

Chelmsford Amateur Radio Society.

NEWSLETTER No.282

July 1989

NEXT MEETING - VHF Contests, Before, During & After.

On Tuesday 4th July we welcome Dave Robinson, G4FRE to tell us about his experiences in this most interesting aspect of Amateur Radio.

Dave is a member of the RSGB Microwave Committee and the RSGB VHF Contest Committee, in addition he is a member of the Sheppey Weston Contest Group.

VHF DXpeditions have also featured in Dave's achievements, see the report on ZB2IQ in RadCom Oct/Nov.88 entitled 'Squarebashers Invade Gibraltar'

The meeting will begin at 7.30pm and we look forward to meeting you all at The Marconi College, Arbour Lane, Chelmsford.

DATES FOR YOUR DIARY.

- 4 July CLUB MEETING - VHF Contests, Dave Robinson G4FRE.
- 23 July ANGLIAN MOBILE RALLY - Highwoods Sports & Leisure Centre, Colchester.
- 1 Aug. CLUB MEETING - Rig Checking Session.
- 5 Sep. CLUB MEETING - Aerials are not magic!, Tony Gilbey G4YTG.

LAST MONTHS MEETING - Constructors Competition - Brian G0BDS.

The worst fears of any Committee when putting in the meeting's diary "June - Constructors Competition" is that on the night there will be only a single or token entry, or worst still no entries at all. Well, we need not have worried because on the tables in the Lecture Room when I arrived were plenty of items to be entered. When all were placed in order and with call signs logged, there totalled 12 entries from 10 people and they were as I have listed below:-

Chris, G0IPU - 5 Element Beam Antenna for 6m working, Chris had worked Malta on this antenna only the day before using 100W e.r.p. on a 20ft pole.

Peter, G4DAN - HF Receiver for all the old HF bands, SSB, AM and CW modes (with a demo using the lecture room blackboard rail as an antenna) also he entered a 12V, 5A, P.S.U.

Martin, G4TOD - Antenna Matching Unit for HF which was purpose made to fit into his furniture and using previously established circuitry.

Harry, G2HPF - Multimeter with plug and socket outlets protection circuitry, internal or external battery operation and calibrated meter checking all built in.

Les, G4CUT - UHF Filter Unit for his 28MHz/1286MHz transverter using solid brass technology to overcome his spurious emission problem with only a .97dB insertion loss.

Richard, G4ICP - Antenna Matching Unit using the Z-match circuitry with modifications by G5RV which aided matching on a multi-band dipole.

Roy, G3PMX - 144-146MHz Halo Antenna for loft mounting with a V.S.W.R. into 50 ohms not greater than 1.5:1 over the band.

Andrew, G4KQE - 10.7MHz Marker Injection Oscillator utilising a modified 11.15MHz board from old Pye PMR equipment and a 2nd Generation Stereo Amplifier with 10W per channel built from circuits published in 1969 Practical Wireless.

George, G0LKY - 100W RF Dummy Load using electric fire heating elements and a brass gauze casing to allow excellent cooling.

Andy, G0JSU - Iambic Keyer with speed and weight control functions adequately tested and examined by Club C.W. operators.

All the entries were of a high order in both technical content and construction which presented the judges - George, G3GNQ and Bill, G4JUW with a difficult time to select the award winners, even though they had stuck rigidly to a pre-determined bench mark system.

After due and just deliberation the prizes were awarded as follows:-

1st Prize	- Harry G2HPF	- Multimeter	£7.00
2nd Prize	- Chris G0IPU	- 6M beam	£5.00
3rd Prize	- Roy G3PMX	- 2M halo	£3.00
Novice Prize	- Andy G0JSU	- Iambic Keyer	£3.00

I am sure all the 38 members who attended thoroughly enjoyed the evening content in the knowledge that "home Construction" still goes on somewhere. Our thanks to George and Bill for performing a difficult task.

NATIONAL FIELD DAY 1989 - Report on this year's activities.

Part One - Gwyn, G4FKH.

When I arrived on site Arthur G3KPJ had already put the operating tent up. I borrowed his billhook and chopped the grass in the area for the NAAFI tent. We have it all sorted out now and both tents were in place by the time the other helpers arrive. Andrew G4KQE was taking the video this year.

It was pleasing to see some new faces as well as a good showing from the old hands. I went off with Arthur (The Archer - KPJ) and helped with the string that attaches to his arrow. This is how we get the tie offs over the trees. In the meantime a team was assembling the beam and beginning the telemast erection. We all helped with the final part of raising the structure with the beam on top. All was going fine until we realised that the 40M dipole was missing. John Greenwood stepped in showing sterling qualities and made one up on the spot!

We were on the air at about 15:15, 45 minutes to go. All aeriels were checked for resonance. ATU settings were noted where these were necessary.

As usual I started off on the key, unfortunately on the wrong band, 20M. It took me 3 minutes to realise this and QSY to 40M, where we stayed for the next two hours. I think I made up for the lost time by doing something like 106 QSO's in the first two hours. We were then relieved and the QSO's kept coming. There was a gap in the operator schedule so I stayed around to operate again prior to going off at about midnight. This will stay in my mind for some time to come because of the peculiar WX. It took me 2 hours in bed to warm up sufficiently to get some sleep. I'm taking a blanket next year. The cake that was brought on Sunday helped a lot in ridding my mind of thoughts of cold.

Part Two - Dick, G3WHR.

Day two of NFD started with my session on the Key. I was fortunate to have a new band 160m, so no need to refer to the checklog at first. We should have been on 160m earlier but a shower of rain had upset the aerial matching, I think it dampened the earth stake!

Our new 12V tent lighting was working really well, the stabilised supply removed any keying flicker.

One thing we could do little about was the Wx. A North wind had started to blow and during the night it got colder and colder. By the time I handed over to Richard, Andrew and Daphne, I couldn't hold a half full cup of coffee without spilling some.

With the dawn came Breakfast, with Daphne doing stirling work in the NAFFI tent. There's nothing like a cooked Breakfast to speed up the QSO rate.

At 7am Gwyn was back on the Key, with Brian as logger. Then came a minor disaster - Brian was called away to attend an incident on the M25. With nobody else on site, Gwyn had to keep log and operate at the same time.

By the time I returned to site everything was back into full swing. However, there was a shortage of milk and water, this was speedily cured by a trip to Blackmore village shop.

The 160m long wire was now redundant, so it was dismantled and wound back onto its storage reel. There's not a lot to do at this time, so we adjourned to the NAFFI tent for a coffee. We had been saving a large cake for any visitors to the site, however, once tasted, it was speedily consumed - absolutely delicious.

As the contest came to an end we finally got going on 10m - the other band with a 2X multiplier. Contacts were rather variable, but Arthur managed a good QSO rate.

I was logging for the final hour, and emerged from the operating tent to find that it and the beam were the only things still standing. The dismantling crew had all arrived and within 45 minutes the site was cleared.

The end of the contest doesn't mean that all the work is done. Before our log is submitted to the RSGB it has to be checked very carefully. If there are more than five unmarked duplicate QSO's then we would be disqualified. The job of checking each contact is absolutely vital.

So how did we do:-

CLAIMED SCORE

	160m	80m	40m	20m	15m	10m	Total
QSO's	53	137	298	63	12	40	603
Points	424	510	1019	193	43	264	2453

The total score is a little lower than last year, but the QSO total has beaten the 600 barrier for the first time ever. Well done to those who took part, and to those who couldn't be there on the day, but assisted us all the same.

Andrew has shown me the rushes of the film he took over the two days. I expect the finished epic to be ready for our FILM night in January.

Advance warning - NFD 1990 will be over the second week-end in June. So book it now.

MEMBERS NEWS - E1a G6HKM.

Welcome to new member Andy Marszewski, SWL, and welcome back to Ralph Polley, G3NAA.

We are pleased to report that through the excellent tuition given at the Morse classes organised by Gwyn, G4FKH, four members have achieved 'A' licence status.

Congratulations go to Elaine Nutton (G7AHU), John Dodson (G7BWG), Brian Shaw (G7AXD) and Alan Smith.

Our thanks to Gwyn, who informs us that the classes are now closed for the summer.

HOUSE EARTHING, YOUR RESPONSIBILITY! - Roy, G3PMX.

To complete the excellent response to my request in April for further information on house earthing, we are publishing the comprehensive article received from Geoff, G3EDM.

ELECTRICITY IN YOUR SHACK - Geoff G3EDM, Chartered Electrical Engineer.

In the April 1989 newsletter Roy Martyr raised the subject of earthing the electricity system to your house. There was the time when the water supplied to your house was through lead and copper pipes but commonly the connection from the street to your house is now via a plastic tube. Even the supply along the road/street is through cement/asbestos piping. The result of this is that the water pipes cannot be relied upon to provide a good, low resistance earth for any electrical purpose.

The use of an earth connection in an electrical system is generally for safety purposes, although as you may be well aware the person using electrical equipment is often insulated from touching earthed metal-cased equipment as, for example, in double-insulated electric drills. Hence the user may be excused for thinking there is some contradiction here.

Providing an earth in a system is one protective measure designed to prevent the user getting a shock from the system in the event that the equipment being used has, or develops, a fault (for example, a breakdown of the insulation of its wiring). Should such a fault occur while you are using your electric lawnmower and the earth lead had become broken without your knowledge then you would most likely be electrocuted. To avoid such disasters one should always have an RCD (residual current device, previously known as an ELCB or earth leakage circuit breaker) installed in the system. The RCDs generally on sale in the hardware stores will automatically cut-off the electricity supply to your equipment in the event of such a fault and before you're electrocuted. They are set to operate when the earth leakage current (through your body in this case) reaches a value of 30mA which is reckoned to be a safe value for most persons.

In your shack you will generally have two earth systems i.e. the mains electricity supply earth (via the third pin on the socket outlet) and the radio earth provided by driving in earth spikes, burying uninsulated copper wire or aluminium foil or as a consequence of installing a two metre deep groundpost into the soil to support your tower for your aerials.

Because you have these two earth systems in your shack you are in much the same situation as the electric lawnmower user. There is now an argument for using an RCD to protect yourself against electric shock. However, their use is not so straight forward as in the case of the lawnmower or other electric tools used outdoors or in the garage. Firstly, it may be desirable to use more than one RCD because your various pieces of ham gear may, quite correctly pass some current to earth even when it is working as it should do. This earth current is frequently a capacitive one, that is to say, caused by the earth current passing through a capacitor (e.g. one you or the manufacturer of your equipment have deliberately placed there to filter out rf getting back into the mains and your TV set/computer or it could be that current passing through the capacity existing between your mains transformer primary and its earthed core). Secondly it may be worthwhile separating the outside rf earth system from the mains earth system since the latter can be quite 'noisy' at rf. Thus on your transceiver you may decide, from the noise point of view that it may be worthwhile having the mains earth disconnected and at the same time bonding the rf earth permanently to your transceiver case; but it is only safe to do this if another RCD is used in the power feed to this transceiver, and here is a case for using an RCD with a lower operating current than the RCD feeding all the equipment in the shack.

You may think that you want none of this complication of using RCDs and decide you are going to bond all, or rather,

both the mains and the rf earths together. However, if you do this you must be on your guard by ensuring that the bonding cable can carry any overload earth current that may arise when any piece of your household equipment short-circuits to earth under a fault condition in that equipment. This overload short-circuit current should last a very short time before the fuse blows or the circuit breaker on your mains distribution board (near the electricity meter) operates. If the earth wiring cannot take this current without overheating then a fire may be started...so do be careful and call in a skilled person if in any doubt about this safety aspect.

To get away from the shack for a while and to come back to the general earthing arrangement for the electricity system supplying your house. Your Electricity Board has different supply systems. My electricity is supplied overhead from a pole transformer about three spans away although it comes into my property underground (something I opted for to keep noise and interference to a minimum when I moved to this house). This system is referred to as a Protective Multiple Earth (PME) system since the neutral is earthed at the source of energy (the Area Board's transformer up the pole) and at intermediate poles. Apart from my rf earth at my installation there is no other earth than a poor one from my copper water tube of about 15m length to the main watercock at the roadside; at this point the water pipe becomes electrically non-conducting. This water supply copper tube, my electrical conduits and my earth wires to all my socket outlets are all bonded (i.e. connected) to the incoming neutral and metallic cable sheath on the circuit breaker board where the electricity supply meter is located.

Technically the Area Board would refer to this system as a TN-C-S system. The supply is TN-C where the last letter indicates that neutral and protective functions are combined in a single conductor; and the S indicates the arrangement within the installation is TN-S (see later). S indicates that there are separate neutral and protective conductors within the installation (i.e. my side of the meter). The other system found in this part of the UK is the TN-S system where a separate neutral and protective conductor is provided throughout the system, that is to say, right back to the source of energy; in your case the sub-station down the road.

In this system the earth wire of your house wiring is connected to the sheath of the cable which goes back to the sub-station and the neutral simply carries the load current of your equipment, i.e. it serves no protective function.

To summarise, the protection arrangements I've described relate primarily to saving the user from being electrocuted but secondly to preventing your wiring from being overloaded in the event of a short circuit fault occurring. Overloaded wiring can start fires and commonly such fires are started because some individual has incorrectly replaced the wrong value of fuse or circuit breaker. Do consider and take action in providing RCDs especially in your shacks and when you are using tools outside the house, that is to say when you are standing on the Earth. Finally, in the appendix below I've explained some of the terms I've used. The bible for all this information is the 1981 Institution of Electrical Engineers Wiring Regulations updated version of the Fifteenth Edition. A commentary is necessary to interpret this complex tome and, if you're interested I suggest you look up B.D.Jenkins 2nd Edition (called just that, i.e. Commentary on the 15th Edition of the IEE Wiring Regulations).

If you have other systems or devised your own methods of protection then I'll be pleased to discuss them with you.

(continued.)

APPENDIX:

Circuit. An assembly of electrical equipment supplied from the same origin and protected against overcurrent by the same protective device(s).

Circuit breaker. A mechanical switching device capable of making, carrying and breaking currents under normal circuit conditions and also of making, carrying for a specified time, and breaking currents under specified abnormal conditions such as those of short circuit.

Direct Contact. Contact of persons or livestock with live parts which may result in electric shock.

Double insulation. Insulation comprising both basic insulation and supplementary insulation.

Earth. The conductive mass of the Earth, whose electric potential at any point is conventionally taken as ZERO.

Earth leakage current. A current which flows to Earth, or to extraneous conductive parts, in a circuit which is electrically sound. **NOTE-** This current may have a capacitive component including that resulting from a deliberate use of capacitors.

Indirect contact. Contact of persons or livestock with exposed conductive parts made live by a fault and which may result in electric shock.

Overcurrent. A current exceeding the rated value. For conductors the rated value is the current-carrying capacity.

Overload (current). An overcurrent occurring in a circuit which is electrically sound.

Residual current device. A mechanical switching device or association of devices intended to cause the opening of the contacts when the residual current attains a given value under specified conditions.

RF earth. A low resistance direct connection to earth made by using earth rods driven into the ground or by burying long lengths of copper wire or strips of aluminium building foil in spade slots in the ground.

Short circuit current. An overcurrent resulting from a fault of negligible impedance between live conductors having a difference in potential under normal operating conditions.

Skilled person. A person with technical knowledge or sufficient experience to enable him/her to avoid dangers which electricity may create.

Socket outlet. A device, provided with female contacts, which is intended to be installed with the fixed wiring, and intended to receive a plug.

Supplementary insulation. Independent insulation applied in addition to basic insulation in order to provide protection against electric shock in the event of failure of basic insulation.

System. An electrical system consisting of a single source of electrical energy and an installation. The system may be identified according to the relationship of the source, and of exposed conductive parts of the installation, to Earth. e.g. a TN-C system.

COMMITTEE MEETING.

The July Committee Meeting will be held in the Telford Lodge (Marconi College Residence) at 7:45pm on Wednesday, 12th July. You are most welcome to join us.

73 from Roy & Ela Martyr, G3PMX & G6HKM

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MEMBERS ADVERTISEMENTS

WANTED

Old valve 'domestic type' mains powered radio, LW/MW/SW if possible, any condition.
Richard G4ICP, Tel No. (0376)84478.

FOR SALE

Microwave Modules MML.144/100-LS, Linear Amplifier for 2 Metres, 1W or 3W I/P, 100W O/P with 12dB Rx Pre-amp. £70 o.n.o.

Elaine G7AHU, Tel No. (0245)359910.

DF NEWS.

Our apologies to all the DF hunters and Dick, G3WHR in particular for the failure in co-ordination by not including the DF Report in the main newsletter.

To cover our embarrassment we have printed a few copies of this supplement for known enthusiasts listing the all important dates for your diaries and promise to include the report next month.

FUTURE EVENTS.

30 June Colchester
7 July Chelmsford
16 July RSGB Salisbury
30 July RSGB Grimsby

Andy Collett has been organising some DF events in the Brentwood area.

If you are interested in taking part in these events then have a word with him at the next club meeting.

73 from Roy & Ela Martyr, G3PMX & G6HKM

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