

Chelmsford Amateur Radio Society

Affiliated to the RSGB.

President: Dick Brocks G3WHR

Secretary: Charles Shelton G0GJS

Club Call Sign: G0MWT

Chairman: John Bowen G8DET

Treasurer: Brian Thwaites G3CVI

Newsletter No. 392

September 1998

The September Meeting.

This month will be the third time **Pat Gowen G3IOR** has agreed to come down from Norwich to talk to us. As many of you know, he is a very keen amateur with some very specialised interests which include satellites and moonbounce, among others. He is also interested in aspects of pollution and he is active in monitoring water pollution around the East Coast. His talk is entitled "**Amateur Satellites Phase III Plus an Environmental Update**".

Unfortunately Pat doesn't enjoy the best of health and is awaiting a visit to hospital. Should this occur at the last minute we wish him well and we will fall back on Plan B!!

As mentioned by our Chairman at the last meeting an alternative program has been arranged should Pat be unable to visit us. At **John G8DET's** suggestion a "**Computer Evening**" has been arranged. The purpose is to have a number of computers on display on which Members will give 'hands-on' demonstrations of their use in conjunction with amateur radio. As usual we will meet at 7-30 at **MASC Beehive Lane** so come along on **Tuesday 1st. September** and, hopefully, meet **Pat Gowen**.

DATES FOR YOUR DIARY

- 31 Aug. Huntingdon AR Rally - Emulf School St. Neots. A428 by Tesco's.
- 1 Sep. Club Meeting - Pat Gowen - MASC.
- 13 Sep. BARTG Rally - Sandown Park
- 13 Sep. Milton Keynes ARS Rally - Bletchley Pk.
- 20 Sep. Cambridge & Dist. AR Rally - Reindeer Pub. Saxon Street Nr. Newmarket.
- 25/26 Sep. Leicester AR & Electronics Rally.

COMMITTEE MEETING

The next Committee Meeting will be held at the QTH of Ela G6HKM. You are most welcome to join us. Ring her on 01376 - 328640 for directions.

MEMBER'S NEWS

We offer congratulations to Harry Heap G5HF who has agreed to become our Vice President. Before accepting he enquired what the duties of a VP actually are. No one seemed to know! Be that as it may, we couldn't think of a more suitable Member to add dignity and a touch of panache to this Honorary position!

Jim Beatwell has passed the RAE. Our congratulations to him! Will he be applying for an A licence or a B?

Congratulations also to Brian Miller who recently passed the RAE. He is now getting to grips with the dreaded Morse before he applies for an A licence.

OOPS! - Geoff G7KLV

We use various methods to ensure the accuracy of Newsletters. We 'spell check' but as we see elsewhere this can produce unexpected results! We proof read but we still miss obvious mistakes! As soon as we have printed all ninety-five copies we notice yet more errors! We try our best but I have to confess to a monumental clanger in the August issue! I can't even push the blame on to Colin because I was responsible for omitting to record that Chris G0IPU's son Matthew has passed the RAE and is now 2E1GOK. My apologies to Matthew and Chris.

YES, UHF DOES GO IN STRAIGHT LINES! - Andrew G4KQE

We recently had a very enjoyable weekend as a family in West Yorkshire. One afternoon we decided to walk a few miles along the Pennine Way, so we drove up to Marsden Moor and parked up near where the Pennine Way crosses the road.

We set off on our walk and after a couple of hours we were in the middle of nowhere, miles from anywhere. All around were hills and valleys and moorland as far as one could see. There is no well defined footpath up there, you just have to look carefully at the ground to see where a few other people have walked and try to follow their tracks. It really is wonderful scenery, lovely and quiet, except for the wind and the birds, but a bit desolate.

I had my mobile phone with me, so I decided to try to give my sister a ring, because I like to phone her from obscure places! I wondered what sort of a signal, if any, I would get on the mobile phone, being miles from civilisation. I soon found out, because as soon as I switched the phone on, the 'S meter' went WHOP!, hard against the end stop!

I thought I must be underneath the transmitter, but knew I couldn't be up on the moors. All was soon revealed however, as I scanned the hills in the distance, for there, about ten miles away I could see a tall radio mast!

That was real line-of-site communication and goes to prove that UHF signals do go best in straight lines!

SANDFORD MILL OPEN DAY

At the kind invitation of Geoff Bowles the Club once again set up a working station in the Marconi Hut. This year, 1998 marks the centenary of the formation of the Hoffman Manufacturing Co., producers and pioneers of ball bearings. Theirs was the featured display and attracted many of their old employees.

This Open Day was the most successful so far with 1857 visitors, about 500 more than last year, and provided a wide range of interests for all ages. The Club station was but one of many attractions on display. As usual, the station was run jointly by Pat G0SBQ and Brian G3CVI, ably supported by Chris G0IPU, with John G8DET doing the PR!

Tony G3YTG was busy flying kites and Geoff G3EDM, heavily disguised, was extolling his other hobby! The weather was kind and contributed to a most enjoyable day.

A FALLIBLE AID TO WORD PROCESSING - John G8DET

"Spell Checker" (or My crow sought spelling chequer)

I have a spelling chequer
It came with my pea sea
It plainly marques for my revue
Miss steaks eye cannot sea.
When eye strike a quay
Right a word I weight four it to say
Whether eye am wrong oar wright
It shows me strait aweigh.
As soon as a mist ache is maid
It nose bee four two late
And eye can put the error rite
It's rarely, rarely grate.
I've run this poem threw it
I'm shore your pleased two no
It's letter perfect in it's weigh
My chequer tolled me sew!

Sauce unknown.

See what I mean! Editor

RAE COURSE

An RAE Course starts at Basildon College on the 16th. September.
Ring 01268-706428 for details.

LAST MONTH'S MEETING - Geoff G3EDM

Solar Cycle 23

Gwyn, like myself, is interested in HF radio propagation, that is to say between 3 to 30 MHz. However, his talk concentrated more on HF than the effects of the sun's phenomena on VHF and UHF, the latter resulting in radio and visual aurora.

The visual phenomena have always been apparent as Gwyn made clear but as technology has developed so we are able to relate our visual sightings to what is happening to propagation within the HF Amateur bands. His first transparency was of the Sun as seen by the Orbiting Telescope of SOHO EIT which clearly illustrated the active sunspots as white areas together with the general make-up of the photosphere and the eruptions on the limbs. The more sunspots then, the more solar flux and the better the HF propagation. However, the solar activity is not a steady thing at all and is for ever changing and sometimes very violently. Gwyn likened the activity of a single solar flare on the Sun as equivalent to some 40 billion atomic bombs of the size of the Hiroshima bomb.

Gwyn explained that the Sun's activities have been documented since humans were able to write and to use lenses in the form of telescopes. With increasing expertise and new technology to hand we are able to record more detail. In fact, Solar cycle 23 which began in May/June 1996, tells us that for $(22 \times 11) + 2 = 244$ years the variations have been recorded. These are, on average, 11 year cycles and the last one Gwyn said lasted just 9.7 years. Also the rise to maximum numbers of sunspots (i.e. maximum flux) is faster than the decline (a graph would show a sawtooth shape); the maximum is expected around March 2000. The cycles are truly 22 years cycles (Hale Cycles) if one takes into account the rotation of the magnetic field around each spot, and although Gwyn did not mention this rotation, other than to mention positive and negative polarities, it does enable the astronomers to say when a Solar cycle starts and finishes.

Cycle 22 was extraordinary for a number of reasons:

- (i) On March 6th 1989 a sunspot group appeared and the next fortnight 11 "X-Class" flares (the largest category of X-ray emission) occurred.
- (ii) On March 13/14th one of the largest geomagnetic storms in the last 50 years took place.
- (iii) In October of that year a large proton event occurred.

These proton events can have drastic consequences for astronauts caught out of the Earth's protecting atmosphere. Additionally, Solar cycle 22 had a very short rise time of 2.4 years leading some analysts to predict a lengthy cycle but in the event it was shorter.

Gwyn continued with an explanation of coronal holes which early in the cycle (i.e. now) are visible only at the poles of the Sun (North & South). Later they are visible in the equatorial regions. Their significance to the amateur radio enthusiast is that they emit streams of plasma (ionised gases) at velocities of between 350 to 1200 km/sec known as Coronal Mass Ejections (CMEs) They do not all reach the Earth but some do and then if they are trapped in the Earth's Polar magnetic field they can cause visual and radio aurora.

Flares were said by Gwyn to build up in frequency as the cycle progresses and are seen as white spots on the Sun at optical wavelengths. They radiate energy throughout the electromagnetic spectrum from Gamma rays to X-rays and through visible light to kilometric waves. Solar flares may be accompanied by CMEs and radio bursts causing Short Wave Fadeouts (SWFs).

Another of Gwyn's transparencies showed the Active Dark Filaments snaking through the sunspot region. They can have a significant impact on the Earth's magnetic field depending on their original orientation on the Sun. Another showed the magnetic field on the Sun using a SOHO satellite magnetogram

The way the strong magnetic field (The Interplanetary Field or IMF), associated with the Solar Wind, curves on its journey towards the Earth was shown in the next transparency (although not to scale). The Solar Wind would travel in a straight line but for the fact that the Sun spins from East to West thus causing the Parker Angle to increase as the particles travel towards the Earth. The Solar wind is always present but travels more slowly when Sun conditions are quiet. When conditions are more active such as during CME's then energetic particles reach the Earth in 3-4 days.

Spacecraft are in a strong position to record many types of parameters and the Advanced Composition Explorer (ACE) is used to monitor and relay information such as IMFs back to Earth. And can give up to one hour's notice of impending events.

Gwyn continued by taking a look at the Earth's ionosphere pointing out that the first effects caused by incoming radiation particles takes place at a height of about 1000 kilometres. Because the atmosphere is so thin at that height the first noticeable effect is at 350 km and down to 140 km and is due to ultra-violet radiation where the layer will be ionised (i.e 'free' electrons being produced which will refract radio waves). This is the F-region. The F layer is considered as two parts, the F1 and the dominant F2 which sits on top.

Soft X-rays from the Sun can penetrate further and most of their energy is used up ionising the E-layer which is between 90 and 140 km up. Electron densities peak at around 105 km above ground. Clouds of electrons are also formed at times and may travel as do thunder clouds. These clouds are what are called Sporadic E (E's) and were dealt with at length by no other than Jim Bacon, the TV weather man, on an earlier visit to CARS. They give good short skip openings on 10 & 15 metres and higher and sometimes are in sufficient numbers to give two-hop transmissions of radio waves.

Hard X-rays and Lyman-alpha rays can penetrate down to the D-layer which resides at a height of 50 - 90 km. A layer at 50 km can be caused by cosmic particles that come in from other galaxies.

Gwyn is responsible for broadcasting RSGB bulletins and gave an insight to some of the parameters used to convey Solar activity that may affect radio propagation. At HF these are chiefly the Solar Flux, the A- and K- indices. A year ago the HF enthusiast would have been quite happy with a flux of 80 or so but the latest figure the author has is for 8 August when it reached 145, the highest in Solar cycle 23. This was with a falling A-index of 17 (previous day 47). The K-index for the 8th was 2; resulting in excellent conditions on 20, 17 & 15 metres for DX around the world (short and long path). Various X-ray levels are coded by letters. A is the lowest and X the highest and each is a magnitude of 10 greater than the preceding one.

For the VHF and UHF activists in the audience, Gwyn whetted their appetites by talking and illustrating the auroral oval at the N-pole. For an A-index of 7 there will be little activity and hence no propagation via aurora; but when it reaches an A-index of 100 then UK amateurs are likely to experience some enhanced propagation so long as the Bz figure does not come into play to switch off this mode. (The IMF Bz value designates the direction of the magnetic flux and it is this interaction with the Earth's own magnetic field that determines the usefulness of the aurora to enhance propagation of VHF and UHF radio waves.

Finally, he showed some Internet addresses. A phone call to Gwyn will produce these for you. This talk was the forerunner of his presentation at the RSGB HF Convention at Windsor on Sunday 11th. October. Why not spend the weekend there!

Thank you Gwyn for a most interesting talk

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Deadline for the next Newsletter is 20th. September.