# *Chelmsford Amateur Radio Society*

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

*President: Harry Heap G5HF* — *Chairman: John Bowen G8DET*

*Secretary: David Bradley M0BQC* — *Treasurer: Brian Thwaites G3CVI*

**Newsletter No. 427** Web Address www.g0mwt.free-online.co.uk **August 2001**


## The August Meeting - The RSGB by Malcolm Salmon G3XVV and Repeaters by Murray G6JYB.

Members will recall the very enjoyable visit by Don Beattie G3OZF, RSGB President, way back in December, in which he gave a brief history of the Society and some of its many achievements. More importantly he outlined some of the organisational changes which were under discussion to make the Society more effective and in touch with its Membership. Malcolm Salmon G3XVV is going to tell us about some of these and explain the new Society organisation. On Malcolm's last visit he masterminded a very successful rig testing session but on this occasion it will be in his new official capacity as Regional Manager. He will also be introducing new Club Member Alan M1DKP who is Deputy Regional Manager (Essex).

Our second speaker is Murray G6JYB who will be updating us on the repeater scene. As well as serving on the Club Committee, and always ready to advise on computer matters, he is also very much involved in the activities of that dedicated bunch of amateurs who form the enterprising Essex Repeater Group. There are some new repeaters including radio internet repeaters, so come along and hear about the latest developments.

We meet at the **MASC, Beehive Lane on Tuesday 7th August.** Our **Chairman John G8DET** will open the proceedings as usual at **7-30 pm** and introduce our speakers for the evening.

As usual there will be a raffle which will be run this month by Ken RFT and our new constructing expert Bob CSV. Visitors are always welcome. No entrance fee is payable, but do please support our raffle.

### Dates for Your Diary.

7 Aug CARS Club Meeting , MASC, 7-30 pm.
12 Aug Kings Lynn ARC Rally, Queen Mary Rd. Kings Lynn.
15 Aug CARS Committee Mtg. 7-30 pm. Danbury Village Hall.
27 Aug Huntingdonshire ARC Rally, St.Neots, A428 nr.Tesco.

**The Net Controller for August is Geoff G3EDM.**

## Member's News.

A belated welcome to Ken Bremerman G0PZG. who has recently renewed his Membership after a long absence! Welcome back Ken, all is forgiven!

Apologies to Steve Heard 2E1EQY who has not been receiving the newsletter regularly. This has been due to a regrettable MECU, (Monumental Editorial Cock Up).

## Mistaken Identity. (MECU. No.2).

We are always striving to produce an error free Newsletter and just when we think we've done it our hopes are shattered by observant readers. Thank you, both! I'm afraid we got our Peters hopelessly muddled in July. It is, of course, Peter Naish who is the President of the Australian Society. Silent Key Peter Neave G4DAN was a popular Club Member who always entered the Constructor's Competition, often with some very unusual items! We offer our apologies.

## Amateur of the Year Award.

This award is made each year to the person who, in the opinion of Members, has made the greatest contribution to the Club or it's activities during the past year. Nominations should be made in writing to Carl G3PEM or John G8DET. The closing date for nominations is at the end of the August meeting. Voting slips will be distributed at the September meeting. It's up to you, so please think about it

## Club Test Equipment.

The Club has a number of items of test equipment. Contact John G8DET for details and loan on 01245 -224677.

## Last Month's Meeting.
## Amateur Satellites by Frank Howe G3FIJ

With the recent launch of Oscar-40 Frank Howe's talk proved to be very popular and we had a full house for the meeting.

Frank started with a bit of history, with the early Oscars launched back in the 1960's. They were simple affairs compared to the amateur satellites of today. They had no solar cells and so their lifetime was limited to just a few weeks. Oscars 1 and 2 just had a simple 144 MHz beacon with no transponders.

Frank has built up a collection of tapes of these early satellites and we were fortunate that he brought some of them along for us to listen to. Listening to the tapes of Oscar 2 and others certainly brought them to life.

Oscar 3 was the first amateur satellite with a transponder, it was however an in-band transponder, 144 MHz in 145.9 MHz out, and so suffered from desense but, nevertheless, it marked a significant milestone. Oscar 5 used a novel form of frequency tones to send the telemetry data which comprised of information such as temperature and battery voltage and Frank made good use of his students at the time to decode all the data. So much telemetry come from this satellite that Frank was half relieved when its batteries finally gave up and they could catch up on decoding all the telemetry they'd recorded.

Oscar 6 which was launched in 1972 contained a cross-band transponder 145 MHz in, 29 MHz out (known as Mode A) and solar panels and had a long and successful life. Frank explained Doppler shift, about 3 kHz during an Oscar 6 pass, which meant you needed to continually adjust your transmit/receive frequencies during a QSO which is no mean feat when you're also rotating your antennas to track the satellite as well! Oscar 7 was launched a couple of years later and this gave amateurs a 435 to 145 MHz transponder but, as Doppler gets worse the higher the frequency, this meant it had even more Doppler shift ! Frank explained how the Doppler shift at these higher frequencies was reduced by using what is known as an inverting transponder. This also had the effect that lower sideband on 435 MHz would

come out as upper sideband on 145 MHz and vice versa. Oscars 6 and 7 provided QSO's over a range of up to 6000 miles and could be worked by amateurs running just 10 watts on 145 MHz or 435 MHz and tracked with the aid of a chart know as an Oscarlator.

Up until this point all amateur satellites had been built by either Australian or American hams, UOSAT-1 was the first British amateur satellite built by Martin Sweeting G3YJO at the University of Surrey. This satellite pioneered the use of the digi-talker which used a synthesized voice to read the telemetry data. This was very popular in schools where children were able to copy and plot the data and gain an appreciation of orbital mechanics.

Oscar 10 and Oscar 13 were the first successful satellites to go into a highly elliptical orbit instead of the Low Earth Orbits some 1400 km high used before. Frank explained that the great advantage of these orbits was the extended pass time; they would be in range for up to 8 hours at a time and provided world wide coverage. It seems the only drawback with them was that the simple Oscarlocator tracking charts didn't work with elliptical orbits so you were forced to use computers to do the tracking.

The space race seems to have been extended to amateur radio with the Russians launching their own series of RS satellites. Some of these had a CW robot which enabled you to QSO direct with the satellite itself although, as Frank pointed out, they were fussy about your sending, requiring you to send at about 20 WPM. If you didn't send fast enough they'd soon tell you!

Frank explained that the RS satellites were build into military Cosmos satellites and their operation would sometimes be suddenly curtailed as the demands of the primary payload took precedence. The RS satellites are ideal for newcomers since they operate in the 21/28/145 MHz bands for which equipment is readily available and require only low power.

Frank then described the latest amateur satellite to be launched, Oscar 40. This is the largest and most complex amateur satellite built so far and was designed to operate in all amateur bands from 145 MHz to 2.4 GHz. Unfortunately it suffered a malfunction when its motor was fired to get to the final orbit. It is now believed to have a gaping hole on one side and has lost the use of several transponders. Fortunately the 435 to 2.401 GHz transponder still works and has been providing worldwide QSO's. Many people think that 2.401 GHz is a hard band to get on, but Frank showed a 2.4 GHz receive convertor that he'd made and a helical antenna which was just over half a metre long. This provided a good illustration of how small antennas can be for the higher frequencies, just the thing if you don't have a large QTH.

Frank finished the presentation by giving times and frequencies to listen out on to hear some of the satellites. There were lots of people jotting these down and hopefully they were successful and heard them.

A good web site for orbital predictions for all the amateur satellites and the International Space Station is www.heavens-above.com. All you need to do is select the nearest large town to your QTH and it will instantly tell you when to listen and where to point your beam.

If you wish to get involved with amateur satellites it's worth joining AMSAT-UK. Their web site is www.uk.amsat.org and the Secretary is Jim Heck G3WGM Tel: 01258-453959.

It was an excellent presentation and we were able to benefit from Frank's near 40 years of expertise in this field. Judging from the question and answer session, I'm sure Frank's fascinating talk has got some Members thinking seriously about getting active on the amateur satellites. Thank you very much, Frank.

*Report by Trevor M5AKA.*

*See the next column for up to date news on A0-40.*

## AO-40 News Update.

From: W4DPH@W4DPH.#TPA,FL.USA.NOAM
To SAT @AMSAT

AMSAT NEWS SERVICE BULLETIN 182.01 PROM ANSAT HQ
SILVER SPRING, MD, JULY 01, 2001
TO ALL RADIO AMATEURS
BID: SANS-182.01

Although AO-40 satellite transponders remain off the air, the ATOS propellant feed system tests have been successful and a new orbit has been achieved. According to received telemetry, the ammonia heater, flow-rate controller, valves and pressure indicators all worked successfully.

AMSAT—DL reports the "blowing of cold gas through the Arcjet is over". The perigee height raised from 280-km (before outgassing) to 851-km following the tests. Apogee height is unchanged. The good news is that AO-40 is now in a safe and stable orbit!

All of the 53-kg of on-board ammonia appears to have been used during the orbital change. Since orbit 302 the ammonia stopped flowing and the pressure indicators in the received telemetry show no additional pressure.

AMSAT-DL is currently looking over stored telemetry as information continues to be downloaded and analyzed.

The spacecraft attitude will now be moved back to ALON/ALAT - 0/0 as soon as possible and command stations are currently preparing for magnetorquing sequences.

Amateur Radio satellite station operators around the world noticed the orbital changes immediately, as they looked for AO-40's signal.

"Congratulations to the AO-40 command team and thanks for the new safe orbit," said Jim, KK3K.

Stay tuned to ANS, the official source of.AO-40 information.

[ANS thanks AMSSAT-NA, AMSAT-DL and the ARRL for this irnformation]

*Our thanks to Carl G3PEM.*

*Incidentally, Carl heard RS12 on 10m for about five minutes the day after the Meeting. A number of other Members tried but, so far, we haven't heard of any other successful reception reports.*

## Interesting Web Addresses.

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| poldhu.com | A history of Marconi's Tranatlantic Station. |
| batesuk.freeserve.co.uk | The history of Marconis in Chelmsford. |
| repairfaq.org | Electronic equipment repair information. |
| net-magic/users/w4faq | Morsum Magnificat Morse program. |

## The Club Nets.

The Club Net operates on Tuesday evenings starting at 8-30 pm clocktime. It operates on 145.375 MHz on the second Tuesday of the month and on 28.325 MHz on subsequent Tuesdays. The Net controller for August is Geoff G3EDM.

Thursdays are SSTV days at 8 pm clock time on 28.680 MHz or 144.725 MHz. Tom G4INM's morning 21 Net on 145.525 MHz is popular with Members and others!

## For Dispsal.

I have a number of odd lengths of steel wire armoured mains cable of various sizes. They are taking up valuable space!

FOB at my QTH. Geoff G7KLV. 01245-473822.


### Joint Editors

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**Deadline for the next N/L is Wednesday 15th. August.**