

# *Chelmsford Amateur Radio Society*

Affiliated to the RSGB.

President: Dick Brocks G3WHR  
Secretary: Charles Shelton G0GJS

Club Call Sign: G0MWT

Chairman: John Bowen G8DET

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We Brits spend an inordinate amount of time discussing the weather. We are going to discuss weather for the whole evening at our next meeting. This will be the second time we have had an evening devoted to the subject. The first occasion was eighteen months ago. The intended speaker had to cancel at the last minute. Our Chairman had one of his brainwaves and suggested Meteorology as the theme for the evening with short presentations by Members. On that occasion Harry introduced us to El Nino which, to be honest, was unknown to many of us. The media took up the subject shortly afterwards!

**Harry G5HF** is our speaker for the evening and he is going to tell us about the role, and latest developments, of satellites in forecasting, followed by some of the attendant problems. He will give examples of the kind of pictures that can be received with modest equipment and show how they can help in understanding forecasts. He will give an account of the equipment needed for reception. Finally some notes on storms, because the media are notoriously inaccurate when it comes to extreme weather. It's time you heard the truth!

We meet at 7-30pm at MASC on Tuesday April 6<sup>th</sup>, weather permitting, that is! Ladies and guests are always welcome. Don't forget to support Ela's raffle, it goes a long way to meeting our expenses!

## DATES FOR YOUR DIARY

- ApL. 6 CARS Mtg. Weather Harry G5HF - MASC.  
 ApL. 10/11 Int. Maritime Coast Station Event \*\*\*  
**ApL. 14 Committee Meeting. 7-30pm - Ela's QTH.**  
 ApL. 18 Cambridgeshire Rpt. Grp. Rally - Bottisham.  
 ApL. 18 Rainham Radio Rally - Rainham, Kent.  
 ApL. 20 Aerial Erection for IMD - 9-30am - S'ford Mill.  
 ApL. 24 International Marconi Day - Sandford Mill.  
 ApL. All mth. Commonwealth Area Stns. DX Event. \*\*\*  
 \*\*\* For details see last month's Newsletter.

## LAST MONTHS MEETING - Presentation No. 1 QRP - Tom G4INM

Tom's subject was the joys of operating QRP. The pleasure Tom derives from this activity extends to the construction of receivers and transmitters for use on QRM. However Tom first advised us that QRP is Q code for, 'Shall I reduce power?' It has come to mean using power below 5 watts on CW and 10 watts PEP on SSB.

Tom explained the challenge in working with only a few watts compared to 100 watts possible. With 100 watts a 5,9 report is common place whereas to winkle out an S0 signal from the noise and QRM and to be given 5,2 gives far more satisfaction. For Tom, nothing is quite like working ZL or VK with a couple of watts and a wire aerial.

QRP has the same activities as QRO. There are skeds, chats and contest. Tom said that when contesting QRP'ers have an advantage as they usually receive extra points. However the same 599 report applies when using only 1 watt in contest.

Tom continued by describing some of the many kits that are available for QRP. He recommended that one should start with a simple kit, with separate receiver and transmitter, and then progress to a superhet receiver in a transceiver. Tom showed us the kit he has from NORCAL (North Carolina) QRP club. For each kit they sell, one is donated to the Third World. Tom stated that the most popular receiver is a direct conversion, (mixer with local oscillator but the conversion is direct to AF without an intermediate frequency). Hum or out of band signals can be a problem but by using batteries and filters these problems can be overcome. Tom's demonstration receiver was so small it had been lost, but Colin found it in the folds of a coat. The matching transceiver Tom then wished to show had also been lost! Being 2cm square this was not difficult. After some rummaging in his bag Tom recovered the transmitter. The DC oscillator can be used for both rx and tx. G4INM mentioned that the tx was crystal controlled on 3.560 with some movement either side.

Some transparencies were then shown on the overhead. These were of an OXO all band transmitter by GM3OXX. This tx works on all bands by changing crystals. Next was the JBS by the same designer. Then Tom showed the QSK 1 watt for 20m illustrating the VFO method of fixed L and switched C's. 'Break in' is possible.

Reading material on the subject was then presented: QRP Note book, G-QRP Circuits Handbook, QRP Classics. Geoff G7KLV said they are all available from the library. Sprat magazine was shown which is a quarterly publication and is the journal of the G-QRP club, founded by Rev. George Dobbs G3RJV. At £6 per year Tom said this magazine has many worthwhile articles on varied subjects.

Colin gave an impressive demonstration of his Mizuho SSB & CW 2watt transceiver for 80m by finding a live QSO.

Before taking questions Tom mentioned that aerials for QRP are usually wire, G5RV etc though some people do cheat with beams.

In response to a question Tom said that he has worked ZL and VK on 1 watt and that 5 watts will take you all over Europe. In the morning of the meeting Tom had worked IK, LA & HA. If you call with CQ QRP the person replying is usually QRP. Replying to another question Tom said his G-QRP club number is 786 and that after 20 years the latest membership numbers are in the 9000's. Tom stated finally that there is far more CW on QRP than SSB.

I am sure that Tom has wetted the appetite of many people with his informative and interesting insight into the world of QRP. Thank you Tom.

Write-up by David M0BQC

## LAST MONTHS MEETING - Presentation No. 2 COMPUTER VIRUSES - Murray G6JYB

What are they? Sources - Symptoms - Strains - Spread - Prevention. These were all explained. The worst thing to do was to think it could not happen to you!.

## STOP PRESS

Due to altered domestic arrangements, Colin G0VDL has a 40ft. tilt-over Tenna Mast surplus to requirements. He is offering this item free to anyone interested, together with a load of magazines! Contact him on 01375-384179.

It could and to some in the audience, it had. The US Army now categorises it as Cyber Warfare, Class 3.

Viruses first appeared in 1987. In 1990 the Michaelangelo Virus was discovered and is triggered on 6<sup>th</sup> March each year (his birthday). In 1995 Macro Viruses were produced which could be attached to Microsoft's Word, and in 1996, to Excel. To inhibit this potential problem ensure that when in Microsoft Excel and Word, select from the top Taskbar - TOOLS - OPTIONS - GENERAL and ensure the MACRO VIRUS PROTECTION box is ticked. Additionally Murray suggested that if you were computer competent to do so, check that your BIOS is ANTI-VIRUS PROTECT enabled. Unfortunately he had found most PCs came with this Boot-Up Protection disabled.

Murray said that exchanging Floppy Disks were the worst offenders at spreading viruses. Responding to a question from Eric, G8ADN it appeared that a few years ago the occasional box of IMATION (3M) 2HD preformatted disks had a virus on them. This would have been a Boot Sector Virus and would have been difficult to detect without Virus Protection Software in use. Geoff G2AMQ said he had also been infected this way. Do not leave a Floppy Disk in the computer when booting up. Again, if confident to do it, alter the Boot sequence to C drive instead of the usual A drive. The problem of doing this is that if one has a major failure you have to somehow change back to A drive to use the manufacturers Boot Floppy Disks. One hopes that this occurs only once or twice in the life of the computer.

Murray liked the McAfee (Network Associates) for real time anti-virus protection and the Dr.Solomon "Magic Bullet" bootable floppy disk for emergencies. He also suggested visiting the following websites: [www.nai.com](http://www.nai.com), [www.icsa.net](http://www.icsa.net) and [www.norton.com](http://www.norton.com) where virus information can be obtained.

Thank you Murray for a useful and topical talk.

Report by John G8DET

#### LAST MONTHS MEETING - Presentation No. 2

#### FREQUENCY SYNTHESISERS by Ken G3PMW

We asked Ken to give us a technical talk on some radio related subject and with a little persuasion he chose frequency synthesisers. He had been professionally involved in their design for use in TV transmitters and although his knowledge of current practice might be a little rusty, the basic principles do not change.

The generation of stable and pure frequencies is most easily done with a crystal but its frequency is virtually fixed and can only be varied by small amounts. However, almost every application requires a range of accurate and stable frequencies in multiples of 1Hz upwards.

The frequency synthesiser enables a range of frequencies to be produced with the accuracy and stability of a reference crystal..

The essential components are a VCO, a reference oscillator and a phase detector, PD. The PD is fed with two signals, one of which is the reference, Fref and the other is from the VCO, usually via a variable frequency divider. The PD compares the phase of these two signals and when they are co-incident their frequencies are the same and there is no error voltage. If the VCO signal varies, an error signal is generated, the polarity of which depends on whether it is above or below Fref. This error voltage is then applied to a varicap diode in the VCO via a low-pass filter. With the correct polarity, the effect is to alter the VCO frequency until it co-incides with Fref again.

The VCO frequency can be varied in discrete steps by altering the division ratio of the divider but it is always locked to, and equal to, Fref. In effect the arrangement is a feedback loop and if correctly designed is always negative and reduces the error. If it becomes positive the effect is disastrous!

To illustrate the mechanism let us substitute some numbers. Let Fref be 10kHz. Let Fvco be 1000kHz and let the divider be set to 100. The other input to the PD will be 10 kHz (i.e. 1000 divided by 100) so that no error voltage is produced. If Fvco varies, an error voltage is produced which will apply correction to the VCO and bring its frequency back 1000kHz again! Now if the divider is set to 90, the VCO frequency will change to 900kHz due to the corrective action of the loop. Thus, the VCO can be set to give discrete steps, equal to, and locked to the reference frequency. The example illustrates the action of a phase locked loop.

Simple digital circuitry enables the divider controls to be labelled conveniently and to display suitable legends. How delightfully simple it all sounds! Unfortunately, in practice that is far from the case!

The design of a successful system entails much detailed theoretical analysis of each stage. In addition, the practical layout and design also requires effective screening, isolation and de-coupled power supplies.

Even with all these precautions the output from the VCO is not always a squeaky clean sine wave! Inevitably it will contain some noise and spurious output and it is effectively frequency modulated with this rubbish. The extent depends on the skill of the designer! If, for instance, one listens to a receiver with a poorly designed synthesiser, the wanted signal will sound rough and there may also be interfering signals. This latter phenomenon may be due to a process called reciprocal mixing.

To understand this, consider the normal mixing process. The mixer is a non linear device which produces sum and difference products when fed with a high level oscillator and a weaker signal, normally the wanted signal. If there is also a strong interfering signal, for instance, it can mix with the spurious outputs of the synthesiser to give in-band interfering signals if the spacing of these frequencies is also equal to the IF.

In order to meet the requirements of sophisticated communication equipment, multiple loop PLL's are used and in some cases frequency multipliers are used

together with loop mixing. IC's are available which combine the essential functions, but often equipment manufacturers use devices tailored to their own special requirements.

One interesting snippet that Ken revealed concerned TV TX's. The synthesiser employed enables the radiated frequency, in the 500 to 900MHz range, to be pre-set in 5Hz steps. Some synthesiser!

Our thanks to Ken for an interesting and instructive talk on a very complicated subject.

Written up by Geoff G7KLV

Fref=>>PD=>>LOOP FILTER=>>VCO=>>OUT Fvco

====VAR. DIVIDER ==<=|

|====DIGITAL CONTROL

#### A SIMPLE PHASE LOCKED LOOP

#### HOW'S THE MORSE? STILL STRUGGLING? - Colin G0TRM

Despite the fact that the Morse requirement may change in the future, this is a question heard over and over again at meetings and rallies. I certainly know it was often asked of me when I was learning. I know some people find Morse fairly easy to learn and use but for me and, I am sure, many others, struggle is not too strong a word.

I first became interested in Morse at about the age of ten when my parents bought me my first key and buzzer as a Christmas present. The key was a shiny black Bakelite model with the characters moulded onto it. That was back in 1944 when I was 10 years old. I kept that key for many years and, in fact, it may still be around, tucked away in one of my many boxes of bits and pieces.

I learnt a few of the letters early on and then all of them when it was necessary for me to gain a proficiency badge in the Scouts. That was at about 6 words a minute with an Aldis lamp.

Over the intervening years I made many attempts to improve on that 6 six words a minute. However having learnt opposites (which is FATAL) and even with the use of other aids I still had a great difficulty in improving my Morse and increasing my reading speed. Until, that is, I joined Chelmsford Amateur Radio Society and learnt that slow Morse lessons were being sent out on 2M every weekday night by Tom G4INM. Almost without fail, Tom would be there night after night sending out letters and numbers at 6, 8 and 12 words a minute in sequence. At the end of each session Tom would request reports from listeners regarding their progress. Unfortunately, being unlicensed at that stage, and without any 2M gear anyway, I was unable respond other than by the occasional phone call or at the monthly club meeting. Sad to say on many evenings no reports at all were forthcoming but that did not deter Tom's endeavour.

Some fifty years later, without Tom's help and constant encouragement I might still be on 6 words a minute, but after a year or two I was able to take the test at Picketts Lock and pass, albeit, with an allowed mistake, and with much relief, became G0TRM. Thanks again Tom for your help and encouragement those few years ago when I became, I believe, your 512th successful pupil.

Members will be aware that Tom's latest success was probably David, now the proud owner of M0BQC, so until recently Tom was still providing his lessons, and I am sure he would be happy to help anyone else.

To those still enroute to the wider world the three golden rules apply,

PRACTICE, PRACTICE AND PRACTICE.

I believe current thinking suggests that 20 minutes practice a day is about right and that the Farnsworth method (if used) should be discarded early on in the learning curve.

If you are just starting:

DO NOT LEARN OPPOSITES, DO NOT LOOK AT THE SYMBOLS WHEN LISTENING, DO IT BY SOUND ONLY AND DO NOT GIVE UP

DO PERSEVERE, DO TAKE YOUR TEST SOONER THAN LATER.

REMEMBER THE EXAMINERS ARE THERE TO PASS YOU, NOT TO FAIL YOU. Good Luck.

#### For Sale

Amstrad 1640, hard and floppy drives and colour monitor.

Yaesu FT200 HF Transceiver. Electret mic. kit.

2m whip and 2m 8 element cross beam antenna and rotator.

Reasonable offers, please, to John G0LSY on 01245-468768.

- Joint Editors  
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Deadline for the next N/L is 25th. March