

**Wythall Radio Club** meets from 8pm every Tuesday and Friday evening at Wythall House, Wythall Park, Silver Street, Wythall, B47 6LZ, near Birmingham. Visitors are very welcome. **Wythall Radio Club** is affiliated to the Radio Society of Great Britain. Contact g0eyo@blueyonder.co.uk

## Ofcom Amateur License Review

If each of us could honestly answer an imaginary questionnaire as to why we came into this hobby, I suspect that we would find many, many different reasons given. If we were also to be asked what now keeps us in the hobby, we would come up with many more different reasons.

This hobby is so broad and wide, that pretty much any interest can be catered for, whether it be rag-chewing, building stuff, contests, computers, data, TV, mobile or portable operation, DXing, Summits on the Air, Worked All Britain, Certificate chasing, working satellites, designing antennas, having a drink and a chat with friends etc, etc. With such a wide range of interests how do we set about framing a set of licence conditions for the hobby and a acceptable method of entry into the hobby.

Right now the Amateur licence is undergoing a review by Ofcom. Simultaneously the syllabus for the various amateur licences issued in the UK are also being reviewed by the Radio Communications Foundation which is responsible for producing the syllabus on behalf of Ofcom. Ofcom are still keen for the hobby of amateur radio and the privileges it grants for us to be able to transmit to be seen as an engineering and scientific hobby, encouraging self-training and the progression from Foundation to Intermediate and eventually a Full licence. They also wish to discourage us from having more than one callsign, something which their own three level structure and limited licensing software have actually encouraged. Although they know how many licenses have been issued they are unable to say how many amateurs there are because we don't give up our licenses when we progress from Foundation to Full. As a consequence of that fact we don't really know whether the hobby is growing or contracting. Club licences are currently

an NOV to an individual's callsign. There have been cases where a radio amateur won't give up a club callsign even when he no longer has anything to do with the club. Ofcom want to regularise this by making the issuing of a club NOV explicit on it being handed back if the individual leaves.

One of the problems is that the history of amateur radio is very much tied up with an era of people coming out of the services with some electronics or radio operator training, of people actually making things and repairing them, and also the fascination of hearing or speaking to people from different parts of a world that has now shrunk with 24 hour news, mobile phones, and the internet.

Clearly the license review needs to reflect the world as it is now and likely to be in the future rather than what is was in the past and it is to be hoped that Ofcom will get this right. I would also hope that they recognise the social role that amateur radio now plays with many in our communities. However they might reimpose more band restrictions between the various licence levels to encourage progression although there was some talk about this being illegal due to human rights legislation (??). I guess the power level restrictions are here to stay. They may put a time limit on how long you can hold a Foundation or Intermediate license. They will look at other issues such as airborne use, repeater licensing, remote operation, regional secondary identifiers and location identifiers. Let us hope they get it right. Personally I don't think there is much wrong with the present licence structure and conditions.

The review of the syllabus has become necessary due to the fact that no one has analogue tv anymore so the EMC stuff is out of date and new technologies like surface mount components and software defined radio are becoming the

norm rather than the exception. Do students still need to know the resistor colour code which certainly doesn't apply to SMD components? Some amateurs consider the full licence too technical, others not technical enough. Some are hostile to M6's and others think G3 are all dinosaurs. Others worry that there is not enough to attract youngsters into the hobby.

As you know the club runs an on-line Foundation Course for those who cannot attend regular classes for whatever reason. I had a request from one American ham to sign up so that he could study the difference between our Foundation entry level licence and the FCC Technician License exam which covers basic regulations, operating practices and electronics theory, with a focus on VHF and UHF applications. Morse code is not required for this license. With a Technician Class license, you will have all ham radio privileges above 30 MHz. These privileges include the very popular 2-meter band. Technicians may operate FM voice, digital packet (computers), television, single-sideband voice and several other interesting modes. Technician licensees now also have additional privileges on certain HF frequencies. Technicians may also operate on the 80, 40 and 15 meter bands using CW, and on the 10 meter band using CW, voice and digital modes.

So you see in the USA the entry license is more band and mode restricted compared to ours, however their power levels are much higher than ours generally 200W for Technician class on most bands. I wonder where we will end up?

Chris G0EYO



# 2m Antenna Tuning Unit

Back in the early 1980's Graham Packer, G3UUS, suggested the idea of a 2 metre Aerial Tuning Unit that would enable the new all transistor 2 metre rigs that had become readily available to load into HF aerial systems. Fig 1 shows 3 aerial systems that could be used. They must be straight wire, no traps, Baluns or any loops of wire that would appear as an inductance at vhf or above.

In those days all HF transmitters had some degree of aerial tuning built in. The valve power amplifier stages required it to match the aerial impedances. The new 2 metre rigs where, as now, designed for 50 ohm aerial systems together with 50 ohm coaxial feeders.

The design of ATU offered is shown in Fig 2. and can be built into a cast aluminium case with a typical layout shown in Fig 3.

- The recommended components are ;  
 C1 & C2 30pf variable air spaced capacitors  
 L1 2 turns 16swg tinned wire 10mm dia. 5mm spacing.  
 Skt 1 & 2 SO239 or BNC – 50 ohm  
 Skt 3 & 4 4 mm terminals  
 T1 600mm RG58U co-ax cable

it to the dimensions shown above for L1. There was enough spare conductor for the straight connections.

I built the unit in the mid 80's and used it to load up G4MEB's 2 metre beam when a connection fault caused the aerial system to go high swr during the winter. Until the better weather and light nights allowed a repair. The atu enabled us to operate on 2 metres although the beam effect was totally lost.

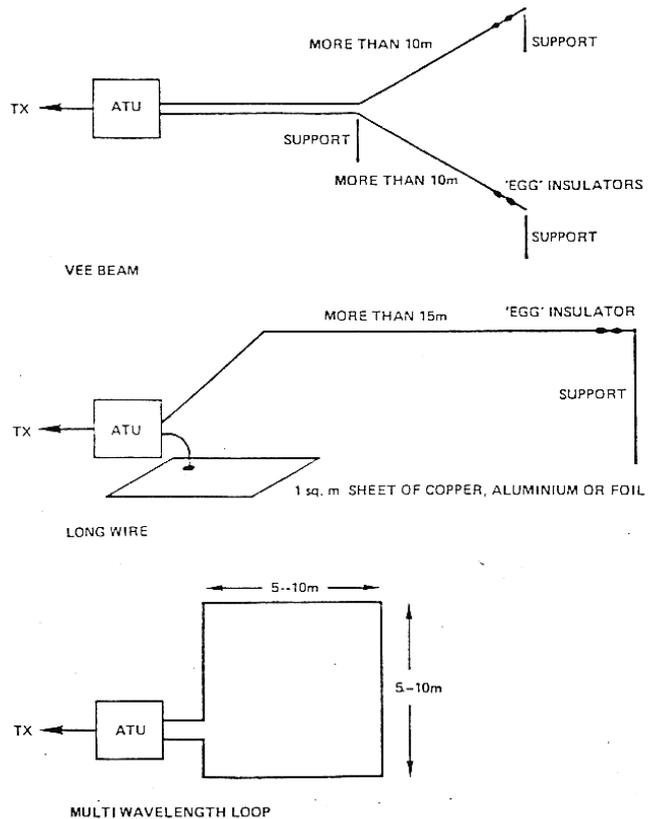


Fig1 Long Wire Aerial Options Using HF Aerial for 2 Metre Transmission

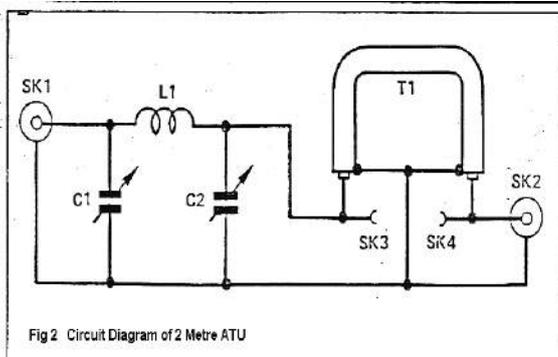


Fig 2 Circuit Diagram of 2 Metre ATU

I have recently measured the variable capacitors as 7- 30pf animals and the coil as 63uh.

I've not used the balun output of Skt3 and 4 but as a unit to match a poor aerial impedance or

I obtained the coil and capacitors from old Pye RT equipment bought for components. The control knobs where from the same source. The aerial sockets were bought new and the box was a freebie during a visit to a local well known radio/transmitter equipment manufacturer in the early eighties. I used a silvered coil from a Pye transmitter and stretched /moulded

long wire to the 50ohm requirements of a 2 metre transmitter it has proved its worth.

The equipment typical line-up is shown in Fig 4.

In use the 2m rig must be set on low

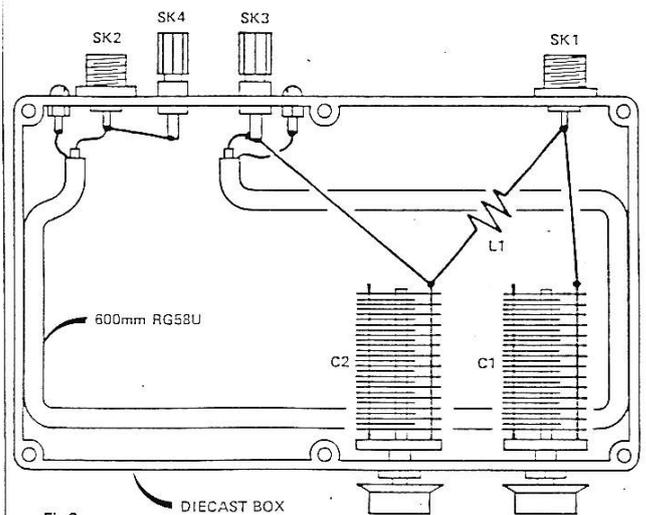


Fig 3

power when tuning the aerial. When trying to set the capacitors for minimum SWR at the rig it is possible to get a total mismatch at the transmitter resulting in high rf voltages on high power quite capable of blowing a pa transistor. Only the handies or rigs designed with a built in aerial could cope with the unusually high rf voltages an impedance mismatch would create.

First tune the two controls on the ATU

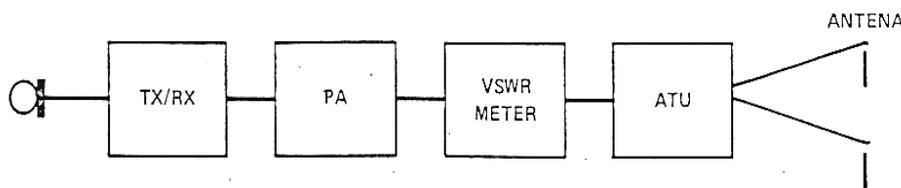


Fig 4 Equipment Line-up With Vee Beam

## 2m ATU contd...

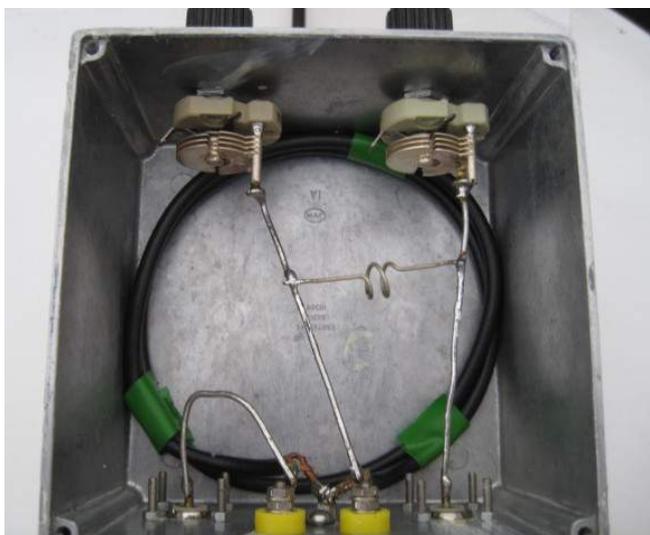
for maximum received signal from a local repeater or beacon. The two controls do interact in the manner of Tune and Load controls on a valved HF rig or linear amplifier. Try slowly rotating one control whilst rocking the other to find minimum reverse power and hence minimum swr. It's a knack to be learnt but an hours twiddling will pay dividends. Once the match has been obtained the rig can switched to high power and will operate happily on or near that frequency. Just keep in mind that a large change of frequency will affect the swr. While you are in the low power mode, move frequency – look at the band edges – to see how much the swr changes. DO NOT play with the tuning whilst in high power mode. The wildly fluctuating swr meter is likely to give you a nervous breakdown and will not do a transistor PA stage a lot of good either. Remember a transistor is the fastest fuse on three legs.

I have used this set up with 20 watts rms RF (80 watts pep) without problem. 400 watts pep would most likely cause the capacitors to flash over unless the swr was 1:1. Get larger air spaced capacitors and a much larger box for higher power use or keep the power down.

It is worth using pointer type control knobs with semi-circular numbered/graduated scales so that setting notes can be made for future use.

This is a simple project that may sit around for years without use. But a portable outing that goes wrong because the 2 metre aerial system has developed a fault could partially be saved by allowing a transmitter to see a low swr due to the effect of the ATU. You may have rf radiating from the feeder beyond the atu but at least the transmitter is happy!

**Peter G4LWF**



# Repeater Antenna and new Colinear installed

Funded by a grant from Western Power Distribution, the 70cm four stacked dipole antenna for the GB3WL repeater was erected on top of Wythall House, together with a new 6m/2m/70cm co-linear dipole for general club use.

A very brave team, led by project manager Dave G3YXM and club chairman Mike G4VPD got on the roof of Wythall House to do the work. As you can see from the photos Dave led the team from the front (or at least on the top). Stew M0NYP, and Kev 2E0NCO were also part of the team with Rob 2E0MEX and Jim 2E0BLP giving them encouragement

New feeders were also installed; a 3/8 inch solid copper low loss heliax type feeder for the 70cms antenna and a low loss flexible coaxial cable for the co-linear.

As you can see the build was not without its dangers; getting from the wall ladder to the roof ladder was a bit daunting according to Mike and Dave.

The whole operation ran fairly smoothly the chimney fixing brackets were changed at the same time as the old ones had been up for over 20 years. The most difficult part was running in the 3/8" feeder. Being solid copper outer it

wasn't very flexible but with a bit of persuasion Dave managed to get it back down into the shack and into the back of the repeater cabinet.

We are still awaiting MOD approval for the use of the frequency and this has now been 6 months. Needless to say we are desperate for this to be granted so we can switch the repeater on and provide the service to the local hams.



# Club's Antenna Renewal Project starts

Wythall Radio Club's main antennas are down! Not because of adverse weather conditions or such like – this was actually planned!

Recently we have purchased a whole new raft of antennas for our club mast, thanks to our friends at Innovantennas and Martin Lynch & Sons. But before anything can go up, the old has to come down!

So it was, that a few days ago, a working party, which consisted of Chairman Mike G4VPD, Dave G3YXM, Pete M5DUO, John M1JSS, went up to our clubhouse to make a start on the big job.

We are pleased to report that all went very well and subject to some maintenance, it shouldn't be too long before the following new antennas are seen above the Wythall skyline.

19 element 432MHz LFA-LN Yagi,  
13 element 144MHz LFA Yagi ,  
6/6 (12) element 50/70MHz Yagi  
Multiband HF Yagi - XR5-T - 9 element  
20m thru 10 m Yagi Force 12  
A new rotator will be fitted, this time a Yaesu 2800 heavy duty rotator will be fitted in the cage assembly on the tower and we will take the opportunity to replace the steel wire luffing ropes on the mast as they are now nearly 25 years old. The feeders will also be replaced .

Work has started on assembling the new antennas in the shack ready for the big build.

Proof of the hard work of the guys involved can be seen below!

**Chris  
G7DDN**

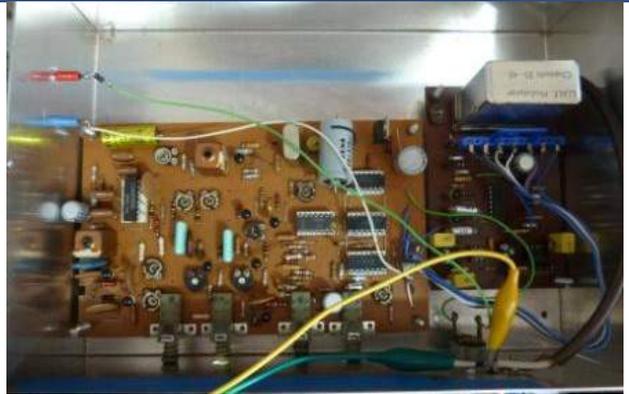


# Out of the Sick Bay and on to my Bench

A while ago now, several Club Members assisted in the clearance and sale of a shack and loft full of SK Frank's equipment and components. An Aladdin's cave literally of all things electrical and electronic between A to Z.

Lurking in one dark recess was a Heathkit TV finished in white and looking in remarkable condition. Having a carry handle and socket for 12vDC in made this set suitable for both home and caravan, but portable- well possibly. After a few initial tests, it was deemed fit enough to be shown some mains. As the set was all transistor fed from a low voltage transformer, switching on soon brought forth the usual FM hiss without any obvious signs of distress. The TV screen remained blank and even with brilliance control at maximum (all knobs to the right) there was no sign of any raster or illumination. At this point we would possibly search for a schematic (well they were an American Company with a British manufacturing and kit assembly site) Not only can you not find a schematic, it is nearly impossible to find any reference to this set.

flourish of the trusty 48 watt soldering iron soon had the cover off and then it was clear that two rectifiers had blown and an electrolytic was poorly. With no schematic and no identifiable remains of the rectifier diodes what to do? If in doubt try a 1N4007 or two! In they went together with a new electrolytic and on switch on rewarded with a



So this is where Heathkit (Gloucester) and Manor Supplies of West End Lane, London get it together electrically speaking. Analogue 625 line TV is all but history now and so the chance find in a rummage box will hopefully enable the Heathkit to display a decent undistorted test pattern.

The Test Generator would basically generate via dedicated IC's a series of patterns and bars to evaluate and align TV's without on-air signals. The selected pattern would then be modulated with to be available RF wise between a user adjustable UHF channel 35-45.

fairly decent raster and the set was attempting to lock both line and frame on just band noise. How then do we generate off-air signals to see and hear exactly what the set is doing? As a very keen Rally visitor, I happened to be rummaging in a box at the Reading Rally back in July and found a part disassembled Manor Supplies Colour Test Generator. Further dives into the depths of the box produced the lid followed by the main board.

Linking a short TV coax lead from generator to TV and tuning across the channels produced a nice and steady pattern with an audio tone showing that all was reasonably well. A little bit cramped at the bottom and expanded at the top shows a linearity adjustment is required, but apart from that, not bad!

Heathkit produced some really good and sometimes complex equipment, still sought after and occasionally you will find an unmade kit

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Well the main-board looked undamaged and as the modulator board was in situ, a couple of coins were exchanged and I wandered off making sure nothing dropped off as I walked back to the car. Back at the car, I sort of fitted it all together, all the IC's were present on the main board and would it work?

The serial number sticker states it is a Heathkit GR9900 1001/03/250 which makes you none the wiser. Quick recap then, we have sound and presumably vision but lack of screen illumination stops us in our tracks.

In most portable TV's the line output stage sits on the pcb for all to see but this Heathkit had it enclosed in a folded tin surround soldered to the earth lands on the circuit board. A reasonably quick



## Or How a Manor Supplies Colour Test Generator perked up a sickly Heathkit TV



Company shut its doors a couple of years ago after an ill-fated attempt to revive the name in the kits marketplace.

Manor Supplies had full page adverts Practical Wire- less, Television and advertised a huge range of mainly surplus items. Despite the impression given of a large warehouse full of goodies, in truth it was a rather cramped small shop busting at the seams. I remember dragging

Actually I made a darned good 17" 625 line TV from those bits, the CRT was bought from Derwent's on Dovehouse Parade near Solihull. All transistor with those funny triangular lockfit range of three legged beasts. Occasionally one in the IF strip would fail and it always seemed to happen whilst watching Monty Python!

All these familiar names gone... Chas Young, Norman H Field, RSC in B'ham, Eddystone, Henry's Radio, Z & ! Aero services, HAC But their memories and products live on...in my man shed

Ian MOIDR

which rings our American Cousins bells big time. Although most folk bought kits, the equipment was also available ready built & tested and Heathkit were renowned for their get it working promise. Sadly the

my poor old Dad to the shop and struggling back across London on the tube with what seemed like a huge box of TV pcbs and the like.

## Wythall Fun Run 2014

This year's Wythall Fun Run took place on Sunday 6th July around the village. Despite the name, it's a pretty serious event with 1.5 km, 5 km and 10 km courses attracting some even more serious entrants!

For the members of Wythall Radio Club though, it was an opportunity for fun of a different kind!

This year we were asked by the organisers to help provide communications for the event. So some of us took a break from our Field Day event to go and help make sure the Fun Run went without a hitch, which it did!

Wythall Club Member John M1JSS rallied the troops into action. We manned 6 checkpoints including race control in the main car park. Operating in pairs we co-ordinated with check point marshalls to pass messages back to race control and

the race vehicle which followed the runners. We armed the race control and vehicle with the club's PMR sets and also gave one to

the St Johns Ambulance also waiting on the car park. We had a great time and it all went very smoothly, although when the roads were closed some drivers seemed to think that it did not apply to them.

Some 298 runners took part in the 10km event which was two times around the circuit and 120 runners participated in the 5km event. The fastest time for the 10km was 33 mins 50 secs and 16 mins 51 secs for the 5km. All runners were running for their charities and some people entered into the spirit by dressing up in weird costumes.

I have no doubt we will be asked by the organisers to help them out next year and given the fun we had I am sure we will. Also it's really quite satisfying to use our love of radio communications to put something back into the community!

Chris G7DDN



### Radio Club communicators

Chris G0EYO/Colin G6ZDQ  
Anita 2E0DUO/ Lee G0MTN  
Peter M5DUO/Jim 2E0BLP  
Dave G3YXM/ Phil 2E0WTH  
John G4QJL/Roy G0HDF  
John M1JSS



# Trying to Build a Successful HF Contest Station

## Episode 3: Planning Progress and Panadapter Problems

### Planning Progress

Since the last update, I've been along to Bromsgrove Council's "Walk in Service" for householder planning advice to hopefully have an informal chat about antennas and towers. I'd started to accumulate lots of paperwork – tower and antenna schematics and details, letters from my old neighbours declaring that I wasn't a public nuisance with my previous mast at my old house etc. There was a little queue of people before me, presumably with questions and details about new or extended houses. It was certainly a case of "and now for something completely different" when it was my turn. Obviously no decisions are forthcoming at this sort of meeting, but I got the confirmations that I was looking for about what level of detail would be appropriate to go in the application. The information I'd brought along would be useful to submit, and the general conclusion was that "more information is better." This was the same summary from a recent small discussion on the CDXC (UK DX Foundation) email reflector. So I shall in layperson's terms describe why an HF antenna has to be so relatively large, and to be effective so relatively high.

I was told that I should also reference my previous successful application. Whilst the mast at my old house was smaller than the new one proposed, I will try to argue that given the size of the garden at

my old house, and the proximity of the neighbouring houses with their rear windows directly facing the mast, this new application should have proportionately less of an impact.

We discussed the likely reasons that would be given against the application, and that I should try to explain why the circumstances exist for the new application why visual disturbance, TV interference should not be significant here etc. There are government planning guideline documents written that are meant to assist the planners. These say that amateur radio should be encouraged because it can benefit industry, and that for short wave antennas "long wire aerials may be needed." I will add some more detail to this as by itself it doesn't give much guidance for those making decisions. 20 feet might seem perfectly high enough to them.

A few weeks ago I'd put up a fibreglass mast at about 35 feet, which was the height that the retracted tower would be including the stub pole. Then I walked around the neighbourhood taking photos, which in almost all cases showed the mast would be hidden behind trees. Also one thing that has changed a lot since I made my last application in 2001 is that many of the council / local government planning offices now list all of their applications online. This is useful to see other successful applications, both in terms of what has been successfully

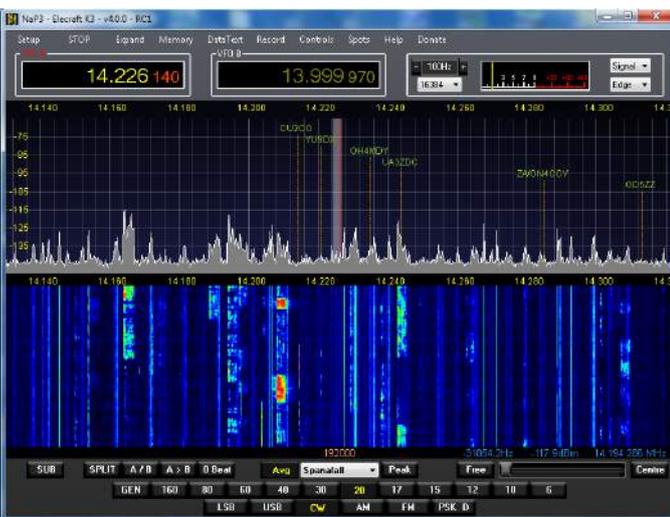
tended for mobile use, and it's currently holding up some tomato plants. I haven't investigated the SWR....

### Panadapter problems

Inside the shack, I have now installed some nice new Yaesu HF radios care of our friends at Martin Lynch, and so I've been able to make up the cabling to connect them together to the station management and antenna switching units I'd mentioned last time. I still need to make up a dozen or so new RF patch leads – something for a wet weekend. All was going well until I tried to connect an external USB sound 'pro' sound card and a panadapter / bandscope unit. The purpose of this is so that I would be able to 'see' the band activity whilst contesting, who is operating next to me and how close, even if I couldn't quite hear them. It can be a very powerful tool. The problem is, at least for the moment, is that I'm struggling with Windows driver problems and a brand new computer that periodically freezes completely – so much for progress!

Many new radios have some form of bandscope built into their front panel screen. However, in most cases the display is too small to make it really practical as a useful tool. There are options available for some radios, or panadapter units to export the display to a PC screen, which is much more useful. There are low cost and medium cost options available for wideband SDR kits, pre-built SDR receivers, or boxes that listen to the IF output of certain radios before filtering is applied, so that you can watch via the panadapter hundreds of kHz, instead of just a handful of kHz from normal SSB. Screenshot attached of one piece of software in action. A novel facility here is that cluster spots can be overlaid on the display too. I hope this gives an idea. By the next newsletter I hope I will have submitted the planning application, and will have either fixed the computer problem, or thrown it out of the window.

Lee G0MTN



applied for elsewhere, and also the comments from the planning committees for successful and unsuccessful applications. Now I just need to find time to put everything together into a well polished application....

As an aside, I do now have my first external antenna at home. Unfortunately it's an old helical vertical for 20m in-

The next issue of the Wythall Radio Club Newsletter will be published at the beginning of Nov 2014

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