

CB Citizens' Band

Britain's Leading Communications Magazine

99p

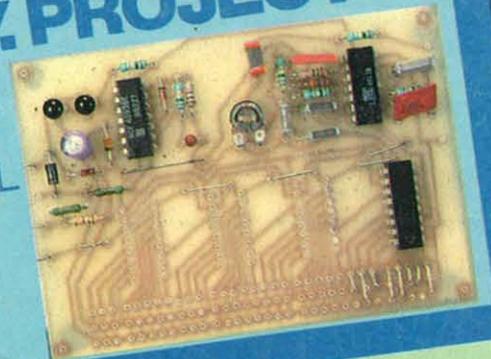
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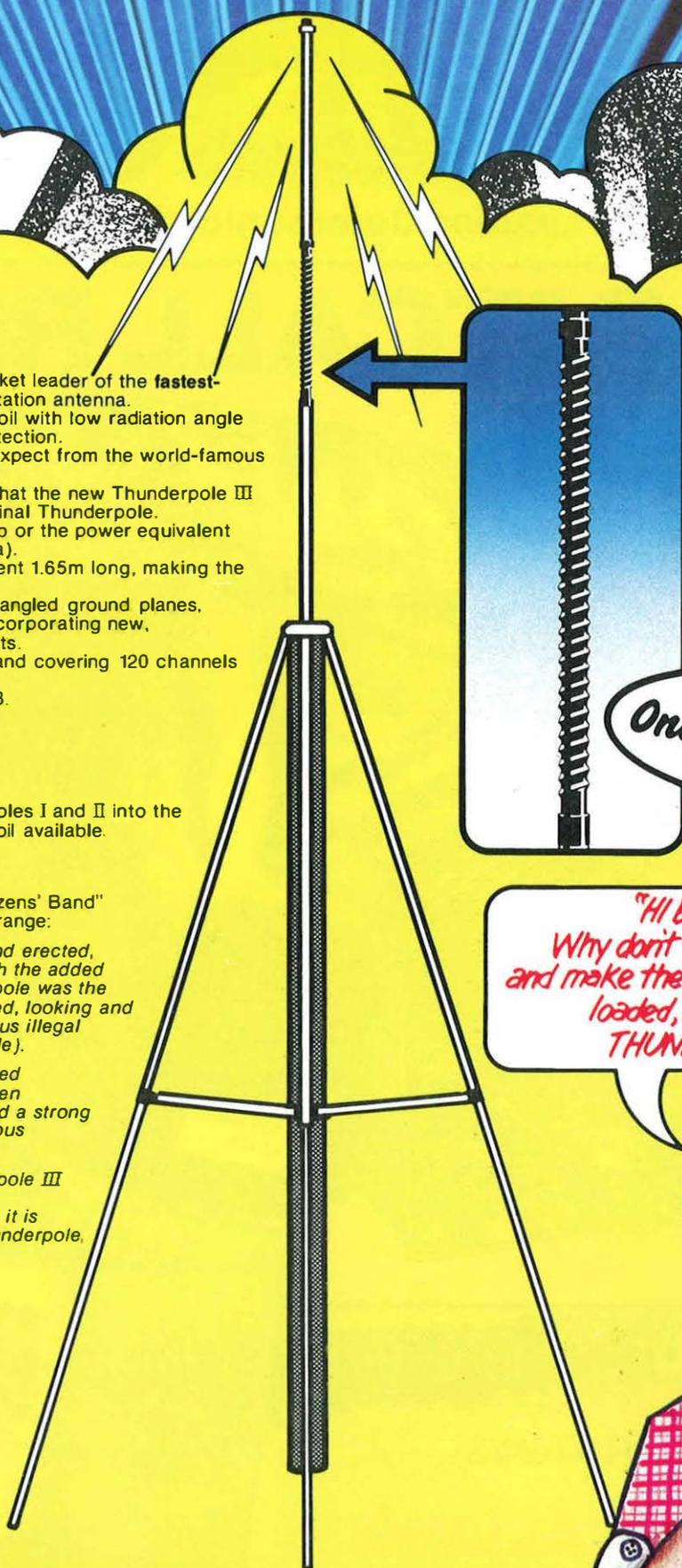
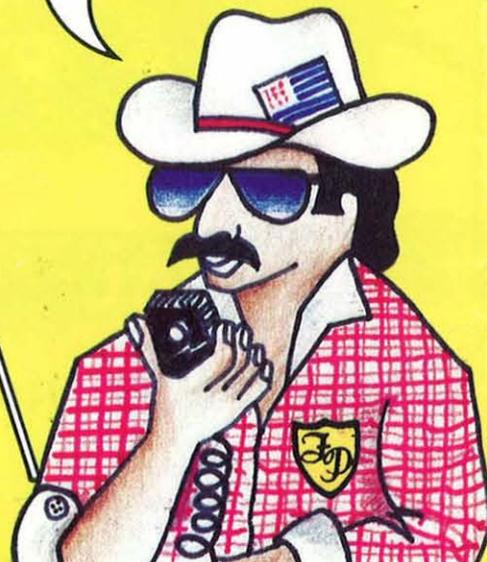
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The III-
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the Rest!

"HI BREAKERS!
Why don't you jump the skip
and make the trip with the centre-
loaded, helically wound
THUNDERPOLE III"



CB Citizens' Band



Inside this month

Trevor Butler looks at how selective calling can enhance CB.

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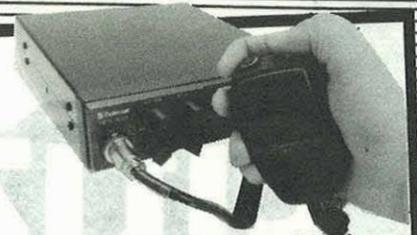
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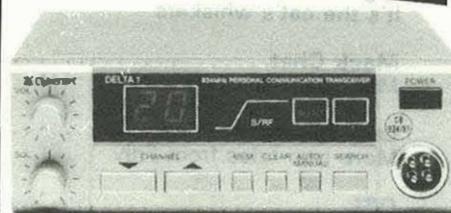
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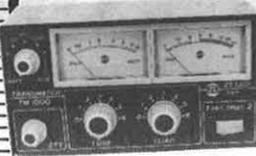
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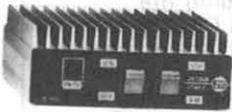
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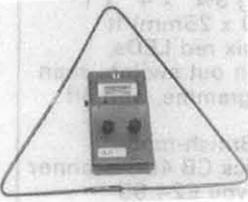
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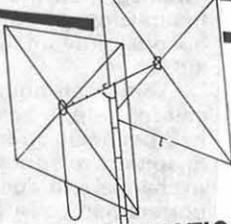
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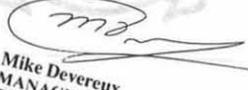


THE NEW 1985 CATALOGUES

Dear Breaker,
 You will be pleased to know that our NEW 1985 27MHz CB catalogue is now available. This year it's even bigger and better than before - packed full of pictures and technical information and a must for any CB radio enthusiast. Why not send off £1 for your Telecomms voucher and in addition receive a £2

Thousands of breakers have already discovered how surprisingly easy it is to shop with our Mail Order Service. Our Hotline team Helen, Shirley and John must hold the record for the fastest despatch in the country - one customer in Lancashire received his order within 12 hours of telephoning them!

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Yours sincerely

 Mike Devereux
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UPDATE

NEWS FROM THE WORLD OF CB

NEWS FROM THE WORLD OF CB

NEWS FROM THE WORLD

Editorial

In a recent feature on American CB, we mentioned that the situation in the USA is so bad that a lot of people had given up monitoring channel nine. Apparently, a group of illiterates in the Glasgow area have misconstrued this and have taken over channel nine, quoting this magazine as their authority! Anyone who asks them to move is informed that, according to *Citizens' Band* magazine, channel nine is no longer to be considered the Emergency Channel! We would like to state here and now that we have always advocated that channel nine

should be kept clear for emergencies (for that particular group of wallies in Glasgow, 'advocate' means 'to recommend publicly!') and there are an awful lot of monitors who support this view. Please keep this channel free and let the monitors do their job.

Elsewhere in this issue, you will find a special DIY project which shows you how to build your own personalised Roger Bleep unit for your setup. If you are afraid of technical projects, don't be! If you follow it closely, I'm sure you'll find it easy to build — and it's something you can boast about.

Eamonn Percival

In Brief: Techtronics 206 Scanner

Scanners are a very rare feature in a 40-channel FM CB rig, and for any rigs that contain this luxury you would probably be paying around £100. It is debatable how useful a scanner can be on our 40 FM channels. In areas of low CB activity it could be most advantageous with the facility for the channels being searched for contacts whilst doing other things. In busy areas, one would need to have the squelch control turned well up so that only the strong stations would be selected.

At last there has appeared on the market (as an add-on unit) the Techtronics CB 206 scanner. The CB 206 scans through all 40 FM CB channels, automatically locking on to any active channel. The scanner will stay locked on channel until the channel clears, automatic delay waits for four seconds of silence before the scanning resumes. The CB 406 also features a six-channel memory for the selection of your most-used six channels that can be scanned separately if you wish.

The comprehensive instructions that accompany the CB 406 explain, in easy steps, how any person capable of using a soldering iron to attach just nine wires can easily fit the CB 206 scanner into most 40-channel rigs. Housed in a black enamelled metal case measuring 3¾" x 4" x 1" (95 x 100 x 25mm) it features six red LEDs, memory in out switch, scan hold, programme, and off switch.

This British-made Techtronics CB 406 scanner will cost you £24.95 inclusive of VAT and post and is available from Pama & Co, 433 Wilmslow Road, Withington, Manchester, M20 9AF. Telephone (061) 445-8918.

Mack the Hack

MSGB Goes Limited

The Monitoring Service Great Britain recently announced that they have become a limited company, although they are still a completely voluntary organisation and, as such, are non-profit making.

The service stretches from Land's End to John O'Groats with monitors keeping a 24-hour vigil to help those in distress, be it at home or on the roads. They are well-known to national organisations and emergency services throughout England. They also tell us they intend to lobby ministers and MPs to encourage them to clean up the channels. Keep up the good work, say we.



CB Aid for Local Hospital

Over the weekend of March 16th, the radio paging system at the Bromsgrove General Hospital broke down and could not be repaired until the following Tuesday. Without the system, the hospital administration found it difficult to contact and direct porters on duty, but local breakers came to the rescue.

A call from the hospital administrator brought CB Aid (Bromsgrove), the local channel nine monitoring group, and CB Lifeline (Bromsgrove), the local fundraising group for hospital equipment, to their aid.

Within an hour of their call for help, a base station had been set up in the hospital's telephone exchange and doctors and porters had been issued with handheld CB units borrowed from a number of willing helpers from both groups.

The CB system was not actually used for any emergencies, but the hospital administration say it certainly took a lot of pressure off the staff.

CB Lifeline chairman Jock Reid said, 'We were only too happy to help'.

Grey Beard's Gleanings

Hi there, I kick off this time with a welcome to what is becoming an ever-increasing band of Westward PT2 owners. Well done Ken!

Whilst I am happy to receive news of wallies and how you are coping with them, it would save time if you could send your news directly to the Editor; this would save a lot of time, likewise any newspaper items on CB — good or bad! Whilst on the subject of wallies, I hear that the DTI is being very active in Scotland; not before time!

Being interested in computers, I was thoroughly entertained by Filly's column in the April issue. With this in mind, I would be interested to hear from anyone using a computer in connection with their CB activities. I have seen the Martello Computer Services (39, Sellafield Way, Jason Heights, Lower Earley, Reading, Berks) 'Breaker' running on Moonshine's Spectrum; very good indeed. More on this at a later date.

I was very interested to learn about a very welcome piece of equipment from The CB Shop, Doncaster, (Tel: 0302 — 66352). This is a cabinet designed to accept mobile rigs when using them as home-bases. A PSU and SWR meter are built-in. At £22.95 inclusive, it means that home-based rigs will be far cheaper and tidier to set up than was the case previously.



The April issue also had news of a marking system to help to identify valuables such as cars, videos, computers and CB rigs. My local 'gendarmes' recommend your postcode and the number of your house (i.e. WS9 9JZ 24).

Is anyone using a scanner RX with their CB? If so I would appreciate full details and comments, please.

With the number of 934MHz equipment coming on to the market, it is good to see that 'home-grown' equipment is well to the forefront. All it needs now is for people to buy the goods! Buy British, you know it makes sense!

Well time's up for this one; keep the letters coming, and if I owe you a letter, write in again and I will get back to you.

The Grey Beard

in any aspect of radio communications. It begins with the very basic 'what is electricity?' and takes the reader through components, circuits, equipment and applications. There is a chapter on CB and amateur radio which is very informative and includes some very clear diagrams.

Reading this book should give anyone a working knowledge of the main aspects of radio in all its forms.

Read All About It

A new book in the excellent Q & A series has just been published. Written by the prolific Eugene Trundle, it is titled "Questions and Answers on Radio" (Newnes Technical Books) and costs £2.95.

As its title implies, it is all about the workings of radio, written in a question and answer format and is aimed at readers interested

Whoops!

In our feature 'Taking Stock' (April), we managed to confuse readers by mixing up two similarly named companies, Roger D of Nottingham and Roger Dee of Sevenoaks. While we wrote about Roger Dee, we gave the address of Roger D — confusing isn't it?

Roger D. of 7 Thyra Court (registered office) and 831 Mansfield Road (retail shop) have, over the past five years, distributed Lake, Stalker Commtron and Nato equipment as well as supplying components to

the UK CB market. They are also the sole UK distributor for Lou Franklin's 'PLL Data Book' and 'Screwdriver Expert's Guide'. At their retail shop, they stock a comprehensive range of 27MHz radios and accessories.

Roger Dee, on the other hand, are at 20 London Road, Dunton Green, Sevenoaks, Kent, and stock a large range of both 27 and 934 equipment, as well as repairs, modifications and accessories. We would like to apologise to both companies for the error.

Auto-Squelch Everywhere

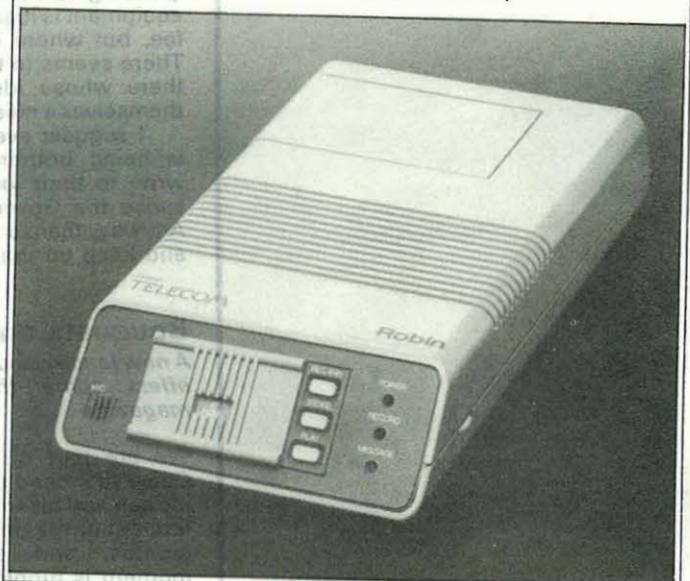
Bury Electronics recently announced that their popular Auto-Squelch unit should now be available in

most good CB shops. Previously only available direct from Bury, the unit monitors the received signal and blanks out any extraneous noise as well as unwanted SSB transmissions.

Every Home Should Have One

British Telecom recently introduced Robin, a new, compact answer/record machine for under £100. Guaranteed to keep even the most hectic lifestyle in order, the unit is sophisticated but simple to use. One of the biggest advantages over

conventional answering machines is its remote voice-activated playback. This means that if you want to check on your messages while you are out, you just need to dial your own number, use a simple speech code and the machine plays the messages back to you. Priced at £99.99, it is supplied with a mains transformer, a doubler socket and a C60 tape.





More readers' thoughts from the mailbag

Pressurise the Government

Special Brew of Corby wants more action...

I am a recent convert to CB radio and have recently started to take your magazine. I must say I find it very interesting and easy to read. The layout and presentation is superb. I think you have got the balance just right — plenty for the enthusiast and plenty for the beginner.

I use a Uniace rig and find it very satisfactory. I have found so many new friends through using CB, that it has given me a new lease of life. Like many others, I am appalled at the number of wallies there are on the airwaves. Can't something be done to rid us of them? The problem in my area is so bad that a lot of people have given up using CB as every time they try to get out, they're keyed out by the usual moronic bucketmouths.

I think that there is a great future for CB in this country but it needs 'policing' to make it worthwhile. All my equipment is legal and I pay my licence fee, but where does the money go? There seems to be a lot of people out there whose idea of fun is making themselves a nuisance on the airwaves.

I suggest everyone out there who is being bothered by these people write to their local MPs. If we pressurise the Government, who knows? Anyway, thanks for a great magazine and keep up the good work.

Bouquets and Brickbats

A new (anonymous) reader from Wigan offers some thoughts about the magazine...

We are part of the "new wave" of CBers (if indeed there is such a thing), my son and his friends having taken an interest in the hobby over the past six months, and enthusiasm at the moment is running high.

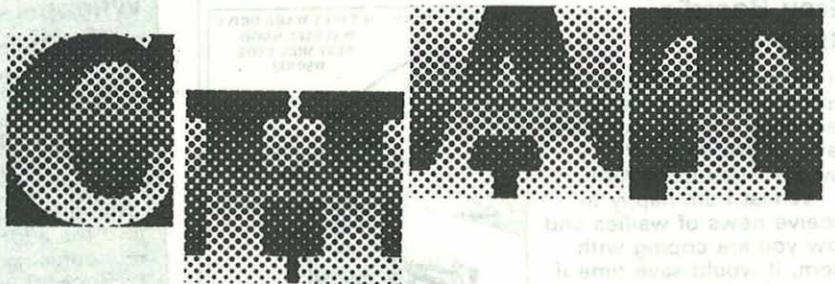
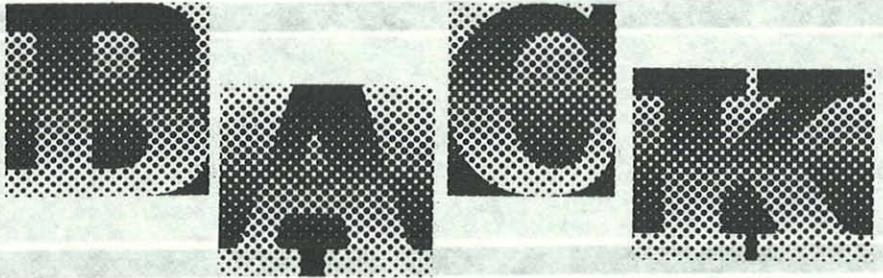
We first picked up a copy of *Citizens' Band* in November 1984 from a motorway service shop and immediately found it to be very helpful and interesting. The presentation is excellent with good clear printing of photographs, diagrams, articles and advertisements. The style and content of most sections of the magazine make it very readable indeed and, having experienced great difficulty in obtaining it from newsagents in and around St Helens, we took out a year's subscription in December.

In many ways we are pleased that we missed the goldrush days when FM CB became legal and the sharks were out in full force. In terms of value for money for rigs and equipment, I suppose the present time will take some beating. However, potential newcomers to the hobby and even CBers of some years' standing now seem to have very little opportunity to see or have demonstrated any new products, since there are so few CB stockists remaining — especially out in the sticks.

This is where *Citizens' Band* comes in. Your reviews are invaluable to those who are almost certainly having to make the most of their purchases my mail order. Money back guarantees from all of your advertisers would also go a long way towards helping the way to take the plunge.

I found the Specs Appeal article by Lou Franklin in your February issue very interesting — keep his articles flowing. He is able to put over technical matters in such a way as to be easily understood by those with no electronics background. We bought a copy of his *Screwdriver Expert's Guide* at Christmas and we find it a great help in dabbling and in understanding CBs generally.

Perhaps the only part of your magazine that we are disappointed with is Grey Beard's Gleanings. We understand that it is essentially non-technical but to have gone to the



trouble of actually testing a range of speech processors and then to report so little about them (February) is really infuriating.

Please follow up with a more comprehensive review of the products as soon as possible. Surely there must be a great deal of interest in these "legal" add-ons.

In the same article, Grey Beard reported that a certain echo/power mike must be a worthwhile investment because *two* people have told him about it! Really — can that be a serious recommendation to buy, or are we not seeing the joke?

Well, as you can see, we could go on writing all day about CB and your magazine. Keep up the good work. Keep publishing articles in the same readable style and maintain a balance between the newsy reports from users and clubs and the technical reviews and reports that stimulate and encourage Cbers to improve and develop their equipment and knowledge.

Keep up the battle to discourage abuse of the airwaves — we would like to offer a solution but, like many before us, we simply don't know of a practical method of preventing those unfortunate individuals intent on depriving the majority of the enjoyment of CB. We liked the idea of inserting a copy of the official user code in a recent issue of the magazine. Maybe it would help if you could offer a simple code of practice prominently displayed in every issue.

We feel very flattered by your comments and it's always encouraging to hear of newcomers to CB. Regarding Grey Beard's column, it's very much a case of personal opinion rather than an unbiased critical review and we hope to take a closer look at various accessories in the near future.

No Hogging

Red Star of Wilts sticks up for homebases . . .

After reading the 'Back Chat' page and 'Truckstop' in your magazine (Vol 5) this month, I have the feeling that some of your readers are out of touch. It seems that the mobile breakers are always complaining that homebased breakers are using the 19. Also, they accuse these same homebased breakers for "hogging" the 19 so much that they cannot use it. Can I invite them to listen to the 19 from a homebase one day (soon) and see just who hogs the channel?

For myself, I have both a homebase and a mobile rig, and use both. I say that so that I cannot be accused of having a bias either way. Now in your magazine, Gismo tells us of the hours he saved by a 10-13 on the motorway. He also recommends a monitor of the month. However, on the 'Back Chat' page of this same magazine, Ranger 3 would like all homebases to move off the 19, "which is for mobile use".

Does Ranger 3 think that all those 10-13s come from only mobile breakers? Does he imagine that some truckers

stop in one place for 10-12 hours a day in order that the mobiles can be told which roads are blocked by snow? Does he think that all the directions through towns and cities are given by mobiles? If that is the case I have only two things to say. Ranger 3 and those who think that way are out of touch. All those 19 monitors and those who help the truckers should say next time "Sorry I cannot help you, I am homebased".

Well, all you monitors, and all you truckers who use them, let your views be known. Do you wish for the help of these unpaid (and unwanted?) monitors, or are you prepared to put pen to paper and support them?

My own feelings are that the 19 should be used to contact monitors, other breakers, and for help and directions, and should be cleared when contact is made. This will enable a much better service to be given to other users, and perhaps encourage a few more breakers to monitor the 19 to give assistance to others. However, that is just one person's point of view, and it may be that I am in the minority.

99 Channels?

N J Wilcock of Witney dreams of not 40 channels, not 80 channels, but 99.

With the prospect of CEPT 27MHz frequencies being adopted in the near future, the question must remain as to what will happen to all the MPT 1320

to buy new equipment for 'dual band' operation.

2. The anti-social element who persist in using MPT channel 19 for their activities, denying it the use recommended in the Code of Practice, would still be able to enjoy (?) 40-channel CB without any extra expense.

Assuming that 'dual band' operation is eventually adopted, it should not be too difficult to modify existing equipment to cover both bands, as is in fact already being done.

However, an even more exciting proposition must lie in the future; since CB would be legal on 26.965 to 27.405 and from 27.60125 to 27.9915, why not go the whole hog and include the frequencies from 27.405 to 27.60125 as well? There is room for a further 19 channels from 27.41125 to 27.59125, allowing the possibility of a full 99 channels of CB. However, new equipment would probably be needed for this concept since the poor old 40-position rotary switch could not readily be modified to cover 99 channels. Either a keypad or, more suitably for mobile operation, a 'search up — search down' switch would be better used. Since these new transceivers would incorporate the latest thinking in CB technology, perhaps the identification system proposed by 'The Blackjack' in the February issue might also be adopted to reduce channel abuse.

By the way, has anyone else noticed that, outside London, CB is at last "growing up"?



Are homebases hogging the channels?

equipment presently in use. Obviously, the simple solution would be to adopt both systems. This would have two particular advantages:

1. It would permit less 'channel density' — that is, more channels would be available to those who would choose

Letters should be addressed to: Back Chat, Citizens' Band, 1 Golden Square, London W1R 3AB



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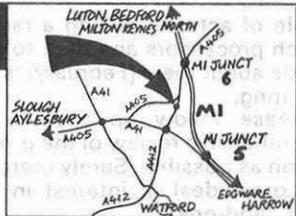


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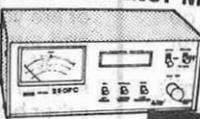
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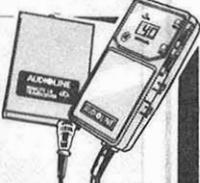
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This top of the range radio features crystal filtering, RF & mike gain, PA facility, DX switch, tone switch and high SWR indicator. (this radio is featured in this magazine's reference section). Excellent value and performance. 160ch. £107

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Smart Alec opens another postbag full of problems

The ultimate antenna?

Mr G. Tracey, from Manchester, is looking for all the gain he can get . . .

Q Please can you help? I have tried to find a base antenna with a gain in the region of 12 to 14dB, as well as a mobile antenna with a high gain factor. Most of the shops I have tried seem uncertain as to the gain of any antenna, unless it has been printed on the packing by the manufacturers and these are usually only in the region of 2 or 3dB. Even the majority of advertisements don't seem to help.

I do not want either a beam, or any other form of directional antenna. Please can you help?

A Unfortunately, Mr Tracey, you are asking for the impossible. For any figure representing gain to be meaningful it must be related to a reference antenna and, for all normal purposes, the half-wave dipole is used as a reference. Since nearly all commercially available antennas for CB are electrically shorter than a dipole they are most unlikely to exhibit gain.

Many of the manufacturers' advertised gain figures are measured against an "isotropic radiator", which is a theoretical antenna, hanging in free space and such figures are invariably somewhat optimistic when compared to a dipole.

Only with the use of a beam antenna, which concentrates the radiated energy in a single direction can the levels of gain you mention be achieved and an antenna exhibiting 12 to 14dB gain at 27MHz would be a very large beast, indeed.

Looks are not everything

Up in Glasgow, Woodchip is having difficulty finding a rather special antenna . . .

Q Please can you tell me where I can obtain an electric retractable CB antenna for my car? I have tried all of the local dealers without success. I know that such aereals were made, as I had one on my last car but it developed a fault and I was unable to repair it.

A Although the use of retractable aereals was quite common prior to legislation, it has been five or six years

since I have seen one and my enquiries among dealers have also drawn a blank, I am afraid. Nevertheless, I must counsel against their use, for a number of reasons.

Before legalisation, many breakers, some of whom shall remain nameless, used this type of antenna because it was very difficult to distinguish from an ordinary broadcast receiver antenna but they were inclined to be highly capacitive, with an inevitable reduction in performance. Woodchip tells us that his last one developed a fault and I am afraid that this was the fate of nearly every example known to me. One big problem was the fact that as they became older they were distinctly disinclined to extend to their full height, with resultant SWR problems. They were also badly sealed, allowing water thrown up by the wheels of the car to find its way into the electrics and the tuning coils and, to add insult to injury, were so constructed that it was impossible to get at the damaged parts to effect repairs.

Back in the late 1970s, retractable aereals were selling for about £25 and many a breaker lived to consider them a very poor investment.

No ground planes?

From Redcar, in Cleveland, F. J. Brown comes, seeking advice on base antennas . . .

Q Have you ever reviewed the Modulator Saturn antenna and, if so, what was the verdict? I am looking for an antenna which I can put up relatively high, without the problems associated with ground planes but which would offer good results. My wife has a Thunderpole III but we are unable to site it as high as I would like.

How would the Saturn compare with the Thunderpole and is there some other, legal, antenna without ground planes, which would give comparative results?

A We have not yet reviewed the Saturn but I have personally used one on a number of occasions and been very pleased with the results.

Answering your question, Mr Brown, raises a few of my own. Why, for instance, are you so concerned to avoid the use of ground plane radials and just how high do you propose to site the antenna? Since all antennae

are balanced against earth potential, the higher you go, the more likely you are to encounter SWR problems and the use of radials is the easiest way to overcome them. However, if care is taken at the time of installation either the Modulator or the Saturn should provide excellent results.

You do not say whether the antenna will be mounted on a roof, or on top of a pole but whichever is the case, you must ensure that it is insulated from any supporting structure and, since high installation infers the use of a long coax run, take care to use a high quality, low loss feeder.

Portable practicalities

Alan Henderson, from Glasgow, wants to modify his hand-held rig . . .

Q I own a Harvard 410T and would like to make a few modifications to it, if possible. I would like to fit a standard hand mike but still retain the use of the internal mike. I would also like to fit an earphone socket but still use the internal speaker when the earphone is not connected.

Please can you also tell me if it is possible to increase the output from 2 to 4 watts?

A Your first two mods depend on whether the rig is fitted with a speaker mike. If the mike and speaker are separate then all you have to do is fit open circuit jack sockets to both. Plugging in the external accessories will automatically shut off the internal mike or speaker but still leave them in working order when needed.

As for your second question, there is no simple way of increasing the rig's power output. Simply changing the chip would not suffice because all of the following stages are set to accept the manufacturers' stated output and to increase the power would necessitate major redesign work.

Problems should be sent to:
CB Q&A, Citizens' Band,
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Rig Review

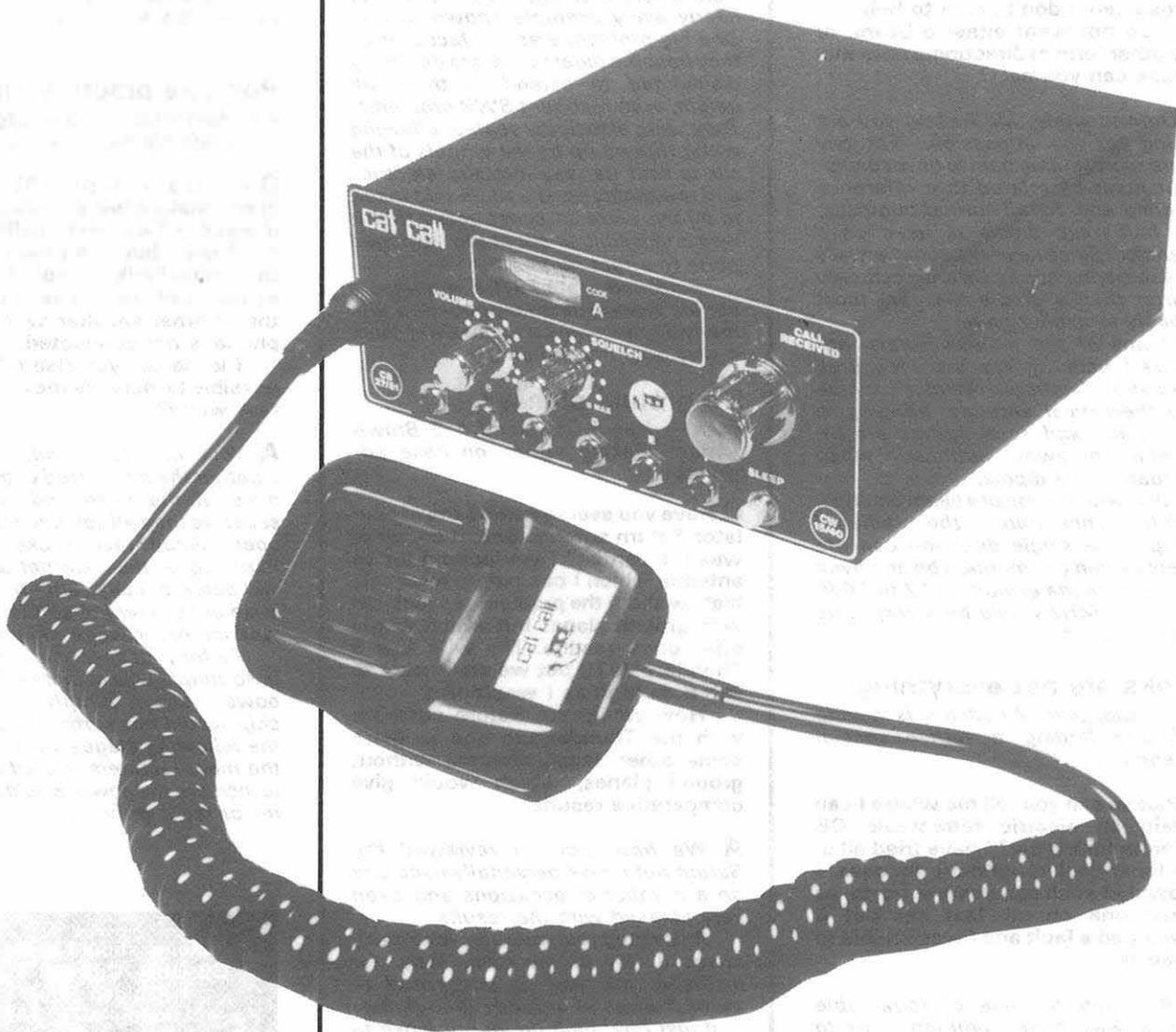


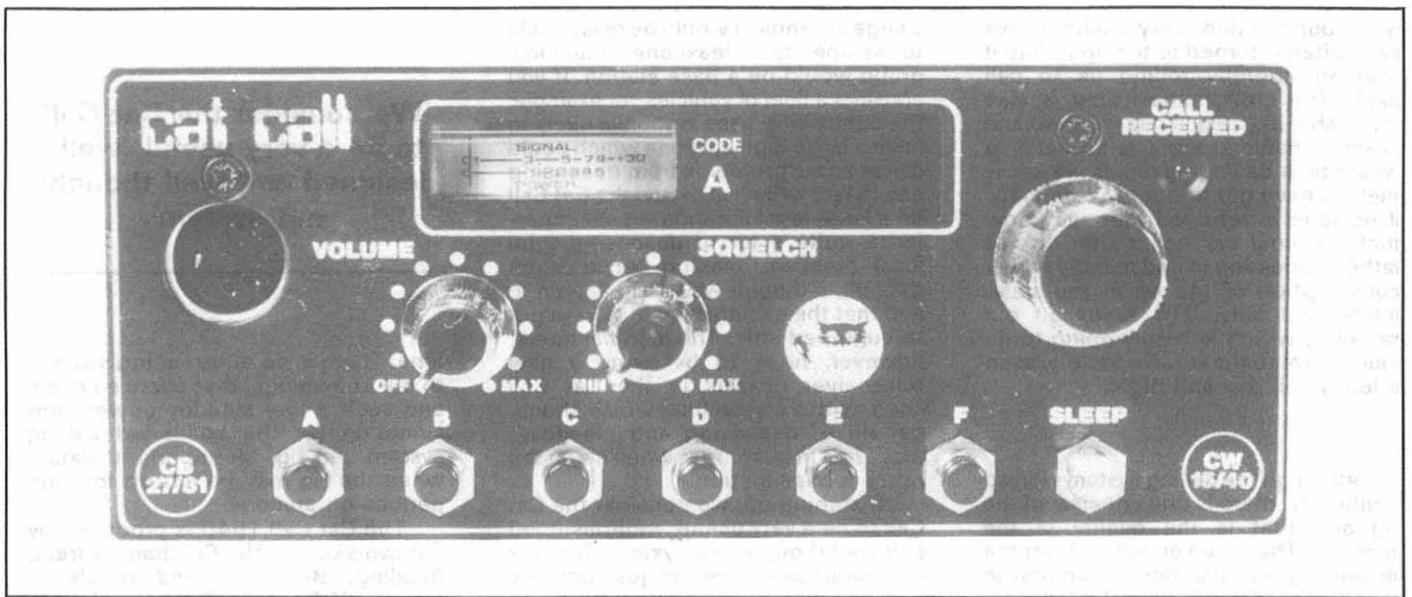
Brian Wright looks at a new sel-call unit

In order to use radio transceivers, such as CB rigs, as a serious and useful means of communication, it is normally necessary to leave at least one transceiver in a group switched on, in order to receive a call. It is usually more useful or, in fact, necessary to have all of the sets switched on, so that any operator in the group can call any other operator, or alternatively so that a base station can call any mobile. With users of private channels such as vehicle fleet operators and other commercial users, this does not pose any problem. The channel is free from any traffic except the operators' own business. The only slight inconvenience is, that if only one channel is used for everyone in the group, then everyone in the group is disturbed by a call meant for only one person. Generally, though, communications by commercial users are brief and infrequent and this causes no great problem.

However, using CB for group communications in this way, whether commercially or between private individuals, presents a few problems. The main one of course is that the squelch is constantly being opened by signals on the channel and the operator has to put up with the constant chattering, white noise or even worse — wallying. Several manufacturers have overcome this problem by producing add-on selective calling units of various design. These units have varying degrees of performance and ease of operation and at least one we tested was excellent. But they all have the disadvantage that they are yet another piece of equipment, with its wiring and separate controls, to add to the rig. A very useful piece of equipment that gets around this problem and adds many desirable features to its selective calling system, is the combined rig and selective calling system called the Cat Call 1540 from Catwhiskers of Reading, Berkshire.

THE CA





CAT'S WHISKERS

The Cat Call is supplied with a large, two-page instruction sheet, which contains very clear instructions on how to wire up and operate the rig. The case dimensions are only 160mm deep x 150mm wide x 60mm high which is reasonably compact, especially for a unit with a complex calling system. A brief look inside reveals what appears to be a small foreign chassis with the calling system PCB mounted below. The calling system PCB is fibreglass and its many components are very well assembled, producing a professional looking PCB. The outer case is made from black plastic coated aluminium with a black anodised aluminium front printed with white markings.

Features

The Cat Call has the usual rig features — a clear 'S' meter, LED channel display, volume, squelch and channel selector knob. In addition to these controls, at the upper right hand side is a small LED marked 'Call Received' and along the bottom of the control panel are six black pushbuttons marked A-F plus one on the right in white, marked 'Sleep'. Also on the front panel is the five-pin mic socket which is on the left. At the rear is the antenna socket and a four-pin socket for power connection; a ready wired plug with flying leads is supplied for the power. An extra lead is also wired into this plug with an in-line jack socket for connecting a PA speaker if required; although the rig has no normal PA facility this speaker can be used in connection with the calling system described below. The usual fixing bracket and mic bracket are supplied, along with various code markers for the rig and a 15-station

directory card which should prove useful.

We will now describe the selective calling system in some detail and, although its operation might sound a little complex, in practice it is quite simple and easy to use. When the rig is switched on, it can be used just as a normal rig, but if the mic is not keyed within about 60 seconds the rig will shut down to the 'Sleep' mode. This is because the rig is supplied with the 'auto sleep' operative, and this can be adjusted internally to give a delay between 30-90 seconds. Alternatively, the sleep control can be adjusted internally to give manual sleep only, in which case the rig will stay on normally until the sleep button on the front panel is pressed. When in the sleep mode, the rig is completely quiet and the meter light is extinguished leaving only the channel indicator LEDs on. The receiver is still on although the speaker is muted and the meter needle will move if signals are present on the channel. If the mic is keyed or any of the buttons A-F are pressed then the rig will come out of the sleep mode.

When calling another Cat Call station in the group, you must know the code of that station. For example, if the station on code B is to be called, then this is done by pressing button B on the panel for about two seconds. When the button is released and assuming the station B is in range and switched on, it will automatically transmit back to confirm that the call has been received, whether the operator is there or not — all clever stuff!

But there's more; if a single confirmation tone is received, this means that the vehicle ignition is on and the operator is likely to respond fairly quickly, but if two tones are received this means that the vehicle ignition is

off and the vehicle is probably unattended. If no confirmation signal is received then either the station is out of range, or the rig is switched off or on another channel and it will be necessary to call again. Once the station being called receives the coded call, it emits a rapid warbling tone through the speaker — the volume being independent of the volume control setting. This tone can be sent to a PA speaker via the jack at the rear of the set if it is desirable to hear the call from outside the vehicle. If the auto sleep is operative and the call is not answered, then the warbling tone will cease and the rig will return to the sleep mode, but will leave the 'call received' LED flashing, so that the operator will know on his return, that a call has been received in his absence. It is possible to call 14 other individual stations by pressing one of the code buttons or certain two-button combinations. As well as the auto sleep, the rig can be returned to the sleep mode manually by pressing the 'Sleep' button even if 'Auto' is operative. When the mic is keyed, the flashing 'Call Received' indicator is automatically cleared. The Cat Call is subject to the normal communications limitations of course. For example, all stations in the group must be on the same channel and in range; also other signals on the channel may impair operation, depending on their relative strength.

It is obvious how useful this system is and it seems that everything has been thought of, and certainly a lot of thought and expertise has gone into the design of the Cat Call system. We have had a pair of these units on test for some time and the system works perfectly. In fact, we will be sorry to part with them when they have to be returned. The 'Call Received' feature

is, in our opinion, very useful as we have often returned to the rig to find it flashing, thereby telling us to call back. The confirmation tone is also invaluable because if it is received and no-one answers, there is no need to waste time calling again, as we know that we have got through. Conversely, if no tone is received then we know that we must call again later. It was rather interesting to find that the power consumption of the rig in the sleep mode was only .015 Amps on our samples, which is hardly going to do much harm to the vehicle battery, even if left on all day and night.

Although the calling system worked faultlessly, there is one criticism of the rig and that is the quality of the receiver. The receiver suffers from the desensing and bleedover common to many rigs that we have tested and, although this is a mobile rig and would not normally be expected to be exposed to prolonged high power signals from

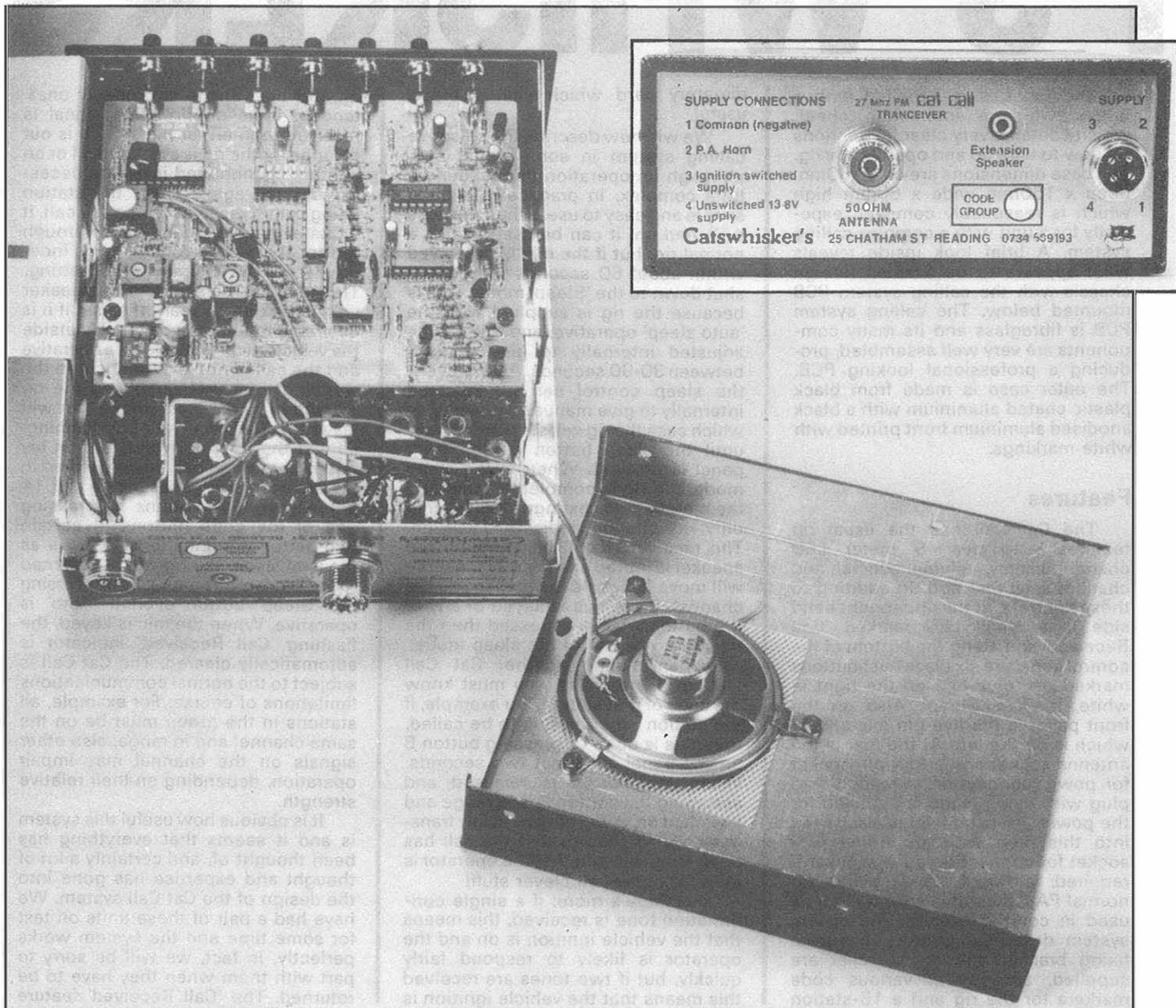
a large antenna, it would be reasonable to assume that at least one station in a group would be a base station. If you consider a fleet of vehicles, for example, the controlling base station is likely to have a large high antenna which could cause some problems from desensing etc. In fact when we tested the Cat Call on a large legal antenna we did experience quite a lot of desensing from local breakers, making conversation difficult, although we would hasten to add that the calling system always got through perfectly. The manufacturers, however, hope to be using a new transceiver chassis in the Cat Call soon, with a crystal filter which should get rid of desensing and bleedover problems in busy areas when using the rig as a base station.

Summing up, we consider the Cat Call to be a very useful, well-designed and well thought-out system. There is no complicated wiring; just positive and negative to the battery plus one extra wire to the ignition switch. The rig is attractive to look at and the silence, while waiting for a call, is sub-

'We consider the Cat Call to be a very useful, well-designed and well thought out system'

lime. There is no other calling system, to our knowledge, that offers so much and such a low standby power consumption for the combined calling system and rig, an important feature when the rig may be left on for long periods on standby.

The Cat Call 1540 is produced by Catswhisker's, 25 Chatham Street, Reading, Berkshire, and retails at around £149 + VAT. Catswhisker's should be producing a base station version shortly which will retail at around £199 + VAT.



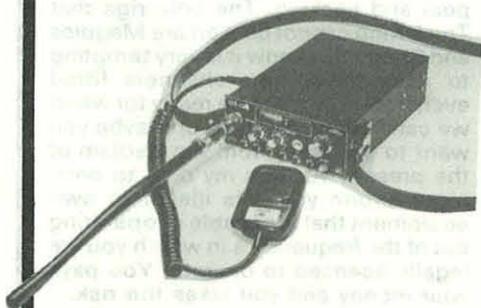
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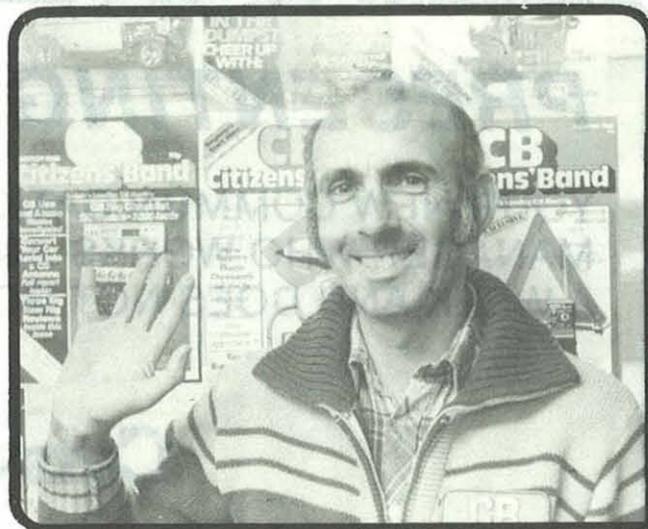
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Mack Chat

Mack asks the DTI some probing questions



O how I sympathise with fellow columnist the trucking Gismo and his trials and tribulations with the authorities and powers that be whilst trying to earn a crust. I well know the feelings of the frustrations of trying to keep a working vehicle on the road that is bound up in red tape. At least Gismo has the benefits or advantages of the CB for the 10-13s and just friendly chat with his fellow work-mates. All my ears are allowed is a simple broadcast receiver. Tape players or stereo is not allowed, so it's Radio 2 in the mornings and evenings and Radio London for the Robbie Vincent lunchtime phone-in.

It was during one of these midday phone-in programmes that the topic of CB arose. The first callers to the programme were failed CBers as they told that they believed that the hobby was full of idiots, music players, swearers, and the rest. Another caller told how he had recently been busted and it was revealed that this person was running a highly illegal station with multi-band equipment and other naughty bits and pieces; the DTI people took the lot. There then came the callers that were suffering from TVI and wanted to know how to cure it. A police lady phoned in to tell of the interference that is caused to her PB radio (police band) by CBers. I thought 'what rubbish' and how does she know that it's CBers? It could be illegal operators. But her next words made me think again when she stated that she hears young people talking about nothing in particular. I would dearly have liked to have been near a telephone to answer some of the questions that remained unanswered and put some of the listeners straight, but alas it was not possible.

With many of the callers discussing how the DTI people are at last taking action against abusers of the frequency and unlicensed stations, it set me thinking. Later in the day I popped into a Post Office to renew my licence that was a month overdue. I forgot all about it, honest I did. A few days later I made a couple of phone calls myself to my contacts in the DTI as I wanted some answers to questions that had arisen from that phone-in programme.

One of my calls to the DTI was to the department that deals with the complaints of interference. What truth is there in the stories going around that more abusers and illegal stations are being busted, I asked. Leaving out the legal and technical jargon, it was confirmed that more naughty stations have been removed from the frequency. It was explained to me that the happenings in each area can be different as it is left to the Radio Regulatory officers of each area as to what action they take. In some places illegal antennas don't exist yet in others they flourish. The main concern of the RRD is interference to other users of the radio spectrum. So if your station is clean even if you are using big twigs or maybe even more than the legal power and perhaps even operating out of band, you might be safe for years. But, who knows, maybe one day your local RRD officer might decide that he's bored and has a listen around the bands. Lo and behold, he finds you having a harmless waffle with your friends. Well, the rest you know. Ding-a-ling or tap-tap on your door and then nick-nick. The RRD will act on most complaints, even from CBers complaining about other CBers who abuse our frequency, but they will not accept anonymous tip-offs: complaints must be in writing with the complainant's name and address.

I am often being asked when will we be getting the new 27 frequency. This was the first question that I put to the frequency allocation department of the DTI. 1987 was the answer I was given. Nobody knows if it will be the 1st of January of the 31st of December of that year but it should be between those dates! The new frequencies, as I am sure that you already know, is the old FCC channels. The present legal users such as the paging systems have been told that they must go and have been given alternative frequencies. Some have already gone but we can't have it legally until it is cleared. I am sure that you are aware that advertisers in this magazine are offering DIY kits or rigs with the combined present 40 channels and the proposed 40 FCC channels. If you are very clever and own an oscilloscope and other test equipment, you could purchase the

conversion kits and fit it yourself. When I phoned and spoke to Chris of Truck King of Watford he told me that the company are now offering a conversion service for you to have your own rig fitted with the proposed 40 FCC channels as well as the present legal 40. This service takes about 10 days and will cost you £45 inclusive of post and packing. The only rigs that Truck King cannot convert are Magpies and Shoguns. I know it is very tempting to have these new channels fitted even if you say it's to be ready for when we can legally use them or maybe you want to get away from the bedlam of the present 40. It is my duty to once more inform you it is illegal to own equipment that is capable of operating out of the frequencies in which you are legally licenced to operate. You pay your money and you take the risk.

In the April issue of this mag there was a letter from Charlie Brown of Borehamwood. Was this letter written with tongue-in-cheek? Parts of it make sense, but CB on 28MHz? You can't do that as it is part of the amateur bands. Any CBer who has dared to venture into the 28MHz would find, I am sure, carriers coming up right over their transmission as the G3s and 4s do tests. The lower part of the 28MHz band may seem quiet, but at times you can hear beacons from many parts of the world as this part is also used for world wide RITTY contacts, not forgetting CW (morse code) and phone. Mind you, many of the powerful Italian CB stations can also be heard at times and the amateurs have a hard time trying to wipe them out.

So what do we call them now? That is if we want to call them anything printable. It's the abusers of the CB frequencies that I'm talking about. 'Wally' it seems is now out, for as you may have heard or read recently, people that are legitimately christened Wally have taken umbrage at the associations given to that name. During a recent radio programme discussing this topic, the definition of 'wally' was read from a dictionary and it is quite complimentary. So what do we call these people who gain enjoyment from disrupting others' pleasure on the CB radio. Giving it some thought, how about 'Nause', short for nauseate?



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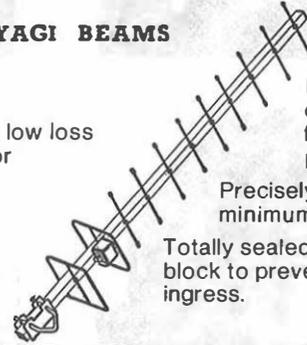
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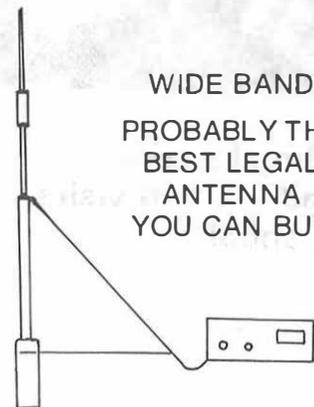
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LADY BREAKERS



Filly breaks new ground . . . and visits a CB shop!

I remember when I bought my first rig. It was getting on for three years ago, now, when things were very different on the CB scene. It was all legal, of course, it's not *that* long ago, but I'm sure I was influenced by the residue feeling of excitement left over from the pioneering days. I've got mixed feelings now. I mean, CB is open to pretty well everyone now, which has to be a good

thing, but sometimes it seems that early excitement has evaporated along the way. It's all so *respectable*. The adventurers seem to have moved on. And the wallies have moved in.

But what am I saying, this maudlin stuff isn't like me at all. I blame it on the cheap plonk my spouse saw fit to bring home from work today. No, I really meant to tell you all about the latest development out here in the sticks.

I remember when I bought my first rig. It was the first, and only, time I've ever been in a CB shop. Those places did, and still do, terrify me — all that sophisticated equipment in the window, the horrifyingly knowledgeable people behind the counter, the questions you feel sure they'll ask you. "Yes, miss, will you require Delta Tune? With or without power attenuator? How about a nice crystal filtered unit?" And that's just when you're buying a rig! What about antennae, and SWR meters, and pre-amps, and scanners, and echo chambers, and . . .

So when a mate of mine called me up and told me about the new dealer in our nearest town (the nearest shop used to be eleven miles away) I was cautious.

"Do they want me to open it?" I joked. There was scornful laughter from the other end. "They don't need you or anyone to open it, Filly! They only opened yesterday and the place has been packed ever since!"

"I wasn't suggesting," I said coldly, "that they needed me to draw the crowds. As you know I am very modest and retiring. Why are you telling me about this new place?"

"Filly!" he said, shocked. "I thought you were supposed to be an enthusiast! Don't you want to come over and see what they've got? Honest, you wouldn't believe it! Everything you could possibly need — rigs, antennae, meters, pre-amps, scanners . . ."

"And there's innocent old me thinking all you need to communicate is a simple rig and a magmount!" I said, huffily. "Who needs all that stuff?" But of course, I knew I would have to go. I would die before I would admit to any male breaker of my acquaintance how little I knew about the more technical

aspects of CB radio. My technical vocabulary, such as it is, comes out of magazines and other people's conversations. There's something very undignified about a screwdriver.

Not without trepidation, I turned up at the new shop. The place was indeed packed. I parked a little way up the road and watched it in my rear mirror.

It was everything I knew it would be. Gleaming pieces of futuristic equipment eyed me through the window. Someone, presumably one of the staff, waited at the door, ready to pounce on any unwary spider that might be passing his parlour. The place was full of men, of course — women generally have better things to do with their time than drool over machines and gadgets they have no intention of buying. In fact, I had better things to do with my time! I switched on the ignition and shoved the gear into first . . .

A hand knocked on the offside window. It was my so-called friend, the one who had egged me on to come in the first place. Feeling trapped, I switched off the engine, opened the door, and climbed out, looking (I hoped) cool and mildly interested.

"Great you could come, Filly," he said with enthusiasm. "There's quite a party — a glass of wine for everyone who comes in today, a prize draw. Everyone's here. Let me introduce you to the owner . . ."

And he swept me over the threshold, the rat. All the local breakers were there — and I was wrong about the women, there were at least ten — and I couldn't see anyone who looked remotely like my idea of a dealer. No smart suits and crocodile grins. The owner turned out to be a fair-haired young man in corduroy jeans and sweatshirt, not at all alarming. He introduced me to his stock and nothing bit me.

You live and learn, you live and learn. All this time I've avoided CB shops like the plague, and there's nothing frightening about them at all. But why am I telling you? You knew that, didn't you? I wish someone had told me before.

And I even won the prize draw. I won a rig. And it had Delta Tune!

COMMUNICATION THE

QSL WAY



David Shepherdson brings us the latest update on the club scene

reetings to you all once more. I've so much to get through again, I hardly know where to start! A few words about last month's visiting.

April 28th saw the 1985 CB/Radio Big Meeting at Stanley and thanks go to all those involved with the organising and for making everyone so welcome. To all friends, new and old, it was nice meeting you face to face instead of through the post as usual. Sorry that I can't list everyone who said hello but, if I did, there wouldn't be any column this month or next, just a long list of names! Anyway, it was great to meet you again John (Jumbo Jet), Des (GBQDC), Gordon (Zulu Whiskey) and Dougie (RDX). I was very sorry not to see Ann (Devil Woman) again this year, but as she is expecting, her doctor has forbidden her to travel. All our very best wishes go to Ann and Steve.

Ann also dropped me a letter recently asking me to say thank you to everyone who took the time and trouble to send her their old Christmas cards and used postage stamps at the beginning of the year. The last sale of stamps and foreign coins raised over £400 which brought the total to £21,000 for the RNLI! This sum was sufficient to buy a new 'Atlantic M.P.E' lifeboat so 'well done' to all concerned. Ann asks for you to keep sending her your old stamps as she wants to get another one, but even faster this time! As for the old Christmas cards, these are cut into gift-tags which are then sold to raise money for the purchase, training and upkeep of guide dogs for the blind. Ann says to make sure I tell you she does appreciate the trouble everyone took in sending these to her and the stamps on the packages also went to the RNLI. So, well done everyone! Don't forget, if you have any used stamps put aside 'just in case', send them up to Ann this week. Let's help the RNLI to get another lifeboat as quick as we can!

Right, a few cards, names and even a few messages coming up now.

A very tasteful Ensign card comes from June (Snowflake) of Desford, and yes June, I like them. Congratulations also go to Geoff and Kathy (Reckless Rat and Family) of Hull on the birth of their second child earlier this year. Hope Anna's behaving herself with the new rival for your attention Geoff!

From Italy hail Enrico and Gloria (1 EB01 and 02) who send out a genuine pack. They may not have personal cards, but they sure take some trouble over what they do send out! From David and Steve (Welshman and Wallaby) of Sheffield come a few cards, while from Andy Downing (The Warlord), late of the Shetlands, news that he's moved and his new address is 21 Hornbeam Walk, Wolverhampton and that he is doing his best to catch up with his mail as it gets forwarded. Mike (White Spirit) of Lerwick, writes to apologise to anyone who was waiting for a return card from him, as he has been waiting for a new print of his personal card. Sorry Mike, but I don't have any club patches available.

Staying in Scotland a moment, a letter from Evelyne (Bunny) who asks for a mention on behalf of her handicapped son Brian. Brian does not have a QSL card, but does have a Midas eyeball card and Evelyn will also swap QSL's sent to them. (I think these are among the best Midas cards I've yet seen.) Also, with four other lady QSLing breakers, Evelyn has helped to raise £200 for Riding for the Disabled and will be taking part during the year in a 24 hour modulation, as will Brian. From Brentwood in Essex, Lionel (Fuel Pump) drops me a line asking for a mention, (with flattery like this, how can I refuse?). Anyway, glad you like the column Lionel, good luck with the 'nets'.

I've had several letters warning me of some dodgy clubs and asking me to pass the warnings on, so here goes. Steve (Hot Shot) of Wilts warns of the 'Caravel of Portugal' to which he sent \$10 (US) 14 months ago without reply or any success, the 'V.E.P.', also of Portugal, 13 months ago; again no reply as yet. Steve's last one is the Kangaroo Whiskey of Australia. He

sent his \$27 (US) by registered post in an International Money Order over two years ago with the only result being that his bank have confirmed that this had been cashed! Letters sent to the 'club' are not answered. Last month's column included a complaint by Brian (Witch King) about the Liberty SB Club of Maryland. Well, since then, I've had another letter from a friend in the States who confirms that this club is a cause of concern. Also earlier this year, I asked if anyone could shed any light on a 'club' called the Jolly Roger (Cheltenham). Since then, someone let me know their address and I wrote on a few people's behalf enquiring about several £7 membership fees. Several months later, no reply, nor my letter returned which should be the case if the club had closed and the PO Box given up. Be warned! Also, I am still getting letters of complaint about the HC Custom Card printers of Northampton. Letters sent to them are ignored as are phone calls. However, let's not forget the other side of the coin, it isn't always a club that lets you down, sometimes it's a QSLer that lets a club down! I've always done my best to send any DR or NBBC packs out by return but recently someone bounced a cheque on me, so now I'm afraid that



QSLer Addresses:

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John (*Jumbo Jet*)

June (*Snowflake*)

Geoff & Kathy (*Reckless Rat*)

Enrico & Gloria (*1 EB 01 & 02*)

David & Steve (*Welshman & Wallaby*)

Evelyne & Brian (*Bunny & Starfighter*)

Lionel (*Fuel Pump*)

Steve (*Hot Shot*)

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Frescobaldi 9, 21049 Tradate (Varese), Italy.

84 Kenninghall Drive, Sheffield, S2 3WL.

PO Box 216, Barrhead, Glasgow, G78 1UB, Scotland.

BD 31, PO Box 388, Brentwood, Essex.

15 Wavell Road, Swindon, Wiltshire, SN2 1LD.

Brian (*Witch King*)

Ian (*Swedish Chef*)

Jim (*Sunray*)

John (*Ten Pin*)

Keith (*Walt Disney*)

Andy Downing (*The Warlord*)

Mike (*White Spirit*)

Denis (*GBQ 271*)

Steve & Jan (*Warrior & Gemstone*)

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PO Box 314, Braintree, Essex.

School Bungalow, Laburnham Avenue, Hove, Sussex.

BB43, PO Box 154, Wolverhampton, West Midlands, WV10 9HT.

56 Arrow Crescent, Alcester, Warwickshire, B49 6BE.

21 Hornbeam Walk, Wolverhampton, West Midlands.

7 Bumside, Lerwick, Shetland Isles, Scotland.

PO Box 5, Consett, Co Durham, DHB 8LT.

PO Box 228, London, NW2 2LE.

cheques will need to clear before I can despatch items in future.

More bad news, or perhaps it's good news going by your response to my comments on the following matter. There has been a rather unpleasant chain letter circulating most of this year and many people are forwarding them to me with various comments about it and the people who start, and pass them on! Most I can't print; this is, after all, a family mag (if you don't count Twong!). My thanks go to all the people who forwarded these obnoxious items to me, please remember if you get one, these things can cause a lot of upset and worry to anyone who receives them and, as my local bobbies say, they are just another way of conning your money out of you!

My thanks go to Ian (Swedish Chef) and Jim (Sunray) as the first two out of the pile. Before I leave the bad news, you may remember that a while ago I asked for info on the Dutch Trucking Club. To be brief, the club was ripping off UK QSLers but I was given the new address of the new President who promised to make things right with the people who had been ripped off. Well, so far I've not heard of any satisfied people. The package promised to these people is quite disgraceful for the £12 that they have sent. So far, they haven't got their package mind you, just a promise of one if they would like one.

Some more cards just in now, starting with one from Keith (Walt Disney) asking me to say thanks to Wendy (Swallowtail) for designing his card for him, must admit that Bambi's

my favourite! From Dennis (GBQ 271) comes one of the Currie Full Colour set, of which there were only four designs done. Steve and Jan (Warrior and Gemstone) of London asks for a quick mention and Steve is a senior member of the Whiskey Hotel Breakers Club. This club is a very good one and current details are available from either Steve or the club, but please help them to reply by enclosing a SASE.

Now I've a very large packet in front of me, so I'll deal with this now and give you an update on one club, some details of a new section and some gen on a couple of others. The updating is about the Freightliners of Essex. This club has always been a genuine one and good value for money which sends out an excellent pack. Recently Ian (FLO01) has handed over the Club to Barry (Black Swan) while Ian set up and now runs the Foxtrot

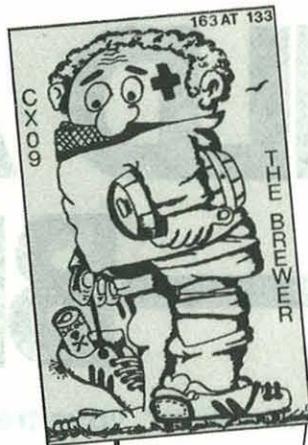
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QSL Service Addresses:

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 Vine Lodge (Labels)

When writing to any QSL club or service, always enclose return postage to assist with a prompt reply, it really does help! Thanks.



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QSL Club Addresses:

Charlie X-Ray PO Box 4, Rhos, Wrexham, Clwyd, North Wales, LL14 1AX.
 Firebirds QSL Swap Club PO Box 9, Brighton, East Sussex, BN2 5HA.
 Foxtrot Lima DX PO Box 455, Braintree, Essex, CM7 7XY.
 Freightliners QSL PO Box 314, Braintree, Essex, CM7 7ND.
 GBQDC PO Box 5, Consett, Co Durham, DH8 8LT.
 Red Admiral DX Brendian Bungalow, Windsor Farm, Croft Bank, Skegness, Lincs, PE24 4RL.
 Romeo Delta X-Ray 10 Wallace Street, Rutherglen, Glasgow, Scotland.
 Whisky Hotel BC PO Box 228, London, NW2 2LE.
 Zulu Whiskey Int PO Box 14, Brighouse, West Yorkshire, HD6 2SE.
 Dragonrider One c/o DR Club, 3 Tarn Villas, Cowpasture Rd, Ilkley, W Yorks, LS29 8RH.

Lima DX Club. This is the DX Section of the Freightliners and is open to anyone interested. Ian retains the title of Honorary President in the FL's, but Barry runs this while Ian concentrates on the DX Section. Membership of the DX 'F.L. Int' costs £5 with 10 personal cards, and not £6 as some invites have misprinted. The package consists of your unit no, ID card and wall certificate, 30 club QSL cards (10 each of 3 different designs), a large mounted club stamp, QSL certificates, cloth patch, exchange QSL's view cards and club stickers, with your XYL free. Now, normally when a club says 'stickers', they refer to the Vine Lodge type. Well in this case, you do get a pile of the 1½" long stickers, but you also get large Black and Yellow 3" x 2" ones! In addition, you also get piles of local info booklets and leaflets, and 14 pages of general information and interest. Also, if required, members may use the club PO Box free of charge for the first year, after which there would be a standard charge. Anyone who is already a member of the Freightliners (QSL Club) who wishes honorary membership in the DX section, can apply for this by sending an A4 size SASE (18p stamp) to Ian quoting their Freightliner Unit number with your request. In return you will receive your F.L. Int ID card and wall certificate. Membership of the Freightliners QSL Club costs £5 plus 5 or more of your own cards to receive your unit no, ID card, certificate 15 club cards, mounted stamp and many

other items too. But do watch which PO Box that you apply to.

Okay, I'll skip through a couple of other clubs on which I have a little info. First up is the Red Admiral DX Group of Skegness. For £3 and 10 personal cards you'll get your R.A no, ID card, certificate, club cards and stickers, 10 envelopes and exchange QSL's and invites. The CX Group, or the Charlie X-Ray International DX Group of Wales to give it its full title. For current prices of membership, please drop Tony (CX 09 — Big Brewer) the Secretary a line with a SASE. Club stamps are available at £2 each, or £3.50 for one of each design, and club cards at 10 for 50p. Just a point here, when sending cash through the post, do pack any notes securely, between your cards for example, and for your own safety, record or register it. For smaller amounts, I accept postage stamps to the value required, it is cheaper than postal orders, and also safer than loose coins, I am sure that many other clubs would accept this method for small amounts. If any club has any strong feelings on this topic, please do let me know and I'll do my best to pass them on. The only forthcoming event I have any details on now is the

Firebirds/POMA Card meet to be held on June 8th at St Stephens Community Centre in Canterbury, Kent. All are welcome to come and dropping Mark (Earlybird) a line with SASE will bring you further details.

One last item, I've been asked if I can shed any light on the following clubs as they appear to have closed. If you have any info on these five, or they are your clubs and you've just moved and are still running them, please do let me know and I'll pass on the info in these pages.

The clubs in question are: India Mike of Falmouth; Cheltenham QSL Swap Club; CB Bridgetown of Hull; WDC of Wakefield and BSF of Peterlee. Okay, that's it, out of room again, if you want a mention, or have any comments, praises or complaints, drop me a line either c/o the DR and NBBC Clubs, or via the magazine (though these will take a little time to get to me) and I'll see what can be done. If you want a reply, please do enclose return postage and I'll get back to you as soon as possible. Anyway, that's all for this time, lots more in next month's mag, so catch you then!

BUILD A ROGER BLEEP

Want to "personalise" your transmissions? Andy Armstrong tells you how in this special DIY project

Here's a "one better" gadget which (almost) speaks for itself. What it actually does is transmit your initials in morse code as soon as you unkey the microphone. You can program it with three or four letters in morse, depending on how long the letters are.

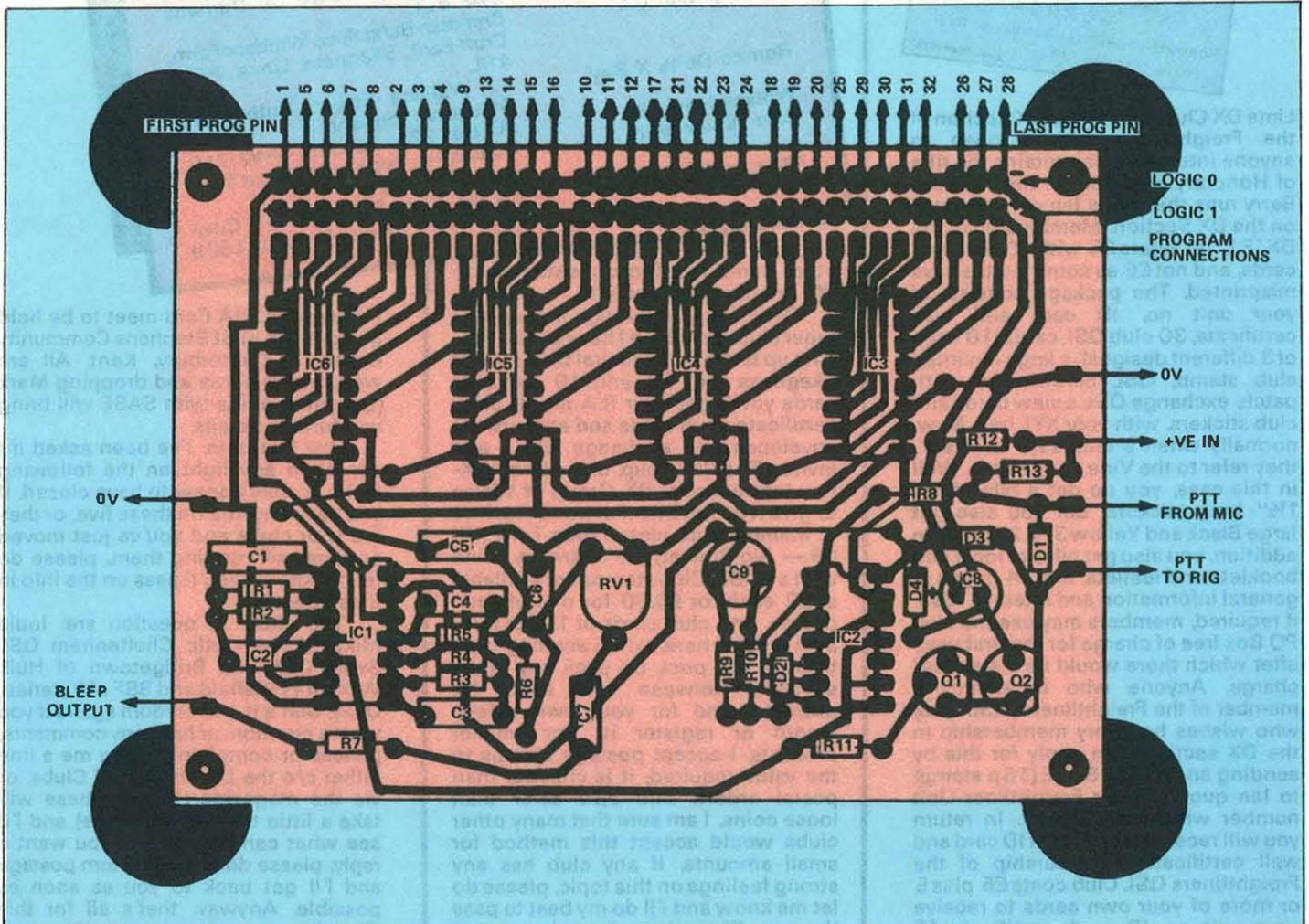
The speed of transmission and the tone (frequency of bleep) used can both be selected during construction, and the volume can be adjusted to suit the rig. Some rigs will have room inside to fit this module, but alternatively it can be fitted in an external box. Power is no problem — if it's

mounted inside the rig it can draw its power from the +12V there — and if it is in a separate case then it can run from a small battery, which will last a long time, or from a separate connection to the 12V supply to the rig.

How It Works

The block diagram, Figure 1, shows the circuit divided into its main parts. While the transmit button is held down, the timer circuitry holds the shift register in the *load* condition, in which it loads the logic '1's and '0's which make up the morse letters. The first load bit in the register is programmed to 0 so that the bleep oscillator is switched off in this mode.

As soon as the microphone switch is released, the timer goes into action. For about five seconds, it holds the rig on transmit. Meanwhile, the shift register is switched into the *SHIFT* mode and the data which has been loaded into it is clocked out. The circuit is arranged so that a '1' on the output switches on the bleep, and a '0' switches it off. The bleep tone is fed into the microphone input via a large value resistor, so that it doesn't interfere with the modulation the rest of the time. In some microphones, the switch shorts out the insert when it is released, so in this case a small modification must be made by cutting the wire from microphone insert to switch to remove



PCB and component assembly (seen from above — the tracks are on the other side of the board)

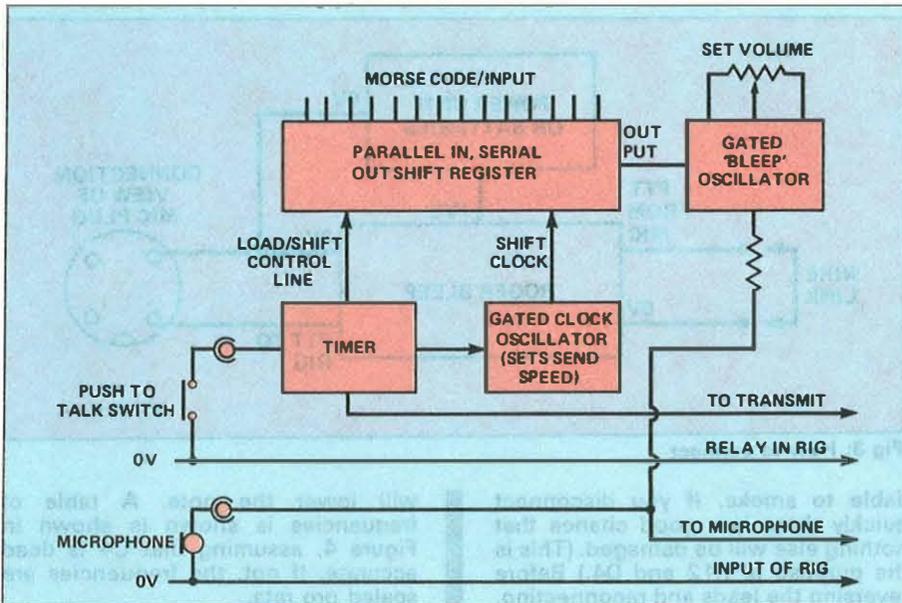


Fig 1: The circuit divided into its main parts

the shorting action. Otherwise the bleep will be shorted out.

The Circuit

The two oscillators used in this project are both of the same conventional design. The logic gate on the output of the clock oscillator is held in the logic '1' state by the timer output

when the microphone switch is held down, and is only allowed to oscillate when the microphone switch is released.

The bleep oscillator is controlled in a similar manner, but by the output of the chain of shift register ICs (IC3 to IC6). The output of the bleep oscillator is a square wave, which does not

sound very good on a transmission. To make it sound reasonably clean, it is filtered by R5, C5, R6, and C6. These components reduce the harmonics to the point where the tone sounds quite pleasant.

The timer has two outputs. One of these switches to logic '0' to transmit the initials. This output switches the shift registers into the shift mode. The other output switches to logic '1' to send the morse, and switches on Q1 and Q2 which hold the transmitter on, as well as switching the clock oscillator on. The time period is given by the time taken for C9 to discharge through R9.

Construction

Note: Before buying any components, read the section on setting the initials into the shift registers. Some sets of initials will only require two or three registers instead of four.

This project is best built on the printed circuit board, for ease of programming among other things. Should anyone wish to try their hand at a Veroboard layout, most of the same instructions still apply.

All the ICs in this project are CMOS types, which are supposed to be sensitive to static electricity. In practice, I have never actually blown one up by not taking antistatic precautions, but once or twice ICs have failed in use for no good reason, and they have turned out to be ones which have been kicking

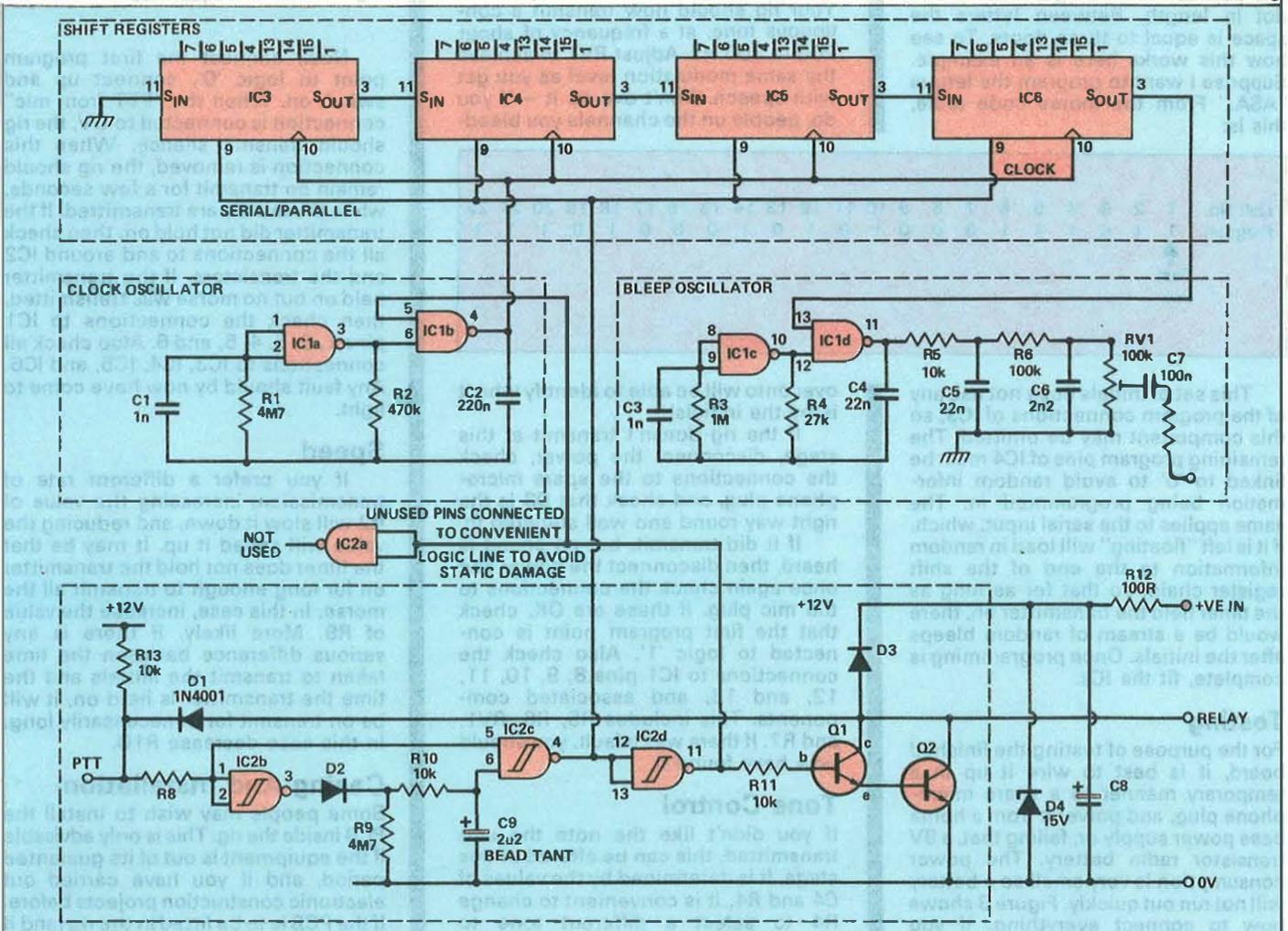


Fig 2: The circuit diagram showing all the components

around the highly static formica workbench for a while. Just to be on the safe side, fit the ICs last, but don't worry if a connection needs to be redone subsequently.

The best order of assembly is to fit the resistors and diodes first, and keep the clipped off legs to use as wire links. The positions of all components are marked on the overlay, as seen from the component side of the board. The next things to fit are the wire links in the main area of the board (leave the ones on the edge for now) and then the rest of the components (except the ICs).

Initialisation

The wire links down the edge of the board are used to set the initials in morse code into the shift registers. The links on the board are numbered in the order in which they are clocked out, and care must be taken to program the links correctly, because correcting an error later can prove tedious.

A logic '1' sends a tone, and a logic '0' sends silence. For test purposes link 1 should be set to logic '1' at first. This will transmit a tone continuously while the rig is on transmit, to enable the volume to be set. Subsequent links should be programmed with morse code data from the table.

The standard for morse code is that a "dash" is three times as long as a "dot", and that the gap between dots and dashes etc forming a letter is one dot in length. Between letters the space is equal to three dots. To see how this works here is an example. Suppose I want to program the letters "ASA." From the morse code table, this is:

Link No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Program	1	1	0	1	1	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	1	1

↑
Test link

This set of initials does not use any of the program connections of IC3, so this component may be omitted. The remaining program pins of IC4 must be linked to '0' to avoid random information being programmed in. The same applies to the serial input, which, if it is left "floating" will load in random information to the end of the shift register chain, so that for as long as the timer held the transmitter on, there would be a stream of random bleeps after the initials. Once programming is complete, fit the ICs.

Testing

For the purpose of testing the finished board, it is best to wire it up in a temporary manner to a spare microphone plug, and power it from a home base power supply or, failing that, a 9V transistor radio battery. The power consumption is very small so a battery will not run out quickly. Figure 3 shows how to connect everything. If you should accidentally connect the power the wrong way round, then R12 is

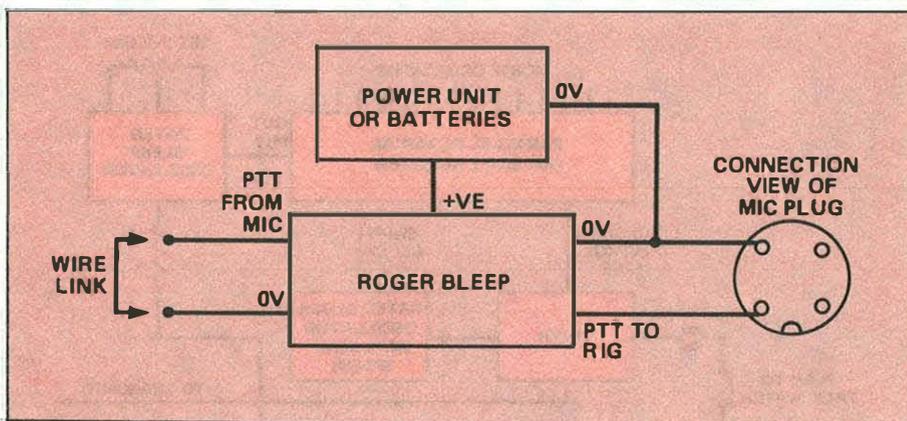


Fig 3: How to connect

liable to smoke. If you disconnect quickly there is a good chance that nothing else will be damaged. (This is the purpose of R12 and D4.) Before reversing the leads and reconnecting, double-check that D4 is the right way round.

Another rig is needed for test purposes. Borrow a portable if you can. If you have a dummy load, connect it to the output of your rig, instead of the aerial, and in any case switch to low power. Tune both rigs to a clear channel, and check, using the microphone, that the modulation is clean. Then unplug the microphone and plug in the roger bleep. Connect the terminal labelled "PTT from mic" to 0V. Your rig should now transmit a continuous tone, at a frequency of about 700 to 800 Hz. Adjust RV1 to achieve the same modulation level as you get with speech. Don't overdo it—if you do, people on the channels you bleed-

will lower the note. A table of frequencies is shown in Figure 4, assuming that C4 is dead accurate. If not, the frequencies are scaled pro rata.

R4 (kΩ)	FREQUENCY (Hz)
15	1377
18	1148
22	939
27	765
33	626
39	530

Fig 4: Table of frequencies

Now, connect the first program point to logic '0', connect up and switch on. When the "PTT from mic" connection is connected to 0V, the rig should transmit silence. When this connection is removed, the rig should remain on transmit for a few seconds, while the initials are transmitted. If the transmitter did not hold on, then check all the connections to and around IC2 and the transistors. If the transmitter held on but no morse was transmitted, then check the connections to IC1 pins 1, 2, 3, 4, 5, and 6. Also check all connections to IC3, IC4, IC5, and IC6. Any fault should by now have come to light.

Speed

If you prefer a different rate of transmission, increasing the value of R2 will slow it down, and reducing the value will speed it up. It may be that the timer does not hold the transmitter on for long enough to transmit all the morse. In this case, increase the value of R9. More likely, if there is any serious difference between the time taken to transmit the initials and the time the transmitter is held on, it will be on transmit for unnecessarily long. In this case decrease R10.

Casing And Installation

Some people may wish to install the PCB inside the rig. This is only advisable if the equipment is out of its guarantee period, and if you have carried out electronic construction projects before. If the PCB is to be fitted in the rig (and if there is room for it) a good way of securing it is to use self-adhesive

over onto will be able to identify who it is by the initials!

If the rig doesn't transmit at this stage, disconnect the power, check the connections to the spare microphone plug, and check that D3 is the right way round and well soldered in.

If it did transmit, but no sound is heard, then disconnect the power and once again check the connections to the mic plug. If these are OK, check that the first program point is connected to logic '1'. Also check the connections to IC1 pins 8, 9, 10, 11, 12, and 13, and associated components. This includes R5, R6, RV1, and R7. If there was a fault, you should now have found it.

Tone Control

If you didn't like, the note the unit transmitted, this can be altered at this stage. It is determined by the values of C4 and R4. It is convenient to change R4 to select a different tone to transmit. Lowering the value will raise the note, and raising the value

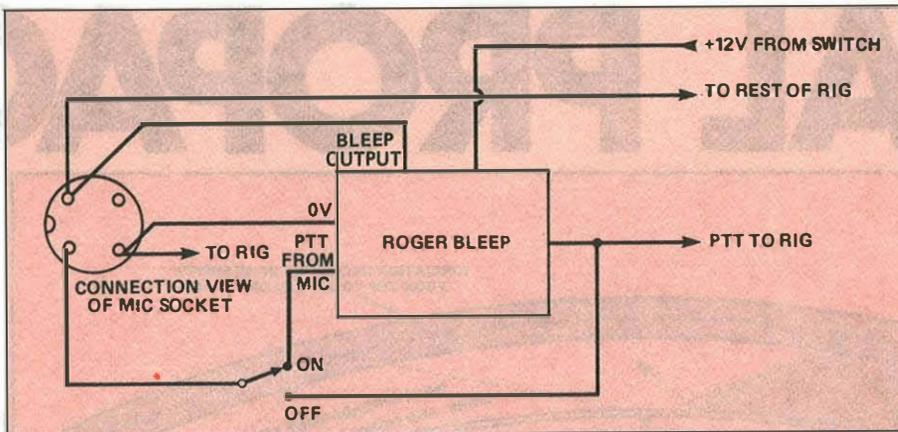


Fig 5: Connecting the unit to a rig

mounting pillars, available from Hobbyboard. So long as the surface they are to mount on is clean, these will stick like the proverbial.

For those who wish to fit the roger bleep in the transceiver, Figure 5 shows the connections which must be made. A good place to find a +12V connection is on the on/off switch, but be sure to connect to the switched side! The bleep on/off switch is an optional item, and if it is not used the wiring should be connected as if the switch were in the 'on' position. Probably the best type of switch to use would be a miniature toggle.

For the majority, who will build this project into a separate case, Figure 6 shows the connections to be used. Suitable cases are suggested in the component list. Once again, the self-adhesive PCB mounting pillars are a good choice to fix the board down.

The complicated switching arrangement shown is only necessary if the board is to be powered by a battery. If it is to be powered from the 12V supply to the rig, the same switching circuit

as for mounting the board inside the rig may be used. This has the advantage of using a cheaper switch.

Morse Code

A	· —	N	— ·
B	— · · ·	O	— — —
C	— · — ·	P	· — — ·
D	— · ·	Q	— — · ·
E	·	R	· — ·
F	· · · ·	S	· · ·
G	— · — ·	T	— —
H	· · · ·	U	· · —
I	· ·	V	· · — ·
J	· — — —	W	— · —
K	· — ·	X	— · · —
L	· — · ·	Y	— · — —
M	— —	Z	— — · ·

Component List for PCB

Resistors

R1, 9	4M7
R2	470k

R3	1M
R4	27k
R5, 8, 10, 11, 13	10k
R6, 7	100k
R12	100R
RV1	100k skeleton preset pot

Capacitors — All polyester or polycarbonate, 8mm lead spacing (eg the ones on page 91 of the Maplin catalogue) unless otherwise stated.

C1, 3	1n
C2	220n
C4, 5	22n
C6	2n2
C7	100n
C8	10u 16V radial electro
C9	2u2 16V bead tant

Semiconductors

D1	1N4001
D2, 3	1N4148
D4	15V 400mW zener
Q1, 2	8C182
IC1	4011
IC2	4093
IC3, 4, 5, 6	4021 (Less than 4 of these ICs may be needed)

Miscellaneous — Not all items may be required for all units. PCB, 4 way microphone plug and 4 way microphone socket (if built into a separate case) (available from Cirkit), 4 x self adhesive PCB pillars (available from Hobbyboard),

SPDT min. toggle switch (3PDT type if used with battery power), case eg Cirkit type 21, 90003 page K6, in line fuse holder and 100mA fuse to fit it (for boxed unit).

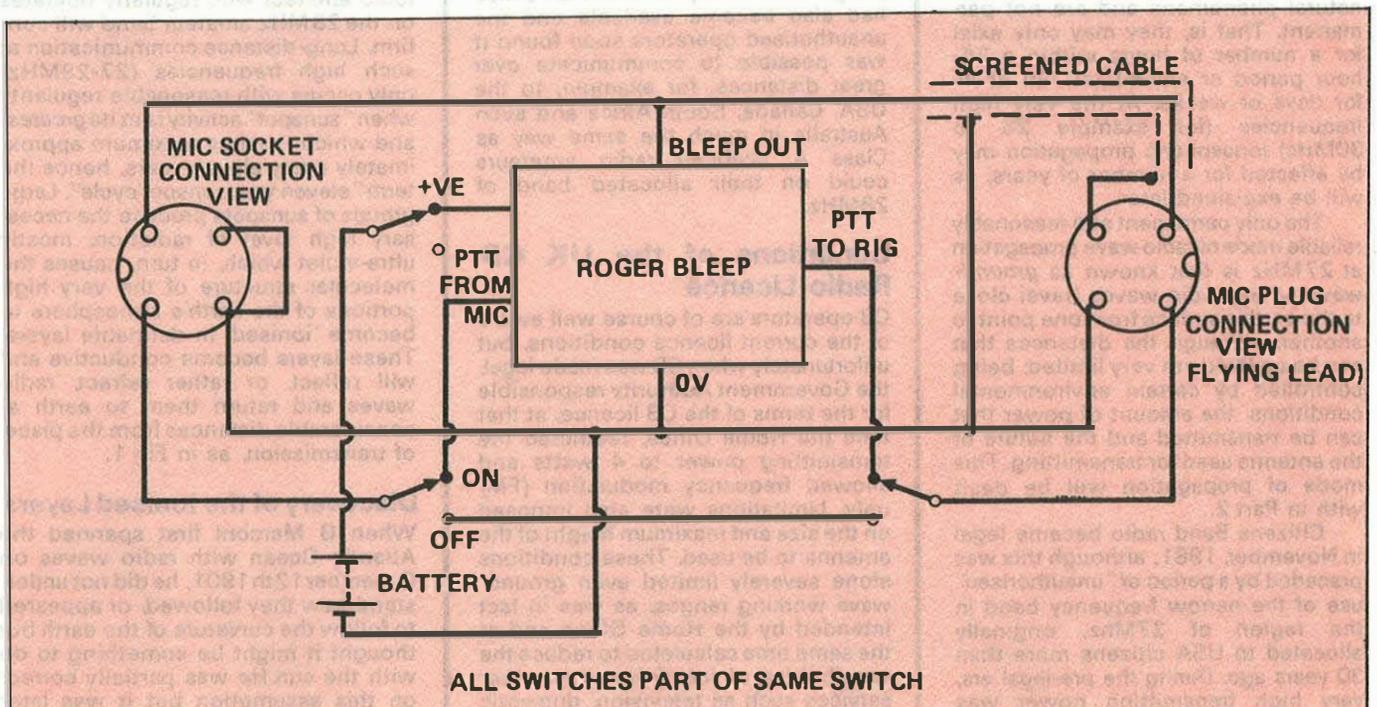


Fig 6: Connections used if the unit is to be cased separately

SIGNAL PROPAGATION

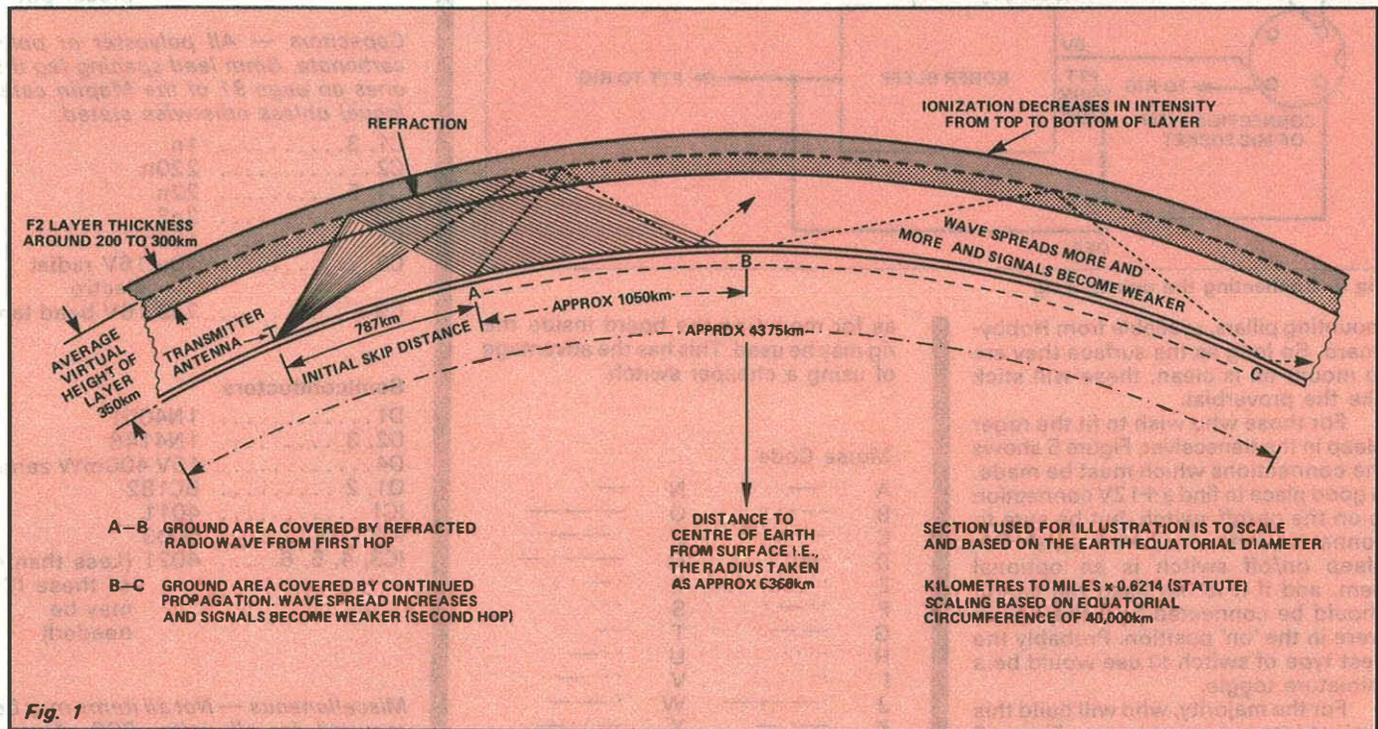


Fig. 1

Ionospheric Propagation. The various annotations and text in the article provide adequate explanation and the relationship between critical frequency and usable frequency. Diagram is to scale i.e., virtual height of F2 layer relative to equatorial circumference of the earth.

Direct long distance radio communication on frequencies within the HF spectrum (from about 3 to 30MHz and thus including the 27MHz CB radio band) is only possible by sky-wave, or more correctly, *ionospheric radio propagation*. The required ionospheric conditions are produced by natural phenomena and are not permanent. That is, they may only exist for a number of hours within a 24-hour period or sometimes not at all for days or weeks. At the very high frequencies (for example 26 to 30MHz) ionospheric propagation may be affected for a number of years, as will be explained later.

The only permanent and reasonably reliable mode of radio wave propagation at 27 MHz is that known as *ground-wave* where radio waves travel close to the earth's surface from one point to another, although the distances that can be covered are very limited; being controlled by certain environmental conditions, the amount of power that can be transmitted and the nature of the antenna used for transmitting. This mode of propagation will be dealt with in Part 2.

Citizens Band radio became legal in November, 1981, although this was preceded by a period of "unauthorised" use of the narrow frequency band in the region of 27Mhz, originally allocated to USA citizens more than 30 years ago. During the pre-legal era, very high transmitting power was frequently used, often 1,000 watts

F. C. Judd explains how signals are reflected and deflected around the earth

or more and the modes of modulation were either AM (amplitude) or SSB (single side band). Efficient antennas had also become available and the unauthorised operators soon found it was possible to communicate over great distances, for example, to the USA, Canada, South Africa and even Australia in much the same way as Class A licenced radio amateurs could on their allocated band of 28MHz.

Conditions of the UK CB Radio Licence

CB operators are of course well aware of the current licence conditions, but unfortunately when CB was made legal, the Government Authority responsible for the terms of the CB licence, at that time the Home Office, restricted the transmitting power to 4 watts and allowed frequency modulation (FM) only. Limitations were also imposed on the size and maximum height of the antenna to be used. These conditions alone severely limited even ground-wave working ranges, as was in fact intended by the Home Office and at the same time calculated to reduce the possibilities of interference to other services such as television, domestic hi-fi systems and the like to an absolute

minimum.

However, even if higher power and more efficient antenna systems had been allowed, the radio propagation conditions (except ground-wave) that were to follow from about 1982 onwards and which still exist, would in any case have curtailed long distance radio communication via the ionosphere (so called sky-wave propagation) as any radio amateur who regularly operates on the 28 MHz amateur band will confirm. Long-distance communication at such high frequencies (27-28MHz) only occurs with reasonable regularity when "sunspot" activity is at its *greatest* and which reaches maximum approximately every eleven years, hence the term "eleven year sunspot cycle". Large groups of sunspots produce the necessary high level of radiation, mostly ultra-violet which, in turn, causes the molecular structure of the very high portions of the earth's atmosphere to become 'ionised' in definable layers. These layers become conductive and will reflect, or rather refract, radio waves and return them to earth at considerable distances from the place of transmission, as in Fig 1.

Discovery of the Ionised Layers

When G Marconi first spanned the Atlantic Ocean with radio waves on December 12th 1901, he did not understand how they followed, or appeared to follow the curvature of the earth but thought it might be something to do with the sun. He was partially correct on this assumption but it was later concluded by two scientists, Professors

PROPAGATION AT 27MHz

Heaviside and Kennelly, that a "conducting" layer did exist in the higher atmosphere and that was capable of reflecting radio waves back to earth which, also being a reasonably good conductor, reflected the waves back again to the ionised layer as Fig. 1 illustrates. The portion of the upper atmosphere containing the ionised layers is known as the 'ionosphere'. Were it not for these layers, all radio waves would leave the earth and continue to travel on into outer space to finally become completely lost. Later, other scientists, notably Professor E V Appleton in the UK and G Breit and M A Tuve in the USA, became interested in the existence of these conducting layers and, during the years 1925-1927, Appleton proved beyond any doubt that at least one layer existed at a height of 100 kilometres and later discovered another, much higher. The lower one is now known as the 'E' layer and does not really concern us as far as 27MHz is concerned. It is the higher layer commonly known as 'F' although there are in fact two, F1 and F2, the latter having an average virtual height of 350 kilometres and which is of greatest importance to long distance communications within the frequency range from about 3 to 30MHz. Note that the 'E' layer must not be confused with what is known as Sporadic E (Es) which takes the form of moving clouds of ionised particles and which, at times, mainly during the summer months, are responsible for semi-long distance propagation at 27MHz. Some may have experienced this. Sporadic E clouds form at a height of about 100 kilometres and move very rapidly, so propagation via this medium may not last long.

The Sunspot Cycles

The beginning of legal CB radio coincided closely with the peak of sunspot

cycle No.21. The absolute peak was between 1979 and 1980 when the Zurich smoothed sunspot number reached about 170 allowing excellent long distance propagation around 27 to 28MHz. From this time on, the cycle began to decline with the numbers of observed sunspots becoming less and less toward the present year. Low sunspot counts indicate less radiation from the sun and therefore lower ionisation density within the F2 layer. The result is very spasmodic DX on 27MHz, or often none at all, for long periods as the minimum is approached. The time of the absolute minimum is not precisely known but prediction (McNish Lincoln) put it somewhere between the end of this year and mid-1987. Only then will the next cycle (No. 22) begin and the sunspot numbers start to increase again, so the next peak is a long way off yet. Even when we do reach the peak of the next sunspot cycle, the present power limitations of CB equipment and antennas will not be very favourable for DX working.

Propagation via the Ionosphere

Text book explanations of radio wave propagation via the F2 layer are often very misleading, particularly as illustrations relating to this are rarely ever drawn to scale. Also the conception of a radio wave depicted as a single line following a path between earth and the F2 layer in order to travel a long distance is not strictly correct although it serves to illustrate the basic principle. Far too much emphasis is also placed on so called skip distances and illustrations concerned with this can also be misleading. As already mentioned, a radio wave does not travel in a narrow straight line but spreads wider

and wider as it leaves the antenna so the angles of incidence and refraction at the F2 layer depend to some extent on the original angle of radiation from the antenna itself. Again refer to Fig. 1. Ionospheric radio wave propagation is a highly complex subject, but some understanding of the formation and function of the ionised layers is worth while. Details of books that delve deeper into the subject will be given at the end of this article.

The F2 Layer and Critical Frequency

The F2 layer does not refract radio waves between frequencies of about 3 to 30MHz all the time. Those frequencies that are refracted are determined by the density of ionisation and there are times when this may not be sufficient to directly reflect, rather than refract waves above a certain frequency known as the *critical frequency*. All radio waves at frequencies above the critical frequency penetrate the layer and travel on into outer space. The *virtual height* of the layer and the critical frequency are therefore two important factors that need to be known in order to determine the frequencies of radio waves that can be refracted by transmitting them toward the F2 layer at an *oblique* angle. The layer virtual height and the critical frequency are found by transmitting short pulses of radio waves directly upward, at an angle of 90 degrees relative to the surface of the earth. As with conventional radar, the time taken for a pulse to reach the layer and return to earth provides a measure of the virtual height that can be expressed in either miles or kilometres, usually the latter (see Fig. 2). The critical frequency is revealed when pulses at a known frequency fail to return, so a sweep frequency pulse transmitter (and receiver) must be used. The special pulse transmitter/receivers for doing this are known as 'ionosondes' and these are in constant use, day and night by World Data Centres, the one for the UK being the Rutherford Appleton Laboratory at Chilton in Oxfordshire. Two 'ionosondes' are used by them, one located at Slough in Middlesex and the other at South Uist in the Hebrides.

However, when radio waves at frequencies *higher* than the critical frequency arrive on an ionised layer at an *oblique* angle, they are bent round (refracted) and returned to earth at an oblique angle from the layer. Knowledge of the critical frequency can provide an indication of *usable higher frequencies*. For example, if the critical frequency were about 7MHz then usable frequencies would be around three to four times higher (around 21 MHz), but remember that this applies only to radio waves meeting an ionised layer at an oblique angle. Again refer to Fig.

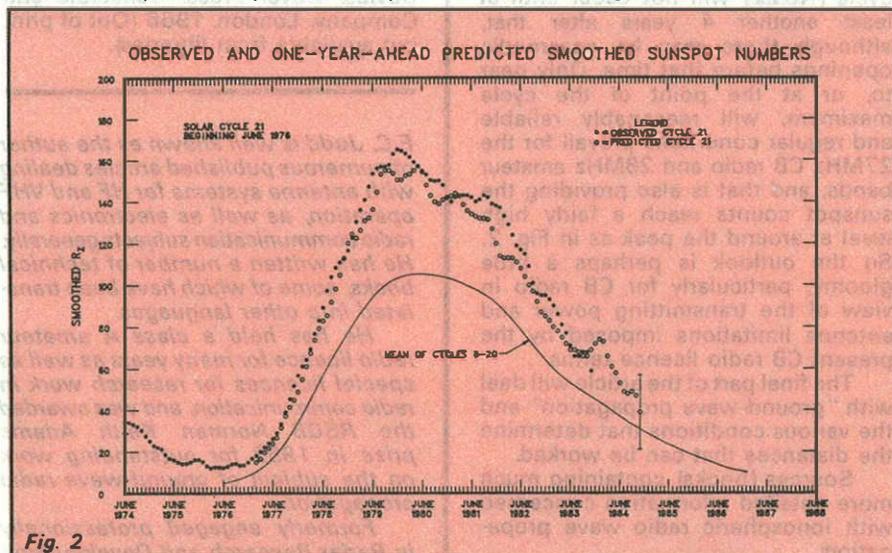


Fig. 2

The sunspot cycle No. 21 showing observed and predicted sunspot numbers. The minimum must be reached before the onset of cycle No. 22 (see text). Predictions cannot be precise. Graph by courtesy of the Belgian Royal Observatory.

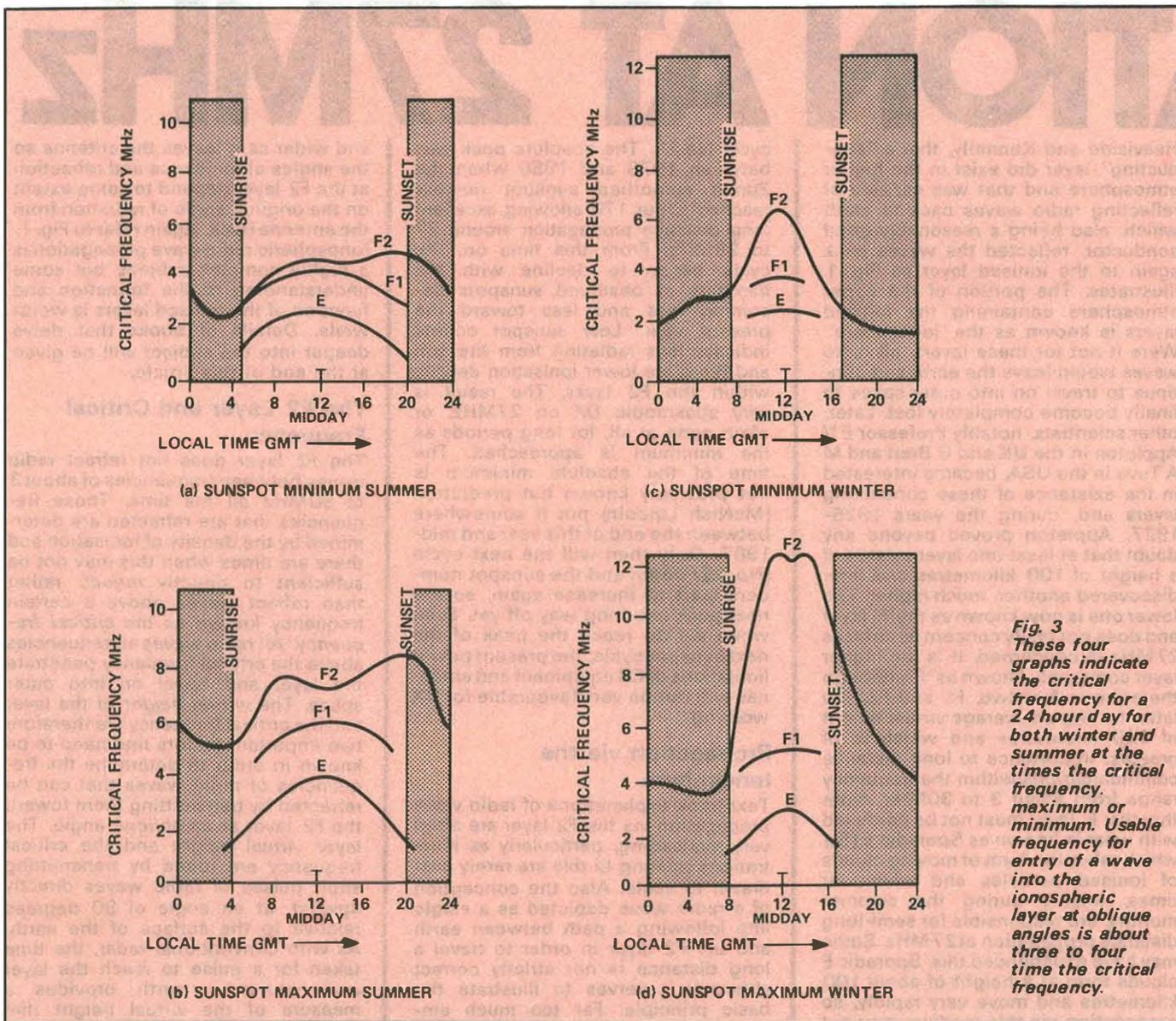


Fig. 3
These four graphs indicate the critical frequency for a 24 hour day for both winter and summer at the times the critical frequency, maximum or minimum. Usable frequency for entry of a wave into the ionospheric layer at oblique angles is about three to four times the critical frequency.

1. The critical frequency varies hourly throughout a 24-hour day and also seasonally — summer and/or winter and at given points in time during an 11-year sunspot cycle. This is illustrated by the four diagrams Figs 3a,b,c and d. From these we can get an approximation of usable frequencies from the indicated critical frequency at a particular time of the day (or night) during summer or winter and for the period of a sunspot minimum or maximum. Only when the critical frequency is very high will there be possible openings, or ionospheric propagation paths, via the F2 layer to distant parts of the world on frequencies as high as 27 MHz. Such openings are rare during a period of sunspot *minimum* and if they do occur are usually along a north/south path or vice versa. Openings at frequencies as high as 27 and 28 MHz are much more frequent, often occurring daily, during a period of sunspot *maximum* (winter time) when the critical frequency may reach 12 MHz or higher.

As already mentioned, conditions for fairly regular long distance communication at 27 MHz are a long way

off yet. If we assume the present 11-year sunspot cycle to reach minimum at around the end of 1986, then the approach toward maximum of the next cycle (No.22) will not occur until at least another 4 years after that, although there may be spasmodic openings before that time. Only near to, or at the point of the cycle maximum, will reasonably reliable and regular conditions prevail for the 27 MHz CB radio and 28 MHz amateur bands, and that is also providing the sunspot counts reach a fairly high level at around the peak as in Fig. 2. So the outlook is perhaps a little gloomy, particularly for CB radio in view of the transmitting power and antenna limitations imposed by the present CB radio licence terms.

The final part of the article will deal with "ground-wave propagation" and the various conditions that determine the distances that can be worked.

Sources (books) containing much more detailed information concerned with ionospheric radio wave propagation:

1. *Sun Earth and Radio* by J A Ratcliffe. World University Library 1970.
2. *The Upper Atmosphere and Solar*

Terrestrial Relations by Professor J K Hargreaves. Van Nostrand Reinhold Co. (London) 1979.

3. *Ionospheric Radio Propagation* by K Davies. Dover Press. Constable and Company, London, 1966 (Out of print but available from libraries).

F.C. Judd is well known as the author of numerous published articles dealing with antenna systems for HF and VHF operation, as well as electronics and radio communication subjects generally. He has written a number of technical books, some of which have been translated into other languages.

He has held a class A amateur radio licence for many years as well as special licences for research work in radio communication, and was awarded the RSGB Norman Keith Adams prize in 1952 for outstanding work on the subject of ground-wave radio propagation.

Formerly engaged professionally in Radar Research and Development, he is now retired and devotes considerable time to the study of ionospheric radio wave propagation.

SELECTIVE CALL

Trevor Butler on selective calling

You needn't be bombarded by unwanted signals and other folks' conversations, simply switch on, sit back and await a call intended for you... it's called selective calling, writes Trevor Butler.

Selective calling systems have been a part of radio communications systems for a long time. Indeed without such a system, many of the radiopaging and private mobile radio (PMR) systems wouldn't operate because there just aren't enough frequencies to go round.

Suppliers like Motorola, Storno and Pye have all adopted various types of sel-call units to work in conjunction with their two-way radio installations. These enable the base station to call particular mobiles without disturbing others, and similarly, if within range, one mobile to work another without the need to contact base. Systems like this also allow for visual indications that a particular unit is being called.

In simple terms, a series of tones operate the squelch on the receiver circuit and when the required set of tones are 'heard' by the radio it springs into life. The set can be programmed to allow for group calls where a number of sets are alerted by one encoded call. British Telecom engineers devised a

selection code for their nationwide radio-paging system which has now been adopted world-wide as a standard — POCSAG as it's called is a sophisticated and complex design allowing the control of the quarter of a million BT pagers in the fourteen bleeping zones in the country.

The new cellular-radiotelephone systems demonstrate the importance of selective calling and signalling. The operations by Racal and Telecom/Securicor rely on signals being relayed to and from the subscriber's unit. By using data signalling (at 8 k/bits) and non-audible tone signalling during a conversation the mobile units flag their positions allowing a particular cell to be allocated. By using low-power operation it is possible to use the same frequency simultaneously in many areas at once without causing interference.

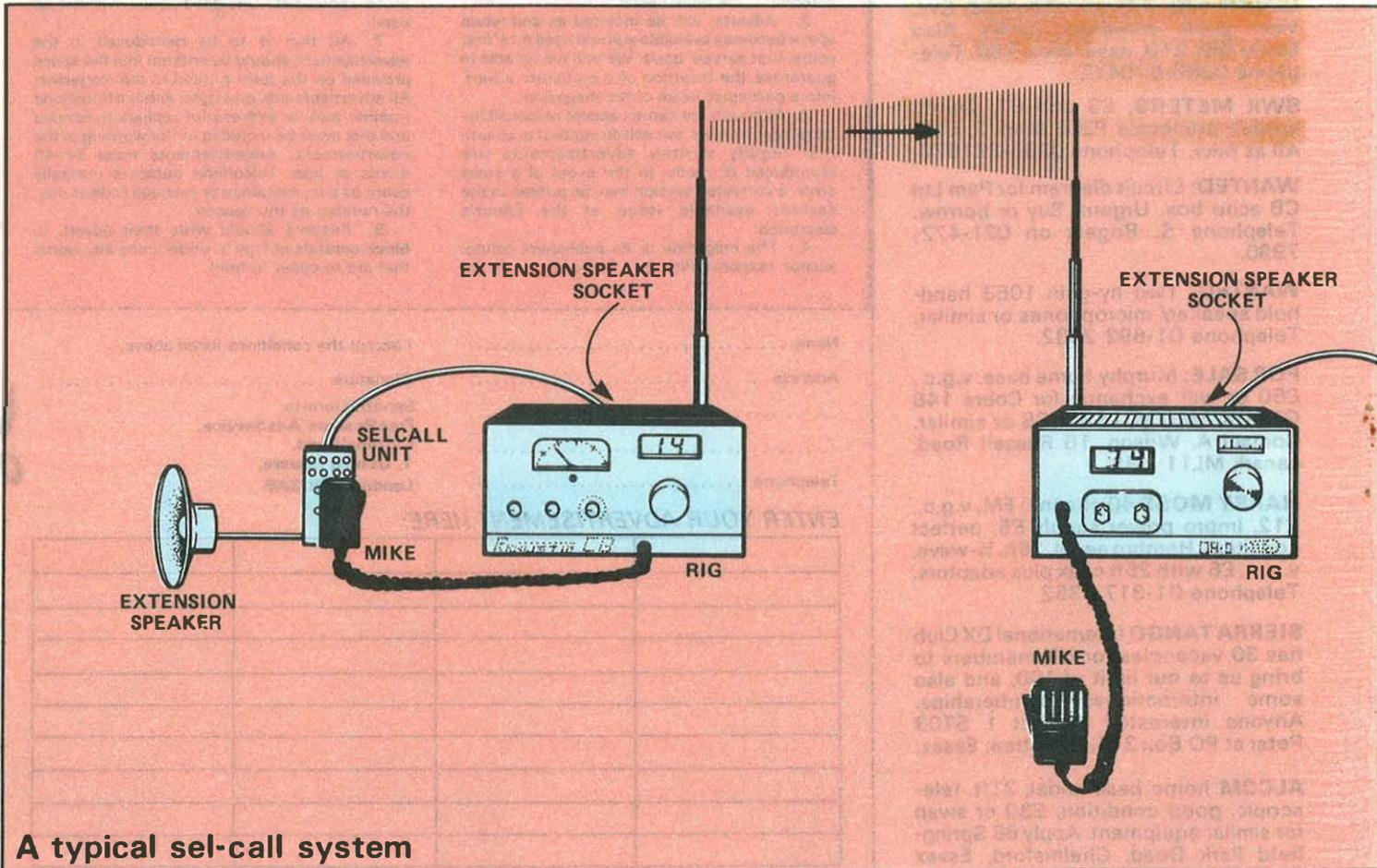
The Total Access Communications (TAX) standard was drawn up by the Department of Trade, and representatives from the two operating companies. Using the 8 k/bit base band, Manchester encoded binary data signalling, the identity, return path of the call, telephone number of the unit and its serial number can all be relayed to the central computer handling the six

thousand units with a capacity for some quarter of a million, although the present limited service area must, under the agreement, be expanded to cover 90% of the population within a few years.

It is perhaps the success in the professional market which led designers and manufacturers to offer similar facilities to people with CB radio sets. Things have advanced though from the early attempts with slow digital waveforms taking several seconds to transmit the coded signal, often failing because a noise pulse appeared half-way through.

Several distributors deal in selective calling devices, either as add-on units or as integral parts of sets, indeed complete systems can be ordered and are used widely by land-owners, farmers and small businesses.

The 'Cat Call' from Catswhiskers as reviewed in this magazine demonstrates the more sophisticated options available, although there are far more simple, and presumably cheaper devices on the market. The Cat Call uses a digital pulse train of pulse modulation with the coded signal continually transmitted up to thirty times in one second — it is therefore more likely that the receiving unit



A typical sel-call system

ING EXPLAINED

The Cat Call from Catswhiskers



will successfully receive one of these calls and react.

Add-on units are available from Catswhiskers although there were, we understand, initial fitting problems with some dealers and 'in-house' fitting is preferred. A unit for the increasingly popular 934MHz band is on its way and currently undergoing research and development. This will probably employ the already tried and tested design currently in use which allows

the set to remain 'asleep' whilst turned on with its receive amplifier muted until the correct code out of the 160 is received. The amp is released and a warble sounds through the loudspeaker or PA horn if fitted.

An extension to this idea is marketed for the farming trade, with many devices operating from a single control this has already shown itself to be a valuable asset in contacting labourers out in their tractors away from the farm buildings. After the two-tone initial call has been made, a confirmation is sent saying whether the vehicle has been turned-off or is empty. The first call can then be cancelled and another initiated. Whilst there would be inherent problems in using this in urban areas, it is used successfully on large estates up and down the country where the channels are much quieter.

If you are already the proud owner of a rig, an add-on tone calling system may prove the simple answer. Datong of Leeds produce two such units. The first is called Code-call and is just an oscillator which is held-up to the microphone during transmission. A modulated tone is then produced from some 4,000 combinations set-up on user-operated switches.

The second and more refined system is called Tone Squelch. This inserts a low-level tone on the speech which, if identified by the receiving station, will open the receiver path. Built in a small (approx 6" x 2" x 1") box, a few connections are required to the microphone socket and internal workings, then the control box can be concealed. These tones would undoubtedly prove annoying if accompanying the speech so there is a filter which removes the tones, after detection, before the speaker stages. Certainly a simple installation; with the possibility of a group of people having their own common calling tone.

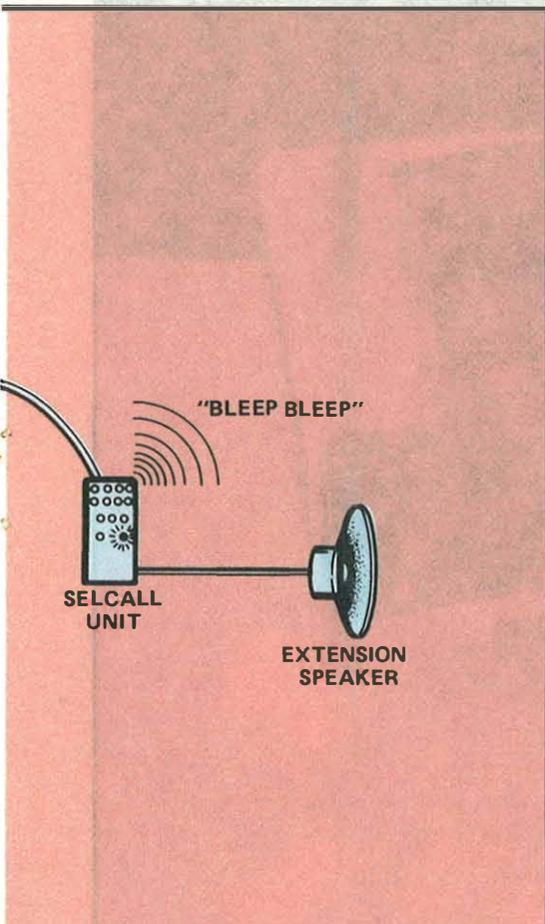
Electro-Medical Supplies have put a great deal of time, effort and money

into the idea of sel-call; their range of literature on the subject demonstrates this. Applications apart from calling are also suggested with a complete intruder alarm system for game-keepers and property owners. Called Elektro Zone, EMS are agents for this system which is really an outdoor all-weather electronic sensing device operating up to 200 feet from its location. It seems compact and is silent when activated so that the intruder is not aware of the detection. On sensing, an encoded signal is transmitted to a small remote receiver and operates within a two mile radius. The detection is then acknowledged by a call from the receiving unit and will alert the user if the intruder again passes through the detection area.

The list of applications is almost endless and the unit together with similar models in an extensive range can be used to cover buildings, vehicles, trip-wires, caravan parks as well as areas of open countryside.

EMS don't stop at alarms though, they include a range of complete selective calling 27MHz sets allowing the installation of systems for farmers and alike at relatively low cost compared to other options, and of course the licensing is simple and frequencies already allocated. Using the existing 40-channel 27MHz CB band, the sets include base stations, mobile units and portables.

With in-house modifications, the sel-call facilities are incorporated on front panel controls to include a buzzer which is activated upon calling. The sets also signal if a vehicle has been parked and the occupier has left so that more time can be allowed for a reply; the call would be heard through the horn mounted on the vehicle. These radios can all be used as normal CBs if required although a protection device can be included to make sure that the rig is monitoring the correct frequency and not being used for general chatter during the working



day!

A number of amateur radio transceivers are being imported with sel-call fitted; with others this is an optional extra. The system used here is Digital Coded Squelch which can use sequential tones to lift the squelch of a particular receiver allowing the operator to hear conversations, rather like the PMR equipment mentioned earlier, although radio amateurs have to obey the clauses of their licences which do not make provision for such things, they were not about when the Wireless Telegraphy Act was passed in 1949.

The commercial tele-type systems MICROTOR and CMTOR employ calling systems; built in to their wonderful system of error correction is provision for identifying the station being called. If you tune around the HF bands these transmissions are recognised by short bursts of warbling tones. These are actually the two machines (computers) communicating with each other. Groups of letters are sent which have to be acknowledged by the receiving machine before any more data is sent.

Ships employ similar signalling methods which are certainly far ahead of the standard Baudot tele-type operation, although they have the advantage of being able to transmit to several other stations. In fact they transmit openly, whereas the error-correcting system will work only between two stations at a time, unless what is known as 'forward error correction' is employed.

From these commercial workings radio amateurs devised AMTOR which sends groups of three characters at a time using standard two-tone codes (Murray Code) except that with normal Baudot radio-tele-type each character is represented by five units; with AMTOR seven units are employed. If four or more of the seven are received satisfactorily, the command is accepted and the receiving station asked for the next group.

Thus two computers together with modulator/de-modulators are able to communicate quite unsupervised provided that they are set to the same frequency.

Research and experimentation is currently underway to employ speech recognition selective calling. 'Speech call' is obtainable from most modern day micro-computers and is an interesting area to explore. There are to be expected, a few teething troubles, but in the years ahead this may well replace tone calling, although it is more likely that the two systems will run side by side for a while.



Datong's Codecall 4096

The EMS Poseidon (below)





SELECTIVE CALLING MODELS



"EMS POSEIDON BASE STATION

The only British Base Station designed and built with the following as standard equipment:

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- ★ Mains or battery operation
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More news from around the clubs

CLUB NEWS

Tunstall Breakers DX Club

May I, as secretary, get a mention for our club in your splendid magazine? We started in February 1984 exclusively for the serious-minded DXer who was home based in the Tunstall and surrounding area.

At present we have 26 members, some of which I am proud to say run regular networks (static/mobile) from the Mow Cop and Buxton areas. Our annual fee is £3.50 and this entitles each member to their unit number, full use of the PO Box and a good quantity of envelopes.

In addition to this, all mail is collected daily and delivered the same day to each member's home address, ensuring the quick acknowledgement and return of QSL cards. Finally, may I say a big thank you to all the breakers we have copied and received cards from in the past.

**Landscaper (secretary),
Tunstall Breakers DX Club,
PO Box 316
Tunstall,
Stoke-on-Trent,
ST6 5JP**

Cree Valley Breakers Club

We are organising a Mass Eyeball on Friday 10th May until Sunday 12th May 1985 at Auchenlarie Holiday Farm, Gatehouse of Fleet, Kircudbrightshire. Caravans are available, so would anyone interested please write with a SAE to the address below.

**Salt Tire,
PO Box 1,
Wigtown,
Scotland**

Tango X-Ray

I am writing to tell you about the International Radio Transmitter Group, or the Tango X-Ray club for short, which is a small, but growing, club based in the Biggleswade/Sandy area of Bedfordshire. The club's main principle is that you should QSL 100%. Any members not doing so will be disciplined or may even lose their membership. We are also seeking to compile an international blacklist of non-100% QSLers with the aid of other clubs in our area and possibly nationwide, so non-QSLers beware!

The club has branches in two other

countries at the moment; in the USA, our controller is John Muttillio of New York who holds the call sign 2-TX-01, and in Italy our controller is Paolo or Gorgonzola (call sign 6-TX-01).

The club meets on the last Tuesday of each month at the John O'Gaunt Inn in the village of Sutton, which is between Biggleswade and Pottton on the B1040. Any enquiries about membership will be answered 100%. Please write to the address below. Life membership is available at £5 but please write to us first as we cannot allow membership until we know your aims as a fellow radio operator. The club caters for all modes/all bands operation (even Radio Amateurs are welcome to join us mere mortals!).

**Swiftnick,
Box 136,
Biggleswade,
Bedfordshire,
SG18 0NA**

Kilo Mike Whiskey DX Club

As president of the Kilo Mike Whiskey DX Club, I am writing to ask if you could give my club a mention. We have over 350 members around the UK, including members in 13 other countries. Our aim is simple: to promote worldwide friendship via radio contact, and membership is only open to serious 11 metre DX operators.

We would like to announce through your magazine the KMW DX Contest for 1985. Entry fee is 50p (UK stations) or \$1 (overseas stations). The contest will run from July 1st until August 31st 1985. It will be run on a points basis: one point each county in the UK contacted, five points each country, and all modes of transmission are accepted. Prizes will include plaques, certificates etc and each contestant will receive unit number and ID card if not already a member.

Entry fees must be sent in no later than July 1st, and all entries must be accompanied by QSLs which will be returned. QSLs are to be sent in no later than January 31st 1986. We thank you for the space in your magazine and look forward to holding a successful contest. Entries should be sent to the address below.

**KMW DX Contest,
43 Spencer Street,
Mansfield,
Nottinghamshire.**

Pembrokeshire Coastal Monitors

You may or may not know about the Pembrokeshire Coastal Monitors (PCM). As a member of the West Wales Coastal Breakers (WWCB), you are automatically a member of the PCM. When joining the club, you are given a WWCB number; the same number is used with the PCMs. We do not work a rota system, members just monitor channel 14 when they have the time.

The PCM is set up to offer aid to all on CB or the public in general by offering advice or telephone assistance. It is not our policy to run here and there with gallons of petrol but we can give out a number of the nearest open garage etc.

We are also going to offer a radio communication network for all types of shows, gymkhanas, sports meetings, horse trials, rallies — anywhere, in fact where radio link-ups may help the smooth running of such an event.

We need members to help with such functions, both hand-held and mobile. If you are interested in the PCMs, contact Water Captain 26 as soon as possible so that we can make up a list of members who will be able to attend such events when necessary. We also need a list of people who would be able to attend any emergencies — people such as mobile mechanics, 24-hour plumbers and electricians, all-night taxis and garages etc. All people recommended will be approached by the PCMs for verification.
Water Captain (secretary),
Pembrokeshire Coastal Breakers,
PO Box 49,
St Davids,
West Wales,
Dyfed

DX Club

P.O. BOX 316
TUNSTALL.
STOKE-ON-TRENT.
STAFFORDSHIRE.
ST6-5JP ENGLAND.

PERSONAL _____

T.B.

West Wales Coastal Breakers

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STATION

R..... S..... T.....

DATE..... TIME.....

FREQ/CHANNEL..... MODE.....

MYRX/TX.....

ANT..... MIC.....

WATTS..... MOBILE BASE

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CB CLUB DERBY

Radio Contact DX Group

I am the secretary of the Romeo Charlie DX Group and I would like to make it known that the West Country has a

new DX club, dedicated to friendship and communication, short and long distance.

Our members all agree with and uphold the principles of 11 metre all modes, AM, FM, and SSB.

The club was formed in June 1983 and we are growing steadily, drawing members from as far afield as Canada. All breakers/DXers interested in our club should write to me, enclosing a stamped addressed envelope, and I will be pleased to send details of the club.

Matthew Soper (IRC 15),
Radio Contact DX Group,
PO Box 94,
Exeter,
Devon

Sierra Foxtrot CB Club

We have been in existence since December 1983 and have a paid-up membership of 220. We hold our meetings every two weeks on a Monday evening at 7.30pm at the O.P.T.A. Club, Elton Road, Ellenton, Derby. The place can be easily found, just off the Derby ring road, and it has a

capacity of 300. We have lots of meets, eyeballs, and a disco at every meeting.

Supervisor, (secretary),
Sierra Foxtrot CB Club,
PO Box 116,
Derby

Bravo Echoes DX Club

The Bravo Echoes operate from Broadway and Evesham, and was first formed in October 1983. Our meetings are held every fortnight at the Gate Inn, Honeybourne, We have 46 members which includes five life members.

We have carried out some sponsored modulations, one of which was for the British Heart Foundation. We recently held a darts tournament for the Avon Vale Playgroup, and we are currently working on some ideas for the rest of this year.

Pete The Paint (Chairman),
Bravo Echoes DX Club,
PO Box 17,
Evesham,
Worcs

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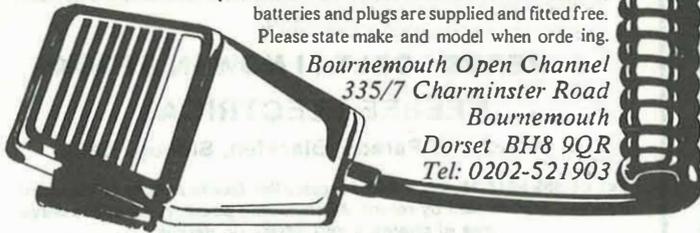
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June 1984	Scanning and Telephone supplement
July 1984	Walkie talkie round-up
August 1984	Audioline 341
September 1984	AR2001 scanner
October 1984	Cybernet 934MHz.
November 1984	CTE antennas
December 1984	Panoramic CB scanner
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AUDIO LINE	340	£40	40	13.8VDC	•			•		•	•	•	•		
AUDIO LINE	342	£115	40	13.8VDC	•						•	•		•	
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MAXCOM	20E	£50	40	13.8VDC	•						•	•	•	•	•
MAXCOM	21E	£50	40	13.8VDC	•						•	•	•	•	•
MAXCOM	16E	£40	40	13.8VDC	•						•	•	•	•	•
MAXCOM	30E	£65	40	13.8VDC	•			•	•	•	•	•	•	•	•



This listing includes most of the rigs available for FM CB. Some rigs are still not on the market, but may be picked up second-hand or may be found in old stock at some shops. The prices quoted are recommended retail prices or typical price — they may vary considerably from shop to shop and area to area.

MOBILES

TX IND. LIGHT	RX IND. LIGHT	CH 9 SWITCH	MIKE POSITION	COMMENTS	ADDRESS	NAME
•			SL		Telecomms, 189 London Rd, North End, Portsmouth	AUDIOLINE
				Report Feb '82		AUDIOLINE
•						AUDIO LINE
			FL		K B & Co Ltd., 202 Cheetham Hill Rd, Manchester	COLT
			SL		Globe, 168 Brooker Road, Waltham Abbey, Essex	COMMTEL
			SL	Dimmer Switch Features		COMMTEL
	•		FL		Roger D, 831 Mansfield Rd, Notts	COMMTRON
			FL			COMMTRON
•	•		FL	Roger Beep Feature		
			SL		Goodmans Loudspeaker Ltd., Downley Rd, Havant, Hants PO0 2NL	CYBERNET
•	•		FL	Report May '83		CYBERNET
•	•	•	FL	Report September '83		CYBERNET
•	•		SL		Telecomms, 198 London Rd, North End, Portsmouth	INTERCEPTOR
•	•		FL			INTERCEPTOR
•	•		FL			INTERCEPTOR
			FL	Great GT868 chassis	Star Warehouse, Chalk Farm Rd, London	JOHNSON
			FL		Roger D, 831 Mansfield Rd., Nottingham NG5 3GF	LAKE
			FR	Report April '83		LAKE
•	•		FL	Report March '83	Lowe Electronics, Matlock, Derbyshire	LOWE
•	•	•	FL	Report November '82	Maggie Electronics, PO Box 35, Andover, Hants SP10 2LG	MAGPIE
•			FL		AM House, 9A Old's Approach, Tolpits Ln, Watford, Herts	MAXCOM
•	•		FL			MAXCOM
•	•		FL			MAXCOM
•	•		FL			MAXCOM
•	•		FL			MAXCOM
•	•		FL	Report Jan '84		MAXCOM



REFERENCE



NAME	MODEL	RETAIL PRICE	NO OF CHANNELS	SUPPLY VOLTAGE	SQUELCH	NB SWITCH	ANL SWITCH	MIKE GAIN	RF GAIN	tone CONTROL	S/RF METER	S/RF LED R/O	HI/LO OUTPUT	PA FACILITY	EX. SPEAK
MERCURY	10 40	N/A	40	13.8VDC	●			●		●		●	●	●	
MUSTANG	CB1000	£49.95	40	13.8VDC	●					●				●	●
MUSTANG	CB3000	£59.99	40	13.8VDC	●			●	●	●				●	●
NATO	40M	£69.95	40	13.8VDC	●			●	●	●				●	●
NATO	2000	£189.95	40	13.8VDC	●	●	●	●	●	●		●	●	●	●
OSCAR	OSCAR I	£85	40	13.8VDC	●					●		●			●
OSCAR	OSCAR II	£49	40	13.8VDC	●					●		●	●	●	●
ROTEL	RVC 220	£50	40	13.8VDC	●					●		●			●
ROTEL	RVC 230	£70	40	13.8VDC	●				●	●		●	●	●	●
ROTEL	RVC 240	£90	40	13.8VDC	●			●	●	●		●	●	●	●
SIRTEL	SEARCHER	£40	40	13.8VDC	●					●				●	●
TANDY	TRC2001	£80	40	13.8VDC	●					●				●	●
TANDY	TRC2002	£70	40	13.8VDC	●					●				●	●
TANDY	TRC2000	£100	40	13.8VDC	●			●	●	●				●	●
TANDY	TRC1004	£79	40	12VDC	●							●			●
TANDY	TRC2003	£130	40	13.8VDC	●										●
UNIDEN	UNIACE 100	£69.95	40	13.8VDC	●					●		●	●	●	●
UNIDEN	UNIACE 200	£89.95	40	13.8VDC	●			●	●	●		●	●	●	●
WESTERN	COMPACT 40	£34.50	40	13.8VDC	●					●		●			●
WESTWARD	P.T.2	£159.95	40	13.8VDC 240V	●					●		●	●		●



NAME	MODEL	RETAIL PRICE	NO OF CHANNELS	SUPPLY VOLTAGE	SQUELCH	NB SWITCH	ANL SWITCH	MIKE GAIN	RF GAIN	tone CONTROL	S/RF METER	S/RF LED R/O	HI/LO OUTPUT	PA FACILITY	EX. SPEAK
AUDIOLINE	345	£139.95	40	240VAC	●			●	●	●	●		●	●	
COMMTEL		£65	40	240/12V	●						●				
HAM INT.	JUMBO	£254	40	240VAC	●		●	●	●					●	●
HAM INT.	CONCORDE II	£154	40	240VAC	●	●	●	●	●	●		●	●	●	●
HARVARD	H401	£149.95	40	240VAC	●			●	●	●		●	●	●	●
HARVARD	WT44		40	BATTERIES	●							●			
KAISER	CBX40	£80	40	BATTERY	●					●		●			●
MAXCOM	7E	£49.95	40	BATTERY	●							●			
TANDY	TRC1001	£119		BATTERY	●					●		●	●	●	●
UNIDEN	UNIACE 300	£149.95	40	240VAC	●			●	●	●		●	●	●	●
WESTWARD	P.T.2	£159.95	40	240V/12V	●					●		●	●		●

MOBILES

POWER JACK	TX IND. LIGHT	RX IND. LIGHT	CH 9 SWITCH	MIKE POSITION	COMMENTS
●	●			FR	Report July '83
●	●			FL	
●	●	●		FL	
●				FL	
●				SL	Report January '83
		●		FL	Cybernet 134 chassis rep. April '82
				FL	Report Oct '83
●				FL	Cybernet chassis
●	●	●		SL	Cybernet chassis
●				SL	Cybernet chassis
●				FL	
●	●			SL	
●				SL	
●				SL	
●				SL	
				SL	Report Nov '82
●				SL	Report Sept '82
●	●			FL	Report Feb '83
●	●			SL	
				FL	Report Nov '83

ADDRESSES	NAME
E.M.S. Communications, Grove St. Wantage, Oxon LX21 7AD	MERCURY
K.B. & Co Ltd, 202 Cheetham Hill Rd, M/cr.	MUSTANG
	MUSTANG
Roger D, 831 Mansfield Rd, Nottingham NG5 3GF	NATO
	NATO
S.M.C. Runbridge St, Totton, Hants SO4 4OP	OSCAR
	OSCAR
Rotel Hi-Fi, 2-4 Erica Rd, Stacey Bushes, Milton Keynes	ROTEL
	ROTEL
	ROTEL
	SIRTEL
Tame Way, Tower Bridge St, Walsall, Staffs	TANDY
	TANDY
	TANDY
	TANDY
	TANDY
Cravenminster Ltd, Unit 8, Ind Est, Llandudno Junct, Gwynedd	UNIDEN
	UNIDEN
Western Electronics, Fairfield Est, Louth, Notts	WESTERN
Westward Electronics, The Mill House, Westward Tuckenhay, Totnes, Devon 086423 336/370	WESTWARD

BASES & PORTABLES

POWER JACK	TX IND. LIGHT	RX IND. LIGHT	CH 9 SWITCH	MIKE POSITION	COMMENTS
●					
				FR	Report December '83. Also comes with telescopic antenna
●				SL	
●	●	●		FL	
●				FL	
					External antenna facility
●					
●					
●				FL	Reviewed August '83
				FL	Report Nov '83

ADDRESSES	NAME
Telecomms. Portsmouth and Globe, Essex	AUDIOLINE
	COMMTEL
	HAM INT.
	HAM INT.
	HARVARD
Globe, 168 Brooker Road, Waltham Abbey, Essex	HARVARD
Telecomms, 189 London Road, North End, Portsmouth	KAISER
A.T.M., AM House, 9A Old's Approach, Tolpits, Lane, Watford, Herts	MAXCOM
Tame Way, Tower Bridge Street, Walsall	TANDY
Cravenminster Ltd., Unit 8, Industrial Estate, Llandudno Junction, Gwynedd	UNIDEN
Westward Electronics, The Mill House, Tuckenhay, Totnes, Devon 080423 336/370	WESTWARD

ANTENNA CHECKLIST

The D.T.I. specs for CB antennas are now more liberal than those originally in force, with the base loading restriction removed to permit any type of loading as long as the antenna is 1.65m in length (or less) and no more than 55mm in diameter. This revised checklist now includes the many new antennas released after this change of heart.

Name
Lists antennas by name and model number and gives you, where possible, the name and address of the manufacturer or distributor.

Construction
The majority of home base antennas are made of aluminium and mobile antennas from stainless steel, but fibre glass can be

CONSTRUCTION	LENGTH	MAX POWER	TYPE	LOADING	MOUNT	PRICE RANGE
AL AL AL AL	1.5 1.5 1.64 1.64	100 500 500 500	B B B B	B B C C	Pole Pole Pole Pole	D E E C
FG SS AL	Various	Various	B M	T C B CW	Various	A-H inc.
SS SS SS SS SS SS SS SS	1.06 1.06 1.06 1.06 1.06 1.06 1.06 1.06	1000 1000 1000 1000 1000 1000 1000 1000	M M M M M M M M	B B B B B B B B	Surface Spring Surface Boot lip Spring Boot lip Mag. Spring Mag. Side Side. Fold over & Quick Disconnect	F F F G G G G G
SS	0.5	50	M	B	3/8" thread	D
SS SS SS SS	1.22 1.22 1.22 1.22		M M M M	B B B B	Stud Trunk Mag. Mag.	D E E G
SS SS SS SS SS SS SS SS SS	1.42 0.61 1.22 1.42 1.42 1.22 1.42 1.22 1.42 1.22 1.42 1.22		M M M M M M M M M	B B B B B B B B B	Mag. Mag. Mag. Mirror Drill Thru Drill Thru Various Various Various Various	G T T T E E D D D
SS SS AL	1.62 1.38 1.66	1000 1000 1000	M M B	B C T	3/8" thread 3/8" thread Pole	C C E
SS AL	1.5 1.5		M B	B B	Various	C D
SS FG SS SS AL SS SS	1.5 1.5 1.5 1.5 1.6 1.5 1.5		M M M B B B B	B B B B B B B	3/8" thread 3/8" thread 3/8" thread Clamp Pole Clamp Tripod	F F F E F
AL AL AL	1.5 1.5 1.66	250 500 500	B B B	B B C	Pole Pole Pole	E F F
AL AL AL AL AL AL SS	1.5 1.5 1.65 1.66 1.66 1.66 1.66		B B B B B B M	B B C C C C C	Pole Bracket Pole Bracket 3/8" thread	D D D E E E

NAME	ADDRESSES	MODEL
AERIAL SUPPLIES	Aerial Supplies (Redditch) Ltd, 6 Widney House, Bromsgrove Road, Redditch, Worcs. (0527 62620/60107)	Silver Star Silver Arrow Javelin Javelin Dipole
ALLGON	Communications, 10 North Street, Strood, Kent.	Various
ARMSTRONG	Stateside Trading Ltd, Audley Avenue, Newport, Shropshire	SAM 10 SAM 20 TAK 10 TAK 20 MAG 10 MAG 20 BDY 20 PEC 20
ARCHER	Tandy Corp, Tamsway Tower, Bridge Street, Walsall, West Mids.	21-904
AVANTI	CB Radio Centre Ltd., 337 Kenton Road, Harrow, Middlesex	AV 241 AV 241T AV 241M AV 241MM
BANDIT	Telecomms, 189 London Road, North End, Portsmouth	B10 B15 B15 B20 B30 B30 B40 B40 B60 B60 B60
BREMI UK LTD.	Unit 6, Innage Park, Holly Lane Industrial Estate, Atherstone, Warks.	B27S C27S HB27S
CB SERVICES	97 Crab Lane, Harrogate, North Yorks.	Bullwhip Knuckleduster
CDMMTEL	Near Third Drive, Fengate, Peterborough	Rocket Shuttle Starlight Shuttle Star Signal searcher Messenger Signal keeper
FREEMAN AND PARDOE	Tything Road, Arden Forest Ind. Est. Alcester, Warks	Invader Thunderpole II Thunderpole III
GAMMA AERIAL PRODUCTS	Lye, West Midlands. (0384 891132/891474)	Skybreaker Avenger Lofty Skybreaker II Avenger II Lofty II Firefly

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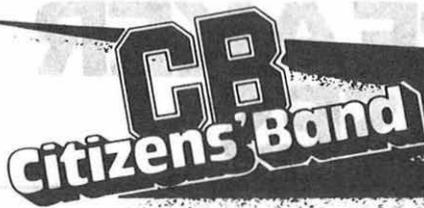
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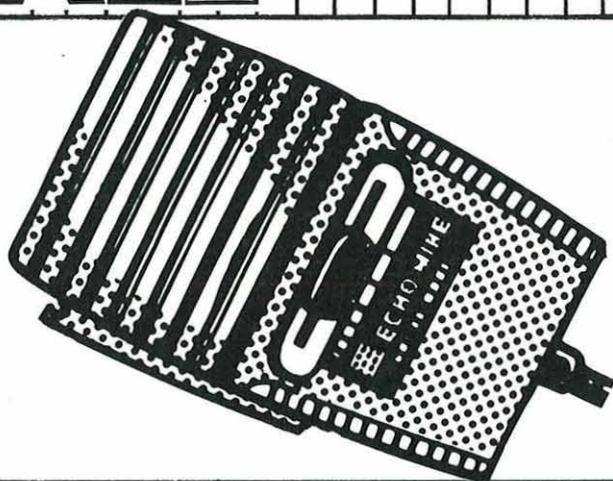


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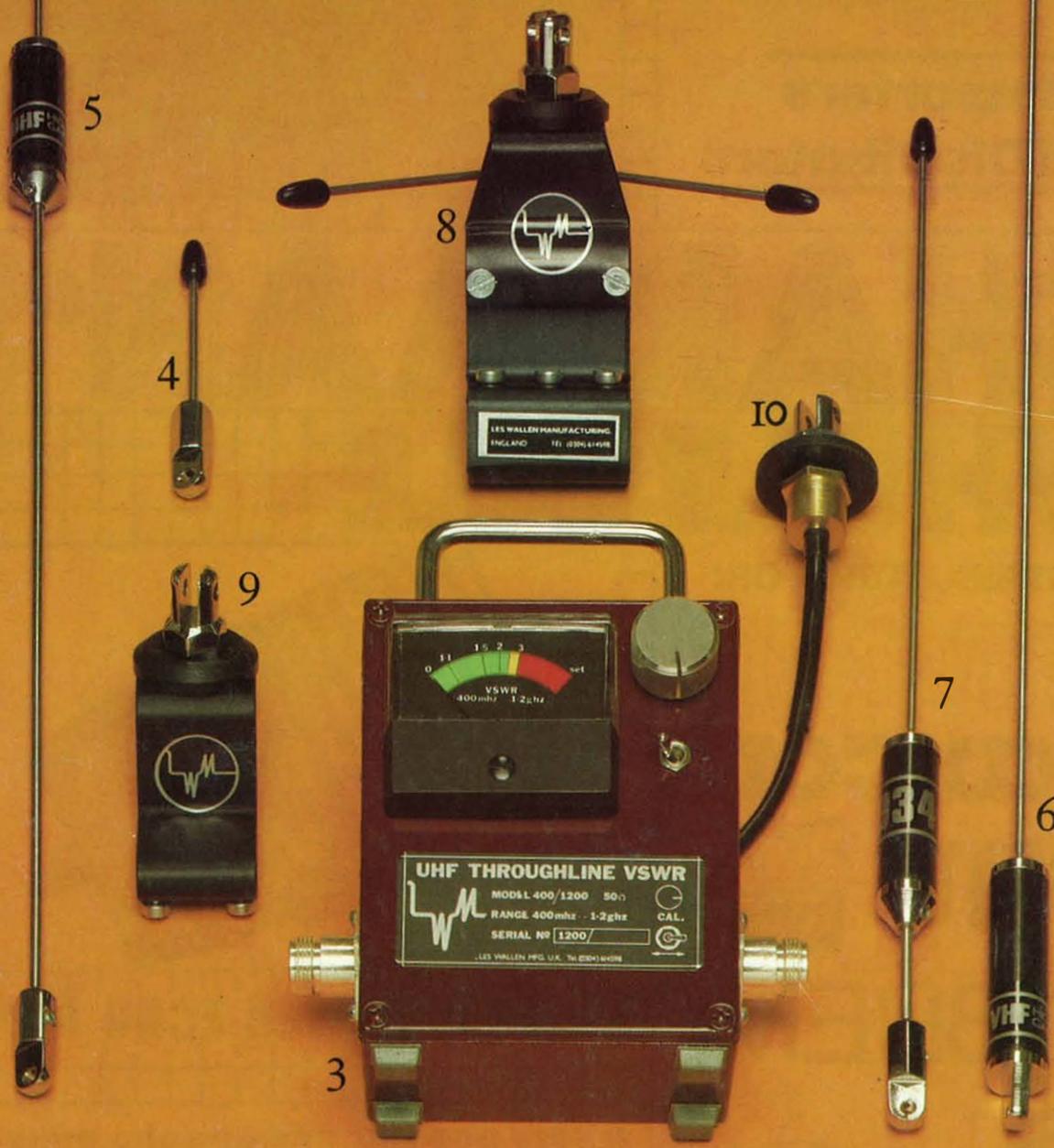
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