THE NEWSLETTER OF THE CROWBOROUGH & DISTRICT AMATEUR RADIO SOCIETY

Crowstalk

G0CRW

M1ESX

www.qsl.net/g0crw

ISSUE 45 FEBRUARY 2000

Welcome to

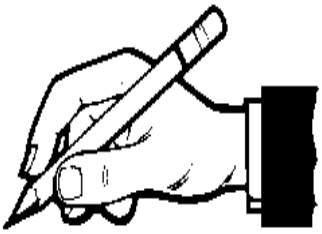
Crowstalk

Contents

Issue 45 February 2000

DIARY DATES

Thursday 24th February
Open Discussion Meeting. An opportunity to give the new Committee some guidance as to what meetings and activities you would like to have during 2000. This will be followed (time permitting) by an informal Members' Question and Answer session on any Amateur Radio related topics.



Dear Members

I know that it seems a long time into the year, but may I take this opportunity to wish you all a VERY HAPPY NEW MILLENNIUM!

I hope that you survived the festivities and did not succumbed to the dreadded 'flu. I thought that I had gotten away with it, but I'm afraid that it caught up with me in the end. Still, all is on the mend now.

My apologies for the non-appearance of Crowstalk for some time. I will not bore you with details, but the reason was the near loss of the hard disk on my PC - with all of the programs, data, etc! It took **many** hours of work to retrieve it.

The situation was compounded by the fact that the machine that prints Crowstalk also went down for a considerable time in January. and then I had to go to the 'States for a while on business. Anyway, all is (almost) back to normal now and here is an issue of Crowstalk to prove it!

I took some extra holiday time after New Year and used it to some advantage. The 'shack' has been cleared out, the P C re-installed, the rig connected up and all systems seem to be go. I have even had a couple of QSOs!! (the first from home since April 99!) The first of the millennium was with a VK4 near Cairns on 12m - it can only get worse!

There have also been a number of DXpeditions going on in the last few weeks. Did you work XZ0A? Although there seemed plenty of 'spots' posted for this station on the DXCluster, most of them seem to come from outside Europe. Propagation from Myanmar to the UK seemed poor on most of the bands and the XZ0A signal strength was way down - if it could be heard at all. It would be interesting to know whether any of you with beam antennas had any joy working this station. I did manage on QSO on 30m!

Amongst other expeditions that were about were Roger Western, G3SXW, and Nigel Cawthorne, G3TXF, who activated both Mayotte (FH) and the Seychelles (S79). They were rather easier to work! Also, as I type this, Andy Chadwick, G4ZVJ, is active from Bangladesh as S21VJ with good signals.

If you haven't been on the bands lately you are missing quite a lot!

On a completely different tack, the AGM went off without any hitch. For those who weren't there the new Committee is listed on Page 14.

It is good to see some new faces on the Committee. I wish you all success for the new year.

The February meeting is an 'Open Meeting'. The objective is to give the new Committee some ideas as to the activities and meetings that you, the Members, would like to have over the comming year, or so.

The format of the meeting will be as wide a discussion as possible. The Committee will give you some idea of the meetings so far suggested and the discussion will go from there.

Such topics as: 'how do we attract younger members into the club?' or :'do we want to do more, or fewer contests during the year?' or: 'can you think of where we can visit during the summer?'

Put you thinking caps on and please attend if you can. It will be your opportunity to influence the new Committee to organise meetings and activities that interest you!

I hope to see you there on the 24th.

73 de Eric, G3TXZ

Members' E-mail Addresses

A good number of Club members are now on the Internet. To assist in (non-over-the-air) communication between us, I have been requested to publish a list of members' e-mail addresses.

At present I only have a few to publish. **If you are on the net I would be grateful if you would drop me an e-mail so that I can publish yours.**

The ones I have so far are:

M0CHO, Glynn Burton glynn@burton1717.freeserve.co.uk
G0WTC , Bill Clark g0wtc@aol.com
G0NOA, Jack Clark g0noa@qsl.net
G6UIF, Margaret Clark g6uif@aol.com
G4DXG, Paul Cross g4dxg@qsl.net
M1BHW, Peter Frier m1bhw@freeuk.com
M0AHA, Alan Hodgson alan.hodgson@lineone.net
G1BVI, Nick Moldon nickm@telinco.co.uk
G7SPT, Pauline Moldon paulinem@telinco.co.uk
G0XBV, Alan Nottage alan_nottage@hotmail.com
G6UUO, Mike Smith micks@freeuk.com
G3OHV, John Taylor xtaylor@ukonline.com.uk
G3TXZ, Eric Tucker g3txz@qsl.net
M1APT, Ian Waterhouse ian@m1apt.freeserve.co.uk

If any of the above are incorrect, please let me know

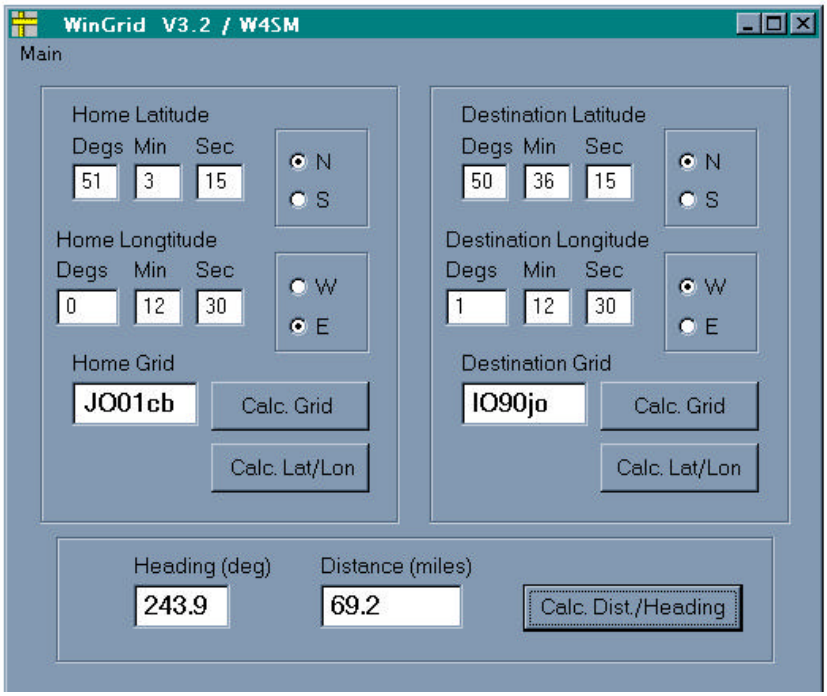
Useful Software?

A little program that I came across that could be of assistance, especially to those who like DXing or contesting on 6m and up.

You can enter either lat and long, or Maidenhead locator for your home station and the DX station and it calculates the other format (i.e. if you enter in lat and long it will calculate locator, and vice versa).

It also gives you heading and distance.

Anyone interested, see me for a copy. It's freeware!



73 de Eric, G3TXZ.

Snippets

I am desperately looking for some help with Crowstalk! Is anyone willing to assist?

What I need is someone who can chivvy members (and others) for interesting articles. Ideally they should have the technology to process these articles into 'MS Word' form and get them to me in electronic form.

An ability to search the 'Net' for interesting content would also be advantageous.

Any takers? de Eric, G3TXZ.

The G4ZU Revisited

Last Crowstalk (if you can remember that far back!) I was on about non-resonant Yagi elements. I finished up with a mention of the, now almost forgotten, G4ZU minibeam design. As promised, here is the next installment. Are you sitting comfortably? Then I'll begin.

Once upon a time, as all good stories should start, I was a young and callous youth with a newly acquired callsign. I had just started work, earning the princely sum of £6.0s.0d. per week, and desperately wished to communicate my enthusiasm for my chosen hobby with the many like-minded hams around the world. I had been a short-wave listener for a number of years (I still have my old SWL logbooks!) and was the proud possessor of a Canadian Marconi Company 52 Set receiver which, if my memory serves me correctly, covered from 1.6 Mc/s to 18 Mc/s (the MHz was not in common useage in those days). I had also been given an hf transmitter! This had belonged to a local ham who was not active anymore. It was home-brew, using a Geloso VFO unit (do you remember those, Oh ancient ones?) driving a 6146 pa. The modulator was a pair of 6L6's. I also had a home-brew 160m box, running the statutory 10W input to a TT11 pa. My antenna was an end-fed inverted-L from the back of the house to the bottom of the garden. Needless to say, I didn't get out very well! But, it was a start.

It was a wonderfully formative period in my ham radio existence. I soon found out about spurious oscillations in the pa of a transmitter - and so did my neighbours' televisions; it was pointed out to me that the anode of the 6146 should not really glow cherry-red! I found out that my puny output power and inefficient antenna (probably aerial, in those days) meant that I had great difficulty in working anyone at all on AM (there were very few using SSB then). If I wanted to communicate - as I desperately did - I was forced to use CW. There started my love of that medium - but that is another story.

My station was slowly improved, within the financial restrictions imposed. The 52 set was made redundant by a home-brew Rx to a design by G3BDQ and then by a Hammarlund Super Pro. This was purchased from another local, for some rediculously low sum, who moved into a flat and didn't have the room for it, or the strengthened floors! It came without a case, was 19 inch rack-mounting size and had a separate power supply. The receiver weighed 105lbs and the power supply 110lbs (excluding an autotransformer - as it was a 115V operated set)!

My main interest turned to 160m CW, as that was the one area where my signal could be competitive. Top Band was hugely popular, back then. The antenna was improved with many radials and all was well. I operated almost exclusively on 160 for nearly three years. However, I still hankered after DX working and was saving my pennies. SSB had taken off in a big way and one of the commercial fore-runners in the field was Roly Shears, G8KW, with his company K W Eelctronics in Dartford, but his KW2000 was on sale for £250,or so - still way out of my league. I did 'phone the company to find out whether any second-hand rigs ever came available. There was one for £105! I bought it. It was a momentous decision, as this amounted to about three month's wages for me. This was the start of being able to talk to the world.

My 160m antenna was initially used, retuned to cover the hf bands. I see from my log that I was able to work on 15m and 10m - something that I had not been able to do before. The DX did come, but something needed to be done about the antenna. All the 'big-guns' used beams - that's what I needed! Again, serendipity stepped in: there was an advert. In the Short Wave Mag. A ham about 30 miles away had a G4ZU Minibeam for sale. I purchased it for £10, I think.

Now, the G4ZU Minibeam is not really a minibeam. It is about the same size as a full-sized 3-element 15m yagi, but it is a tri-bander and does not have any traps, spikey bits, or dangling wires, so its visual impact is relatively low. This was an important factor to placate the neighbours. It is claimed to be equivalent to a closed-spaced 2-element yagi on 20m, a bit better than a 3-element on 15m and about a 5-element on 10m. This is because the full lengths of the elements are used on all of the bands. How does it work without traps? Well, it uses centre loading - either inductive, or capacitive as required - electically switched by transmission line switches. No physical switching, relays, etc. are present

I do not know when George Bird, G4ZU, first published his design, but I have a copy of the RSGB Handbook, Third Edition, 1961 in which it is explained briefly. It looks like a conventional 3-element yagi with the dimensions given in Figure 1. However, the driven

The G4ZU Revisited

element is unusual in that it is untuned, being fed with 300Ω ribbon. The parasitic elements have inductors and/or capacitors at their centres, these being switched in and out automatically as required by using the transmission line stubs as frequency switches. Remember that a stub acts as a short-circuit at the frequency at which it is λ/4 long. This is shown in Figure 2.

I remember that this antenna worked splendidly. Perhaps not a great performance on 14MHz, but excellent on 21MHz and exceptional on 28MHz. I can remember one contact on 10m when I was talking to a far-eastern station only to be told that I was two S-points up on any other G on the band. Very good for the ego!

Well, that was a long time ago. I was off the air for about 10years and since coming back on have used wire antennas exclusively. However, with the thought of increased sunspots and better propagation, I'm now in the market to put a beam up again. I still have the constraints of limited space and visual impact, so all of the advantages of the old G4ZU are still just as relevant today. Did the antenna work, or was it just nostalgic memories? I now have the computer tools to find out, so I modeled the antenna and did some analysis. The results will come next time.

73 de G3TXZ.

The "INTERNET"; are you connected??

Members may recall that in a past issue of "Crowstalk" the "Ed" mentioned that I have acquired a new computer; an "all-singing, all-dancing" Intel P2 400MHZ with lots of RAM and ROM, running Windows 98. With it came the opportunity to join the Internet; something which the old Windows 3.1 25MHZ "clunker" couldn't cope with.

After a few unsuccessful attempts at installing some of the "freebie" internet programmes on offer (some aren't quite so easy to install as the providers claim), I was about to give up on the idea, when Nick G1BVI (thanks, Nick) came to my rescue and connected me to "FreeUK". This is working well, and I am now the proud possessor of the "E-mail" address *j.clark@freeuk.com.* I also have the address *g0noa@qsl.net;* more about this later.

It is known that several of our members have E-mail facilities, and it occurred to me that it would be useful to have a list of members' E-mail addresses published in "Crowstalk". Our Chairman/Editor agrees with this proposal, and members who are "on" E-mail are invited to send in their address details to Eric G3TXZ, so that an "E-mail directory" can be prepared and inserted in a future issue of the Newsletter.

Al Waller K3TKJ has set up an E-mail forwarding service specially for Radio Amateurs. A visit to *www.qsl.net* will produce a simple form requesting name, call-sign and current E-mail address. These particulars go by E-mail to Al, and a message comes back confirming that your application is being processed. Within 24 hours you will receive an E–mail giving you your address in the form *(callsign)@qsl.net.* You also get a password and an allocation of space for your very own Web-site! Any messages for *g0noa@qsl.net* are automatically routed to *j.clark@freeuk.com.* I know that this works, as one of our members has already contacted me by that means, and his message was waiting for me on the ISP server when I next logged on!

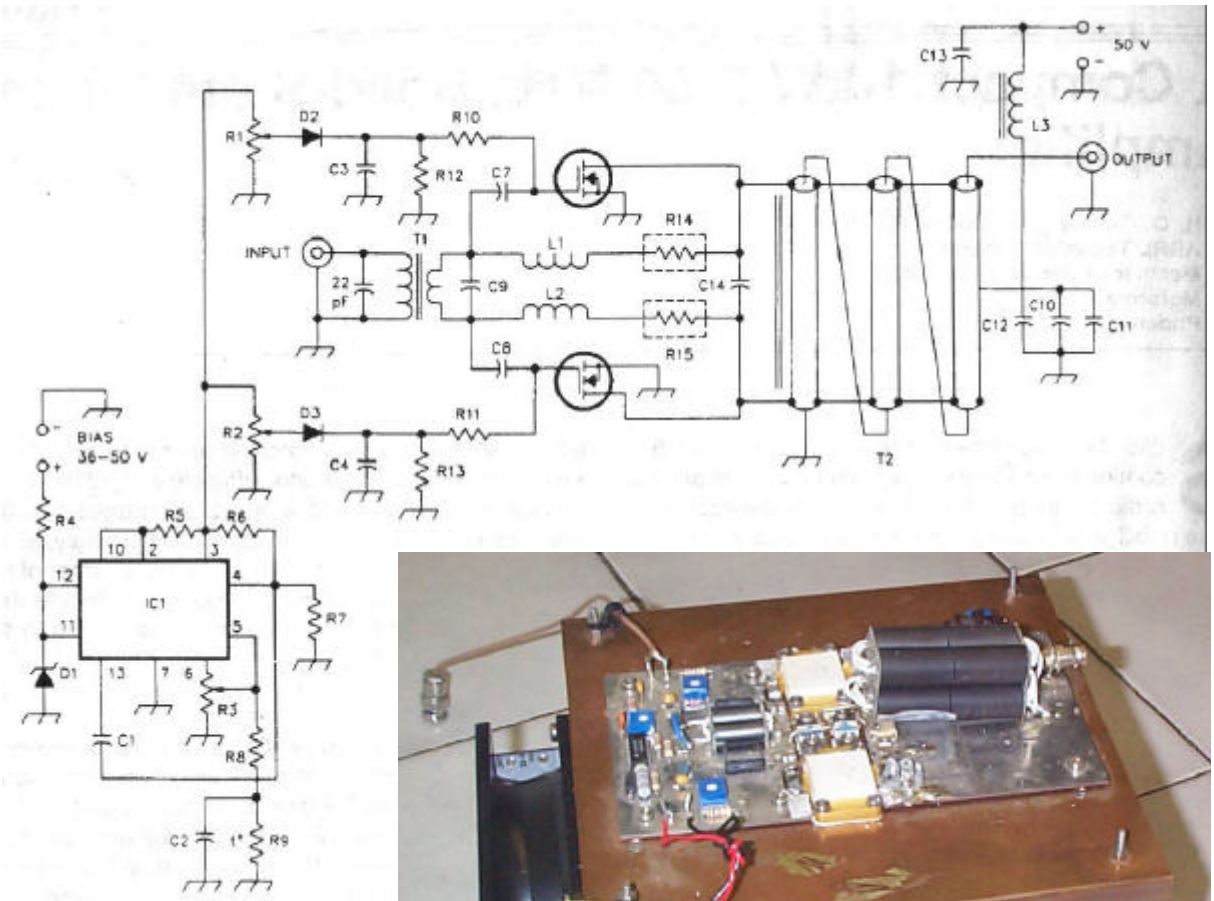
This service (like that provided by the packet SYSOPS) is entirely free, though (again like the packet SYSOPS) donations towards the running costs are appreciated. Give it a try!

Snippets

Do you like CW? Do you operate in CW contests? Yes? "Sad thing!", I hear you others cry. Anyway, for those warped individuals, like myself, who do, there is some interesting software that simulates a pile-up on your PC.

It is for receiving and keyboard practice and is very challenging. You can set it for up to nine stations calling you at one time and the object is to copy and correctly type as many as possible. More details from G3TXZ.

Nick's Amplifier



For those of you who didn't get to Nick, G1BVI's, talk on Power Amplifiers - or if you did and would like to see it again, here is the circuit and a picture of his 'full legal power' MOSFET amplifier that is essentially flat from Top Band to Six Metres.

As you can see, the circuit is remarkably simple: just two FETs to get you from about 5W up to 1kW!!

IC1 and its associated circuitry, including networks from R1 to R10 and from R2 to R11 are all biasing components. The rest is the rf bit!

As those who were present at the talk saw, the amplifier works very well, delivering plenty of whoomph into a 50Ω load. What you may not have seen was the panic when the amp stopped working! Oh b....! Oh, no! Not £xxx worth of MOSFETs gone for the proverbial?

However, the panic subsided when I noticed that the temperature/ current cut-out on the extension lead that we were using had tripped. On reading the little notice on the lead, it gave the rating as 4.5A fully wound, 6A fully unwound. The lead was 18m long and we had about 2.5m of it unwound!

Well, at about 1.2kW rf output from the amp, with no more than 50% efficiency, the total power taken from the supply was at least 2.5kW. At a rough calculation that was over 10A. No wonder the cable got extremely hot and the cut-out tripped!!

On resetting the cut-out the beast burst into life again with no damage being sustained. Needless to say, we did not run it at full power again that evening!!

A case of RTFM, or something like it! Think before you act!

73 de G3TXZ

The Diehard DXer

The piece below comes, via a tortuous route, from an article in the February 1998 issue of World Radio., via Clinton Herbert, AB7RG and then N7RCM in Las Vegas. Could it be relevant to one of our Field-Days??

5:00am - Fellow DXers arrive. Crawl out of nice warm bed.
5:30am - Toss all gear into truck
5:45am - Get gear out of neighbor's truck, and put it in yours.
6:00am - Get speeding ticket while hurrying to get to the mountain.
7:15am - Get to "the site," near top of mountain.
7:16am - Start unloading gear.
7:20am - Get poked in eye with 20M vertical by fellow DXer.
7:50am - Arrive at hospital to get eye patched up.
8:30am - Get another speeding ticket while heading back up to site.
8:45am - Arrive back at site. Unload antennas yourself this time.
9:45am - Hike up to mountain top. Pass out from exhaustion.
9:50am - Wake up to smelling salts and laughter from fellow DXers.
10:00am - Put up antennas, and set up rigs.
10:15am - Fire up rig, call CQ for half an hour; no replies.
10:46am - Hook up coax to rig...
10:48am - Realise that finals are kaput in main rig.
10:50am - Hook up back-up rig, this time with coax.
11:00am - Yell CQ, rare VP8 comes back; antenna falls down...
11:15am - Wake up to smelling salts, fellow DXers shaking heads.
11:30am - Guy Antennas.
12:05pm - See long list of QSOs made by fellow DXers.
12:06pm - Notice rare VP8 in fellow DXer's logbook.
12:07pm - Beat fellow DXer over head with logbook.
12:09pm - Restrained by rest of DXpedition team...
12:30pm - Back to rig for another attempt.
12:35pm - Nearby lightining strike kills receiver. Notice wet pants...
12:36pm - Look for shelter
12:38pm - Find Cave!
12:41pm - Watch antenna get struck by lightning while hiding in cave.
12;42pm - Wish it was fellow DXer's antenna, or him that was struck...
12:45pm - Realise you're not alone in cave...
12:46pm - Pick up really big rock...
12:47pm - Mauled by large angry bear.
12:50pm - Get pulled out of cave by fellow DXers.
1:05pm - Finally get talked into receiving medical treatment.
1:30pm - Arrive back at hospital.
1:55pm - Receive series of painful rabies shots, and multiple stitches.
2:30pm - Get out of hospital and return home.
2:35pm - "Explain" stitches and eyepatch to wife.
3:00pm - Realise gear is still up on mountain, with bear.
3:01pm - Wish fellow DXers were still up on mountain, with bear...
3:03pm - Consider taking up drinking.
7:00pm - Get phone call from DXer buddies.
7:05pm - Agree to go on DXpedition again tomorrow...

Well, it could be you!

Train Cab Radios

Some time back a request was made re the small beam antennas seen on railway property. These antennas are for the Cab to Signalbox Radios fitted to trains.

This Radio is called Secure Radio and was mainly introduced for Single Man Working, where the Train could be worked by a Driver Only with no Guard. It means that the Driver has a direct link with the Signalman. It is a very unique piece of equipment and has other uses other than speech.

The set up is as follows. Modern signalling is done from Power Boxes that cover a wide area and has done away with all the small Signalboxes that used to be found at each station , Junctions and level crossings. A lot of Level Crossings are controlled by a Signalman in a Power Box using remote cameras. Others are controlled by the passage of Trains and are automatic. These are the Half Barriers.

As with the system of using a large number of signal boxes that split the track up into sections, so the Power Box does the same but from one place, but these are called AREAS. As an example the Brighton Area covers from just outside Lewes in the East to Hove in the West and Patcham (just north of Preston Park.) in the North. All movements are controlled by one signalman in the Power Box for that Area. For this Area there are a number of antennas all linked so as to cover uninterrupted reception and transmission. There are also antennas in the tunnels. The Area has a unique two digit ident number, which is associated with the Frequency of the Radio TX/RX. Each area has a different frequency and associated Ident Number. The Signalman knows where a train is through the Track Circuits and is indicated on a master Track diagram or map by a unique Train Number. This Diagram and ALL signal displays, Point operation, And Train Movements are controlled by a MASTER COMPUTER in the Power Box. This in turn communicates with other Computers at remote locations for the same purpose.

The Computer also controls the On Train Radio. First the Driver has to set up his Radio. He does this by entering the Area Code from a keyboard on the Radio. Next he will enter the Signal Number ahead of him and press the CALL BUTTON on the key pad. This sends the UNIT NUMBER of his unit as Identification to the Signal Box Computer. The Signalman has already entered the TRAIN NUMBER into his console for the train on that piece of track, and the computer now links the Train Number to the Unit Number and send a signal back to the train and the Train Number will be displayed on the Radio. This indicates to the Driver that his Radio is now set up. As the Train moves from that section to the next so the Train Number moves on the signalman's diagram. If the signalman wishes to talk to the driver he will dial up the Train Number and the computer will send a signal to the Transmitters in the area that the train is in and the transmitter will send the signal to the trains Radio. This will beep and alert the Driver. The Driver will then press a SPEAK button on the radio Keypad and communication in DUPLEX is established. Similarly if the Driver wishes to speak to the Signalman he will press a CALL button and the reverse happens. All calls are on a queue basis first in then second in etc. and the signalman will respond in that order. If however there is an emergency, the Driver will press. an EMERGENCY button that will override the queue and cut off other communications and sound an emergency alarm in the Signalbox. Communication will be opened immediately.

As the train moves into the next Area Control the Computer will send a signal to the Train and automatically change the frequency of the on train radio and is indicated in the display on the Radio. The train is now being routed and controlled by the next Signalman.

The Cab Radio system has other facilities apart from voice communication. If a

Snippets

The RSGB and the Chiltern DX Club are organising an IOTA 2000 Millennium programme with the objectives of celebrating the Millennium, promoting IOTA and having fun on the hf bands.

The programme will run all through 2000 and the idea is to work as many IOTA island groups as possible. Each month a new geographical area will count for extra points.

The programme looks as if it will be good fun. I have more details if needed.

73 de Eric.

Train Cab Radios (contd)

Train is held at a signal, Rules state that after a predetermined time the Driver must contact the signalbox the signal Telephone. With the Radio this is done by the press of a Signal button on the Radio console. This will send a signal to the computer in the Signalbox and TRAIN WAITING will appear next to the train Number on the signalman's Train List VDU and also sound an audio signal to alert the signalman.

To explain more on this. Although the train position is indicated on the main Track Diagram (which is a massive display that stretches right across the signalbox) the signalman also has a VDU that displays all the trains in his area. As each train moves onto the next area it is removed from his display and appears on the next signalman's display. In this way the list is updated continuously.

When the signalman receives a TRAIN WAITING indication he will respond by sending an acknowledged signal back to the train and the word WAIT will appear on the Cab Radio display. This tells the Driver that the signalman is aware of its presence at that signal. The signalman may wish to talk to the Driver and in this case he will open communication instead.

The signalman also has an EMERGENCY STOP facility where he can send it to any particular train or a BLANKET TRANSMISSION to ALL TRAINS in his AREA. This will activate a particular Radio or ALL Radios in the area and produce the word STOP on the Radio display accompanied by a continuous BEEP BEEP in the cab. The Drivers action is to immediately apply emergency brake and stop. When he is at a stand he will press a STOP button on his radio keypad and a signal will be sent to the signalbox and TRAIN STOPPED will appear next to his train number on the signalman's VDU. Communication will then be established by the signalman as appropriate. The Driver will not move until this communication has been made and he is authorised to proceed.

If there is a major disruption to services and delays are occuring, The signalman has the facility to record a message to all Drivers and this will be sent out automatically at intervals as a general call to all trains in his area. (unfortunately in my experience the signalmen rarely use this facility) This would save Drivers calling the signalman to find out what all the delay is.

The Drivers controls incorporate a safety device called would you believe a DRIVERS SAFETY DEVICE. It is a foot pedal that must be depressed all the time the reverse is away from the OFF position. This is an update on the old DEAD MANS HANDLE. On some older trains this handle system is still used. The Safety device has a contact on it that if the device is activated by the Driver lifting his foot or releasing the handle (on the older trains) the brakes are automatically fully applied. This will also send a D.S.D. alarm to the signalbox via the Radio and alert the signalman. The signal will also be sent if the Driver moves his reverse into the mid position thus isolating the D.S.D. (Strictly against regulations and DANGEROUS). The D. S.D alarm will only be sent if the train is moving at more than 3 MPH. When the train is at a stand the automatic signal will not be sent. If the Driver has to leave the cab to carry out rules The signalman has the facility to talk to the passengers via the Radio and the public address system on the train.

So you now see the Cab to Signalbox Radio is a great advance in adding to the safety of Train Operation. It is a boon to the Driver especially when it is blowing a gale and pouring with rain and he would have to stand outside and use the signal telephone.

I hope you have found this explanation of interest and would appreciate your comments. Any questions re Railway operation and steam locos I will try to answer.

73 de Mick, G6UUO.

Snippets

The observant amongst you may have noticed the second callsign shown on the front cover of this month's mag.

A second call for the Club was discussed in Committee some months ago. Initially it was thought that we would go for a second Class A call. However, it was decided that a Class B call would be of more benefit, as Members with B calls could operate without A classs supervision (a situation that is not legally correct with our existing A call).

M1ESX has been reserved and will be issued shortly.

Recipe of the Month

To Make the Most of a Lemon

Not a recipe, as such, this month but some tips for the cook! They come from an old recipe book - its fifteenth edition was dated 1928! - and is from a chapter called 'Wrinkles for the Cook':

Add a few drops of lemon when boiling rice to whiten it, it also helps the grains to separate.

Use the juice for lemonade, the rind for flavouring sauces, the pulp to remove stains from hands, or cleaning brass with the addition of salt.

Dried pith can be used as a firelighter.

The pips can be used with salted water to clean discoloured glass bottles.

The juice mixed with a teaspoonful of bicarbonate of soda is excellent for a headache.

The juice, addedto a large glass of boiling water and a pinch of cinnamon, taken at beadtime, is good for a cold.

Before squeezing, heat the lemons thoroughly and you will obtain nearly double the quantity of juice.

Well, what do you know?! de Eric, G3TXZ.

Don't Forget!

FEBRUARY MEETING

24th February
at 'The Plough'

'Open Meeting'

An informal discussion on Club activities

GUESTS WELCOME

A Plea!

We are desperately in need of Raffle Prizes

Have you anything you can donate?

It does not need to be expensive.
It doesn't even need to be new!

Anything that you think may be suitable as a prize would be welcome

Please give your donations to Jenny, 2E0ALR, QTHR.

CROWBOROUGH & DISTRICT

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This is a list of members as of going to press.

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M0CHO	Glynn Burton
G0WTC	Bill Clark
G0NOA	Jack Clark
2E0ALR	Jenny Clark
G6UIF	Margaret Clark
G1SHH	Tony Compton
M0CPC	Chris Cook
G4DXG	Paul Cross
G0RXN	Mark Davis
G0NAR	Adrian Fenton
M1BHW	Peter Frier
G0HFK	Bob Fuller
2E1FZE	Hilary Glover
2E1GIE	John Glover
M1DRB	Kate Glover
G7WAJ	Andy Hagland
G3GTF	Bryan Harris
G4DRV	Jim Harris
G1ITE	Peter Hayler
G0VVV	Michael Headey
M0AHA	Alan Hodgson
M0AJA	Jean Hodgson
G7JLL	Pepper Jarvis
G0ABM	Trevor Johnson
G0JDM	Tom Kewell
M0ABT	Stuart Little
G7TDL	Charles Lucas
SWL	Irene Lucas
G1BVI	Nick Moldon
G7SPT	Pauline Moldon
G0XBV	Alan Nottage
G3KCR	Denis Payne
G4DRB	Bill Pickering
G0OSS	John Porter
G3FET	Les Rawlings
G3TUX	Chris Rees
G3TLB	Keith Smith
G6UUO	Mike Smith
G3OHV	John Taylor
G3TXZ	Eric Tucker
G8HGI	Martin Warriner
M1APT	Ian Waterhouse
G3CYU	John Wilson
G8LSD	Allan Wyatt

SUBSCRIPTIONS FOR 1999 ARE
£6 INDIVIDUAL MEMBERSHIP
£10 FAMILY MEMBERSHIP