



Rockwell
Collins



Rockwell International



COLLINS



April 2007 Issue #16

This newsletter is sent out to all who have called in on the AWA net and who have email facility, and those who have paid for mail envelopes, with the hopes that it will encourage you to call in again and help to keep the AWA net alive and well.

Should you not want to receive any further publications of this newsletter, drop me a note and I will take you off the mailing list. Should you prefer to receive a hard copy via snail mail, please send an SASE for the period you would like to receive these and I will process for you.

Happenings:

Don't forget the date for the AWA open day at Rand Airport, Saturday 21 April. We will be there from 08:30 and running the AWA station from the venue (hopefully).

Make a note in your diaries to come and join us at the Rand Airport should you want to. Any one looking for a lift, contact us and we will see if we can organize with someone who may be coming from your area. It's always cheaper if you can get someone to share petrol costs. Hopefully this year we will manage to get the flea market on the go too with lots of antique goodies to whet your interest. Should you want a table to display your wares, please let me know well ahead of time and we can certainly see about making the flea market a success. I will keep reminding you via the newsletter.

We hope to have a few items for sale at the flea market and monies gathered from this can be used to mail out issues of the newsletter by snail mail to those who do not have email, or internet. So bring your purses along and support our cause.

ZS0AWA/CW.



Heard on frequency this last month has been Barrie ZS6AJY, Ian ZS5IAN, Clive ZS6AVP, John ZS6JBJ. Join us on Saturday afternoons at 14:00 SAST. The net is run at ± 12 wpm and so should meet the needs of all interested in CW. 7020 is the frequency.

AM Net:

Please come up and join us if you have the time and the inclination. 19:30 Wednesday evenings on 3615 and 06:00 Saturday mornings. We have changed the time now due to the band opening a bit later as the winter months approach and the sun raises it's head a bit later every day.

The Saturday morning net has been fairly well attended and we did not think that we would get the response that we have so far. Heard on frequency this month have been Gary ZS5NK, Rod ZS5RK, Don ZS5DR, Munro ZS5IN, Rad ZS6RAD, Barney ZS6BLL, Willem ZS6ALL, Denis ZR6DNS, Brian ZS2AB and yours truly ZS6ADY.

Should you happen to know of another AM net running, or come across one, let us know the times and frequencies that these happen so we can publicize them. I am sure there will be a few ardent listeners out there.

I know that Willem is involved on a Sunday morning early with AM transmissions around 3700, so there is another one to listen out for.

SSB Net:

The SSB net continues to grow in numbers as the band improves. More and more new callers coming, in and some of the guys that haven't called in for a while. So keep it up. It's the only way to make Willem work for that cup of coffee at the end of the net.

We appeal to all of you, when calling in on 40m, should you not be able to hear the control station, try letting someone know who you can hear and you know can hear the control station. It's better than doubling over everybody.

Promotions:

On Saturday 17th March, Cliff and I went off to visit the SAIEE (South African Institute of Electrical Engineers) in Observatory here in Johannesburg. It is on the original Observatory site which is the highest point, by a few cm, in the Johannesburg area. The original telescope which was installed in 1923 is still there and quite a monster it is too.

Cliff was invited by the Sandton club to join them on an outing and Cliff then invited me. The whole idea was to go and see what was there and what, if any, were the possibilities of getting some of our antique equipment, that has been donated for a museum, displayed there.

We were given a tour of the site first, which is quite overgrown at this stage, and then went on to see the display of electrical equipment etc. The only disappointing part of the tour was that they have been moved in to temporary premises while renovations of the original office blocks take place and have had to store a lot of equipment in a 40ft container. Of course Cliff and I were mainly interested in anything that related to Amateur Radio, which was not extensive, but was represented by a few items. There was a section related entirely to Trevor Wadley's inventions and of particular interest was his personal first version of the Barlow Wadley receiver. (See

Photo) Of course Wadley was not only in to Amateur radio, but radio waves themselves and his version of a distance measuring instrument (Telerometer) which was accurate to within a few cm over a 50km distance, was the forerunner to the modern day Theodolite.



The Wadley Receiver



The Telerometer

Other points of interest were the first Radar that were built in SA and placed along the coast during the war years, a Hertz clock which was used to set the clock speed on a Turbine to make sure that it was maintained at 50 Hz, quite a few different receivers in not too good a state of repair etc.

When we questioned our guide about the possibilities of getting some space for antique equipment. We were told that at this stage it would be impossible, but maybe in 2 – 5 years we may be able to do something. So once again we sit with the problem of where to go with our Antique Radio Equipment.

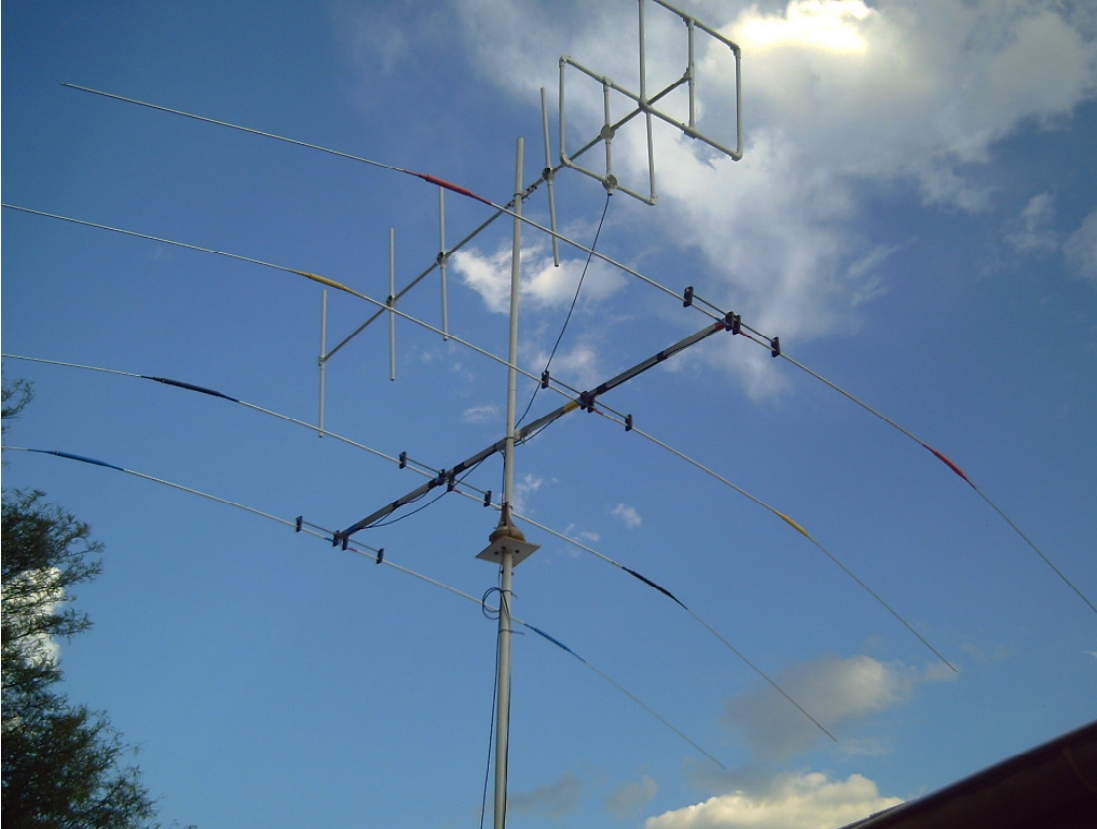
The collection of valves at the Centre is quite large and range from the earliest valves made for X-Ray to receiver valves and of course transmitter valves. Of interest was this example of the forerunner to the micro chip, which was made because of the tax that was placed on valves. So the obvious was to build a multi function valve, less tax to pay.



All in all it was a pleasant morning and well worth the time to go and visit a place that is steeped in the history of radio and the rest.

The 4 Element mid-loaded multi band array.

By Michael E Brink. ZR6BRI.



My antenna installation consists of a 4 Element HF multiband dipole and a 6 element VHF 'Quagi' mounted on a rotator. The VHF Quad / Yagi hybrid uses an active quad radiator, a quad reflector and 4 vertical Yagi directors to give a 12 dBI gain. The design is by N6NB and is taken from the Radio Amateur Antenna Handbook by William I. Orr (W6SAI) & Stuart D. Cowan (W2LX). The entire VHF antenna is enclosed in 20 mm white plastic conduit tubing to make it static proof and is glued together using standard plastic electrical L, T and X junctions. The HF antenna is my own design. The entire setup is very light (about 10Kg) and sits on a single 50mm diameter, 8 meter steel pole. It can be dropped and put back up by one person. The rotator is mounted on the small square platform at the top of the 6M pole, and the 2M section above the rotator has the antennae attached to it. The entire setup including rotator cost me about R1500.

I have worked in the electronic industry since 1975 and now, having retired, I recently decided to pursue a hobby that I always wanted to get into. Amateur Radio. I wrote my test last year, and having passed, set about kitting myself up.

I had the transceivers, and so to get operational, what I needed was a quick to assemble and tune, compact, light, cheap, portable, easy to build antenna system. Resultantly I settled on a multi element dipole. The initial design called for a six-element setup but after a bit of experimentation, I settled on a four-element configuration.

I went for a mid loaded element because I have never been a fan of base loaded coils. The highest current region of an antenna is closest to the feed point and it is the current region that is responsible for propagation. So, why kill it with a coil. So, I gave each element a 50/50 current region / voltage region and put the loading coil in the middle.

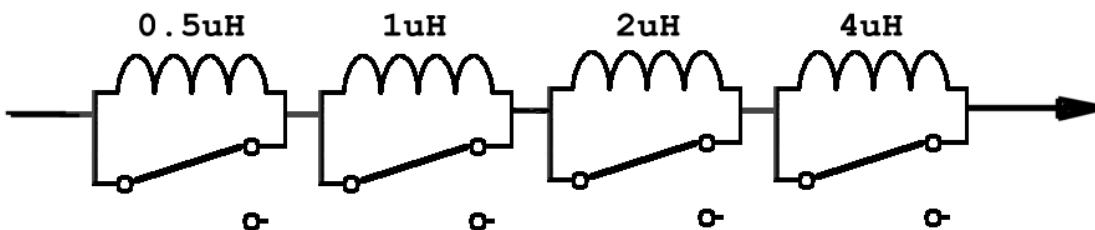
The mid loaded dipoles are each 2.5 meters and this makes the tip-to-tip dimension of the antenna, 5 meters. The 4 dipoles are mounted on a 2.5 meter aluminium beam and so I was able

to assemble and test the entire antenna inside the shack (which is 4.5 x 7 meters. ~ Average garage size). Winding the coils took a fair amount of trial and error but after about 2 weeks of winding, testing, unwinding retesting and rewinding coils I eventually got them right.

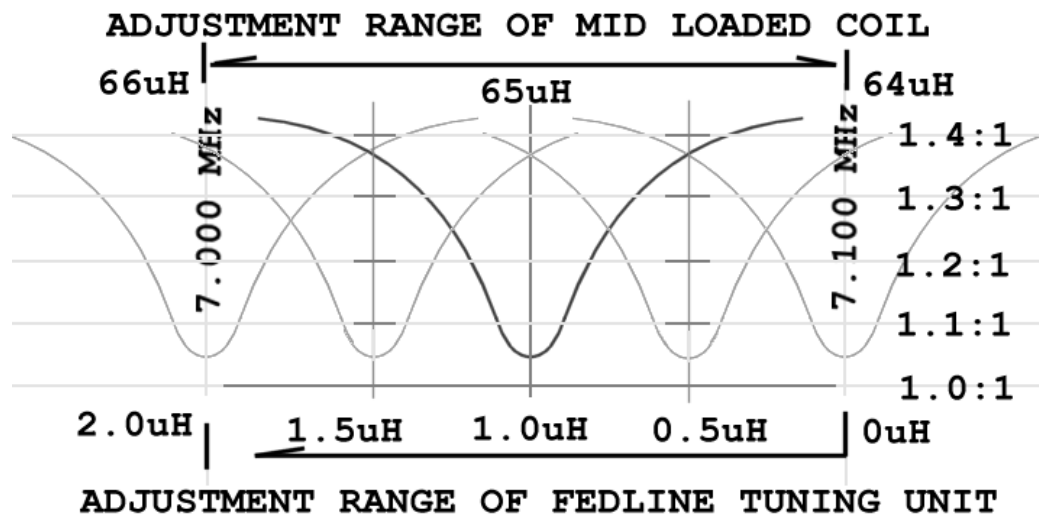
First I wound and tested each individual coil and mounted the first mid-loaded dipole on the beam. This one was wound to give a 1:1 SWR at 3.625 Mhz with the ability to adjust the centre frequency up or down by 100 Khz. I then constructed the second, which individually give a SWR of 1:1 at 7.05 Mhz. Then I connected them together, and driving both dipoles simultaneously and the interaction between them was minimal. Next was a dipole for 14.200 MHz and then 21.450 Mhz.

All four elements are driven simultaneously by a single feed line.

Now, the reason why I set up each element for the top of the band was so that I could make myself a small FTU (feedline tuning unit) with which to bring the resonant frequency of the relevant dipole of use down a little. (Some may however prefer to tune the dipoles for the exact frequency you want to work.) The FTU consists of 4 coils and 4 switches that allow me to switch four small coils in or out enabling me to move the resonant frequency of the dipole down a little to the exact frequency I wish to work with. The circuit of the FTU looks like this :

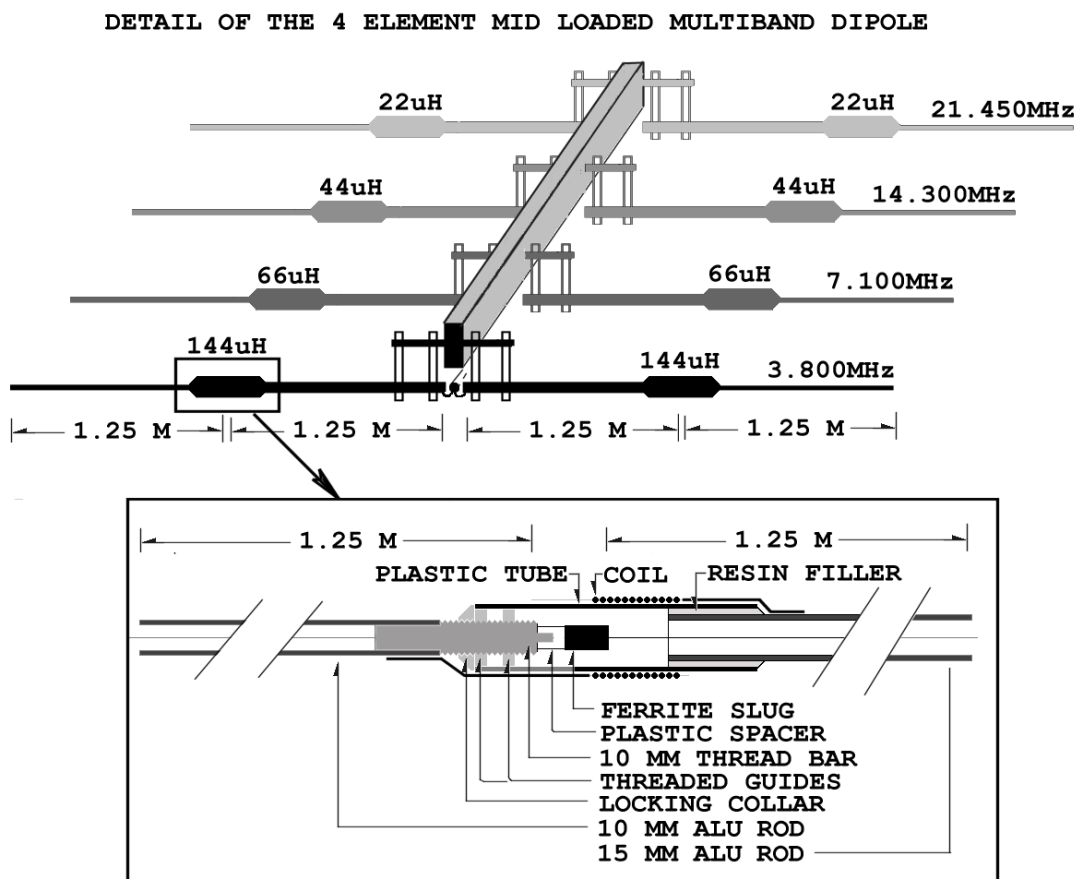


This allows me to insert an inductance from 0 – 7.5uH in the feedline in 0.5uH increments.



As can be seen from the above graphic, the coil's inductance can be adjusted up and down to set the exact desired centre frequency of the dipole. This centre frequency can then be adjusted downwards by adding a small amount of inductance into the feedline using the FTU. Some amateurs may want a precisely tuneable configuration while others may be happy to set up the dipole for 1:1 at the centre of the band and not be too worried about the SWR climbing to 1:4 towards the end of the band.

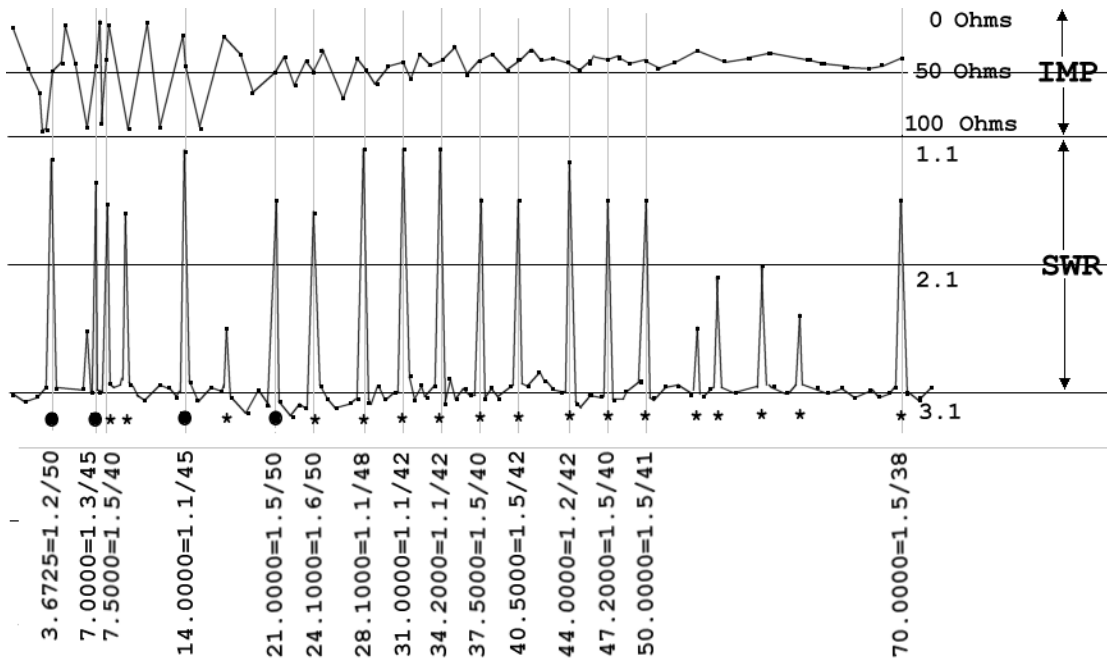
The antenna configuration looks like this :



The two 1.25 Meter lengths of aluminium tube are connected to a plastic tube around which the coil is wound. The thinner, outer tube has a threaded insert made of 10mm threaded bar which has had some of the thread removed on a lathe so that the bar slides into the thinner tube. Two threaded guides are secured inside the tube with resin inside the plastic tube. (A very good 5-minute resin glue is available from most hobby or hardware shops) A plastic tube is glued onto the inner end of the threaded bar which has been turned away to leave a small shaft which the plastic spacer can slide over. A 4 cm ferrite slug is in turn glued to the end of the plastic spacer. The thinner rod is then screwed into the threaded guides and when in position, an outer locking collar is used to lock the rod in place.

This makes the process of fine-tuning the antenna very easy. Unlock the locking collar, rotate the rod in or out and lock the collar again. Far easier than unscrewing the connections, winding and unwinding the coils and putting everything together, to find that you are still a little out. Repeating this process for eight coils on 4 sets of dipoles gets to be very tedious after a while, I can tell you (The ferrite slugs are optional and you are quite welcome to spend a week winding and unwinding coils to get them just right if you have the time and the inclination to do so.)

Now, once you have put this setup together, with four elements, you are in for a rather pleasant surprise. You don't need any more elements for the higher frequencies. This configuration has a beautiful SWR at 28, 31, 40, 50 and 70 Mhz which resultantly makes it usable through all the bands. So, it is a really effective true multi band antenna. Now, I have to go and find myself a nice rig that is capable of working 50 and 70 Mhz because I have just the right antenna for it.



An impedance/SWR plot for the 4 element multi band antenna showing the SWR peaks and dips as measured with a MFJ SWR antenna analyzer

● = Actual element * = Virtual element

You will find that with this configuration, a number of virtual elements have been created. So, when it came time to make the 28 and 30 MHz elements, it was not necessary as the array automatically created virtual elements at those frequencies. Not only that, but it creates even more virtual elements, the further up the band you go and one gets almost perfect virtual elements at 50 and 70 Mhz as well. Now, on my installation, the 30 Mhz virtual element is currently sitting at 31 Mhz but, as I have said before, I can bring that one down a little with the FTU and a little fine tuning when I am eventually allowed to use it so no problem. I am sure that those of you that are using automatic ATU's will be able to tune it right in. As it was, it took about a month of playing to get the virtual elements to come in at exactly 24, 28-31, 40, 50 and 70 Mhz.

(The last few pages will be in next months issue so hang on to this one)

Restoration News:

I have received from Om Pine ZS6GST, an article on restoring old valve rigs by Chris Parry G8JFJ. It is just over 600Kb in size and can be emailed with ease. Anyone interested in a copy of this article can drop me a note or let me know on the Saturday morning net, and I will get copies off to you. Rad ZS6RAD and myself have reviewed it and both think it will be of interest to the serious restorer. The stipulation from the author is that it can be copied and distributed as much as we want, but no one should be charged for it.

Swap Column:

Any swaps or items for sale in the antique line ? Let me have the details and we will advertise it here.

There is an online swap shop on the website of the Highway Amateur Radio Club for ALL amateurs and interested parties to use - it is not restricted to members only. We have been invited

to make use of this facility too. Should you want to, use the link to the HARC at the end of the page to take you to their website.

If you would like to forward this newsletter to any other interested parties, please feel free to do so. Print it out and put in on your club notice board, or give it to someone interested in valve radios. If you know of any who report in on the net but don't have email, print it out and give them a copy.

Net days and times:

Saturday 05:30 AM Net – frequency 3615Mhz
Saturday 08:30 SSB net - frequency – 7070Mhz
Saturday 14:00 CW net – frequency 7020Mhz
Wednesday 19:30 AM net – frequency 3615 (-5 for QRM)

This, and past copies of the AWA Newsletter can be downloaded from <http://members.harc.org.za/newsletters/AWA/>. Our thanks to the Highway Amateur Radio Club in Durban (<http://www.harc.org.za>) for providing this service to our members and other interested parties.

Thanks for the bandwidth.

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