



**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

#### Officers

Chairman: Vaughan M0VRR

Secretary: Chris G0EYO

Treasurer: David G0ICJ

#### Committee -

Martin G8VXX

Chris G6KMQ

Lee G0MTN Contest Liaison

Peter M5DUO Antenna maintenance.

Mike G4VPD

Mel M0MAJ

Martin G7WBX

Colin M0GJM QSL manager

Neil M0YMM IT manager

Tom G3PQP Homebrew Leader

#### Chairman's Message

I must start by saying a BIG thanks to all members who helped to make this years rally a great success; we have received a number of complements from both Traders and members of the public. A job well done so thank you.

I'm wondering if we have had any of our members, friends or family affected by the Icelandic volcano? Well there sure was disruption to the International Amateur Radio Union region 1 executive committee meeting; with delegates stranded at various airports only a few made it to Sofia. The meeting eventually took place via web conference.

I have been approached by a number of members new and long standing, some local and some not so local with regards to having more of an input into committee meetings. Not all people are comfortable talking in front of a room full of people, starting discussion, making comment or suggestions. I have given this some thought as to how we can include the voices of members that may not always be heard. So I have set up an email address [yoursay@wythallradioclub.co.uk](mailto:yoursay@wythallradioclub.co.uk) that will drop into an anonymous inbox. We can then have an agenda item called "yoursay" where I will raise any points and make comments or suggestions on behalf of the member. I don't suppose there will be many but the facility is there if needed. Well it must be springtime as my garden has burst into life and is now looking like a set for a wild life TV program. Sherryn definitely has more green in her fingers than me; this year we not only have tomatoes but beans, peppers, peas and even chillies. I'm still hoping that my tennamast seed grows into a beautiful tower. .... One day maybe..See you at Plug and Play weekend.

73s Vaughan

# Wythall Radio Club

## Wythall Contest Group

G1WAC G4WAC G7WAC G0WRC M5W



[g1wac@wythallradioclub.co.uk](mailto:g1wac@wythallradioclub.co.uk)

<http://www.wythallradioclub.co.uk>

## Newsletter

### May - June 2010

## Wythall Radio Club voted RSGB Region 5 Club of the year 2009

Wythall Radio Club has been awarded RSGB Region 5 Club of the Year for 2009 Along with the winners of the other 13 regions, our entry was considered for National Club of the Year 2009. and the winner was announced at the RSGB AGM held in Bedford on the 17th of April.



to have fun in the things that the club does. Well done everybody.

On Tuesday 13th April, Trevor Bailey M0KMB, our Region 5 manager, came along to the club to present the certificate of award to Chris G0EYO and the shield to Vaughan M0VRR. We will

This is the first time a Regional Club of the Year award has been made in region 5 and it follows from a successful introduction of the award in Region 4 (North East England). Region 5 covers Central England in which there are 30 radio clubs. All UK clubs were invited

to enter the Club of the Year award and had to submit a resume of why they thought they ought to get the award. The club are very proud to win this award and our success is down to the good spirit engendered by its members who look

keep the certificate permanently but the shield, which is sponsored by LAM communications of Barnsley will be returned after one year.

Chris G0EYO

## Come and join us for a plug and play weekend in Wythall Park with GB4VE

Over the weekend of the 8th and 9th of May the club is having the first Plug 'n' Play Radio Day.

The idea is to have a stress free fun weekend playing radio in the great outdoors. We have arranged to use the same field as we use for VHF NFD for the Saturday and Sunday with camping over night on the Saturday. The Club's Radio Van with push up mast and Gas Generator will also be on site for the whole weekend.

So this is your opportunity to come and familiarise yourself with the Radio Van, setting up

a special event station, how is the best way to start the generator, what plugs go where etc..

We shall have some of the clubs HF wire antennas and a UHF/VHF vertical plus various feeders, PSU's and radios BUT bring your own radios, bits of wire, ATU's and anything you want to have a go at. May be we can put up a wire loop hanging from the trees or make a c-pole etc.. Basically there are no hard and fast rules we can put something up give it a go change its direction try again... try something else etc.... And to top all this off, this same weekend happens to be the 65th anniversary of VE

day and Chris EYO has managed to get a special event call sign GB4VE so you could make some nice contacts.

It's a self catering weekend but I'm sure the club can stand the cost of some soft drinks, bring your own beer and BBQ or the local chippy is only up the road.

As for weather well it's anybody's guess, dress for all seasons..

Are you interested in having a go ?  
Vaughan M0VRR

# Airband Receiver Part 2: Squelch and Audio Circuits

Amateur Radio Project  
from Barry's Bench



This is the concluding part for the airband receiver. Described here are the squelch module and the audio power amplifier along with some construction details.

## SQUELCH MODULE

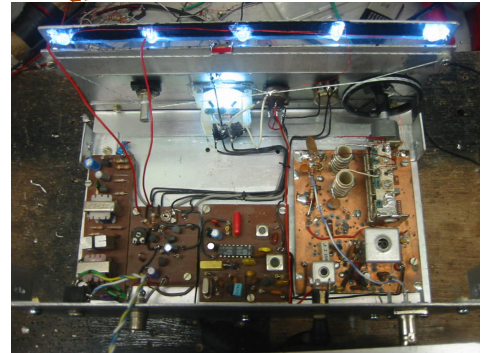
The squelch module consists of discrete devices and performs well. Included in the squelch module is a simple S-meter which gives relative signal strength indication. Present on pin nine of the IF chip (TDA1072) is a voltage which varies from approximately 0.2 Volts for no signal up to approximately 2.6 volts for a signal of 300 uVolts into the receiver, it is called RSSI voltage (received signal strength indication). This voltage drives the S-meter directly via a few passive components. The meter used here is from a CB set but any meter with a FSD of 50 – 200uA will be fine. R1 with Vr2 is used to zero the meter

under no signal conditions whilst Vr1 is used to set the full scale deflection with maximum signal input.

The RSSI voltage is used to control the squelch circuit operation. Tr1, 2 and 3 form a Schmitt trigger which monitors the incoming RSSI voltage set by Vr3 (the squelch control).

When the RSSI voltage exceeds the threshold voltage of the Schmitt trigger (approximately 0.3 volts), Tr2 is biased off. This in turn causes Tr3 to conduct allowing 12 volts to be present at its emitter. With 12 volts present at the emitter of Tr3, DC supply

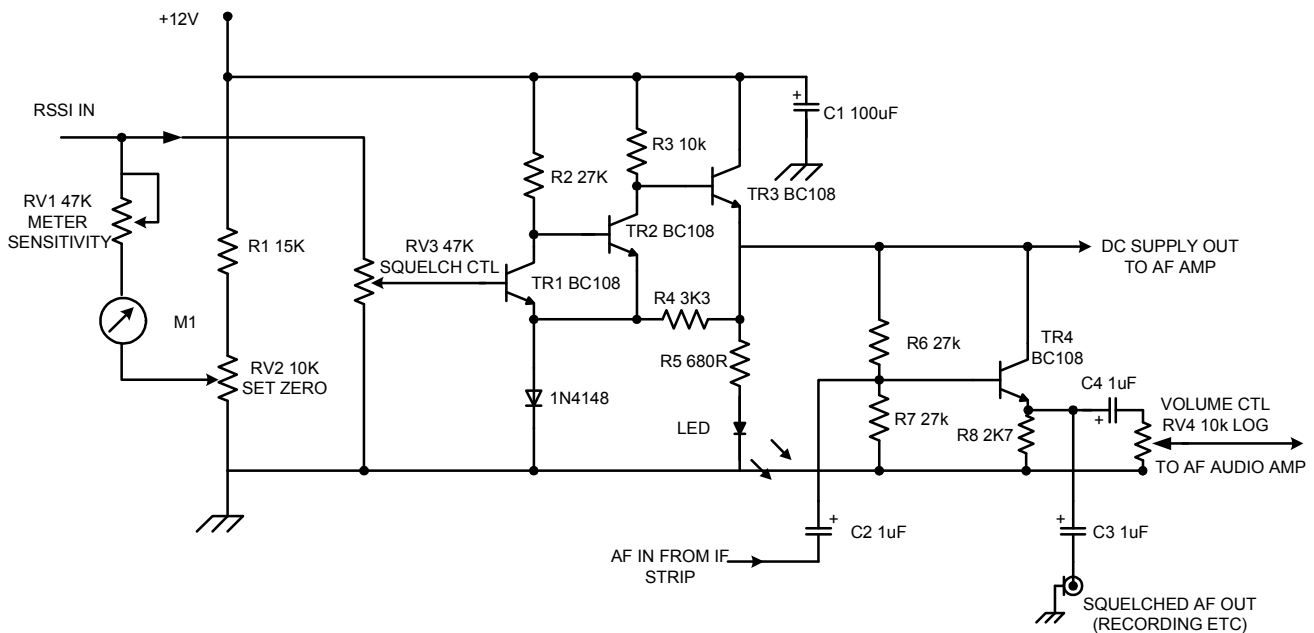
to the audio power amplifier is maintained and also the squelch gate (Tr4) allows audio to pass. Tr4 is simply an emitter follower (a buffer), audio from the IF chip enters the buffer via C2 and leaves via C4 to the volume control. Squelched audio also passes through C3 which is connected to a phono socket on the rear of the chassis for external audio out (recording etc.). With no 12 Volts DC present at Tr3 emitter (i.e. no signal present) both the audio power amplifier and the buffer will not pass any audio thus eliminating the annoying hiss present with no received signal. If you are not bothered about an external audio feed then Tr4 and its associated components can be omitted as the audio power amplifier will still be “squelched”. Also included is a busy light consisting of an LED connected to Tr3’s emitter, when there is a signal present or if the squelch is opened via the squelch control the LED will light accordingly. For such a



simple circuit it really does perform well, you could use a more elaborate circuit with better performance but I don’t think it is justified in this project. All of the transistors used are BC108’s (Europa again!), however any general purpose npn small signal transistor will do (BC546 etc.)

## AUDIO POWER AMPLIFIER

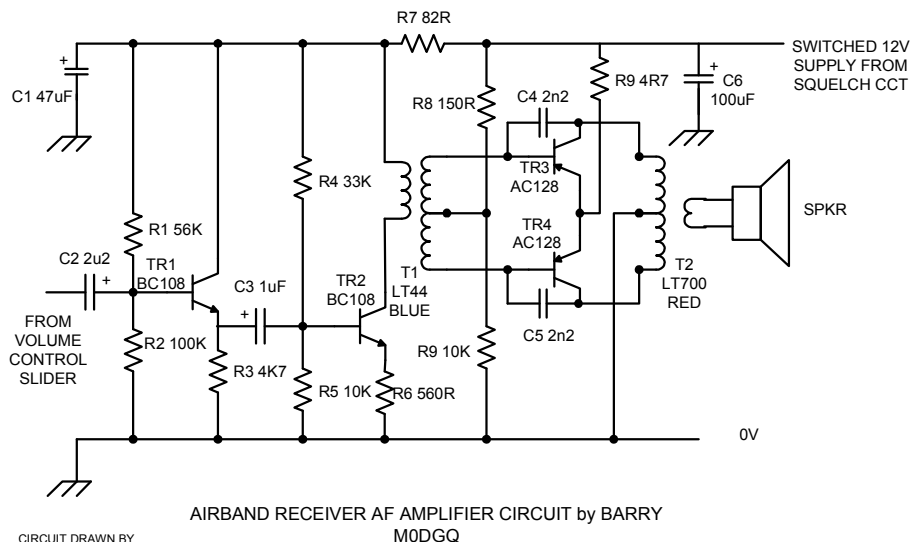
As you can see from the circuit diagram, the audio power amplifier is made from discrete components and is shown for interest only. The only reason this was done is because at the time of building/designing I had no LM386’s in the junk box. This discrete amplifier is not to be recommended as the LM386 is superior in every way and as such an alternative circuit is also given. Old timers will probably recognise the discrete transformer coupled amplifier circuit (most 70’s pocket radios had something similar to this in them), I had the bits in the junk box so I used them.



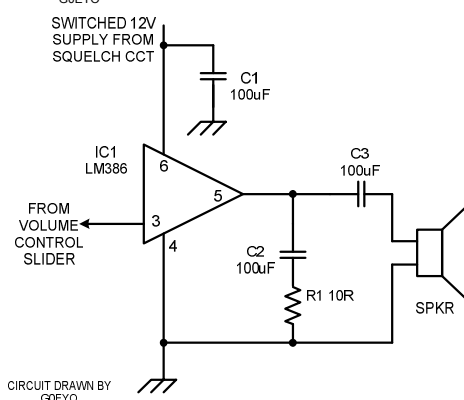
CIRCUIT DRAWN BY  
GOEYO

AIRBAND RECEIVER SQUELCH CIRCUIT by BARRY M0DGQ

# Airband Receiver Part 2: Squelch and Audio Circuits



CIRCUIT DRAWN BY G0EYO



CIRCUIT DRAWN BY G0EYO

Power output is a few hundred milliwatts which is fine for most purposes.

As can be seen, the LM386 amplifier is very simple and low component count. Audio enters via pin three and exits at speaker level from pin six, a Zobel network is included on the output, not much to say really!

A more powerful amplifier chip could be used if so desired, however Tr3 in the squelch circuit would have to be changed to a power Darlington pair due to the increased current demand from the more powerful amplifier.

## CONSTRUCTION HINTS

The radio is built in modular form as this allows each module to be built and tested individually. The RF board is probably the most difficult to construct and very much depends on what type of tuning capacitor you may have, my layout suites the capacitor I had at the time. A printed circuit board is recommended for this module. Keep all wiring/PCB tracks as short as possible; remember this is VHF and not so forgiving as HF regarding lead lengths etc. As far as mechanical construction goes that is very much up to the individual constructor. I used a drive cord (braided Dacron fishing line) tuning scale purely for simplicity, if you're not

bothered about absolute frequency readout then a reduction vernier would be okay, there are many possibilities. Photograph four gives a view of the drive cord arrangement used in this project and photograph five shows the scale lamps, I used five white high brightness LED's running with less than the usual current flowing through them (these are running with 15 mA) as this greatly prolongs their life. Epoxy glue was used to stick the LED's in place.

The optional RF preamplifier can

also be seen on the RF board, built dead bug style next to L1. An old germanium transistor is used in this preamp (and it is a PNP type) as several were in the junk box, however a modern silicon transistor can also be used provided the base bias resistor is changed accordingly (see table in circuit diagram). The preamp is configured as a grounded base amplifier (or common base as it is also known).

Housing all of the modules in a screened metal cabinet is recommended although a wooden cabinet lined with aluminium foil can be used. A suitable loudspeaker is mounted in the lid of the case.

## ALIGNMENT

The RF and IF boards are the only modules requiring alignment. The following procedure assumes the squelch and IF boards are connected correctly together. Set Vr1 on the squelch board to 3/4 of its travel (i.e. it is about 10k). Next adjust Vr2 so the meter indicates 2 to 3 on the scale. Inject a 10.7MHz signal at 10mV pk-pk (unmodulated is fine) into the input of the IF board. Adjust IFT1 and 2 for maximum indication on the S-meter. If you exceed

meter FSD then reduce signal generator amplitude and readjust Vr1.

If you don't have a signal generator then all is not lost; if the transformers came out of working sets or sets that have not been tweaked then they will not need much alignment and can be set up once the RF board has been adjusted (my transformers only needed an 1/8 of a turn tweak). Also, I think the club has a signal generator that could be used.

The alignment of the RF board does require a frequency counter capable of reading up to 150 MHz. Connect counter to Tr2 source. Adjust L3 to obtain a frequency range of 120.7 MHz to 146.7 MHz from end to end of tuning capacitor.

The next step assumes RF module is connected to IF module correctly and rest of boards are connected and working correctly. Set squelch so busy LED lights. Inject an AM modulated signal of 300uV @ 120 MHz into antenna socket. Tune into signal using tuning capacitor. When signal is heard adjust trimmer capacitors on C1 and C2 (assuming they are physically there) for maximum signal strength. Adjust T1 for maximum signal. Readjust IFT1 and 2 on IF board for maximum signal strength. Readjust trimmer capacitors on C1 and 2 for best band edge strength (high and low). If you do not have a signal generator, connect antenna to radio and tune for one of the many constant data channels present in the airband (start with one in the middle of the band if possible) and align as above.

## IN USE

Once alignment is complete you will have a good airband receiver. As it is, sensitivity will be good for modulated signals of 3uV or better. If you are in a fringe area of the airport then you can add the optional RF preamplifier which will increase the sensitivity to 0.5 uV. If you are within 30 miles of an airport then you will hear sky born traffic easily without the need for the pre-amplifier but to hear the tower you will probably need the preamplifier unless you have a good antenna (all I have is 2m of wire poking out the back of the radio in my attic). You have to be quick when listening to pilots/atc as they only pass the information that is required at that time, messages tend to be very brief and much jargon is used; q&h and squawk are just some of the terms used but I am sure there are aviation experts in the club who can explain the various terms used.

Barry M0DGQ



# Hogwash for Hamsters -by Jerry Spring VE6CNU

## A Book Review by Chris Colclough G1VDP

When I was first asked by Ilkka to do this review, I thought "hmm, not really my thing but why not?" So I ordered the book from Trafford publishing and waited for it to arrive in the post.

Having now read the book I can honestly recommend it. Jerry has a similar background in the hobby to me, he took his test at a similar time to me, and through the fact of getting married and moving homes he put the hobby on a back burner for a similar

period of time. So I thought maybe this guy is seeing the hobby from a similar angle to me. The book itself is a light hearted or humorous look at

the hobby with some very funny stories, poems, limericks and jokes. There are too many people who take the hobby way too serious these days, not that this is a bad thing but sometimes it is better to look at the hobby from a humorous side too, and I think Jerry has got this balance just right.

Once the reader gets past the Americanisms and the American/Canadian sense of humour – we all find things funny in different ways in the many differing countries – it is a very funny book. I found it hard to put down, especially one night when I got in bed at 22:00 and started reading it, looking at the clock only to see it was almost midnight and I had to be up for work at 05:30! Jerry starts the book off introducing himself, which as I said earlier is very similar history to me, and then leading with a story where I am sure we can all relate to about that elusive DXpedition and that starts the tone of the book off.

We find jokes like; what do you call a CW operator equally good at sending with his left or right hand? AmbiDXterous (one which I had to read twice before getting the joke). There are takes on the Nursery Rhymes we knew as children;

Little Bo Peep,

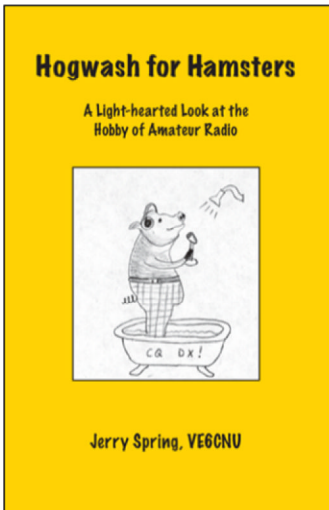
Has lost too much sleep,  
Chasing Dx until three,  
Too many nights,  
As she kept on the lights,  
Trying for DXCC.

Jerry has also come up with his own Murphy's Law for hams, a page full of true statements of "Remember When" which again most of the readers who have been licensed for more than 10 years will relate to. Adverts for equipment for sale, questions from the foundation exams written in Jerry's own way and many other light hearted looks at the hobby.

Would I recommend it? Yes, but it would be nice to be able to get the book from say the RSGB/ARRL book shops, rather than ordering and waiting as each book is printed to order so I am led to believe. Some of the stories and jokes will be heard at many of the conferences and meetings around the world, each being told by the orator in their own way. I know I certainly will be taking it with me to this years RSGB conference and will be quoting one or two of the stories and jokes in the bar – if you want to stop me just buy me a drink!

**Chris G1VDP**

<http://www.trafford.com/Bookstore/BookDetail.aspx?Book=188791>



## Wythall Club Member Wins Major RSGB Trophy

One of Wythall Radio Club's newer members has won one of the most prestigious trophies awarded by the RSGB.

Dave Pick, G3YXM, was presented with the "Wortley-Talbot Trophy", the largest of all RSGB trophies (first awarded in 1929 and annually thereafter for "Outstanding Experimental Work in Amateur Radio") by RSGB President Dave Wilson, M0OBW, at the Society's AGM in Bedford on April 17<sup>th</sup> 2010.

Dave had been "on the fringes" of our club for some time but joined last year. He had originally come along so that his wife Jan could take part in the Foundation licence course of 2008 along with my wife Lynne. Thanks to Wythall RC Tutors, both girls passed their exams and since then, Dave has been a welcome visitor on several occasions, including at events such as VHF Field Day last year. Many of you will not know much about Dave, so perhaps it would be appropriate to fill you in on a few biographical details. He has lived in King's Heath for many years, spending most of his working life as a

Senior Engineer at the BBC in Pebble Mill before retiring a few years ago. He still works freelance however, and is often still to be found at the "Mailbox", BBC Midlands' new home. He also used to run the Ariel Radio Club at Pebble Mill and still holds the rather desirable callsign G2BBC, which he airs on sadly all-too-rare occasions!

He may be better known to you as the writer of the bi-monthly LF column in RadCom but Dave also sits on the RSGB's Technical Committee, mixing with some pretty august company, including some of the best known names and pioneers of Ham Radio in the UK today.

However, the award of the "Wortley-Talbot Trophy" was given, not for any of the above, but for a two-part article he wrote for RadCom last year on Remote Operation via the Internet.

Dave has been a pioneer in the UK in this area. The first time I worked him on 160m a few years ago, he stunned me by giving me a signal report from Birmingham (guess what that was!!!) followed immediately by signing himself GM3YXM and proceeding to give me another signal report from his remote Scottish station! To say I was confused would have been

an understatement!

The whole story of remote operation is perhaps a topic for a club talk, (if we can persuade him to do so, as Dave is naturally a shy man) but in the meantime, enjoy the photos and if you want to congratulate him in person, he is a fan of real British ale! Dave's Radio website is at [www.wireless.org.uk](http://www.wireless.org.uk)

**Chris G0MLY/G7DDN**



## Club Diary

Monday	3rd May	Foundation Course session 6
Tuesday	4th May	2m UKAC contest
Saturday	8th May	Foundation Course session 7
Sat-Sun	8-9th May	Special Event Station VE day in Wythall Park GB4VE (Plug and Play)
Monday	10th May	Foundation Course Exam
Tuesday	11th May	Committee Meeting
Tuesday	18th May	Homebrew
Tuesday	25th May	Talk on Dams and Underground Tunnels by Vic Smallshire
Saturday	29th May	Intermediate Course session 1
Tuesday	1st June	2m UKAC contest
Wednesday	2nd June	Intermediate Course session 2
Monday	7th June	Intermediate Course session 3
Tuesday	8th June	Committee Meeting
Monday	14th June	Intermediate Course session 4
Tuesday	15th June	Homebrew
Saturday	19th June	Intermediate Course session 5
Monday	21st June	Intermediate Course session 6
Tuesday	22nd June	talk to be advised
Monday	28th June	Intermediate Course session 7
Tuesday	29th June	Intermediate Course session 8
Saturday	3rd July	VHF NFD
Sunday	4th July	VHF NFD
Monday	5th July	Intermediate Course Exam
Tuesday	6th July	2m UKAC contest
Tuesday	13th July	Committee Meeting
Tuesday	20th July	Homebrew

## Wythall make a donation in support of the RSGB's Spectrum Defence Fund

In January of this year the RSGB established a Spectrum Defence Fund to challenge Ofcom as regards its interpretation of the various Acts and Directives that cover PLA/PLT and the threat they pose. For those unfamiliar with the problem, PLA/PLT is sending data around your house via mains wiring. The frequencies used cover the whole of HF and although they are supposed to be filters to null out the interference in the ham bands these are not always effective resulting in noise wiping out our favourite bands. The Fund will be ring fenced for use only in funding initiatives directly target at protecting radio spectrum noise floor. At the appropriate time, this may well include legal action, but will also include appropriate representations to regulators, standards bodies and other organisations directly

involved with the introduction of technologies which pose a threat to the radio spectrum noise floor.

The club decided that it is all our interests, as radio hams, to help the RSGB fight this imposition and acquiescence by the regulatory authorities, so the committee agreed unanimously to donate £100 to the fund.



## 25th Annual Wythall Rally Great Success

The club held its 25th Annual Radio Rally at Woodrush Sports Centre in March and it turned out to a great success. Lots of members, both young and old, turned up to help and even non-members turned up to help with the car parking after our usual "explorer scout" crew ended up on camp that weekend. No real issues, although at traders large dog did bite another trader, badly enough to require A&E treatment. Another trader decided to double to size of his stall without reference to the rally organisers and he also left a lot of rubbish behind for us to clean up. His fee will increase next year. With a little gentle reminding the "No Smoking" signs were heeded. We put out chairs for visitors to have a rest on this year and this was appreciated.

The rally attracted about 14 more paying customers than last year and the club made an overall profit of about £1300. Members are asked to think about a wish list on what to spend the money. We have already decided to give the RSGB Spectrum Defence Fund £100, (we only got one donation of £1.50 in our bucket at the rally)

## Training Report

By the time you get this our six Foundation candidates will be preparing for their examination on May 10th, we wish them well.

### Intermediate Course

We are planning an Intermediate Course starting Saturday 29th May with nine sessions mostly on a Monday with the occasional Saturday and finishing with the examination on 5th July

### Advanced Course

Our next Advanced Course will start on Saturday September 4th with the exam on Monday 22nd November. This course will also be a mixture of Monday evenings and the occasional Saturdays.

Schedules for the above courses are available from Chris G0EYO [g0eyo@blueyonder.co.uk](mailto:g0eyo@blueyonder.co.uk) and we are actively seeking candidates for both of them

### Foundation Course

If we can muster enough support we will run another Foundation course in 2010, starting Monday 19th July with the exam on the 16th of August.

# The "TAKEAWAY TWO" Regenerative Receiver by Barry M0DGQ



Here is a very simple receiver capable of resolving CW, AM and SSB transmissions in the frequency range 1.5 MHz to 5 MHz also it is cheap to build. The set uses two transistors and is built on a wooden chassis lined with two takeaway curry tins (hence the title). This is a simple fun project which demonstrates what can be done with a couple of transistors, it is also quite nostalgic for me as some of my first built receivers were regenerative (mine used valves as transistors were quite expensive at the time and the valves came free, courtesy of duff television sets!).

The circuit uses the old principle of regeneration (a very popular technique used in the early days of radio). In simple terms, an active device (transistor or valve) can exhibit gains of many thousands if positive feedback is applied to the circuit, i.e. if it is made to oscillate. Also high gain is achieved (not as high as the above) if the circuit is brought almost to oscillation. As can be seen in the photograph, the circuit is built on a PCB however veroboard or dead bug style will also work fine. The two tuning capacitors used are rather old but modern polycarbon types will be just as good in this project (G-qrp club sales). The radio drives small ear pipette type headphones (these can be purchased in most "pound" shops) to good volume from signals in the 10uV region so a good antenna is essential for this project (I used 30m of wire trailed in the house roof space). A slightly different circuit is also shown driving a high impedance crystal earpiece. Which one you use is up to you (subjectively I think the ear pip one just has the edge over the crystal earpiece circuit). A separate audio amplifier capable of speaker volume can be added if desired.

## CIRCUIT DESCRIPTION

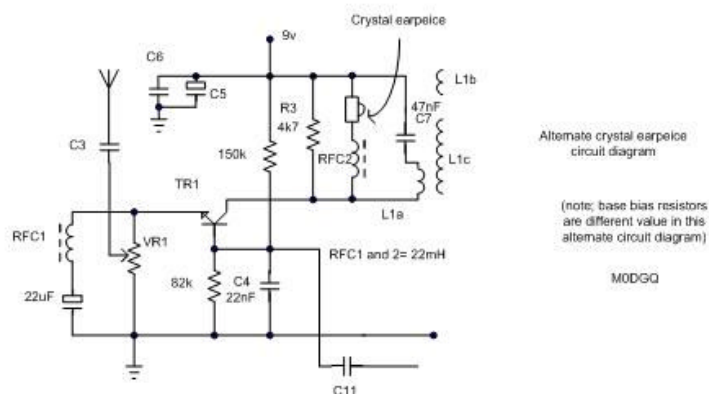
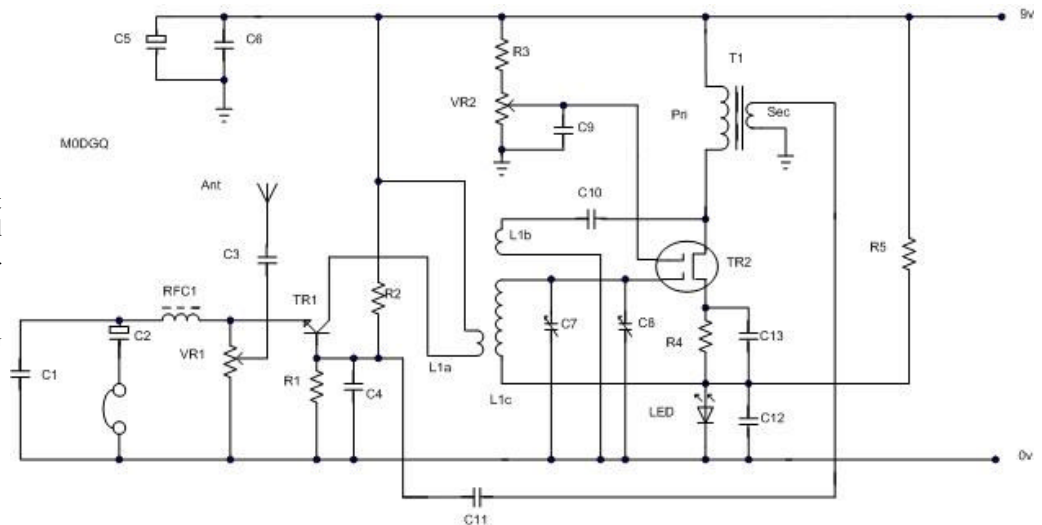
The circuit comprises of two separate stages; an RF preamplifier and the regenerative detector. Tr1 is the RF preamplifier, it provides a small

amount of gain but more importantly it isolates the antenna from the following stage; Tr2 the regenerative detector when used for CW and SSB reception has to oscillate at roughly one kilohertz away from the incoming receive frequency in order to demodulate the transmission. Without Tr1 stage this oscillation would be radiated by the antenna causing interference to other nearby receivers.

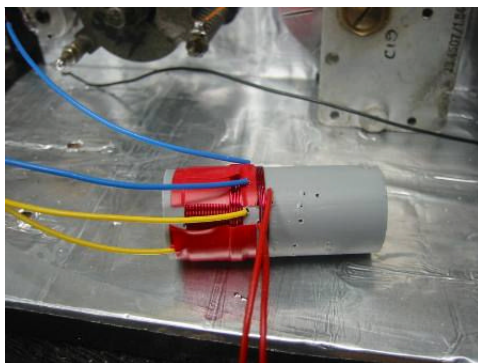
Tr1 is configured as a common base RF amplifier. The antenna signal via C3 is presented to VR1 (used as a crude RF attenuator) and then to the low impedance input of the preamplifier (Tr1 emitter) which gives a reasonable match. For simplicity this stage is untuned. Bias for Tr1 is provided by R3 and R4. C4 decouples Tr1 base to ground at RF frequencies. L1a is the collector load for Tr1 and couples the amplified RF signal to L1c. L1a only has a few turns providing a good impedance match to Tr1 collector. C7, C8 and L1c form a parallel tuned circuit and it is this tuned circuit that provides the selectivity for the set. The tuned circuit is connected to the high input impedance of Tr2 gate 1 which presents very little loading to the tuned circuit thus maintaining



its Q when the detector is not oscillating (AM reception). Tr2 is a dual gate mosfet and its gain/ positive feedback is controlled by varying its gate two DC voltage via R4 / Vr1. LED 1 gives a greater gain range by allowing Tr2 gate 2 voltage to go negative with respect to its source if required. Feedback or regeneration for this stage is achieved by a small coupling winding L1b which is lightly coupled to L1c (L1a, b and c are all wound on the same former); amplified RF signals are present on Tr2 drain, a small proportion of this signal is fed to L1b via C10. L1b winding is arranged such that the fed-back signal passing through L1b is IN phase with the signal in L1c, thus these two signals are thus added, creating a larger

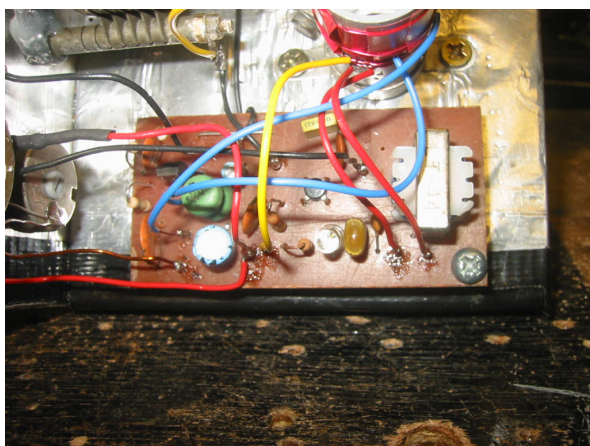






amplitude signal. This loop continues until a point is reached where Tr1 will be freely oscillating. It is this oscillation that gives the stage an extremely high gain; a not quite so high gain will also be achieved if the stage is brought just to the edge of oscillation. Another effect of feedback or regeneration is that the Q exhibited by L1c will be hundreds of times greater than normal thus giving a much greater selectivity, as a point of interest this is how Q multipliers work.

As Tr2 is operating in a non linear mode, demodulation of the signal will also occur in this stage (hence the term regenerative detector). The drain load for Tr2 is an interstage audio transformer type LT44; it has a primary impedance of 20 Kohm and a secondary impedance of 1 Kohm. As far as RF is concerned the primary is acting as a high value RF choke due to its large inductance and is the drain



load for Tr2, so no RF will pass through the transformer, AUDIO frequencies however will and do pass freely via the transformer to the secondary winding. So, audio is present at the secondary of T1 at a source impedance of very roughly 500 Ohms. This source impedance is not low enough to drive the low impedance headphones (40 ohms or so) to a useable level; a further impedance transformation is needed.

Audio from T1 is fed to Tr1 base via c11. Tr1 base is at RF ground due to C4 (a 22nF) but at audio frequencies its input impedance is high, so we can feed audio in to the base and retrieve from the emitter at a very low source impedance suitable for driving the headphones, in effect, as far as audio is concerned Tr1 is an emitter follower (a buffer) stage.

Thus Tr1 is doing two tasks; amplifying RF and at the same time providing audio power gain. RFC1 and C1 prevent RF from reaching the headphones which would otherwise severely attenuate the incoming RF signal. C2 provides DC blocking so Tr1 can operate correctly. C11 also provides DC blocking to maintain Tr1's base potential. If an audio power amplifier is to be used, take C11 to amplifier instead of base of Tr1.

#### ALTERNATE CRYSTAL EARPIECE CIRCUIT

The crystal earpiece circuit is slightly different in operation. Here, we are driving a high impedance load (a crystal earpiece exhibits several megohms impedance), so Tr1 needs to produce voltage gain at audio frequencies. Looking at the circuit, audio is applied to Tr1 base as before but the earpiece is connected across R3. At audio frequencies the combination of the earpiece and the 4.7 kohm resistor make up the collector load. RFC2 blocks any RF that would otherwise pass through the earpiece's flex, this is done to maintain stability when regen is in use. So, at RF all Tr1 sees as a collector load is L1a in parallel with R3. The impedance presented by L1a is much lower than R3, so realistically all Tr1 sees is L1a. C7 is included to present an open circuit (ish) to audio frequencies, without it the earpiece would be shorted out via L1a, but it maintains an RF path for L1 due to its low capacitive reactance at RF (effectively it is a short circuit at RF).

Tr1's emitter is connected to ground at audio frequencies via RFC1 and C2, thus providing voltage gain (not power gain as in the previous circuit) at audio frequencies. The AF voltage gain of the stage will be roughly R3 divided by the emitter impedance (the capacitive reactance of C2 @ 1 KHz in series with internal emitter resistance of about 25 Ohms).

#### IN USE

If you find you can not get your set to oscillate (you will hear a faint "rushing" sound or squealing in the headphones when oscillating), reverse the connections of L1b or L1c.

You may notice there are two variable tuning capacitors. The larger one (500 pF) is used as a band set control and the other (50pF) is used as a bandsread (fine tune) control.

When the set is used for SSB/CW (i.e. it is oscillating) tuning will be very sharp and practice will be required, large control knobs are recommended for the tuning controls. The ones used here are made from

a bleach bottle top and an aerosol can top, these were filled with finishing plaster to give a "weighty" feel. The RF attenuator VR1 is useful when receiving very strong signals, without it blocking can occur (the set goes into complete silence).

For reception of AM signals the regen control should just be on the brink of oscillation. For CW reception strong oscillation should be used but less for SSB.

A good aerial must be used. An earth may be beneficial to some; in my case it made reception worse as broadcast stations tended to swamp the amateur stations. This receiver is not intended for any serious radio work, but it does give an insight to what can be achieved with a few components and most of all it is a fun project. CW stations will be heard with ease and SSB stations will also be resolved once tuned in correctly (this does take practice). Many broadcast stations can be heard (international ones too).

#### COMPONENTS

The coil L1 was wound using 32 SWG enamelled copper wire. The former is 21mm OD plastic overflow pipe. L1c is 35 turns close wound. L1b is 8 turns next to ground end of L1c. L1a is 7 turns wound over L1c ground end (see photograph).

If polycon capacitors used; L1c should be 40 turns and both gangs of polycon capacitor should be wired in parallel for bandset capacitor (tuning range will be slightly reduced). Headphones; use ear pipette type and wire both half's in series to obtain 40 ohms.

A metal chassis/ curry tin should be used for the construction of the set to eliminate hand capacity effects.

Tr1 BC108  
Tr2 BF981, BF966 etc.  
RFC1 22mH or greater  
T1 LT44 push pull amp transformer (the blue one)  
LED 1 standard red or green LED  
C7 500pF variable capacitor  
C8 50pF variable capacitor  
C1 1nF  
C2 10uF  
C3 10nF  
C4 22nF  
C5 100uF  
C6 100nF  
C9 10nF  
C10 390pF  
C11 220nF  
C12 100nF  
C13 10nF  
R1 150K  
R2 150K  
R3 47K  
R4 330 Ohm  
R5 1K  
VR1 2K2 Lin pot  
VR2 47K Lin pot

Barry M0DGQ

# Contest Group Report

Summer is on the way, and so are a number of portable events for you to get involved with. The Backpackers contests are a gentle way into radio-sport. On several weekends throughout the summer, short 4 hour events will be run. Simple stations set up on hilltops, picnic areas and safe roadside areas will be used to make QSOs up and down the country, and into mainland Europe. In the past several Wythall teams have been on the air, adding a bit of club rivalry to the competition. Old FT290's, newer FT817's, or anything that's portable and low powered could be used on 2 metres.

For the bigger events, VHF NFD is only a few months away. At this point it's likely we'll have a similar Low Power event to last year, which seemed a reasonable mix of fun and activity for the club, and gave us a reasonable placing too. If you have any ideas, please speak up at the next committee meeting. On the HF side, there are still plenty of world-wide DX events each weekend.

## Special Contest Callsigns for Individuals

Until now, all UK Special Contest Callsigns were Notices of Variation to club callsigns. Their use has been in multi-op entries by these clubs, and also in single-op events where a member of the club or society uses the call. Some of the clubs' with an SCC have a small membership, perhaps with only one or two contesters amongst them. Some of these SCC's have hence become synonymous with individuals, although they were not officially 'personal' SCCs.

All this has now changed. Any UK amateur that so wishes will now be able to apply for their own SCC. Of course, it's not quite as simple as we would hope, although there are some reasons behind this. There are 520 possible combinations of SCC's in total, given that there are 2 x prefix letters G and M, 10 digits, and 26 suffix letters.  $2 \times 10 \times 26 = 520$ . At least 130 are already allocated to clubs and contest groups. Ofcom assumed that there could be a high demand for individual SCCs, which could exhaust the available supply of callsigns, but also present too much demand on the Ofcom staff to process the requests. Hence qualification criteria have been announced with the intent to reduce the amount of callsigns issued that are not used. Evidence of participation in several contests is now required, although this should not be a barrier to anyone serious about qualifying, even with a modest station.

If you are interested in obtaining your own personal SCC for use in the above contests, go to the Ofcom website here to read more

and then download the application form:

[http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/amateur/special\\_call2](http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/amateur/special_call2)

## M0XXT WPX SSB Contest 2010

The Versatower was loaned out to the M0XXT Dorridge Scout Group for the WPX SSB Contest at the end of March. A large antenna array was put together. At the top of the head unit, near 100 feet, there was a commercial A3S 3 element HF triband yagi, covering 10m, 15m and 20m. On top of this was a full size 40m 2 element yagi, which was constructed of fibreglass fishing poles. A further 20 or so feet above that was a pair of 80m dipoles. These were held in a thrust bearing which allowed the dipole centres to remain fixed, whilst the tower rotated beneath it.

The 5 operators, including a visiting Canadian amateur, made over 3300 QSOs in 48 hours of operating in the Multi-2 category. This enables 2 stations to transmit at once, although this requires some significant engineering in terms of band-pass filtering to keep the RF from one radio away from the other radio.

See more photos at <http://www.m0xxt.co.uk>

Lee G0MTN



## Contest Calendars

Date	Time (UTC)	Contest Name.	Dates - Mode - Frequency - Exchange
May	1900-2030.	<a href="#">80m Club Championships</a>	3rd - SSB; 12th - Data; 20th - CW
June	1900-2030.	<a href="#">80m Club Championships</a>	7th - Data; 16th - CW; 24th - SSB
June 5/6	1500-1500.	<a href="#">National Field Day</a>	1.8-28MHz, RST+Serial

1 May.	1400-2200	<a href="#">432MHz Trophy Contest</a>
1 May.	1400-2200	<a href="#">10GHz Trophy Contest</a>
1-2 May.	1400-1400	<a href="#">432MHz-248GHz Contest</a>
9 May.	0900-1200	<a href="#">70MHz Contest CW</a>
15-16 May.	1400-1400	<a href="#">144MHz May Contest</a>
16 May.	1100-1500	<a href="#">1st 144MHz Backpackers</a>
23 May.	1400-1600	<a href="#">70MHz Cumulatives #3</a>
13 Jun.	0900-1300	<a href="#">2nd 144MHz Backpackers</a>
19-20 Jun.	1400-1400	<a href="#">50MHz Trophy Contest</a>
20 Jun.	1000-1400	<a href="#">50MHz Backpackers</a>
27 Jun.	1400-1600	<a href="#">70MHz Cumulatives #4</a>

The next issue of the Wythall Radio Club Newsletter will be published at the beginning of July 2010

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