Chelmsford Amateur Radio Society

Affiliated to the RSGB. *Club Call Sign: G0MWT.*

President: Roy Martyr G3PMX. *Secretary: Charles Shelton G0GJS.*

Newsletter No.388 May 1998

THE MAY MEETINGS.

There are two meetings this month. Due to a long standing booking at MASC our traditional 'First Tuesday' meeting is not available so it has been shifted to the 'Second Tuesday'. So as not to disappoint members Colin G0TRM has arranged an extra event!

May 5th. Visit to the Borough Emergency Planning Centre. We will meet outside the Civic Theatre in Fairfield Rd . by the Eastern National bus station at 7-15PM for 7-30PM. There is plenty of easy parking and all are.welcome. Don't miss this chance to peep behind the scenes!

May 12th. Some love them and some hate them but like it or not we are stuck with computers! They are finding increasing applications in our hobby. Having installed our computer sooner or later we start to think about the Internet! Not sure what it is or what it does or how to join? All will be revealed at 7-30PM at the MASC when **Jan G7UVP** will answer all our questions in his illustrated presentation **'The Internet".**

DATES FOR YOUR DIARY

5 May BORO' EMER'CY PLANNING CENTRE.
12 May CLUB MEETING MASC -The Internet
17 May DUNSTABLE DOWNS RALLY- Dunstable
25 May EAST SUFFOLK WIRELESS REV.-Ipswich

Committee Meeting: Wed. 13th May

The next meeting will be held at 7.30pm at the QTH of John G8DET. You are welcome to join us.

Constructors Competition: 2nd. June.

ONLY ONE MONTH LEFT TO FINISH YOUR PROJECT.
THE TIME WILL PASS QUICKER THAN YOU THINK!

Members News

Congratulations to David Bradley who has recently passed his Morse test, aided and abetted by Tom G4INM. David's new call sign is M0BQC. It was G7HFC.

It is with regret that we record the sad passing of Roly Martin, a SWL and. until recently. a Club member.

Last Months Meeting.

Four members who have recently purchased new rigs were persuaded to tell us something about them with no holds barred. In spite of a few short-comings at least three of them are satisfied with their purchases. They were good enough to provide some notes for this report but unfortunately space has required some editing. Sorry chaps! Now read on.

The Kenwood TS570D - Brian G3CVI

Why did I buy the Kenwood TS570D?..My FT747GX had suffered a brew-up and although professionally repaired had earned a reputation for component demise due to running some of its circuits "on the nose" for component ratings.Looking around and listening to on-the-air chat I formed the conclusion that the 570 would warrent a test run....hence a trip to THE EMPORIUM, the staff having prepared one fo me to test.

My main criteria were cost and performance about equally important followed by size and the DSP facility being built-in. Audio quality and compatibility with my existing interests I were important. I checked it out on 40m during the afternoon broadcast invasion of that band.The result was very impressive due to the improved front-end selectivity shown so well in the brochure.The dual pre-amps and band-pass tuning worked very well and by carefully adjusting the sensitivity in stages the weak amateur Signals became readable. Application of DSP derived noise cancellation continued to improve the quality of the output audio so I was already convinced that the 570 was my next rig.

There are 48 menu selectable facilities available, far too many to list and discuss individually, each having up to ten possible settings . Two entirely separate menus can be established with two VFO's so the choice of configuration is legion! .

WARTS AND ALL was mentioned to me when the talk was first discussed so I truthfully detailed the two main shortcomings as I saw them.There is no facility to enable one's transmitted signal to be monitored....easily overcome by running lowest power into a dummy load and listening to the signal on a pre-recorded tape of one's own voice on a receiver in another room. Secondly the lowest transmit output level is 5 watts which makes transversion a problem since most transverters require about 100 to 250 milliwatts. An attenuator is needed but it would reduce the received signal which is not desirablee....so some other system must be devised. Lastly, DSP at the output end is not ideal but to buy a rig which does the processing at RF means a price bracket beyond mine at the time .Considering the actual cost of the 570 and the narrow filter, the generous part exchange offered me was too good to pass up so I "plumped" and have not regretted the move ever since.

Summing up I can say that Kenwood has put on the market a very impressive transceiver whose easily tailored transmit signal is equal to any others I have heard recently on the bands. The very slight initial drift soon settles to "Zero-beat with WWV" continuously and the synthesizer noise is really well below that on some more costly rigs I have tested on the same antenna system. Finally, may I extend an invitation to anybody who would like to have a demo to contact me for a day and time; I shall be so delighted to show them the NEW RIG.

The TenTec Omni V1 - Geoff G3EDM

When asked to talk about my transceiver without demonstrating it in action my first thoughts were ..." what can I talk about?" I decided it would be useful to beginners on HF to describe how both the transmit and the receive side of the transceiver functions. For 48 of my 52 years as a ham I have been a home-brewer although latterly had assembled the Heathkit SB104, the forerunner of all solid-state rigs with a clear digital display. See my article in RADCOM July 1973 for more details.

As I batted last I was able to highlight some of the differences between the Kenwood TS570D and the Icom 756, especially as the Omni VI uses basically only one Intermediate Frequency (IF) of 9 Mhz. In the FM mode it does use a second IF of 455kHz and on all other modes it uses a second IF of 6.3MHz. This may be a ploy to use standard filters but it does provide the facility of a front panel variable Passband Tuning(PBT) control. This enables the PBT filter to be moved +/- 1.2 kHz for (a) avoiding QRM and (b) centring the 170 Hz spaced Mark and Space signals within the chosen bandpass crystal filters when receiving Digimode signals i.e. CW, RTTY, Amtor, Pactor and G-Tor signals. After the signal has passed through these filters its IF is restored to 9 MHz before demodulation using a product detector. From here on it is simply audio amplification.

The Omni VI is a no-compromise amateur-bands-only transceiver providing optimum selectivity. The 9 MHz IF gives excellent Image Rejection of unwanted strong signals 18 MHz away. Some transceivers up-convert to high 1st IFs of some 70 MHz and do this at the expense of more mixing noise each time an extra IF is employed. In down-converting from the received frequency a local oscillator(LO) must be used to mix with the incoming signal. In the Omni a lot of care has been taken to make sure this LO has very low phase noise because this noise will be superimposed on the required incoming signal making it more difficult to read. The higher the phase noise the worse the situation gets. Crystal oscillators have lower

phase noise than digitally generated oscillations. The Omni designers have made very clever use of existing techniques by refusing to generate the LO frequency entirely digitally as in most other modern rigs. In this rig digital generation, of the now standard 5.0 to 5.5 MHz Variable Frequency Oscillator(VFO), commences with a variable/programmable digital oscillator running between 200 to 220 MHz and itself locked to a 20 MHz crystal (cut for minimum temperature drift) in a temperature controlled oven. This variable frequency is divided down by a factor of 40 to derive the 5.0 to 5.5. VFO frequency (actually 4.97 to 5.53) for mixing with the band crystals to produce the required mixing frequency.

Dividing the 200-220 Mhz digital oscillations by 40 means also that the phase noise is divided by 40 or reduced by 32 dB. The claims by Ten-Tec of a" noise floor" lower than fully synthesized rigs appears to be justified in my experience on the HF bands. I have made no measurements but this rig can sort out the weak signals in the presence of strong adjacent signals which is adequate confirmation.

The block diagrams for both the transmit and receive modes were shown to highlight some of the facilities of this rig. Microphone gain is controlled separately from power level, the latter being continuously variable from 0 to 100 watts, using concentric control knobs. Selection of filters is by means of clearly labelled buttons on the front panel. A narrow (NAR) button selects an optional filter (500 Hz for my choice) on the 9 MHz IF board. This is in addition to the maximum of 4 selectable by front-panel buttons in the 6.3 MHz IF. The rig will withstand up to a 2:1 VSWR without reducing power, thus feeding 25 to 100 ohms.

By far the most useful control is the automatic DSP notch filter which when selected will take out any carrier by at least 50 dB which virtually makes it disappear and more than one heterodyne at a time may be suppressed which is very handy when someone decides to tune on top of the station you're listening to!

The rig has iambic keying for type A and B CW transmissions and fast QRK is so good at speeds up to 60 w.p.m that any breaker can be heard in the space between dots! A slower, programmable QRK is available for those that like a hangover!! Metering is by conventional moving coil meter and a switch selects: Forward Power, SWR, Collector Current, Audio Processing Level and Signal Strength. All filters are available in any mode and this avoids the necessity to use the FSK input socket which may be driven by external TTL levels to provide the 170 Hz shift required by lots of digimodes. I could have described many more facilities but would emphasise that before spending money on your favourite rig you should at least spend as much on the aerial system because "if you can't hear 'em you can't work 'em". If I were to ever have a small plot of land again I would try at least two, but preferable four variably phased vertical aerials.

The only annoying weakness of this rig lies in the design of the Phase Locked Loop (PLL) circuitry which occasionally jumps out of lock. This manifests itself as an "auroral flutter" on the received and transmitted audio.

The ICOM 756 - Ken G3PMW

The choice of equipment depends upon prejudice and experience, coloured by a number of features felt desirable. My main requirement was to have DSP to assist reception by reducing the effects of local received hash. It had to be small and if possible have a spectrum display, long wanted after a failed attempt to make one in 1950.

The rig has a frequency coverage of 30kHz to 60MHz, and uses four conversions down to a final IF of 15.625khz for the DSP. There are 55 push buttons and 11 knobs, most of them having dual functions. The prominent feature is the five inch LED window for the information. The top half is frequency and mode information with all the filter selections. The bottom half has the spectrum display and all the selectable memory data. Virtually everything can be selected and adjusted.

Operationally, it is very convenient for the expert DX chaser by having two independent receivers and the choice to work split frequency, with very easy change over between the receivers. They have separate first mixers and synthesisers and common RF, IF and audio circuits, which limits the split to only one band. The available memory frequencies are far too many for me, but the use of three stacked frequencies on each band key push switch is very useful for the SSB, CW and RTTY merchant. All the usual features are provided, in common with most rigs.

Down sides of the equipment!! The manual could use a good index to find just the feature needed NOW! The output power scale on the meter is weird by being 100% at all powers, and it is not easy to get the compression just right. The spectrum scope amplitude range could do with a second gain setting to increase the sensitivity. It needs an S9 signal to show usefully, away from the base line. But I still find it very useful indeed. The final horror is the number of spurious signals within the receiver. I stopped counting at 160 of them, but there is no specification on which to hang a complaint. To be fair they are very tiny and not noticeable on an aerial, except for one at S7. All rigs in the shop had them, and there was a crop of them in the FT100MP as well. They come from switch mode power supplies and the multiplicity of frequencies needed for all of the IF conversions

We rounded off the meeting on a humorous note with Jan G7UVP advising us not to buy a Yaesu FT8500. He had invested in one of these horrors because he couldn't find room to install a 2m rig in his new car, every bit of spare space being occupied with some gadget or gizmo! The boot mounted transceiver is controlled remotely by forty two buttons mounted on a microphone or a 'Rig on a Rope' as he calls it! To make matters worse some of the buttons have more than one facility and each button press is accompanied by a bleep with an ascending or descending tone change where appropriate.

Our thanks to Brian, Ken, Geoff and Jan for providing us with an interesting and entertaining evening.

Gas Mantles and Amateur Radio - Harry G5HF

This is the third and final instalment of Harry's interesting account of his early experiments in amateur radio.

One day a small procession headed for Wimbledon Common - the chief engineer, the chief chemist and myself with Father tagging along for a laugh. We set the spark transmitter and the boat on the bank, degreased the filings and tested the system. It worked OK. The boat tiller was kept central by a spring and solenoids were fitted to both sides to attract a soft iron strip attached to it. A four way switch operated by a pawl and ratchet allowed selection of the boats heading, position 2 for starboard, position 4 for port and 1 and 3 for ahead. The receiver operated the magnet connected to the switch.

We launched the boat, switched on the 6 volt motor and pointed it out to the middle of the pond. I pressed the key, a burst of wireless waves and the boat started turning to starboard. Another burst and it went ahead. A third burst and it moved to port and a fourth and it went ahead. All worked magnificently. When the boat reached the middle of the pond, someone said "Now try and make it come back." I pressed the key and it turned gently to starboard, but when the boat was pointing straight back to us I pressed the key.....nothing! I pressed the key frantically a dozen times but there was no response. The boat was now turning in tight circles in the middle of the pond.

As we had half expected something might go wrong. An essential part of our equipment was a highly trained dog - "Go fetch, boy!" And off he went. The trouble with dogs is that they are so intelligent. A dog swims under the surface, with only his nose, ears and eyes showing, so to grab a floating boat he has to stretch up and paddle like mad to bring it back. In a few seconds he discovers that by dragging the boat down and flooding it he can swim back comfortably, but all the electrics are drowned and that is the end of experiments for the day.

The trouble (rather obvious today) was that clean, dry degreased iron filings rust over in a couple of minutes in the humid atmosphere which exists just over a pond's surface. Rusty filings don't work a coherer! However, Nickel filings work fine for several days, before they need cleaning with acid.

After several trials we got it working quite well but it was rather long-winded and I got more fun operating the spark transmitter. I had learnt Morse by now and it gave a great sense of power - the loud rasping sound and the thought that you could send messages to the Nation. I never got a reply, probably because I didn't have a receiver.

I bought a copy of Short Wave World and discovered a Telsen kit for making a one valve receiver for receiving the BBC. This used "Reaction" to feed back the output to the input and so increase the signal strength and selectivity, but too much made it oscillate and, to my great joy, I found that it made a noise on Father's receiver. I could now send Morse and interfere with the Stock Exchange reports when Father returned from work. I also read that if you modulate the anode current of an oscillator, you could transmit speech. I had an earphone in the anode circuit of the receiver (not recommended today in case you hear 120 volts) and if I shouted into the earphone when the set oscillated, my Mother could hear me clearly in the other set. I could now make rude remarks to Father when he switched on.

I read somewhere that you needed a licence to do that sort of thing so I joined the RSGB and got an "Artificial Licence" by saying I wanted to carry out experiments on oscillators. Nowadays, we talk of dummy loads, but the term Artificial Aerials suggests dipoles and the like are natural and grow in gardens. My late wife, Pippa, insisted that they did.

A well known amateur John Curnow, G6CW, lived nearby and acted as my Radio Father, so I asked him how to get a full licence. He explained that you had to write a letter to the Headmaster (the Postmaster General) detailing experiments you wished to carry out and that were not possible with the Artificial Aerial. Only propagation and aerial design came in that category, so I chose aerial design and got my licence in 1933 - or to be honest my Father got the licence on my behalf. The Post Office would not write to me direct as I was under 21.

What a charade that licence business was. The terms made it clear you were not allowed to send CQ. You were only supposed to be carrying out technical experiments, so you had to send TEST. The rest of the world knew that TEST meant a British amateur was calling CQ and from then on we chatted to each other, much as we do today. For some reason the Headmaster never found out that the whole system was widely abused and just as well it was, because so many operators were already Morse friendly when WW2 broke out.

If I hear Test today I switch off immediately.

Are there any other members who would like to tell us about their introduction to amateur radio?

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Deadline for the next News Letter is Saturday 17th May