Chelmsford Amateur Radio Society

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

President: Dick Brocks G3WHR — *Chairman: John Bowen G8DET*

Secretary: Charles Shelton G0GJS — *Treasurer: Brian Thwaites G3CVI*

Newsletter No. 404 — **September 1999**

The September Meeting.

Once again no expense has been spared to bring you an interesting, and varied, double bill of attractions. And, once again, we are calling upon the expertise of Club members.

Mike Wheaton G4ZPE (Zippy) and **Clive G1EUC** will give us an up to date briefing on the Essex Repeater Group's activities. They will be giving an illustrated talk on G3DA (2m), GB3ER (70cms) and the 10GHz beacon GB3CMS. They will also be outlining their proposals to build two new repeaters, on 6m and 23cms. Mike is Chairman of the ERG. Clive is a relatively new Club member, but he is probably known to members who have met him at rallies. We are very pleased to welcome him as one of our guest speakers. Members who have travelled the back lanes of Danbury may have noticed the impressive array of aerials at his QTH.

Our other star attraction is **Murray G6JYB,** the Club's Hon. Computer Consultant, who needs no introduction! His subject will be Computers and the Millennium. He will be giving us some practical, straight talking advice (his words) on a potential problem for all computer technocrats. A very topical subject! When he's not 'computing', Murray is very busy 'repeating' and is a very keen member of the dedicated ERG team.

Our worthy **Chairman, John G8DET,** will call us to order at **7-30pm, on Tuesday the 7th September at MASC Beehive Lane** and will do his best to maintain a semblance of order during, what promises to be, a very lively and interesting evening.

Don't forget **Ela's** raffle. Committee members are not always the winners!

Dates For Your Diary.

Aug. 29 Essex Rpt. Group Jumbo Sale.
Sept. 7 CARS Meeting - MASC Beehive Lane 7-30pm.
Sept. 12 Lincoln Hamfest - A5 5 miles N of Lincoln.
Sept. 15 CARS Committee Mtg. - Ela's QTH 7-30pm
Sept. 18 Chelmsford 800 Celebration.
Sept. 23 Visit to PO Sorting Office - Springfield 6-15pm.
Sept. 24/25 Leicester AR Show - Donnington Park.

Visit to PO Sorting Office.

Chris G0IPU has organised a visit to the Springfield sorting office. The date is Thursday 23rd.September and we meet at 6-15pm sharp for 6-30. Unfortunately numbers are limited to 20 and all places were snapped up at the August meeting. You can try ringing him on 01245-269207 in case he's had a last minute cancellation.

The Club Net.

Details of the Cub Net were given in the August N/L
Ken G3PMW is the controller for September.

Essex Repeater Group - Jumbo Sale.

The ERG has acquired a large quantity of test equipment which they are offering for sale. Oscilloscopes, general, RF and microwave test equipment will be available at bargain prices. The sale will start at 10am continuing until 4pm on Sunday 5th. September, that is this coming Sunday!

The sale will take place at South Hanningfield at Marks Lane Farm which is at the end of Marks Lane. This is the first turning on the left off South Hanningfield Road. From Chelmsford, on the A130 at Rettendon Common , South Hanningfield Rd. is on the right, opposite The Bell public house and East Hanningfield Road. The location will be signposted and there will be talk in on 145.35MHz. Further details from :

Murray G6JYB on 01245-474969 or mjniman@iee.org. or http://www.swsystems.co.uk/erg.

or from Mike Wheaton G4ZPE on 01268-768467.

RSGB Hamfest - Colin G0TRM.

The Society was well represented at the above rally, held this year for the first time in the extensive grounds of Hatfield House. Something like 10 Club members, singly or in groups enjoyed a visit on a very hot day, but seemed to agree that the new location was a good choice. One or two things may require a little fine tuning but, overall, a good time was had by all.

Although it is believed that no major purchases were made, there were many opportunities to spend hard earned cash. Most of the usual big dealers were present in the three marquees. There was an extensive flea market outside, spread out in an wide area, most of which was in the welcome shade of some very large trees.

The rally was aimed at a wider audience than just amateur radio so CB interests, model aeroplanes, craft activities and children were catered for. Food and drink stalls were in abundance and one could enjoy a snack to the strains of an excellent jazz band.

Did I buy anything? A couple of books from the RSGB stand and a handful of smaller items from the flea market which looked useful at the time but may, or may not, end up at next year's Club table top sale. I thought it was a very good day!

Last Month's Meeting - Part One. 'RAYNET' Millennium Considerations.

A brief talk was given by **Roger Armsby**, Essex County Council Emergency Planner, and **Nigel G6ZVV** of RAYNET on their duties within Essex. The local authority has a statutory responsibility in planning for major events such as oil and chemical spillages, nuclear radiation, floods etc. so that their impact on the public is minimised. Central control triggers the warning to the local areas of an occurrence. Fax and phone are the main means of communication though packet radio has recently been introduced. RAYNET operates as a safety net to the emergency services using 2 metre equipment.

Whenever there is an incident Roger calls on RAYNET to help in coordination. Examples were given of reporting in from

Southend front on the state of high tides and of providing link communication for beach cleaning. It is the sudden widespread incident or the one that lasts a long time that stretches the resources of the emergency services and when RAYNET assistance is vital.

The millennium is very much on the minds of emergency planners. If there should be problems with the telephone and fax the support required from RAYNET in the event of an emergency would be essential. For that reason Roger asked if any members of CARS with 2 metre hand-held facilities would make themselves available for call out over the millennium period.

Andrew G4KQE thanked Roger and Nigel for their interesting account of County emergency activities.

Charles G0GJS (01245-256654) and Chris G0IPU (01245-269207) undertook to organise details of members willing and able to help.

Report by David M0BQC.

Last Month's Meeting - Part Two. Fibre Optics - Carl G3PEM.

By way of introduction Carl opened his talk about Fibre Optics by saying that "fibre people" tend to use wavelength rather than frequency as the numbers tend to be large when referring to light (around 1000 THz!). Like radio, fibre optic technology was developed here in Essex, in Harlow in 1966. When Carl started working with this type of medium, the amount of data that could be sent down a single fibre was 144 Mb/s, but just 10 years later when he left, the capacity had increased to 320 Gb/s, or 50 million 64 Kb/s channels!

The theory of the principle of the fibre optic stems from Snell's Law, which deals with the bending of a ray of light when passing between materials of different refractive index, and when the angle of incidence is reduced beyond a certain amount, that reflection occurs in the material. This is what happens in a fibre, the light is reflected internally at the interface of the fibre itself and the outer layer, the cladding.. Carl passed round the meeting a sample of cable that he had partially unwrapped, so that we could see the construction, and the very fine glass fibre itself. Fibres can transmit several modes, in a similar way to waveguides, but the modes need to be limited, to reduce the dispersion along their length, that is why multi-mode cable is cheaper than single mode cable. The single mode cable is now becoming the industry standard, and has a typical diameter of 8-10 uM.

To put a signal down a cable, a light source is needed, and for this either LEDs or Laser Diodes are used. The LEDs are cheaper and have a broader spectrum, but are less efficient with only about 2% coupling efficiency, and operate at about 850 nM. Laser Diodes are much more efficient, at about 70% coupling efficiency, have a narrower spectrum and operate at about 1300 to 1500nM.

To convert the light signal back into an electrical signal at the other end requires an optical detector in the form of a photodiode or an APD, an Avalanche PhotoDiode. The basic principle of the photodiode is that light disturbs the PN junction and causes a current to flow. (Who can remember experimenting with the black painted glass encapsulated OC71s when some of the paint had been scratched off, and the operation of the transistor varied depending on the intensity of the light in the room?). The power of the photodiode is measured in A/W (amps per watt), the amount of power that can be expected per unit of light. Photodiodes are relatively cheap and have about a 90% capture rate. The APD has gain, but suffers from temperature instability, thus complex circuitry is required to control the stability, requiring a reverse bias of some 300 volts, which can catch out the unwary engineer prodding around a 5 volt circuit! This type of detector also has quite high noise level.

The use of fibre optics is ever increasing, with a cables now circumnavigating the globe, linking all the continents. The Internet is now the main user of the intercontinental fibres, which are starting to take traffic from the satellites. At a local level, cable television companies are laying fibres to connect homes to their systems. From an Amateurs point of view, why not operate a remote ATU using fibre optics - no RF can get down that cable!

There are several types of cable, depending on their design parameters, and the end use. They have varying parameters of strength, pulling force and bend radius. Carl showed us on the overhead projector cross sections of several types of cable, but all were multilayered, and used a variety of materials to protect the delicate fibre inside.

About 10 years ago the maximum distance between repeaters in the cable was only about 20 Km, whereas nowadays repeaters can be 100 - 120 Km apart. The predicted life of fibres is about 25 years, due to the minuscule cracks in the glass, but fibre optic technology is such that to upgrade a system just requires the equipment to be upgraded, as of course the fibre is still there for the new system.

Carl finished his talk after tea by answering a few questions, and then showed us a clever system that had been developed to feed a cable along a water pipe using a drogue and a magnetic detector to ascertain where the cable was in the pipe.

Once again, we have been very lucky in the Club to have a talk on up to the minute technology, and we all express our thanks to Carl for his excellent presentation.

Report by Andrew G4KQE.

Electric Clocks - Geoff G7KLV.

We had a power cut recently.. Our two radio controlled clocks, one from Rugby and the other from Germany, kept going with smug self-satisfaction, however! Two other clocks had to be reset. One clock was an elderly synchronous type which always has to be started a number of times before it goes forward, the one way mechanism having seen better days. The other clock was a digital one and wouldn't respond to any of the push buttons. Always fearing the worst and recalling the problems Peter had with mains surges, and before taking Ela's time honoured (though misguided!) advice to bin it, I decided to open the case and see if there was anything obviously wrong. The push button mechanisms was surprisingly simple and rather like some computer keyboards where contact between two PCB pads is made by a moving contact. In this case the moving contacts consisted of circular discs of dished springy metal approx. 3/8 in. diameter with tiny protrusions on the circumference which mated with holes in the board for precise location. There was an indent in the centre of each disk, which when pressed made a kerdoinking noise. The six discs were held in position by a piece of wide Sellotape! Shorting across the connecting wires indicated that the problem was dirty switch contacts. So, I decided to have a go and stripped the Sellotape off and cleaned the PCB and discs with petrol. Fixing the disks back in position was quite tricky as they tended to be attracted by the Sellotape. After some trial and error each one was placed in position with a tiny sliver of tape before applying the final strip. Success! No need to consult the Argos catalogue!

If you're fed up with my servicing notes, you know what to do! All your contributionswill be gratefully received!

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Deadline for the next N/L is Wednesday 22nd September.