



CONSTRUCTORS' COMPETITION 1996

On Tuesday 4th June we meet at the Marconi College, Arbour Lane, to see the latest products of members being entered in this years competition.

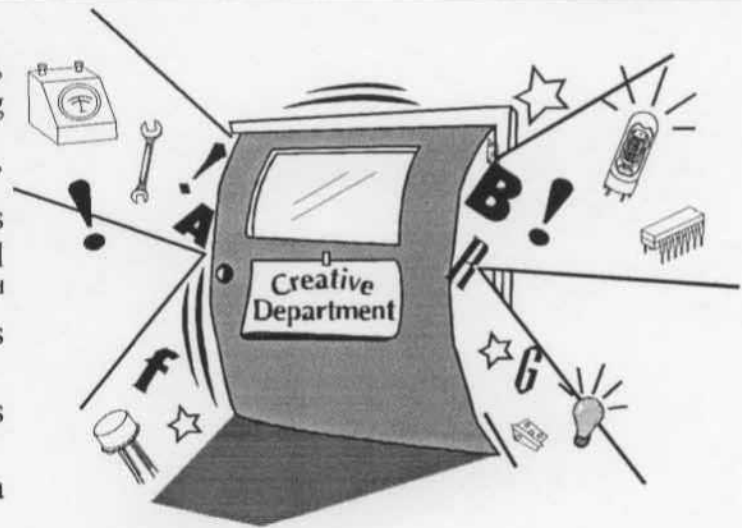
Paying particular attention will be the two Harrys' G2HPF and G5HF who have volunteered their services as judges and depending on the number of entries will award the prizes of £10, £7 and £5 to the chosen 1st, 2nd and 3rd winners respectively; as in previous years there is also a prize of £5 for any first time winner.

The meeting will be informal, however, competitors should observe two simple rules:-

1. To add to the interest, please be prepared to give a short talk on your entry.

2. For the benefit of the judges and the subsequent Newsletter report, please provide a short written description of the entry, together with your name and callsign.

The meeting will begin at 7.30pm and we can look forward to an enjoyable and informative evening.



DATES FOR YOUR DIARY

- 1/2 June NATIONAL FIELD DAY - Museum Site.
- 2 June WATERS & STANTON OPEN DAY - Hockley.
- 4 June C.A.R.S. CONSTRUCTORS' COMPETITION.
- 15 June RSGB HQ OPEN DAY - 10am to 4pm.
- 2 July CLUB MEETING - C.A.R.S. Bygones, Juhn, G8DET
- 28 July C.A.R.S GARDEN PARTY - at QTH of G3EDM.

NATIONAL FIELD DAY 1996

Helpers will be very welcome from 8.30pm onward on Saturday.

Visitors are also welcome throughout the period of 1st/2nd June.

Full details of the location and method of entry were published in the May Newsletter.

RSGB REGIONAL MEETING

As forecast, the attendance for this event at the Rivenhall Village Hall was very poor, being overshadowed by the Ipswich Rally, however, for those who came (including six CARS members) there was a lively debating session for 2½ hours covering a wide range of subjects.

The meeting was chaired by RSGB Zone C Council Member Fred Stewart, G0CSF, supported by the President Peter Sheppard, G4EJP and Executive Vice-President Ian Kyle, G18AYZ. Our Regional Representative Malcolm Salmon, G3XVV minuted proceedings.

THE BIG ONE

In the Society's postbag last month, a wall poster announcing the Waters & Stanton sixth annual open day on Sunday 2nd June; it is proclaimed "BIGGEST EVER", so all we can say is "see you there"

MEMBERS NEWS

The Society extends a welcome to Kenneth Warren a S.W.L. who joined recently.

Peter Cott, G3BDV has kindly donated an IC-702HF transceiver with the wish that it be presented to a CARS young member. The Committee have decided that this lucky person should be Peter Mead, SWL, son of Andrew, G4KQE. Congratulations to both Peter's for this friendly exchange.

Editorial note:- Our prolific scribe Geoff, G7KLV has contributed a series of articles on his workshop activities as column fillers in following editions. Sorry Geoff to cut the first one in half.

THE PHILIPS RECEIVER - Geoff, G7KLV

In this highly competitive age one of the best things about retirement is that you don't have to meet too many deadlines. Apart, that is, from those set by our exacting Editor, "her indoors" (not sure who is the harder taskmaster) or the looming deadline of this months meeting (the Constructors Competition, I mean). With these few exceptions you can start a project and drop it as and when you please.

Casting aside natural modesty I can safely claim to hold the record for the number of half completed projects. As soon as any project shows the slightest sign of actually working it gets pushed to one side and another one is started. Coupled with this grasshopper mentality is an inborn reluctance to record any notes of progress to date, apart from the odd sketch on the edge of the newspaper, which gets thrown out anyway. Consequently if one goes back to the project later one can't remember how far one got or, in the worst case, just exactly what that odd bit of Veroboard with a few components tacked on is actually supposed to do!

But I'm sure that you don't suffer any of these shortcomings, or do you?

Glancing through the magazines in the Library, construction details of a simple analogue frequency meter caught my eye. A high degree of accuracy was not claimed. It uses mains frequency as a reference so it is very simple to set up. Basically, it consists of a frequency to voltage converter. MAPLIN stock the IC and can also supply a data sheet. It is an LM2917 and is classed as an "automotive" type. The data sheet gives all sorts of exotic applications such as the basis of a device to prevent wheel slip and for ignition timing applications. It will work from a few cycles up to about 100 kHz and gives a linear DC voltage out. Linearity, however, is no better than 1% so it can be seen that it would not be as accurate as a digital frequency counter but, nevertheless, the author claims that it is a useful piece of gear for the experimenter.

I was slowly getting the bugs out of it and hitching some frequency dividers on to extend the range when I had a 'phone call from a gentleman who wanted to find a home for two old radios. The Industrial Museum were not interested as they were not "Made in Chelmsford". He reckoned they were 1950's or 60's. Of course I couldn't resist them. He said they would go to the dump otherwise. I immediately pushed the dividers to one side!

From CMOS and 10 volts to valves and 250 volts keeps the mind active! You have to treat CMOS with a degree of respect otherwise a false move and you blow up the IC. Valves are much better tempered and robust but you have to exercise care to avoid catching a packet! (continued next month)

INTERNET ON THE RADIO - Jan, G7UVP

Last months talk was given by Larry Pleasant and his friends in the Essex Internet Pkct Group (EIPG). The group formed in 1994 with the stated aims of furthering the use of TCP on the radio and offering assistance to people who wish to set up TCP stations.

The Internet is one of the run-away successes of the 90's and is responsible for increasing the computer awareness of the general public. The Internet has it's roots in the late 70's when the American Government sponsored a project to link together research establishments, both Government and Academic. The project was funded by the DARPA (Defence Advanced Research Projects Agency), and one of the objectives was that the system should be able to work if any part of the network was not available, being the late 70's with the ongoing Cold War, it was to continue after a Nuclear War. To this effect part of the project was concerned with transmission over radio. Initially this was for commercial users and Satellite links. Fortunately for the amateur radio world, Phil Kahn, who was one of the key people in the project, was also a Radio Amateur (KA9Q). He wrote a program called NOS (the original one was called NET). This allowed the Internet protocols and services to be implemented on the existing AX25 packet network. The program code was made freely available and has been taken, modified and enhanced by many other people. There are versions now called GRINOS, WNOS, JNOS, UKNOS and TNOS to name a few.

The talk began by Peter Onions (G0DZB) explaining that TCP/IP stands for Transport Control Protocol/Internet Protocol. Taking the Internet Protocol first, this is concerned with addressing the message. His analogy of the Royal Mail raised some interesting if not disturbing facts. When we send a letter, we place the text on paper, put it in an envelope, address it and put it in a letter box. We then don't know how it will get to the destination, when it's going to arrive, what state it's in when it gets there or if it arrives at all! The IP addressing used on the Internet has many similarities. Internet nodes are a co-ordinated set of numbers in the series XXX . XXX . XXX . XXX where XXX is a number between 1 and 255 (0 is a special "broadcast" address). The Amateur Radio part of the network has the initial number 44. The next number usually refers to the country, the 3rd number is usually a county (or part of) and the final number identifies the individual. For example, 44.131.185.204 translates to 44 - Amateur Radio, 131 - UK, 185 - N.E. Essex, 204 - G0DZB. This address is translated to the more frequently used, and easier understood g0dzb.ampr.org. Every amateurs address is held at the University of San Deago in America, with copies available on special nodes called Domain Name Servers.

Having explained how the address is formed, Peter went on to explain how it is put into a packet that can be transmitted on the radio. The AX25 protocol (From Amateur X25) used for amateur radio requires the destination and source address to be callsigns, usually with a secondary identifier. To transmit TCP/IP we have to use two addresses in each packet. At first this sounds like an overkill but it does have an advantage. Just like the Royal Mail where we don't know (or care) what route a letter takes to arrive at the destination, the same applies to TCP/IP. All that is necessary is to pass the packet +:G7 6to a station that has a rough idea where the destination is, it then passes it to another station that has a better idea, and so on. The two addresses in each packet are useful because the final destination is wrapped inside the local or intermediate destination which is changed as the packet is passed from station to station. This might sound very hit or miss, but it actually works very well. For example, it is possible to communicate with Australian stations with a round trip time for the packets of about 30 seconds. The accuracy of the system is dependent on a set of routing tables held at each station. These hold the details of how to get to different parts of the network with varying degrees of accuracy. For example, the table might hold the details that 44.131.187.* (N.E. Essex) is on the local radio port, but 44.136.*.* (Australia) is via G6FBB. G6FBB then contains the details of the next station to call and so on. Some versions of the NOS remember routes as they are learnt.

Having designed a very efficient addressing system, it is also necessary to make sure the packets all arrive, and having arrived, assemble back into the correct order. This is what the TCP part of the protocol does.

Each packet that is received is acknowledged (ack) by the recipient, and if the sender does not receive an ack after a set period of time it sends the packet again. To speed up operations, the sender can send 4 packets in one go and receive one ack for all of the packets. However, if one packet is corrupted on route, it is the TCP's job to request the corrupt packet to be sent again and then assemble the packets in the correct sequence before passing the contents of the message to the application above it.

The TCP/IP system has a number of services available within it. These are the same on radio as they are on the Internet. Examples of services

available are Telnet, which allows a user to log on to and use a remote computer, Mail (that one should be self explanatory), NNTP (Network News Transfer Protocol), for the transmission of news bulletins, and http which is the system used for World Wide Web pages. Having explained the mechanisms and services available, our second speaker, Matt (G6WPJ) described how they have been put to use in the Essex area.

The EIPG has set-up a store and forward service for mail and news, program and text transfers, keyboard to keyboard chat sessions, multi-way cross country keyboard conferences together with the Internet services finger, ping and domain name servers. This has been achieved by setting up a series of Hubs that are all interconnected. In the centre is the node GB3EP. This is situated on the hill at Danbury, as the topology of Essex is much like a fried egg, and everyone can see the top of the yolk (Danbury). Each of the surrounding nodes provides an access point for their users and gives them access to anywhere in the world for all of the services listed above. At present GB7EP is a real time data repeater working on 70cms at 1200 baud. There is also a link from GB7EIP which is run by Malcolm G3XVV which handles all the forwarding of messages and provides a link to the AX25 mail system. This collects copies of all the bulletins sent on the NTS and converts them to the NNTP system. This has the huge advantage that the bulletins are sorted out into news groups, and you can selectively gather those which interest you. +:G7 6The future plans of the group are primarily to increase the speed between the hubs. Matt and John (G8STW) have designed a regenerative radio modem that can operate at speeds up to 28,800 bits per second. The system is still in the experimental stage, but the EIPG have obtained permission to use two 50KHz channels on 70cms. Two channels are necessary as the regenerative receiver starts transmitting on the output within a few milliseconds of receiving data on the input. With this type of speed available, it is possible to have WWW (World Wide Web) pages available over the radio, so Internet on the radio will keep up with all the facilities on the rest of the Internet. (I was a little surprised that they had digital voice recordings on some web pages, as I have found a microphone cheaper and easier to use for audio on the radio!)

During the tea break the members of the group demonstrated what could be done on two systems set-up in the room. The system was running at 14,400 bits per second, (as this can fit in the normal 25KHz channel) and showed how usable it all was. It generated a great deal of interest which led to a questions and answers session when we resumed.

Firstly, how to get started. The system will run on almost any PC although a fast 286 is probably the slowest practical machine. You need a copy of the NOS program, a TNC (or a Baycom modem) and a radio. For fast access a board is needed to fit into the TNC (most TAPR compliant TNC's can be adapted) and some modifications to the radio are needed. This is because the audio or the IF section of the radio will filter out the tones needed. It is usual to feed the audio input directly into the radios' variator. It is possible to modify an ex-PMR radio so the cost for the system can be very low.

The group commented that most 1200 baud modem chips are no longer available or in short supply, so the advent of cheaper, faster modems is not too far away. Setting up the system is not as straight forward as getting on the AX25 network, but there are a number of manuals to help. The main one of these is "NOSINTRO TCP/IP over Packet Radio" by Ian Wade (G3NRW) available from the RSGB bookshop. Also useful (although it can be very heavy going) is Internetworking with TCP/IP, principles, protocols and architecture by Comer. Most of all, the EIPG are there to help.

I have been using TCP/IP for a number of months and have found it most rewarding. Next month I will give an account of my trials and tribulations in getting started. But one piece of advice from someone who has been setting up TCP/IP computer networks for some 10 years and thought he knew how to get NOS working.....Ask an expert first.

COMMITTEE MEETING

The next Committee meeting will be held at 7.30pm on Wednesday 12th June, in Telford Lodge, you are welcome to join us.

FOR SALE

TOPWARD TPS-2000 Power Supply, 30 Volt, 6 Amp, variable, as new, similar model to MAPLIN ref: GW14Q.

Contact Alan, G0LSH, ☎ (01245)264045.

73 from Roy & Ela Martyr,
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