newsletter

"*having fun with rf*"

wythall radio club

wythall contest group

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Jul—Aug 2014

Wythall Radio Club meets from 8pm every Tuesday 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

Wythall Rally comes home for 2015

Many of you will know that following the last rally in March, I stood down as rally organiser after 29 years (bar a couple along the way), and in the last newsletter I gave a short summary of the actions required for someone else to take on the organisation of this important source of funds. I am pleased to report that John M1JSS has volunteered to project manage the next rally with support from the committee.

The last rally, although a success financially again presented us with parking issues, due this time to the building works at the school, including a new church, which lost us the fields and thirty percent of the car park. There was also talk of further building works for next year and clearly the church would demand even more space on a Sunday and although we were hiring the school hall and the sports hall for some £600 plus, that seemed to give us no rights over parking spaces.

Therefore the committee have decided to abandon Woodrush Sports Centre and return to Wythall Park where we held the rally for over 20 years. We have hired the Britannia Room, Park Hall and the Scout Hut (which has been extended) and it is believed that we might be able to hire the new Archery range that is currently being built behind the tennis courts. This will mean about 1/3rd less space for traders and more rooms to man but is better than abandoning the rally at Wythall altogether.

Parking again will be an issue to resolve. The rally is basically a morning affair and John M1JSS and the committee will need to liaise with other users of the park on Sunday mornings, such as the Dog Trainers, Footballers, Rugby players, Tennis and Archery clubs to see if we can avoid them having Sunday morning matches and games, thus giving us maximum use of the car park.

If the ground was hard enough at the time, it might also be possible to park cars on the edges of the football fields if no matches were planned.

No doubt other issues will surface between now and next March but together I am sure they can be resolved.

Walter M0GRO SK Sale of Gear

Walter's family very kindly donated his radio gear to the club for their use and for sale for club funds. Treasurer Ian M0IDR organised an auction for Walter's gear and at the same time included equipment generously donated by Bill Mahoney G3TZM on behalf of Derek G3MGB. The club decided to keep Walter's FT7800 and TS430 with its PSU and a VSWR meter for training and special event purposes, but the remaining items were sold for £700

Ian is holding a table top sale of remaining unsold stuff, including things left over from the rally in the club classroom on Friday 11th July at 7.30pm. Ian has invited other local club along as well so it should be a good evening. If anyone has items they would like to donate to the club this would be a good time for them to be offered for sale. Contact Ian for further details.

Chris G0EYO

Pictures from early rallies at Wythall Park *; top to bottom; Traders in the Britannia Room; Parking marshall Ben about 14 years, he is now a policeman in his early thirties; David and Lawson cooking the B&B books*

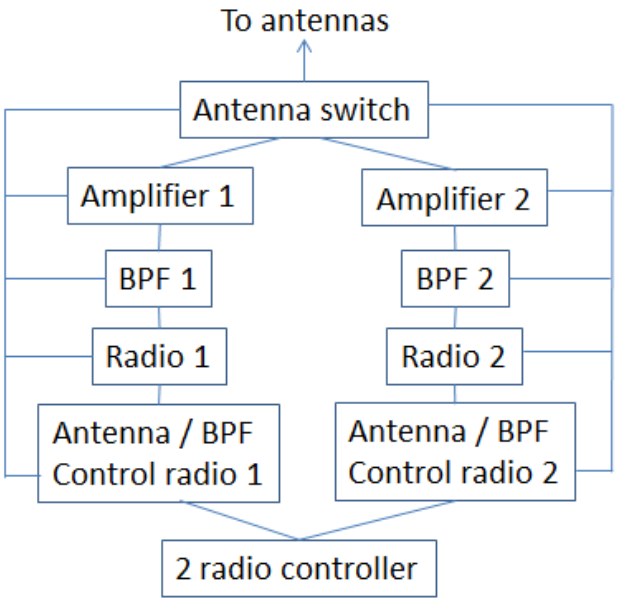
Trying to Build a Successful HF Contest Station : Episode 2: Shack Design and Automation

I'm falling behind with progress considering what I expected to have complete by now – I still have no outside antennas, and I've not finished my preparation for a meeting with the council planning officers yet. More news on this next time, hopefully. In the meanwhile, the garage / shack construction has been progressing well. This has involved new windows, insulated plasterboard walls, and replacement of a rotten roof just before it collapsed. At least the radio room should now keep out the rain. It seemed like a long time was spent painting walls.

The intent is to build a "Single Operator 2 Radio" HF Contest station. If you consider that with a traditional 1 radio setup, you should be calling 'CQ Contest' for much of a contest to make a good score. This means you are listening to your own voice or CW (or RTTY etc.) calling CQ for literally hours. To save your voice, or CW keying fingers from getting fatigued, it is advantageous to automate calling CQ and let the PC take the strain. So rather than just listen to the computer calling, the idea of a SO2R station is that you have a second HF radio that can listen to on a different band and hunt for new contacts whilst your computer is calling CQ. More automation is required here to control which radio you want to listen to at different times. Whilst Radio1 is transmitting, you only want to listen to Radio2. Whilst Radio1 is not transmitting, you want to listen to Radio1 (and if you're an expert you might wish to listen to Radio2 at the same time.) All contest rules say that single operator stations can only transmit on one frequency at any one time.

Quite a few years ago I made a switch box with lots of relays that changed the receive audio, transmitted audio and CW paths over between two radios with a flick of a switch, or a footswitch. This worked, but as it was all manual switching it was never really a practical solution to use live in a contest. For the new station I've purchased some control boxes from Microham, based in Slovakia, which is integrated to the PC contest logging software, and should handle all of the necessary switching automatically.

With two HF stations at once, there are also more decisions to be made regarding antennas. One solution would be that each radio could have its own antennas.



Excluding PC connections, headphone audio, microphone, CW, data, PTT lines etc.

This would be an expensive approach. Instead, the antennas available are planned to be shared between the two radios via switch box, controlled by the station control hardware and software. A suitable antenna should be selected automatically for each radio when they change band. It should also prevent radios trying to be on the same band at the same time, or trying to use the same triband antenna say on 15m and 20m at the same time, which could otherwise be very bad for the health of the radio i.e. BANG / magic smoke!

Even transmitting on one band with 400 watts whilst receiving on another band when antennas are in close proximity will cause a receiver failure, or at least introduce significant local noise, so transmitting bandpass filters (BPF) are needed. These also need to be tied in to the station control system so that the BPFs are switched to the correct band. You could change everything by hand, but at 2 o'clock in the morning when you're tired, it would be easy to forget to change something over.

I also found a clever power / SWR meter, badged as a digital vector wattmeter from Larry N8LP who runs Telepost in

Episode 2 cont'd

the US. This has two couplers which will allow the outputs from both radios to be shown in a single display.

Perfect for SO2R as only one radio will transmit at once, and it removes the need for a second meter.

For the SO2R station, we now know that there will be a lot of radios, amplifiers, control boxes etc. to keep within arm's reach and within a field of vision. If you need to stand up to tune an amplifier, or you can't see that your BPF is powered and behaving, then this is not ideal and will cause fatigue and expensive mistakes. So I settled on a corner desk solution, which keeps everything ithin reach. For the PC monitors, I have mounted these on low cost monitor arms which keeps the desk space free, but keeps the monitors still at a low level. The "Health and Safety" advice given from my work said that recommended placement for display screens is that the top of the screen should be level with your eyes. Needing to constantly glance up and down over the course of a 48 hour marathon contest would be very fatiguing, so this is good advice to follow. A long contest like that is the equivalent of a full working week, all rolled into one.

A high level block diagram is shown on p2. This is a work in progress – several items on the shopping list I'm still saving up for. It can become more complex still – automatic band change amplifiers can also receive band data from the radio controllers, and there are several rotators that can also be controlled via software.

In summary, the same theme of increased automation to minimise the work the operator needs to do comes up time and again. We need to keep the operator focussed on making contacts, and not worrying about flipping switches, or getting tired out through eye strain or back ache. Station automation components can be built, or bought, and there are more options available as time goes on as demand for remote operation, and the popularity of "station control programs" on your shack PC both increase.

Lee G0MTN

Using Petroleum Jelly for temporary antenna connectors

I've been trying to find a product to protect my temporary antenna connectors for either Field Days or my holidays near the sea. The problem is two-fold; firstly water ingress to the coax and the connectors from rain and secondly corrosion. The corrosion issue only seems to occur near salt water and spray and occurs within a couple of days.

I used to use self-amalgamating tape for Field Days but the effort in applying and removing it forced me to rethink. I started using high quality insulation tape instead – the stuff that has some nice stretch and doesn't go brittle in the cold. This worked for many years. Unfortunately, the cheap stuff, from say Maplins might have the required insulation properties but has a brittle plastic feel and not very pliable – it's certainly difficult to make waterproof between layers. Last time out for Wythall Radio Club SSB Field Day, torrential rain found its way through a crack between two layers of tape and the SWR went high.

Near the sea, it's not so much the coaxial connectors that I'm worried about but the corrosion. Anything that isn't stainless seems to corrode in days trashing your engineered widget thingamabob.

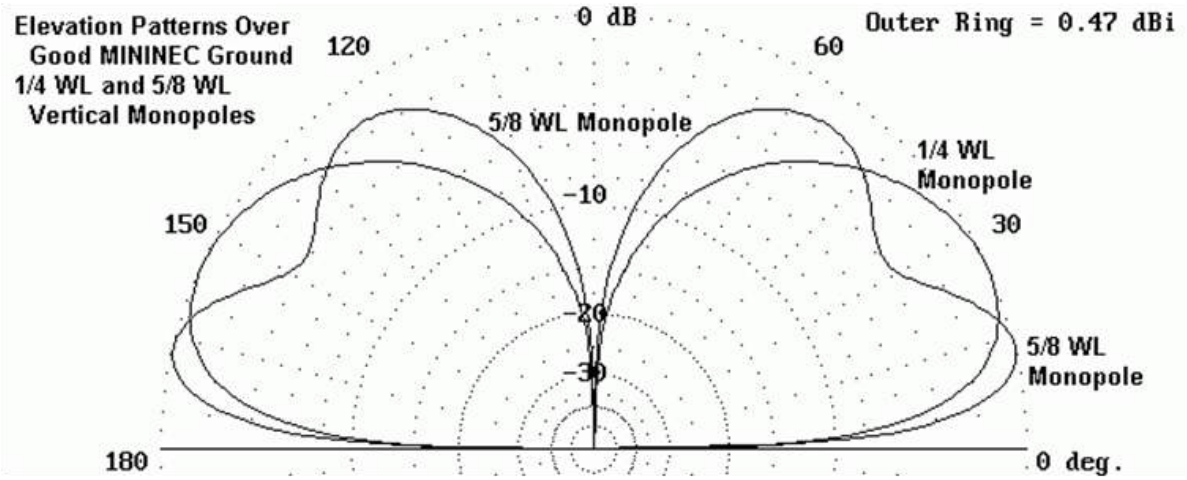
I did think that a quick squirt of WD40 might help cure the corrosion problem and planned to bring some on holiday with me but I forgot! As an experiment, I coated the ends of the antenna elements and dipole centre connectors with Vaseline. A week later and the Vaseline was still there and no corrosion. Result.

But there's more. I put up a couple of antennas yesterday and started to coat the threads of the PL259s as I assembled lengths of coax with bullet connectors. As I screwed them up, a small sleeve of the jelly would be squished out like a seal. Could I have found the holy grail of temporary sealants? I've no idea, but I still used a few turns of my Maplins insulation tape and the added benefit was that my hands were very soft by the end of the day!

Callum M0MCX

TABLE TOP JUNK SALE AT WYTHALL RADIO CLUB ON FRIDAY 11TH JULY AT 7.30PM. ALL ARE WELCOME, COME AND GRAB A BARGAIN

Multi-banding 10m long 1/4 wave 40m vertical antenna for 15m band



1/4 wave vertical for 40m band can also be a 5/8th for 15m band

I happen to like the 40m band. When I first started in amateur radio, I enjoyed easily copying signals out to 1,000 miles with a simple wire loop and the 40m bug stuck with me. Of course during the day, a simple dipole or wire full-wave loop at 10-20 feet above ground level will work great. At night, once darkness falls, efficient low-angle antennas will also work very long distances. Trans-Atlantic SSB contacts are easily possible if you are prepared to stay up late and work the USA from around midnight (from UK). CW and Digital modes are even easier. Alternatively, get up early and work around the world, even VK and ZL.

Vertical Antennas

I have made a number of verticals for 40m band. Most failed in that they just didn't work as well as my low loop. Last year's trip to Cornwall changed my outlook on verticals and I have since put up a big fat 8.6m long marine vertical in my garden and I have gradually added 25 buried radials. Regular readers will know that I used to feed this with the SG230 ATU (see http://www.m0mcx.co.uk/marine-vertical-installation-with-radials/). Recently I junked that idea and instead thought I'd tune it for 40m as a monobander. Good news, for 40m, it works pretty well with an impedance of about 35 ohms* (see note at bottom). However, my big random 60m loop fed with an ATU in the attic normally still outperforms it, particularly during the day for NVIS "inter-G".

It was whilst mucking around with this marine vertical that my interest in how I might achieve a good match for the 15m band might be achieved. Maybe I could achieve a 3/4 or 5/8 vertical for 15m? After all, will the formula for every third harmonic still hold true for a vertical too? Well, nearly.

Out the box, my marine vertical was too short. It's only 8.65 meters long and experience tells me that a quarter wave ground mounted vertical for 40m band needs to be around 9.5m long, depending where you want the bottom of the SWR curve to be. Further, the resonant frequency can change slightly if you add more radials. I have ended up with 25 radials of various lengths. The average radial length is around 8m. The good news is that a well installed 40m vertical will give you a very broad 2:1 SWR curve of over 1 MHz easily covering all of the 40m band. To compensate for my slightly reduced vertical element length for 40m, I added 4 turns of 3-core white electrical cable as antenna wire 1m from the base of the antenna. This gave me a fine resonant frequency of 7.125, effectively making the antenna slightly longer.

Checking on the 15m band though, I noticed that my SWR curve was only starting to become usable right at the top end of the band; 21.450. Below that frequency, the SWR was less than enthusiastic. As a keen digital mode user, as well as SSB, I lengthened the antenna, changing my four turns around the base of the vertical to six, adding around 30cms in total to the amount of extra wire in the system. This dropped the resonant frequency to 7.03 and also dropped the 15m band by the effectively three times the difference. Remember, every 100Khz I dropped the 40m band, I would be dropping the resonant frequency for 15m band by 300kHz.

My SWR curve for both bands is now well under 1.6:1 and signals on 15m band are now most comparable to my big loop. In fact, the further away the DX station, the better the vertical seems to work, perhaps an indication that I have achieved some low angle gain.

64% – the magic vertical length?

Dave, K3DAV talks about the magic length of a vertical being 64%. He wrote an article about this here:

http://www.k3dav.com/64wavelengthsecret.htm

He says that 64% element length is apparently the best vertical length that delivers the greatest gain at the lowest angle of radiation.

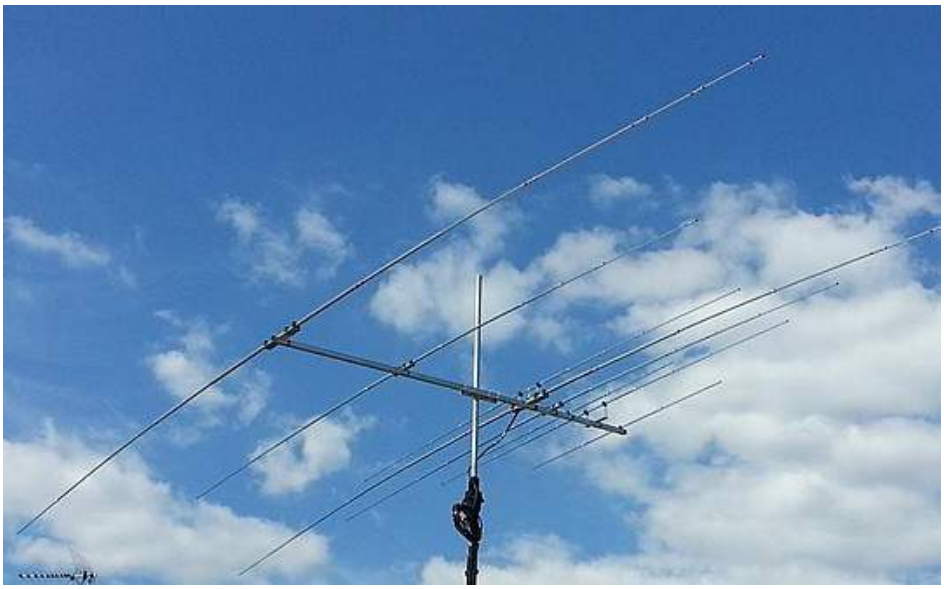
I read Dave's article and began to wonder how far off I was in achieving 64% for my 15m band. Assuming that I am allowed to consider the Velocity Factor (VF) of 95% for my main element, my maths seem to demonstrate this. Of course, if I'm not allowed to take into consideration the VF, then my theory won't hold water!

Callum M0MCX

Note on vertical antenna impedance: A badly grounded vertical will give you a near 50 ohm impedance. Adding more radials actually drops the impedance to around 30 ohms for a fabulous grounding system. I can live with this mismatch which is still better than 2:1 SWR but if you can't, you may need to transform the impedance. There are many ways of transforming these impedances but I'll leave that for another day.

New Antennas for the club mast

This summer the club will be making a major investment in a new antenna line up for our fixed mast at the rear of Wythall House. The existing antennas were installed around 1992 and have given good service over the years. A recent inspection and repair party decided that corrosion on some of the antennas was bad enough for us to consider a replacement of all them. In 1992 we installed the following antennas on the mast::



70cm 21 element yagi
2m 18 element boomer yagi
6m 5 element yagi
HF 3 element Tribander
All turned by a Create RC5-A rotator on a P40 HD Versatower. The antennas were fed with four 50m runs of H100 cable.

The plan is to replace all of the above with the following from Innovantennas;

19 element 432MHz LFA-LN Yagi, with directive gain of 18.3dBi on a 4.56m boom
13 element 144MHz LFA Yagi , with directive gain of 16.1dBi on a 8m boom
6/6 (12) element 50/70MHz Yagi with directive gain of approx 11dBi on a 5.4m boom
Multiband HF Yagi - XR5-T - 9 element 20 thru 10 m Force12 Yagi on a 3.5m boom, all on a new 20ft stub pole.

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 This is a significant investment for the club but should last us through the next 25 years. Chairman Mike G4VPD is the project manager and will be looking for helpers to undertake this mammoth task.

Chris G0EYO

Training News

We are nearly at the end of the Intermediate class of 2014 and six students will be taking the exam on July 7th. We wish them all luck. We did our practical work on Saturday 14th June (see below) and you can see how busy they all were with their soldering irons. Ryan Lester will be taking his Foundation re-sit on the 7th of July as well and we also wish him good luck and hope he will get his M6 callsign this time.

We will start an Advanced course in September for the exam in December and I am considering running another on-line Foundation course sometime in July/ August.

Some one asked me the other day how many people we had got through the various exam stages for the licence. I said I thought it was in the region of about 80, but on a quick review of my candidates list I find that some 160 examinations have been held since 2008.

My thanks once again to the other course tutors, class helpers and invigilators who freely give up their time to make this all possible. I could not do it on my own

Chris G0EYO

Clockwise: Anita, Kev, Roger standing, Dawn, Craig, Darren And Kevin

One for the Sick Bay: Repair of an FDK750X

The Multi-750X is a largish mobile transceiver covering the full 144-148MHz range of the 2 meter band. It puts out 20 watts, SSB, CW, or FM and was contemporary with the Icom IC-290H or Kenwood TR-9130.

It has fewer features, notably no memories at all, and is physically larger, but a lot less expensive. The rig does the standard 600KHz offset for FM repeaters, and odd splits can be worked between the two VFOs. An up/down mic. is standard. The rig can scan the band despite the lack of memories and has a bright LED display and a led bar graph S-meter/power meter. I have seen a version with a “proper” meter as well.

The most interesting extra available at the time, was the matching Expander-430X transverter, which the rig can control, creating a really large dual bander. Cross band satellite operation would be a snap with the transverter.

Receive is OK if a little insensitive but the front end overloads easily.

It was marketed as a mobile 2m all mode transceiver at the time and has seen the light of day under various brand names both here and in the ‘States.

With the bonnet up,

The innards remind you of the type of construction from the 60's with many components haphazardly mounted onto the boards. The boards themselves have loads of flux still on them - obviously never having been removed after flow soldering. Wiring was all over the place with a few tie wraps to try and tidy it up.

Dry Joints…..was the most used phrase in any comments or reviews and I suspect that many rigs were retired early because of this recurrent issue.

A sticker on this particular one shows repairs in 1989 and 1990 for “dry joints” and indeed the reported issue was suspected dry joints again.

Symptoms were:

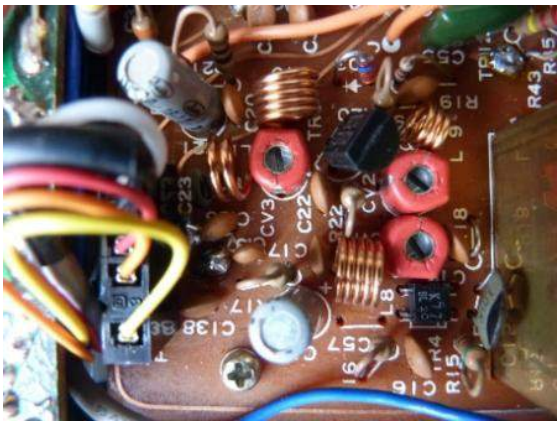
Low or no transmit power with it gradually increasing but not being stable. It was established that a few quick presses of the PTT would bring up 20watts but the slightest touch would send power output all over the place.

The original soldering on the PA board was ‘orrible and I guess had been subject to previous repair which was OK but flexing this board did not vary the output.

A few joints were re-flowed anyway and of course it made no difference.

Turning to the main board and PA driver area revealed again several joints where the solder has crystallized and these were re-flowed with fresh solder.

Whilst the board was out of the rig, the FM carrier level preset literally fell out, the solders looked good, so I guess the component had not been fully inserted during manufacture.



Did it make a difference- well NO!
The rig worked without it even being in place, but it no longer responded to pressure on the boards, so progress perhaps.

The rig was now producing 20w consistently but after leaving it overnight

Yup- you’ve guessed it.

The plug in connector between the driver and PA stage was like all the others, a bit feeble and so an attempt was tighten the socket end.

Time will tell if it behaves now, but I have that niggly doubt somehow.

From the pictures you can see how densely populated the boards are and one can only re-flow a certain number of joints.

Fingers Crossed, we need to get Alf back on the air waves!

Ian M0IDR

MB6IWL - What is it and should I care?

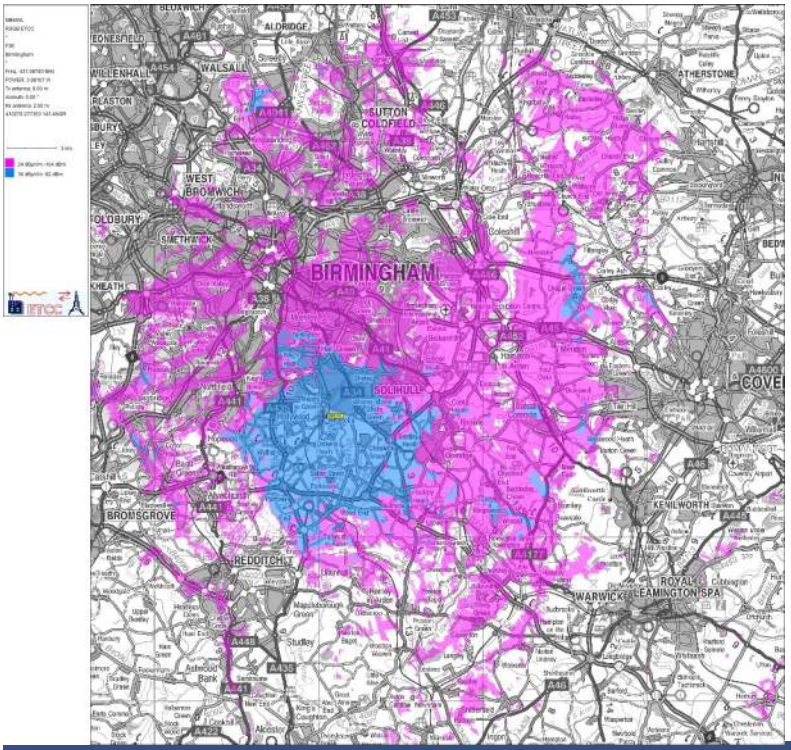
A passing interest
Most of you will be aware that I have had a passing interest in the digital mode known as D-STAR for some time. How D-STAR works and how to use the mode are not really the subject of this article but I am giving a talk on D-STAR basics this coming October for those who are interested in learning the basics.

The purpose of this piece is to give you some of the background into what MB6IWL is and how it came about. Of necessity I will refer to some aspects of D-STAR protocols and will try to explain in simple language as I go along.

Just another mode
D-STAR is just another Amateur Radio mode. It is very similar to FM in that it uses very narrow FM (6.25kHz) to, in effect, "carry" the digital signal. In its early days, it was seen as being tied in to one manufacturer although it is actually an open standard. Anyone can build D-STAR equipment.

As time has gone by, hams have experimented with the protocol. Both software and hardware projects have appeared to enhance the mode. The most exciting developments have taken place since 2012 with the advent of open reflector systems and even homebrew D-STAR radios which can be built from scratch.

Connectivity is everything!



While it is perfectly normal and ok to use D-STAR just like any other mode, (simplex or via repeaters) D-STAR really comes alive when it is connected to the Internet. Since the signal is itself digital, it is easy to send those signals (and other accompanying data) onto the web and manipulate it to your hearts content.

What MB6IWL is then, is a gateway, a portal if you like, to enable Wythall members (and any others passing by!) a way in to the Internet from their D-STAR radios.

A one way street
MB6IWL is a simplex gateway so it is strictly a one-way street. You can either go *into* the internet, or you can listen to what is *coming out* of the gateway.

It is not a repeater in the normal sense of the word in that it doesn't relay your signal locally.

What it does do, is allow your little D-STAR signal to access the full world of D-STAR by getting you out of just Wythall and into the wider world.

The world is your lobster!
Once you are into the gateway, you can route your signals anywhere in the world that you wish, all controlled from your D-STAR radio.

Fancy a chat with your mate in VK? Just tell your signal to go there! Fancy listening to the Dayton Hamvention repeaters? Just link up to them! Have a friend in Peru? Just tap in his callsign and route to him! The world is indeed your oyster!

At last, a use for Handhelds!
Perhaps the most fun that most hams are seeming to have with D-STAR is with handhelds. Just about everyone owns one, but if we are honest, they don't get the use their cost demands. Too many of us have them in the drawer, awaiting the next Wythall Rally!

But with a D-STAR HT, you can talk worldwide from the comfort of your own home! And with MB6IWL on your doorstep, you have a local ready-made way to do that at no cost to you!

It started with a dongle...
The genesis for MB6IWL began when I was first getting into the mode - I became aware of something called Digital Voice Access Point (DVAP) Dongles. I bought one from last year's National Hamfest.

These clever devices plug into a USB port on your PC and act as your own personal D-STAR gateway. In other words, it is just like MB6IWL but restricts use to you personally and to a range of about 100 metres (extendable with a better antenna of course).

These DVAPs allow you therefore to have your very own personal private simplex gateway to the internet, freeing you from being dependent on having a D-STAR repeater near you. I enjoy using mine as I wander around the house!

An added bonus, since they are so portable, is that wherever you go, as long as you take your computer and DVAP Dongle, you can have D-STAR access. I have successfully used my DVAP on holiday in both Norfolk and France. Mike G4VPD has used one in Spain.

One step beyond...
As far as general public use in concerned, the issues with the DVAP are its restricted RF coverage and it being a private hotspot. It was then that I got to wondering if it was possible to create a *public* hotspot for Wythall. (continued on P8>>>>>)

GB3WL inches closer

Wythall Radio Club's new 70cms repeater GB3WL is getting ever closer.

The modified Tait unit's inner workings have been completed on the test bench of G1YFF in Cambridge and has been delivered to the club.

Repeater Keeper Dave Pick G3YXM said, "This is another milestone in our repeater project. It is great to have the repeater complete and ready to go. As soon as the license to operate GB3WL arrives, we will aim to get the repeater on the air as quickly as possible"

Another recent development has seen Wythall Radio Club gain a community grant towards GB3WL's antenna system. A spanking brand-new commercial 4 stacked folded dipole array will be in use for GB3WL, courtesy of club member John Smout M1JSS and his employers, our friends at Western Power Distribution.

So while we await the Notice of Variation that allows GB3WL to become "live", it seems that Wythall members have more than a little antenna rigging work to do, which will be soon because Dave G3YXM reports that the new collinear and the stacked folded dipole array have arrived.

Chris G7DDN

Photo; left to right; Chris G7DDN , John M1JSS presenting the cheque to Chairman Mike G4VPD with repeater keeper Dave G3YXM

MB6IWL cont'd

Some research turned up various kits that could be constructed called GMSK modems. These connect to the Data port socket on any modern mobile rig and with the help of free software, effectively turn them into D-STAR gateways.

I purchased a kit from Fred at Dutch*Star and got to work. To cut a long story short, the kit worked, though I tried a few different radios out to get the best signal...

Getting MB6IWL on the air...
While doing this, I applied for an NoV for a public hotspot and was given MB6IWL within 24 hours! This is because it has to be attended and it is on 70cms.

I could apply for an unattended gateway but was told it would take probably 4 years on 70cms if I got it at all, and that 2m was a better bet, but that most frequencies are already taken! Best go with the first option then!

There have been a few teething troubles, involving connections from the GMSK board to the radio, software issues, hard wired vs wifi internet etc, but I have finally settled on the following configuration...

An old Tait PMR mobile does the RF bit - it is connected to my dual band white stick on the roof via a duplexer so I can still use 2m at the same time on the same antenna.

The Dutch*Star board does the GMSK part - a Raspberry Pi computer connects the GMSK board to the internet, and basically all I do is switch it on in the morning and turn it off at night!

The first Wythall "Repeater"
So Wythall has it's first ever repeater (albeit simplex and D-STAR) while we await clearance for our next big project in GB3WL.

Gobbledygook!
And if you have read this and have no idea what I've been talking about, then please come along this October to my presentation on D-STAR for Dummies! It's time you joined in the fun!

Chris G7DDN

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

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