wire because that is what I observed. Now I think I have proved the point, and remember that not every listener can string out 23m of wire, whereas almost everyone can fit a one metre loop in the garden, particularly when the loop will perform perfectly when installed close to ground. And yes, I did try the test on my favourite 909kHz where the Wellbrook gave me a signal no less than 20dB higher than the 15m of wire, with similar results on 60kHz. **Rugby** was crashing in at a wavelength of 5km with an antenna only one metre in diameter.

## Revealing Review

I must also mention that I asked Wellbrook if they could make me a totally screened loop for formal EMC measurements of radiated emissions in the 150kHz to 30MHz range, with a restriction in size to 600mm diameter since that is called for by the test standards for marine equipment, and I'm delighted to report that I now have their loop and it's performing brilliantly inside the r.f. anechoic chamber I use daily for emission measurements. It's a real pleasure to find such a keen and knowledgeable British company and I wish them well in the future. Sadly, as most of you will have noticed, more and more of the 'old' companies in the hobby radio field are falling by the wayside, but I never expected the announcement that Lowe Electronics had deserted the field in which they had a leading position when I was one of the owners of the company. I worked jolly hard to establish the Lowe range of 'HF' receivers and personally thought it a very defeatist move to sell the designs and production rights to SMC, who themselves shortly thereafter abandoned the hobby market altogether. Quo Vadis HF-150?

Let's all be thankful that a few companies are still persevering and

providing good service, as are many of my ex-staff who struck out on their own, notably David Brown up there in Cumbria and the chaps at the **Shortwave Shop** in Christchurch.

I am writing this before my review of the Rohde & Schwarz EK-07 receiver hits the street and consequently there hasn't been any feedback on that subject. I mentioned a reference to the EK-07 in an article by Willem Bos that was published on the **Radio Nederland** Website (and there's another shock; the ending of Media Network and Jonathan Marks from the airwaves). Back to the Website [www.rnw.nl/realradio/](http://www.rnw.nl/realradio/) where you will find a review by Willem Bos of the Kneisner & Doering KWZ-30 receiver; a review that offers the kind of detail you don't often see because of space limitations in a magazine. Willem's text has to be read many times before one fully understands the nuances it contains, but some points which stood out for me were firstly the acceptance of the value of carrying out third order intercept point measurements at higher levels than the "3dB above the noise floor", which Radio Nederland so vigorously promoted when they were disputing the measured results for the AR7030. Minds have clearly changed in Holland.

The second topic I found revealing was the long explanation and discussion on the use of d.s.p. filtering, not only in the receiver under test but as a general observation. I'm pleased to note that Willem refers to my own description of d.s.p. effects as 'monkey chatter', and goes on to describe how the sound of sideband splatter from a strong a.m. station through a d.s.p. system sounds like a loudspeaker with grit in the voice coil. That's a pretty accurate description, and I get the distinct feeling from this section of the review that Willem is trying his best to present a fair view, but has to express reservations about current d.s.p. performance, and reserves final judgement until the arrival of lower cost 24-bit processors which should (perhaps) improve things.

I strongly recommend that you take a look at Willem's review because it is very good reading, and there is no doubt of his authority on the subject. In case you do not know Willem Bos, he is the owner of **RF Systems**, the manufacturer of antenna systems, which is perhaps why he chose one of his own antennas for use in the review even though the makers of the receiver manufacture an antenna of their own. He has also had a long and close professional relationship with Jonathan Marks (Radio Nederland) and his products have always been highly regarded by the **World Radio and TV Handbook**, for which publication he writes most of the equipment reviews.

Finally and sadly, the death was announced in January of William (Bill) Hewlett the co-founder of Hewlett Packard with his friend David Packard who died in 1996. The story of Hewlett-Packard is well known among the r.f. engineering fraternity, from their beginnings in a garage to becoming the dominant force in r.f. test equipment and later in computer related products.



## What's In A Name?

Those of us in the industry were amazed when the newly appointed chief executive officer (c.e.o.) of Hewlett Packard announced that the test equipment division was to be re-named as Agilent Technology, one of those typically fashionable unmemorable names which mean absolutely nothing. 'HP' will always be 'HP' in the test and measurement field and it was always a name meaning confidence and accuracy. Agilent means absolutely nothing, and the inside joke in the industry is that you can only remember it as an anagram of 'G\*N\*T\*L' which is rather rude. Adding further insult to injury occurred when the said c.e.o. appeared in TV advertising standing in front of the original Hewlett-Packard garage which is preserved as a California State historical landmark. Not that HP are alone in this pursuit of meaningless names; the British Post Office has decided to become 'Consignia', the other well known German test equipment company of Wandel & Goltermann has become 'Acterna' which is equally meaningless and instantly for

Enough of this rambling. I hope to have made a start on restoring my Collins 75A-1 by the time I next scribble and will let you know of progress. I have also had an intriguing suggestion from Ian Fleming (no, not that Ian Fleming) that I should take a review look at the simple one valve receiver, several of which are available as kits, and which give excellent results. This won't please the anti boat anchor brigade, but it's certainly different. As it happens, I have in my collection a couple of HAC one valve receiver kits which are unopened and therefore unbuilt. I may just be tempted to sacrifice one of these to see how they perform (Editor's permission allowing).

## Happy listening

### **SWM**

The ALA-1530 active loop antenna can be obtained from **Wellbrook Communications,**

The Farthings,

Beulah,

Llanwrtyd Wells,

Powys,

Wales, LD5 4YD,

UK,

Phone 01591 620316

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