

newsletter

"having fun with rf"

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wythall radio club

wythall contest group

G4WAC G1WAC G7WAC
G0WRC M5W

Sept—Oct 2012

Wythall Radio Club meets from 8pm every Tuesday evening at Wythall House, Wythall Park, Silver Street, Wythall, B47 6LZ, near Birmingham.

How much excitement can a club take??

Well it has been a disappointing summer for outside events but we have a lot to look forward to in our Autumn schedule. By the time you read this we will have had HF SSB NFD over the weekend of 1st and 2nd September which was held in the field at the back of Wythall Park with a station kindly provided by Callum M0MCX and supported by a number of club members. On the weekend of the 15/16th September we shall be assisting Darren GW5HOC with the special event station at Stoke Prior Steam Fair near Bromsgrove. Members are welcome to come along and have some fun with the DX on 40m as well as be enter-

tained by all the machines, vehicles and stalls that are on the showground. Tim M0URX is giving a presentation on the Timor 4W6A DXpedition he went on last year and we hope to hook up live with one of his fellow operators based the other side of the world. Then on the 25th we have the AGM (see below) and then its October. Wythall House are running another beer festival on the 6/7th and we will start the Tuesday CW class on Oct 9th. Mark G4FPH is also giving a talk on the "perfect mobile rig from Atlas Radio" on the 9th and we have the annual

shooting contest scheduled for Sunday October 21st. This is quite a lot to look forward to and we hope the members will come along and support us.

There is quite a lot planned for November and December but you can read about that in the next newsletter. However it is worth you making a note in your diary that the club's Xmas social is planned for **Saturday 8th December**. If members wanted it we could perhaps put on something special like a race night with videos and a tote. We did several of these many years ago and they proved very popular.

Looking back on the year so far, there have been many high points and few, if any, low points but I suppose one of the most enjoyable things we did as a club was our trip to Avoncroft museum. Now that was having fun with RF.



Notice of WRC AGM 25th September

The committee are considering the introduction of election of officers and committee by secret ballot at the AGM which means that we will need to publish the nominations prior to the AGM. We are also required to give 21 days notice of our AGM.

Notice of AGM of Wythall Radio Club on Tuesday 25th September 2012 in the WCA Board Room, Wythall House, commencing at 20:30.

Agenda

1. Check on members present
2. Appointment of Minute Taker
3. Apologies
4. Proxies received
5. Acceptance of 2011 minutes
6. Matters arising from 2011 minutes
7. Chairman/Secretary Report (brief)
8. Treasurers Report (brief)

9. Resolutions on Changes to Constitution recommended by WRC Committee (these will be pre-published to enable proxies/postal voting to be organised)
10. Election of Officers and Committee by ballot
11. Election of Auditors
12. AGM of Wythall Contest Group
13. AOB (suggestions for committee to consider)

We also invite nominations to the position of;

Chairman
Secretary
Treasurer and the Committee

The constitution currently calls for a committee of 6 ordinary members but this may be reduced to 4 under current re-

view of constitution)

So if you wish to put yourself forward to any of these positions you need to find yourself a proposer and seconder from current membership.

If you have been a member of WRC for less than one year at the time of the AGM then because of constitutional rules, you won't be able to stand for either an officer or committee position. Once you have your proposer and seconder sorted, please send Chairman Chris G0EYO g0eyo@blueyonder.co.uk an e mail with your name, callsign, position being nominated (either officer or committee member) and callsigns of your proposer and seconder so these can be put on the relevant ballot papers. Please do this no later than 13/9/2012 but earlier if possible.

Chris G0EYO



2m Receiver Converter

This 2m rx converter is part of a 2m transverter for use with a HF transceiver (28 -30 MHz) but can be used as a stand alone down converter. The converter is sensitive and unconditionally stable. The antenna signal first passes through a two pole 2m bandpass filter, L6, L7. These coils are mutually coupled to each other.

Tr1 is configured as a low noise RF preamplifier. L3, the collector load for Tr1 has a low impedance centre tapped winding which feeds D1, D2 forming a single balanced schottky diode mixer.

The down converted IF

leaves the mixer and is fed to a HF (28 - 30 MHz)

grounded base preamp Tr2.

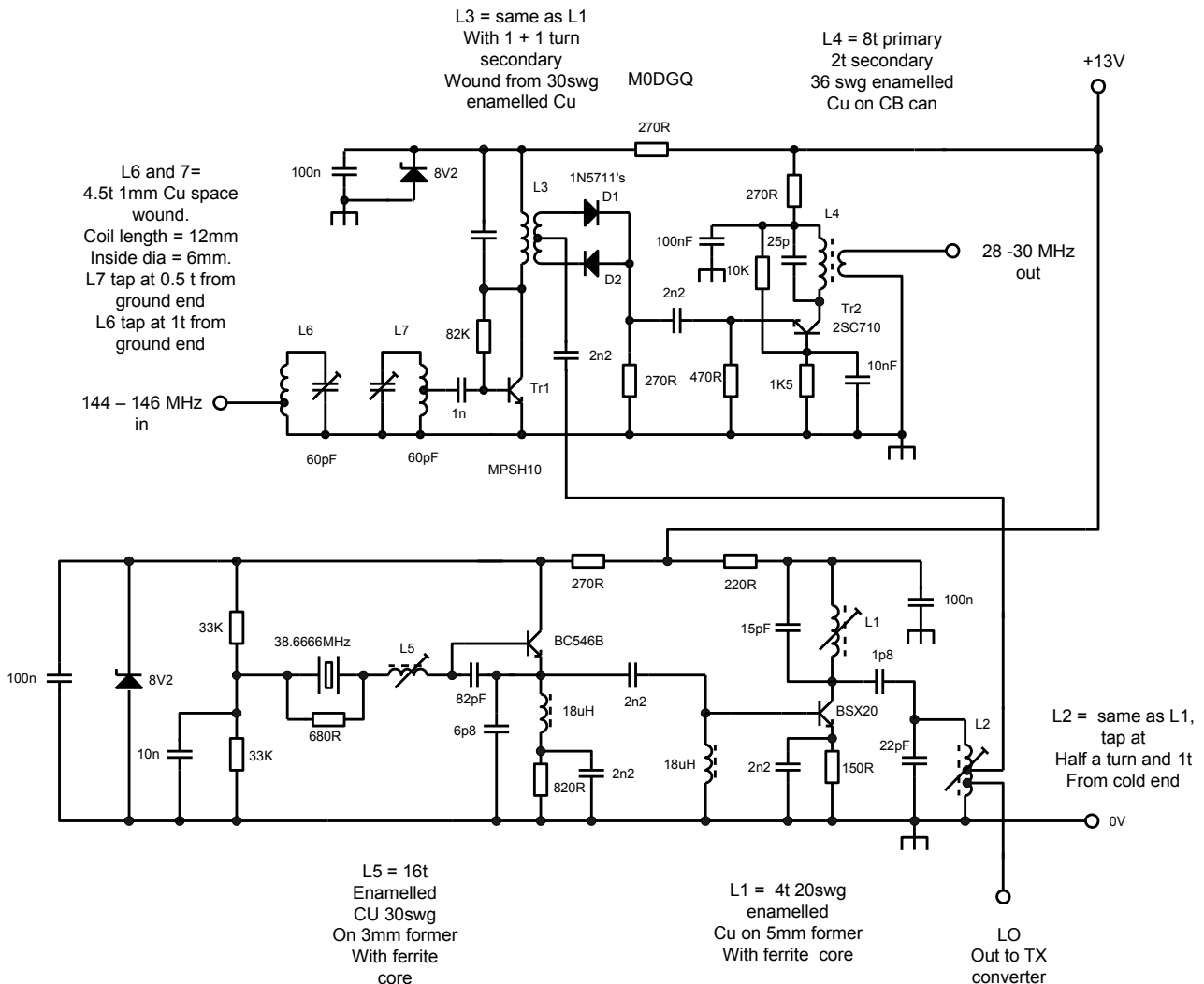
The local oscillator strip uses a 38.6666 MHz third overtone xtal multiplied by X3 to produce a LO frequency of 116 MHz.

With a average sensitivity HF receiver this 2m con-



verter will copy signals down to the 0.25 uV region.

Barry Zarucki M0DGQ



The Yaesu YD844A Desk Microphone- can we rebuild it?

A sorry tale about one of these iconic cast aluminium desk mics that accompanied the FT101 range of transceivers.

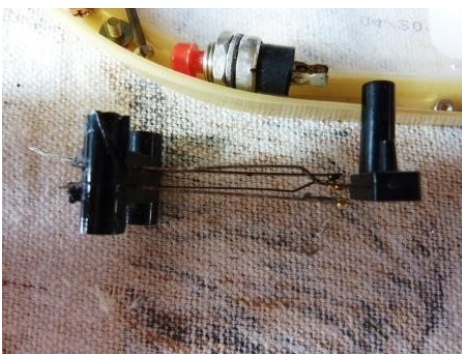
Bought by a "screwdriver expert" who stripped away most of the parts, substituted the PTT switch for a knackered one and returned it to the seller as "not working" I think we know the rest.... But it ended up at the Stockwood Park rally for £3.

Perfect for a rainy day project.

The paintwork is superb and all the aluminium parts are pristine but the nearly bare base plate reminds me of the task ahead.

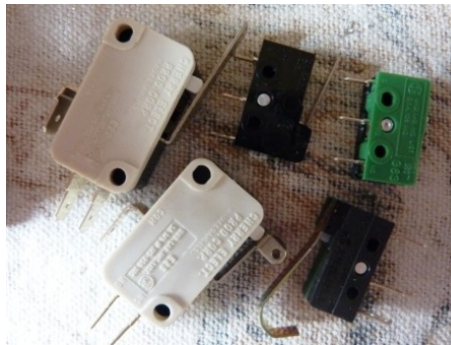


The PTT- in fact there are two, one conventional with a lock and the other on the base that is actuated by lifting the mic. The American Hams will like this, so they thought, but quite often you find the wires to this cut so clearly it was an annoyance to some.



The original PTT switches were large with long leaves which seemed to go out of shape and indeed the one that remained looked reasonably OK but failed miserably to make contact. Two sessions with the sonic cleaner cleaned up the leaves but contact was unreliable and so a modern solution was needed.

Microswitches offered the most obvious solution but finding a suitable one out of

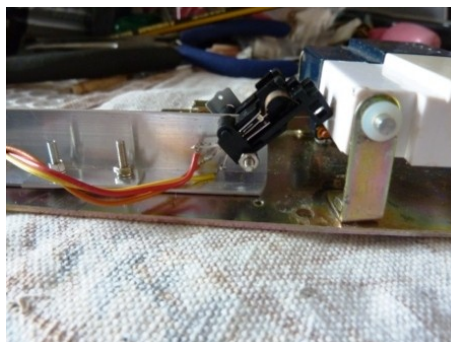


my selection of around 20 types proved difficult.



Two types nearly made the grade but were finally discounted as I could not reliably achieve sufficient lever movement to actuate the switch. A fairly long session on e-Bay resulted in the purchase of these- inexpensive switches but looked as if they would do.

So how do we fit the switches so that pressing the PTT button or lifting the mic will switch the rig to transmit?

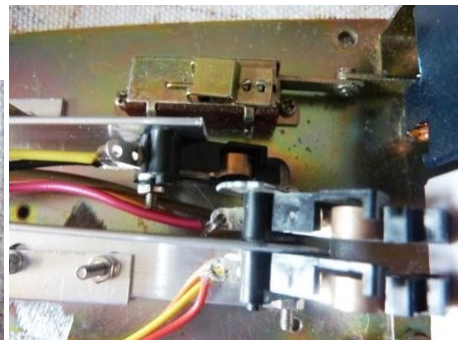


A piece of aluminium formed and drilled to suit existing holes in the base plate will be the answer and it was a case of offering the bracket and switch to the PTT button and adjusting for reliable operation.

In practice the alignment was so critical that I drilled oversize mounting holes in the bracket and made up a piece of flat

aluminium drilled to accept the fixing screws. The bracket then sat between this "washer" and the base, the oversize holes allowing for front to back and side-ways movement for precise alignment. A firm tightening of the screws holding the bracket and switch completed part 1

Part 2- the fitting of the base operated PTT was easier and again a bracket was made and the switch fitted and aligned for reliable operation.



At this point I should say that the YD844A was a dual impedance mic, but as the mic element was missing, the hunt started for a suitable replacement. The covering of the impedance selector switch by the new brackets was unimportant as this was never going to be a restoration in the true sense- more of a rebuild from scratch.

Looking at the simple circuit which curiously only shows one PTT switch, we need to short the PTT line to the return "chassis" line and so the button PTT switch is wired to NO (normally open) and the lift operated PTT switch is wired to NC (normally closed) because when it is sitting on the desk, the switch has changed to NO

Replacing the curly cord, wiring the switches and connecting a short section of screened cable for the mic insert completed the job thus far.

Of course the dynamic mic insert from Tom's microphone project would be a good starting point, but I can't vandalise that project!

The search continues.

Ian Reeve
M0IDR

New Members Information Booklet

When you join a club, it is often difficult to pick up on all the things that the club does, and how it does them and who does them and when they do them. Just remembering names of club members can be difficult and that equally applies to callsigns. Wythall Radio Club have been giving this matter some thought and a few months ago started putting together a new members' pack. Colin MOGJM took on the task of turning the ideas into reality and with a bit of editorial support from Chris G7DDN and Chris G0EYO came up with the Members Information Booklet. This A5 booklet has 8 pages of pictures and information which will prove very useful to any member when he joins the society. We also include a current list of members and callsigns (which at the moment shows 77 members listed – a record for WRC). The table of contents shows what is included in the booklet:

- Introduction
- Contact Details
- Meetings
- Radio Club Membership
- Organisation
- Website
- Yahoo Group
- Training
- History of Wythall Radio Club
- Aspects of Amateur Radio
- The Cub Shack
- Directions

We only intend to hand these out to new members so we only print off about 10 copies at a time (thanks Phil 2E0WTH and Colin MOGJM) but if any existing member was keen to have one that would not be a problem, just ask Chris G0EYO. This way we can keep the booklet up to date and fresh without having to worry about having large numbers of copies to dispose of.

Other suggestions for members' "freebies" include pens, car stickers, etc plus of course you can purchase a wide range of polo shirts, T shirts, fleeces, hats and other items with the club logo on as many members have chose to do so. Information on these is in the File section of the G4WAC Yahoo Group website.

Download the Clubs Calendar onto your Outlook Calendar

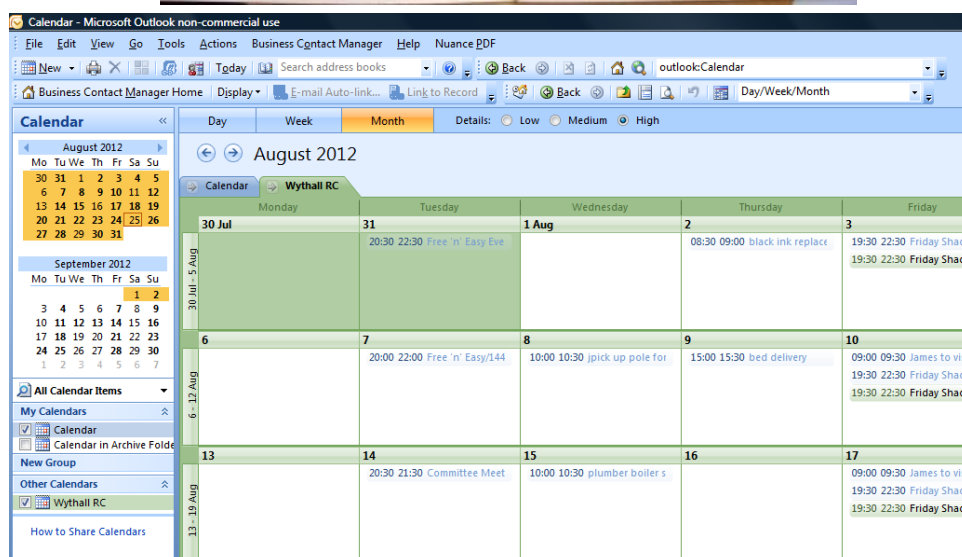
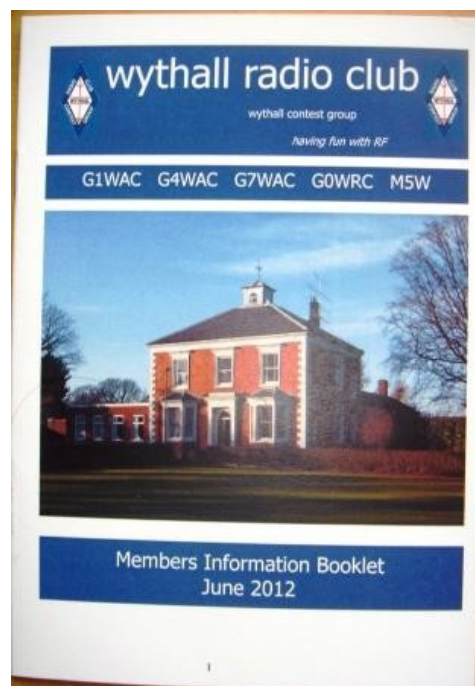
Chris G7DDN has been doing a great job in creating and updating a calendar

of club events. You can find this by going to the WRC website www.wythallradioclub.co.uk and clicking on EVENTS on the homepage header. A much easier way is to import this calendar to your OUTLOOK calendar. We can do this because Chris has created the WRC calendar in google calendar. Go to this URL

<https://www.google.com/calendar/ical/wythallradio%40gmail.com/public/basic.ics>

Open Basic.ics

The calendar should now appear in your OUTLOOK calendar screen as a separate calendar (see below) and should regularly sync with the WRC calendar so your OUTLOOK calendar is always up to date. And if you sync your OUTLOOK calendar with your smartphone that will be updated too!



"The lights are on but....."

Fault diagnosis on a venerable FR101 from Yaesu



The FR101 is a dedicated Amateur band receiver, a classic of the 1970's, that covers 1.6Mc's to 29Mc's in switched ranges.

Styling matches that of the FT101 and designed to be used with the FL101 transmitter, the receiver has various options including plug in boards for 2m and 6m reception. On the rear apron, there is interface connectivity for the FL101 and the FT101 allowing for transceiver or independent receive and transmit function. By linking the VFO's together and selecting the appropriate options from the front panel switches, either VFO can be used to control both the rx and tx frequency.

The receiver features a very accurate analogue frequency readout, attenuator, crystal calibrator, noise blanker, selectable AGC, RF gain and squelch. Using 26 silicon transistors, 12 fet's, 6 IC's and 39 diodes, the receiver has a quoted sensitivity of 0.3uV for Signal to Noise ratio 10dB, the same as the FT101. It does require an external speaker, connected by a phono plug to the rear panel, and the matching SP101 looks the part, but was and still is expensive for what it is a cheapish speaker.

Construction wise, a very complex and busy chassis with several multiple function or single function plug in boards, together with numerous other fixed pcb's. Plug in boards are not without their problems as the contacts age but usually a quick extract, clean & re-insert is

all that is required to cure those pesky crackles.

Service engineers used extension boards or riser boards to lift the pcb in question clear to take voltage readings, these risers

have long gone but veroboard can be used to home brew as long as the correct pitch socket is available. These can still be found by rooting through junk boxes at rallies and are bright green to aid recognition. Of course I am not the only one looking for these and the street-wise sellers have already removed them from the 10p boxes!, as they are increasingly doing with the GZ34 rectifier valves which now fetch at least £10. I digress so back to the patient on the workbench. For their age, this range of Yaesu kit, FR101, FL101 and of course the FT101 in its many versions were and still are used as the workhorses of many Amateur Stations but there are issues and the one described here has become if you like a "stock fault" of these classic pieces of kit.

"The lights are on but there is no one" in describes the silence when you switch on your favourite Yaesu and you are met with silence (apart from a faint hiss from the electrons whizzing around those

early silicon transistors). Everything is lit up except for the VFO led and this is the clue to the fault.

Do check though that the VFO selector switch has not been put to EXT, as, of course, in that mode it is expecting to be controlled from an external VFO.



The first time I encountered this problem, it was after prolonged use on a hot Summer's day, the receiver just died and the VFO led went out. The Yaesu manual did not have a schematic -it did show the pcb's but the regulator board shown did not match the one in my set- I made the assumption that there was a voltage line missing and so went straight for the regulator board.

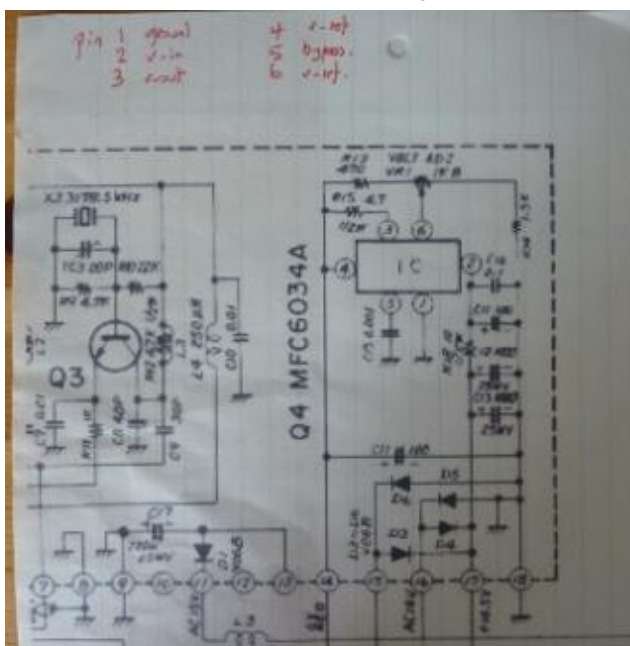
I could not extract the board to take voltage readings, so very careful placing of the test meter probes was called for. There was a good 18v unregulated input but could not find any output from the "ugly bug" chip, so had I found the problem. The chip- MFC6034 should provide a very stable 6v supply from pin 4 and this was missing.

A look through the Fox Tango group site confirmed my findings but did not come up with a solution apart from visiting the fox Tango candy store and purchasing one for \$16 + shipping! I bet they bought up all existing stock from Motorola or Yaesu.

To prove the point, an external 6v supply was hooked up between the relevant points on the pcb (+ve to pin4 of chip, -ve to chassis) and the receiver sprang to life reassuring me that there was no fault further down the 6v rail which had taken the chip out.

I kept the existing chip in situ and wired in "ugly bug" style of the reverse of the board, a 3 pin 7806 voltage stabiliser. In to pin 2,

Continued on page 8



Circuit Simulation; its a Wizard!

Last year I purchased a circuit simulation software called Circuit Wizard from Maplins to assist in the Advanced training course in basic electronics. The software contains a large library of components and their characteristics which you build up as a circuit on the screen and then press the simulation button to see if the circuit does what you would expect it to do. With this I was able to demonstrate simple circuits such a half-wave, full-wave and bridge rectifier circuits, capacitor-resistor timing networks and transistor amplifiers. The software allows you to measure points on the circuit; apply inputs signals, and measure outputs. The software comes in two levels, standard which is around £60 and professional which costs around £90. I bought the standard package but it does not feature some of the virtual test equipment that is available in the professional so this year I upgraded to the professional package.

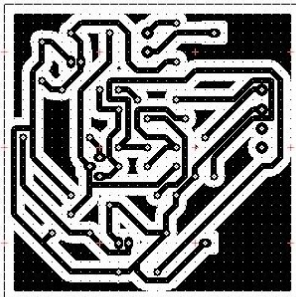
I have started to use the software on a number of projects involving a mixture of audio and logic and I have never used it for RF circuits where its limitations might be exposed.

Barry M0DGQ sent me a circuit of a CW oscillator based around a concept known as "twin T" or "phase shift" (google it). In Barry's circuit the oscillator output was applied via at volume pot to an audio IC device LM386 which drove a speaker. My software package doesn't show this IC as a library item so I drew just the oscillator section with the software.

Once I had drawn the circuit I tried to simulate it. I couldn't get it to oscillate. I checked the component values again. Found I have inserted the zener diode the wrong way around. Tried again, still no oscillation.

Barry had called up a BC546B NPN transistor; my library didn't have this but did have a BC547B which I

thought was near enough to work. By connecting up my virtual oscilloscope to the volume pot slider I could monitor the output. As I adjusted the present pot in the oscillator circuit (10k lin), I could see the circuit oscillate at around 5k-6k ohm setting. The most difficult thing to

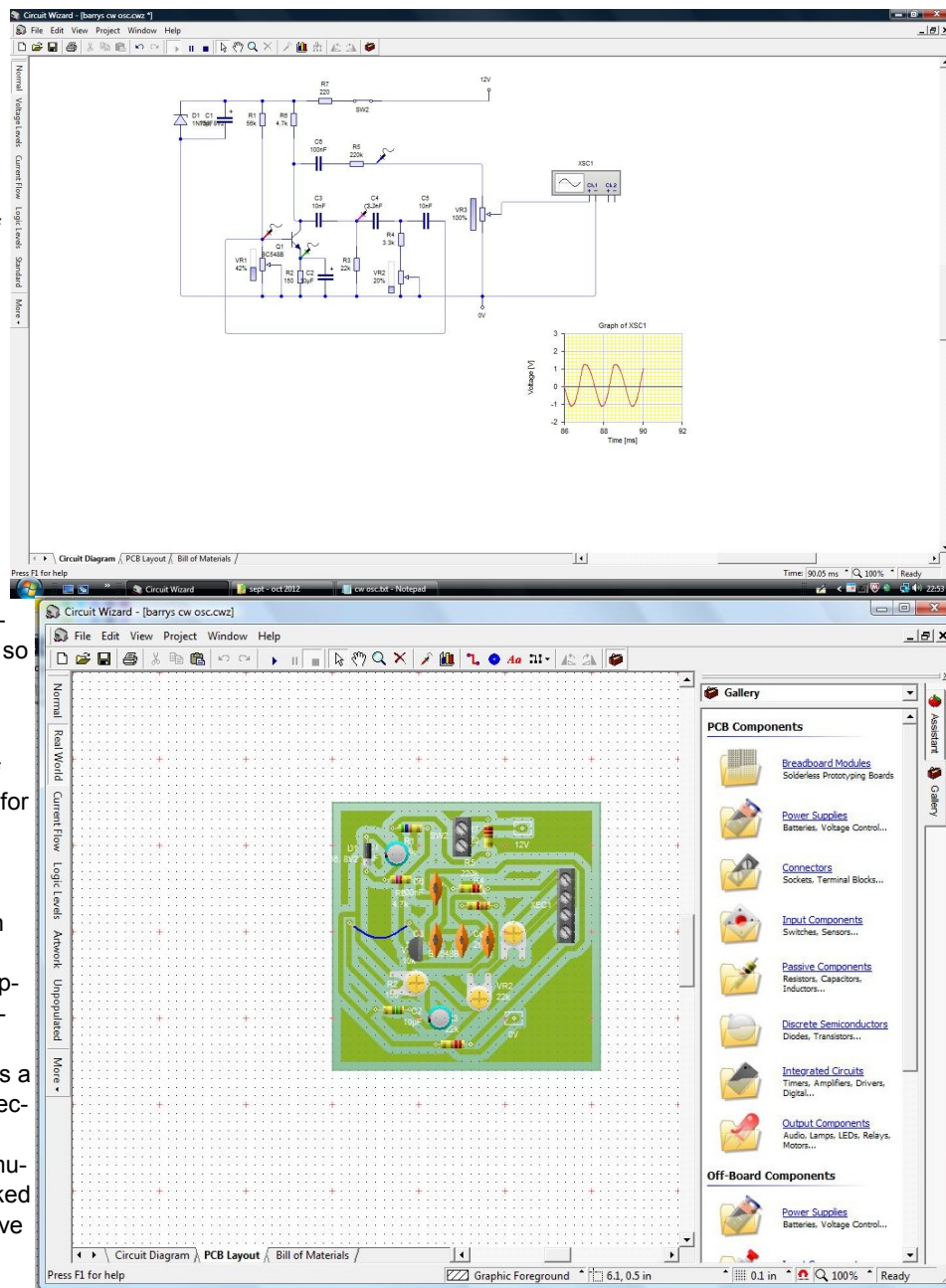


get your head across is the need to understand the timing control on the display graphs. Once I had got this figured I was able to see that the oscillator circuit was producing a 2v p-p sine wave at the volume pot slider. (see diagram) Once I was satisfied with the circuit I could now proceed to the other function of the software which is to draw out a printed circuit board based on the circuit I had drawn. This is quite simple, you just go through

a wizard deciding whether you want single or double sided pcb, thin, normal or thick tracks, size of pcb and it does all the work for you including placing your components. When it is finished you get to see the final build plus you can print off pcb artwork, component silk screen printing plus a bill of material of all the parts shown on the circuit.

This software is great fun to use and will be of interest to those who a) want to understand how the circuits work and b) want to get the pcb artwork drawn.

Chris G0EYO



Changes to the club's constitution proposed

The committee asked a sub-group comprising Chris G7DDN, Stew M0NYP, Anita M6DUO, Lee G0MTN and Jon M0JMM to consider possible changes to the club's constitution because it had found to be wanting when faced with conducting the EGM held last November. The sub group minus Jon met a couple of time and Chris G7DDN presented a summary of their report to August's committee meeting. This report is filed on the G4WAC Yahoo group site for members to consider before the September committee meeting so that the committee can make recommendations to the AGM.

To summarise the report

- New members should have a probationary period before being approved by the committee
- Unacceptable behaviour affecting the running and well being of the club to be punished.
- Members to give permission for committee to make checks on them to verify fitness to be a member if the committee so wish
- Withholding or withdrawal of membership to be by the committee with the right to appear before the committee before such a decision is made.
- Dates subscriptions due and applicable rates to be clarified. A definition of family member and voting rights to be looked at and to allow for junior members to be given free membership without voting rights.
- Structure of committee to be considered with a view to reducing it to three officers and four committee members
- An end to co-option on the committee but welcoming members taking on a role in the club
- Introduction of secret ballots at the AGM for election of officers and committee and any resolutions requiring a vote and therefore for nominations and resolutions to be pre-published so that ballot papers can be prepared and distributed before the AGM.
- Clear definition of the use of proxies and also introduce postal voting
- In the event of winding up of club assets to handed over the WCA.
- Amend the Child protection policy to remove the need for a specific Child

protection officer but to recognise that all members have a duty of care in that respect.

- Amend some anomalies on the use of club IT
- Initiate further discussion on Honorary membership rights, rights of expelled and resigning members to rejoin
- Introduce a grievance procedure to sort out personal differences between members which don't really involve the club

Between now and the committee meeting on the 11th September we will need to come up with a set of proposals that can be agreed by the committee for the membership to decide on at the AGM which is on the 25th September.

We don't have to make all of the changes at one go. Having clear rules on how to deal with unacceptable behaviour and establishing a grievance procedure as well as having new members approved by the committee would seem sensible to most people. Tidying up the definitions of membership and their voting rights would also seem to be worth supporting. Recognising that members can have an active role and some responsibility without having to be an officer or committee member is recognising what has happened this year and it seems to be working very well.

Having officers and committee elected by ballot and limiting the number of committee members to 6 or even less has to be more democratic than a show of hands at the AGM and agreeing to only use proxies for pre-published resolutions should avoid any arguments in the future.

We are seeking the views of the membership on the sub-groups recommendations but there has been little response to date, apart from the proposal for a probationary period which could prove a bit contentious.

Don't hesitate to let the officers and committee members know how you feel about what is proposed. Constitutions are a bore and for most of our existence we have never had to even look at it, but when we do a clear and unambiguous one is essential.

Chris G0EYO Chairman

Training

Our first intense Foundation training programme over two weekends went well with four of the five candidates passing the exam. So well done to, Rob M6HCS, Jim G M6BXG, Jim J M6EAO and Darren M6LPD. Roy will be retaking the exam in early September and we hope for another pass. The intense programme probably wouldn't suit everyone as there is not a lot of time for revision and reading in between sessions and I don't think it would suit youngsters. We are now about to embark on a 15 week programme for the annual



Advanced Course. On paper we might have about 4 or 5 candidates. This course is on the usual Monday evening between 8pm and 10pm. The exam is on Wednesday Dec 5th.

The class room has undergone a transformation. A problem with the projector one Tuesday prior to the Foundation course starting resulted in us quickly purchasing a 42 inch LED TV and putting it on the wall where the notice board was. This proved to be a great success and we turned the tables and chairs through 90 degrees so that people are facing the screen. It means that we can use the white board for explanation purposes.

The projector problem turned out to be a leaking SMD cap on the lamp supply control side and this was fixed by Barry M0DGQ, our resident genius, without the aid of a circuit. So we have the projector for use when we use the Dart Room up-



Continued on P8

Contest Calendar

VHF Contests dates

4 th September	19.00 to 21.30	144mhz UKAC
9 th September	09.00 to 12.00	Second 70mhz contest
11 th September	19.00 to 21.30	432mhz UKAC
25 th September	19.00 to 21.30	50mhz UKAC
2 nd October	19.00 to 21.30	144mhz UKAC
9 th October	19.00 to 21.30	432mhz UKAC
21 st October	09.00 to 12.00	50mhz AFS
23 rd October	19.00 to 21.30	50mhz UKAC
30 th October	19.00 to 21.30	70mhz UKAC (last)
3 rd + 4 th November	14.00 to 14.00	144mhz CW Marconi
6 th November	19.00 to 21.30	144mhz UKAC
13 th November	19.00 to 21.30	432mhz UKAC
27 th November	19.00 to 21.30	50mhz UKAC

HF Contest dates

12 th September	19.00 to 20.00	80m Club Sprint SSB
27 th September	19.00 to 20.00	80m Club Sprint CW
7 th October	07.00 to 19.00	21/28mhz Contest
10 th October	20.00 to 21.00	80m Club Sprint CW
25 th October	20.00 to 21.00	80m Club Sprint SSB
8 th November	20.00 to 23.00	Club Calls
14 th November	20.00 to 21.00	80m Club Sprint SSB
17 th + 18 th November	21.00 to 01.00	2 nd 1.8mhz Contest
29 th November	20.00 to 21.00	80m Club Sprint CW

Training cont'd

stairs.

The one thing that puts people off having a go at the Advanced course is the maths involved. This, although a challenge, is not as scary as people believe. There are nearly 40 formulae spread throughout the syllabus and any of these can be called upon in the exam. However you don't have to remember the formulae as these are given to you in the exam paper booklet. But you do need to know what each formula is for. They start off with simple Ohms Law and go up to more complex equations such as those for resonant frequency.

There are four skills required to conquer the maths side of the course:

1. Understand how to scale indices up and down; e.g. micros to picos to nanos; millis to micros; Mega to Giga.
2. Select the right formula from the sheet by knowing what it solves
3. Manipulate the formula, i.e. if $I = V/R$ the R must = V/I
4. Be comfortable using a scientific calculator

We spend the first session of the Advanced Course practising these skills because given that formula questions have unambiguous answers, you only have to plug the right numbers into the right formula to get the right answer = easy marks.

Fault diagnosis on a venerable FR101 from Yaesu (cont'd)

Out to pin 4 and centre pin to earth. Slotted the pcb back in and –perfect– job's a *good un!*

Since then have had a second one with exact same symptoms, easy repair and will keep the old girl going for many years to come. Interestingly, although Yaesu made mods along the way, the regulator boards that carry these chips have received the most modifications in both the FR101 and FT101, showing that Yaesu must have been aware of reliability issues.

Here is the regulator board from a FT101 showing two such devices and again failure results in the VFO led not lighting!

Long term use has not revealed any issues associated with leaving the dead chip in situ, making this a quick 15 min job.

Now back to my FT200 which has a intermittent fault on receive, the cause of which has so far remained a mystery. I remarked that using board extenders made servicing and measuring voltages easier, but they were near impossible to find.

Some enterprising American Guy is making these for various rigs, to buy is \$100 + postage etc for the FT101 but he also does others and interestingly he is offering a "rental" deal whereby you have for 30 days, do

the tests you need to do, then return them to him. Brilliant!"

Ian
MO0IDR



The next issue of the Wythall Radio Club Newsletter will be published at the beginning of Nov 2012

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