

CB World

For Citizens Band users and
two-way radio enthusiasts
DECEMBER 1980 60p



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COME ON!

Number 1 December 1980.

INTRODUCTION

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It is an offence to operate, import or install an unlicensed transmitter in the UK. CB WORLD realises this and points out that it is not our deliberate intention to encourage the illegal use of c.b. equipment. See pages 49-51 for penalties handed out by courts for illegal use of c.b. transceivers.

Welcome to the 'big one' — CB WORLD. This is our very first issue, thanks for buying it, hope you enjoy it. We are not going to apologize for there not being enough information about. There is; one has to get out and about and find it.

Most magazines start off by declaring their editorial policy and readers obviously want to know what side we are on.

Firstly, we make it clear that we, like many members of the public, want c.b. legalized in this country as it is in other parts of the world.

The Government must stop dragging its feet and do something positive. The Green Paper has been out and a response is now needed.

However, we are not going to take sides in the 27/ 41/ 928 MHz issue. We just want c.b. — we can't put it simpler than that.

Secondly, we are not attached to a club or pressure group. We are part of IPC and join the stables which includes such greats as *Motor*, *Autocar*, *Motor Cycle Weekly*, *Amateur Photographer*, *Shoot*, *Cage and Aviary Birds* and so many others it would take up all of this space to list them.

Just to repeat what we are. We are the magazine for everyone and anyone interested in the fun and pleasure that can be enjoyed from using c.b. and two-way radios. Having got that off our chests we will proceed. Oh, one other thing. It is not our intention to encourage the illegal use of c.b. radio. Anyone using an unlicensed transceiver (rig) is breaking the law. They can be fined quite heavily and can have his equipment confiscated.

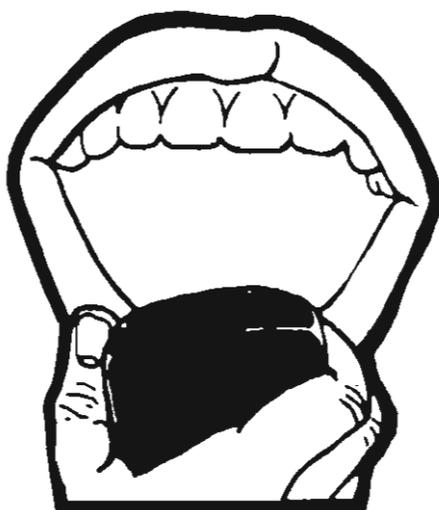
Back to the more pleasant things. We would like you to write to us with your views, comments and stories. In this issue we are asking you to 'come on' with 'handles for towns' 'U.K. c.b. jargon' and letters. The letters reproduced from *Wireless World* should get you going — perhaps we'll ask *Wireless World* to reproduce ours!

So, come on, you good buddies and lady breakers, get those pens out and put your thoughts and ideas on paper.

Club secretaries can also feel free to report on activities (meetings, charities, good deeds) since we intend, in future issues, to introduce 'Club Corner'.

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History of Citizens' Band radio

by James Bryant, President CBA

In the closing months of the Second World War allied agents in occupied Europe were issued with a new communications device: a hand-held u.h.f. transceiver no larger than a box of chocolates. This was a massive improvement on the h.f. transceivers previously used, which had to be transported in a large suitcase and rendered their users very liable to detection. The new radio, a masterpiece of miniaturization for its time, had a range of only a few miles and so was difficult to detect. It was used in conjunction with a Mosquito aircraft, which flew over Europe on a schedule each night collecting agents' information and relaying instructions to them.

After the war, it was realized that similar radios might form the basis of a new sort of two-way radio service which any member of the public might use. The stolid postmasters of Europe, who controlled the radio spectrum in their countries, disagreed, but in the United States the Federal Communications Commission (FCC) recognised the merits of the idea and in 1947 the U.S.A. inaugurated the world's first "Citizens' Radio Service" using a.m. at around 450MHz.

The hand-portable "spy radios" turned out not to be what the public wanted. The majority of users bought mobile (vehicle-mounted) or base station transceivers and the largest users of the service were small businesses, although there were quite large numbers of private users as well. In its first ten years the service saw several hundred thousand licence holders.

In 1953, the authorities in New Zealand instituted a c.b. service at 26 MHz.

When the United States inaugurated

their service the transistor had not been invented but by the mid-'fifties transistors were being manufactured in large numbers and being used in portable electronic equipment of all kinds. However, these transistors could not be used at frequencies as high as 450 MHz and there was pressure on the FCC to introduce a new c.b. service at a frequency which might allow the use of solid-state electronics, with all its advantages of small size and lower power.

In 1958, the "Class D Citizens' Radio Service" was introduced. It used the 27 MHz (11 metre) band, which had previously been an amateur band in the United States, and permitted the use of up to 4 watts of amplitude modulated (a.m.) signal on 23 fixed channels, with inter-channel spacing of 10 kHz (some channels were spaced 20 kHz apart — the missing channel being allocated for radio control). In the ensuing 22 years, the system has changed little — the most significant change being the use of single sideband (s.s.b.) and its growth, in 1976, from 23 to 40 channels.

Although the 11 metre band had not been very widely used, the American amateur community was furious at its loss — particularly to a service which demanded no technical qualifications of its users. For the next decade or so, few American amateurs had a good word to say for c.b. and several amateur magazines made a habit of telling one or two anti-c.b. anecdotes each month. Since amateurs talk to each other all over the world, and American amateur magazines are widely read throughout the world, radio amateurs in many countries came to

regard c.b. with the hatred normally reserved for political opponents. This is the main reason for the radio amateurs' well-known opposition to c.b. Such opposition has now largely faded in the U.S.A., where many people have come to amateur radio by way of c.b. and many amateurs use c.b. regularly to talk to unlicensed wives, girlfriends and families. (If this seems a sexist remark it only reflects the male dominance of amateur radio, as opposed to c.b., which is used by large numbers of both sexes.)

In countries without c.b. the attitude persists and many amateurs still see it as their duty to oppose c.b. "in the sacred name of amateur radio" even though there is now strong evidence that a c.b. service benefits amateur radio in many ways. Fortunately, the attitude is by no means universal and there are many more amateurs whose experience with two-way radio leads them to believe that it should be much more generally available to the public at large. Four of the six founders of the Citizens' Band Association are licensed amateurs.

Following its introduction in 1958, 27 MHz c.b. grew steadily until 1973 when the first energy crisis showed that cars fitted with c.b. were better able to find scarce fuel and avoid the speed traps set to enforce the new 55 mile/h speed limit. C.b. use then grew very rapidly indeed, and there are now well over 40,000,000 c.b. users in the U.S.A. — nearly one fifth of the population.

The growth was not confined to the U.S.A. Today, some 53 countries, including every European country (with the exception of the U.K. and Eire, both

of which have undertaken to introduce a c.b. service), has some form of two-way radio available to the general public. In some cases (France, for example) the facility is inadequate and there is pressure for a better one, but only in the British Isles, in all Europe, is there still no provision at all for public two-way radio. Even the U.S.S.R. has c.b.

Such a repressive attitude on the part of the U.K. authorities is an intolerable imposition upon the right of the citizen to have access to modern technology. In mid-1976 I founded the Citizens' Band Association (C.B.A.) to campaign for a legal v.h.f. c.b. service in the U.K. In doing so I was prompted by three considerations: concern for human rights, a realization of the benefits of c.b. radio, and an engineer's interest in seeing that the U.K. has the best possible c.b. radio system.

I work for a company manufacturing integrated circuits ("silicon chips"!); Many millions of these are exported from the U.K. to Japan, where they are used in the manufacture of c.b. radios for the U.S. market — a real example of coals to Newcastle except that the chips we export to Japan are of lower cost and higher quality than their own manufacturers can supply. My employers are frequently consulted about the best ways to use their chips and my job often took me to Japan to advise on the design of c.b. radios.

I was fascinated at the possibilities which a c.b. system can offer to its users — I was also appalled by the unsuitable technical standard used for c.b.: 27 MHz a.m. The reason for the use of 27 MHz a.m. in the U.S.A. is obvious and reasonable — it was the best standard available when the service was introduced and it is now too late to change it. Many other countries which use 27 MHz, however, seem to have chosen it "because the Americans did".

If this choice had led to an international standard c.b. system then there would be considerable justification for it: people could move around the world on business or vacations and continue to use their own c.b. radios. But this is not the case — with the noble exception of the U.S.A. and Canada, which have identical c.b. standards and allow each other's nationals to operate while visiting, no two countries have exactly the same standards and regulations. There are differences in power, in numbers of channels, in types of modulation, in permitted antennas, and in emission standards. The result is that one cannot take the same radio from one country to another and use it legally.

When the C.B.A. was formed, therefore, the committee discussed frequency at some length and decided that since no international standard was involved, we should consider from scratch the technical standards we would propose for U.K. c.b.

We considered 27 MHz since, because it is widely used throughout the world, equipment might be expected to be more quickly and cheaply available than would be the case at other frequencies. 27 MHz



has a number of very serious drawbacks: it is a frequency which is particularly liable to cause interference to tv and other electronic equipment; it can be used, particularly with the use of illegally high powers which exacerbate the interference problem, to communicate over distances of thousands of miles; and the frequencies are already allocated in the U.K. for other purposes.

27 MHz is near enough to commonly used tv i.f. frequencies to cause interference to many television receivers. It is little use to argue that if the tv were properly designed it would not suffer in this way since few tvs are properly designed in this respect, and any Government which seeks to licence a c.b. service must recognise as much. Furthermore, the 27 MHz signal seems to find its way particularly easily into amplifiers, hi-fi systems and other pieces of domestic equipment and play hob with their operation. Again, they should not be susceptible to such interference, but they are and we must recognise the fact. The a.m. and s.s.b. used in the U.S. system makes such interference worse, and while still debating the frequency we came to the firm conclusion that U.K. c.b. should use frequency modulation (f.m.) because of its lower potential for interference.

27 MHz is a frequency which for perhaps 4 years of every 11, can travel all over the world by ionospheric reflection ("skip"). The purpose of c.b. is not "cut-

rate amateur radio" but short-range communication for the general public. The possibility of long-range communication interferes with this in two ways: signals from far away may, on occasion, swamp local signals (ask any illegal 27 MHz operator for his opinion of Italian c.b.); and in order to talk long distances by skip some people will buy linear amplifiers (or "boots"), which are easily available for use by radio hams on the 28 MHz (10 metre) band, and boost the output of c.b. transmitters to hundreds or even thousands of watts. These high power signals cause massive interference to tv and hi-fi and also prevent c.b. users with the legal power levels from using the service.

Our final reason for rejecting 27 MHz was that this band of frequencies is already allocated for model control and paging. There are over 100,000 users of this band, with an investment of well over £20,000,000, who would be inconvenienced if 27 MHz were to be allocated for c.b.

Instead, we decided that it would be sensible to campaign for c.b. on a v.h.f. or low u.h.f. frequency between 40 and 500 MHz (for the rest of this article I shall refer to this band as "v.h.f." rather than "v.h.f. and low u.h.f." as would be more proper — v.h.f. actually ends at 300 MHz, but it is too clumsy to mention this every time). This range of frequencies has a number of advantages: it contains bands which could be made available for a c.b. service: it does not suffer appreciably from skip (frequencies below 100 MHz are, in just, occasionally affected but those above are not); it uses antennas (aerials) which are smaller and more efficient than 27 MHz ones; with modern techniques transceivers may be made which have high performance and low cost, and ranges of around 15 km (10 miles) may be obtained between two mobile stations.

(These last two features do not seem to be shared by the 900 MHz u.h.f. band proposed in the Government's recent Green Paper on Open Channel. What evidence there is — and there is not yet sufficient to reach a final conclusion — suggests that 900 MHz c.b. will offer ranges of only 1-2 km (1 mile) and that simple sets will cost in the region of £400 each. If either of these facts are indeed true such a service would be quite unacceptable both to the C.B.A. and the general public.)

The C.B.A. was thus established in June 1976 to campaign for a v.h.f. citizen's band radio service in the U.K. We were pressing for a v.h.f. f.m. service and, in view of the large number of radio modellers in our original membership, we were opposed to a British 27 MHz c.b. Although we published a full technical specification as a basis for any discussions I do not propose to spend any time on it except for one widely misunderstood point — our proposals for automatic transmitter identification.

The C.B.A. are frequently accused of

wishing to encourage the Home Office to act as "Big Brother" and monitor every c.b. communication. This is not the case. Our proposal for automatic transmitter identification is a response to the Home Office's claim that it would be impossible to prevent misuse of c.b. If every set were to contain a special silicon chip which sent a unique pattern of tones whenever a transmission was made it would be easy for the authorities to identify a set which had been used to make anti-social transmissions of any kind. Moreover, c.b. users, being aware that they could be identified in this way, would be discouraged from abusing c.b.

Such a chip could be installed in every c.b. set for less than 75p. The Green Paper claims that such an identification system would be very costly: since the electronics needs cost only 75p we must assume that the Home Office are talking about the cost of administration. If the identification code of every c.b. set were to be kept on file, this is true, but if the code is only recorded when an offence is committed and then used to verify that a particular radio was involved the administration cost could be as low as the chip cost. In any case the matter is now of academic interest only, since the Green Paper does not propose the use of auto ident.

After its formation, the C.B.A. announced its existence by means of

letters in a number of newspapers and electronics journals. This led to a steady growth of membership, with occasional spurts following magazine articles and tv programmes, so that today our membership is well over 4,000 with members as far North as Orkney and as far South as Scilly.

We started to press the Home Office for c.b., both directly and via M.P.s at once. The response was firm and negative. The Home Office had no intention of allowing public two-way radio at any time or on any frequency. Early replies, both to members who wrote directly to the Home Office and to M.P.s who raised the question, were worded to give the clear impression that not only was c.b. an unsavoury matter but that anyone who had the temerity to suggest that it might have any benefits was both a rogue and a fool — and probably a dangerous subversive as well.

The climax of this attitude came when Lord Wells-Plestel, Minister of State in the Home Office, answered a question on c.b. in the House of Lords by reminding his hearers that "The Government must recognise the serious disadvantages of allowing large numbers of people to communicate with each other". Shades of 1984!

However, the efforts of the C.B.A. and the U.K.C.B.C. (the United Kingdom Citizens' Band Campaign — the other

national group campaigning for c.b.) were not without effects. In 1976 the media had never heard of c.b. and tended to think that "The Citizens' Band" was something to do with Black Dyke Mill. By 1978, after numerous radio, tv and press mentions of c.b., the C.B.A., and individual members' activities the British public began to notice c.b.

Freddie Laker helped! With the introduction of Skytrain services to the U.S.A. many thousands of people visited friends and relatives in America and heard of c.b. for the first time. Many of them brought c.b. radios back with them and the numbers of "breakers", or illegal 27 MHz operators, rose from a few hundred to thousands and then tens of thousands. Today there are nearly 90,000 breakers in the U.K.

This growth of illegal operation is a mixed blessing. While the pressure of large numbers of c.b. operators ensures that there is constant media interest, it allows the Home Office to claim that, because people who use c.b. commit an offence, all supporters of c.b. are "criminals". This is a real problem. On many occasions the C.B.A. has been refused permission to take stands at exhibitions or exhibit material in public places because "c.b. is illegal and you are lawbreakers".

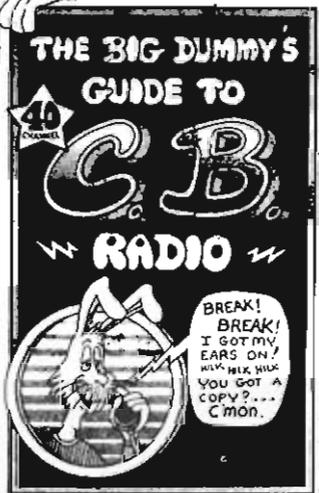
Another problem of illegal operation is that while it arouses a lot of interest in a change in the law it reduces the amount of pressure for it — in general, breakers make poor campaigners because they are unwilling to write letters to M.P.s, the Home Office, or the press lest they be "busted". In the few days since the Green Paper was published we have had hundreds of letters from breakers asking if they can send us their comments to forward to the Home Office since they do not dare send them directly. We shall be happy to do this — letters should be sent to the C.B.A., 16 Church Road, St Marks, Cheltenham GL51 7AN, in an envelope marked "GREEN PAPER RESPONSE". The sender's name and address should be enclosed on a separate piece of paper which will be filed by the C.B.A. and not sent to the Home Office; this enables us to return any reply the Home Office may send.

Between 1976 and the General Election in 1979, our campaign had no visible effect on the Government — the Home Office was adamant that c.b. would never be legalized on any frequency. However, the amount of political interest had grown during those three years from negligible to considerable. This was helped in February 1979 when *Custom Car* magazine published a detailed comprehensive article on c.b. and the C.B.A. sent a copy, with a covering letter, to every single M.P. This aroused a lot of interest and promises from Mrs Thatcher and Mr Whitelaw that, when the Conservatives came to power, they would review the question of c.b. At about this time, too, an all-party Parliamentary Committee was formed by Patrick Wall and Austin Mitchell to work



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within Parliament for legal c.b.

In May 1979, the Conservatives came to power. Almost at once the tone of Home Office comments on c.b. began to change and the C.B.A. took advantage of the election to write to every M.P. again seeking support for an early introduction of c.b.

Naturally enough, there were no immediate developments in the first few months after the election, although Tim Raison, the Minister of State at the Home Office, did reply to a Parliamentary question that he was sympathetic to the idea of c.b., though not on 27 MHz, and was studying the problems involved.

By the Autumn of 1979, 27 MHz c.b. use had grown considerably and many new c.b. clubs had been formed around the country. Most of these were groups of breakers but a number were devoted to campaigning for legal c.b. In November, Keith Townsend of the Midland C.B.R.C. called a meeting of representatives from all British c.b. clubs, under the Chairmanship of Patrick Wall, M.P., to discuss the formation of a national co-ordinating body to keep all the clubs informed and co-ordinate the campaign. The meeting was a stormy one, since many of the representatives of breakers' clubs wanted to campaign for 27 MHz and only 27 MHz. Although this attitude is understandable in view of the investment their members had already made in 27 MHz equipment, it was impractical in view of

the Government's repeated statements that 27 MHz is an unsuitable frequency for a British c.b. service. Politics is the art of the possible, and a campaign for 27 MHz c.b. in the U.K. is likely to fail, while one for c.b. on any suitable frequency is much more likely to succeed.

This has been the view of the National Committee for the Legalisation of C.B. Radio (N.C.L.C.B.R.) since its inception. We are campaigning for c.b. on any frequency which will provide a suitable service, and any club or group who will support such a campaign is welcome to join us. Many of the clubs supporting us want 27 MHz, but the National Committee campaigns only for c.b.

By the end of the November meeting, the nucleus of a National Committee had been formed with Councillor Theo Yard in the chair. In a series of monthly meetings, held at various venues around the country to stimulate local support, the Committee organized a programme of demonstrations and marches which culminated in a mass meeting of over 5,000 people in Trafalgar Square on July 6. These marches and demonstrations served two purposes — they demonstrated to the Home Office that there was massive support for c.b. rather than a few dozen malcontents, and they aided in the recruiting of many more active campaigners.

On May 7, even before the climax of the campaign, the Home Office responded. In answer to a question from Patrick Wall in

the House of Commons, Mr Raison announced that a form of c.b. would be legalized in the U.K. The service would be called "Open Channel" and a Green Paper would be published to promote discussion.

The Green Paper was finally published on August 5. It proposes 40 channels, with 25 kHz spacing, around 928 MHz. Copies of the Green Paper may be obtained, free of charge, from The Home Office, Supply and Transport Branch, Royston Road, Caxton, Cambridge CB2 8PN (a most appropriate postcode!). Comments on the Green Paper are invited by November 30 1980 and should be sent to The Home Office, Radio Regulatory Department, Waterloo Bridge House, Waterloo Road, London SE1 8UR.

Publication of the Green Paper by no means ends the C.B.A.'s task. We must respond to the Green Paper and more campaigning may be needed to ensure that the Home Office reacts quickly when all the Green Paper responses are in. We have already applied to the Home Office for an experimental licence for 928 MHz so that we can decide for ourselves the ranges which may be expected at this frequency.

In short, we expect to be busier than ever over the next 6-9 months. If you would like to help us in our campaign please write to our membership secretary, Pamel Webster, at 16 Church Road, St Marks, Cheltenham GL51 7AN.

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HOW CB WORKS

"What we want is something simple," they said. "You should be able to do that."

There was an implicit choice of attitude here. Either it was a compliment to my skill in writing simply, or it was a gross slander. I chose the first, because I like a quiet life. What was needed, it seemed, was a simple explanation of the personal radio scene, to be read by people who didn't want to be blinded by science and whose involvement with electronics didn't extend much beyond an occasional flick of the on-off switch on the hi-fi.

Bands, channels and frequencies

The first thing to get straight is all this business of names. There's citizens' band, there's open channel and there's a frequency — up until now 27 MHz. It all gets a bit confusing, particularly when modulation comes into it as well. It doesn't matter, of course, what it's all called, but most people will probably feel better about it if they know what all the gobbledegook is supposed to mean.

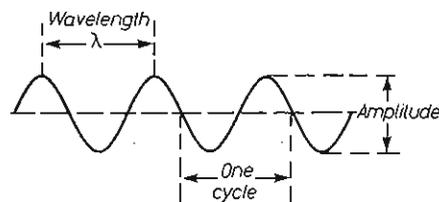
The term *frequency* is the best one to start with. All it means is the number of electrical vibrations per second performed by the *carrier wave* radiated by the antenna (or aerial, if you prefer the Queen's English). There is a range, or spectrum, of vibration rates from a few thousand per second to many thousand million per second which can be used for radio transmission, the number chosen for much of the world's personal radio equipment being around 27 million per second, or 27 MHz. The British open channel is to work just above 928 MHz. This sounds rather a large number, and is in the very high frequency (v.h.f.) range, but is really quite small compared with some radars, which work up to two hundred thousand million, or two hundred gigahertz (200 GHz). It's prob-

ably best to forget about these impossibly large numbers, anyway.

A group of frequencies, say all those between 27 and 28 MHz, are called a band, meaning a band of the whole spectrum, in this case citizens' band. You may have heard the hams talking about the 144 MHz band, which means 144-146 MHz.

More often than not, one hears talk of wave bands, rather than frequency bands. Wavelength, as its name indicates, is the distance a radiated wave travels during the time of one vibration. Waves radiated by transmitters working at around 144 MHz travel just over two metres in one cycle of vibration, and so the 144 MHz band is also called the 2 m band. A 27 MHz wave travels 11 metres in the time of one cycle and this area of the spectrum could be called the 11 m band, though c.b.ers don't often refer to it in this way. If a little mental arithmetic wouldn't upset anyone, you can obtain the frequency or wavelength from the other by working out $300 = fw$, in which f is the frequency in MHz and w is the wavelength in metres. Open channel will therefore be on wavelength $300/928 = 0.32$ m, or around 32 cm.

A channel is simply a channel of communication, working on a band around a specific frequency. If a c.b. set has 40



A carrier wave and its vital statistics. The number of cycles of the wave per second is the frequency.

frequencies which can be used, it is said to be a 40-channel set.

Modulation

When c.b.ers talk about a.m., s.s.b. and f.m., they mean the way in which information is carried by the radiated waves. If just the carrier were radiated, as in Fig. 2(a), you wouldn't hear a thing. Human hearing stops at around 20,000 air vibrations a second; headphones and loudspeakers a little higher. Since this is 1,350 times slower than the 27 MHz transmissions, the result would be unspectacular. It could be made audible by a technique known as heterodyning, but who wants to listen to just one note?

If, of course, the transmitter were to be switched off and on again, information would have been passed, namely that the signal had gone off and on. Do this often enough in a pre-arranged pattern, as in Fig. 2(b), and you have Morse code. Speech is not a series of 'offs' and 'ons' but a succession of increases and reductions in the size, or amplitude, of the carrier according to the size of the speech wave, which is shown in Fig. 2(c). The radiation is being changed, or modulated, in amplitude by the speech waveform and is said to be amplitude-modulated, or a.m. This is a very common way of transmitting information and is used in the medium and long wave bands for broadcasting.

When a carrier wave is modulated in this way, there is no longer just the one frequency present. Other frequencies, above and below the carrier, are formed, as in Fig. 3, and are called sidebands. All the information (speech) is carried in these sidebands and the upper one is exactly the same as the lower, but reversed. Since only one sideband is needed to carry the information, only one need be transmitted, and this is what is done in single-sideband

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HOW CB WORKS

(s.s.b.) equipment. The radiated power that would otherwise have gone into the redundant sideband is saved and can be used for the other. The carrier isn't needed, either, since each sideband can be radiated on its own, so even more power can be saved — much more in this case, because in a.m. most of the power is in the carrier. The only problem is that an ordinary a.m. receiver wouldn't make much sense of an s.s.b. transmission: the missing carrier has to be re-inserted at the receiver, so that the ordinary detection process can take place. If this inserted carrier is not tuned to exactly the same frequency as the original carrier, the audio sounds like either Donald Duck or someone calling from the grave, so that very precise tuning is needed, sometimes with a *clarifier* control.

Frequency modulation (f.m.) is shown in Fig. 4 and is, as you might imagine, modulation by altering the carrier frequency rather than its amplitude. Since a change in amplitude won't have much effect on the signal in an f.m. system, interference is reduced. A special type of detector is needed at the receiver for an f.m. transmission. Open channel will use f.m.

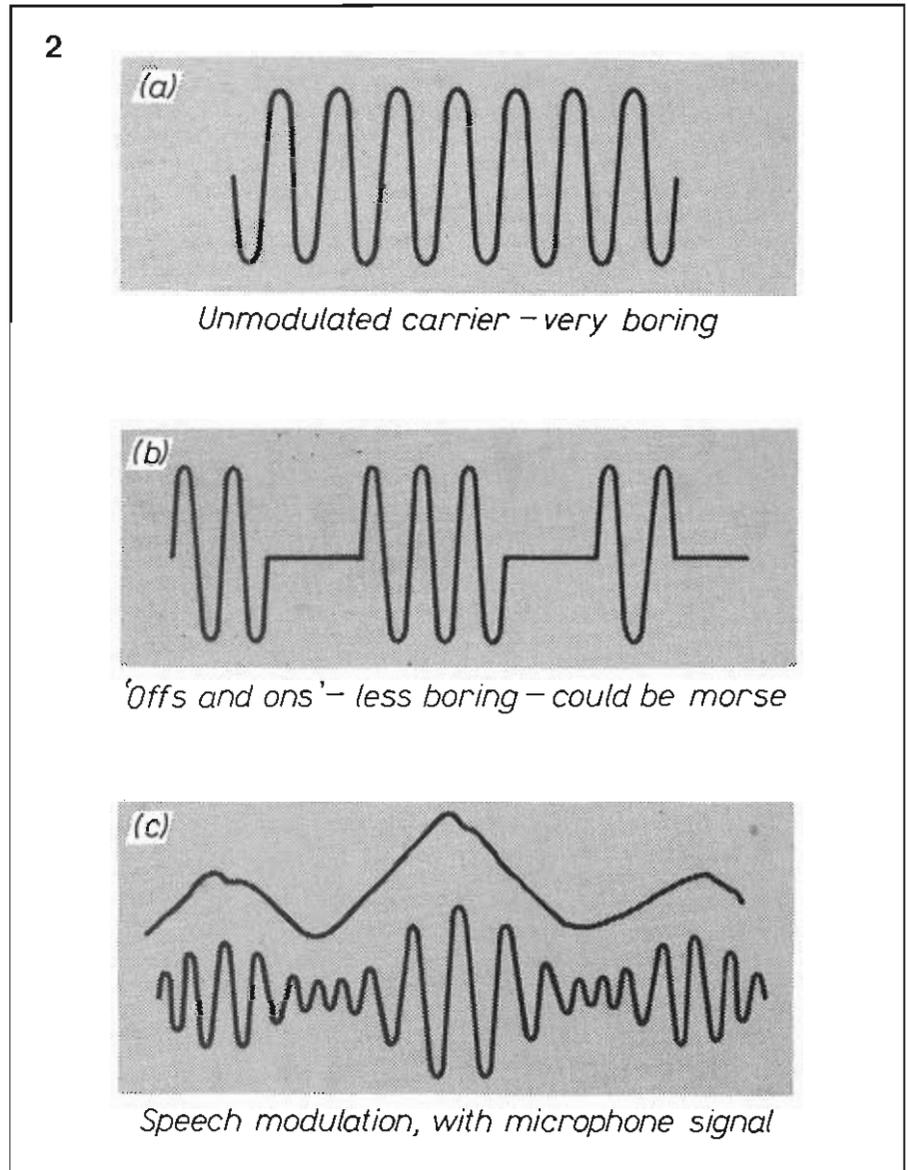
Tuning

You can forget all that business of grinding tuning knobs round and round. When you're looking for Capital Radio on the f.m. band, you have about 20 MHz to go at. Open channel, on the other hand, has a total of 1 MHz, so there isn't much room for error. Instead of expecting you to do it all manually, the set designer arranges the circuit to do it for you, using as its reference a quartz crystal, or several crystals. All you have to do is to push a couple of buttons or turn a switch and the frequency synthesizer inside performs its acrobatics to produce exactly the right frequency, within a very small margin of error. To avoid Pinky and Perky or 'voice from the grave' effects on s.s.b., there is usually a clarifier control, which varies the automatically-achieved tuning by a very small amount — not anywhere near enough to take the tuning out of channel.

Transmitter

To transmit, you need to have a carrier wave, which you modulate when the microphone is used.

The amount of power sent out by the aerial will probably be up to about 25W, which may not sound too much when compared with household electrical gear, but which is rather a lot at 900 MHz. I mentioned earlier that tuning and stability of the carrier wave is quite important, so here we have two incompatible require-



Unmodulated and modulated waves.

ments. Power generates heat, which is not the handiest stuff to have around when you're trying to keep frequencies stable.

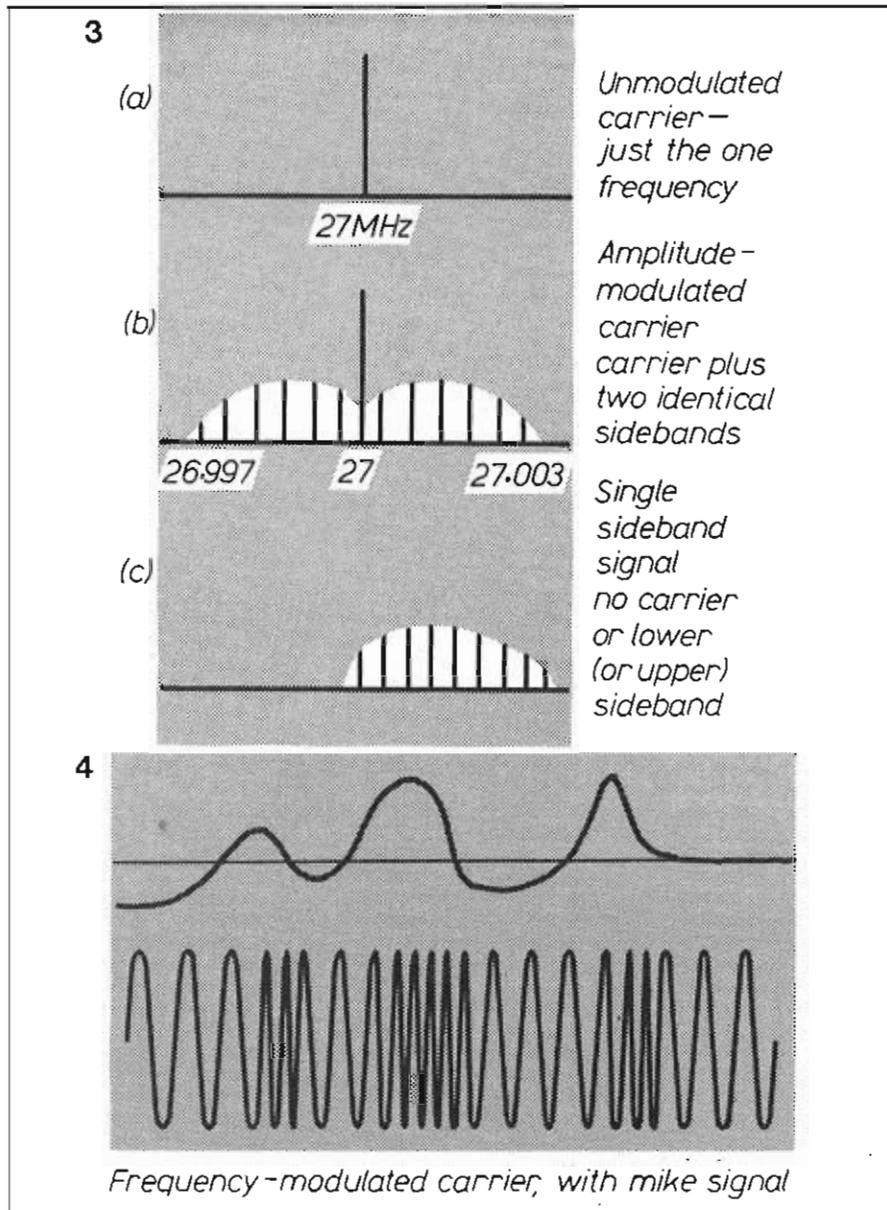
For this reason, and several others which are a bit too bothersome to go into just now, designers don't generate the 928 MHz at high power straight away, as is indicated by the skeleton transmitter in Fig. 5. All the clever frequency generation bit — oscillators, frequency synthesizers and all — works at fairly low power levels so that everything can be handled without too much sweat. When the correct frequency is obtained, by various means, then the power can be increased by amplifiers and the resulting high-power carrier wave passed to the aerial.

Before it gets to the aerial, though, it has to be modulated by, fairly obviously, a modulator, which is a circuit which makes the speech waveform from the microphone and its amplifier (the signal from the mike isn't big enough to do the job on its own) change or modulate the carrier wave in sympathy with the speech going into the mike. The result of all this is a high-power carrier, amplitude-modulated by chat from people calling themselves Blue Knight, Cheeky Beaky and Bald Eagle.

Receiver

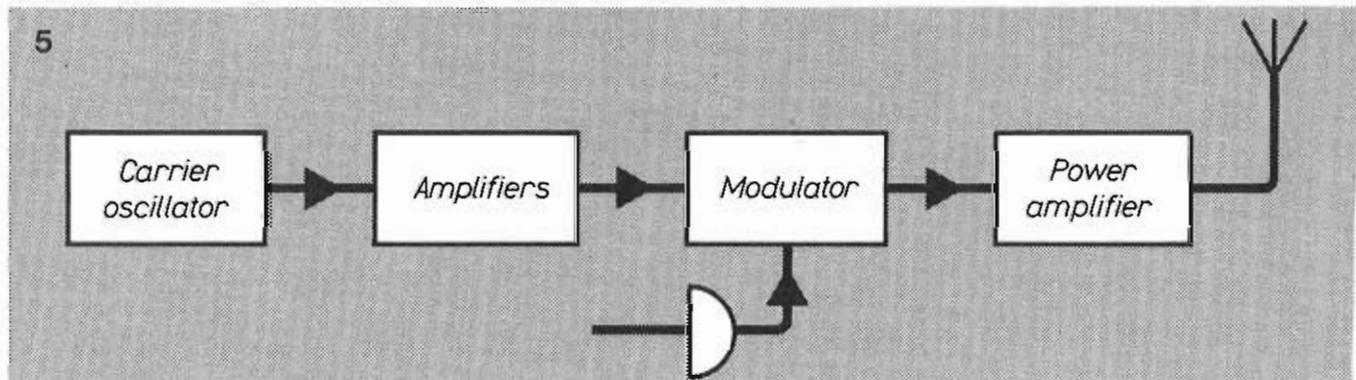
Having optimistically emitted one's amplitude-modulated signal in the form

HOW CB WORKS



Top: Modulating a carrier produces sidebands, but only one needs to be transmitted in s.s.b.

Above: A frequency-modulated carrier, with the microphone output corresponding to it.



The bare bones of an amplitude-modulated transmitter.

of pleas for recognition, one confidently sits back to await a reply, if not several. To receive these replies, one needs, not unnaturally, a receiver.

The amount of signal voltage hooked out of the air by a receiving aerial is minute. Suppose the receiver is 1100 metres from the transmitter and that the frequency in use is 27 MHz: remember we said that the wavelength of a 27 MHz wave was 11 metres. Divide 0.12 by the number of wavelengths between the two aerials (100) and square the result. This answer, about 1.4 millionths, is the size of the receiver aerial voltage compared with that of the transmitter aerial. The above, highly complex, mathematical *tour de force* is really for half-wave dipoles in free space, but it does indicate the order of things: in fact, the received signal will be a lot less than that shown in the calculation.

So, what is needed in the receiver is a fair amount of amplification, or gain, before it can be used. Several transistors, with all their associated bits and pieces, are used to do this, and each one must be tuned (tuning means that a circuit is used which responds to one frequency and ignores all others). If, therefore, six stages of amplification were used (six transistors etc.) one would have to adjust the tuning of each one to receive the signal — not a very practical idea, although it was used in the early days of radio.

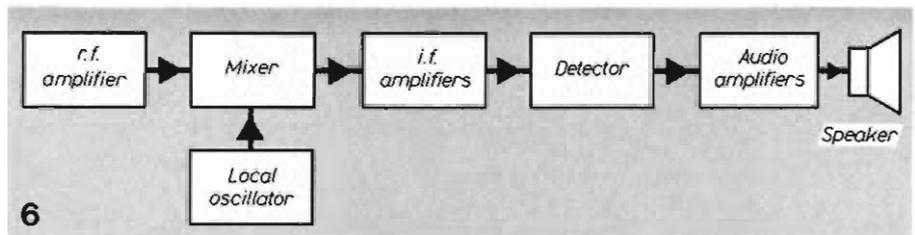
The way out is to use a circuit called a supersonic heterodyne, or *superhet*, for short, a sketch being shown in Fig. 6. One stage of gain, called a radio-frequency amplifier (r.f. amplifier) is used, which may be variably tuned to the signal or broadly tuned to the whole band. After this comes a device called a mixer, which combines the output of the r.f. amplifier and that from an oscillator to produce another signal, which looks like the amplified aerial signal, but is at a lower

HOW CB WORKS

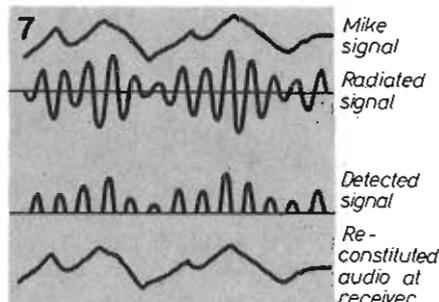
frequency. After this comes a collection of fixed-tuned amplifiers (i.f. amplifiers) which gives more gain still. The advantage of all this is that the amplifying stages do not need to be adjusted for signals on different frequencies — one adjustment to the oscillator, called the local oscillator, will tune the system to a different signal input frequency and give the same frequency out of the mixer to the i.f. amplifiers all the time. The i.f.s can thus be designed to give of their best as regards amplification without regard to variable tuning and only one tuning adjustment is needed — that to the oscillator.

After the i.f.s comes the detector, which retrieves the speech waveform from the signal it became after the modulator in the transmitter. There are many different ways of detecting a signal, and the name is wrong anyway, because it doesn't detect anything, it only removes the redundant carrier from the speech waveform. Fig. 7 gives an idea of the process.

Now the speech waveform has re-emerged, all we want is to make it big



6 A superhet receiver, minus the frills. The only tuning control needed is on the local oscillator.



7 The detection process.

enough to drive a loudspeaker. Since the speech is, by definition, in the audio range of frequencies, the amplifiers needed to do this are called audio stages.

So there we are, then. You generate a carrier wave, modulate it by the speech signal from the mike, amplify it and transmit it. Someone else's set picks it up, amplifies the pathetically small signal, mixes it with a local oscillator signal, amplifies it, detects it, amplifies it again and uses the result to drive a speaker.

It seems simple enough to me. I can't understand what all the fuss is about.

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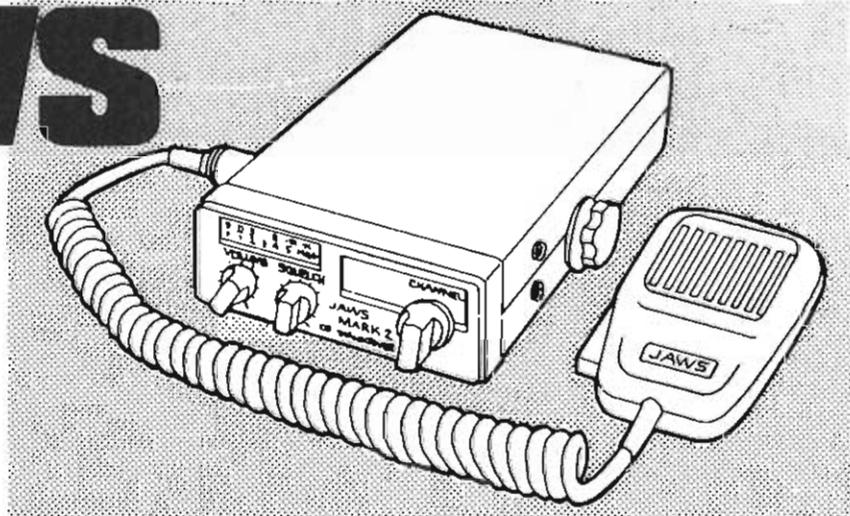
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CB SLANG

get the lingo right for UK. OK

Why use second-hand American, when we can have brand-new English?

Citizens' Band slang originated with U.S. truckers, who used a lot of it before c.b. was thought of. Thousands of UK c.b.ers continue to conduct their conversations in imitation American "truckspeak" and there are few things quite as ludicrous as American slang spoken in a South-East English accent.

There is nothing wrong with colourful, imaginative slang, but there seems to be no convincing reason for a lame, passive acceptance of the U.S. variety. It ought not to be beyond us to generate a decent collection of words and phrases of our own, which mean something here, not across the Atlantic.

Of course, no one will object if you prefer plain English. If you want to get a message across, it hardly seems sensible to

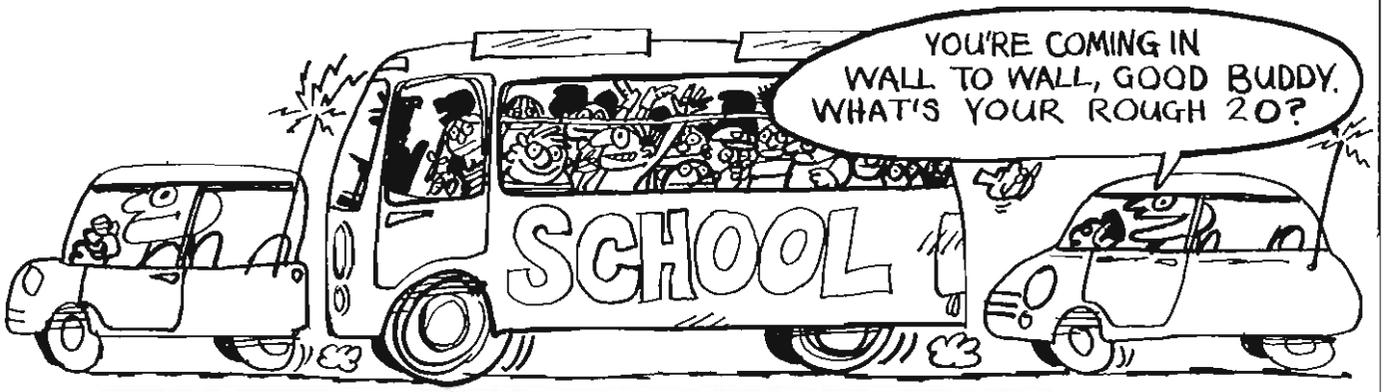
camouflage it in double-talk. But if you're simply out for a natter with another c.b.er then you can have a bit of fun with the language: Cockneys have been doing it quite successfully for a long time now.

Some time soon, there could be a *CB World* code book of home-grown c.b. slang, ready for the time when we can all use our rigs without fear of a Buzby feeling our collars. Send in your suggestions and we'll try to get them in the book, if they're imaginative enough and if they mean something to UK c.b.ers.

The following list includes a few of the code words in current use. Some of them are American, some come from the '10' code and one or two are completely idiotic: whoever it was who coined 'negatory' and 'pository' needs muzzling.



Breaker	Anyone who is a c.b. user.		the meeting on channel and the usual invitation is "Do you fancy an eyeball".	"Come back" and "Bring it Back".
Skip	Word used to describe interference on channel from atmospheric conditions.			
Copy	"Do you copy" — meaning can you hear me or do you receive me clearly. In talking to a new breaker you might say "I haven't copied you before, breaker, have I".	Twenty	This describes your location — home, work or travelling. The usual question is "What is your rough twenty?".	Roger dodge Meaning "I understand what you mean". Also Roger Dee or Rodge or just Roger.
Good buddy	A general greeting between two breakers.	Nine	This is a short version of 10-9 which simply means "Would you please repeat what you said".	Brown bottle An alcoholic drink.
Eye ball	To meet a fellow breaker face to face. You arrange	Come on	Used during a conversation when you want a reply or it's the other person's turn to talk. Also	Doughnut Word used for roundabout.
				Ten one This is used to signify that you are receiving a poor signal.
				Ten four Or just "Four", "That's a four", meaning message received and understood.



Ten nine	See under nine.
Ten ten	Means "Cheerio and good luck".
Black top	Description for major road but not motorway.
Super slab	Motorway — M1, M6 etc.
Smokey	A policeman.
Buzby	Home Office official.
Back door	Distance immediately behind your car.
Rocking chair	The middle mobile breaker in a convoy of three or more vehicles.
Wall to wall	Meaning I am receiving a very loud and clear copy.
Ears (as in ears on)	Referring to do you have your c.b. turned on.
Rig	Description for a c.b. transceiver.
Boots	Word used for an amplifier.
Burner	Same as boots (short for after-burner).
Shotgun	A passenger riding front near seat.
Seat cover	As shotgun, but could be female passenger.
Fur lined seatcover	Female passenger as in shotgun.
Tail gunner	Passenger in rear seat.
Supercharger	Same as boots and burner.
Roller skate	Small car like a Mini, etc.
Pregnant roller skate	Volkswagen, Beetle.
Big wheels	Description for a truck.
Negatory	Means No.
Pository	Means Yes.
Sitting duck	Means you are a 'breaker' operating from your home.
Going down	Finishing transmission.
Wait one	Means please hang on that channel for a moment (when dealing with a traffic problem).

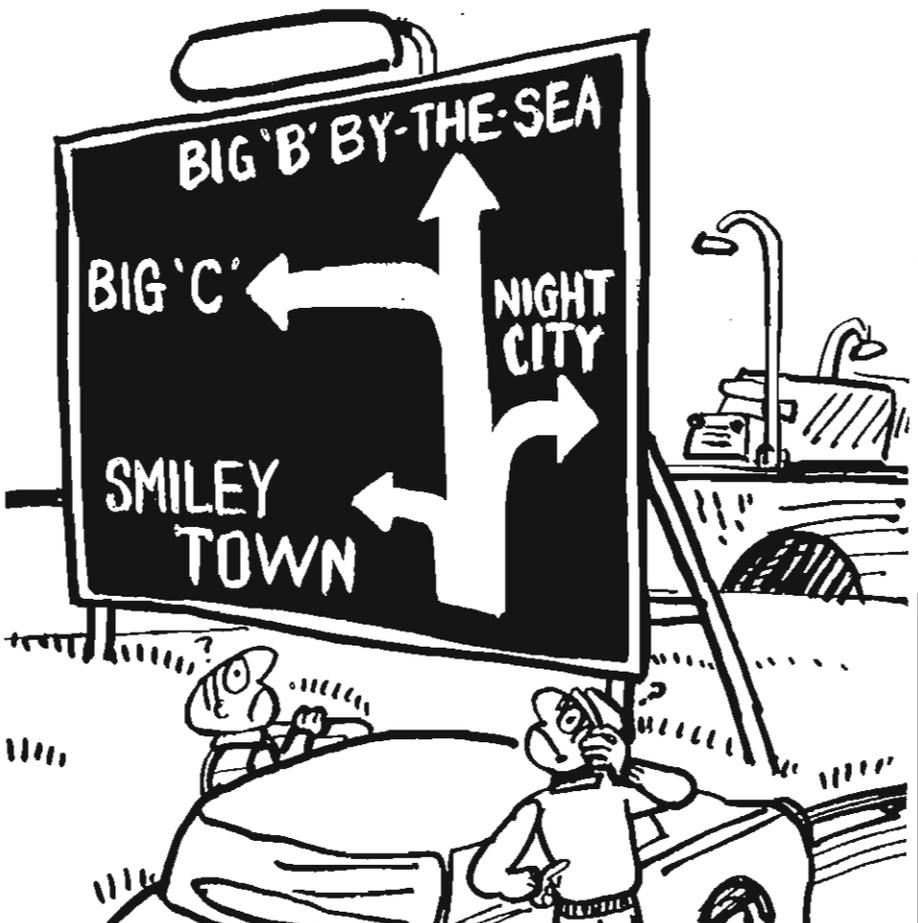
HANDLES FOR TOWNS

We would like readers to write-in giving handles (names) for towns.

As we said in another section of the magazine we are British and as such should encourage the use of our own rich and colourful language. Breakers often describe the town they are near/ in by saying "Big C". If you live in an area such as Sutton this could mean to the "Rubber Bander" (new c.b.er) either Croydon, Carshalton, Coulsdon or Caterham. All of these places are within 5 to 6 miles of each other. We would then, like to encourage the use of handles for each big town. Eventually we will publish a list of acceptable handles in future issues of CB World.

We are told for instance that the following might be acceptable. SMILEY TOWN (East Grinstead), BIG B BY-THE-SEA (Brighton), BIG C (Croydon), NIGHT CITY (Horsham). Again with your suggestions CB World can compile a code book listing most big towns and cities.

So let's hear from you good buddies and send your suggestions on a post card to the Editor, CB World, IPC Electrical-Electronic Press Ltd., Quadrant House, The Quadrant, Sutton, Surrey.



Bring it back

Since this is our first issue, we have not received letters from readers. We thought that it might be useful if we kicked off with a selection of letters reprinted from our sister publication *Wireless World*. In some instances we are including the 'c'mon' reply.

If you wish you can 'bring it back' to these letters but also we would like you to write to us on any c.b. subject and we will do our best to publish your comments. Send your letters to *Bring it Back*, CB World, IPC Electrical Electronic Press Ltd., Quadrant House, The Quadrant, Sutton, Surrey.

ILLICIT CB ON 27 MHz

A number of people have urged the Government to move quickly on citizens' band radio before illicit use of 27 MHz gets out of hand. I have a nasty suspicion that it's already too late. The authorities will never catch these users (they can't even be bothered to catch those who jam v.h.f. amateur radio repeaters continually, where they know the names and addresses of the offenders; how will they catch tens of thousands of illicit c.b.ers?), even with the current wave of indiscriminately stopping anyone and everyone with a non-broadcast antenna on the roof of their car (RSGB cards count for nothing and I now have to carry my licence at all times — not a legal requirement officially).

It's difficult to see what will entice these users on to another band. Certainly, rigs will have to be a good deal cheaper than the £50-£100 black-market price of an American 27 MHz rig smuggled into the country, and I don't see that as being economically viable for British manufacturers as there will only be the home market and the chances of even the EEC adopting a system other than 27 MHz a.m./s.s.b. must be pretty remote. And there'll always be people who prefer the American mode and its U.K. illegality and just want to say '10-4' to each other: they'll never give up 27 MHz. And there's something to be said for international compatibility. My 2-metre amateur rig is pretty useful anywhere in the world I care to go with a reciprocal licence. Would it not be a good thing to standardise c.b. equipment in a similar way? Then there would be a far greater market to encourage U.K. manufacturers (who already make the odd frequency synthesiser for Japan) and the possibility of cheaper rigs. Temporary import controls could establish the U.K. industry, which could then stand or fall on its ability to compete internationally.

What this all comes to is two points. First, 27 MHz will never go

away; the technical problems are easily sorted out and it really comes down to acknowledging that the present thousands are unlikely to leave the band. Either they are legalised or they aren't. Second,

prices for v.h.f. rigs that are above the £50-£100 mark will ensure the continuation of 27 MHz use and will equally ensure that the average 'citizen' won't be able to afford to use his 'band', leaving the way open for a future government to take the said band away 'because nobody's using it; it was never really necessary'. At best, such a c.b. would be little broader-based, socially speaking, than the amateur bands, which are almost exclusively middle-class. U.S. and illicit U.K. 27 MHz activities are totally classless, at least partially, because everyone can afford a rig.

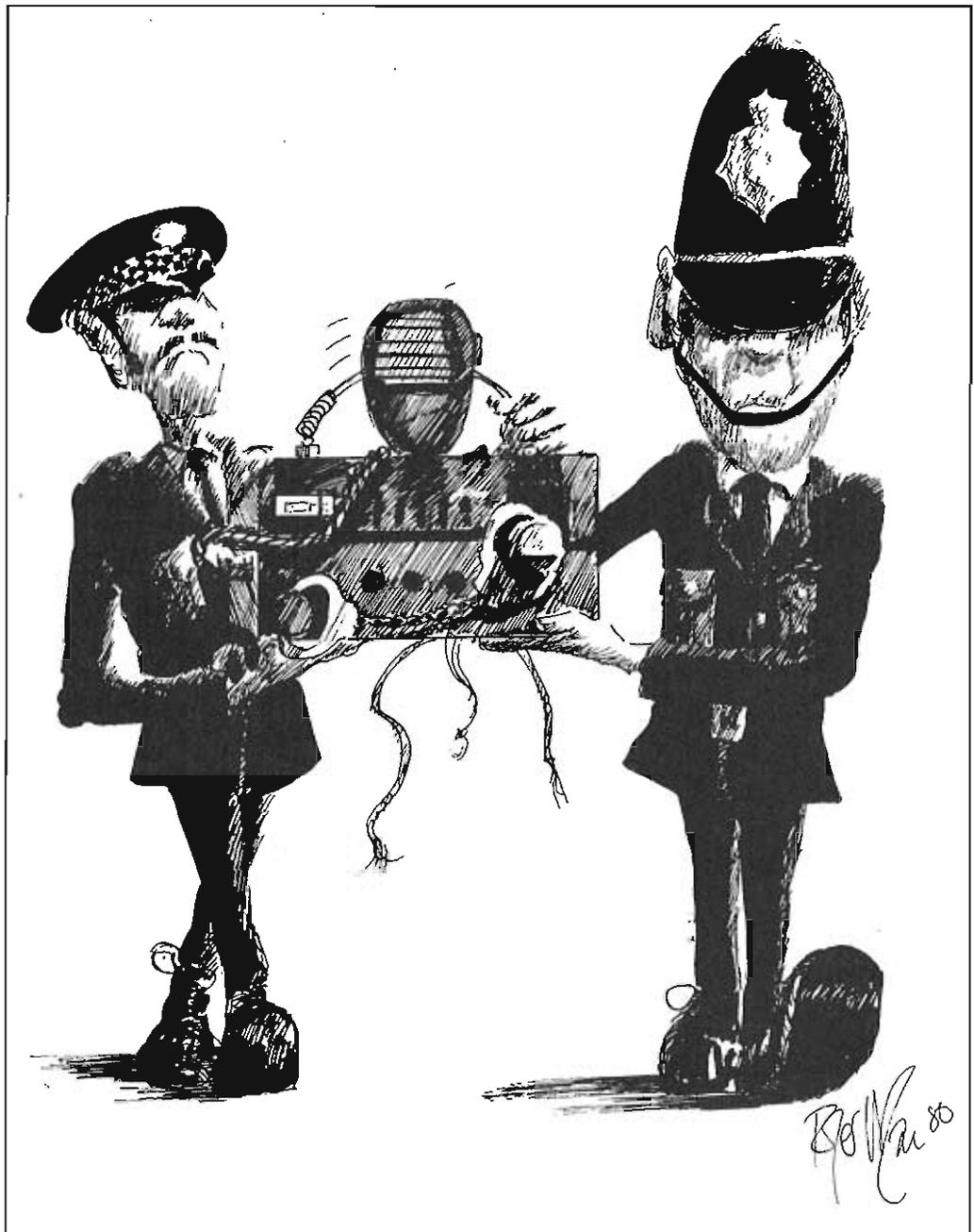
After long consideration we may find that the technical arguments

against 27 MHz — which are very powerful and generally sensible — must be reconsidered in view of the social implications of a v.h.f. citizens' band or indeed any band which requires expensive equipment and isn't already — albeit illicit — in use.

*Richard Elen, G8RJX
Croydon*

UHF CITIZENS' BANDS

Mr Hooper's account (February letters) of the success of the u.h.f. citizens' band in Australia (not the world's first by the way — that



Bring it back

honour probably belongs to the United States, which had Citizens Radio Class A at 462.55 to 462.725 MHz from well before 1973) is interesting in that once again it shows there are several sides to a story and some silver clouds have dark linings.

In Canada we have recently been discussing the possibility of a new citizens' band at 900 MHz. In commenting on this, our Council made a suggestion that if such an allocation is made, the modulation system should be different from that used on other services on adjacent frequency bands.

Our reason for this was that we understand there is a problem in Australia in that cheap equipment produced for the citizens' band is often used illegally on other nearby bands, instead of equipment meeting the proper type-approval specification applicable to those bands. Mr Hooper's comment about the u.h.f. c.b. equipment being used on the amateur bands reminded us of this.

This is not to say u.h.f. c.b. is a bad thing: it certainly is a better bet than 27 MHz, if a frequency slot can be found which does not disrupt other services, and if something is done to prevent the c.b. equipment from becoming the standard equipment for commercial services nearby.

Bob Eldridge
Western Canada
Telecommunications Council
Burnaby
B.C., Canada

POPULATION DENSITY

R.B. Hooper's letter in your February issue is interesting. He's perhaps forgotten about the density of population here. England comes second, after the Netherlands, with 900 people per square mile. Scotland, from where I write, is No. 22 on the world's list, with 170; but even that is heavily concentrated, in its central area. A lot of the rest is mountainous.

Victoria, Mr Hooper's home-state, is Australia's most densely crowded! This happy region has 37 people per square mile, almost the same as Finland! His island-continent is itself at the end of the world's list. As it's roughly the same area as the continent of Europe it can well afford the 'luxury' of citizens' radio, without 'mutual interference'.

With these facts in front of him, Mr Hooper must realise that the authorities here, with a population of around 55 million, view with

some foreboding just how many thousands will apply for this 'privilege'! When was he last here? If so, did he ever have the experience of driving a car through the English Midlands? All the towns merge into one another!

The U.S.A., which he quotes, is No. 27 on the list, with 50 people per square mile! Like Australia, its vast area has undoubtedly made c.b. radio both feasible and necessary.

In most of the U.K. one is within easy reach of a telephone. Our communications system has, fairly recently, been extensively modernised and is quick and effective.

King Canute would have been gratified!

W.C. Ritson
Stromness
Orkney

WORST OF BOTH WORLDS

In reply to W.C. Ritson's letter in your April issue I would like to make the following comments. The c.b. system described by Mr Hooper is u.h.f./f.m. and therefore essentially limited in range. I cannot see the relevance of population density figures which are averages for areas far in excess of the range of the system. Mr Ritson's only other argument seems to be the value and highly questionable statement that "In most of the U.K. one is within easy reach of a telephone". It is surely obvious that the telephone and c.b. radio would provide complementary and not alternative services.

Personally, I doubt if the familiar chaos/abuse/impossible-to-police argument is the real reason for Home Office opposition. This argument, if valid, must apply with equal or greater force to an illegal 27 MHz system, but no serious attempt seems to be made to stop the sale of such equipment. 27 MHz equipment of all types is widely and quite openly advertised. One would have to be naive indeed not to believe that there is already an extensive c.b. network in this country.

By refusing to consider the allocation of the relatively small amount of spectrum space needed for a system similar to that used in Australia while turning a blind eye to the sale of 27 MHz equipment, the Home Office seems to have achieved the worst of both worlds, a situation where c.b. is denied only to the more responsible, law abiding section of the community.

W.J. Williamson, G8MMA
Yell
Shetland

C.B. FOR THE INFIRM ONLY

Much has been said for and against c.b. radio, in the U.K., for a long time now. I have studied the question and find more facts in favour than against. As a paid up member of the R.S.G.B., may I say I am not one of the short-sighted members that can't see the vast good that c.b. radio could do in the U.K., but it must be in the hands of those who really do need it, i.e. the infirm and disabled only.

Many of these people cannot take the Radio Amateurs Examination, for many reasons, and some, given a test paper to do, would just break down. I go along with J. Berry of Bristol (June letters) when he says that far too many of the radio amateurs in the R.S.G.B. are feeling far too high and mighty just because they have a licence. Many amateurs look down on the S.W.L. or on those that can't for some reason pass the examination. As for pirates, there are many in clubs under the umbrella of the R.S.G.B., I'm sorry to say.

Alf Brimming
Lawrence Weston
Bristol

GOOD, CLEAN FUN

After reading your September editorial on c.b. radio I wonder if it is to be future policy of *Wireless World* to provide free publicity for any other type of illegal activity, provided only of course that its supporters claim their number are such as to render legalisation imperative.

I would be happy to provide details of several groups of people at present operating outside of the law who would welcome the support of a long established periodical in order to have their activities legalised. Each of these groups, I am sure, would claim equal ability at least with the c.b. pirates, to meet the qualifying standards apparently acceptable to *Wireless World*.

I am not particularly opposed to c.b. I am opposed however to modification of law by blatant disregard for it. Presumably it should not be too difficult in the near future to secure abolition, for instance, of the driving test, assuming a handful of people can obtain sufficient publicity for their "freedom of the road" philosophy. There is no difference of principle; it is merely a question of degree. Good clean, fun, in fact!

Your (unintended, I am sure) equation of c.b. with some of the current tv programmes may well be apt. But your contention that many megahertz of airspace are occupied by trash, as you call it, as justification for an extension of the situation, is surely as specious as your statement that an argument based on the necessity to legalize the activities of law-breakers "does carry a certain force".

If your editorial is a representative sample of the calibre of the argument being advanced in support of c.b., I find the "Home Office's blank and uncomprehending disapproval" not in the least surprising.

J.D. Pearson G3KOC
New Holland
South Humberside

RIDICULOUS UK

I wonder whether your UK readers realize how patently *ridiculous* your country appears to us when we read of opposition to the introduction of citizens' band radio in the UK ("Mobile CB Dangers" — January letters).

We have millions of c.b. radios operating in North America in everything from baby carriages to giant trucks and airplanes and we hear from the UK that it is socially and technically undesirable!

I. Switzer
Switzer Engineering Services Ltd.
Mississauga
Ontario, Canada

OWNING CB SETS SHOULD BE AN OFFENCE

The mere mention of citizens' band radio in the technical press almost invariably precipitates heated correspondence. However, despite this, one fact seems to be generally overlooked — that certain people do use c.b. equipment within this country and as such are openly flouting the law of the land. Furthermore c.b. sets are both widely advertised and are readily available from several retailers, despite regulations which expressly forbid their importation. Unless action is taken soon it will be impossible to clear the 27 MHz band if and when such a service is legally introduced on more suitable frequencies.

The activities of these c.b. pirate operators cannot possibly assist the efforts of many hardworking

Bring it back

and responsible people who are at present campaigning for a recognised c.b. radio service within the United Kingdom. The apprehension of the 27 MHz and other pirate operators is, however, seriously hampered by the present regulations, and I suggest that only by changing the law to make it an offence to possess radio transmitting equipment without the appropriate operating licences will the situation be readily brought under control.

J. Berry of Bristol (June letters) is mistaken in his belief that the "high and mighty" radio amateur is opposed to c.b. as such. The two services are fundamentally different and each has its part to play in a responsible society. The majority of radio amateurs do, however, take exception to the belief that c.b. should be introduced as an amateur band for unqualified operators, especially so since a radio amateur licence is readily available to any person who has sufficient interest to pass a simple examination.

W. B. Kendal G3GDU
Crawley
Sussex

ANOTHER CANADIAN ON CB

I felt it necessary to write in an effort to assure *Wireless World* readers that not all Canadians are cast in the same mould as Mr I. Switzer whose letter appeared under the heading "Ridiculous UK" in your May issue. Considering the rudeness of the opening paragraph one tends to suspect that the writer is at least to some extent lacking in manners and thus is hardly qualified to comment on what is socially desirable or acceptable.

Mr Switzer implies that as there are millions of citizens' band sets operating in North America it therefore must be a good thing and the rest of the world must follow. This theory that high numbers make anything desirable and good is a very interesting one. In North America we have millions of people with cancer, VD and all kinds of things that in my ignorance I thought were nasty.

One problem of c.b. is the tendency of some people to prattle away with no thought to logic or common courtesy; but then sometimes we get the same thing in a much older form of communication.

C. Henry
Pte Clare
Quebec, Canada

CB, STARLINGS AND EXHAUST FUMES

No sooner do I return from my first visit to England, than my first copy of *Wireless World* appears. And, upon scanning through the issue, I find a letter from my esteemed colleague, Shruki Switzer, defending citizens' band radio (May letters).

Shruki, of all people, should know better than to defend the social and technical desirability of c.b. just because it has proliferated so widely in North America. A similar defence could be made for starlings chlorinated hydrocarbons, and exhaust fumes.

I think that there are excellent arguments to the effect that c.b. radio is wasteful of resources, both spectrum and material, which in some other allocation system (an auction system, for example) might be otherwise used. C.b. may be an amusing technological hobby or pastime, but I have seldom seen it used as an effective communications tool.

Benjamin F. Dawson III
Hatfield & Dawson
Seattle
Washington, USA

EXCLUSIVE CB SYSTEM FOR BRITAIN?

I read with some alarm the letter from Mr James Bryant to the previous Prime Minister (News, April). So Mr Bryant wants Britain to "lead the world into a new generation of c.b. radio". In fact his main objective appears to be to ensure that in the event of the legalization of c.b. in this country a new non-standard system will be specified which will enable an exclusive "club" of British manufacturers to cash in on this new consumer bonanza, the consumer being at the mercy of any mutual "arrangements" regarding prices etc they can get away with. I wonder what Mr Bryant's interests are in all this? Is he in the employ of one of the un-named companies who have stated their willingness to manufacture this equipment? He certainly seems to have some axe to grind against 27 MHz!

As for the suggestion of c.b. on 900 MHz, I cannot see that being at all practical in built-up areas using cheap hand-held equipment. The "identi-chip" method of determining the origin of a particular transmission sounds fine until

one realizes that any electronics "bod" worth the name could easily by-pass or mute its coded output. Assuming that the system was a practical proposition, are we to have yet another computerized monstrosity like the DVLC at Swansea to keep track of all the c.b. sets in Britain?

Britain has always been a country which encourages free international trade. The proposed system seems designed to restrict it.

Finally, are we not supposed to fall in line with the edicts of the EEC in matters relating to the harmonization of technical standards? All other c.b. in Europe is on 27 MHz.

A. Blakemore
Ripley
Derbyshire

*Mr Bryant is employed by Plessey and makes no attempt to conceal this fact. — Ed.

CB ROMANTIC?

Why are so many people against c.b.? It appears that somehow they are afraid it's going to degrade or lower the position of that almighty being, the licensed transmitting amateur. Surely this cannot be, as any citizens' band would not be connected with, or in, any amateur band. I am in full agreement with the people who argue about the interference caused by operation on a.m. in the 27 MHz band. This is, as anyone with basic radio knowledge should know, useless for local or short-haul contacts, the all-round answer being the use of u.h.f. and f.m. An Australian friend of mine tells me that since the introduction of a u.h.f. c.b. band in his country they get better range; also the operating standards of stations seem to have improved.

I do not like the emphasis placed on the American system on 27 MHz in most letters, and in recent programmes on the radio and television. All this talk of "Rubber Ducks", "Smokey Bears", "10-4" etc. has gone a long way to putting people against c.b. It may sound romantic to some, but in my opinion does nothing to help.

In reply to Mr Riley's letter in the January issue, in the controlled experiment it is apparent that the driver was compelled to answer the questions put to him while trying to negotiate a difficult course. Fair enough, but surely in an actual "on the road" situation any sane driver would firstly be moving very slowly, and if called on the radio could say "stand by, I'll call you back". Personally in bad traffic conditions I even turn off my car

set to avoid distraction. As to the reference to inexperienced c.b. users vs. experienced communicators, I think driving experience comes first. Anyway, one only gains experience by being able to do a thing in the first place.

In conclusion, on the arguments that a citizens' band could be misused, you find in all walks of life there are always a few who try to spoil things for others; one can even hear this at times on the amateur bands. Also I think a good c.b. band could be a source of income for the government, i.e. licence fees, VAT on equipment, possible c.b. magazines, etc. — even, as some people have suggested, compulsory membership of a society, such as the RSGB, so there can be some check that you're not being a bad boy. Finally, if anyone does not like c.b., he need not buy any equipment, or even listen on the band, need he.

J. Berry
Bristol

MOBILE CB DANGERS

I would like to add my voice to those of the many (I hope) people who are opposed to the introduction of citizens' band in the United Kingdom.

My reasoning is not so much against the use of home based stations, but against the possible introduction of mobile stations. Communication while on the move is indeed a serious business, and I believe it is frowned upon by our police force. Mobile communication has even prompted research into its effects on a driver's decisions, e.g. an Open University production "Just an accident?" on October 2nd, 1978 was a documentary on research carried out by a university research group. The group was conducting experiments on many drivers, where a driver had to negotiate a course, consisting of driving through two posts. The posts were situated at such a distance apart that the car would either not go through them, and thus knock them down, or they were not spaced so close so that the car would clear them. After a control experiment (i.e. without any communication with the driver) the car was fitted with a transceiver. The driver was then asked to negotiate the course while answering questions. It was found that there was a 40% increase in the number of times each driver tried to get through a gap that was too small for the car.

Bring it back

If these results are compared with those situations a driver usually encounters in a busy city or crowded streets, then I believe if that driver were engaged in communication on a c.b. mobile rig, his chances of having an accident would dramatically increase. This situation would also apply to radio-telephone system and even amateur communications while mobile. I am not trying to abolish mobile communications, but if dozens of inexperienced c.b. users suddenly take to the road I feel the accident statistics would suddenly rise. I think that experienced communicators (amateurs and professionals) should be allowed to continue, but surely the convenience that mobile c.b. might bring is heavily outweighed by the cost of people's lives.

C. Riley
Woodthorpe
Nottingham

ARTIFICIAL TESTS

If Mr Riley is trying to argue a case against mobile c.b. based on danger to human life (January letters), he should produce more convincing evidence than the results of artificial tests conducted by a university research group. I have no statistics to prove it, but I doubt if radio-controlled minicabs, which have both inexperienced drivers as well as mobile radio operators, show an

excessively high accident rate due to use of the radio in heavy traffic.

Surely only the silliest driver will attempt to operate a radio while negotiating a hazard, which requires both hands to be on the steering wheel? The tests referred to by Mr Riley, would, I am sure, produce even more alarming results if the drivers concerned were told to light a cigarette or change a tape cassette, while negotiating the obstacle course set for them by the university.

The point which should be made about mobile c.b. radio is how many lives could be saved by intelligent use of it on the roads. I am at present in correspondence with the Home Minister over this aspect of c.b. radio, in connection with the recent tragic pile-ups on the M1 and M5. I firmly believe that prior warning could have been given in time to those drivers involved if some had been equipped with mobile c.b. The time factor is vital in fog and, under these circumstances, any driver, especially truck drivers, would have the c.b. open all the time; therefore, they would be prepared for advance warning of an accident from any c.b. equipped vehicle a mile or so ahead. This would allow time to take evasive action and also warn other drivers in the vicinity, visually and on the radio, of the situation.

Mr Riley states that police "frown on" the use of mobile c.b. If this is the case, what then is their reaction to the carnage of a motor-

way pile-up, which often includes their own men and vehicles? Police patrol cars on the motorway are just as vulnerable as other vehicles in fog, and are equally helpless in either warning or being warned by other drivers, or of summoning assistance if their vehicles are immobilised in the accident area.

In my opinion, the time has now come for Chief Constables to stop frowning on c.b. and to start listening instead to the conclusions of their own motorway patrolmen; and then make public their views of the benefits that mobile c.b. radio could bring to motorway safety and the saving of human life.

Tanlaw
House of Lords
Westminster

PRESUMPTIONS

Whilst Mr Riley makes some valid points with the help of OU (January letters) he also makes some presumptions, e.g. that a driver using a "c.b." would continue to discuss the evening's menu with his wife, etc., and simultaneously attempt almost impossible trials of judgement on the road. Also Mr Riley feels that accident statistics would suddenly rise "if dozens of inexperienced c.b. users suddenly [took] to the road." This assumes that inexperienced c.b. users would also be inexperienced drivers. Tell that to new taxi drivers.

May I state that, notwithstanding my name, I am English, white and a road user, also I value my life and others. Furthermore, I have had several years' experience on US roads, notably, with about a "dozen" truck drivers who drive the road crew and p.a. equipment belonging to the rock-and-roll group that I work for between every major USA city (many, many thousands of miles). Invariably, if they suspected danger ahead (or behind) they immediately dropped the 'mic' in their laps and coped with the situation, if any, then recontacted. Most importantly the same reaction was seen by myself in the many 17-21-year-olds that I have as friends in Los Angeles and Miami. Incidentally my own (hired) car had everything but c.b. and I didn't miss it.

Mike Januszkiewicz
Ipswich
Suffolk

WHEN NOT TO USE IT

I have been following the controversy over citizens' band radio with great interest. I think my own experience may be useful here.

I must take exception to the experiment reported by C. Riley. When I first bought c.b. equipment, I quickly learned that there are times when one should not use it while driving. Since then, I have primarily used it to monitor traffic conditions on the road ahead of me, and to report any unusual conditions.

C. Riley does not mention that it is acceptable in c.b. usage to interrupt one's conversation to devote full attention to a curve or intersection, and then to return to the radio. To properly simulate this condition, the experimenters should have told their subjects that they were to answer questions, but that they should only do so when the road did not require their full attention.

The experiment, as reported by C. Riley, did not use drivers accustomed to the use of two way mobile radio.

Rather than citing experiments based on erroneous premises done under laboratory conditions, British opponents of c.b. ought to visit the USA and see it in operation. I am sure that any of the hundreds of c.b. clubs in the USA would be glad to show an observer how c.b. actually works, instead of a theoretical model.

Charles Curley
Los Angeles
USA



In these days of ever increasing restrictions and legislation why is it necessary to determine and control the transmitting frequencies of c.b. radios or, as the government would have it, O.C.s? From a radio control model-aircraft operator's point of view the answer is simple — because the present c.b. sets are virtually all operating on, or around, 27 MHz, the frequency band that he uses to control the flight of his models.

It should not be difficult for the c.b. operator to appreciate the difficulties this can cause the modeller: when two people speak on the same c.b. channel at the same time the resulting transmissions are jumbled and unintelligible. In a similar manner, two separate transmitted signals picked up by a receiver in a model aircraft causes chaotic signals to be passed to the servos — operating mechanisms for the

CB and aircraft

control functions of the model.

With a short transmission from a nearby c.b. radio on the identical signal (or within a few kHz spacing either side) the model control will be lost during the period of the 'glitch' — a longer interfering signal will almost certainly cause the model to crash. C.B. transmitters mostly have a greater transmitted output than the legally limited output of the

model transmitter and the ground-to-air range over which interference can occur is considerable.

There are many authenticated cases of models being 'shot down' by c.b. interference and in some areas of the country it is totally unsafe to fly r.c. aircraft because of the degree of c.b. operation. Perhaps it is hardly surprising that some modellers are rather 'up-tight' about the illegal use



Auto 504K — circa 1916-1936

Very large models, such as the half full size 'Pitts' Biplane shown here, can only be flown with an exemption to the Air Navigation Order (Granted by the C.A.A.). Such models are fitted with 'fail safe' devices to cut the engine — but not prevent them from crashing — on loss of the correct signals.



modellers

by David
Boddington

of these outfits on 'their' frequencies. Having actually witnessed, at an r.c. model exhibition with thousands of spectators in attendance, the vowed intention of two c.b. operators "to see if we can shoot some of those b . . . y models down" I can vouch for the irresponsibility of some of the c.b. fraternity.

In this instance we had some highly sophisticated monitoring equipment in

use and were able, by not flying on that frequency, to avoid a potentially dangerous situation. Although simple monitors, to check for interference, are used by many model flying clubs and groups, their use is limited and frequently will only confirm that interference was present *after* the accident.

Radio control model aircraft have been flown since the 1930s but it was only after

the war that the hobby became increasingly popular and there are now in excess of 100,000 licenced r.c. model operators. Equipment, that started as bulky, heavy super-regenerative type outfits, have now developed into highly sophisticated a.m. and f.m. equipment with all of the latest 'state of art' electronics included.

Typically, a modern six function f.m. outfit will consist of a hand-held transmitter, with twin dual-axis control sticks and auxiliary lever or switch controls, a receiver/decoder and electromechanical servos. Rechargeable nickel cadmium cells are normally used for the transmitter and the airborne pack and a mains charger is

Modern radio control equipment for models consist of a hand held transmitter (note the control sticks on the left and right hand sides of the case) a receiver/decoder, rechargeable nickel cadmium batteries, switch harness, servos and, not shown, a mains charger.

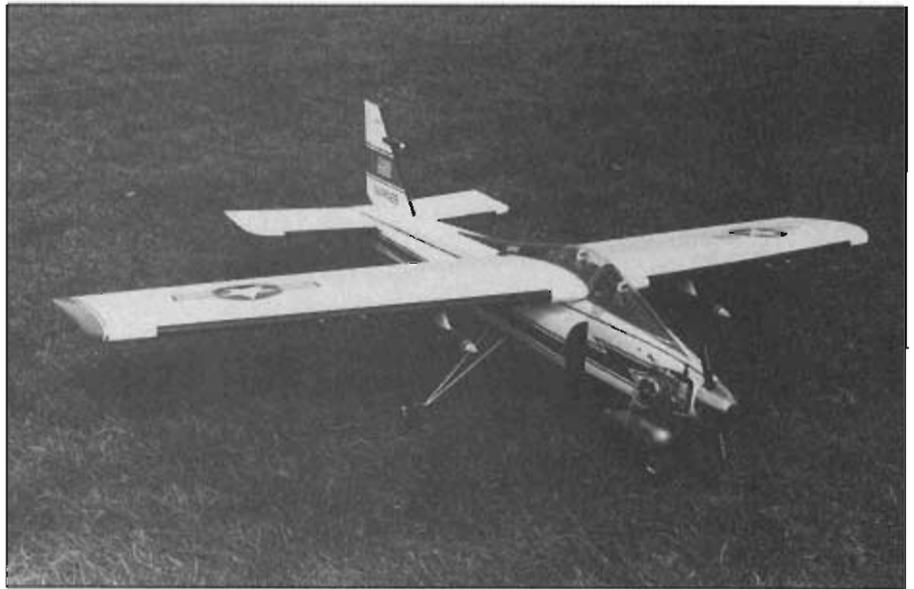


included — the cost would be in the region of £180.00 — hardly a toy! There are cheaper outfits for sale with fewer functions, dry-battery operation and lower quality, but the serious aircraft modeller will certainly be spending in the region of £100 to £200 for a single r.c. unit, and the majority of that cost is 'tied-up' in the model.

No such thing as a typical r.c. model exists as they range from simple gliders to highly complex, perfect scale miniatures of full size aircraft. When you consider that many hundreds of hours may have been spent in creating a beautiful scale representation of an aircraft it will give some idea of the value of some of these models — it may also give some indication of the apprehension faced by the modellers, when flying, at the thought of c.b. interference. Model weights vary from a pound or two to eleven pounds, although there are some specialised models — including commercial models flown for tv and film work — weighing many times these limits.

Even the smaller, lighter models, flying at speeds of around thirty to forty miles per hour, are to be treated with the utmost respect. The Society of Model Aircraft Engineers (the governing body of aeromodelling) have produced a safety code dealing with the safe flying of r.c. model aircraft; unfortunately it cannot legislate against the illegal use of c.b. equipment affecting the model during flight.

Despite having the legal and licensed right to operate our r.c. model aircraft on the allotted 27 MHz frequency band we are by no means free of restraints. Power models (the engines are usually of the glow plug type, using Methanol-based fuels) can be noisy and noise pollution recommendations are quite restrictive. Silencing arrangements for the engines



This typical sports aerobatic model, a 'Gratty', is powered by a 40 cu ins. capacity engine; weighs about 5 lbs and is capable of flight speeds up to 60 m.p.h.

have improved considerably but it remains difficult to find flying sites near urban areas — the loss of control and crashing of models, due to radio interference, is hardly likely to improve the position.

One bright light on the horizon is the possible allocation of a limited frequency band in the 35 MHz range specifically for model aircraft use. Before c.b.ers get the idea that this could leave the 27 MHz band free for their use there are a number of other considerations to be borne in mind:

- This allocation would only be for the use of r.c. model aircraft; cars and boats will continue to use the 27 MHz frequencies.
- There are other users of the 27 MHz band apart from modellers, i.e., police

hospitals, commercial paging systems etc., depending on the specifications agreed.

● It may cost as much as £80.00, depending on the specification to be agreed, to convert many of the existing 27 MHz outfits to 35 MHz operation and, for economic reasons, many modellers will have to continue operating on 27 MHz.

Modellers, generally, are not anti-c.b. as such — they are however totally opposed to its use on the 27 MHz band. Hopefully, the Green Paper discussion document will resolve the c.b. frequency dilemma (I can't think it will ever be referred to as the Open Channel) and no doubt modellers will be among the regular users of the equipment. In the meantime, the illegal c.b. operator should realise that he is just that — illegal — and that the effects on radio control models can be highly dangerous and, from the modellers' point of view, extremely expensive.

No sensible modeller wants a 'war' with the c.b.ers — we would both be the losers — but irresponsibility on the part of the illegal operators will undoubtedly antagonise them to the extent of taking all of the necessary steps to obtain a prosecution. The penalties, as we know, are quite considerable, but frequently less than the loss that may be suffered by the modeller. It has to be admitted that although the c.b.ers can 'shoot down' a model aircraft the reverse is not possible.

However, use a little Sci-Fi imagination and picture the following. The modeller has purchased a high power transmitter, capable of putting out highly destructive 'rays'. Standing outside the house of the illegal c.b. operator he proceeds to 'tune in' to the frequency of the colour television, transmit and blow the set to smithereens! Doubtless the c.b. operator would be rather incensed — is it so different to the present conduct of some of the c.b. fraternity?



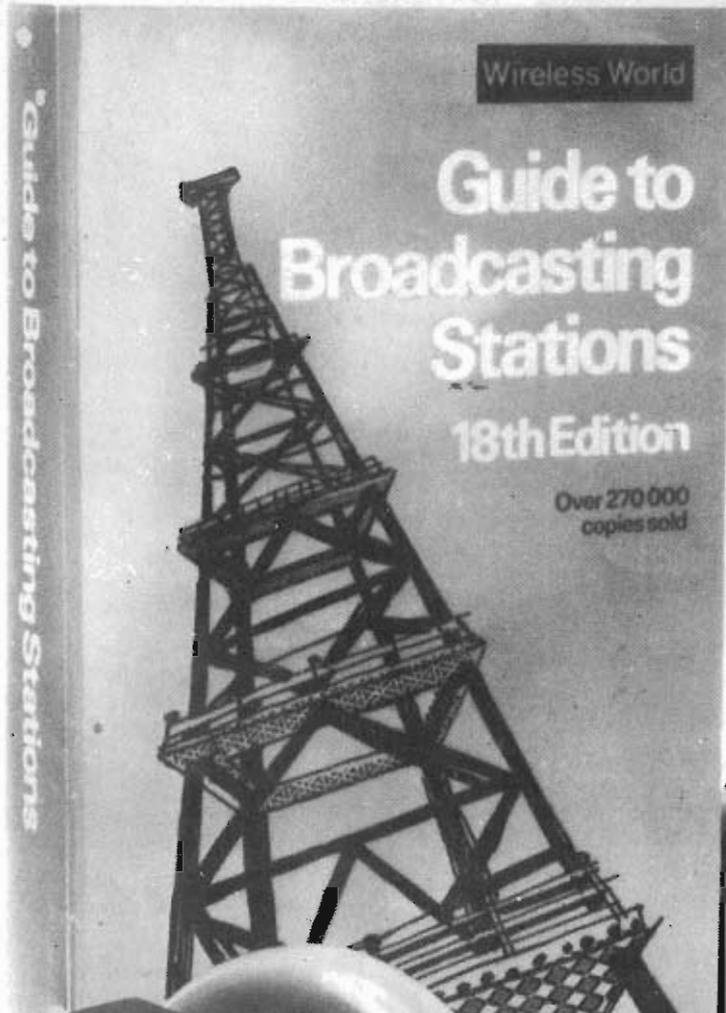
Many hundreds of hours building and finishing is represented in these fine scale models. To crash one of these superb models, through radio interference, is very hard to accept by the builder. Here is a model of DH82A Tiger Moth.

Guide to Broadcasting Stations

18th Edition

Around the world some thousands of radio stations are sending signals. If you're receiving, this standard guide will tell you who's where. It lists stations broadcasting in the long, medium, short wave and vhf bands, dealing with them by frequency, geographical location and alphabetical order. Sections are helpfully cross referenced. The Wireless World Guide to Broadcasting Stations is the eighteenth edition of a publication which has sold over 270,000 copies. In addition to the stations data, it includes much useful information on radio receivers, aerials, propagation, signal identifications and reception reports.

£3.25 inc. postage.

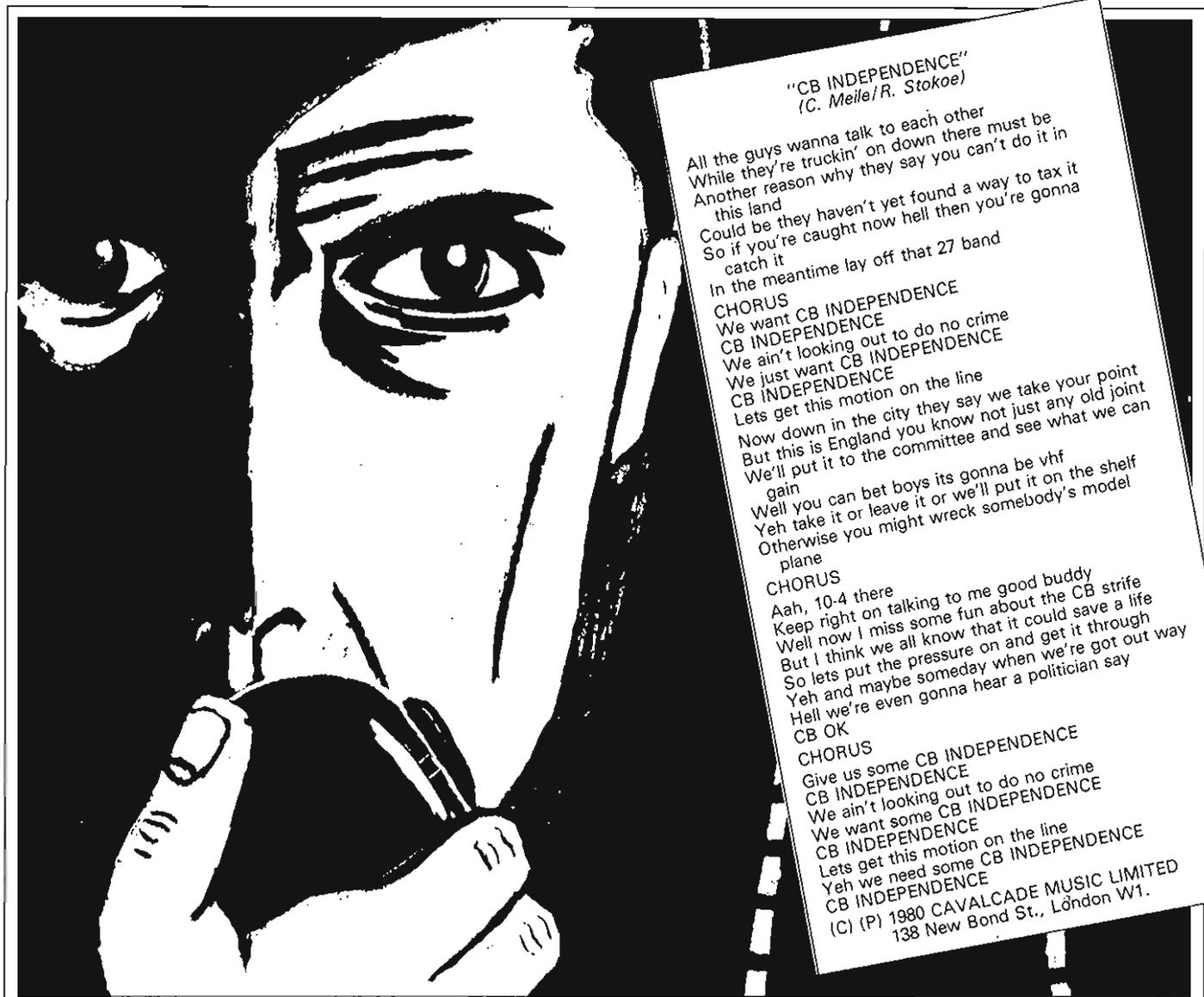


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"CB INDEPENDENCE"
(C. Meile/R. Stokoe)

All the guys wanna talk to each other
While they're truckin' on down there must be
Another reason why they say you can't do it in
this land
Could be they haven't yet found a way to tax it
So if you're caught now hell then you're gonna
catch it
In the meantime lay off that 27 band

CHORUS

We want CB INDEPENDENCE
CB INDEPENDENCE
We ain't looking out to do no crime
We just want CB INDEPENDENCE
CB INDEPENDENCE
Lets get this motion on the line
Now down in the city they say we take your point
But this is England you know not just any old joint
We'll put it to the committee and see what we can
gain
Well you can bet boys its gonna be vhf
Yeh take it or leave it or we'll put it on the shelf
Otherwise you might wreck somebody's model
plane

CHORUS

Aah, 10-4 there
Keep right on talking to me good buddy
Well now I miss some fun about the CB strife
But I think we all know that it could save a life
So lets put the pressure on and get it through
Yeh and maybe someday when we're got out way
Hell we're even gonna hear a politician say
CB OK

CHORUS

Give us some CB INDEPENDENCE
CB INDEPENDENCE
We ain't looking out to do no crime
We want some CB INDEPENDENCE
CB INDEPENDENCE
Lets get this motion on the line
Yeh we need some CB INDEPENDENCE
CB INDEPENDENCE
(C) (P) 1980 CAVALCADE MUSIC LIMITED
138 New Bond St., London W1.

CB INDEPENDENCE

The record "CB Independence" is the result of the adoption of the song/record by The National Committee for the Legislation of Citizens Band Radio Technical and Industrial Sub Group for the legalisation of c.b. radio in the United Kingdom.

The arrangement came about after Richard Town, G.L.C. Councillor, met John Fogarty, Director of Cavalcade Records, and Richard (being a member of the Committee) and John suggested "Why not make a record". The result, "CB Independence".

From the start Cavalcade decided that this project would have to involve the making of an authentic record which would stand up on its own merit. The care and thought put into the project clearly

illustrates this.

The producer of the record is Ron Liversage a well known figure in the music industry, and particularly country music, for over ten years. In that time Ron has been associated with many important country artists and indeed administers the catalogue which contains compositions by one of the foremost country artists in the world such as Don Williams. Ron decided to 'beef up' the sound of 'ROAD-RUNNER 10-14' (Aka Chris Roberts Band) by featuring the legendary pedal steel guitarist B.J. Cole and in addition one of the foremost female vocalists in the U.K. did agree to do the back up vocals on the understanding that she would remain anonymous — guess who she is, breakers!

However, sound and ability alone are not good enough in the competitive record business; other factors including sleeve design are of major importance. Therefore great care was taken in designing the sleeve which is both eye-catching and at the same time synonymous with the subject it is promoting. B. Clough was brought in to design the sleeve for the project.

The results are there for all to hear — a truly outstanding and credible country sound (shades of Johnny Cash) and that is a "big 4 for sure". Mercy sakes good buddies we got ourselves a hit record.

By kind permission of John Fogarty of Cavalcade Music CB WORLD reproduces the words of "CB Independence". You could say that this is "copy" for a breaker.

ANY TALKERS?

John Woolfe Racing is coming in wall to wall with hot news for every CB freak. You know the best CB equipment comes from the States — and that's what we're offering. The most comprehensive and exciting range of American made CB accessories — selected and imported for you by John Woolfe.

There's a lot to choose from and you're going to like what you see.

Write or phone our Work 20 and we'll send you full details and prices.

OK you breakers? Don't wait. Make for the high ground with JWR.



JWR 

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TRUCKIN' AND PAINTIN'

TRUCKS, their drivers and their families belong to a world of their own in the U.S.A. It's an environment that's real, homely, friendly and almost clannish.

Songs are written, records are made and films produced about the myths and stories built around the trucker as he speeds through many states with his enormous load-carrying truck.

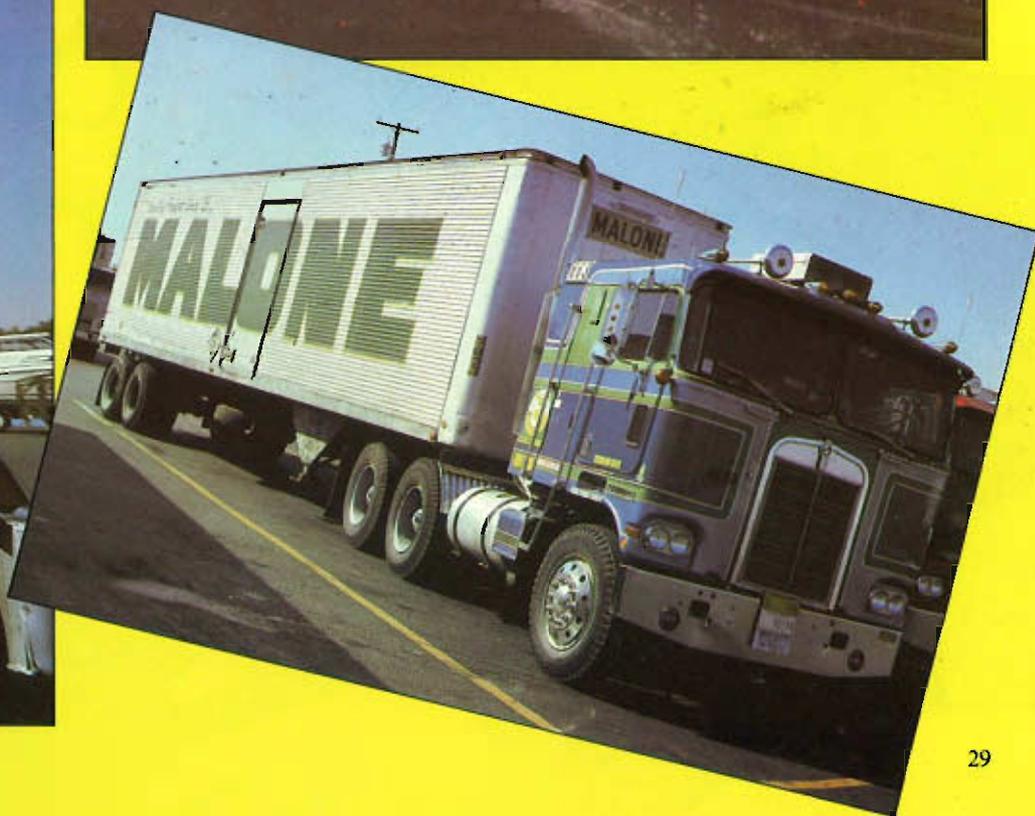
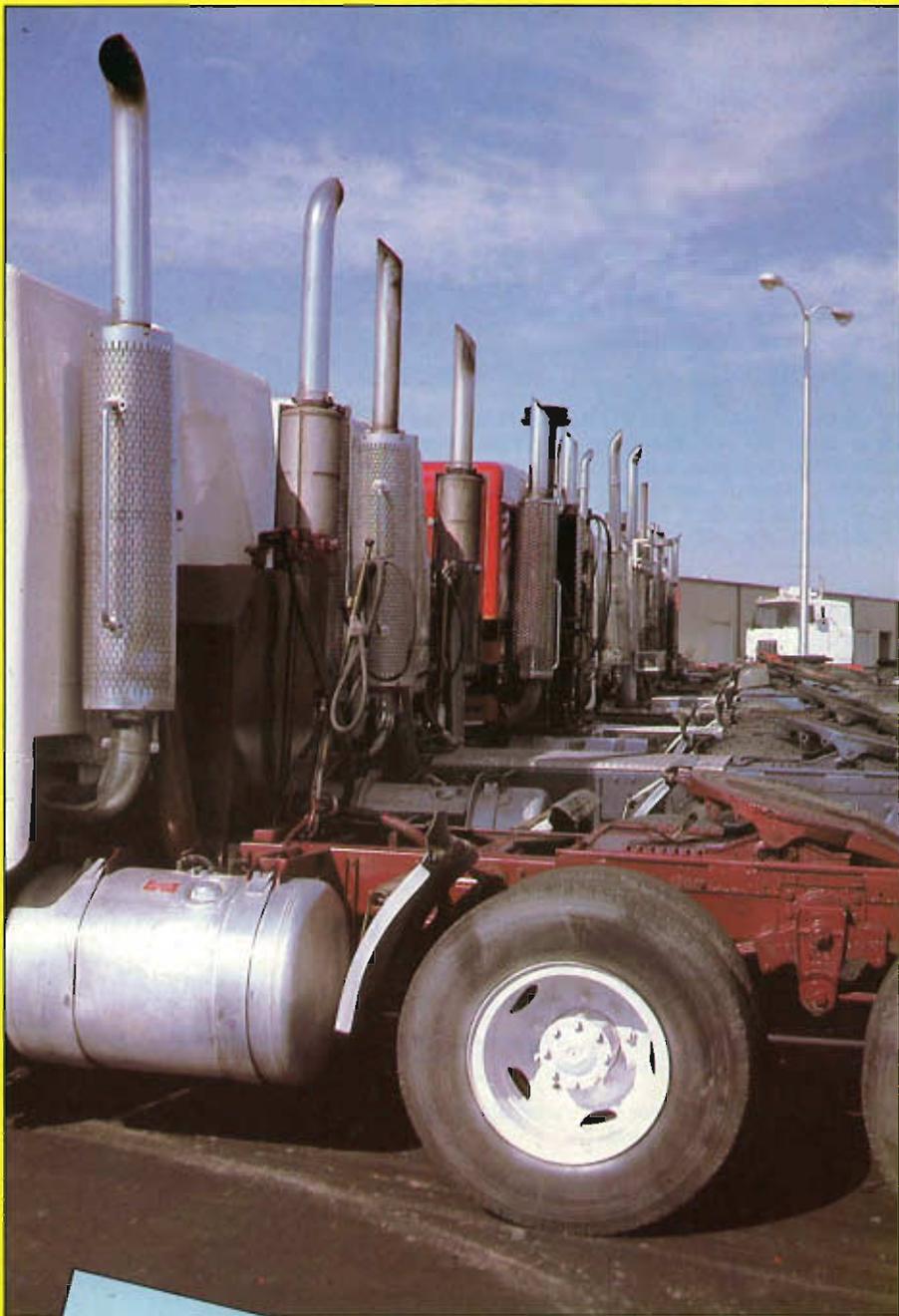
The truck takes pride of place and it's not unusual to see a truck driver go over his vehicle with a leather cloth at a rest stop before he eats his meal. Maybe this goes back to the days before trucks when horses were given a good brush down at the highway inns.

The real reason however is pride. He or she is proud to be driving along state highways in a clean, sometimes mean, looking truck.

Many truck drivers — more likely to be owner drivers — keep their vehicles in trim to such an extent that their driver cabins become virtually extensions of their own homes. This would include mod cons such as stereo, c.b. of course and carpeting which could grace the floor of any lounge.

CB WORLD captures the truck in all its superb glory with these photographs kindly lent to us by Andrew Harris. We may be accused here of not showing British trucks. Well where are they? If readers would like to submit colour photographs we would be very keen to publish them. If we have enough interest we will run a competition based on the best looking UK truck submitted.





T shirt and cap badge

offer

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Please send me the following CB WORLD gear and enclosed find remittance of *£. to cover my order. Cheques and money orders should be made payable to CB WORLD T-SHIRT OFFERS and sent to 10 MARSHALSEA ROAD, LONDON, SE1 1HL.

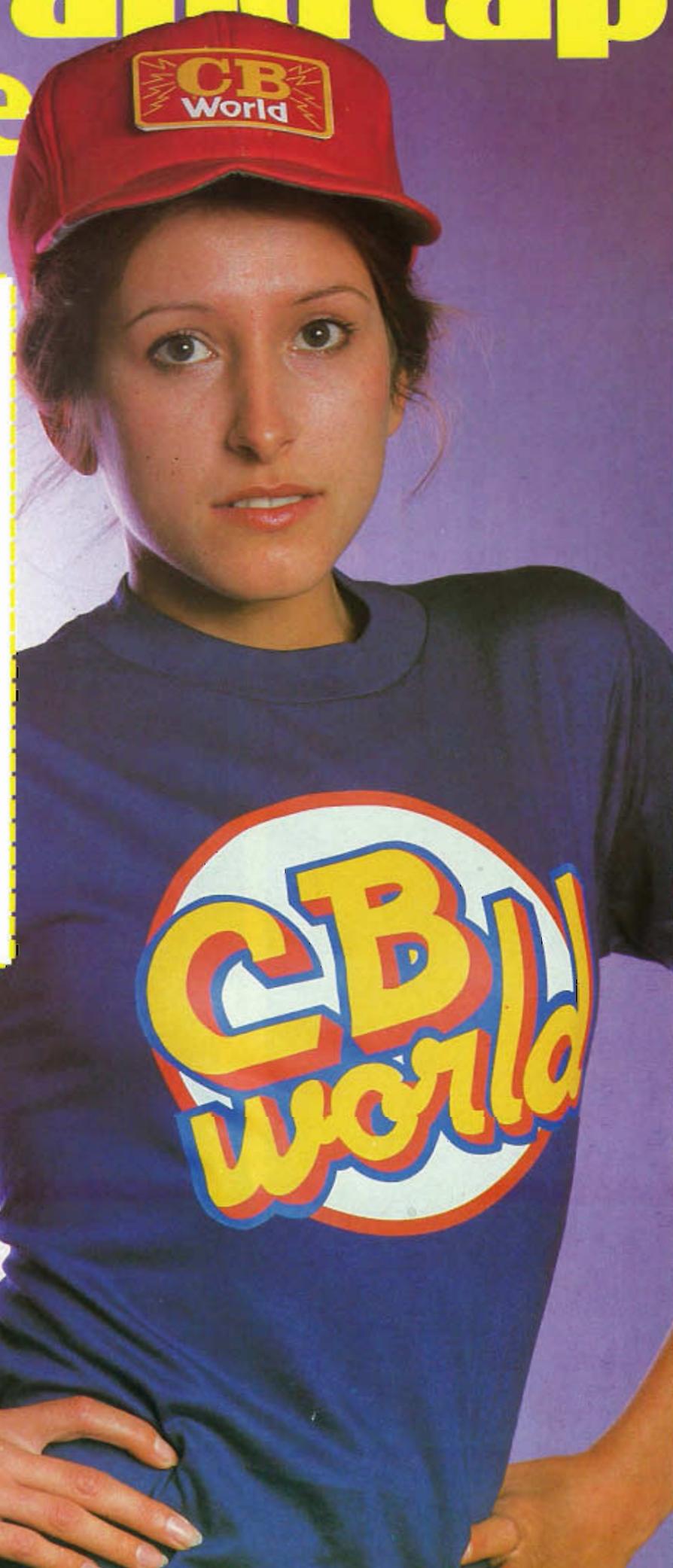
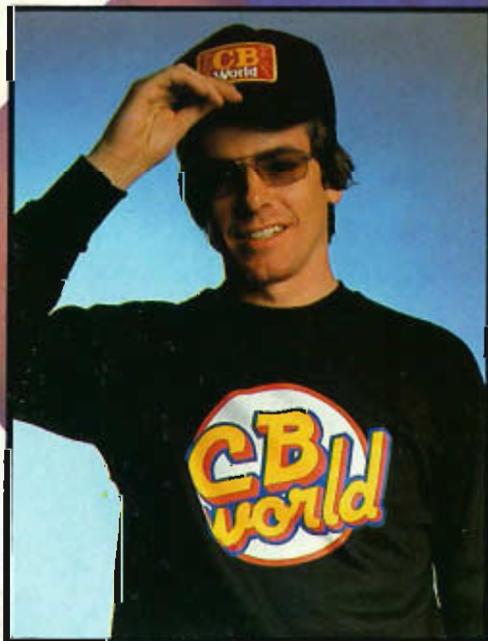
T-SHIRT	<input checked="" type="checkbox"/>	Number Required	
Size 34" - 36"	<input type="checkbox"/>	<input type="text"/>	at £2.95 each = £
Size 36" - 38"	<input type="checkbox"/>	<input type="text"/>	at £2.95 each = £
Size 38" - 40"	<input type="checkbox"/>	<input type="text"/>	at £2.95 each = £
Size 40" - 42"	<input type="checkbox"/>	<input type="text"/>	at £2.95 each = £
LONG SLEEVED SWEAT SHIRT			
Size 34" - 36"	<input type="checkbox"/>	<input type="text"/>	at £6.95 each = £
Size 36" - 38"	<input type="checkbox"/>	<input type="text"/>	at £6.95 each = £
Size 38" - 40"	<input type="checkbox"/>	<input type="text"/>	at £6.95 each = £
Size 40" - 42"	<input type="checkbox"/>	<input type="text"/>	at £6.95 each = £
CAPS (with badge)			
All adjustable			
Red	<input type="checkbox"/>	<input type="text"/>	at £2.95 each = £
Black	<input type="checkbox"/>	<input type="text"/>	at £2.95 each = £
Blue	<input type="checkbox"/>	<input type="text"/>	at £2.95 each = £
BADGES (sew-on)	<input type="checkbox"/>	<input type="text"/>	at £0.50 each = £
			Total of order *£ <input type="text"/>

All prices include V.A.T., postage and packing.

Please send the whole order to my address shown below (please print in capital letters)

Name:

Address:



Folks behind EB

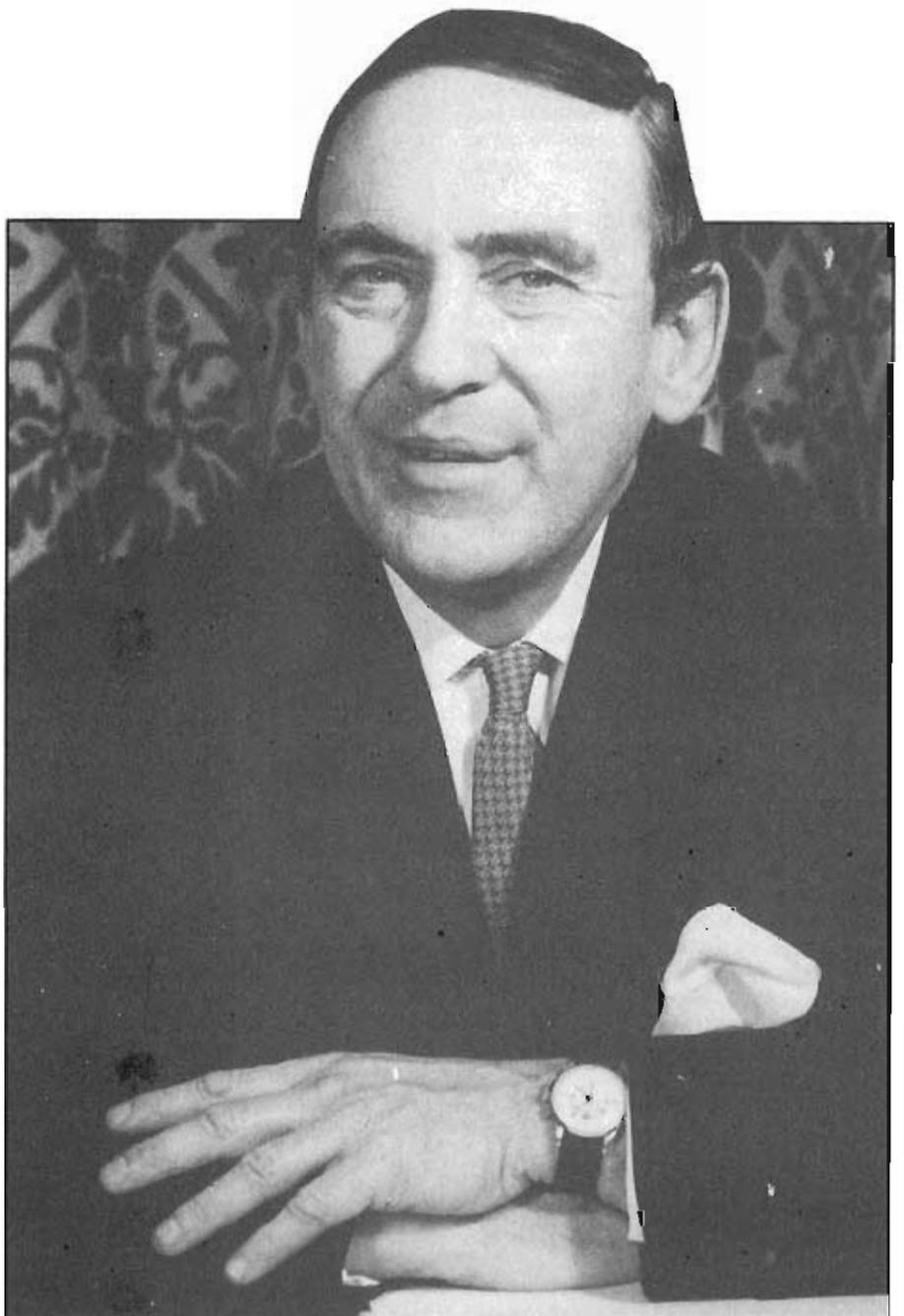
A personal view of people in the c.b. news

Patrick Wall M.C., V.R.D., M.P. (Con., Haltemprice) the intense, experienced backbencher, formed the all-party, parliamentary working party for c.b. radio in September, 1979.

During the lifetime of the previous government, Wall had asked several questions in the House, and demanded action to legalize citizens'-band radio in the United Kingdom from the then-responsible minister at the Home Department (Home Office to us lesser mortals), Dr Summerskill. Time and again, he received that well-worn reply: "Because of the administrative, regulatory and social problems associated with its (c.b.) introduction we remain, on balance, opposed to its introduction in this country." Wall was well stonewalled.

Then comes the adjournment debate. Our hero takes the floor of the House of Commons. Across from Mr Wall is an obviously ill-at-ease minister but, this time, instead of the craggy features of Dr. Summerskill, a fresh face — newly-appointed Timothy Raison, who seems eager to please, but who is aware of his limited technical knowledge. Sensing gladiatorial combat, the public gallery is hushed, as our hero pleads the c.b. case. The minister replies from a Home Office prepared text. It is over. What happened to the cut and thrust of debate? Where was the rapier-like wit and devastating parry?

During that House of Commons debate it was said by the minister that there was no national support for c.b. in this country. The Home Office, through their minister, suggested that during a 'busy weekend' only were heard transmitting. Quite what the difference is between a busy weekend and any other weekend was not made clear. It was also said that the monitoring was carried out



Patrick Wall M.C., V.R.D., M.P.

by units of the Post Office in 'all areas'. It is now common knowledge that a form was issued on the Wednesday morning prior to the so-called busy weekend. Just how the Post Office knew that it was going to be a busy weekend beforehand is again not made clear. The group controllers duly completed these forms with an estimated figure and sent them back. "We're far too busy catching more important sources of interference affecting vital services to worry much over c.b." one keen Buzby told me. "We just wrote in a sensible-sounding figure".

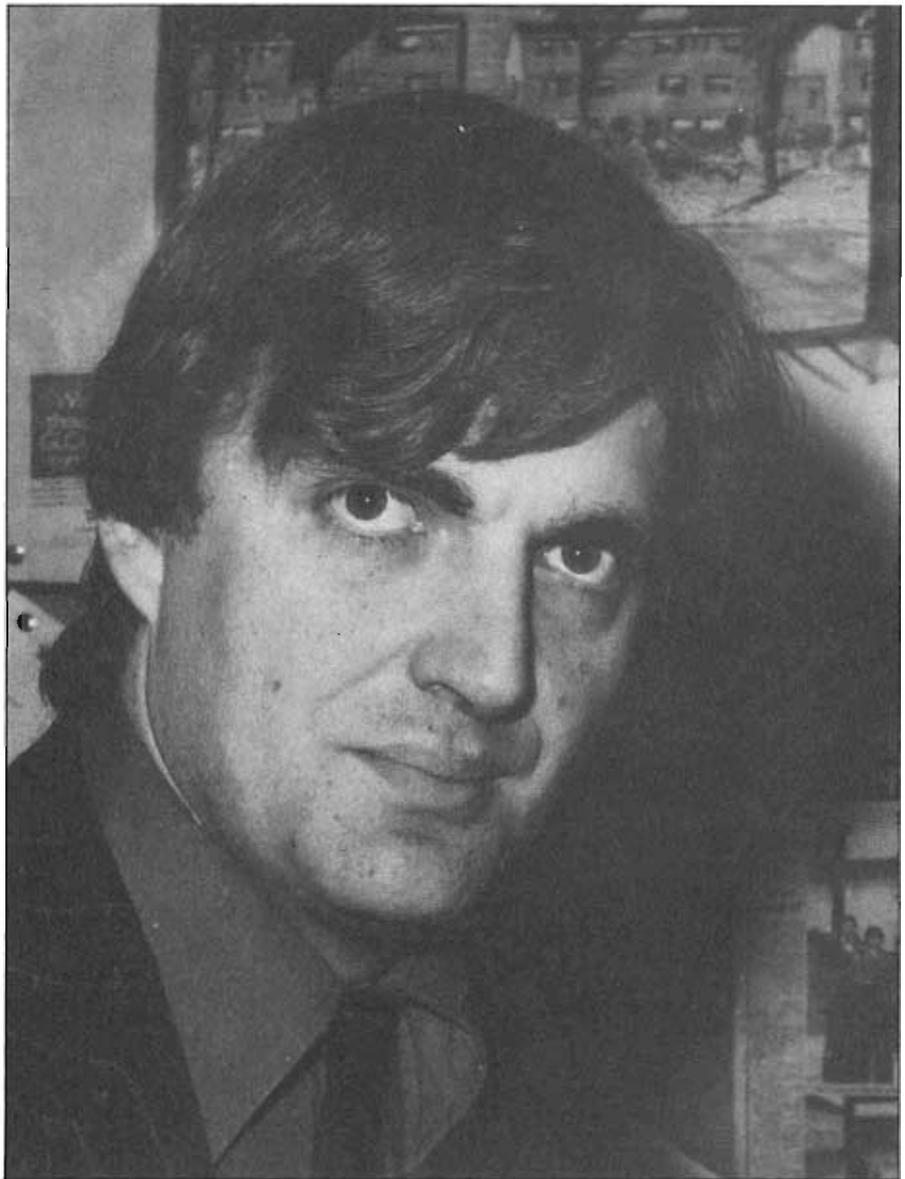
John Butcher M.P. (Con., Coventry SW) and secretary to the parliamentary working party, recognized bureaucratic baloney when he saw it. The numbers just didn't add up. So, in an attempt to get at the truth, he tabled a written parliamentary question.

In how many areas did this monitoring take place? His idea was that, by knowing the listening area as a fraction of the square miles of the UK and multiplying by the number of operators heard, a true number would be obtained. The reply was that the monitoring was carried out by units of the Post Office in all areas. It sounds as though someone, somewhere, was caught with his pants down.

John Butcher also caused comment by his use of c.b. slang at the Trafalgar Square rally. Starting his speech with "Fellow breakers all, this is Meatman. My 10-20 the House of Commons sending a 10-5 to Big Daddy," he then commenced to harangue the audience on their use of the colourful language, ending up by pleading, "When we get legal c.b., try and speak plain English." Fine sentiments, John but isn't the point of c.b. that you can speak in plain English, or plain Irish, or plain Urdu, or, heaven forbid, plain c.b. slang?*

Richard Town, GLC (Con., Bexley, Erith & Crayford) is hard to define as being wholly for c.b. as we know it or against it. As technical adviser to the parliamentary working party and the campaign he has to tread a diplomatic path between the government, M.Ps and campaigners. In addition, he has the onerous task of avoiding the clever little technical traps placed in the way of a decent c.b. service in U.K., which he has done with great aplomb yet, on the matter of frequency, his statements have served to split the movement between 'responsible campaigners' and 27 MHz 'breakers'. He was the prime mover behind the backing for a

*Wouldn't have thought so — you can do the same on the telephone or any other channel of communication. (Ed.)



Richard Town GLC

legal c.b. system from the Greater London Council and subsequently the influential Association of Metropolitan Authorities. As he says, "I knew the rivalry between local and national government, and, being a member of the former, the rest was easy". As far as I'm aware he was the only full-time campaigner to be booed at the Trafalgar Square rally on this issue of frequency.

Early on in the campaign Lord Belstead, a junior minister in the Home Office, announced that 27 MHz would not be legalized and that steps would be taken to outlaw the sale or advertisement of 27 MHz (11 metre) equipment. Thereafter, Richard Town started a campaign to get the old BBC1 405-line black-and-

white television transmitters switched off, so that c.b. could be put in this band (41 MHz to 47MHz). This was all very well, except that it put Richard Town fairly and squarely in the establishment camp so far as the breakers were concerned. As he told me after Trafalgar Square, "I can get all the popularity I want by speaking in c.b. slang and acting like a breaker. I tell it like it is, the truth".

It seems like a lonely way of doing things.

Theo Yard is First Honorary Vice President of the National Committee for the Legalisation of Citizens' Band Radio, and a councillor with the London Borough of Lewisham. Lewisham was the



Austin Mitchell M.P.

first local authority to back c.b., although Richard Town would probably dispute this. Councillor Yard's skill is exercised to the full in holding the National Committee together, it being an organization made up of delegates from all of the campaign clubs around the country. A stranger collection of dissimilar individuals it would be difficult to imagine, yet the national committee has had some notable successes.

It has presented a virtually united front to government and the Home Office officials. It prepared an acceptable technical specification for c.b. equipment together with the major British manufacturers and retailers; organized the Trafalgar Square demonstration and

finally got the campaign theme song "CB Independence" recorded, pressed and distributed. The National committee has been accused of being in the pockets of big business. The campaign clubs (and that's you and I) must realise that fighting wars costs money. If we don't contribute by, at least, buying the record, this charge will remain.

The British c.b. movement needs all the friends it can get. It is fortunate to have this bunch of politicians on its side.

Austin Mitchell M.P. (Lab., Grimsby) the vice chairman of the parliamentary committee, handles the media with consummate ease — an accomplishment which is hardly surprising since, up until

his selection as a prospective parliamentary candidate he was a television reporter in the 'socially-aware' mould.

Rumour from *Private Eye* suggests that he has an interest in a future ITV franchise, which proves that, as far as freedom of communication is concerned, he's putting his money where his mouth is. But we must have some sympathy for Mr. Mitchell since it was his Government which consistently refused to contemplate the legalisation of c.b. in this country.

EDITOR'S NOTE

After the above went to press Richard Town was elected Chairman of the National Committee for the Legalisation of Citizens' Band Radio.

FAULT FINDING

We have read through a copy of THE BIG DUMMY'S GUIDE TO 40 CHANNEL CB RADIO published by The Book Publishing Company of Tennessee and in spite of the derisive title we find the book to be of great practical value to the beginner. Its advice is obviously based on many years of down-to-earth practical experience in operating CB rigs in the USA.

Here is a typical sample of advice on fault-finding which we feel would be helpful to potential users of CB equipment in the UK. The book is generally available in the UK and can be obtained through advertisers seen elsewhere in this issue — we thoroughly recommend it.

RECEIVING

Symptoms	What to Do
1 No dial lights, no receive, set is dead.	1 Is it plugged in? Check to see if power switch is on. Check to see if fuse is blown. If it is, replace it with another fuse of the same rating. Don't use aluminium foil. Check for possible frayed wires or missing insulation. If it is a mobile, sometimes the ignition key must be on for the rig to get its power. Check connections where the rig gets its power. Check earth connection.
2 Can receive but cuts in and out. Dial lights blink.	2 Intermittent connection to power or battery. Check fuse holder. Check earth connection. Make sure that screws are tight on all mounts. Wiggle power cord and antenna coaxial cable — see if it makes the power cut on and off. Check power plug on transceiver.
3 Dial lights come on, but no reception.	3 Check squelch knob and make sure the mike cord is plugged in. Make sure PA/CB switch is in CB position. Wiggle microphone cord and connector. If it cuts in and out, there might be a loose connection in the connector or mike. In this case, the mike cord might need to be cut off and re-soldered.

Symptoms
4 Receiving only very nearby stations.
5 Receiving only hiss.
6 Fuse blows when rig is turned on.
7 Stations received move the S-meter, but do not come through speaker clearly or not at all.
8 Nearby stations sound fuzzy.
9 Smoke comes out of top of rig when turned on.

What to Do

4 Is the antenna connected? How is s.w.r.? If the s.w.r. is high, possibly there is a short in the coax or connectors. Check local-distant switch — should be in distant position. Check r.f. gain knob; it should be all the way up. If it is a valve unit, check the valves.

5 Check antenna and connector. Take antenna connector off and put it back on again. If that makes any difference in the hiss, try other channels and a radio check with a nearby station.

6 Short or blown transistor inside radio. Check to see if screws or mounting bolts are touching any components or wires inside the radio. Do not replace the fuse with a larger fuse or aluminium foil. This can cause further damage to radio.

7 Check squelch knob. If speaker sounds fuzzy, try plugging an external speaker in. If this works, you might have to replace speaker. Check wires leading to speaker inside radio. Could be bad audio transistor.

8 If they're within 100 feet, this might be normal. Try switching local-distant switch to local, or turning r.f. gain down.

9 By all means turn it off!! Pull the plug. Check to see what size fuse is in the fuse holder. It should be no more than 6 amps for a valve radio and no more than 3 amps for a transistorized radio. Check the polarity of the battery connections in a mobile. Check to see that the negative and positive wires are connected right. If you are using an external speaker, make sure that none of the wires leading to it

Symptoms

What to Do

touches the chassis of the radio or the body of your vehicle. After disconnecting radio from the power, replace the fuse with one of the proper value. Check to see if any screws or mounting bolts touch components inside radio. If the polarity was reversed, try out the rig again. If the fuse blows again, there is probably a blown diode or transistor.

10 Receiver just hums.

10 Microphone not plugged in. If radio uses external power supply, it might be faulty. Try radio on a car battery or another d.c. power supply. If it's a valve unit, there might be a valve or capacitor out.

TRANSMITTING

Symptoms

What to Do

1 When mike button is pushed, receiver does not cut out — cannot transmit.

1 Check microphone cord and microphone switch. The cord might have pulled some of the wires loose in the connector. These can just be resoldered to the proper pins inside the connector. If radio has a relay, it might need to be replaced or cleaned.

2 Transmits a carrier, but no modulation.

2 If you can receive OK, the problem is probably in the microphone or cord. Check PA/CB switch.

3 No carrier, no modulation.

3 Could be the crystal. Check mike cord. Try different channels.

4 One or more channels not working.

4 Crystal or crystal oscillator is not working. Could be channel selector switch.

Symptoms	What to Do
5 Fuse blows when transmitting.	5 Blown power transistor. Screws or bolts possibly shorting against components inside of radio. Short-circuit in antenna connector or antenna.
6 Only getting range of ¼ mile or so. Relative power meter reads zero.	6 Check antenna and coax cable s.w.r. Antenna load and plate adjustment screws might need to be set. If all these are OK final transistor might be blown. Have it replaced.
7 Transmitter "breaking up". Choppy transmission.	7 Probably a loose connection somewhere. If it only does it on transmission, it's probably the microphone or cord. If on transmit and receive, it might be the antenna or coax cable. Check the earth on the antenna.
8 Squealing on transmit.	8 Loose wire in microphone or cord. If you are using a power mike, try turning it down slightly. If this doesn't help, try a new battery in it. Make sure that the aluminum foil shielding in the power mike is in the right place if you change the battery.

Symptoms	What to Do
9 Your voice heard from speaker when transmitting. Howling.	9 Check the PA/CB switch. Also check external speaker wires and PA speaker wires to see if they are earthed to the body of the vehicle or radio. Also check for short-circuits in microphone or connector.
10 Weak modulation.	10 If you're using a crystal microphone, the mike element might need to be replaced. Valve or transistor blown.
11 Modulation distorted.	11 Power mike turned up too high. Antenna out of adjustment. Mike gain up too high. Microphone might need to be replaced.
<p><i>Note:</i> Sometimes a loose valve or crystal can prevent your rig from working properly. So check all plug-in parts to make sure they fit snugly in place.</p> <p>Some radios, usually older models, have open relays. Dirty contacts can prevent a radio from switching from transmit to receive. Clean the contacts using a burnishing tool or by pulling a slip of paper through them while holding them lightly together.</p>	

CBers

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- Top loaded coil for maximum CB efficiency
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- Actually improves AM/FM reception on many autos
- Fits most cars, simple one hole cowl installation
- Complete with all wiring, switches and cables
- No loss switch box assembly for CB or auto radio use
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How CB saved our day

by Glyn Heston

Little did I know what the end of day had in store for us as we set out that Saturday morning for a pleasant — or so we thought — day out to the coast. The weather forecast shown on television the previous night indicated clear sky, dry and 70°F, ideal for a run out in the car with my wife, daughter Julie and son Graham. For the children, aged 8 and 9, this was real excitement. "Where are we going then, Dad?" said Graham. "Big B by the sea", I said, having heard before the c.b. slang for Brighton.

"Oh, good, Brighton" said Graham, cockily. He'd heard it before, too: in fact, he knew most of the c.b. jargon from listening to me on other occasions.

"Is that a four then?", I said. "That's a big four for sure, good buddy", he said. Funny, really, but the c.b. jargon does not seem right at home or in fact anywhere else other than in the car.

Early start

We had decided to start about 7.30-8.00 a.m. as we had to drive through London, which I hate, then out to the South. I'd planned that because from Watford, where we live, I'd estimated one hour to the centre of Smokey Town (London, to those without ears) then about two hours to the coast — even longer if we had to stop, and with two energetic children we stop, often. My overall estimate was three

hours at the most, getting us to Brighton by 11 a.m. — time to find a good spot before having our lunch, which, in our case, would be sandwiches, coffee, fruit, cheese and some home-made goodies.

Just before London and just south of it I picked up some friendly breakers (ever met an unfriendly one?) and we exchanged the normal greetings and "rough twenties", handle swapping, etc., my daughter frantically writing down the new names as we chatted away. One eventful moment was when we were putting out the "any breakers for a copy?" call and got a reply almost strong enough to make my aerial look for cover. "Yeah, good buddy, you got the Mackerel", came the "wall-to-wall" reply. Turning up the squelch and turning down the volume controls, we tried to work out our "twenties" and believe it or not he was the next car in front. When we realized this, a wave of hands and a 10—10 and we were gone. The rest of the journey was uneventful; no prangs, no punctures, no sickness and only one stop.

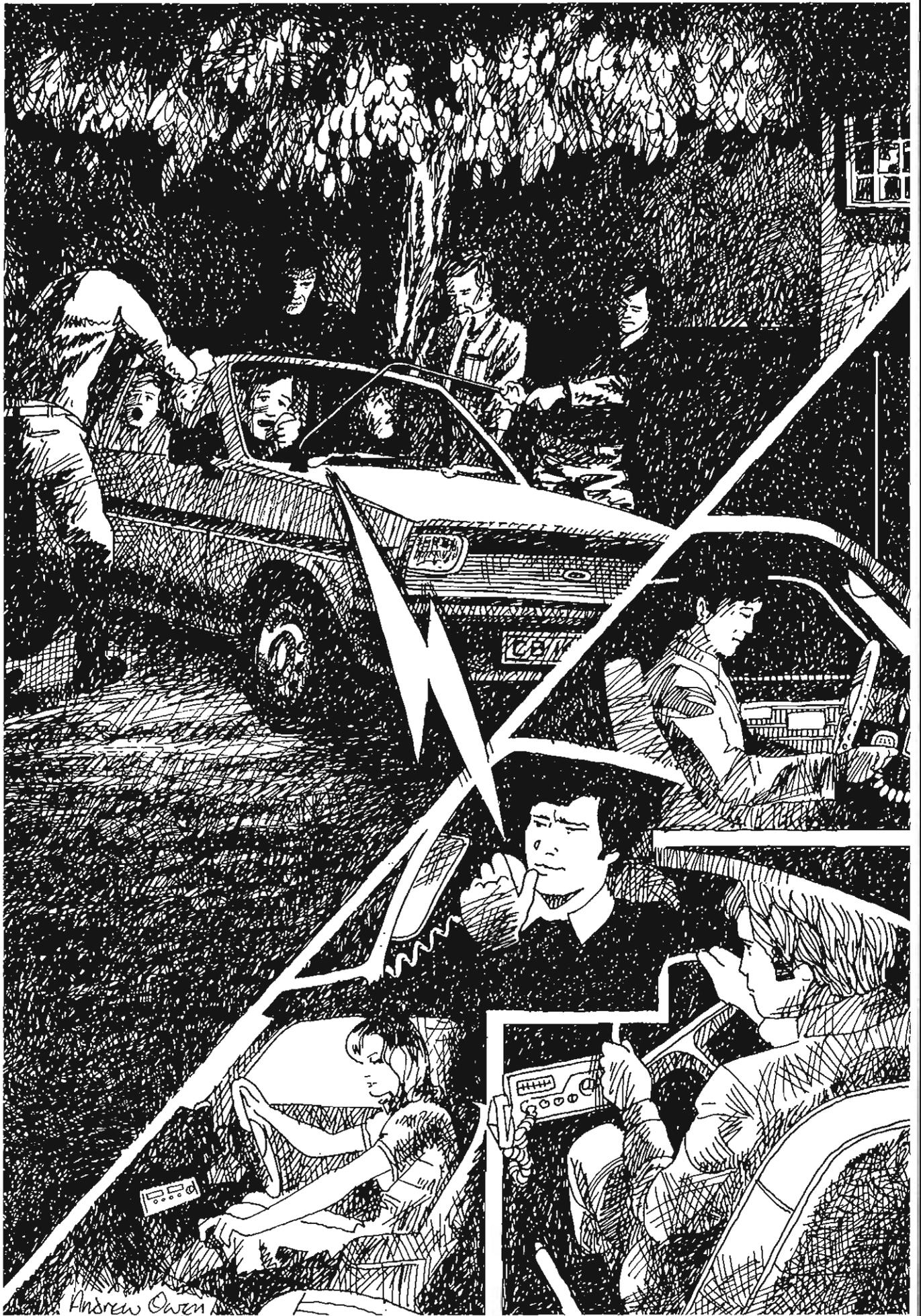
At about 6 p.m. we set-off for home, but instead of taking the main road back, we decided to take a route through the countryside. There was no hurry to get home and we could always have that extra hour in bed. After all, tomorrow was Sunday. Off we went and, flicking the button to the 'on' position, we thought we'd try to copy a few c.b.ers on the way.

It seemed after a while that everybody had either fallen asleep at their transceivers or else the c.b. users in Sussex had all been 'busted'. This does happen sometimes: when it does, you tend to think that some technical disaster has happened and you want to dump the whole unit, aerial as well, into the nearest dustbin.

Dead

After about ten miles, I switched the thing off, dismissing it as dead, promising to look at the terminals and connexions first thing in the morning. The countryside at this point was very beautiful. The golden yellows of the fields bordered with the rich greens of trees and hedgerows. I can never understand why most people go to coastal resorts via the main roads; it's much less crowded and more fun using the country roads.

At about 7.30 p.m. we reached a very attractive village by the name of Britton, which looked like one of those villages that would enter the 'Prettiest Village in Britain' competition and win. Thatched cottages and old-world shops were in evidence and there was the Norman church that always seems to be the focal point of any small town or village. On the road from Britton, we came to an inn. It really did look inviting and, unable to resist it, I pulled the car into the car park at the rear.



Andrew Owen

"Anyone fancy a drink and a snack?", I said, unnecessarily. "Yes please", came back the reply from Julie and Graham. My wife looked relieved: the children had been getting fidgety.

"What's the place called, Dad?"
 "It's the Thatchers", I answered.

It was a friendly little place and, since we were in no hurry, we lingered over the soft drinks and decided to have a proper meal to save bothering to cook at home — it was my wife's day out as well! By the time we decided to be on our way, it had turned quite dark outside and we could barely find the car.

Blinding light

The car park entrance was marked by two large, white-painted stones. It had one of those crunchy surfaces not unlike the sand you get on beaches, only coarser. In the centre of the car park was a very large tree, which acted as a kind of small roundabout. At the back of the car park, a stream ran the whole length, forming a boundary. I remember seeing the stream as we went in, and I recall a slimy deposit over it and a horrible smell.

"Let's keep together", I said "and we'll make it across". "It's a bit creepy", said Julie, "I hope there's no bats or creepies about". I have to admit that I wasn't too happy myself — I even fancied I could hear a crunching of feet in the car park, in addition to our own.

Once in the car, we settled down for the off, and then it all started to happen. A blinding light hit the front windscreen, dazzling us all as we stared out front. For a moment, I wondered what it was but, when it started to move, I realized that it was another car parked, partly hidden, under the tree. With a screech and a showering of sand, the car swung right across the bonnet of mine, completely blocking my path.

"Are they mad?"

"What the hell's going on?", said my wife. "Are they mad or drunk".

"I'm not hanging around to find out", I shouted as I started the car and reversed. Finding a forward gear I headed for the exit and again the other car lurched forward and blocked my path.

"I'll try again and ram the maniacs this time", I said.

"No, we'll never get home if we damage the car", said my wife.

At this point a touch of panic gripped me and, to make things worse, Julie started to cry. Suddenly, the other car's doors opened and four youths stepped out, looking every menacing.

"Dad, use the c.b." screamed Graham.
 "What's the help code?"

"10.34".

Then I remembered — the rig was on strike. Still, nothing ventured . . .

"Breaker, Breaker on the one four



channel, this is a 10.34, repeat 10.34. Need help at the Thatchers, Britton. Any breakers copy, come on".

Crash.

"They've snapped our aerial", shouted Graham in a high-pitched, shaky voice.

One of the youths had spotted me using the mike and had snatched at the aerial, breaking it in two. The others had now gathered round and were advancing.

"He's got c.b.", I heard one of them shout.

"We'll have that then for starters", shouted back another.

Instinctively, we all pushed down the locks on the doors: things were getting a bit out of hand.

"Do you think anyone heard you on channel", said my wife, trying to sound calm.

"I hope to God they did". There was no way of telling, especially as I had only one chance and before that nothing was coming through. "They're trying to get in", shouted Graham again. By this time, Julie was crying even more.

Hands were indeed trying the outside door handles and a chill of fear gripped me as my car started to rock from side to side. Incredibly, they were actually trying to turn the car over. It all began to feel like a bad dream. But it wasn't a dream: the yobboes were out there and they seemed hell-bent on grievous bodily harm, if not worse. The things that went through my mind in the event that these madmen got into the car don't bear repeating, but I do remember thinking that a belt across the snout with the Krooklok might slow them down a bit.

Rescue?

The car was bouncing from side to side, and I was about to unlock my door and have a go, when, suddenly, cars started to pour into the car park at speed. Headlights flashed, and the whole car park was alive with cars and flashing lights.

By now, the car had stopped rocking and I managed to get my door open. Two of the gang had got back into their car, which I noticed was a hot rod, whilst the other two, not able to get in, had run towards the back of the car park.

Other drivers were getting out of their cars as the hot rod with its two occupants made a zig-zag around them and headed fast for the exit. Crump! In its mad dash for the road, it crunched the marker stone at the exit gate. It didn't stop, and it careered up the road, making some very loud and expensive noises. The rest of us reached the back fence, hot on the heels of the other two. Five yards separated us from them as they dived over the fence like frightened rats.

Rout

The two youths hit the dirty stream, and we all fell about laughing as, looking over the fence, we saw two filthy-black-looking objects emerge from the stinking water. They looked like something out of *Dr Who*.

"Shall we get them, mate?", said someone further down the fence. "No, leave them. Thanks to you, they've had their lesson", I said.

Returning to my car I found that several "good buddies" had comforted the family and things were almost back to normal.

"I got your 10.34, good buddy", said one guy, "and put out a call myself. In fact, quite a few of us picked it up and got here as fast as we could".

"Just in time", I said. "It was getting a bit nasty. Look, thanks a lot for your help. I'm going to the local nick to report what's happened, then we're off home to Watford. Do you fancy a quick one on me?". "That's a big four", they all said, in unison.

No harm done

Leaving the pub half an hour later, we drove the three miles to the local police station and made a report out to the desk sergeant on duty. I obviously left out the bits on the c.b. aspect and made out that a few people who happened to be in the car park had come to our assistance.

"Well, sir, there's not much I can do at the moment, is there?" said the sergeant.

"No I guess not", I said, smirking at the thought of the two smelling youths trying to dry out somewhere and the hot rod with some big expensive repair bills due.

"All's well then, sir: no harm done", he said finally.

"No, you're quite right thanks to c.b.", I muttered.

"Thanks to what, sir?"

"Thanks to CB. It's the nickname the kids gave to my car. You know — Charlie Brown".

"Oh! Well, good night sir, safe journey".

All names and locations have been changed although the events actually took place.

CB AND THE RADIO AMATEUR

Pat Hawker, G3VA



Young enthusiast studying for his licence

The radio amateur is regarded sometimes as the friend sometimes as the foe of c.b. Both share a common interest in the use of two-way radio not for business but for pleasure. But their ways then seem to diverge — and at times to conflict.

In the Home Office "Open Channel" discussion document it is stated unequivocally that "if an individual wishes to use sophisticated equipment to communicate over long ranges and make international contacts, he should become a licensed radio amateur by taking the appropriate examination". But this does not draw a distinction between the two approaches that I feel most amateurs would wish to make.

The international (ITU) definition of the amateur radio service is: "A radio-communication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique

solely with a personal aim and without pecuniary interest".

This definition with its emphasis on self-training and technical investigations underlines that most amateurs do regard their hobby as radio operation that arises out of their interest in the technology and operating practices, and not primarily as an agreeable, social means of talking to fellow enthusiasts (though of course it is). People point out, of course, that in the early days of amateur radio, most of the equipment was home constructed. Today the "all-home-brew" amateur station is a rarity — but this does not mean that the 25,000 British radio amateurs have lost interest in the technical side of radio communication.

In "A Guide to Amateur Radio" I pose the question: "Is amateur radio nowadays just a matter of operating factory-built equipment or is it a hobby for those with an interest in technical development and home construction of equipment?". The

answer I give is that some amateur enthusiasts are interested primarily in *operating* equipment and in making friendly two-way contacts with other amateurs, 'chasing dx (long distance)' contacts or in taking part in many operating 'contests'; but they find that technical knowledge and expertise is needed to get the best out of equipment and antennas and to avoid causing interference. Others are still basically more interested in technical development, equipment construction and the scientific investigation of unusual modes of radio propagation: but these find that operating their equipment is often the best way of judging the merit of — or furthering — their technical work. Either way, amateur radio reflects a combination of both technical and operating aspects of radio communication.

No 'Novice' licences

Most 'amateurs' would agree, with one notable exception, that the licensing facil-



ities, the technical — and for operation below 144 MHz — Morse examinations are now at a sensible and fair level, though unfortunately the cost of taking these examinations has gone up, in 'real' terms, over the years.

Where it can be argued that the British licensing system unnecessarily discourages the newcomer is the absence of any form of 'beginner's' or 'novice' licence akin to that in many other countries.

In the USA, Australia, Spain etc. restricted forms of licences are available that permit Morse operation after taking very simple examinations. In the UK there is only one level of "Radio Amateur's Examination" (RAE) and only the 12-words-per-minute Morse. The recent change in the form of the RAE to "multi-choice" questions is resulting in a much higher pass rate. Indeed, for anyone with a serious interest in the technology of radio communication, the RAE is not an impossible barrier — and nor is it an unreasonable hurdle to surmount before using, for example, a 150-watt s.s.b. transmitter on 144 MHz or 432 MHz with the real possibility of unwittingly causing interference to radio and television reception.

No Morse test has to be taken to use these bands with a "Class B" licence and these now account for a very significant proportion of all new British licences. By using the OSCAR satellites, taking advantage of "ducting" etc., international contacts are common.

There is (and always has been) criticism of the requirement to take a Morse test before amateurs are permitted to use the h.f. bands below 30 MHz. This is an international requirement; although the Japanese licensing authorities do permit low-power operation on h.f. without a test on the grounds that interference is unlikely to be caused to stations outside of Japan.

Is Morse obsolete?

But one notices that criticism of Morse as an "old-fashioned, near obsolete" form of communication comes almost entirely from those who have never learned to use it. For many of us Morse remains a "live" (near ideal) means of communication with foreign amateurs who may speak little

English. It allows very many more stations to work in a restricted band of frequencies; it allows simpler aerials and equipment to be used. While speech has become the dominant mode, it would surprise many people to find how much Morse continues to be used not only in the UK but all over the world.

As a New Zealand amateur wrote recently: "Critics of Morse code have failed to get their message to the thousands of operators who continue to use it and experience great delight and satisfaction in doing so. Many of these seldom or never use 'phone' and are oblivious to the discovery by phone operators that Morse is archaic and obsolete. The critics may have to learn Morse if only to get their message across to the unconverted!"

Be that as it may, amateurs also find it difficult to convince c.b. enthusiasts that many of them support c.b. in principle, though worried at what they have seen happen in some other countries. There is also, to be frank, the fear that c.b. could adversely affect their own interests; although certainly there is nothing in the Home Office Green Paper — including the controversial 928 MHz proposals — that could fuel this fear.

How c.b. developed

To understand why the "c.b. versus amateur" argument ever arose it is necessary to look back into the history of c.b. It is often forgotten that the "Citizens' Radio Service" was inaugurated in the U.S.A. as long ago as 1947 in order to provide two-way radio for the private citizen in the conduct of his personal affairs or business activities. But at that time the service was confined to 460-470 MHz (although powers up to 50 watts were permitted). In 1947, 460 MHz was still considered a very high, virtually unexploited band — though frequencies of this order had been exploited during the second world war for "S-phone", the simple equipment used to talk directly from aircraft to members of Resistance movements during operations.

There was no rush to make use of 460 MHz c.b. and interest in the U.S.A. remained very slight until in 1958 a new "Class D" system was established on 27

MHz. In order to do so, American amateurs, who had been permitted to use 27 MHz as an amateur band, were denied its use — a procedure which was not calculated to improve relationships!

Furthermore the new Class D facility quickly registered an appeal to a type of user for which the service had never been intended: the "radio hobby" enthusiasts, many with a frustrated interest in radio communication but not wishing to take the obligatory Morse examination (the U.S.A. has never had the equivalent of a Class B v.h.f.-only amateur licence for phone-only operation).

The American Class D regulations had been formulated to discourage "ham-style" operation: power was limited to 5 watts, the height of aerials was restricted, inter-State operation was officially prohibited and the maximum range was intended to be 15 miles.

The F.C.C. soon discovered that it was one thing to put such clauses into the licence but quite another to attempt to enforce them.

Even in the 1960s, before the big boom in c.b. that followed the energy crisis of late 1973, it would have needed an army of inspectors, equipped with sophisticated surveillance equipment, to have traced the flagrant offenders or those causing an increasing amount of television interference in the cities.

C.b. and television

Television interference from 27 MHz c.b. equipment is not a figment of anti-c.b. imagination. By 1976, the F.C.C. alone received over 80,000 complaints of interference to home entertainment equipment of which 85 per cent of television complaints were ascribed to c.b. Official complaints to the F.C.C. represent only the tip of the iceberg and it is likely that at the height of the American c.b. boom the reception of around a million viewers was being affected to a greater or lesser extent. However, one must be careful not to translate such figures to the U.K. where virtually all television reception is on u.h.f. Band IV-V (470-850 MHz) whereas much of the interference in the U.S.A. was to v.h.f. Channels 2 and 5.

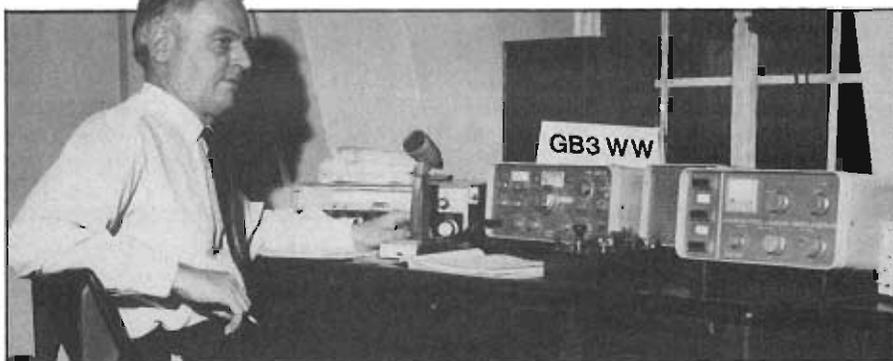
Again this problem caused friction between c.b.ers and the amateurs — since

the media frequently used the term 'ham' for both types of operation. Again, in an attempt to stop c.b. operators using high-power amplifiers to raise their power up to 1-2 kW, F.C.C. have prohibited the sale of linear amplifiers covering the 28 MHz amateur band. Indeed there has been some "invasion" of 28 MHz by c.b. operators, totally illegally, particularly the section of the band used for amateur Morse.

How c.b. helps amateur radio

Yet c.b. has not reduced the number of recruits to amateur radio — rather the reverse. Experience in America, Australia and several European countries has shown that many of those who have become interested in two-way radio through c.b. have gone on to obtain the more flexible amateur licences with the use of long-distance international bands, and with lower levels of mutual interference. Indeed c.b. has become a major source of amateur recruitment.

It is not my purpose here to debate the pros and cons of the Home Office Green Paper, except in so far as they affect the Amateur/c.b. debate. Certainly the Home Office proposals are unlikely to add fuel to any flames that may exist. Most amateurs are anxious that any c.b. frequency should be clearly separated from amateurs — 928 MHz is almost half-



Pat Hawker operating the Wireless World amateur radio station

way between amateur bands at 432 MHz and 1300 MHz (though most amateurs would agree that 928 MHz poses serious technical/cost problems to c.b. equipment manufacturers). Again the Home Office is not proposing to allot official "call-signs" to Open Channel operators — and this may reduce amateur-type operation aimed at random international and/or long distance contacts. The opposition to 928 MHz on grounds of ineffective short ranges seems over-stated. Under conditions of "ducting" there is no doubt that even low-power 928 MHz Open Channel transmissions would, in certain weather conditions, travel several hundred miles, particularly across the English Channel, North Sea, Irish Sea etc.

— though that is not the intention.

Historically, amateurs have had their own licensing problems though mostly in the now distant past. In the mid-twenties an attempt was made by the authorities — alarmed at the ease with which amateurs were freely communicating all over the world — to clamp down on all international working by British amateurs. The ban was soon circumscribed but it taught amateurs to be wary of officialdom.

Today the Radio Society of Great Britain, the national society of the radio amateurs, has excellent and close contacts with the Home Office — pointing to the need for Open Channel users similarly to establish and negotiate with the authorities through a strong national organization.

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COME AND SEE US — BUT COME CLEAN

RIGS RIGS RI

On these pages we show a selection of c.b. equipment used in countries where c.b. is legal. It is hoped that legalisation of c.b. in the UK comes soon and in future CB WORLD should be in a position to not only show photographs but review the performances of transceivers and other c.b. accessories and equipment.



PRESIDENT — MADISON
40 channel AM/SSB Base Station Transceiver.
Controls: Power/ Volume. PA. Squelch. Mike Gain. RF Gain. SWR/ CAL. Clarifier. Tone.
Switches: NB/ ANL-OFF. SWR-RF/ MOD. CH 9-OFF. Mode.
Features: Lighted digital clock with Switch. Alarm and Time set. Digital channel Indicator. Headphone. PA and external speaker jacks. Automatic modulation control.



PRESIDENT — ADAMS
40 channel AM/SSB Mobile Radio.
Controls: Power/ volume. Squelch. Mike Gain. RF Gain. Tone. Clarifier. Dimmer. SWR/ CAL.
Switches: ANL/ NB-OFF. PA-CB. Mode. "S" RF-MOD. CAL. SWR. Normal. Scan. CH. 19. CH. 9.
Features: Digital Channel Indicator. TX Indicator. Automatic Modulation Control.



PRESIDENT AR 7
40 channel AM Mobile Radio
Controls: Power/ Volume. Squelch.
Switches: ANL-OFF. PA-CB.
Features: "S" RF Meter. Digital channel Indicator. Automatic Modulation Control.



PRESIDENT AR 14-4
40 channel AM/SSB Mobile Radio.
Controls: Power/ Volume. Squelch. Mike Gain. RF Gain. Clarifier.
Switches: NB/ ANL-OFF. PA-CB. CH.9-OFF. BRITE-DIM. Mode.
Features: "S" RF Meter. Digital channel indicator. TX/ RX Mode + CH. 9 Indicators. Automatic Modulation Control.

RIGS RIGS RIG

PRESIDENT AR 711
40 channel AM Mobile Professional Radio.
Controls: Power/ Volume. PA. Squelch. Mike Gain. RF Gain.
Switches: Hi-Lo filter. NB/ ANL-OFF. PA-CB. CH 9-OFF. CH 19-OFF. NORM-OFF.
Features: Noise cancelling mike. Separate external speaker. "S" RF Meter. Digital Channel Indicator TX/ RX Indicators, Automatic Modulation Control.



FIVENINER (shown in-dash)
40 channel AM Mobile Radio.
Controls: Power/ Volume. Squelch. RF Gain.
Switches: PA-CB. Delta.



PRESIDENT AR 44
40 channel AM Mobile Radio.
Controls: Power/ volume. Squelch. Mike gain. RF Gain.
Switches: ANL/ OFF. PA-CB. CH9-OFF. BRITE-DIM.
Features: "S" RF meter. Digital channel indicator. Automatic Modulation Control.



One of the most important parts of any radio station is the aerial or antenna. Efficient, well sited antennas transmit and receive better signals than poorly sited, inefficient ones, often offering as much improvement as a tenfold increase in power. As for the rules, it sometimes seems that human sacrifices and witchcraft are the only answers, but this article is an attempt to develop a more practical approach.

Antenna basics

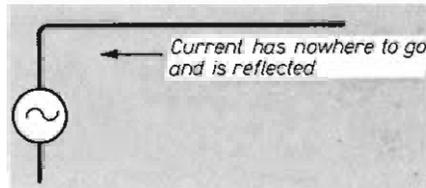
When an electric current flows through a wire, it sets up a *magnetic field* around the wire. The reverse is also true: a moving magnetic field crossing a wire causes current to flow in that wire. A voltage appearing on a conductor sets up an *electric field*; for instance, if you place your hand close to the screen of a working tv set, you can often feel an almost furry, slightly itchy feeling, especially on the back of the hand. This is caused by the electric field. Now radio waves, heat rays, visible light, ultraviolet, X-rays and so on all belong to a class of radiation known as *electromagnetic radiation*, which means that both a magnetic and electric field are involved, and the radio antenna serves merely to turn the voltage and current provided by the transmitter into such an electromagnetic field. If we connect an infinitely long conductor to the transmitter, then a current flowing down the conductor sets up a magnetic field, and the voltage sets up an electric field. Because the conductor is infinite the energy never reaches the far end but, if the conductor is a practical one, then a very different situation occurs, as seen in Fig. 1.

Impedance. The current flows along the conductor until it reaches the end. Because the current cannot flow anywhere from the end it starts back towards the transmitter and is said to be reflected. Since the current is not the direct current of a battery, but is changing from positive to negative and back to positive at, say, 27 million times a second (corresponding in this case to a frequency of 27 MHz), then the current flowing one way in the antenna is reflected so that the current varies from a maxima to a minima every half wavelength. This is a steady condition and is called a *standing wave*, as seen in Fig. 2.

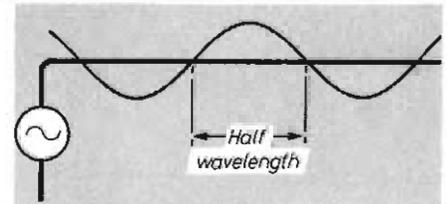
The current at any point and the voltage at that point are related by Ohm's Law, which gives the *impedance* of the antenna as the voltage at a point divided by the current flowing at that point, or V/I . This impedance varies with the length of an antenna, and Fig. 3 shows the way in which it varies. When the antenna is less than a quarter wavelength long, or $\lambda/4$ (λ , lambda, is the Greek letter used to represent wavelength) the antenna seems, to the transmitter, to be like a capacitor in series with a resistor. At $\lambda/4$, then, the antenna looks like a 35 ohm resistor. As it gets longer, it looks like an inductor in series with a resistor, until at $\lambda/2$ it looks

noise suppression

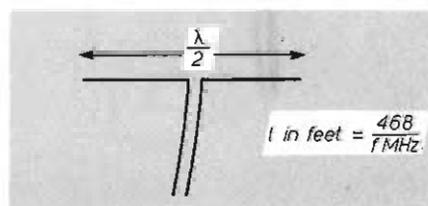
HOW MOBILE WORK - AND INTERFERENCE



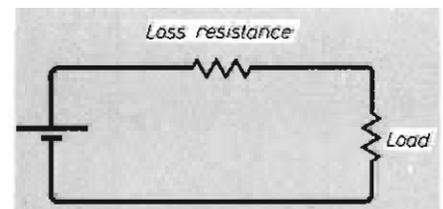
1 When current reaches the end of the conductor it has nowhere to go but back to the transmitter. It behaves as though there were a reflector at the end of the conductor.



2 'Reflected' and forward waves combine to form standing waves.



4 A half-wave dipole.



5 An electrical circuit with loss driving a load resistance.

ANTENNAS HOW TO KEEP AT BAY

by Peter Chadwick

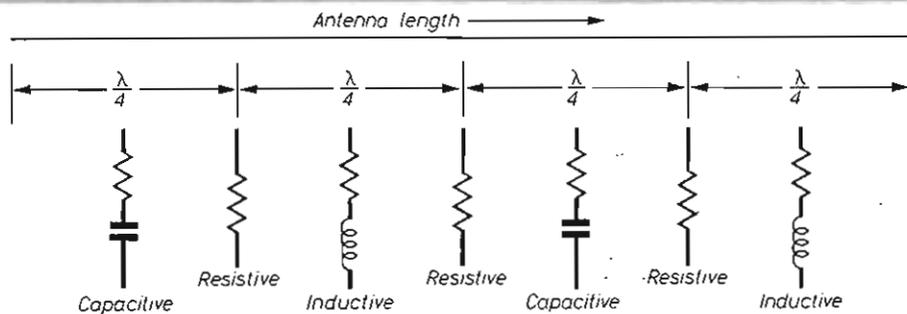
like about a 4000 ohm resistor. The pattern repeats itself as the antenna gets longer, although the values of the resistances change.

Loading. One of the most common antennas is the half wave dipole in Fig. 4. Because it consists of two quarter wave antennas "back to back", it exhibits twice the feed impedance of the quarter wave, or about 70 ohms. At 27 MHz, it is about 17 feet long, and thus often becomes impracticable — especially when working mobile! But when a load for a transmitter consists of a capacitor or inductor in series with a resistance, as in the first and third sketches of Fig. 3, the transmitter has a problem in supplying power to the load. The easiest way to simplify the problem is to put an inductor in series with a capacitive load to 'cancel it out' and leave a pure resistance, and vice-versa. Nevertheless, it is not quite so simple.

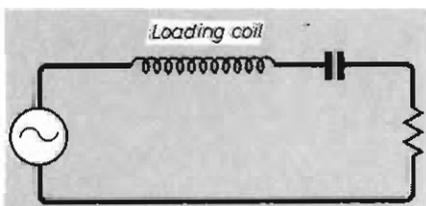
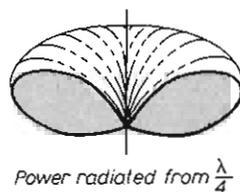
Look at the circuit of Fig. 5. If the load resistance is small compared with the loss resistance, obviously very little power gets to the load. Similarly, an antenna has loss resistance, and in series with these loss resistances, a purely imaginary resistance called the *radiation resistance*, which represents the power "lost" by radiation — that is, usefully radiated power. If the radiation resistance is low, and the loss resistance high, then the radiated power is low. So, if the inductance connected in series with the capacitive load of a short antenna is 'lossy', then the losses in the antenna will increase. The shorter the antenna, the lower the capacitance, the higher the series inductance need to be, and the lossier it is. Now, since the inductance, or loading coil, has a current flowing through it, it too will radiate so, that if the coil can be placed in the antenna, it will be even more effective, and this is often done. The coil has the right value to resonate with the antenna capacity at the operating frequency. If the coil is placed in the middle of the antenna, then it 'sees' less antenna, and so less capacitance connected to it. This means that the coil needs to be bigger, and the law of diminishing returns comes in — the higher the coil, the better it radiates, but the more lossy it is!

The other problem concerns the resistance. This rises to a value of about 35 ohms at the $\lambda/4$ point. Below this it drops to very low values, and thus offers problems, since most transmitters work best if they see 50 ohms. There are several methods round this problem, and one of the best is the $5/8$ wavelength antenna. This is an antenna $5/8$ wavelength long, with a tapped coil at the bottom converting the antenna load to look like 50 ohms. It also offers gain — up to twice the power — over the simple short antenna with loading coil, and this is because the radiated power is concentrated in a flat 'pancake', as in Fig. 7. The power radiated from the $\lambda/4$ is spread over a greater volume and so less power is radiated in any particular wanted direction.

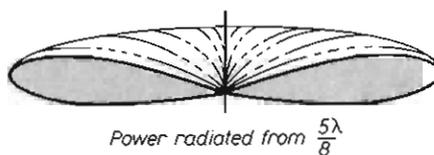
From all this, it is obvious that short



3 Antennas of different lengths are different in the kind of electrical impedance they present to the transmitter.



6 The equivalent to Fig. 5, but in this case the load is the antenna, and the loss is in the loading coil.



7 Quarter-wave antenna radiation pattern, compared with that from $5\lambda/8$ antenna, on right.

antennas do not work as well as rather longer ones.

Standing wave ratio. S.w.r. is often a bigger bogey in people's minds than in practice. All s.w.r. means is how far the impedance of the antenna departs from the design impedance — usually 50 ohms. A 2:1 voltage s.w.r. means that the load is either 25 ohms or 100 ohms — and the v.s.w.r. does not say which. So a $\lambda/4$ whip with no losses, which will give a v.s.w.r. of better than 1.5, is a good idea. It does not mean your rig will not necessarily work if the v.s.w.r. is 3 or 5; it just means it will not work as well. In addition, some rigs may be damaged if run for a long time into a high v.s.w.r.

Since antenna impedance changes with length and v.s.w.r. is influenced by impedance, the best compromise is obtained by adjusting length to get the lowest v.s.w.r.

The 'best' antenna

This is a very difficult thing. In spite of what the advertisers say, there is no universal best antenna. Part of any antenna system is the earth or ground, and the lower the resistance of the ground the better. Unfortunately, a magnetic mount has generally a shorter antenna and no direct ground connexion, and so is generally less efficient. A quarter-wave antenna, bumper mounted, is around 8 feet long, which is not very convenient. So, for most people, the 'best' antenna is the best one for your installation — long or short, bumper or wing-mounted, or what have you.

Siting the antenna is important. Internal-combustion engines are electrically very noisy, so the further away the antenna is from the engine, the better. In addition, the steel of a car body offers some sort of screening against the engine's electrical noise. So, for a front-engined car, it is best to mount the antenna at the rear, and vice versa. For a fibre-glass body, the first thoughts are "forget it"! Although not quite as bad as that, it takes a lot more work to get rid of ignition.

Suppression

The simple suppression methods used on the broadcast bands are not just good enough at 27 MHz: the noise sources and suppression components needed are often different.

Firstly, ignition. Rev. the engine up and, while it is running fast, kill the ignition. If the noise goes, it is caused by ignition — if it does not (with the car stationary) it is probably dynamo/alternator noise.

Ignition noise needs some care if it is to be suppressed all the way. Normal carbon leads are fairly effective, and suppressed plugs can help even more. If the noise still persists, then a coaxial suppression capacitor (*not* the normal sort) from each ignition coil termination is a good start. If you need to go further, complete screening of the coil, distributor, plug leads and

plugs must be carried out.

Coaxial capacitors are useful on the dynamo or alternator, but *not* on the 'F' terminal of a dynamo. Similarly, the control box can often stand treatment of this sort. However, a lot of electrical noise gets into equipment through the power leads, and a power-lead filter in the radio-equipment power lead is a good idea. Then take the supply to the filter straight from the battery, with different leads to the car electrical system.

Engines, bonnet lids and so on are rarely in good electrical contact with the body of the car. This means in many cases that bonding the engine to the body with heavy copper braid in three or four places, and bonding the bonnet at the hinges helps enormously. Another area where noise can be reduced is by bonding the exhaust system to the body with braid; again at several points. Finally, for a really painstaking job, fit coaxial bypass capacitors to every lead passing through the bulkhead.

Driving on dry roads sometimes produces wheel or tyre static, showing up as a steady popping noise at speed of 15-30 m.p.h. Various forms of discharger are available, as there are for brakes, but for tyre static, little beats the injection of some powdered graphite through the

valve stem. On the other hand, the advent of tubeless tyres has helped enormously.

On occasion, especially with high power, all sorts of strange effects can manifest themselves when the transmitter is switched on. These can be such things as lights coming on, rear window heaters heating up — keep the antenna away from them — or even electronic ignition systems stopping altogether. Most of these problems can be cured by better bypassing of the leads to these devices, and better bonding to earth of those things that should be so connected. Similarly, it can work the other way, and there have been cars in which not only all the bonding and screening so far discussed have proved necessary, but also filtering of leads to and from windscreen wipers, clocks, petrol gauges, thermometer, oil pressure, ignition lights, flashers, etc., have been necessary. Also, each case needs to be treated on its own merits, and it is not always possible to lay down hard and fast rules in all cases.

Finally, transmitters can cause arcs and sparks. For this reason, *never* use a transmitter while filling with petrol. Although the ignition hazards are low, they are not yet well enough understood to say exactly where the limits lie, and it is better to be safe than sorry.

B4, 61A moves to F3, 115

...or if you haven't got a pocket edition of the current Geographers A to Z of London with you: Dorset House, Stamford Street, S.E. 1, moves to Quadrant House in Sutton, Surrey.

This is the new headquarters of our parent company, IPC Business Press — and our new address as from 10th November.

It's a brand-new, purpose-built tower block of twenty storeys linked to a low-rise block of seven, and it's situated right by Sutton railway station. The environment is nice and the facilities are impressive: our new telephone system is one of the most modern in the country and callers will receive just about the latest answering service they've ever had.

This is only one way in which we hope our move will be of benefit, not simply to us, but to everyone who has been used to contacting us at Dorset House, Stamford Street, S.E. 1.

We look forward to seeing or hearing from you at our new address, so please make a note in your diary now.



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THIS & THAT

When c.b. becomes legalized there will be thousands of breakers coming on the air waves — some say that it will be almost impossible to get a conversation going at all. It may be difficult, but handled properly everyone should be able to get through, providing certain codes of conduct are kept to. We would like to see an official code of conduct and perhaps this may well be printed on the back of licences if and when licences are issued.

No swearing

In the meantime we suggest the following guide to new c.b. users. No swearing on channel, no advertising or business deals discussed on channel. Always be polite and cheerful on the air. No one wants to copy a miserable sounding voice — neither do they want to copy a smart Alec or boaster. Remind yourself that when meeting a person for the first time face-to-face you usually greet him or her in a friendly fashion. Then do the same on the air.

Don't be rude

If you are listening to a conversation on channel and you feel you want to contribute to it, don't interrupt rudely, but instead say at the right moment — "Breaker on the side". You then wait to be invited to speak. This might happen if you are listening to a conversation about some trouble one breaker is having with his antenna. The other breaker is trying to explain but may not be sure on the advice he is giving. If you know you have the answer or can be helpful then you come in with "Breaker on the side" and speak when asked. On the other hand, they may not want you to break into the conversation. You would not go up to a couple on the street and just start talking to them — why do it on the air.

Be friendly

In selecting a name (handle) don't try to be one up by choosing a name that has a double or rude meaning. Who wants to copy 'Flasher' or 'Big Dick' or 'Knockers'. It might sound amusing to the owner but the average breaker doesn't think so.

Don't be clique. Try to speak to everybody and anybody — it's much more friendly that way. Remember how you felt when you first came over. Your "Any breakers on one four for a copy" would not be answered if the 'listeners' were only waiting for their buddies. When the 'any breakers' call goes out and you get it 'wall-to-wall' greet him by saying "you got this breaker and you are bending my needle". Or "your are coming in through the windows". Be friendly.

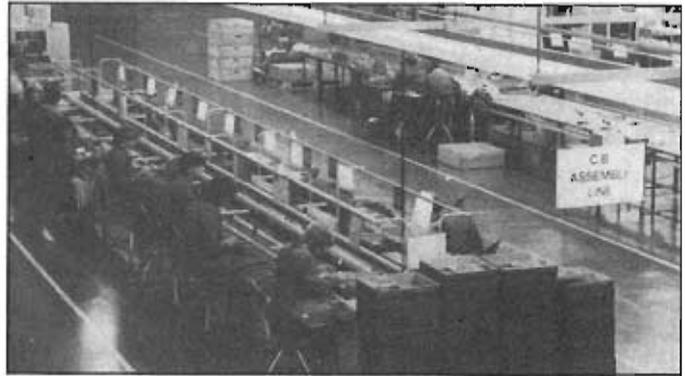
You don't need to use all the c.b. slang in the American c.b. books. In fact you can have a normal conversation and just end each question with 'come on', 'come back or 'bring it back'; some might say 'over' but not many. That's a 'Rodge' or 'that's a big four' is a way of saying "I entirely agree". Too much jargon is ridiculous.

"Truckspeak"

Imagine hearing this, "Yeah Good Buddy, I'm a little 10-6 but give me a 10-9 my roller skate is out of motion lotion near my local twenty. If you fancy an eyeball at our water-hole I'll buy you a brown bottle, is that a Rodge". OK, the seasoned c.b.er knows what this all means but the rubber bander — sorry, new c.b.er, would have a hell of a problem. What it actually means is this. "Yes my friend, I am a little busy right now but repeat what you said as I have to buy petrol soon for my car, near my home. If you feel like a drink, I'll meet you at the pub, do you agree". The former version may be fine when you get used to c.b. but there is no need for it all of the time.

Keep it short

Keep conversations fairly short, for two reasons. Firstly you may only have contact for a short while as you will go out of range, especially if you are going in opposite directions. Secondly, give other breakers a chance to use the channels. Don't have long conversations on channel 14 or 19. 14 is the calling or introduction channel and 19 for lorry drivers. When contact is made, suggest another channel — don't forget there are 40 to choose from.



Study the photo above and note the sign saying c.b. Assembly Line. This photo was taken inside a British factory. Can we believe our eyes folks. Where is it all happening? (Photo by kind permission of Electrical & Radio Trading) see page 54 of this issue.

Have fun

Finally, remember, when it all happens a lot of fun can be had by all. Be polite, friendly, sensible and law abiding and all that c.b. stands for will be an enjoyable experience.

CB in France

We learn that in France the same situation exists as in the UK with regard to c.b. Thousands of breakers are at it and the numbers are increasing each month. The French Government are lashing out fines around the £360 to £450 mark. French police, who at one time were not particularly interested, are under orders to prosecute and take away c.b. sets being used. Rumour has it that like the UK the French Government might give it the go-ahead but on the 900 MHz+ frequency.

Philips are at it?

Below is a photograph of a c.b. transceiver made by Philips. Is this the in-dash unit we are going to see as standard equipment in motor cars when c.b. becomes legalised in the UK? Philips, simply 'ears' ahead.



"Mr. CB"

J.W.R. (John Woolfe Racing Ltd.) have been appointed U.K. stockist for "Mr. CB" antennas and accessories. "Mr. CB" — part of the Trice Electronics group (U.S.A.) — have been making c.b. accessories for five years. The range includes Fibreglass and stainless steel antennas, mikes, cords, plugs, connectors, adaptors, suppressors, and mounts. Consul mounts for c.b. radio and instruction manuals are also available.

Speech Processor

Sold by T & T Electronics, Norwich, the "persuader" speech processor claims to increase your "talk power". It is claimed that by plugging your microphone into the processor it helps to increase power when the going gets tough. Fully automatic in operation when switched off the mike connects direct to the transmitter. Although mentioning it we have not tried it out ourselves.

Southend Showdown

A new secret society has sprung up in Southend.

Fans of citizens' band radio have got together to put pressure on the Government.

But until their hobby is made legal members are not divulging their identities.

Meanwhile the group, known as the Southend Breakers' Association, will be joining with similar organisations in the country, to get

THIS & THAT

the Government to honour its pledge to make c.b. radio legal.

Breakers is the jargon used to describe someone who uses c.b. radio.

A spokesman for the group said: "We have got together in response to the growing demand for such an organisation in Southend.

"We estimate there are at least 60 or 70 enthusiasts in the town.

"But because much of what we do and discuss fringes on illegality, most breakers don't relish the idea of being named.

"It's hoped we will soon be affiliated to the National Committee for the Legislation of Citizens' Bands.

"We will put pressure on all local MPs to support our aims in the Commons, and speed up the day when we will not be breaking the law."

He said that among the organisations affiliated to the national committee is the Greater London Council.

The group disagrees that its activities would interfere with vital communication links or domestic

appliances and tv sets.

The spokesman said: "We believe the Government could allocate us a frequency which would suit everybody.

"We are looking for a frequency which will allow us to make contact up to 20 miles.

"Breakers could be used for emergencies, to help in traffic jams, and linking small boats with the shore.

"We are prepared to meet any Home Office, postal officials and the police to discuss problems which may have to be cleared up if we become legal.

"Our main aim is to become legal first and here in Southend we will try to make us just that." (Reprinted from SOUTHEND EVENING ECHO 13 Oct 1980)

Guilty £640 Fine!



Miss Annette Box was a very foolish young woman to have operated a "Citizens Band" radio when she knew it was against the law. Breaking the law can never be condoned, no matter that the law concerned is regarded as foolish by many people and as a result is widely disregarded.

However, in no way did Miss Box deserve the savage penalty, a fine of £600 plus £40 costs,

imposed upon her in May by Tunbridge Wells magistrates. For operating her radio when she should not have done, she was prosecuted by the Home Office and duly arraigned for a series of offences concerned with installing and using transmitting equipment in a car.

Miss Box's second omission, after failing to observe the law of her country, was to appear without legal representation, even though she pleaded guilty, hoping, as the saying goes, to throw herself on the mercy of the court. She received none. The size of the fine dismayed everyone who heard it imposed. It was savage, unfair and entirely out of scale with the offence.

Miss Box's third omission was to feel so upset about what had happened that she went off abroad on holiday, without considering the possibility of appeal against so daunting a penalty. By the time she returned she was out of the period in which an appeal can be lodged, and she faced the dilemma of paying the fine, or going to prison in default.

All this, for having been caught pursuing a hobby that has become so commonplace and popular in this country that the police are said to be not bothering themselves about it.

At first the unfortunate Miss Box decided that she could not pay

such an enormous fine out of the income from her tiny, almost one-woman, hairdressing business. So she would go to prison. But how could she? If she went to jail, her business would collapse, and when she returned to freedom, a convicted felon, she would have to start all over again.

So last week Miss Box was hauled before the court again and asked to explain why she had not paid her fine. Fortunately she found herself a more sympathetic magistrate, who accepted her offer of £200 down and the rest in instalments of £30 a month.

Miss Box is a spirited young woman, and pointed out to the court that in other parts of the country the offence she committed was dealt with by fines of £25, or £50 at the most. But of course, her case had been decided, however, unfairly, and the disgracefully high penalty had to stand, no-one in court for that May hearing having had the grace to advise her that she could and in fact ought to appeal.

There will be future occasions when while penalising some drunken driver or vicious hoodlum with a fine of £100 Tunbridge Wells magistrates will hark back to the sad day when £640 and confiscation of equipment was their sentence for a young girl pursuing an innocent if illegal hobby. (Reprinted from KENT & SUSSEX COURIER, 26 Sep 1980)

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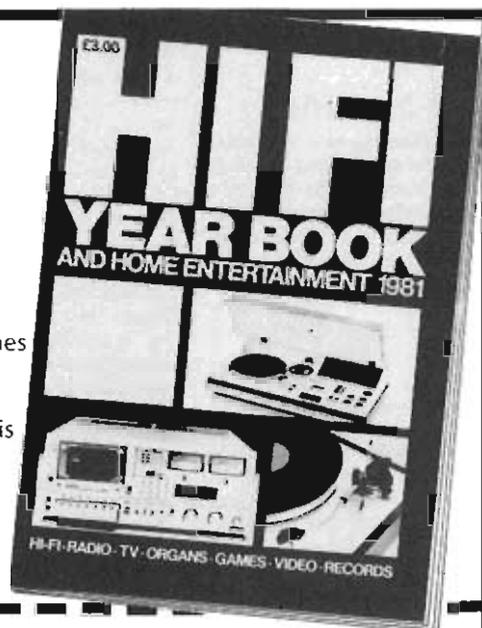
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CB rigs for sale

At first our photographer thought he was seeing things. A British lorry travelling the streets of London actually delivering c.b. rigs. He rushed to buy a mid day 'Standard' expecting to read screaming headlines exclaiming that c.b. had been legalised. This not being the case he threw himself in front of the lorry, camera at the ready to take the above photograph. If it's not delivering c.b. rigs what is it delivering and who is it? See page 54.

Any advance on 1,000,000

It is incredible how many estimates are going around on the number of illegal c.b. users in this country. CB WORLD has conducted its own mini survey based on newspaper reports and this is what it found.

Source	Date	Number
Wolverhampton Express & Star	9th Oct.	100,000
Guardian	27th Oct.	170,000
Bracknell News	9th Oct.	200,000
Beckenham & Penge Advertiser	9th Oct.	250,000
CBA (Citizens Band Assn)	20th Oct.	250,000
Mitcham News	10th Oct.	350,000
North Wales Weekly News	9th Oct.	750,000
Crawley & District Observer	10th Oct.	1,000,000

Who are these breakers who are prepared to be counted? Who is the official counter of c.b. users? What are these estimates based on? CB WORLD will not be drawn into this guessing game but if the average of the above is worked out, it represents 358,333. Do I hear 360,000?

Guilty Fined £200!



An Essex lorry driver carried a citizens' band radio hidden under his driving seat, Colchester Magistrates heard.

The set worked on the same frequency as the beepers used to page doctors and was a "potential hazard", said Mr. Robert Atkins, prosecuting.

An Eastern Telecommunications detector van heard a voice broadcasting 'Breaker one nine', the citizens' band call sign, and followed the lorry down the A12 towards Chelmsford.

When the lorry was stopped near Brentwood the driver Edgar Beasley denied he had been transmitting, the court heard.

Beasley, of Grange Road, Dovercourt, pleaded not guilty to using a radio transmitter without a licence, and guilty to installing a transmitter without a licence.

He was found guilty of using the radio and fined £50. For installing it he was fined £100 and ordered to pay £50 costs. The court ordered that the radio should be confiscated.

Beasley told the court he bought the set from a man at a garage for £100 some weeks before being stopped, but had never managed to contact anyone.

(Reprinted from EAST ANGLIAN DAILY TIMES 10 Oct 1980)

Guilty £150 fine!



A citizens' band radio operator from Dovercourt was fined £150 by Colchester magistrates.

Edgar Beasley, of Grange Road, admitted installing a transmitter without a licence, but denied using the radio. But magistrates found the charge of using the radio proved.

Mr. Robert Atkins, prosecuting, said two Post Office officials were monitoring the A12 for illegal radio transmissions when they picked up a message from a car transporter.

The driver, Beasley, was stopped and the radio was found under the front seat, with aerial and power leads under a sleeping bag.

Beasley claimed in court he was not using the radio and had only used it a couple of times in the two weeks he had had it.

Mr. Michael Hawkins, one of the officers who traced the calls to the transporter, told the magistrates: "I noticed that the radio was very warm, indicating that it had been connected up. My opinion was that it had been connected before the vehicle was stopped."

Beasley was fined £100 for installing the radio, and £50 for using it.

(Reprinted from HARWICK & DOVERCOURT STANDARD 17 Oct 1980)

Guilty £55 fine!



Ambulanceman Alan Turner has been in trouble with the law — "because I tried to help people."

He is one of Wigan's "Breakers" — illegal citizens' band radio operators.

"We're real villains," said an embittered Alan at his Standish home after being fined £10 by Wigan magistrates. "We help save lives and raise money for charity. Yes, we're really bad."

He was prosecuted by the Post Office for having a CB radio installed in his car. The magistrates confiscated the equipment and ordered him to pay £45 costs.

Alan told the court that on several occasions he had used the radio to help out at accidents during off-duty hours.

"I know of several individuals in all three services who have CB radios which they use to help with emergencies."

Alan is a member of the Chorley United Breakers' Association, or CUBA for short. Its members come from all walks of life but all have one thing in common — a keen interest in CB radio.

"If a CB user is passing the scene of an accident he can call up a fellow user who can then call the emergency services," explained Alan.

"Yet look what thanks we get. I just cannot understand why it is not legal."

He dismissed claims that the CB frequency disrupted hospital paging systems and interfered with model aircraft.

"The Post Office keep coming up with this excuse but it's rubbish. The truth is they are frightened of losing their monopoly."

A Post Office spokesman said: "We are following a Home Office directive in bringing these prosecutions."

The nations CB users are anxiously awaiting the outcome of Government discussions into the possibility of making CB legal.

But until then they must continue to play cat and mouse with Post Office detectors.

"We are not trying to flout the law but surely helping people is right."

The ultimate irony for Alan came last Friday night during a fancy dress party organised by CUBA in aid of a local hospital fund.

Presenting the prizes was a woman magistrate. Reprinted from WIGAN POST 7 Oct 1980.

Guilty Sent to prison!



Time out Rubber Duck ... Iranian student Serzhik Harapetian's stay in Britain could soon be over.

The 22-year-old Citizens' Band radio enthusiast appeared before Brighton magistrates yesterday.

But he quickly found himself behind bars — for overstaying his leave in this country.

Harapetian, who lives with an English family, admitted four offences of using illegal radio equipment and one of staying in the United Kingdom after his visa had expired.

After hearing the case, magistrates remanded Harapetian in custody until October 21, with a view to recommending deportation. Home Office representative Mr. Robert Atkins said Harapetian was stopped by police in Brighton.

"They saw a radio set in his car and he admitted it was a CB and that he had used it earlier in the evening at Portslade.

"Three days later he was stopped again and still had the radio in the car. He admitted talking to another driver with it," said Mr. Atkins.

He added that Britain had been flooded with illegal CB radio sets which were interfering with legitimate users on certain frequencies. "This is potentially disastrous. Doctors' emergency beepers and model aircraft share the same frequencies.

"Using these radios near a hospital will flood the beeping system, making it useless.

"If one was used at a model aircraft display it could send the models out of control. This has happened in the past," said Mr. Atkins.

Miss Marie Higgins, for Sussex Police, said Harapetian's visa expired last November.

He had applied for an extension, which had been refused, and it was now too late for an appeal.

Harapetian told the court he wanted to go to Sweden where his sister was.

"I was going there but my money from home has not arrived. I owe £140 rent to the family I am staying with and did not want to go without paying them," he said.

(Reprinted from BRIGHTON EVENING ARGUS 8 Oct 1980)

Radio backing

The Institute of Journalists has written to the Home Office favouring the introduction of citizens band radio, which it says would be "a most useful tool for reporters" provided the system has an adequate range in urban areas. (Reprinted from GLOUCESTER ECHO 21 Oct 1980)

“Any breaker for a visual, focus it back”. This might be the future greeting from one good buddy to another in the year 2000 and why not!

We are told today, with the micro ‘chip’ technology and the ‘mini metro’ robots, that anything in electronics is possible — then why not have in your hand a microphone capable of receiving and transmitting pictures as well as sound. When the picture received is out of focus, you might still say “You are coming over a bit 10-1”. If you get a clear sharp picture and what you see is unattractive, you might still want to say “you are coming over a bit 10-1” wishing them all the low numbers as you fade them out.

With a cash card you are at present able to press out your code number and receive cash from banks after closing hours. Perhaps in the year 2000 you would be able to key in, with your hand-held mike, your code number and from a few miles away enquire about your credit (or otherwise) in your bank account. You would receive the digital information on your mike’s VDU (Visual Display Unit), store the information until you arrive outside the bank and then press the payment key, bingo, you have the cash.

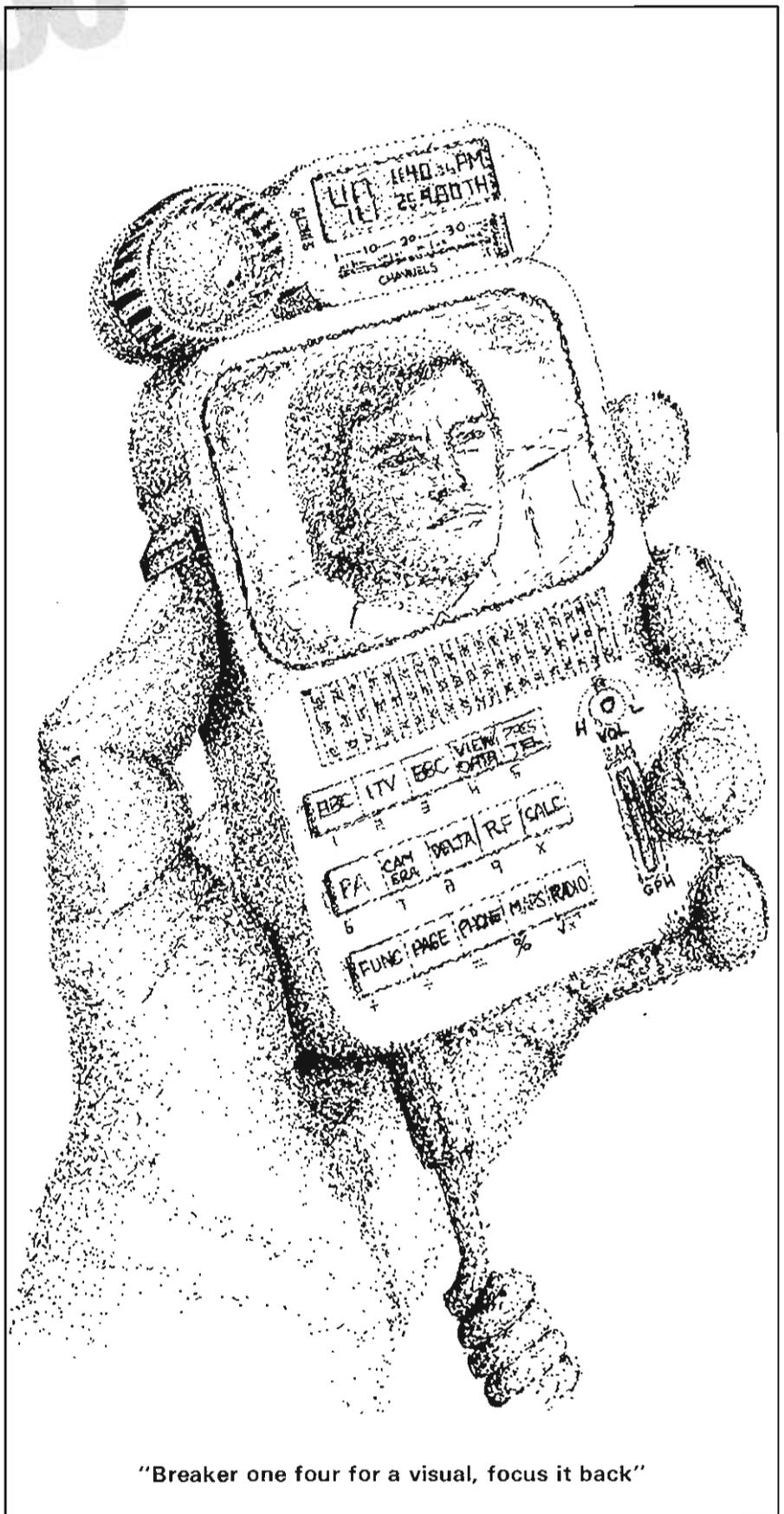
Imagine having Viewdata and Teletext data at your fingertips. You could be out in the country in your car absolutely lost. Press the buttons on your mike and the maps of the area zoom up before your very eyes (touch of the James Bond). Perhaps you have run out of petrol, miles from anywhere, and with a few taps of the buttons you get a fix on the nearest open petrol station. Maybe a robot could then drive out to you with a gallon can of “motion lotion” (petrol).

One of the most exciting things must surely be the opportunity of watching television from the VDU. Mind you, if you have placed your mortgage on Black Knight in the 2.30 at Haydock, it would be advisable to stop the car, pull in and watch your selection in safety. If you didn’t and you were driving along watching your horse winning at 50-1, then its an even better bet that you will end up six feet under ground and that’s ‘a big four for sure’.

From your mike you should, in the year 2000, be able to get a digital read-out of your car’s performance and capacities. It should be able to tell you for instance:

- Petrol in tanks (or amps in battery if electric driven)
- Battery charge
- Oil pressure
- Temperature of engine
- Tyre pressures (without getting out of car)
- Miles per gallon
- Radar spotter
- Radio/hi-fi/telephone.

Imagine the strain in taking the family on a 500 mile dash through France with



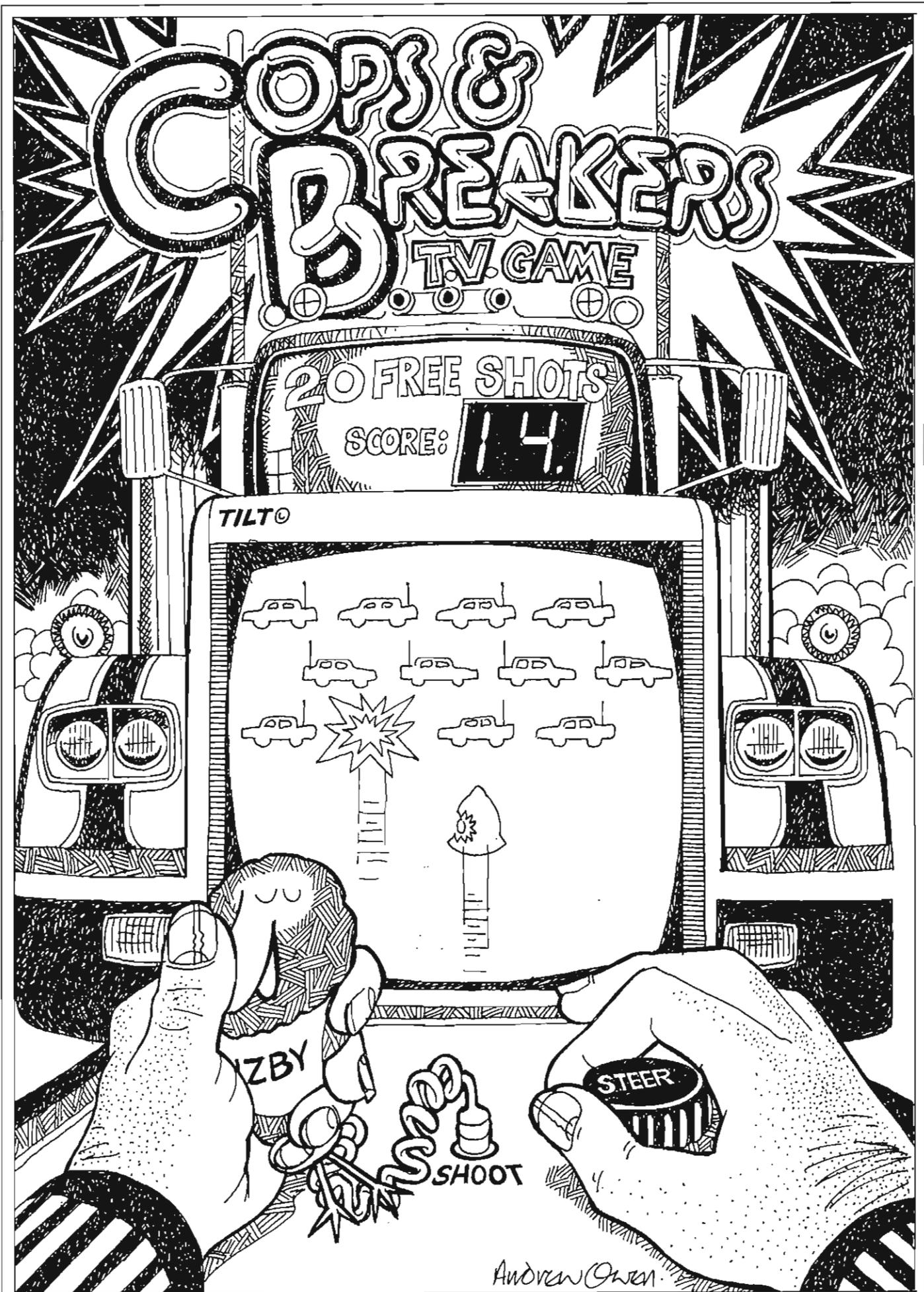
“Breaker one four for a visual, focus it back”

two or more tiresome children. How can we keep them occupied? Plug in some Video Games. Space invaders, chess, football, tennis, the list is endless, the mind boggles.

Perhaps the mike could be programmed to open your electrically operated garage door. Perhaps the whole thing could take

over and by pressing buttons your whole car becomes remote controlled like a model aircraft.

There’s one other thing, I had almost forgotten what your hand-held multi-purpose digital-read-out VDU mike could be used for in the year 2000. Citizens’ Band!



Put this TV Video Game on your Christmas shopping list. The Home Office have!

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NEXT ISSUE

THE NEXT ISSUE of CB WORLD, due out early in 1981, will contain some very exciting developments. We will not mention here exactly what they are — our competitors might copy. The centre spread in colour will remain and we hope to publish your letters based on what you've read and seen so far.

We are considering publishing a CB WORLD register of c.b.er's handles. But we wondered whether breakers would be keen to give them.

We would not expect you to give your real name and address but we hoped you might give your handle and local twenty.

The directory could be very useful for breakers travelling the towns and by calling them on the 14 channel you could tick off for copies, eyeballs or brown bottle swapping. Is it too naughty for us to produce this directory which could read as follows?

BISTO KID (NEWCASTLE),
 HONKY TONK (OLDHAM),
 SHINING MOON (CRAWLEY),
 BIG BRUVER (PLYMOUTH),
 CHIPMUNK (CATERHAM),
 TRITON (DERBY).

If you dare, write in to the Editor, CB WORLD, IPC Electrical-Electronic Press Ltd., Quadrant House, The Quadrant, Sutton, Surrey and give your handle plus local 20 and we'll do the rest. We hope to include them in the next issue. Club Secs, having obtained permission from their members, could send them in to us in one go. Go on, don't be shy, give it a try.

Also with the next issue we may well have someone very well known write for us. We can't tell you who he is until he agrees.

In the meantime, all you good buddies have a very enjoyable Christmas. Do all good things and deeds, especially if there's snow about and people need help. Keep those flies off your glass and the bears off your rear bumper. Bye, bye, we gone, breaker break.

CB Deliveries

The truck is not delivering c.b. rigs. It belongs to CARTWRIGHT BRICE & CO. LTD, suppliers of commercial stationery and paper based in London S.E.1.

CB made in UK

Sorry no prize for guessing in which factory our picture was taken. The factory is Aiwa in South Wales. CB assembly line, in this case, is their Circuit Board assembly line.

Club Corner

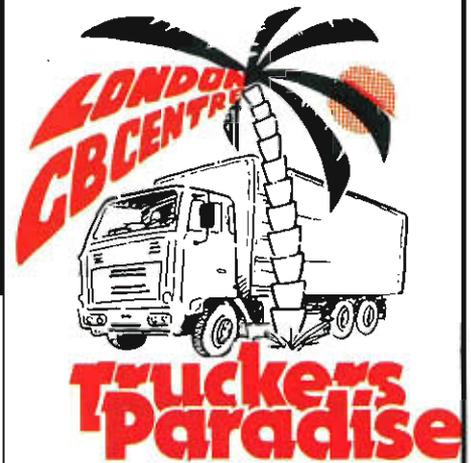
IN THE NEXT ISSUE — published early February 1981 — we are introducing "Club Corner". This section will be devoted to the happenings, events, talks, visits, charities, darts matches, rallies, parties and any other thing you feel worth mentioning. If supported with a good black and white photograph, so much the better.

As a starter, the Carshalton Club, run by Iced Diamond and husband Triton advise CB WORLD that they now have a membership of over 500. The club has only been going for just over one year and meets every Thursday. The admission fee is 25p and a disco is provided for members once a month. The club has a scheme whereby a solicitor is on hand to deal with c.b. offences. The club will pay for legal and solicitors fees but will not pay for the actual fines or replacement rigs. It would appear that the club arranged for the solicitor and on the first day, four breakers were fined £50 with £50 costs. In the following week three breakers had to pay £40 costs only with no fine and the fourth got a conditional discharge. The club put up £300 in the first place which turned out to be a good investment in that it saved costs all round. On another occasion a club member who was physically handicapped arrived in his specially adapted Mini, only to find on leaving the club his car had gone missing. The club sprang into action and 30 members went out looking for the car. The Mini was discovered half a hour later by the Carshalton breakers undamaged, and there lies the end of a happy story.

Club secretaries or those who can pen paper should send things to: "CLUB CORNER", CB WORLD, IPC ELECTRICAL-ELECTRONIC PRESS LTD., ROOM 312, QUADRANT HOUSE, THE QUADRANT, SUTTON, SURREY SM2 5AS.

London CB centre at TRUCKERS PARADISE

10 Marshalsea Road, London SE1 Tel. 014031717



We carry a wide range of C.B. equipment in our shop covering everything that you could ever possibly need. If you live in the London area our shop is open from 9.00-5.30, Mon.-Sat., and we're just 1 minutes' walk from Borough tube station. If you can't get in to see us send **25p** for our catalogue of C.B. and Trucking goodies. We can send most things by post and below you will find a few special mail order offers.

T. SHIRT SPECIAL OFFER

Our famous Busby T. shirt really puts the message over. It usually sells for £3.50 + P&P but we're offering it for only **£3.25 inc. P&P**. We use only top quality American shirts and they are available in black, navy blue and red. When ordering don't forget to give your chest measurement.



QUICK RELEASE C.B. MOUNT

This is the **ESSENTIAL** accessory when you want to be able to remove your rig quickly and easily. The mount is in 2 sections: connect one part to the radio and install the other part under the dashboard or wherever is most convenient. Attach the power leads and the aerial and that's it, when you want to remove your rig, just slide it out. These mounts usually sell for around £10 but we are offering them for only **£7.95 inc. P&P**.



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Get ahead of everyone else with our great cap offer. Caps are available in black, navy blue, red and yellow and come complete with a high quality embroidered badge on the front. Our caps are guaranteed to fit almost any head and have an adjustable strap at the back. Special CB WORLD price **£2.95 inc. P&P**.

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There are so many C.B. books available now that we have decided to offer only the three best.

THE BIG DUMMY'S GUIDE TO C.B. RADIO is an excellent book covering every aspect of C.B. It has all the information you need to know when buying a rig, when installing one and when actually using one. The best book at the best price **£2.95 inc. P&P**.

SLANGUAGE LANGUAGE

is America's best selling C.B. dictionary and contains thousands of words and phrases in use by our C.B. buddies in the States. Essential reading for everyone interested in C.B. **£2.50 inc. P&P**.

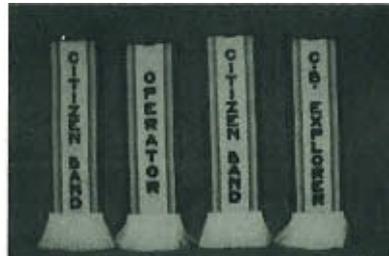


C.B. BIBLE is probably the best selling C.B. book in this country. It's only small, but it tells you everything you need to know on how to talk C.B. **75p inc. P&P**.



MINI SCARVES

These colourful mini scarves are designed to hang in the window of any car or truck. They are 9" long and come complete with hanger and sucker. Choose from 3 designs: 1) C.B. Explorer, 2) C.B./27Mc, 3) C.B. Operator. **£1.95 each**.



WHAT'S YOUR HANDLE

Use our D.I.Y. sun-strip kit to display your handle. It comes in green and measures 68" x 4", big enough for car, van or truck. When ordering print the name that you require on a separate piece of paper and we will send you the letters which you then stick onto the strip. Sun-strip **£1.59**, letters **12p each**.

C.B. EQUIPMENT

Whatever kind of antenna you're looking for, we've probably got it in stock, and at really competitive prices. D.V. 27's from **£9.50**; twin truckers from **£25.00**; electric retractables from **£27.00**. Unfortunately, a lot of antennas are too long to send in the post, but most other items — no problem. Just send us a cheque or postal order and you'll have the goods in a matter of days. If you require any information do not hesitate to 'phone and we'll be happy to help. If you have Access or Barclaycard we can take your order over the 'phone, just ring 01-403 1717.



P.A. Speaker **£12.95**
S.W.R. meter & power meter **£14.95**
Extension Speaker **£12.95**

ATTENTION ALL CLUBS

As well as supplying the best in C.B. equipment and accessories, we are able to supply clubs with all kinds of personalised clothing such as T. Shirts, sweat-shirts, caps and jackets, all at very reasonable prices and with quick delivery. Please write or 'phone for further information. We also give a discount on most C.B. items when you produce your membership card.

To: Trucker's Paradise, 10 Marshalsea Rd, London S.E.1

Please send me the following items, for which I enclose a cheque/or postal order for the sum of £.....

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Letters for Sun Strip.....	£0.12 each	
Big Dummies Guide.....	£2.95	
Slanguage Language.....	£2.50	
C.B. Bible.....	£0.75	
Mini Scarves: 1 . . . 2 . . . 3 . . .	£1.95	
Extension speaker.....	£12.95	
P.A. speaker.....	£12.95	
S.W.R. meter & power meter.....	£15.95	

NB — we are sorry to say we are unable to accept Irish cheques or postal orders. Whilst we are happy to send goods out of the British Isles, please phone and check what the extra postage costs will be.

We can accept post or telephone orders on Access or Barclaycard. Tel: 01-403 1717. All prices include V.A.T. & P - P. If you don't want to cut your copy of CB WORLD send your order on a separate piece of paper.

I enclose cheque/P.O. for £.....

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