Chelmsford Amateur Radio Society

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

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

Newsletter No.387 April 1998

THE APRIL MEETING.

Thinking of buying a new rig? Three Club members have taken the plunge recently and we have persuaded them to come along and tell us about them, the good points and the bad! Brian G3CVI has treated himself to the good value for money Kenwood TS 570D and Ken G3PMW has purchased the HF plus 6m Icom IC756. Geoff G3EDM with his interest in digi modes is pleased with his TenTec Omni VI and he will also be giving some tips on HF operating in general which should encourage a lively discussion!

Chairman. John G8DET, will open what promises to be an interesting meeting at 7-30pm on **Tuesday 7th April** at MASC, Beehive Lane, Chelmsford . Don't miss it!

DATES FOR YOUR DIARY

Apl 4 CAMBS RTG RALLY - Bottisham
Apl 7 CLUB MEETING MASC - Three Rigs
Apl 25 INT MARCONI DAY - Sandford Mill
Apl 26 BARTG RALLY Near Coventry

Committee Meeting: Wed. 15th April.

The next meeting will be held at 7.30pm at the QTH of Geoff G7KLV and Phyl. All welcome but please economise on transport.

Internat'l Marconi Day: Sat. 25th April.

There are still a few operating slots left on the Club rig or bring your own if you prefer. See Pat G0SBQ or give him a ring on 01245 467545

9 Apl. Planning Mtg. at QTH of Charles G0GJS at 3pm.
21 Apl. Aerial erection, Sandford Mill at 9-30 am.

Visit to Borough Emergency Planning Centre: Tuesday 5th May at 7-30pm.

A visit has been arranged to see the emergency control centre at the Civic Centre in Fairfield Road by the Bus Station. Our host will be Mr Kelvin Ward the Borough Council Emergency Planning Officer. During our visit, which is expected to last about 1 1/2 hours, he will discuss his work and the plans to cover the many possible emergencies that could occur.

Very many organisations have a role to play in a major incident and how they are summoned and co-ordinated will be explained. A short video will be shown. Radio communications naturally play a vital role at such an incident and numerous standard PMR sets are installed in the centre as well as an amateur radio set-up, ready to be operated by Raynet volunteers if required.

Have you put your name down yet? If not please ring me,
Colin G0TRM on 01245 223835

NOTE: The May Club meeting is on Tuesday the 12th.

Constructors Competition: 2nd. June.

GET CRACKING NOW!

Slow Morse Transmissions.

Please contact Tom G4INM at the next meeting or ring him on 01245 259194 if you would like him to continue the transmissions.

Last Month's Meeting John G8DET

Mr Richard Eassom is a Project Manager for Marconi and reminded the audience that his last CARS presentation was about "Digital Radios", this time he wanted to cover "Automated HF" or "Auto Link Establishment" (ALE).

HF communication was introduced in the 1920s and was a truly remarkable achievement, however it needed skilled operators to cope with the choices of frequencies, variable skip zones, fading and interference. Although all of these things are coped with by Radio Amateurs they are too complex for non skilled personnel.

Satellites were first publicized by Arthur C Clarke in 1948 and became a reality 10 years later. They were projected as being the answer to replace HF but in reality they cost a lot of money and from a military point of view can easily be knocked out or jammed. The terminals are expensive. There is traditionally little coverage near to the North & South Poles.

The Americans wondered if modern computing power would enable the HF spectrum to be used more efficiently and at a lower cost. Skilled Operators may not be needed and a wide range of mediums could be transmitted eg FAX, Data and even the Internet. The aim being to make the transmission and reception medium transparent to the end users.

Richard said that 'shore to ship' is quite easy; it is brute force , eg 2 sites with 40kWatt transmitters using 8 frequencies send the same message many times. There is a fair chance that one will be picked up by the ship!.

Marconi Comms in New Street have been using "Managed Comms" since about 1984 call ASSATS (Adaptive Ship to Shore Automatic Telegraphy Systems) for the Royal Navy. The ASSATS has one site equipped with say 10 receivers monitoring a range of frequencies. The ship transmits a known signal which is received by say one receiver. At the shore Transmitter site a few miles away a signal is sent to the ship to tell it which frequency was copied. This is produced by the automated control equipment. Once the "good" frequency is noted by the ship it sends all the current messages on that channel. 110 baud FEK. All ships have preset times to transmit in case the link is lost. Using this system it has been noted that communications across the Atlantic required only 17 Watts.

MIL Standard 188-141A System - is an international standard system (defacto standard) again from America. It is for nets with a small number of users, small & medium traffic capacity for Voice & Data. The digital radio previously used was shown embedded in a system and is used to scan a range of predetermined frequencies. The transmitter calls initially on full power until it knows it has been heard when it can back the power off.

KV90 for the Swedish Military is Marconi's latest synchronous (fully meshed) system which can have 400 to 600 centres usually

operated in 10 centre nets. It will handle any traffic which is in the audio bandwidth of 300Hz to 3kHz and is transparent to the end users. Just like using a telephone or the Internet.

The systems comprises the management of Frequency, Assett (eg, Tx & Rx), Traffic and Links, all controlled by a Network Control using TCP/IP.

The system is real time and self learning even to the extent of logging who can be heard when not involved itself. The system is secure and encrypted.

Richard illustrated the above Systems with anecdotal examples using traditional skilled operating techniques.

Marconi now have a contract with DERA at Malvern to assist with the production of a new standard.

Problems encountered on ships are that the many Kilowatt transmitters are quite near the receivers. To reduce interference filters are used which are controlled by relays for reliability (not pin diodes). Link Maintenance is used when the channel varies with conditions such that minimum power is used at all times. It has automatic filtering to demodulate interfered with signals.

Richard had brought along a Receiver Control Unit with a Motorala 6802 25 tone parallel modem board with telephone interface and Forward Error Correction. It had interfaces for RS 232, aerial tuners etc.

A Personal Computer (typically a laptop with Windows NT) is also required to complete the system. 100 Man-years of software are used in the system.

For the future Richard projected the ALE could be used for all military eg Army, Navy and Air Force integrated. This would give savings on spectrum and equipment and would mean that all arms of the military could talk to all the others!. The Managed Network concept could also be extended to include VHF, Satellite and Airbourne communications

Richard showed some slides from Sweden with the KV90 system operating at minus 20 degrees C (previous day it was -45). The equipment even had some snow on it. The Receiver featured in his previous talk used a vacuum fluorescent display and worked well even at these temperatures.

The speaker was thanked for an excellent evening and all agree that 'Auto Link Establishment' was achieved.

Question. If the channel failed what happens?

Richard If the channel was sending say data and it fails - this is normally sent in blocks with a known error rate - it goes back to where it lost traffic and re-sends from there. ALE is a Half Duplex System.

Question How does the channel known it is really you and not a spoof?

Richard All channels have LPI (Low Probability Intercept) and is encrypted.

Question What level does the system go down to?.

Richard Basically Brigade level, not Green Bricks (backpack) as used on the battlefield by infantry men.

Question Synchronization - how does it work?

Richard Marconi was lucky in that it had years of working with HF and knows a lot about time delays. The system has to be told of the local time (from a watch) or told to scan known frequencies quite quickly until the link is reestablished.

Richard promised to come back next year and present a Green Brick Lecture. Thanks Richard for a superb presentation.

Gas Mantles and Amateur Radio: **Harry G5HF**

We continue with a chemistry lesson and an account of "H&S At Work" 1920's style!

The next problem–was to get iron filings. Every chemical laboratory had a bottle of "Iron Filings" but this material was made chemically pure by reducing a chemical salt to pure iron but this was much too fine for a coherer. So the engineer said he would file some iron in his workshop. The workshops in those days were very simple as they dealt with either steam or gas engines, so the main tools were the blow-torch and the sledge hammer, but as steel and iron were the main materials the whole place was saturated in oil and grease. Taking an oily file and an oily piece of steel, the engineer produced some beautiful filings, liberally coated with oil and useless for a coherer. So the chemist degreased them with Ether. Why Ether? I'll explain.

Gas mantles are made from Ramie fibre from China. This is a very fine, strong fibre like a silky kind of cotton and very strong. The mantles were made on knitting machines in many shapes, domes, tubes and the Max Miller. This last one was so- called because Max Miller used to describe a pretty girl as "A little bit, some more and then not quite so much" and this described the mantle perfectly! The knitted mantles were then attached to a clay ring by tying and then dipped in Thorium Nitrate solution. Thorium is radio-active but nobody bothered in those days and although the whole factory was thick in Thorium dust nobody seemed to suffer. My Dad was handling Thorium all his life and lived to 93. He said radiation was good for you! There is no truth in the rumour that the cemetries in Wandsworth glow in the dark!

Next the mantles were fired on high pressure gas flames to burn off the fibre and convert the Thorium Nitrate into Thorium Oxide ash, which took up the same shape as the original knitted fibre. Thoria ash has the same strength as cigarette ash and is very fragile, so the finished mantle could not be despatched to all countries of the World and parts of Glasgow. I mention Glasgow because huge quantities of mantles were purchased by the occupants of the tenement buildings where gas lighting was widely used, as it provided heat as well as light. In those days (perhaps even today) it was customary to drink a glass of whisky on Saturday night and they found by bubbling coal gas (containing 30-40% carbon monoxide) through the whisky, the drinker got an extra kick! However, in order to bubble gas through the liquid it was necessary to break the mantle and fit a new one later. Hence good business for Dad.

To protect the mantle during transit, it was dipped in Nuskin which mothers used to treat small cuts and abrasions on their children. It stung like hell when put on an open wound, but in a few seconds it left a film over the wound and kept out the dirt.

Nuskin is a solution of Cellulose Nitrate in Ether. Cellulose Nitrate is also called Guncotton, because it was used as a propellant in the guns of the Great War. Today the police would clear a radius of 5 miles if you reported a tank of 50,000 gallons of Guncotton in Ether, but in those days no one bothered. Father thought it might be a bit dangerous in a factory of 500 girls, so he put it in a little wooden shed. In the 25 years it was there, I never heard of any trouble, though they did call the Fire Brigade to do a test. They put some Ether in a shallow tray, set it alight and asked the Fire Brigade to put it out. Water was no use at all, so they tried foam which appeared to smother the fire, but in a few seconds the Ether pushed it's way through the foam and re-ignited. When the foam finally ran out, the Fire Brigade said "Sorry, we can't help you," so they packed up and went home. So, we used Ether to de-grease the iron filings and a better degreasant you couldn't find because Ether dissolves almost anything!

We will continue next month with part three. This is a highly technical account of trials with a wireless controlled boat, with the assistance of a well trained dog. and some hair raising experiments with amplitude modulation!

The New Look Newsletter

As most of you may already know, due to his illness, Roy fells he is unable to produce the Newsletter. With his and Ela's help we have undertaken to produce it for the timebeingusing Microsoft Publisher.

Colin G0TRM and Geoff G7KLV

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Deadline for the next News Letter is Saturday 25th April