

CB World

For Citizens Band and
two-way radio enthusiasts

AUGUST 1981

60p

CB antenna design facts

Club Corner

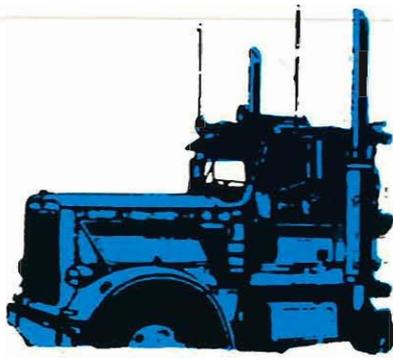
SWR made easy

CB for disabled

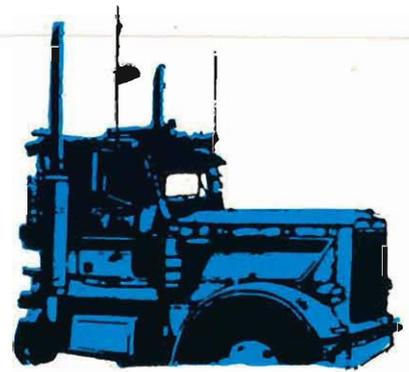
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BRITISH CHIPS ARE FROZEN

YOU WOULD have thought that with all the phrases about "The White Hot Heat of the Technological Revolution" (H. Wilson) "The Growth of our Industrial Base will come from the small business" (M. Thatcher) and all the other warnings to U.K. Industry to get geared up for an increase in leisure hobbies; such a nowadays simple thing as a microchip would be being churned out by the millions for the new British Citizens' Radio Service.

Not so.

It is understood that despite assurances given to Ministers by Home Office officials that "Pleasmy Electronics" can have a chip ready in a fortnight, the supply of this vital one component is in the virtual monopoly of the Japanese.

This wouldn't be so bad if our Far East friends shared their technology with us as we do with the rest of the world.

Again, not so.

The Japanese chip will initially only be available to their other associated trading houses in the Far East. That means your first set, if it is to use integrated circuit technology for reliability and low unit cost will be made in the Far East. A leading c.b. campaigner used to use the phrase, "I don't want Japanese jobs for Japanese workers but British jobs for British workers" regularly in his broadcasts. What happened?

It's been suggested that one of the reasons for the funny one off British channels with carrier frequencies going to four decimal places was to ensure that the, at present, £1m per week c.b. industry didn't add a further load on the U.K.'s balance of payments deficit. This reasoning was met with screams of anguish from those who make their money from importing and not making, culminating in threats to stop c.b. legalisation by taking an action under G.A.T.T. (an international treaty) called the General Agreement on Trade and Tariffs.

The action should be taken against the countries who sign these trade treaties and then don't abide by them.

Meantime U.K. companies are working with "piggy back" printed circuit boards which confuse a readily available chip producing the F.C.C. channels so as to get the British frequencies out.

I seem to remember devoting a lot of my taxes to a state-owned firm called INMOS precisely so that this sort of thing wouldn't happen.

But it has.

Brian L. Chalmers-Hunt

NEXT MONTH

In CB WORLD next month we will be starting our new series on passing the radio amateurs examination. (See Page 49) Also Richard Town will be spending time in our laboratory carrying out his first equipment test. This will be a regular monthly feature telling readers how the new c.b. equipment actually performs. (See Page 14).

The theft of c.b. equipment is on the increase, so we will be telling you how to deter the opportunist thief. Also included will be Bring it Back, Club Corner, This and That, Let There be Music, Femme Scene and more of your Handles●

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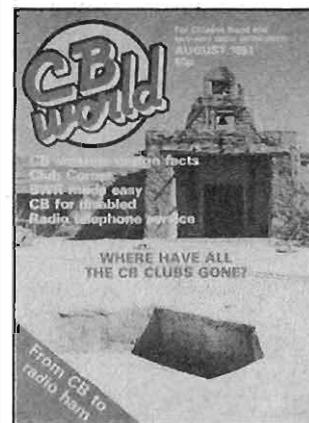
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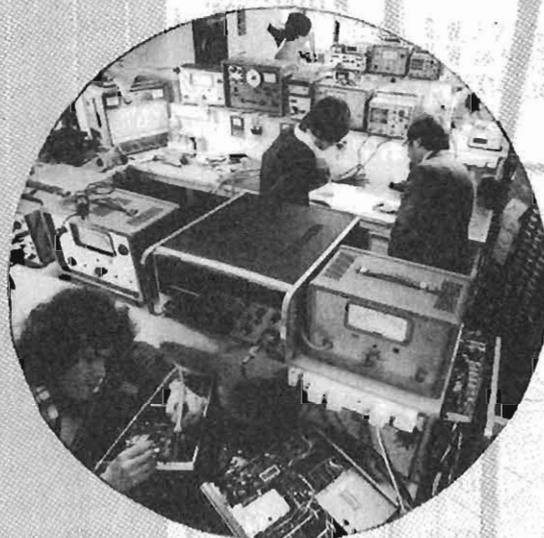
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So why the photograph of boxes? This simply assures you that when it's truly legal you can have it off the shelf!



LOWE ELECTRONICS

TRADE ENQUIRIES WELCOMED



The majority of **C.B. CLUBS** stateside no longer exist.

There are fears that this situation could occur in the U.K. after legislation. Club organisers have plans to ensure survival. p6

C.b. will open up a completely new world of communication for the **DISABLED**. This month we introduce the concept and in future editions will give reports on actual installations. p9

An antenna is not just a "twig" but the result of considerable research and testing. How much do you know about **ANTENNA DESIGN?** p12

UNBIASED EQUIPMENT APPRAISAL requires a professional approach. *C.B. World* have established a laboratory for putting all c.b. and two way radio equipment under the microscope. p14

Matching the antenna to the set requires knowledge of what is needed and how it is done. The correct sequence for obtaining a **GOOD SWR** is revealed. p18

Once again we have been eavesdropping and the latest problems experienced by breakers are revealed in this month's **FACTS AND FALLACIES** p21

READERS have continued to swamp us with letters. A selection of those received during the past few weeks will be found in **Bring it Back**. p22

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Let There Be Music

HANDLES for towns, handles for people . . . these are rolling in every day. The ingenuity of our readers to think up new handles never ceases to amaze us. p26

Contrary to the American scene c.b. clubs are flourishing in the U.K. This month's **CLUB NEWS** shows that social activities will play an important part in keeping groups of breakers together. p38

Do you fancy making a telephone call from your car? The idea might be good — but it could well remain an idea because of the long waiting list for the **RADIOPHONE SERVICE**. p43

LADY BREAKERS have the opportunity of expressing their own views on the predominantly male orientated pastime of talking to each other in riddles. p46

FEMME SCENE

We have told you how to obtain a good SWR (when c.b. is legal). If **PROBLEMS** are envisaged then some causes of failure have been predicted. p54

Tired of listening to idle chat and waffle? Then why not turn on the radio or put a cassette in the slot. **LET THERE BE MUSIC** gives a round up of the latest equipment available for the car or truck. p56

Has your c.b. club a future?

THERE ARE TWO main ingredients of a UK c.b. club which have provided solidarity to the citizens radio movement for the years preceding legalisation:

(1) Breakers activities are illicit in nature and therefore, due to the ever present threat of legal action being taken against the individual 'breaker' by the state, an enhanced feeling of security is provided by one's fellow club members.

(2) Each club shares a common belief with all other clubs throughout the U.K. that the law forbidding a citizens' radio service is wrong and should be changed.

So given that being a breaker will soon not be illicit and that the law against c.b. in the U.K. is to be changed; will your c.b. club still exist?

About the corniest national newspaper headline I saw during the campaign was "Banding Together for Legal C.B." Despite the "AM or bust" headbangers, all of us, including the chairman of the Parliamentary Working Party, Major Sir Patrick Wall MP have been united in causing a fundamental shift of power away from the State and to the individual.

With sets and aerials soon to be freely available at Rumblelows, Woolworths, Dixons and Tandy stores and our new frequencies filling up fast with rubber-banders no one will care a jot who caused the biggest convoy to be seen this side of Biggleswade or which so-called c.b. "celebrity" caused the Home Office to discard their proposals for restricting the length of your aerial to 1.5 metres.

There are many different types of clubs to be found in U.K. They can be divided into five main categories.

(1) The personality clubs that are held together by the sheer presence of "Disco four hundred and twelve" (also can be split asunder by him too).

(2) The public service clubs, whose main reason for existence is a particular charity or service to the public.

(3) The special interest clubs that are formed because of a shared interest of its members i.e. sidebanding, legalisation or even brown bottles.

(4) The clubs that just provide a get together for a regular social evening.

(5) Clubs with a mix of any of the foregoing.

Whatever the reasons for a c.b. clubs' existence, in the States most seemed to die out after a time because of the sheer weight of their growth. In addition, "Disco four hundred and twelve" may move out of the area or discover that his membership (which he claims to be 58 million) are beginning to take c.b. seriously and he is deposed as "president".

He immediately becomes, after losing his title just another breaker and no more or less important.

The public service clubs may find that their active membership comprises the hard working and dedicated few who began the whole operation in the first place. These hard working few rapidly become sick of doing it all themselves and will soon resign.

The special interest clubs lose their membership as their members interests change and, due to inflexible policies of the management, cannot change to meet the new interests.

The members of the social club get tired of seeing the same old faces at their get-togethers and stop getting together.

The larger the club becomes, in the USA experience, the more difficult it is to keep the members interested.

Our Stateside correspondent reports that c.b. clubs that sprouted up during the heydays of c.b. were plenty. There was just about every kind of c.b. club that you could think of. There were clubs for the lawless, clubs for the legals, clubs for the emergency monitors, clubs social, c.b. chess clubs, c.b. QSL card swapping clubs — you name it, there was a c.b. club for it.

Which clubs survived? The QSL card clubs as well as the emergency monitoring clubs. Just these two.

Those who collect QSL cards seemed to be die hard operators. They were into c.b. before the radio fad had really begun. They hung in there through all the interference and the 10-75 and are still surviving now the channels are more disciplined.

As for the emergency monitoring teams,

their participation in the overall c.b. programme has been magnificent. There are only about three national emergency monitoring clubs and all are doing quite well.

The Eire experience is closer to home.

Before their own legalisation announcement Dublin had one club — called the Dublin 27 club — which ultimately splintered into fifteen or sixteen separate outfits, due to sheer weight of numbers.

As with the U.K.'s National Committee for the Legalisation of CB Radio (NATCOLCIBAR) so Eire has the National CB Council of Eire with "affiliated" clubs being "awarded" delegate status.

In Eire, the fact of the matter is that there is no longer any need to be in a club. In Dublin there are only four clubs left with any real say authoritatively in c.b. matters. The most recent club to become a ghost town being the Fingal Breakers.

Throughout Eire's capital city it is estimated that there are only three hundred breakers belonging to and regularly attending a c.b. club. North of the border it is understood that the Ballemoney Breakers are also in the throes of "changing".

The answer could be found with the umbrella organisations which in setting up regional groups based upon existing clubs accept and process individual memberships.

Indeed NATCOLCIBAR has already taken the decision, in principle, to do something like this possibly on the lines of the Radio Society of Great Britain for 'hams'.

Yet, to many of the club leaders this poses a threat to their authority. This in turn causes them to attempt to either ignore or attack the umbrella mostly in the semi-privacy of their own club but never at the umbrella organisations own meetings.

This feeling is understandable since the local clubs faithful members just might turn their heads away from the local club and devote most interest towards the national umbrella leaving the club leader with loads of local paperwork, and little real authority.

The hard-won British citizens' radio service, came about through the hard work and dedication of the individual clubs up and

Club administrators must be prepared to cater for all age groups having a wide range of interests. If this is accomplished the clubs will survive.

(photo Concrete City)



down the country.

Anyone who has had anything to do with the legalisation movement knows that there are powerful forces arranged against them.

If the powerful forces view ever came to be accepted again, not only would c.b. clubs become ghost-like but 27MHz could become the 'ghost town' of the airwaves. ●

There are many c.b. clubs situated throughout the U.K. which have been built up over the past few months by dedicated and hardworking members. The majority are not regimented but run with a free and easy programme, attracting new members all the time. Their future after legislation is assured provided that they remain versatile, flexible and provide what the members want.

Take for instance the Bugs Bunny Give us a Nine Club. We asked Bugs Bunny, one of the originators if he saw any future for the club, once the cloak and dagger atmosphere of c.b. had been removed. He looked in horror, probably because this was inference that his days (sorry, the Club's days) were numbered. Standing on his little back feet in the centre of a group of the Club's administrators in a situation rather like the mad hatter's tea party, we received such a convincing story that we left knowing theirs is one club that definitely will stay.

This club was conceived by a small group of breakers from Ashted and Leatherhead in Surrey who wanted a local meet of their own. From the outset the Club has been run completely free of rules and regulations and with no official president or committee.

This successful formula has brought the membership from an anticipated 50 in the early days last November to a figure now exceeding one and half thousand, and growing steadily week by week.

The primary aim in starting the Club was to help in the battle for legalisation of c.b., since all concerned realised how beneficial a cheap method of two-way radio communication would be to the community.

At this point we should explain how the Club got its rather unusual name. "Give us a 9 Bugs" was the local catch phrase about the time the Club started. Bugs Bunny was a local breaker with a rather 10-1 rig, and all he was ever heard to say was, "Give us a 9". When the time came to choose a name for the Club the name as it now appears was suggested by Uncool Harry and seconded by

Country Boy. As a shy Breaker Bugs Bunny didn't want his handle used, but was outvoted 20 votes to 1."

The club began in a small local pub called The Woodman, and after a few weeks they found they were attracting Breakers from five and six miles away. Although they couldn't have found a better landlord than Paul, they soon arrived at the point where they either closed their doors to new members or moved the meet to a large hall.

They were fortunate in getting the co-operation of the landlord at the Hand in Hand, Boxhill (Surrey), who was kind enough to offer the use of the hall at the rear of his pub, which remains their regular Tuesday night meeting place. Shortly after the move the Club were sure that their "no rules" policy was a real winner. Breakers began travelling 30 miles to join them at their meet and the numbers grew so rapidly that they soon topped the 1000 mark after only 3-4 months since the first meet in November.

From the start the Club realised the importance of keeping all members up to date with the local c.b. news through a newsletter which is available to each member free of charge. They also publish occasional technical articles, and features on various aspects of c.b.

Members have enjoyed taking part in social events, from darts to bowling, discos to barbecues. They see the Club becoming a general social meet for people who enjoy c.b., rather than a c.b. club in the purised sense.

The Club has a good rapport with the Surrey police and members have been able to give some positive assistance on a recent case. They are always willing to help when asked, although they accept the fact that their help is given on an unofficial basis.

The Club are collecting in aid of leukaemia research by means of special raffles and the collection of postage stamps and ring pulls from drinks cans. The Club does not make a profit and all money is ploughed back into raffle prizes, and the other expenses that are incurred in running a club of this size.

We left Bugs Bunny convinced this one club had "got it right". **We hope that the majority of c.b. clubs in the U.K. will not suffer the same fate as those in the United States. ●**

The Bugs Bunny Club has over 1500 members. Large and small groups will be found most evenings and weekends enjoying themselves in some activity arranged by the club organisers. This is the conclusion of yet another successful foxhunt.



ON THE CB BALL AT RUGBY



RICHARD TOWN was recently invited to one of the Rugby Town Breakers Club meetings. Rugby is a club run on professional lines, whilst ensuring that c.b. fun isn't lost. Membership registration is by handle, with serial number of rig and whether a.m., f.m. or s.s.b. and whether base or mobile. The club is one year old and has about 500 members.

At their Christmas dance over six hundred pounds was raised, which is to be made available to the local hospital for a special bed which will be identified with a plaque inscribed as having been donated by the club. During last winter the club organised the distribution of about 150 heaters of various sorts to the local aged, infirm or bed ridden so as to ward off Hypothermia.

Future social activities include a weekend in Amsterdam and a treasure hunt where entrants lose points if they have to contact a marshall for directions. It's unclear whether the contact may be made by c.b.

Rugby Town channels are 9 for emergencies, 19 for truckers, 21 for calling. Not all forty channels are available since there is a constant wall to wall carrier on 15, medical services on 14 and use of 38 produces harmonics to Warwickshire's emergency services. If TVI or BCI is reported to the club then they will assist either the breaker concerned or the complainant. In this way good relations are maintained with the police, local council and their local M.P. Jim Pawsey.

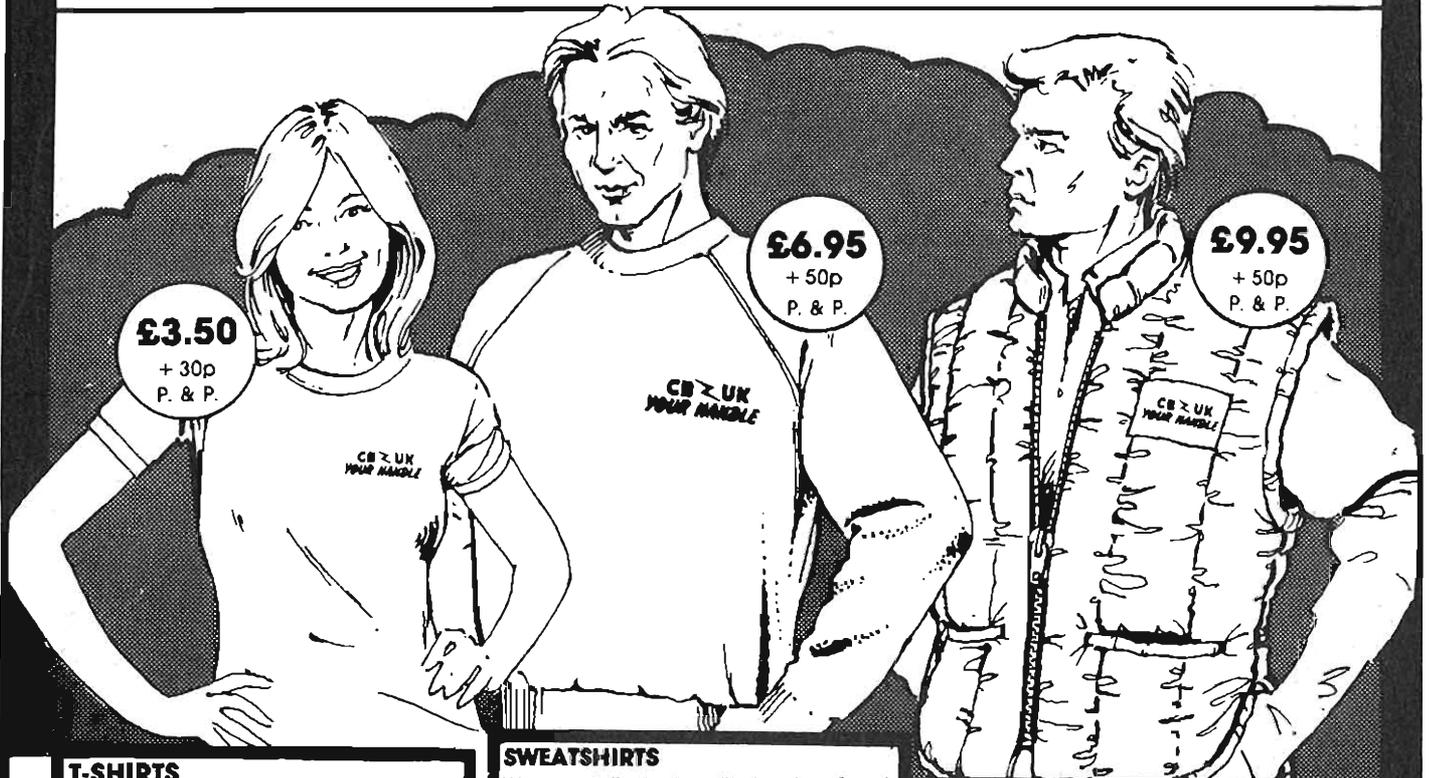
The club magazine is a really well produced and set out with plenty of adverts from the local traders. It's complete with 'the alternative c.b. dictionary' containing entries such as 'asbestos' as in "you'll 'av to do asbestos you can", and similar groaning cartoons.

Above all Rugby Town breakers struck me as a friendly club — and isn't that what it's really all about?

Richard Town will be out and about visiting clubs in your area for CLUB SPOTLIGHT as a regular feature. If your club would like to be featured contact him at CB World. ●

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For further details/ prices please phone or write to our CB Sales Department at Northampton (0604) 30804. Trade enquiries also welcome.

The above items can be purchased with your CLUB name or design in the minimum quantities stated. Orders of minimum quantity or above will receive maximum club discount. All "Specials" are subject to a "one-off" origination charge to cover artwork and screen preparation. Specifications of all items (colours/sizes) as in catalogue.

C B installation for the



disabled — no problems

C.B. radio will give the disabled a completely new communications system so that no one, however handicapped, need feel alone.

A COMPLETELY NEW WORLD is about to be opened up for the disabled. This is the legalisation of citizens band radio. CB will provide a sound communication system to all who up to now have difficulty with physical movement, sight or hearing.

Those who are already associated with c.b. are a rare breed of people who are prepared to spend time and money on helping those who wish to become involved. Read **club corner** to see what activities club members get involved with.

Adaptation of available equipment has already been discussed by *CB World's* technical staff and there is no reason why anyone, no matter the extent of the affliction, cannot operate a suitably modified set. The

extra cost of modification to an installation could be a matter of pence rather than pounds. The resultant enjoyment and benefits will be priceless.

For example, it is perfectly feasible to mount a c.b. set and antenna on an electrically operated wheelchair using the existing powerpack for the supply to the set. A special antenna with ground plane can be mounted at the back — with a suitable pennant to stop pedestrians poking their eyes out and the set mounted vertically by the armrest or other position for easy access.

So simple, but it does mean that no person need have problems about keeping in touch when out on the pavements or shopping precincts. Discharging wheelchair batteries,

tiredness or sudden panics for the newly afflicted will soon bring help.

Loss of limbs or for those hard of hearing, does not present too many problems because either a pair of, or a single headphone and an attached mike can help the wearer to concentrate on the contact yet remain in control of movement. Switching normally incorporated in the hand-mike can be either supplemented or replaced by a simple foot or finger operated switch. We found a bell-push switch mounted on the tiller control of a three-wheel vehicle worked well.

For the hard of hearing a simple amplifier inserted between the headphones and the set will make listening far easier plus power mike for those with a soft voice will all help

to make conversation between two breakers easier.

Fitting a c.b. set to an Invacar also presents no problems. These vehicles are fitted with a conventional 12 volt system and the set can be wired either direct to the battery. Because these vehicles are fitted with GRP bodies it will be necessary to use a ground plane aerial. Electrical interference suppression could be a little more difficult than with an all-steel body car but is not insurmountable. Any difficulties should be referred to the local specialist.

Accessories such as mike, headset and controls can be adapted to the particular driver's needs. If there are doubts about drilling holes for the aerial there is an adhesive type aerial mount on the market.

Fitting a c.b. to a suitable converted mini or for that matter any other vehicle will obviously depend on the particular driver's requirements but it is anticipated that no problem is insurmountable. Many c.b. enthusiasts are involved with some aspect of electronics and welcome a challenge.

Home bases can also be adapted to meet individual needs. For those who have sight problems, controls can be identified in braille and the channel switch given various channel location marks.

Any disabled breaker who is contemplating using a c.b. set is recommended to contact his local suppliers. They will be able to recommend a local club and members will be only too pleased to help advise on equipment available and once installed show how to use it.

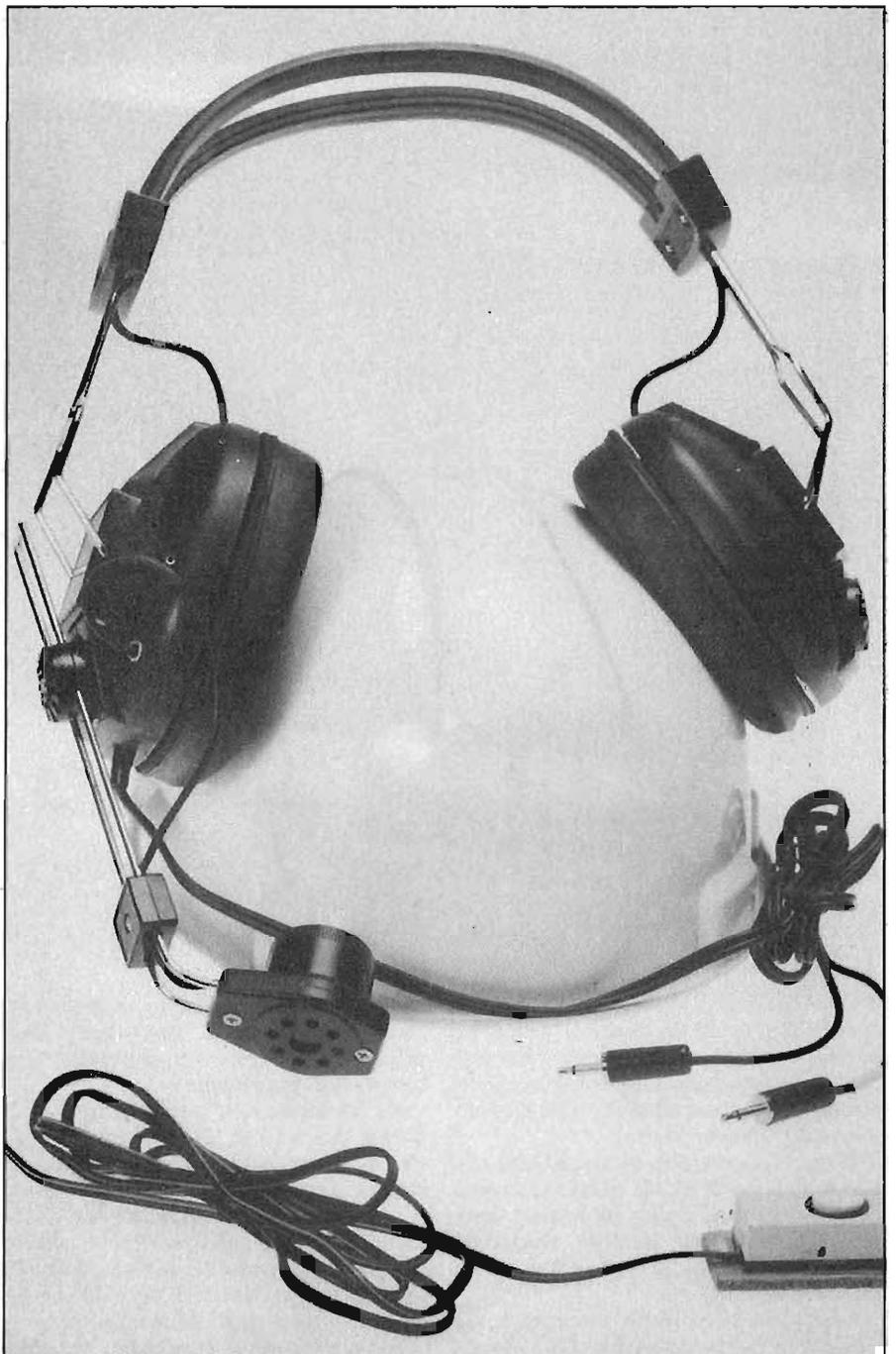
For those who are more severely handicapped, pressure switches can be incorporated for actuation by mouth probe or head movement and channel selection switches servo assisted or remotely controlled. There could also be an application for "blow" operated microphones.



Fitting a c.b. to this car is as simple as fitting . . . to a mini.



A single headphone and mounted mike could be used by those in cars with converted controls.



The disabled with home bases can use a pair of headphones. Note the "bell push" switch which can be substituted for the more conventional mike switch. In a car this could be mounted on a tiller control or operated by a foot.

MINI OLYMPIC GAMES

LOWESTOFT — September 26 to October 3 1981

Sponsored by CB World for

The International Year of the Disabled People 1981

To all Good Buddies, Lady Breakers, Clubs and Two-Way Radio Enthusiasts



Charity committees all over the country are seeking publicity and financial support, to make 1981 a year to remember for disabled and handicapped people.

The Mini Olympics for the Mentally Handicapped is an event that has been held for the last two years. This year we are hoping to have 2,000 competitors, all competing as in the real olympics for their gold medals. This will take place on September 26th till October 3rd 1981 at Lowestoft.

The Finance Committee for the Mini Olympics is offering through CB World to give CB'ers in the UK the opportunity to be partly responsible financially for this event, bringing great joy to all the mentally handicapped competitors and obviously good publicity to all CB'ers in the UK.

WHY NOT MAKE THIS YOUR CLUB'S CHARITY FOR 1981

CB World will publish all donations contributed by clubs. All clubs wishing to make the Mini Olympics (of the mentally handicapped) their club charity please write to: **JOHN HARPER, STILLWATER, ROLVENDEN, KENT** for registration and further details or telephone Rolvenden 302.

CB World have kindly agreed to enter into this good cause and have donated space free of charge.

CAN YOU PLEASE HELP

CB CLUBS SO FAR

At this time (3rd July) the following clubs have agreed to become involved in this appeal for financing the Mini Olympic Games in September in Lowestoft.

Ace Breakers	— Romney Marsh
Berwick-on-Tweed Breakers	— Berwick
Chelmsley Wood Breakers Club	— Birmingham
East Kent Breakers	— Canterbury
East Kent DX Club	— Canterbury
G.I.B. Club	— Gibraltar (overseas)
G.S.B. Club	— Gibraltar (overseas)
Kidderminster Social Breakers	— Kidderminster
Lima-Tango DX Club	— Tenterden
Lion's Den	— Torquay
Market Town Breakers	— Ashford
Molesey Open Breakers	— West Molesey
North Birmingham CB Club	— Birmingham
Oakleaf-Sidebanders Club	— Tunbridge Wells
Paddock Wood Breakers	— Paddock Wood
Ramsgate Breakers Club	— Ramsgate
Rural Breakers CB Club	— Folkestone
Sandyman's CB Club	— Cambridge
South Wales Big 10-4 Club	— Swansea
Uttoxeter Breakers Club	— Stoke
Whiskey Mikes	— West Malling
CB World Breakers	— Sutton, Surrey

Dear CB World,

I am encouraged by the number of CB Clubs who have registered to financially support the games and already over £1,500 has been collected for this event.

Our first mass eyeball and barbecue is planned for the 15th August at Lenham (nr. Ashford), Kent. Already thousands of breakers have declared their intention to attend and have a good time. Clubs and breakers wishing to have stands or participate in this event should ring me on ROLVENDEN 302, or write to me at Stillwaters, Rolvenden, Kent.

For the centre of England breakers, there is a disco/party night to be held on August 3rd at Chimes Night Club, Leamington. For this, contact Warwick and Leamington CB at P.O. Box 6, Leamington Spa, CV32 6SB.

Meantime, keep the interest flowing and the funds keep growing. 51s and 73s.

John Harper



CB ANTENNA DESIGN FACTS

Antenna design facts. Quick reference table

	1	20	40
Channel No.	27.60125	27.79125	27.99125
Frequency (MHz)		50.02°	50.38°
Electrical length of 1.5m rod, ho	49.68°	8.71	8.85
Radiation resistance, R_r , Ω	8.57	-261.94	-258.61
Reactance, X_a , Ω	-265.13		
Reactance of 1.5uH tuning inductor, X_L , Ω	260.14	261.94	263.81
$(X_L + X_a)$, Ω	-4.99	0	+5.20
Resistance of tuning inductor, ($Q=300$) R_S , Ω	0.87	0.87	0.87
Total antenna circuit resistance ($R_G=2\Omega$), R_T , Ω	11.44	11.58	11.73
Antenna input impedance Z_{in}	12.48	11.58	12.83
Reflection coefficient $ \rho $	0.212	0	0.217
Proportion of input power dissipated or radiated by antenna circuit, $1- \rho ^2$	0.955	1	0.952
Resistive efficiency $\frac{R_r}{R_T}$	0.749	0.752	0.755
Effective radiated power 4W input, watts $0.94 \times (1- \rho ^2) \times \frac{R_r}{R_T}$	2.69	2.83	2.70

As *CB WORLD* goes to press, proposals currently before the Home Secretary include a restriction on twig lengths. It is to be expected that the allowed 4 watt transmitter output will produce 2 watts effective radiated power.

RICHARD TOWN takes a look at the facts which have led up to this proposal. It's for you to decide whether it will work.

Antennas in Free Space

If we connect a transmitter to an antenna, assuming an ideal situation with no resistive losses, and if we are able to match the antenna so that no power is reflected back to the transmitter, then all the power fed in is radiated since there's nowhere else for it to go. Different sizes and shapes of the antenna affect the distribution of the power radiated into the space around the antenna but do not alter the total radiated power.

So total radiated power is different from effective radiated power.

One concept, which cannot be achieved in practice, is an isotropic antenna which radiates uniformly in all directions. This antenna is a useful reference and is often used to compare the gains of other antennas.

For an isotropic antenna the power flux density at 'd' metres is:

$$p = \frac{W}{4\pi d^2} \text{ watts per square metre.}$$

where 'W' is the total power radiated.

So the corresponding field strength is:

$$f = \frac{30 W}{d} \text{ volts per metre.}$$

If a short dipole is used as an antenna then there is no radiation from the ends of the elements and the power distribution has a dough-nut shape. Consequently there is an increase in the power radiated broadside to the dipole. The gain in the broadside direction, relative to isotropic is 1½ times or 1.76 dB. Increasing the length of the dipole has the effect of reducing the radiation at high angles and thus increasing the broadside gain. This increase is small and for a half wave dipole amounts to some 0.38 dB.

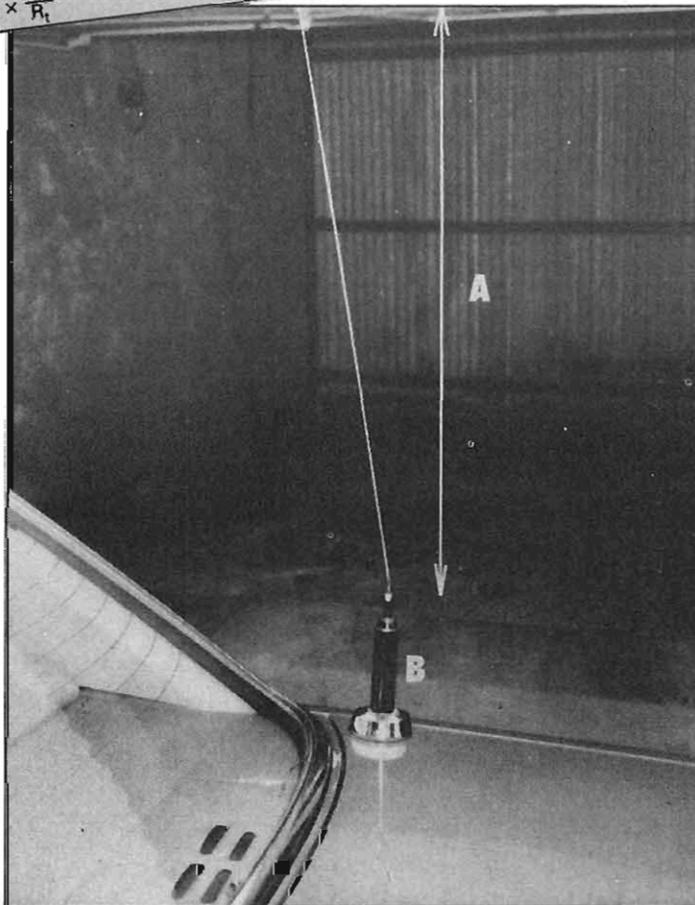
So decreasing the length has the effect of increasing the radiation at high angles i.e. in the direction that you don't want to talk.

The effect of the ground

If you imagine that your dipole is half embedded in a perfectly conducting ground, we then have a monopole radiator and all of the power is radiated into the hemisphere above the ground rather than into a complete sphere. Thus, for a given input power the power flux density is doubled; thus the antenna gain is increased by 3 dB. This applies to either short dipoles or to half wave dipoles, which become quarter wave monopoles above the ground.

So, all your rig power is developed across your twig and the earth or your car body. But since the comparable aerial is in free space and sky hooks are difficult to come by at your local c.b. store, the comparison is only theoretical.

Typical base-loaded magnetic mount antenna.
A. Radiating element max. length 1.5 metres?
B. The Loading Coil (series inductor).



Elevated antennas

A monopole antenna is fed with transmitter power between the base of the element and the ground. If a monopole is elevated, then a 'ground plane' or artificial earth must be provided for the transmitter power to be developed across.

This might comprise a car roof, a system of horizontal or sloping wires, or a flat metal plate. The ground plane could consist of four horizontal rods extending to a radius of a quarter of a wavelength from the axis but where this is not convenient a radius of one-eighth of a wavelength is usually satisfactory.

Only if an elevated ground plane is properly matched will the power be radiated into the whole space around the antenna. Some of the power will be reflected from the ground below and its a matter of practical convenience whether the resultant of the direct and the ground reflection are considered to modify the antenna radiation pattern or as treated as part of the propagation path.

If the ground is flat and un-obstructed, then the radiation pattern in the vertical plane breaks into a number of radiation 'lobes' dependant on the height of the antenna and not its size. If the direct and reflected rays are in phase (i.e. additive) at the receiver then the received signal is twice (6 dB greater) than the free space value or the antenna is said to have a 6 dB gain. On the other hand if the direct and ground reflected rays are exactly out of phase then the signals cancel or the receiver may be said to be in a null of the antenna pattern.

You can't go into a c.b. store and 'buy' a 6dB gain antenna since this gain is due to the distance between transmitter and receiver and the distance between the transmitter and its earth.

In most practical cases for c.b. on 27MHz there will not be a good reflection and the antenna gain may approximate that of an antenna in free space. The important point in this discussion is that overall gain does not particularly depend on the length of the antenna or on whether it's a dipole or a monopole.

Effective Radiated Power

Section 1.2 of the draft specification for the 27MHz cb service states:

"The output radio frequency power of the equipment is limited to 4W. With the antenna permitted for use with the equipment, this gives an effective radiated power (e.r.p.) of 2W."

This is a precise and unambiguous definition although in practice the e.r.p. obtained from an antenna will depend greatly on its configuration and location.

The International Telecommunications Union (I.T.U.) radio regulations define e.r.p. as:

"The product of the power supplied to the antenna and its gain relative to a half wave dipole in a given direction."

In another definition gain is defined as:

"The ratio, usually expressed in decibels, of the power required at the input of a loss free reference antenna to the power supplied to the input of the

given antenna to produce, in a given direction, the same field strength or the same power flux density at the same distance."

When not specified otherwise, the gain refers to the direction of maximum radiation. The gain may be considered for a specified polarisation. In addition **"gain relative to a half wave dipole"** has a reference antenna which **"is a half wave dipole isolated in space whose equatorial plane contains the given direction."**

Thus, by definition, an ideal half wave dipole remote from the ground with an input power of 4W (the maximum power specified for the equipment) has an e.r.p. of 4W. The corresponding erp's for other antennas with a total input power of 4W are:

Isotropic antenna	2.44W
Short dipole in space	3.66W
0.276 lamda dipole in space (a 3m dipole at 27.6MHz)	3.76W
Short monopole on perfect ground	7.30W
0.138 lamda monopole on perfect ground (a 1.5m monopole at 27.6MHz)	7.50W
0.138 lamda monopole elevated above ground at a maximum of a radiation lobe	15.00W
0.138 lamda monopole elevated above ground at a minimum of the radiation lobes	zeroW

However, these complications, which depend upon the antenna location, need not be taken into account since section 3.3 of the 27MHz specification states that the radiated power should be measured by direct comparison with a calibrated half wave dipole. In this method of measurement the e.r.p. of a 0.138 lamda monopole in perfect conditions would be expected to be $\frac{3.76}{4} = 0.94$ that of the dipole (-0.28 dB).

So, with simple theory a 2W e.r.p. limit might be exceeded dependant upon its height above the ground. Now we start to consider how to match the 50 ohm output impedance of your rig to the aerial suggested to be permitted.

Radiation resistance

The length of an antenna is rather critical when considering the radiation resistance and other resistive losses in a practical antenna. When other losses, for example due to the 'Q' of a practical loading coil or to the resistance of the ground plane are present then some of the 4 watts will be lost as heat and less power will be radiated. These losses become more serious as the antenna is shortened since the radiation resistance for short antennas is proportional to the antenna length.

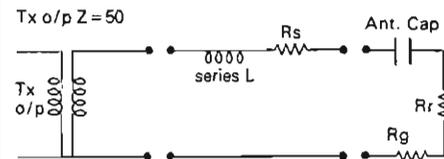
It should be remembered that only for a tuned antenna such as a quarter wave monopole or a half wave dipole does the input impedance approximate to the radiation resistance.

This should be read in conjunction with the earlier theoretical considerations when it was admitted that the suggested 1.5m antenna is only 0.138 of a wavelength.

Antenna Matching

In the practical situation an antenna, shorter

than a quarter wavelength, has a capacitive reactance and this is tuned by a series inductor located at the base of the antenna. Tuning cancels the reactance and the resulting input resistance is then matched to the 50 ohm output impedance of the transmitter using a transformer or auto-transformer (tapped inductor).



Complete theoretical circuit of proposed antenna. The antenna is assumed to have a length of 1.5 metres and a diameter of 6mm.

The characteristic impedance of the rod is therefore:

$$z_0 = 138 \left(\log_{10} \frac{h}{r} - 0.435 \right) \text{ ohms}$$

$$= 138 \left(\log_{10} \frac{1500}{3} - 0.435 \right)$$

$$= 312.4 \text{ ohms.}$$

At the centre frequency, channel 20 which is 27.79125MHz, the electrical length, h_0 is 50.02°

and the reactance is:

$$x_a = -z_0 \cot h_0$$

$$= 261.9 \text{ ohms.}$$

The radiation resistance is:

$$R_r = 40 \tan^2 \left(\frac{h_0}{2} \right)$$

$$= 8.71 \text{ ohms.}$$

The ground losses, R_g , depend upon the installation but it is reasonable to use a value of 2 ohms for a good system.

The antenna is tuned with a series inductor coil, L_s with a reactance of +261.9 ohms i.e. 1.5 micro henries. If this coil has a 'Q' of 300 the resistance of the coil, R_s , is 0.87 ohms.

Consequently the input resistance of the total circuit $R_{ic} = R_r + R_s + R_g = 11.58$ ohms. Thus at the centre frequency, the proportion of the power radiated is:

$$\frac{R_r}{R_{ic}} = 0.75 \text{ of the power input.}$$

Thus with an input power of 4W, 3 watts is radiated and the e.r.p. is $3 \times 0.94 = 2.82$ watts. This leaves $1\frac{1}{2}$ dB for losses in the matching transformer and for mismatch losses when the transmitter is on other channels.

The confusing thing to watch here is that power radiated is different from effective radiated power (e.r.p.). You can see this from the first I.T.U. definition.

Broadband Capabilities

Similar calculations may be undertaken at other frequencies but allowance must be made for the power reflected at the now mismatched antenna. The series inductor and antenna capacitance present a reactance and the input impedance is given by:

$$Z_{in} = \sqrt{(R_s + R_r + R_g)^2 + (X_L + X_a)^2}$$

$$= \sqrt{r_{ic}^2 + (X_L + X_a)^2}$$

THE

EURO DIMENSION

Wednesday, 24th June, 1981.
Commons Written Question no. 117.

Sir Patrick Wall (Haltemprice): To ask the Secretary of State for the Home Department, whether he has reached a decision on the representations made to him recently on the appropriate frequency sub-band for citizen's band radio.

Mr. William Whitelaw: I am grateful to my hon. Friend for the way in which he has drawn to my attention the wide range of views on this issue, all of which I have carefully considered. Because of the growing demand for a c.b. service and the serious situation which now exists through interference caused by illegal a.m. equipment, the Government's first priority must be to introduce a viable f.m. service in the autumn.

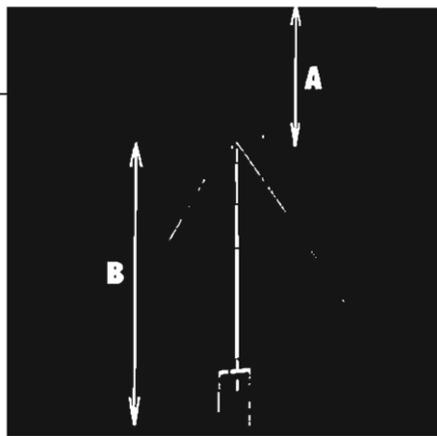
This can only be achieved now by using the frequency band 27.6 to 28 MHz. Forty channels will be available, with a transmitter output power of 4 watts. The performance of such equipment would be superior to anything which has been adopted by our neighbours in Europe, and should match the performance and cost of illicitly-used American equipment. The specifications for

this service and for the additional one at 93.4 MHz will be available from H.M.S.O. from today (June 24).

I recognise the force of the arguments put to me that we should move towards eventual commonality with Europe. It will be our objective in the longer term to adopt the relevant specification recommended by C.E.P.T. We therefore propose to consult with those concerned in order to reach agreement on the relocation of the existing authorised services in that band and on the protection of the services which would be affected.

So, the door for additional channels is still open. But what sort of legal services do our Euro breakers have? Our table provides some of the answers.

The first thing to note is that some European countries do permit amplitude modulation (a.m.) in addition. Score ten out of ten for that. But at only half a watt maximum permitted power from the rig's antenna terminal (except Sweden). Score two out of ten for them (but ten out of ten for Sweden). Norway and Sweden also permit single-sideband (s.s.b.). Score ten out of ten for them.



Typical ground plane antenna.

A. Maximum length 1.5m?

B. Maximum height above ground 7 metres unless with 10dB attenuation?

It is assumed that the antenna has been transformer matched at the centre frequency of the band and is effectively fed by a short section of transmission line of characteristic impedance equal to the input resistance at the centre tuned frequency.

The reflection coefficient of the antenna is:

$$|\rho| = \left| \frac{Z_{in} - Z_0}{Z_{in} + Z_0} \right|$$

The proportion of the input power reflected is $|\rho|^2$ and the proportion of the power dissipated or radiated in the antenna circuit is $(1 - |\rho|^2)$.

The calculated values are given in the table and it may be seen that even a good inductor with a 'Q' of 300 gives more than enough bandwidth for the application.

Alternatively, somewhat lower values of 'Q' for the tuning coil would still give an e.r.p. of 2W, as long as ground losses are kept small, and would permit less sharp tuning of the aerial.

It's been shown that using good, practical loading inductors in conjunction with a moderately good antenna installation, effective radiated powers well in excess of 2W e.r.p. may be expected from an input of 4W on all channels of the 27MHz citizens radio service. Section 1.2 of the specification, which indicates that the output power limit of 4W will give an e.r.p. of 2W therefore allows a margin for practical operational circumstances.

They've twigged your rig

If the restriction on twigs is accepted then the following types of antenna, currently in common use will be banned by the licence conditions:

Any antenna whose radiating element or rod is greater than 1.5m (5 ft) length overall.

Top loaded antennas where the tuning coil radiates.

Helical wound antennas where, if the helical was strengthened out, the length would be greater than 1.5m.

Beam antennas with parasitic elements.

Centre loaded antennas

How the authorities are going to enforce the use of "approved" antennas is anyone's guess. Similar questions have been asked about how the 7m height restriction will be enforced. I can only suppose that if you don't cause interference it's OK. Or am I being naive? ●

GETTING INTO THE NEW RIGS

"THE MANUFACTURER, assembler, or importer of citizens band equipment is responsible for ensuring that the apparatus conforms with the specification; and any additional requirements imposed by regulations under the Wireless Telegraphy Act 1949. Conformity with the required standards may be established by tests carried out by the manufacturer, assembler or importer, or by a reputable test establishment acting on his behalf, but in either case conformity with the specification will remain the responsibility of the manufacturer, assembler or importer."

*Extract, performance specification
Home Office, Radio Regulatory Dept.
27MHz radio equipment. MPT 1320.*

So reads paragraph 3 of the forward to our new citizens radio service specifications.

CB World believes that there will be unscrupulous claims made for the performance of the new sets, with fly-by-night dealers offering so-called bargains that, in reality turn out to be nothing more than rubbish.

As from our September issue, month by month we will exhaustively test each rig as it comes on to the market in our own laboratory, together with a sample of accessories. If an antenna constantly exhibits a poor SWR for example we say so.

Our lab equipment includes the following:
Two Schlumberger FS30/FSM500 digital

signal generators, a Polarad spectrum analyser, Techtronics oscilloscope, Airmec 301A millivoltmeter. Power will be measured on Bird thru-line watt meters with Electro-Impulse Inc. dummy loads.

Frequency will be measured by a Marconi TF2424 frequency counter plus a Racal with digi-divide as a back-up. Finally a Siemens filter curve tracer completes the list of major equipment in the laboratory.

We believe that if you pay for four watts with 1 microvolt sensitivity you should have it.

Needless to say, if we find any equipment being sold with exaggerated or false specification claims being made we'll expose it. ●



Richard Town in the CB WORLD test lab, putting a new set through its paces.

Members of the CONFERENCE OF EUROPEAN POSTS AND TELECOMMS authorities (C.E.P.T.) — Their legal 27 MHz systems

Country	Denmark	France	Germany	Holland	Norway	Spain	Sweden	U.K.	U.S.A. (not CEPT member)	C.E.P.T.
Parameter Measured CB Channels	23	22	22	22	22	10	24	40	40	22
Frequency Band MHz	26.96-27.23	26.96-27.23	26.96-27.23	26.96-27.23	26.96-27.23	27.035-27.205	26.96-27.26	27.60-28.0	26.965-27.405	26.96-27.23
Channel spacing	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz
Max permitted R.F. power	0.5W	2W	0.5W	0.5W	0.5W	0.5W	3.5	4W	4W	0.5W
Max radiated R.F. Power with integral Antenna	0.1W	0.4W	0.1W	0.1W	0.1W	0.1W	0.7W	With permitted antenna 2W	—	0.1W
Frequency tolerance	±1.6 kHz	±1.5 kHz	±1.5 kHz	±1.5 kHz	±100 Hz A3 ±1.5 kHz	±1.5 kHz	±1.5 kHz	±1.5 kHz	—	±1.5 kHz
Classes of emission	Amplitude Angle	Angle	Angle	Angle	Amplitude Angle Single Side Band	Amplitude Angle (Amplitude Recommended)	Amplitude Angle, Single Side Band	Angle	Amplitude Single Side Band	Amplitude Angle

The second point to notice is that throughout the C.E.P.T. member countries, frequency modulation (or angle modulation as the bureaucrats insist on calling it) is the standard norm. Therefore if there is to be any commonality, as the Home Secretary calls it, between one member state and another; as things stand at the moment, **f.m. will be the standard form of modulation.**

Within member states borders however, it is for their own governments to decide what additional modulation systems may be employed in addition to f.m. Similarly, if a member state wishes to add another band of frequencies to the regular C.E.P.T.

channels, so long as interference is not caused to another countries' radio systems, provision is provided under Article 3, section 114 of the protocol of the International Telecommunications Union for this to be done. The story of I.T.U. and how it functions will be for another issue.

The third point to note is the number of channels. There are 22 C.E.P.T. channels which correspond exactly to the first twenty-two of the forty frequencies used in the U.S.A. (Sometimes known as the F.C.C. forty.) We already know that there is, at peak times in densely populated cities, channel congestion.

How the Brussels or Paris breaker copes at rush hour eludes us. Score four out of ten for

the C.E.P.T. countries, ten out of ten for our very dear U.K. But the frequencies upon which our forty channels are based are non C.E.P.T. because of the existence, in U.K., of other authorised users of the these channels. Score zero out of ten for the U.K. since we have been excluded from the European dimension.

The conclusion to be taken from the Home Secretary's answer to Sir Pat's question, given what we have discussed above, is clear.

The Euro c.b. dimension on a further twenty-two channels IN ADDITION to our existing forty is a promise we must not allow the Government to forget.

Only then will U.K. overall score ten out of ten. ●

Richard Town

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The most versatile c.b. antenna to date, thanks to the **exclusive dial-a-match** (pat. pending) coil. **No cutting is required**, so the antenna can be tuned with a simple twist of the tuning collar, which changes the coil inductance to precisely accommodate the antenna to any particular mounting.

The space-age core material is wound with heavy 14 SWG solid copper wire, then **double sealed to maintain peak performance** under the most adverse atmospheric conditions.

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PERFORMANCE

No VSWR problem: Each antenna is factory pictured and tested to be in the 1.3:1 to 1.7:11 band.

We use top quality fibreglass so you don't have to worry about unnecessary breakages. Each antenna is staked to the base for added security.

The widest range in fibreglass. Six types of antenna in six different colours and lengths.

Lab tests show Breaker 1-9 Road Hog gets you out further.

Another great new twig from Breaker 1-9. This 60" centre loaded stainless steel antenna is rated at 1500 watts. The top rod is tapered. 17.7 stainless steel which fits securely into two set screws in the coil. The coil is precision wound with 16 gauge, solid copper wire to eliminate power failure and static.

THE WARRIOR

The VSWR is typically 1.5:1 or less over 120+ channels. **Ideal for SSB.**

All of these antennas fit the whole range of Breaker 1-9 mounts, for wing, boot, bumper, roof or gutter. Also suitable for mag mounts.

If you want to get out furthest, insist on the best, insist on . . .

BREAKER 1-9

Understanding

ANYONE LISTENING to channel 14 is bound to hear "any breakers out there with an SWR meter for a copy"? This means that someone wants to correctly match an antenna to a set to ensure optimum performance.

SWR is defined as the Standing Wave Ratio and is the ratio that is used to indicate how much of a signal from a c.b. set actually passes from the aerial during transmission. In other words the antenna must be matched to the set to ensure the maximum transfer of power from the transmitter to the antenna and also the most efficient transfer of a signal from the antenna to the receiver.

The length of the antenna is critical and unless this adjustment is made accurately then the set can be severely damaged.

Any antenna will only carry out its function when it is tuned to either the frequency on which it is to be used or to the centre of the frequency band over which it will be operating. For instance with a straight 40 channel set this is channel 20.

Although c.b. antennas are usually supplied already adjusted at the factory, small adjustments are necessary because location and methods of mounting can vary considerably causing slight differences in the original setting.

To adjust the SWR, it will be necessary to obtain an SWR meter. There are cheap ones on the market that will do the job but for the enthusiast it is best to look for one costing between £15 and £20.

It is also necessary to obtain a 0.5m length of co-ax cable (known as a patch lead) with a PL259 plug at either end. The cable must be soldered to the plug connectors.

The SWR meter will have two SO239 sockets matching the PL259 plugs. One is identified as "antenna" and the other "transmitter". The whole process is made a lot easier if a friend is available to make any adjustments to the antenna.

Detach the antenna lead from the set and plug it into the "antenna" socket on the SWR meter. Next connect one end of the

patch lead to the socket on the set and the other end of the "transmitter" socket on the SWR meter.

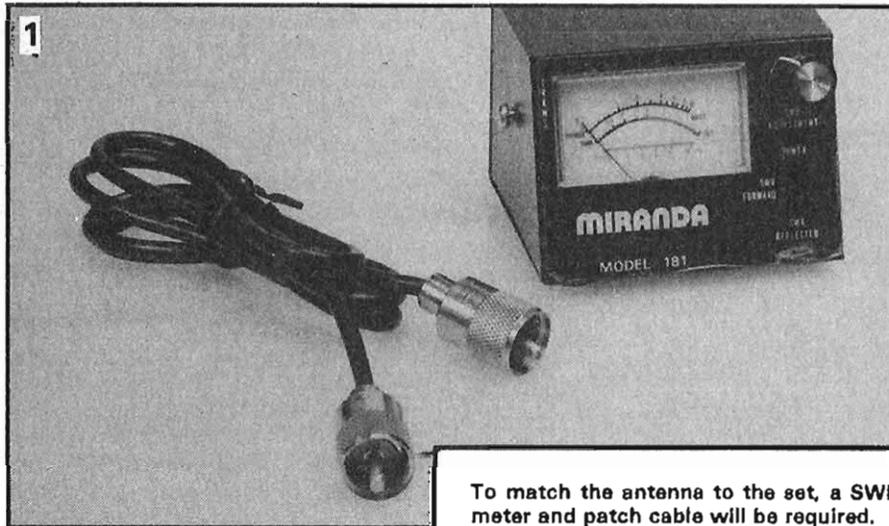
Check that all connections are tight, switch on the set and allow to stabilise for several minutes.

Set the channel selector to the 20 position. For international readers with AM/FM/SSB sets always set the switch to AM so that any RF power output is constant. It is possible to whistle when setting up SSB sets but will require a good pair of lungs.

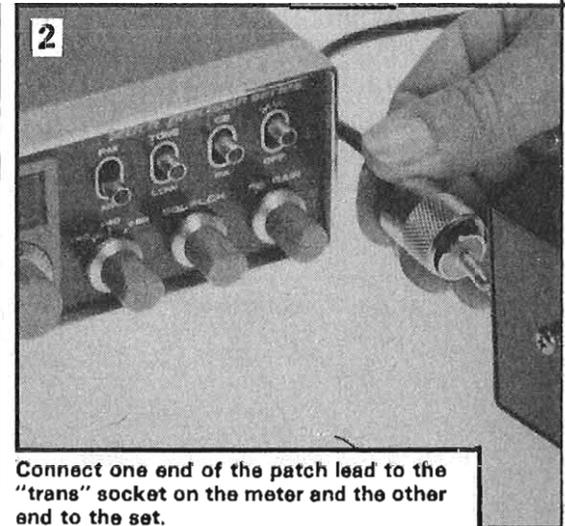
When a single meter instrument is being used, move the switch to the "forward" position and turn the "sensitivity" control to minimum. Depress the mike key and adjust the sensitivity control to obtain "maximum" reading on the meter. Note this reading.

If a two meter instrument is being used depress the mike key and adjust the sensitivity control to obtain a maximum reading on the "forward" meter.

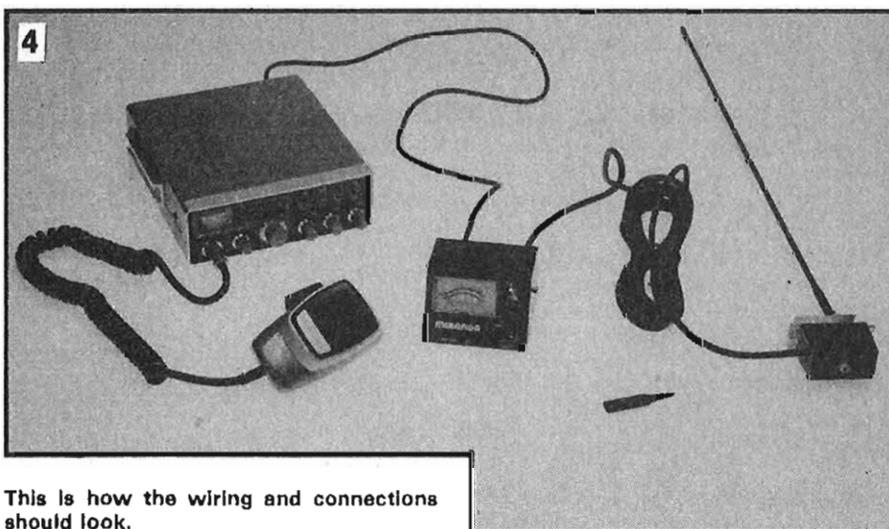
Next move the switch to the "reflected" or "reverse" position and the SWR will be



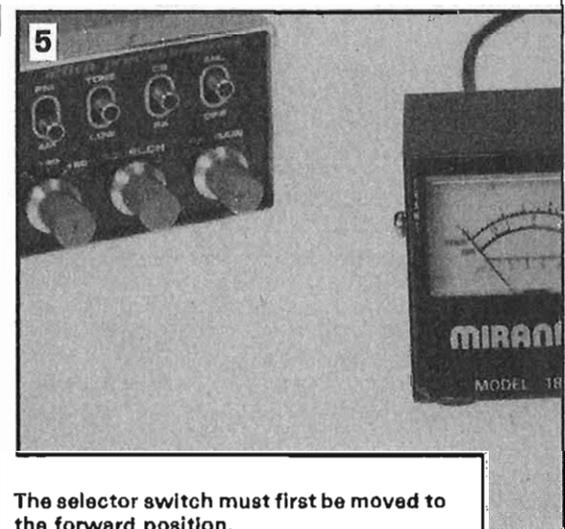
To match the antenna to the set, a SWR meter and patch cable will be required.



Connect one end of the patch lead to the "trans" socket on the meter and the other end to the set.



This is how the wiring and connections should look.



The selector switch must first be moved to the forward position.

SWR

shown on the meter scale. On two meter instruments the SWR will be shown on the "reflected" meter. Again note the reading.

The more sophisticated instruments incorporate a power measurement scale on a separate meter. In this case the selector switch has three positions namely forward, reverse (or reflected) and power. With these instruments the SWR measurement must be obtained using the procedure for a single meter instrument.

Every antenna should be supplied with instructions for fitting and adjustment. Read these through and familiarise yourself with the method of adjustment. Make only small adjustments to the antenna as instructed by the manufacturer and if an assistant is helping, make sure he moves away from the antenna.

Move the instrument selector to the "forward" position and with the mike key depressed move the sensitivity control to give a maximum reading. Next set the instrument selector to the reverse (or

reflected) position and make a note of the reading.

If the reading has decreased from, for example 2.2 down to 1.9, the adjustment is in the right direction so make a further adjustment in the same manner as before. Switch the instrument selector to the forward position and repeat the whole sequence again.

Should, however, the SWR reading increase after the antenna has been adjusted then the adjustment was in the wrong direction. Carry out an adjustment in the opposite direction, set the instrument selector to the forward position and repeat the whole sequence again.

When the SWR reading does not vary with any further adjustment or if a SWR reading of 1.5:1 or less is obtained then that is usually good enough. This is particularly important when antenna adjustment is made by cutting off short lengths. It is easy to cut off too much.

Non sus antennas usually have couplers or matchers fitted to the co-ax cable boxes. Adjustment procedures for these are basically the same but obviously adjustments are made at the unit using the special tool provided. *Do not* use a metal screwdriver.

If difficulty is experienced in getting a reading of 1.5:1 or lower then look for a bad antenna earth at its mounting, dirty or insecure connections in the aerial or PL259

plugs, or a damaged or wrong specification co-ax cable.

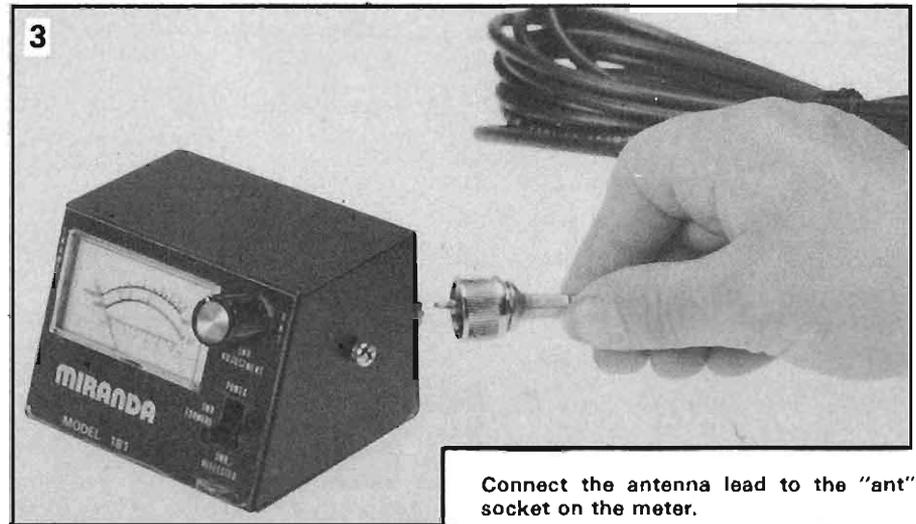
Once the best possible SWR reading has been obtained then it is back to the drawing board and whole procedure must be repeated for channel 1 and channel 40. Obtaining a perfect SWR over the whole band is nearly impossible but the best average setting should be the objective.

Those who wish to check the power output, it is necessary to obtain a c.b. dummy load power meter and plug it into the "antenna" socket on the SWR instrument in place of the cable to the antenna.

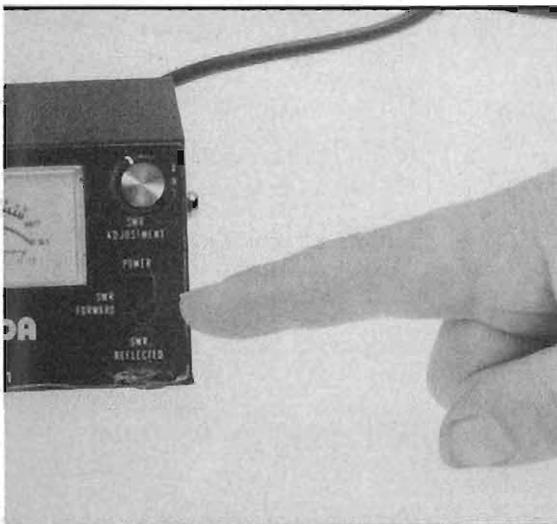
Set the selector to 'power' and the transmitter to AM, depress the mike key and note the power output from the transmitter.

Some SWR meters are fitted with a small switch on the back and marked with several figures including 50. This should normally be set to 50 which will set the instrument to correctly measure the SWR in a 50 ohm system. CB transceivers and antenna are normally meant to match an impedance of 50 ohm. SWR meters which do not incorporate these switches are usually made for use with a 50 ohm system.

It is acceptable to leave a SWR meter permanently connected so that the performance of antenna and transmitter can be continually monitored. There may be a very slight decrease in set performance usually only noticed over the life of the set by the perfectionist●



Connect the antenna lead to the "ant" socket on the meter.



Adjustments may be made at the antenna or splitter (when fitted). Only use the special adjustment tool provided.

Traffic Signals

Nº5

FLAT-TYRE IS BUILDING HIS FIRST RIG....



UNLOCKS IT NONCHALANTLY...

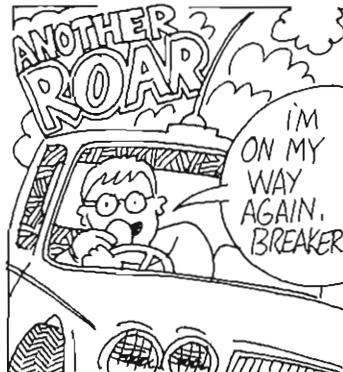
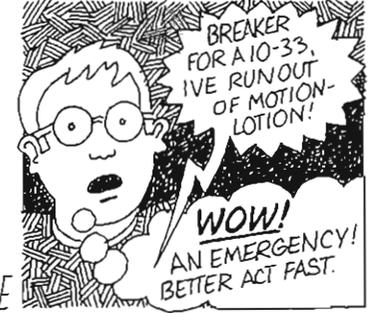


BUT ONCE INSIDE... A SUBTLE CHANGE TAKES PLACE..

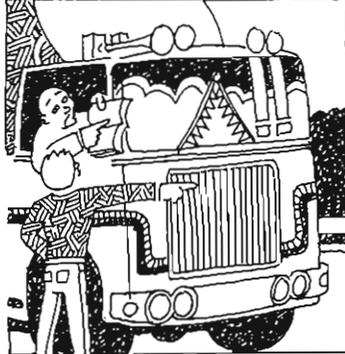


YES, FOLKS, THIS SAME SUBTLE CHANGE THAT HAS TAKEN PLACE FOR THOUSANDS OF OTHERS, THIS SAME HAUNTING, SUBTLE CHANGE, THAT HAS CHANGED MEN'S LIVES, SUBTLY, WITH IT'S HAUNTING, BUT ALWAYS SUBTLE, CHANGE

ANYWAY, THE FIRST THING THIS ACE BREAKER HEARS IS..



ON AND ON IT GOES, OUR...



WHO CROSS HIS PATH....



DOES THIS MEAN(SHOCKAROO) ANOTHER **CB-LESS** NIGHT?, WILL IT DENT YOUNG CLEVER DICK'S **SELF-IMAGE**???, WILL THE CHANGE IN FLAT'S PHYS BE LESS THAN SUBTLE WHEN HIS **SWEET MUMSIE** HAS PHINISHED WITH HIM? ALL MIGHT BE REVEALED IN NEXT ISSUE'S **TONSIL-TICKLING LIP-SPLITTING ISSUE!!**

TO BE CONTINUED.....

FACTS AND FALLACIES

by D. P. Evans

The following are a further selection of common errors and misunderstandings brought to light in conversations with the writer or in some cases overheard on the air.

AERIAL POSITION A neighbour using an identical vertical aerial to one used by the writer, complained he was unable to get a good SWR reading. The one used by the writer gave excellent results across the entire 27MHz band.

Comment A great deal has been said about aerial positioning for optimum results in other articles, so I will not bore you with a further re-hash. On visiting my neighbour's house to look at his aerial it occurred to me that the information we give is often too way out for the average c.b'er and that the more obvious information needed by them is overlooked. His vertical aerial was mounted against the wall of the house and from top to bottom was only about one inch away from the brickwork.

As anyone with experience of aerials will know this method of mounting would make the aerial virtually useless but an average breaker does NOT know this, so maybe we are to blame for not giving more basic information.

The reason for the poor SWR is very basically that the aerial must behave as a tuned circuit at 27MHz and this effect is spoilt if the aerial is close to a large object such as a building.

In this particular case a significant proportion of the RF power that managed to get from the aerial would be absorbed by the brickwork which would be an additional problem and would further aggravate the already poor performance due to the high SWR.

It also depends upon whether the brickwork has iron stanchions within it and, indeed whether it is wet or not and even if it has got barbed wire across the top of it. SWR will only be changed by the brickwork when the brickwork tries to act as part of the aerial.

'S' METER AND RECEIVER SENSITIVITY A fairly common remark heard is that my receiver is good because it gives a low 'S' meter reading on skip signals and in some cases it is also used in the reverse sense that a high reading on skip is a sign of a good receiver.

Comment Firstly a receiver is unable to tell the difference between local and skip signals, a beam aerial may discriminate one against the other, but the receiver certainly cannot. So far as the receiver is concerned a signal is a signal, local or distant, it does not care, all that affects the receiver is how strong that signal is.

Secondly the 'S' meter is only an indication of comparative levels and it shows that one signal is stronger or weaker than another. There is a preset adjustment inside the transceiver to set the meter to a pre-determined level for a certain received signal strength.

As an experiment two identical COLT 210

transceivers were compared and a discrepancy of 3 'S' points showed between the two sets when receiving the same signal.

If so desired the meter could be adjusted to indicate 9 or more on all received signals but this would not make the receiver itself any better or any worse.

All c.b. transceivers are capable of receiving signals of less than $1\mu V$ (one millionth of a volt) and there is very little to choose between them so far as sensitivity is concerned.

HIGH LEVEL PULSE TYPE INTERFERENCE The writer has often been asked what causes the very loud machine gun type interference frequently heard throughout the c.b. band.

Comment This interference is caused by the Russian long distance over the horizon radar transmitters and it can be heard, depending on time of day and year, somewhere between approximately 3MHz to 40MHz.

When it is heard on the 27MHz band it is a safe bet that this band is open for skip.

The pest of this transmission is only too well known to commercial and amateur operators who have been plagued with it for many years. It has been aptly named the "Russian Woodpecker".

DX'ers 'Q' CODE A widely heard phrase used by the DX fraternity at the end of a 'CQ' call is "QRT and standing by".

Comment The exact meanings of many of the 'Q' codes have been published in a previous article. The generally accepted present day commercial and amateur meaning of QRT is "My station is closing down for a prolonged period", QRX is sometimes used and this means "I am standing by".

Neither of these codes would be used in the context heard on c.b. where it would be far more appropriate to say "I am standing by for a call — over", rather than QRT — "My station is closing down".

R.F. PRE-AMPLIFIERS One of these was proudly demonstrated by a friend showing how the 'S' meter reading increased when the pre-amplifier was in use.

Comment There is no doubt a significant increase in meter reading when an R.F. pre-amplifier is switched on but the real test is does it improve the signal you are trying to hear? In this case and others it certainly did not. The wanted signal was completely lost in a confusion of signals that were previously unheard.

This is caused by the mixing together in the pre-amplifier of unwanted signals, generally high power short wave broadcasting stations, on frequencies well away from 27MHz which defeats the object of the pre-amplifier to improve reception. Generally in practice they actually worsen reception. As previously mentioned a c.b. receiver is a very sensitive instrument and the best way to improve reception is by improvements to the aerial.

UPPER AND LOWER SIDEBANDS ON A.M. This concept is frequently misunderstood and it is difficult to explain simply without driving the reader away with boredom, panic or frustration.

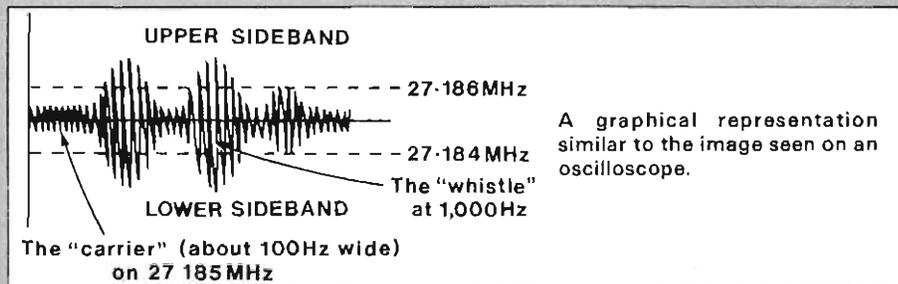
Comment The usual mistake made is often caused by the drawing provided with the explanation, that is a squiggly graph, and that this in some way represents, upper sideband top half and lower sideband bottom half. This is not true and the drawing is only a graphical one similar to that seen on an oscilloscope (if you could afford one).

A simpler and more correct explanation is shown by taking a simple example. The transmitter is say on Channel 19, that is 27.185MHz. Now if you whistle this gives a note of say about 1kHz. (This only means one thousand alternations per second and if that seems too complicated never mind take my word for it.)

Anyway, when this pure 1kHz whistle is amplitude modulated on to your 27.185MHz transmitter carrier frequency you end up with three frequencies, the strongest being the original carrier and the carrier plus and minus the 1kHz. i.e. 27.184MHz lower sideband, 27.185MHz the original carrier and 27.186MHz the upper sideband.

With speech which has a spread of about 300Hz to 3kHz in c.b. equipment you get many different sideband frequencies which in this example would spread to a maximum of plus or minus 3kHz each side of 27.185MHz.

If either the upper or lower group of sidebands is selected with a filter you end up with a single sideband transmission. (The carrier frequency at 27.185MHz should also be suppressed.) This could not have been achieved by just slicing off the top or bottom of the squiggly graph normally used for the explanation, in fact this slicing principle is used in receiver detectors for recovering the A.M. from the carrier but that is another story. ●



BRING IT BACK

FROM DOWN UNDER

I recently purchased your first issue of *CB World* and trust you will be on the side of law and order for the future of citizen band users of 27MHz. I have been a citizen band operator whilst on a twelve month visit to Ireland and since then a number of countries throughout Europe, and find that it is of great enjoyment and assistance in the way in which my wife and I live.

For the past two years, we have mostly resided in a motor-caravan, and with the assistance of c.b. have made many friends in all parts of Europe through which we have travelled. It is also comforting to know that should an emergency arise help is always close at hand, and although c.b. is still considered illegal in Ireland, there have been numerous occasions when c.b. operators have assisted the law enforcement officers.

To give an example of this, during the visit of His Holiness Pope John Paul II, c.b.'ers assisted in security arrangements at the Dublin venue. At this point in time I should also

to comment that despite the political situation within Ireland, the National CB Council for Ireland called for a total ban on the use of c.b. during His Holiness's visit, and as an operator myself there at the time, I can say that this was adhered to one hundred per cent.

During our trip recently to Portugal our c.b. happened to malfunction, and it was only through the kind co-operation of the local breakers that we were back on the air within 48 hours. All this was arranged with very little English spoken by the Portuguese breakers, and I subsequently learned from others in that country that during a severe earthquake in Portugal not so long ago, assistance for medicines and information on conditions were related first hand by c.b.ers.

Having now been in England for some time and listened to many people and read many publications and various letters for and against citizens band radio, I would like to add my comments to the never ending saga which will undoubtedly continue until the Government decides in its wisdom what it intends to do and when.

Firstly, I must criticize a lot of the

c.b. operators in England and class them as totally irresponsible and inconsiderate. I substantiate this remark by saying that if these so-called operators wish to have 27MHz licensed then they should cease firstly using any additional amplification for transmission, and at the same time give some thought and consideration to other operators within their area. The use of additional amplification for transmission is not only a selfish act, but also contravenes many European and FCC regulations, not to mention increasing the incidents of T.V. interference. Secondly, operators must learn to curb their language whilst on the air. They are not aware who may be listening to them, and if bad/foul language is heard it is a point in favour of the Government for non-legislation. So if you are going to use your c.b., keep it clean.

I for one would like to see legislation made on 27MHz, as this appears to be the world-wide frequency which is being accepted by most Governments, the latest of which is France which legalised within the last couple of months.

My final criticism is aimed at the so-called National CB Council of Britain, and to them I would comment that they must be a lot harder on clubs associated to them; at the same time stopping these demonstrations which not only cause frustration and annoyance to the general public and of course the Government, and as an ex-member of one of the most highly respected c.b. organisations in Ireland, I would be prepared to offer some pointers and assistance in this matter.

I am sure that each and every c.b. user will benefit by just using a little thought and common sense, and with this in mind, legislation cannot be too far away.

Both my wife and I find great enjoyment in c.b. and it has been our pleasure in meeting the "Father of CB", Mr Al Gross, who has left his address with us together with assurances of any technical or documentation help and advice he can give in the efforts to have c.b. legalised in England — so come on all you Buddies, let us have a bit of co-operation. I for one would be willing to give any assistance asked for if it would help in the legalisation of c.b. in England.

*Kiwi Camper
London W2.*

only hours after our c.b. was confiscated by officers.

A summons arrived on my doormat on 21st May, demanding that the owner of the car appear at Port Talbot Magistrates court; my name was not mentioned, although I am the owner of the c.b. that was taken.

Where is British justice if it allows handicapped people like myself to be victimised by ill-informed so-called "officers of the law"? I say "victimised" because police policy towards c.b. is so erratic that nowhere in Britain can one be sure of their reaction. How can it be fair for my friend and I to be prosecuted when, while we were on holiday in Devon a short time ago, police were seen to condone c.b. openly; while in South Wales, they choose to make a scapegoat of someone who could not commit a bank robbery even if they tried, because they are blind. Where is their sense of proportion — indeed, their sense of decency and common sense?

If they have to prosecute someone, I am sure they could find a breaker better equipped to defend his or her case than myself — perhaps they are afraid to chance their luck.

*Andrea Jann Dando
West Glamorgan.*

EARLY BREAK

The June issue of your magazine was the first I have read, and was most impressed by the variety of news and information given. Unfortunately, I still need to save a lot of green stamps before I can buy a rig.

In the May issue, you mentioned two children of four and four and a half years old as being the youngest breakers. My sister's baby went on the air at five months and his handle is Baby Bunting. Is he the youngest baby breaker?

*Dawn
Brighton, Sussex.*

ED. This letter is obviously going to be challenged but please no experiments in maternity wards or antenatal clinics!

THANKS FROM THE BUSH

I am a new lady breaker and my handle is Bush Baby. I am learning fast thanks to your articles. I read with interest the section, in your June issue, on 'the installing of a home base' which helped

HANDICAPPED VICTIM

I give details of how a friend and I were apprehended by two police officers last December

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me and, I am sure, many other breakers.

I enjoyed the c.b. poems and the c.b. wheels colour spread.

Thanks for a really first class magazine.

*Bush Baby
Irvine, Scotland.*

THINK FIRST

About three weeks ago, I was monitoring our local breaker channel — I do this most afternoons as I work from home. I received this transmission on 57 on the meter. "25 with a 10-33 my front seat passenger has had a heart attack, does anyone with access to a telephone copy this transmission?" Before I could key a landline, a transmission followed from a lady breaker. "Eyeball, eyeball, the blue Henry on the Tyne bridge". I was astonished by this, and after someone else had got back to the 10-33 on channel 9, the heart attack victim was guess where, in a blue Henry on the Tyne bridge. It seems that an eyeball, eyeball is more important than a heart attack victim. This has only happened once, but then you only die once. The majority of people use parts of the 10 code, 10-1, 10-4, 10-6, 10-36 etc, but they do not take the trouble to learn the rest of it.

From the above story, it seems that people ride around with their rigs switched on and their brains switched off.

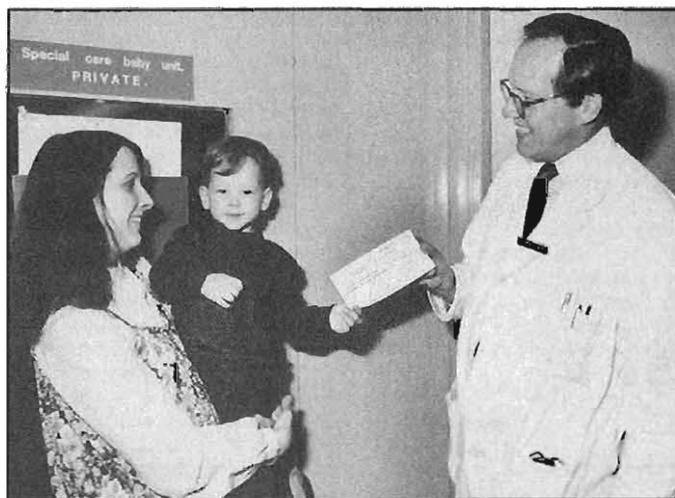
May I also ask if everyone has sold their watches to buy rigs as the amount of 10-36's in our area is ridiculous.

*The Driver
County Durham.*

INSURABLE CB

Theft of c.b. transceivers is on the increase. Although it is illegal, I can assure readers that they do not need to lose out. Insure your set, this can be done. My agent frowned at first, but decided to have a go. I insured my equipment for £200, and received a quote without question of refusal. My agent informed the company that this equipment is illegal — to this he got a reply of acceptance.

In December of last year, my equipment was stolen. I reported the theft to the police. This they noted, filed and forgot! Theft was then reported to the agent who put the wheels in motion. A few questions were asked about receipts etc and after about four months I was paid £195 by the Prudential Insurance Company.



A WORD OF THANKS

Please print this picture, so we at C.R.I.S. (Citizens Radio Information Service) can thank all the people who helped us to raise money at the CB Radio Show in Kenilworth, for the Special Care Baby Unit at St. Thomas Hospital, London.

You can join C.R.I.S. at a cost of £1.00 per year. For this you can use the service as often as you like. Please enclose a SAE, as all money sent is donated to charity.

*Wonderwoman
London, SE1.*

I hope that this will incite a few people to insure their equipment against theft. Although I had written proof of my insurance, the breakers in Southampton have failed to respond. Equipment is stolen all too often.

*Big Biker
Shirley, Southampton.*

PATRIOTIC — 1

I purchased a copy of *CB World*, April/May edition for the first time, and may I say it is 'First Class'.

I congratulate you on supporting British industry, and wish you good luck for the future. There are many foreign products on the British market, so let's push the manufacturers to make c.b. rigs now, before the Japanese invade us once again.

*Bill Eatock
Wigan, Lancs.*

ED. Have you read this month's Come On yet?

DISSENT IN BUSBY CAMP

Whilst I was in the forces as a radio technician, I used to operate and look after (30kw) transmitters working s.s.b. worldwide, as well as the usual field type transceivers. When discharged from the forces I wanted to become a radio ham.

The standard r.t. (speech) procedure presented no problems, but I was unable to master the morse code which was essential to the exam.

Due to this, you can see why I am delighted that c.b. has really taken off.

I work for "Busby" and along with other Busbies do not agree with all their policies. Please tell all the good buddies that not everyone who drives about in a little yellow van is an arch enemy.

Derbyshire

GRANDDAD SPEAKS HIS MIND

So the Home Office are to grant 0.39 of 1 mega hertz for f.m. c.b., to be shared between about one million users. Who are they playing about with? They have been dillying and dallying for about ten years now. The public will not stand for this, so are we to have another Australia on our hands?

I am one of those who up to now have been very patient, but at the

CB
world

eyeballs
SMALL AD SECTION

Do you have ...

- SOMETHING TO SELL
- A SERVICE TO OFFER CB USERS
- OR ITEMS YOU WANT TO SWAP

Then why not take a small ad in CB WORLD'S EYEBALL section.

For further details see page 61

FOR CITIZENS' BAND AND TWO-WAY RADIO ENTHUSIASTS

BRING IT BACK

age of 73, I am not waiting any longer. To hell with them and their paltry minute segments and flea power.

*Grandad
Portsmouth, Hants.*

CB DIRECTORY

I would be very pleased to see handle listings looking like telephone directories, to show the Government we are not a bunch of loonies, and also for our own reference. I would be prepared to pay for this, to be updated four times a year, with a new directory once a year.

As IPC are a large company would this directory be possible?

*Lonely Hunter
Ruddington, Notts.*

ED. Yes. Once legalised this could well be possible.

THANKS

Through *CB World*, I would like to thank fellow breakers for their help after a high speed blow out on the M56. This caused my vehicle to turn through 360°. I was eyeballed by a trucker, Black Shadow, who with Jetranger changed my wheel, whilst Treble Seven supplied hot sweet tea.

I believe c.b. can be a major contribution towards road safety.

*David Hicks
Christleton, Chester.*

MRS BEAR FOR MR BEAR

After reading the readers' letters in *CB World*, I feel I must air my complaints regarding attitudes towards the police taken by some readers. My husband, a "smokey bear" is as interested in c.b. as anybody else, so are his colleagues. For obvious reasons he does not possess a rig, but it does not mean that he is obsessed with tracking down unsuspecting breakers by devious means.

In the course of duty, he has confiscated rigs, but he and his colleagues feel that this is a job for Customs and Excise, not the police. Please remember that you are not dealing with spiteful individuals, but the law which they must represent.

*Mrs Bear
The Forest.*

RATCHET JAW MARATHON

I just had to write to the excellent

CB World and tell all you breakers eyeballing "Bring it back" about our marathon — no, not the running kind, but 24 hours and 8 seconds of continuous ratchet jawing.

Dirty Dog and Flying Lizard performed this feat with various helpers, and as few breakers on-the-side as possible. Any that did come in, did so to pledge money to our bleary eyed breakers.

I offer congratulations to all local breakers for helping to raise £400 for the Essex CAT cancer scanner fund.

We defeated all local records — are there any greater ratchet records in your 20?

*Happy Jack
Chelmsford, Essex.*

PATRIOTIC — 2

Just great is the expression for *CB World*. I think I have tried them all, but you are the best without doubt.

There is no need for all this American influence, so let's be British and get a good c.b. set going and above all a good solid emergency channel back up.

*Ray Williams
Grantham, Lincs.*

ANOTHER VICTIM

I am unable to disclose my name or address for reasons which will become obvious when you have read the following. It is a first-hand account of a personal experience with the police and so I wish to remain anonymous.

A friend and I were stopped by two police officers, uniformed, and in a marked police patrol car, while attempting by the use of our c.b. to arrange a meeting with another c.b. owner. Before the patrol car was in sight, we had ceased to transmit, and when we were apprehended by the officers there was no evidence whatsoever to prove that we had been transmitting. The P.C. and the Inspector then proceeded to question us, without either producing I.D. or cautioning us, and finally demanded that we either permit them to search our car or allow them to take the car away. Naturally, and without full knowledge of the law on this point, we did not wish to make matters worse for ourselves by obstructing the officers and so when they found our c.b. we handed it over, thinking this to be the lesser of the two evils. The officers failed to prove that we had been transmitting, or that this was in fact a c.b. No test transmission was made by them, and they gave no reason for stopping us initially, except on suspicion of our use of the c.b.

The final irony of the situation was that while collecting his receipt from the patrol car, my friend saw why the police had suspected us — they had a c.b. fitted in their car. We realise that c.b. is illegal, but the transmission and W.T. laws state that it must be proved that the owner of the equipment was transmitting before equipment can be confiscated. We would have been perfectly within our rights to deny the officers entry into our car. My friend had one additional problem, however, namely that because I am totally blind myself, he did not wish to risk a confrontation with the police in my presence. I do not want sympathy, but in no way whatsoever did the officers concerned take this into consideration.

I hope my letter will be a timely warning for someone else about to be guilty of the crime of friendship.

Crime of Friendship

CONVERSION

We write to tell you how much we enjoy your great *CB World*, and tell you our views on c.b.

We are glad that the Government have made some decision on the legalisation of c.b. At present we cannot judge if it is a suitable choice to put c.b.s on f.m. It will be interesting to see how many of the a.m. users will switch to f.m. in the autumn. We intend to stay on a.m. and also use f.m. What about a vote over whether a.m. is better than f.m., so we can show the Government what the country wants?

Looking forward to the autumn decision.

Keep up the good work.

*Captain Kirk & Mikey Bar Kid
Chalfont-St-Peter, Bucks.*

THAMES AND REACT

Thank you for your write up on our service both THAMES and THAMES MEDICO 9. It is good to know that you are interested in a British Monitoring Service.

Unfortunately, due to the REACT motif being stamped over the write up we are now being asked if we are part of REACT, which we are not. We are however in the process of joining with BEST to offer a larger cover and do not wish the breakers to be confused that we are in any way attached to REACT. The main difference is that we do not charge anything to join. We offer our help to anyone totally free, regardless of whether they wish to affiliate to THAMES or not.

Please try and put right the confusion of the REACT stamp over us.

We have no axe to grind with them, but we would like the breakers to know that they have a free British Monitoring Service working now.

*R. Lingwood (Sec)
London SE4.*

10-500 TRANSLATE INTO ENGLISH PLEASE

I would like to comment on the ever increasing amount of rather infantile Yankee c.b. jargon being used on the air. Surely we British have lost enough of our national heritage already what with having to use this damned "foreign" money and with all the other impositions from Brussels.

Let us at least keep our own language. What is wrong with plain speaking? When c.b. is legal we shall have nothing to hide! I am quite sure the "fuzz" are as well versed in this jargon as any of us, so who are we trying to fool?

*Rawwar
Broadstairs.*

GOVERNMENT EMPLOYEE'S CONCERN

At present I do not own a rig, due to the fact that I am employed by the Government, and taking a risk would mean more than confiscation.

I see quite a lot of rigs being seized and feel sorry for the breakers concerned who are trying to bring them in. I cannot do anything to help, as most of my colleagues are against c.b.

I think your magazine is one of the best.

*Dragonman
Cheshire.*

PRO FM

Whilst reading my June copy of your magazine, I came across a piece in *This and That* headed "Natcolibar Statement", which I think was shameful.

I personally dislike a.m. as there is too much interference, and think f.m. is a lot clearer.

Why bring down the Government policy? I think their decision was correct. Those with a.m. rigs can quite easily get them changed.

Those of you without rigs who think f.m. rigs are too expensive — would you be prepared to spend an extra £20 or risk a £400 fine?

Thanks for a great magazine.
Sleepy Henry
Bedford.

WHERE IS YOUR LOCAL SHELTER?

I think your magazine is great and it will be the only c.b. one for me.

I must say that your lead article in the June issue was very interesting, though it makes little sense in protecting your rig and gear if you cannot survive yourself.

One reads too many reports or hears mentioned on t.v. of planning permission being turned down for atomic shelters with only the privileged few being permitted to have a shelter from which to govern the aftermath.

There are so many countries now able to use nuclear arms that the threat of use is already with us, and no unreasonable request should be ignored by the authorities where shelters are concerned.

If war was declared, I am already spoken for but it would be nice to know that others would still be around when I returned.

Soldier Blue
S Wales.

A QUESTION — OR TWO

I would like some information about citizen's band radio.

What is the range of the f.m. wave, and is the signal loud and clear? Does a.m. go all over the world?

Will c.b. radio be as good in Britain as it is in America, and on what date will it be legalised?

Barry Gorman
Fairfield.

ED. Effective radiated watt for watt, f.m. 'goes' as far as a.m. Also the interference caused between two conversations on a.m. on the same channel is less than two conversations on f.m. on the same channel.

Home Office proposals restricting the length of your twig could reduce the range.

Will c.b. be as good as in America? Certainly as proposed we're better off than some European countries. If we get the extra Euro twenty-two channels on top of our offered forty, it will be better. With regard to legalisation date, this is still unknown although it should be "sometime during the Autumn".

CB AND CD

Breakers can be a life-saving aid in the case of flood, snow and any other

emergency but not "When the bomb goes off".

The Greater London Council report PS 506, quoted in the article, is obsolete and the official view is now that Civil Defence measures at best are useless and probably dangerous because of the illusions they have generated.

The casualties given for the two tiny atomic devices used on Hiroshima and Nagasaki gave no hint of the holocaust a nuclear war would reek upon Britain. We are a target worthy of about 500 warheads, each 50 times larger than the first bomb used.

It should be obvious therefore that our survival depends on disarmament, not on our Rinky Dinks.

Chicken-Muck
Stowmarket.

ED. This is typical of a number of well meaning but "better red than dead" type letters we have received in response to Richard Town's article.

Richard tells us that the Government takes Civil Defence very seriously indeed and has devoted several millions of pounds in upgrading the state of this country's preparedness.

CB World maintains that c.b. will help in this. Any other attitude is to consign the survivors to relying totally on state communications systems which will be badly damaged, if not totally incapacitated.

Unilateral nuclear disarmament whilst the super powers still have vast nuclear arsenals at their disposal will not cause them to disarm. Indeed whilst the Warsaw pact countries are still adopting a warlike stance, it would be foolish for UK to be defenceless.

SHORTAGE IN CHANNEL

All I seem to read about are a.m. rigs being thrown away — what about the f.m. sets? It is my own opinion but I believe that within the first year of legalisation, many breakers will be sick of the overcrowded (40) channels (27.601 to 27.991) and will be shouting for more. Maybe they should be campaigning now!

The established breakers who are still about, will be on the old channels (26.965 to 27.405) or on some rigs in the Hi-bands whether it be a.m. or f.m.

All these new f.m. rigs look great, but they are still 40 channels. Maybe if the Government gave us more than 40 channels and SSB for DXing, more breakers would change over.

I enjoy your magazine every month.

The Jackal
Hartlepool, Cleveland.

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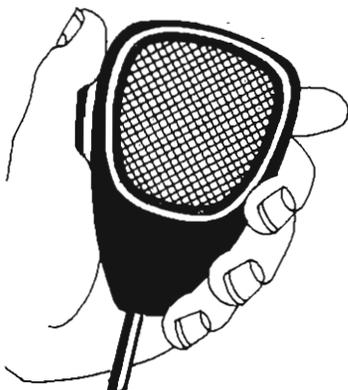


HANDLES FOR TOWNS

In the first two issues of *CB World*, we asked readers to submit the code names for their home twenties. We received a tremendous number of suggestions and we set out below the third list of those submitted. We are not saying that they are correct and neither do we admit that this is the full extent of code names for each town. If you disagree with some of them or wish to add others, feel free to drop us a note or postcard and we will correct or add to the list in a future issue. In brackets we have indicated the breaking or calling channel. In most cases this is either 14 or 19. With your help we would like to build up a complete list of calling channels, so send in the calling channel for your area.

Send your suggestions to the Editor, *CB World*, IPC Electrical-Electronic Press Ltd., Room 802, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS.

Abbotts Bromley	Sin City (19)	Cambuslang	Breaker Town	Falkirk	Big F
Abergele	Jaw Town	Carluke	The Hen Run	Fillongley	Muppet Town
Ainsdale	The Acorns	Carnforth	Crossroads	Fleetwood	John O'Groats
Aintree	Iron Town/ Race City	Carnwath	The Big Hole	Forth	Windyhill
Airdrie	Taxi Palace	Castairs	Crazy Village	Frodsham	Toad Hill
Allanton	Little A	Chelmsford	Big C	Garston	French Connection
Anglesey	Woolly Back	Chester	Medway	Gourock	Wee G
Armadlae	Banger City	Cleghorn	The Wee Horn	Greenock	Big G
Armitage	Bog Town (19)	Clitheroe	Cement City	Hartshill	Shakey Town
Atherstone	Hat Town	Clwyd	Cruiser County	Haydock	Race Town
Banwell	Hill Billy Land	Clydebank	Bombsite City	Heckmondwike	Little H
Barnsley	Union Town	Coarstang	Butchers Town	Heswell	Greenbelt (19)
Bathgate	Steel Town	Coleshill	Shakey Town	Heysham	Oiltown
Batley	Little B	Colwyn Bay	Cruiser County	Hickley	Hawaii
Bedworth	Boston	Congleton	Bear Town	Higher Broughton	David's Town
Benllech Bay	Sea Side	Corby	Steel Town (19)	Holywell	Waterfront
Bentham	Cow Town	Craigneuk	Wine City	Howwood	Ghost Town
Birstall	Dodge City (19)	Crosby	Shakeyside	Hyde	The Maze
Blackburn	Dirty Water/ Kyber Pass	Darlington	Noisy City (25)	Johnstone	Twiggy Land
Blantyre	Ginger City	Daventry	Big D	Kettering	Big K
Boghall	Boothill	Deganwy	Sleepy Valley	Kilbarchan	Habby Land
Bolton	Cloggers Alley	Denbigh	Straight Jacket Town	Kilbirnie	Steel Town
Bolton le Sands	Expressoland (27)	Densbury	Little D	Kirkby	Colditz
Bootle	Shoe Town	Derby	Ram City	Kirkcolm	Double K
Bothwell	China Town	Droylsden	Towel City	Kirkintilloch	Big K
Braehead	The Shift	Dumbarton	The Rock	Kilsyth	Dry Town
Bridlington	Paddling Pool (19)	Dunsyre	Firey Country	Knowsley	The Open Zoo
Brownhills	Coloured Hills	Dyserth	Quarry Town/ Fall Country	Knutsford	Crown Town
Burnt Island	The Happy Hunting Ground	Easby	Ghost Town (27)	Latchford	Lock Town
Bursledon	Dollar Bill	East Kilbride	Polo Mint City	Leek	Mill Town
Burtonwood	Base Town/ Little America	East Whitburn	The Wee W	Leven	Black Hole
Bury	Pudding Town	Eccles	Cake Town	Linwood	Detroit City
		Everton	Toffee Town	Livingston	Big L
				Llanddulas	Caveman
				Llandudno	Lumpy Town
				Llanfairfechan	Crazy Kitchen
				Llangefri	Butter Town
				Llanrws	Market Town
				Lochwinnoch	Hill Billy Country
				Longbridge	The Circuit
				Lower Broughton	The Valley
				Lowtown	Coal Town
				Lymm	Little Village
				Lytham	Lands End
				Macclesfield	Silk Town
				Manchester	Rainy City
				Mansfield	Stagtown
				Meriden	Kawasaki Top
				Methill	Allamo
				Mobberley	Slow Town
				Mochore	Pig Town
				Mossley	Bell Air
				Moss Side	Red Light Side
				Nantglyn	Wet Candle Town
				Neath	Cattle Town
				Nelson	Flag Town
				Newbigging	Farm City
				New Brighton	Devil's Village
				Newton le Willows	Motor Town
				Nunbaton	New York
				Northampton	Big N (16)
				Partington	Ponderosa
				Peak Dale	Crater Town
				Pembroke	Twin Town
				Pembroke Dock	Bye City
				Penmaenmawr	Granite Town
				Penrhyn Bay	Little Lump



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HANDLES NATIONAL REGISTER!

Albatross	Leicester	Black Raven	Motherwell	Cats Whiskers	Pelsall	Doctor Syn	Cheltenham
Albatross	Portsmouth	Black Shadow	Perth	Cavalier	Newark	Dolphin	Abingdon
Alley Cat	Wishaw	Black Spot	Billericay	Centurion	Dunbeg	Door Knob	Brownhills
Ambassador	Dunbeg	Black Night	Dunbeg	Chad Valley	Castleford	Double Decker	Brownhills
Amerthist	Reading	Black Top	Brownhills	Cheakoe	Port Talbot	Double Eagle	Wolverhampton
Anchor Man	Stirling	Bluebird	Horley	Cheese Maker	Isolton Le Sands	Doughball	Hamilton
Android	Helensburgh	Blue Spider	St. Andrews	Cheeky Monkey	Newall	Dragon Air	Tiverton
Andy Capp	Douglas I.O.M	Blue Max	Kidlington	Cherry Picker	Chippenham	Dragonfly	Norwich
Angel Lady	Luton	Blue Fairy	Edinburgh	Chicken Chaser	Oxford	Dragonfly	Alford
Angel Lady	Mersey	Blue Mouse	Motherwell	Chicken Duck	Kidderminster	Dream Topping	Aldridge
Animal	Shieldhill	Blue Boy	Shieldhill	Chicken George	Tilecross	Driver	Conway
Antman	Perth	Blue Frog	Garstang	Chieftan	Corby	Duchess	Alford
Apache	Mallaig	Blue (Ace)	Cheam	Chinaman	Hayle	Duchess	Fareham
Appollo	Salford	Knight		Chinaman	Hayle	Duchess	Cardiff
Aramis	Birmingham	Blueprint	Brighton	Junior		Duke	Cardiff
Astra	Peterborough	Bobby	Shieldhill	Chipmunk	Portsmouth	Dusty Bin	Frome
Astro-Nut	Birmingham	Marshall		Chipmunk	Salford	Dusty Rose	Brownhills
Atom Ant	Saundersfoot	Bobcat	Worksop	Chippa	Lancing	Dynamite	Chelmsford
Aunt Sally	Ellesmere	Bobcat	Alford	Chopper One	Chelmsley Wood		
Aunt Sally	Milton Keynes	Bomber	Motherwell	Chunky	Perth		
Axeman	Neots	Bonnie	Shieldhill	Chicken		Eagle	Rugeley
Axeman	Tonyrefail	Bootlace	Gwynedd	Cinderella	Loughborough	Eagle One	Leeds
		Boot Racker	Widnes	Circuit Breaker	Luton	Echo	Bude
Baby Doll	Nottingham	Bowdie	Tiverton	Circuit	Rugeley	Electric Legs	Boxhill
Baby Driver	Salford	Bopper	Okehampton	Diagram		Electric Man	Harrogate
Baby Duck	Stourport	Bottle Popper	Sherborne	Citizen Smith	Reading	Eledump	Reading
Baby Face	Kidlington	Bricklayer	Farnborough	Cleopatra	Kidderminster	Enterprise	Kidlington
Baby Jane	Northfleet	Brick Stacker	Brownhills	Clotted Cream	Nottingham	E. Type	Cranford
Bad Bob	Motherwell	Bridge Hopper	Rushall	Coaster	Castleford	Evergreen	Kidlington
Bald Eagle	Milton Keynes	Bright Eyes	Rugely	Cockney Rebel	Dunbeg	Executioner	Reading
Bandman	Motherwell	Bright Eyes	Kidlington	Colonel Bogie	Reading	Eye Lashes	Pelsall
Bantam	Cheltenham	Bronze Bullet	Motherwell	Concord	Reading		
Barney Bear	Northampton	Brown Eyes	Shieldhill	Condor	Ellesmere	Fair Maid	Motherwell
Barabbas	Trowell	Bubbles	Thrapston	Condor	Liverpool	Ferret	Accrington
Barracuda	Carterton	Buccaneer	Kettering	Colt 45	Barnet	Fire Ball	Shieldhill
Basil Brush	Northampton	Buccaneer	Wishaw	Controller	Walsall Wood	Fire Boy	Creswell
Bate Digger	Pennington	Buckle Bottle	Motherwell	Cornflake	Fareham	Fire Cracker	Holytown
Bear Cub	Lancing	Bucket Basher	Keyworth	Corvette	Pelsall	Fire Eater	Southfields, London
Beef Burger	Aldridge	Bulldog	Molesey	Country Squire	Portsmouth	Fire Fox	Aldridge
Beer Belly	Marston Grn	Bumblebee	Molesey	Courier	Scunthorpe	Fire Max	St. Neots
Bees Knees	Armitage	Burmese Blue	Nottingham	Cotton Bud	Derby	Fisherman	Reading
B.E.M.	Thurlby	Busta Blood	Hemel	Cowboy	Moreton	Florrie	Douglas, I.O.M.
Big Aitch	Milton Keynes	Vessel	Hempstead	Cowboy	Hampstead	Flying Fox	Lichfield
Big Bird	Port Talbot	Buzby Basher	Corby	Coyote	Walsall Wood	Flying Fox	Newark
Big Daddy	Perth			Crackerjack	Pelsall	Flying Fox	Radlett
Big Falcon	Armitage	Mr 'C'	Orpington	Crazy Horse	Portsmouth	Flying Squad	Kidlington
Big Foot	Armitage	Cactus	Shieldhill	Crazy Legs	Nottingham	Fly Swot	Hove
Big Wheel	Heysham	Cameraman	Nottingham	Creeping Jesus	Knottingley	Foreman	Tonyrefail
Billy The Kid	Boston	Camper Man	Tamworth	Crew Girl	Motherwell	Four Star	Dunbeg
Bingo Queen	Perth	Camper Lady	Tamworth	Crusty Cut	Wallsend	Four Stroke	Brownhills
Bionic Gert	Marston Grn	Candy Bar	Doncaster	Crystal	Lowestoft	Fox Cub	Lichfield
Black Arrow	Oxford	Candy Floss	Kidlington	Cuckoos Nest	Dunbeg	Foxy Lady	Dunbeg
Black Arrow	Motherwell	Cannon 35	Fakenham	Curly One	Rhondda	Foxy Lady	Lichfield
Black Android	Kidlington	Cape Kennedy	Nottingham		Portsmouth	Frog	Peterborough
Black Anode	Kidlington	Captain	Ardrissan	Daffodil	Holmwood	Gaitor	Dumfries
Black Bantam	Rhondda	Captain	Rhondda	Dafy Duck	Garstang	Galley Boy	Ardrissan
Black Bob	Dunbeg	America		Daktari	Streetly	Galley Ranger	Dunbeg
Black Beard	Northfleet	Captain	Thrapston	Dallas	Chelmsford	Gannet	Abersychan
Black Beard	Tile Cross	Birdseye		Dancer	Kidlington	Gemini Girl	Kidlington
Black Bear	Lancing	Captain	Birmingham	Dark Warrior	Dunbeg	Geisha Girl	Perth
Black Baron	Stoke-on-Trent	Kremmen		Dartboard	Motherwell	Gemini	Newark
Black Cat	Perth	Captain Nemo	Preston	DC Ten	Aberdeen	Gentleman Jim	Kidlington
Black Neck	Blakenall	Captain	S Yorks	Deadman	Halifax	Ghost Rider	Highbury, London
Black Albatross	Manchester	Pugwash		Deck Chair	Leicester	Ginger	Coventry
Black Russian	Newcastle	Captains Mate	Ardrissan	Delta Lady	Leicester	Ginger Nut	Edinburgh
Black Panther	Midsomer	Caretaker	Tiverton	Desert Rat	Prestatyn	Gingerbread	Perth
	Norton	Carla	Birmingham	Desperate Dan	Nottingham	Man	
Black Pixie	Hull	Catfish	Hove	Diamond	Shieldhill	Gold Top	Nottingham
				Cutter	Felixstowe	Golden Bantam	Rhondda
				Dipper	Derby	Golden Angel	Burton-on-Trent
				Dick Turpin	Hexham	Golden Eagle	Norton Canes
				Diesel Doctor	Nottingham	Golden Eagle	Pelsall
				Diesel Duck	Cirencester	Golden Eagle	Burton-on-Trent
				Dipstick	Dartford	Golden Eagle	Wells
				Disco Baby	Alford	Golden Midget	Bury St. Edmunds
				Disco Lady	Manchester	Golden Boy	Epsom
				Disco Queen	Carnoustie	Goldilocks	Sunderland
				Dixie	Ipswich	Goon	Dorking
				Docker	Port Talbot	Graduate	Fareham
				Doctor	Bedford	Grape Ape	Rugeley
				Snuggles		Grasshopper	Carnoustie

Grease Monkey	Cirencester	Hot Lips	Motherwell	Kingfisher	Shipston-on-	Live Wire	Scunthorpe
Green Archer	Shoeburyness	Hot Lips	Pelsall		Stour	Live Wire	Middleton
Green Giant	Midsomer	Hot Point	Houston	King Jeb	Nottingham	Live Wire	Lowestoft
	Norton	Hot Shot	Lowestoft	King Rat	St Ives	Liverbird	Garswood
Green King	Bury St.	Hotrod	Nottingham	Kitten	Walsall Wood	Lucky Rose	Motherwell
	Edmunds	Houdi Elbow	Motherwell	Koolcat	Shepperton	Lone Wolf	Bushy
Grey Cap	Milton Keynes	Hubpuller	Kidlington			Loose Elastic	Heysham
Grey Streak	Bolton Le Sands	Hutch	Preston	Lady Bantam	Rhondda	Lovey Legs	Heywood
Grizley Adams	Stamford			Lady Bluebird	Cheam	Low Flyer	Mallaig
Grocer	Stamford	Ice Man	Shielhill	Lady Docker	Port Talbot		
Growler	Dunbeg	Island Girl	Kidlington	Lady Fox	Newark		
Guitar Man	Manchester	Invisible Man	Rhondda	Lady Jane	Armitage		
Gummy	Wolverhampton	Iron Maiden	Perth	Lady Jane	Kingsbury		
Gunfighter	Doncaster			Lady 'M'	Wandsworth		
Gunslinger	Evesham	Jackal	Wakefield	Lady Madonna	Norwich		
Gypsy	St. Neots	JC	Norton Canes	Lady Penelope	Cleland		
		Jailbird	Aldridge	Lady Penelope	Kidlington		
Habbit	Telford	James Bond	Enfield	Lady Polecat	Milton Keynes		
Hangman	Catterick	Jig Saw	Kingshurst	Lamb Chop	Northampton		
Hangman	W. Drayton	Jimmie Jazz	Orpington	Laminator	Rugeley		
Happy Hippy	Dunbeg	Jockey	Walsall Wood	Lancashire	Warwick		
Head Banger	Guilford	Joe 90	Kidderminster	Lass			
Head Banger	Heswell	Joe 90	Telford	Leading Lady	Nottingham		
Heavy Rocker	Amŵch	Johnny One	Birmingham	Lemon Top	Rugeley		
Hide and Seek	Easby	Eye		Leroy	Slough		
High Flier	Mallaig	Jolly Green	Halesowen	Levi	Saddleworth		
Highland Lady	Peterborough	Giant		Lighthouse	Kidlington		
Highway Flyer	Tamworth	Jolly Roger	Cleland	Lightning Man	Oxford		
Highway Rebel	Radcliffe	Jon Boy	Swindon	Lion Tamer	Mersey		
Highway Star	Fife	Juicy Lucy	Chelmsford	Little Dog	Cirencester		
Hijacker	Shrewsbury	Jump Jet	Lincoln	Little Foot	Breneton		
Hillbilly	Cumbria	Jump Lead	N Malden	Littlejohn	Newall		
Hitch Hiker	Pennington			Little 'H'	Milton Keynes		
Hobbit	Linwood	Karate Man	Manchester	Little Mo	Bacup		
Honde Kid	Telford	Karla 1	Stanley	Little Miss	Norwich		
Honey Bear	Lancing	Kick Down	Brownhills	Muffet			
Honestal	Macclesfield	Kimo Sabi	Heywood	Little Owl	Oxford		
Honeysuckle	Dorking	King Edward	Norton Canes	Little Plum	Bolton Le Sands		

Answers to last month's crossword

ACROSS	DOWN
1. Ford	1. Four
4. Nine	2. Day
6. Anode	3. Pot
7. Buzby	4. New
9. Watts	5. Eats
14. Megahertz	8. Breaker
16. Turkey	10. Antenna
17. Tuning	11. Lady
19. Cobra	12. Pest
22. Major	13. Attic
24. Radio	15. Roger
25. Twigs	18. Hedge
26. Power	20. Boil
28. One	21. Arson
29. Odd	22. Moped
	23. Jaws
	25. Ten
	27. Rig



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Madame Cholet	Doncaster	Pedalpusher	Rugby	Sand Piper	Beccles	Storm Rider	Shrewsbury
Mad Hatter	Guildford	Pedlar	Long Eaton	Sergeant	W. Drayton	Straight Vodka	Northampton
Mad Hatter	Horley	Penny Pitstop	Johnstone	Pepper		Strecker	Cleland
Mae West	Stanley	Peppermints	Bedford	Sasquatch	Magor	Street Light	Pontefract
Magic Man	Alford	Pepsi	Hull	Saxox	Motherwell	Striker	Gwynedd
Magic Rat	Motherwell	Pied Piper	Shieldhill	Scarecrow	Keyworth	String Bean	Stanley
Majestic Lady	Motherwell	Piggy Bank	Northampton	Scarlet Dragon	Clwyd	Story Teller	Prestatyn
Mallen	Orknes	Pilgrim	Wellington	Scarlet Lady	Shepperton	Super Bitch	Cheam
Marine Boy	Pennington	Pink Lady	Newark	Scottie	Newhouse	Super Carrot	Rugeley
Masquerade	Shepperton	Pink Panther	Dorking	Scotty Dog	Broadstairs	Super Dope	Argyll
Matchmaker	Wakefield	Pint Pot	Shrewsbury	Scouse Mouse	Buckley	Super Slug	Preston
Maverick	Oxford	Pipe Major	Bacup	Scuba Man	Salford	Super Smurf	Cottingham
Megastar	Nottingham	Pippa	Hove	Sea Captain	Cleland	Super Star	Stourport
Megatron	Wallingford	Pipp Squeak	Kidlington	Sea Eagle	Shieldhill	Super Stud	Blackpool
Mermaid	Dunbeg	Pirate	Abingdon	Secret Squirrel	Edinburgh	Super Tramp	Dunbeg
Mermaid	Weston-Super-Mare	Piston	Hayes Heath	Sexy Lady	Motherwell	Sweeney Todd	Newport
Metric		Playboy	Kidlington	Shadow Fax	Pontypridd	Sweet Cinatti	Burton-On-Trent
Hammer	Tile Cross	Ploughman	Milton Keynes	Shady Angel	Kidlington	Sweet Pea	Dartford
Michellin Man	Keyworth	Polecat	Milton Keynes	Shady Lady	Doncaster	Tartan	Newhouse
Mickey	Blackpool	Polo	Reading	Shady Lady	Rugeley	Pimpernel	
Dripping		Pongo	Tiverton	Shandy Man	Preston	Tasmanian	Guildford
Mickey Finn	Keyworth	Pool Hustler	Heswell	She Wolf	Shieldhill	Devil	
Midget	Kidlington	Popeye	Coventry	Shoestring	Oban	T.C.	Orpington
Midnight	Abbots Bromley	Popeye	Hexham	Side Rider	Loughborough	Tea Bag	Rhondda
Runner		Popeye	Houghton-Le-Spring	Silky Hen	Rhondda	Tea Cake	Cumbria
Midnight Sun	Kidderminster	Porcelain	Leicester	Silver Bird	Cambridge	Tea Lady	Lowestoft
Midnight	Johnstone	Porcupine	Abingdon	Silver Cloud	Cumbria	Teasmaid	Johnstone
Surfer		Powerpipe	Armitage	Silver Cloud	Pelsall	Teddy Bear	Macclesfield
Mighty Moth	Pembroke	Psychodelic	Airdrie	Silver Dollar	Coventry	Texan	Swansea
Milton Kid	Milton Keynes	Warlord		Silver Dollar	Tonyrefail	Thermostat	Corby
Minder	Nr Mold	Pure Bantam	Rhondda	Silver Fox	Gainsborough	Three Parrots	Woodford
Minnie Moose	Rugeley	Purple Patch	Kidlington	Silver Fox	Kidlington	Tic Tac	Stourport
Minute Man	Bourne	Pussy Galore	Wakefield	Silver Fox	Oban	Tigress	Isle of Man
Miss Piggy	Nottingham	Pussy Kat	Mallaig	Silver Lady	Heath Hayes	Tiny Tears	Motherwell
Mister Chips	Bridlington	Quasimodo	Worcester	Silver Lady	Tonyrefail	Titanic	Milton Keynes
Mister Shifter	Weston-Super-Mare	Queen Bodecia	Fakenham	Silver Tiger	Sale	Tom Thumb	Tiverton
Misty	Aldridge	Radar	Motherwell	Silver Surfer	Okehampton	Tonkatoy	Motherwell
Moby Dick	Kidlington	Radar	Lowestoft	Silver Swan	Reading	Tool Box	Bolton Le Sands
Moby Dick	Reading	Radar	Scunthorpe	Simple Simon	Pennington	Torque	Penmaenmawr
Mole	Holmwood	Radar	Mallaig	Sinbad	Menstrie	Wrench	
Mole	Kidlington	Radar Man	Mallaig	Singer	Okehampton	Track Points	Manchester
Money Penny	Aberdeen	Radiator	Corby	Sixpence	Northampton	Trade Plate	Northampton
Moon Dog	Coventry	Mr Raffles	Milton Keynes	Skeeter	Droitwich	Trooper	Banwell
Moon Raker	Chelmsford	Rainbow	Beccles	Skeleton	Banwell	Twelve Bore	Brookfield
Moscow Mule	Dorking	Rainbow	Gwynedd	Skinhead	Stourport	Twikki	Port Talbot
Moucher	Loughborough	Rascal	Scunthorpe	Skinny Mother	Okehampton	Twinkle Toes	Nottingham
Mover	Caldicot	Raven	Telford	Sky Diver	Pennington	Twinkle Toes	Stanley
Mrs Chips	Bridlington	Raven	Bookham	Sky Fly	Huddersfield	Tyga	Wakefield
Muppet Man	Porth	Raven	Birmingham	Sky Pilot	Eastleigh	Urban Cowboy	Atherton
Music Man	Johnstone	Razor Eddy	Birmingham	Sky Walker	Shepperton	Urban Cowboy	Kingswood
Mustard Man	Milton Keynes	Rectifier	Johnstone	One		Uncle Bulgaria	Doncaster
Ned Kelly	Kidlington	Red Dog	Thurlyby	Smelly Welly	Rochdale	Uncle Remus	Gainsborough
Neighbour	Aldridge	Red Eagle	Oban	Snake Bite	Stanley	Undertaker	Northwich
Nest Egg	Telford	Red Eye	Milton Keynes	Sneezy	West Drayton	Venus	Prestatyn
Night Nurse	Houston	Red Lion	Preston	Snoopy	Worcester Park	Villain	Ilfracombe
Night Rider	Rhondda	Red Rocket	Horley	Snow Bird	Thurley	Virgin One	Colwyn Bay
Night Rider	Heath Hayes	River Man	Rugeley	Snow Cat	Oban	Voyager	Brownhills
Night Rise	Motherwell	Road Hogg	Kidlington	Snowflake	Keston	Vulcan	Pelsall
Nojjer	Tunbridge Wells	Roast Potato	Dorking	Snowman	Heywood	Wallbash	Pelsall
Nomad	St Neots	Robbie Robot	Nottingham	Snow Queen	Perth	Rebel	
Northwind	Wetherby	Robin Hood	Tintern	Snow White	Oban	Warlord Rebel	Dorking
		Robot	Burton-On-Trent	Snow White	Orford	Warload Rebel	Porth
		Rocket Man	Newark	Sony	Telford	Warlord Rebel	Armitage
Odd Job	Lowestoft	Roller Coaster	Kidlington	Sour Kraut	Nottingham	Washington DC	Kidlington
Old Caveman	Long Eaton	Rooster	Dorking	Southern Swan	Glasgow	Wasp	Banwell
Old Smoke	Birmingham	Rooster	Dorking	Spaghetti	Scunthorpe	Wheeler	Oban
Omaha	Fakenham	Booster		Bender		Dealer	
One-Eyed Jack	Kidlington	Rooster	Kingshurst	Space Rider	Shepperton	Wheeler Willie	Kingsbury
Opal Fruit	Sheffield	Booster		Spark Plug	Walton	Whiskey Man	Brownhills
Oracle	Abingdon	Rubber Bullet	Cleveland	Sparrow Chest	Keyworth	White Bantam	Rhondda
Our Kid	Manchester	Rubber Duck	Cheam	Sparticus	Pelsall	White Bear	Carnforth
Outlaw	Motherwell	Rubber Duck	Norton Canes	Spider	Banwell	White	Henwood
Outlaw	Long Eaton	Rum Runner	Wallsend	Spoke	Perth	Diamond	
Overdrive	Brownhills	Running Bear	Irlam	Sponge	Manchester	White Eagle	Ilfracombe
		Rupert Bear	Cleveleys	Squire	Fareham	White Horse	Newhouse
Paper Loan	Chadwell	Rose Bud	Tile Cross	Squire	Motherwell	White Horse	Swindon
Paper Man	St Andrews	Rusty	Chelmsford	Star Dust	Kidderminster	White Lady	Milton Keynes
Patchman	Chemsley Wood	Rusty One	Lancing	Star Fire	Castleton		
Peacock	Derby	Routemaster	Chadwell	Star Fire	Telford		
Peanuckle	Bude	Sage	Chepstow	Starsky	Preston		
				State Trooper	Birmingham		

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Playing about with boats on the water is an increasingly popular pastime for many and a pipe dream for even more.

To the owners of the larger pleasure boats marine radio is not new. This type of equipment is very expensive when compared with the proposed cost of FM c.b. sets.

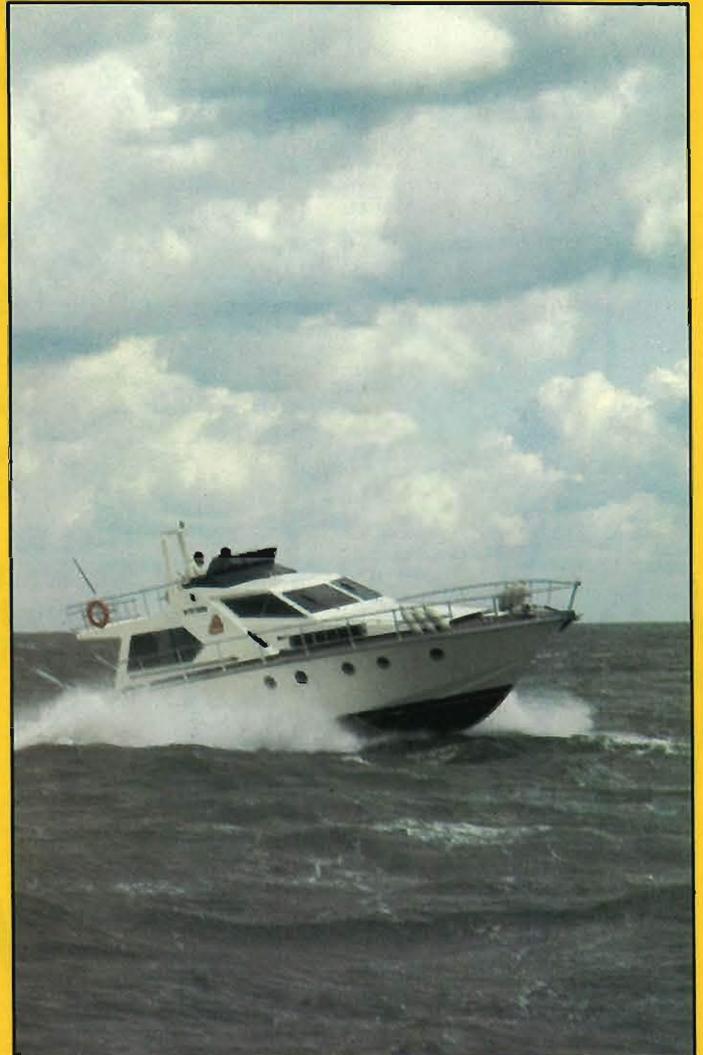
Although c.b. must not be considered as the prime radio for the larger pleasure boats, use in smaller ski boats will be an excellent aid to safety.

It even means that the crew can be told to "come on in now your lunch is ready".

Marine law does not require the larger pleasure craft to have a VHF radio telephone but insurance companies may insist upon it if the owner has not already voluntarily done so.

These photographs are reproduced by kind permission of *Motorboat and Yachting*, like *CB World*, an IPC publication based in Sutton.

CB on water



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THIS & THAT

CB and flood help

Two West Sussex breakers recently proved that c.b. and the police can work in harmony. On the night of June 2nd and through the following day when floods were causing havoc along the South Coast, Wrecker One and Moonraker were monitoring breakers' road condition reports, advising enquirers of blocked roads and arranging for the rescue of stranded motorists.

As dawn broke, Wrecker One was to be found diverting traffic from the flooded A24, putting out cones and notices and pulling waterlogged cars back onto dry land. Moonraker stayed with his mobile rig and continued to monitor all calls and pass messages.

At the end of the day these two breakers had rescued 35 vehicles and advised many more motorists and truck drivers on road conditions and alternative routes.

What is gratifying is that vehicles obviously wearing c.b. antennae were parked by police vehicles and c.b. sets being operated in the vicinity. After a while the police left as this particular scene was well under control, and probably wishing other breakers could organise themselves so effectively.

Well done Wrecker One and Moonraker.

Playing the numbers game

We are often asked how many breakers are there in Great Britain?

Several figures keep appearing in the press. One, one and a quarter and even one and a half million have appeared in print in various national newspapers. The method which the National Committee for the Legalisation of c.b. radio uses and the one generally quoted by the Parliamentary Working Party has been calculated by James Bryant, NATCOLCIBAR's treasurer and President of the Citizens' Band Association.

When the National Committee was formed in Wednesbury, West Midlands at the end of October 1979, best estimates then available were 30,000 breakers throughout the UK.

Extrapolating figures of c.b. antenna imports into this country gives a compound growth figure of

some 16% per month. This ties up with trade claims that our industry is now running at a **million pounds per week** and is confirmed, allowing for inflation by the National Electronics Council's 1978 report on market size which predicted forty five million pounds per annum. Thus, the figure for the end of July is roughly seven hundred and six thousand and to the **end of August a staggering 819,479!!** As Esther Rantzen would say, "Unless of course you know different."

Arise Sir Pat

Major Patrick Wall M.C., V.R.D., R.M. (rtd) M.P. has been awarded a Knighthood in the Queen's birthday honours list.

As Chairman of the Parliamentary Working Party on Citizen's Band Radio he has led the parliamentary campaign over the past eighteen months, for the UK's legal service promised us in the autumn.

Major Wall is also an Honorary Vice President of the National Committee for the Legalisation of c.b. radio (NATCOLCIBAR) which he helped to form in November 1979.



Major Wall, the Conservative M.P. for Haltemprice, is on the House of Commons select committee on defence, a vice president of the North Atlantic Assembly and chairman of their military committee.

Speaking after the award was made public Pat said "I am proud to be associated with the U.K. Citizen's Band movement, a cause which has been taken up by members of parliament irrespective of their political party."

CB World on behalf of our



readers also offers our sincerest congratulations.

We wonder what his handle will be now.

Chain stores rumble CB

RECENTLY SEEN at Rumblelows trade exhibition were these Amstrad FM c.b. sets pictured above.

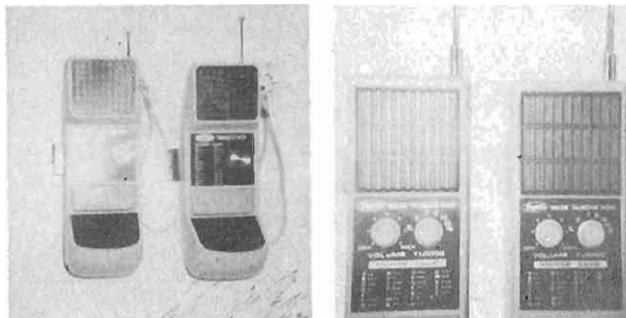
The versions for the U.K. will not have 'piggy-back' boards modifying

the output of CEPT frequencies to bring them to U.K. channels as these sets had when we viewed.

As soon as the 27/81 specification equipment becomes available, we will be putting it under the microscope in our laboratory and the results of our exhaustive examinations published.

Latest expected prices from Rumblelows will be CB900 at £75 and the CB901 at £85 complete with mike.

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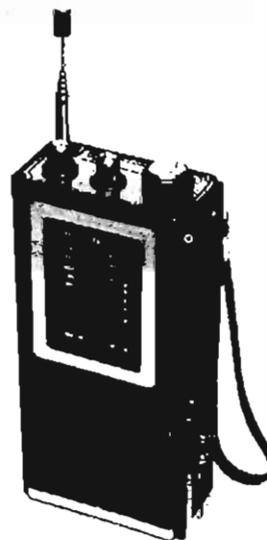
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THIS & THAT

RIP OFF CASE HISTORY

In order to remind you that your rig is only as safe as you want it to be; in addition to our list of stolen rigs *CB World* will publish as a regular feature a short case history of how one of your fellow readers got ripped off. **Don't let it be you.**

"Microchip" was driving home after being up for the previous twenty hours due to his business. He stopped at a motorway service area on the way back and bought a copy of *CB World*. Just before getting home he had a copy. During his conversation "Microchip" gave details of his home 20.

Due to his fatigue, he drove up to his house, parked and — yes you've guessed it — not locked his car.

Our soon to be ripped off hero went indoors, flopped into an arm-chair and began to read.

Meantime outside, he was being relieved of a Realistic TRC 421A serial no. 4151072 and his favourite K40 speech processor.

Was anyone on the side when "Microchip" was in contact with the other breaker? Who was the other breaker?

Someone, somewhere must have eyeballed him at sometime. Anyone been offered a second-hand Realistic in or around the Orpington area?

The sneaky rig thief of channel 14 must be stopped.

Staff appointments for CB World

The editor is Mr Brian Chalmers-Hunt, who transferred from his position as a features writer on

Commercial Motor, also published by IPC. He has written and published more than 100 books on automobile engineering and prior to joining IPC Business Press was a lecturer in automobile engineering and a freelance writer. Mr Chalmers-Hunt, a member of the Guild of Motoring Writers, took up his position on June 1.

Mr Richard Town, a former member of the GLC, started as editorial correspondent with *CB World* on June 8. He is a certified merchant navy radio officer and communication adviser to the National Council for Civil Defence. He has written many articles on telecommunications and has been an editorial consultant to *CB World* since its inception in November last year.

Miss Janet Hobbs has been appointed secretary to the editor and Mr Nick Ratnieks moves to become senior advertisements representative for the journal.

CB Seminar

The Car Radio Independent Specialists Association, in preparing themselves for the introduction of legalised c.b. in the autumn, are to hold a seminar on c.b. radio on Wednesday, September 23 at the Kenilworth Hotel, London.

Although aimed primarily for CRISP members, other car radio dealers interested in selling c.b. and representatives of c.b. clubs will be welcome.

Further information on this seminar is available from Trident News Service, 19 Parkstead Road, London SW15 5HS. Tel: 01-876 3209.

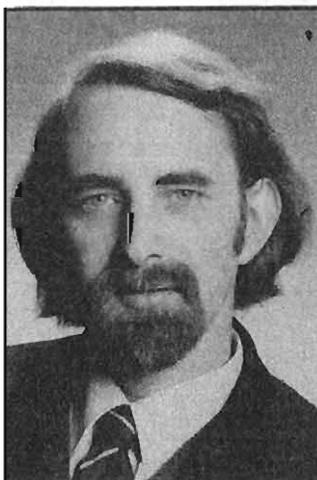
President Grant and others

Because *C.B. World* has an international following we will from time to time be reviewing 27AM sets using our link-up with the American journal *C.B. Magazine*. This is in addition to the laboratory tests for U.K. specification equipment when it is made available to us.

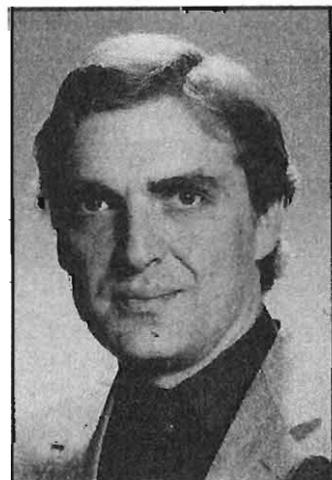
"Rubber Duck to Logi Baird, say good buddy, where do I ger transistors and I.C.'s for C.B. and R.F. applications?"

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Brian Chalmers-Hunt



Richard Town

The first set to be put under the international microscope will be the famous President Grant which is renowned for its performance and range capabilities. Those breakers who have been lucky enough to travel abroad in countries where c.b. is legal will probably have seen these sets in abundance.

We would like to thank Knight C.B. Specialists of 201 Dunstable Road, Luton — Tel: 0582 425722 — for their participation in making certain items of electronic test equipment available in our newly appointed laboratory. This will ensure continuity in our equipment and accessory test programme.

L.C.L.'s runaway success through C.B. World

Last month L.C.L. Imports Ltd. took a full page advertisement in *C.B. World* (page 21) offering a complete c.b. unit for £65 inc. VAT and delivery.

We are told that the response has been phenomenal but one problem has arisen. Several readers, in their enthusiasm, have forgotten to send their name and address. Therefore they will be upset by an apparent lack of service.

If you replied to the advertisement, have not heard from L.C.L. Imports Ltd. yet, and think that you have forgotten to give your name and address then please write to L.C.L. quoting the cheque or postal order number.

Grove House Electronics, Bognor Regis

We have a large file of letters sent by *C.B. World* readers complaining that goods have been ordered and money sent to the above company but, although cheques have been passed through the bank, no goods have been forthcoming.

This company advertised in the earlier editions of *C.B. World* but in view of the problems caused they will not be allowed to do so in future. (They have not at the time of writing this, paid our bill either!)

C.B. World staff have tried to follow up readers' complaints and received promises, promises and more promises from the company directors. Unfortunately as yet there has been no action.

Our latest attempt at making contact has revealed that the telephone service to Grove House is no longer.

We would recommend readers contemplating purchasing goods by mail order from Grove House Electronics not to do so and certainly not to send any money.

This recommendation will continue until Grove House Electronics directors can convince the Editor of *C.B. World* that all complaints have been brought about not by malpractice but by other reasons not within the control of the directors.

Also that all letters of complaint and telephone calls have been satisfactorily actioned, i.e. letters replied to, refunds made or telephone calls returned.

Fortunately, most companies advertising in *C.B. World* are known to the staff and therefore readers should not experience any difficulties in obtaining their mail order supplies. If there is any doubt then contact the Editor first.

It is the unprofessional company that can give an expanding industry a bad name.

Well Jointed radio

Antex (electronics) Ltd. of Plymouth, Devon, has introduced a new "Ready to go" range of soldering irons ideal for amateur radio and c.b. enthusiasts. The CS and XS miniature irons are fitted with a fused, moulded 3-pin main's plug and 0.75mm² cable.

The anti-roll handle and the new first finger guide/protector are made from extra tough engineering plastic and provide greater control for accurate operation.

Both models have retained the well proven system of slide on bits which envelop the heating element ensuring efficient heat transfer and easy inter-change of a wide range of standard bits.

The CS model with a power consumption of 17W produces a maximum tip temperature of 420°C. The larger model, 25W, produces up to 400°C with much greater thermal capacity as a general purpose soldering iron.

Packaged in blue and yellow blister packs and at a recommended selling price of £5.30 plus VAT, the models CS and XS are available from electrical suppliers, hardware stores and chain store.

Break or bust

You will have read about the quickest bust which has occurred after the rig being brought or installed. The record stood at 50 hours unless you knew better. You did.

Tiger One from Colchester held our previous record, its now been broken by Robot in Plymouth.

Gentleman (?) purporting to represent the Post Office came into Robots yard, identified his equipment and asked for permission to confiscate it without any back-up paperwork or warrant. Robot had brought his equipment in Plymouth. The day before. Twenty hours before his bust.

The gentlemen travelled in a Triumph 1300 Toledo but, and here's the catch — it's 'F' registered. Not only that but, as Robot reports to us, the rigs were confiscated in exchange for a written undertaking that no further action would be taken.

Meantime down in Kernowland

(Cornwall to the rest of us) Westward Television reports that a Range Rover and a Rover 3500 saloon (2000 shape) are carrying men posing as Home Office officials and confiscating equipment with 'official' looking Home Office passes.

Westward TV reports that the equipment finds its way on to the continent whereupon it's sold.

If you're suspicious, still be courteous, but examine credentials carefully.

OBITUARY



As mentioned in our last issue, **Ivan Francis**, the General Manager of REACT (UK) died suddenly of a heart attack during the last weekend of May, aged 47.

Although Ivan spoke with a pronounced Canadian accent, he was actually born in England. His earlier years were spent as a merchant sea-

man, before emigrating to Canada in 1954.

For the next twenty years he worked as a consultant to wood products and the machinery manufacturing industries before moving to Kamloops, British Columbia.

Ivan became the Kamloops REACT team leader in 1975 before returning to England in 1978.

As one of the 'original' c.b. campaigners, Ivan set up the REACT (UK) Supporters Club in order to promote the concepts of community service through c.b. radio. The REACT (UK) Supporters Club was one of the original delegates to the inaugural meeting of the National Committee held in Wednesbury in 1979. His tireless campaigning for the c.b. movement in general as well as for REACT in particular led him to make over thirty radio and television broadcasts in the early days of the campaign.

Ivan Francis' fondest wish was to see c.b. made legal in the U.K. He will be sadly missed. ●

Applications for membership to REACT (UK) should in future be sent to:

P.D. Horn (Executive Director)
REACT (UK)
10 Buckingham's Way
Leicester LX10 3PX
Telephone: (STD 0455) 27 2037.

Fourteen days should be allowed for applications to be dealt with.

Alistair MacKay becomes Executive Managing Director and Vic Bull the press officer.

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CLUB CORNER

HUCKNALL WELFARE BREAKERS CLUB (Nottingham)

The Hucknall Welfare Breakers Club was formed due to demand from local breakers. By the second meeting, membership was over 150.

They are affiliated to the Nottingham Area Club, the largest in the area with over 2,000 members, and have the same objective which is to further the cause of c.b. radio on a local, national and international basis.

Meetings are held on Tuesdays at 7.00 p.m. and all breakers actively interested in c.b. are welcome. Further information is available from the Committee, Hucknall and Linby Miners Welfare, Portland Road, Hucknall, Nottingham.

A78 C.B.B.C. (Largs and District)

This newly formed A78 Citizens Band Breakers Club, has around 75 members and would welcome any other enthusiasts to club meetings every other Wednesday at the local school.

In the future they hope to increase their activities from the showing of video films to treasure hunts, etc. The first club disco is coming up soon.

The club breaks on channel 14.

MERMAID CITY BREAKERS CLUB (Mablethorpe)

The Mermaid City Breakers Club was formed in Mablethorpe, Lincolnshire on the 9th March, with an initial membership of 30. At the last eyeball the 150th member joined. The committee has not set any membership limits, consequently there are breakers from seven years to 76 years.

Guests are welcome at any of the eyeballs which are usually held at "T.C.'s" club in Mermaid City. Other information on their part of the world is as follows:

Breaking Channel — 19.
Lincolnshire — Birds Eye County.
Grimsby — Fishtown.

CONEY ISLAND BREAKERS

The Coney Island Breakers have a membership of around 70, and still

rising. They are not a club as such, but a mass eyeball to which everybody is welcome.

Club members eyeball every Wednesday and Saturday at 8.00 p.m. at the Victoria in "Monster City", where a good time is had by all.

An invitation to any out of town breakers to come on down, is sent by the committee and all *CB World* readers are welcome.

HILLBILLYS CLUB (High Wycombe)

The Hillbillys club was formed on the 20th March, and meet every Friday night at the Friend At Hand, West Wycombe Road, High Wycombe.

The committee is restricting membership to 100, because they feel the smaller the club, the more members will participate in activities. During April, there were only six days that the club did not do anything. Convoys are organised to Club Eyeballs.

CONCRETE CITY BREAKERS (Newcastle upon Tyne)

The Concrete City Breakers Club was formed earlier in the year and now boasts a membership of 160. Although membership is now closed, guests are still welcome..

The Club meets every other Wednesday at the Station Hotel in Killingworth and there is never a dull moment.



Members of the Concrete City Breakers plod on to raise money for an intensive care unit for babies.

The picture below was taken at a recent sponsored walk held to raise money for the intensive care unit for babies at Newcastle General Hospital. Money raised went to buy oxygen monitors at a cost of £300.00 each.

Through *CB World*, they would like to thank everyone who took part in the fund-raising events.

CLUB FOURTEEN (North London Breaker Association)

Club 14 is a branch of the North London Breaker Association, but is run as a totally separate undertaking. It has been in existence for about three months.

The club meets every Thursday at the Spotted Dog in Willesden High Road, NW10, from 8.00 p.m. until 12.00 p.m. membership is 50p enrolment and 25p weekly, with attractions including an accessories shop, eyeball, a buy and sell board and disco.

A mini convoy recently went up to Derby to meet the Calcan Breakers club. A good time was had by all. Thanks are sent to all at the Calcan for making the Club 14 members so welcome.

Other activities such as a western dance and a coach trip are to be organised.

HELP REQUESTED

I wonder whether you can help me. I hope I am not asking the impossible, but I need a list of all the c.b. club addresses in and around Chester and Wirral area.

I thought it would be a good idea if my club (night club) in Chester could organise an eyeball night. This would really be the first night club to do so. My boss agreed and left all the arrangements to myself. I have sent off for the leaflets which I then want to send to clubs, so they can give them out to breakers on their eyeball night. I need to get as many breakers interested as possible, at least 300.

A firm date for the night will be given once approval is received.

Hopefully this is not an impossible task, but I do need your help. Please telephone Blue Angel, Motion Lotion City. 051-355 5569.

GATEWAY BREAKERS CLUB (Betws-y-coed)

The recently formed Gateway Breakers Club meet every other Wednesday at the Miners Bridge Hotel in Gateway City (Betws-y-coed).

Starting with 50 members, they are growing quickly in size. Membership is £4.00 per annum, and includes membership card and entrance to all the meetings. Guests are welcome at just 25p. A club rig is available on loan to members if their is broken, stolen, etc.

More information on the club is available from the Secretary on (06905) 612.

ATTIC BREAKERS CLUB (Bridlington)

The Attic Breakers Club formed in March by two friends has now swelled up to 90 members with many more on the waiting list to join.

Already they have held pool and darts competitions against other local clubs and more recently a lady breakers versus male breakers football match. The ladies won 16-9! A sponsored walk by two local breakers in aid of their local maternity hospital took place on Saturday 6th June. Everyone in the club is trying to help raise money for vital equipment.

ROYAL 'T' BREAKERS CLUB (Tain, Ross-shire)

The newly formed Royal "T" Breakers Club has a membership of over 100, and new membership requests are being received daily.

The Club have official eyeballs on the first Saturday of each month, where a wide range of subjects are discussed. Sub-committees for the D.X. club and technical club, are both well supported.

At present they are arranging for T shirts, badges etc. to be printed. These will have the club motif and members handles printed on request.

Indoor/outdoor sports functions and competing against other interested clubs are high on their list.

If you wish to join the club, just give them a shout on 14.

BEECH BREAKERS CLUB (Essex)

Family participation is the key word for the Beech Breakers club in South West Essex. As well as fighting for 27 legal AM, they work on charity fund raising with the emphasis on having fun while they are doing it.

Recent fund raising activities have included disco's, treasure hunts and a bedpush from Loughton to Southend.

RHYTHM AND BLUES BREAKERS CLUB (Norfolk)

Newly formed in East Anglia is the Rhythm & Blues Breakers Club. Membership is currently 135 and local interest is growing fast. Membership costs £1.25 per quarter with benefits for members at all social events. The Club meets on alternate Wednesday evenings at The Bell Hotel, Botesdale, Nr. Diss in Norfolk, and the committee would like to invite any breaker to drop and give them an eyeball.

Club members are especially interested in the furtherance of the campaign to retain the use of AM, as opposed to the proposed legalisation of FM.

Their breaking channel is 14.

THE PIRATES OF SHEFFIELD

The Pirates meet every Thursday from 8.00 p.m. at the Mill, Halfway, Sheffield. After three meetings,

there is a membership of 90. Membership is £1.00 with 25p subs per week. The club holds a weekly raffle and members draw and their first "Pie and Pea Supper" was held on 4th June.

All breakers welcome at meetings.

ASSOCIATED BREAKERS CLUB (Bolton)

Associated Breakers Club, alias Claypit Clogtown Breakers Club, meet at the Aquarius Club on Monday nights from 7.30 p.m.-12.00 p.m.

At present the members are hoping to raise £3,000 to buy three guide dogs for the blind.

Members are very interested in news from other clubs and can be contacted, c/o Dial Electrics at 528 Lever Edge Lane, Bolton or telephone Bolton 652442.

BISCUIT TOWN BREAKERS (Reading)

The Biscuit Town Breakers (BTB) is claimed to be the biggest club in the big R.D. (Reading — home of Huntley & Palmers) with over 1,000 members. Their Chairman, Silver Surfer, is renowned for his 'on air' style. This is popular with the 'Mike Yarwood's' of the area. B T B care very much how c.b. is organised both legally and illegally. They have drawn up a bandplan and code of practice which went down very well at a recent NATCOLCIBAR meeting to which they sent a delegate.

On the other side, they have rugby, darts and football teams. At the club meetings held every Sunday evening, they have an information hour, resident disco, trade stands and, of course, a bar.

Bravo Tango Bravo, their DX section meet every other week and have a technical meeting at irregular intervals.

If any readers are interested in attending one of their meetings, please send a stamped addressed envelope to B T B at PO Box 123, Reading in Berkshire. This address is useful to their DX section for receiving QSL cards.

NEW ALTON CLUB

Charlie Farlie — club secretary — tells us that the A.D.B.C. has been going for a couple of months and that membership is growing fast.

Meetings are held each Friday night at the local bottle breaker, music is provided and a raffle organised — occasionally a few silly pub games are included in the programme for some extra fun. Throughout the year members plan to run convoys and a Tramps Ball.

The Christmas party they are planning will be fun. It's a "Come as your handle" party and the best dressed will receive a great prize.

Anyone who would like to visit the club should go to Alton on a Friday night, call up on 14, and wait for someone to direct them to the meeting place.

NORTH BUCKS BREAKERS CLUB

The North Bucks Breakers Club was formed in October 1980. At the very first eyeball there were nine breakers present — membership now stands at 200.

The club meets each Monday night at the Folly Inn, Adstock, Buckingham, and their contact address is 3 Beech Close, Buckingham MK18 1PG.

The club gave £150 to the Gwent Breakers "Sleeping Beauty Fund", and are now working to raise £600 for Buckingham Hospital.

AIRWAVES IN THE CANYON (Derbyshire)

The Canyon is a small housing estate in Bolsover, Derbyshire, a thriving c.b. community with enough breakers to warrant a club of its own, although there were several large, well established clubs within the transmission area.

A friendly landlord, sympathetic to the cause at a time when the initials c.b. were still very dirty, was found and the Canyon Breakers arranged their first eyeball. It was held in the Cross Keys, Bolsover, on Thursday 29th January 1981.

Forty breakers were expected, but by the end of the evening over 100 breakers had paid their subscriptions and after just two weeks the membership book was full with the handles of 200 breakers!

Six months later, having held many functions such as convoys, large eyeballs, treasure hunts, discos and even a friendly visit from the local C.I.D., who encouraged members to report any rig thefts, the club moved to Hillstown Miners Welfare, Hillstown, Derbyshire.

Because the new premises are so spacious, the membership book has been opened again, and anyone wishing to join should go along on a Wednesday at 7.45 p.m. Visitors are also welcome.

GLAMORGAN BREAKERS ASSOCIATION

Mrs. G. Bunce of the West Glamorgan Breakers Association would like to point out that anyone wishing to contact the club should now write to The Dock Hotel, Aberavon, Port Talbot, West Glamorgan, South Wales.

HANDLES FOR TOWNS

Continued from page 26

Pensby	Inky Town
Peterborough	Diesel City
Polesworth	Square Village
Port Dinorwic	Fishing Pond
Port Talbot	Smoky Town
Prescot	Crushed Baby
Prestatyn	Push Over City
Rainford	Wet Henry
Rainhill	Wet Lump

Ravenstruther
Redwell
Rhosneigar
Rigside
Risley
Ruddlan
Rugeley
Runcorn
Ruthin

Salford
Sandy
Sankey
Shrewsbury
Skelmersdale
Speke
St. Anne's
St. Helen's
Stalybridge
Stockport

Tenby

The Rookery
Crimson Water
Accapulco
Cherrytree Country
China Town
Mason's Town
Power Town (19)
Boom City
Sierra 20

Matchstick Town
Big Twig (19)
Sugar Town
7 City
Concrete City
Talk Town
Square Town
Glass City
The Paddock
Box Town

Big T

Thelwall
Trafford Town

Upholland

Viewpark

Walkden

Wallasey

Warrington

Watford Gap (M1)

Wellingborough

West Kirby

Weston-Super-

Mare

Whitburn

Whittelsey

Winton

Wishaw

Yaxley

Dipper Town
The Park

Tulip Town

The Park

Las Vegas

Sea Wall

Wrekin Town

Coffee Shop

Big W

Bikini Beach (19)

Vegas

Clear Water

Big W

Lost Village

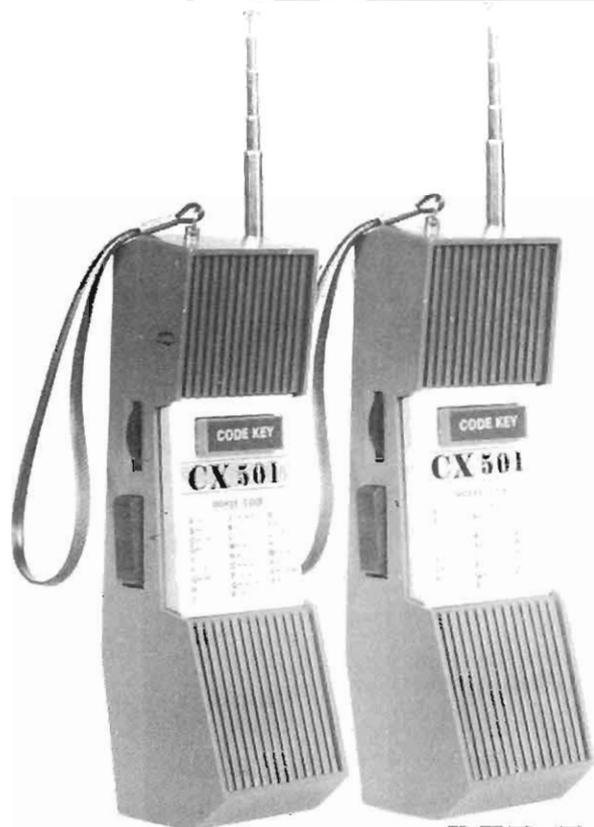
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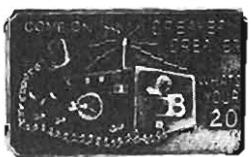
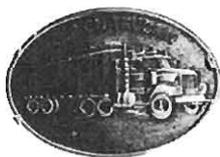
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<p><i>Please send me the following items:</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Pendant @ £3.50 each = £..... (A or B)</td> <td style="width: 50%;">CB Buckle @ £2.00 each = £.....</td> </tr> <tr> <td>Chain @ £2.00 each = £.....</td> <td>Trucker's Buckle @ £2.00 each = £.....</td> </tr> <tr> <td>Record @ £1.50 each = £.....</td> <td>Total enclosed £.....</td> </tr> </table>			Pendant @ £3.50 each = £..... (A or B)	CB Buckle @ £2.00 each = £.....	Chain @ £2.00 each = £.....	Trucker's Buckle @ £2.00 each = £.....	Record @ £1.50 each = £.....	Total enclosed £.....
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Chain @ £2.00 each = £.....	Trucker's Buckle @ £2.00 each = £.....							
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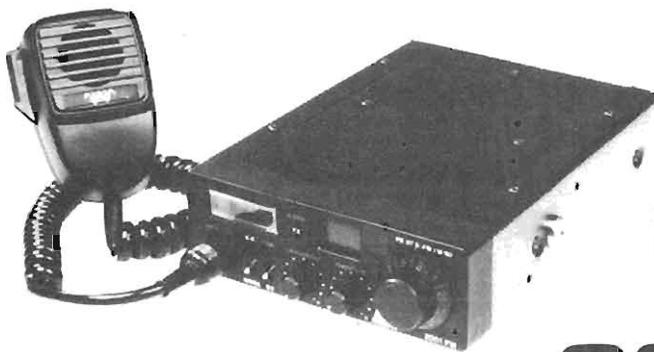
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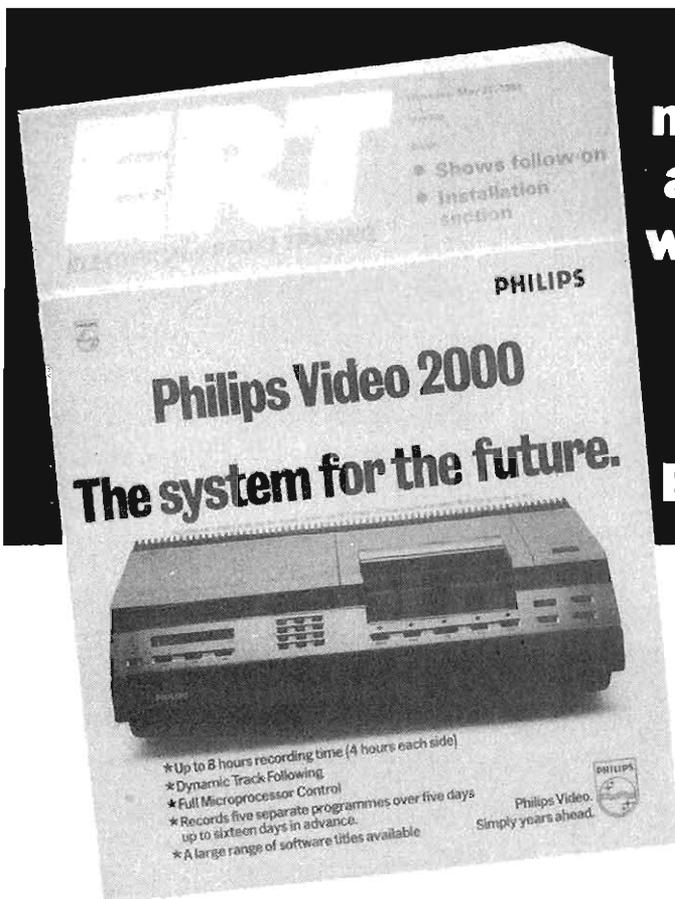


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BUSBY BACKS THE AIRWAVES

Super-hero plans his next business coup using his automatic car radiotelephone.
Bottom: British Telecom Radiophone Service areas.

RICHARD TOWN continues his regular feature on other radio stations. This one tries to give Busby's answer to c.b. — but at a price. When you pull alongside a Rolls Royce with its chauffeured passenger speaking earnestly into a telephone handset — here's the latest equipment he'll be using.

It will operate in all Radiophone areas (see map) and a national or international telephone link-up is possible, without going through the operator as with the current equipment. Previous equipment was only of the nine channel simplex type, but with the use of a duplex filter, this new equipment is capable of transmission and reception at the same time on the same antenna.

The Stornomatic 900 automatic radiophone features an automatic re-dialling facility, memory store for numbers you call regularly together with your own personal code word to prevent unauthorised calls being made (as is possible with the present system) on your 'phone bill. This equipment even has an automatic timer that tells you how long a call made has been in progress.

To make a call, the number required is keyed into the key pad or it may be recalled from the memory store when it will be displayed on the LED front panel. The 'C' button is then pressed or the telephone handset is lifted whereupon the stored sequential pulses will be transmitted automatically.

If the number dialled is engaged then the digital LED display will light up 'BUSY'. In this case it's not necessary to enter the number again since it can be recalled immediately by pressing button 'C'.

To receive a telephone call in the London area the caller dials 140 for the London Radiophone Centre and asks the operator for the number required. On receipt of the sequential pulses of your radiophone number, the equipment emits a bleep and the display indicates 'CALL FOR YOU'. Lifting the handset automatically connects you with the caller.

The Storno equipment memory accepts up to 16 digits for automatic dialling into the STD system. So calling Paris or New York directly from your car is possible. Scanning for a free channel happens immediately after you press 'C'. The digital panel indicates the word 'SCANNING' and then dials directly.

Up to 12 different phone numbers can be stored which can be recalled at will by depressing the memory recall button.

The equipment is also fitted with an autotimer so as to time the length of your calls. This starts as soon as the handset is lifted. The digital display then converts into an autotimer showing the duration of the call in





The latest digital readout car radiotelephone from Storno (transmitter is boot-mounted).

minutes and seconds. When the call ends and you replace your handset, the elapsed call time remains illuminated for a further five seconds.

It's even possible to programme the radiophone to prevent unauthorised use by means of your own digital password. Two levels of control are available. By using the button 'S2' all outgoing calls are barred until your own digital 'password' is entered. Alternatively, by using the button 'S1' outgoing calls can be restricted to numbers already pre-programmed, into the memory store only.

Storno claim to be Europe's market leaders in radiotelephones. With this little piece of cunning gear, they certainly have something to boast about!!

The main problem is that our super hero, in his super car with his oh so super golf clubs might have to wait some time for his radiophone.

British Telecom are currently advising applicants for a radiophone license and number that there could be a six year delay before meeting their order.

CB World spoke to one such applicant, a Mr Hope who is a self-employed engineer. He had applied for service because being self-employed, radiophone was considered vital for his business so keeping him in contact with his clients, when out on a servicing call.

Mr Hope re-applied, after having been a

subscriber for two years, in January 1980. He assures us that, with his equipment (then the Storno nine channel type with 25 kHz channel spacing) Busby offered him service "within a few months".

He's still waiting. His existing Storno equipment is now out of date since channel spacing has been changed to 12½ kHz. Busby won't modify it as they have been doing for existing subscribers since he's, according to them, not "existing". The cost of the Stornomatic 900, advanced as it is, is about £2,800 to buy, which is a great deal of capital for one person to find.

Our super hero may be able to afford this but what about our self-employed engineer? Mr Hope tell us that all his work is with foreign companies with agents in London and therefore all his business is in the export category. Mr Hope tries to maintain contact with his clients by stopping off at, more often than not, vandalised telephone boxes.

Let's suppose that if Mr Hope did decide to invest in the latest advanced technology from Storno, then surely he'd get his radiophone service?

The waiting list as at January 1980 was 1,800. It is now some 3,000. All because there are just not enough channels. In Busby's own words "... the number of radio channels depends on the amount of frequency spectrum allocated to the service by the Home Office."

So British Telecom is not entirely to blame for this problem although, more often than not, they have to carry the can. It is not

known whether they foresaw this problem looming and whether their lobbying for more channels was early enough or hard enough.

It's true to say, however, that the UK c.b. movement has succeeded in getting channels in the face of stiff competition with other powerful interests — such as British Telecom.

One answer which could help, is a c.b. to telephone line interface, otherwise known as a "phone-patch". But, as things stand at present, any connection to a telephone line must be "approved". Yes, you've guessed it, approved by — Busby.

Another method which is beginning to have positive results is the reduction in channel spacing. British Telecom admit that some 1,200 London area applicants are due to be released from their bondage this month.

In addition the Solent radiophone area is also due to be open this month. But this leaves some 1,800 in limbo still waiting.

Ongoing discussions are still proceeding for an allocation in the 900 MHz region of the spectrum, despite the propagation difficulties of this ultra high frequency.

All of this does not help our intrepid, self-employed Mr Hope, or even super hero with his super golf clubs.

The Home Office sure is a great social leveller. ●

Note: Busby rentals radiophone at £100 per quarter for the automatic service and £40 per quarter for manual.



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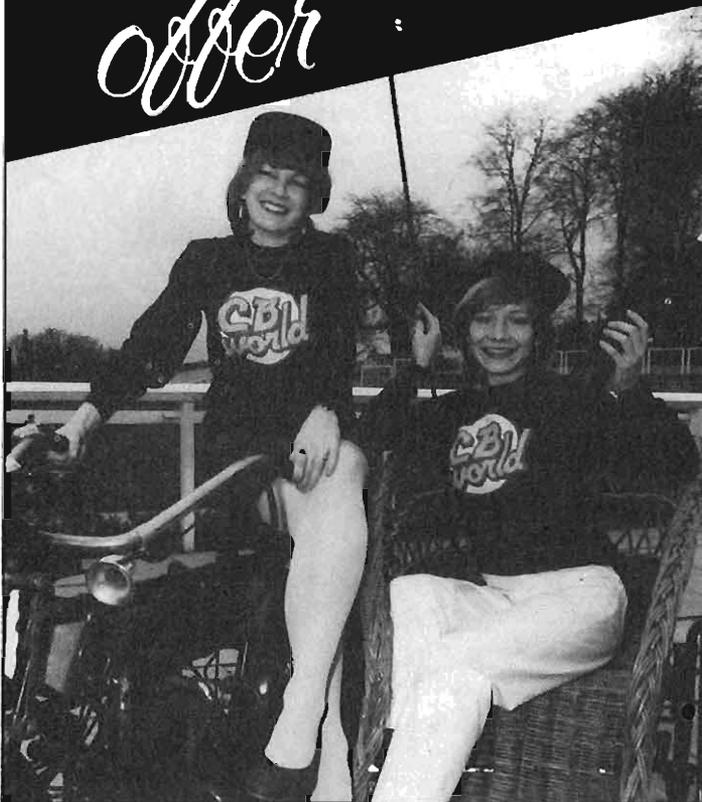
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Femme Scene

by Teataster

IT WAS two years ago that I first met my Liberator. I had never heard of c.b. radio, never seen 'Convoy' and thought radio hams were a group of eccentrics in the mould of Tony Hancock as he appeared in the now famous T.V. series h-Hancocks h-Half h-Hour.

I had associated two-way radio with police or the 'Flying doctor' and the closest I got to c.b. radio was 'The Dukes of Hazzard'. I wasn't the only one was I?

It was not long before Liberator began to initiate me into the c.b. cult. In those early days we travelled the length of the U.K. visiting some pretty dreary places, to attend meetings of various clubs and associations supposedly in an attempt to get together and present a united force to pressurise the government into legalising c.b.

I marched from Hyde Park to Downing Street and attended rallies and demonstrations. I am now, quite frankly, bored by the whole scene. I am sick of listening to the 'lunatic fringe' insisting on 27AM and refusing to listen point blank to any plausible alternatives.

Isn't c.b. supposed to fun?

I have often head women accused of being 'bitches' and of stabbing their best friends in the back but really fellers you can certainly teach us a move or two. it seems to me that a few people, to whom the rest of us owe a great deal, have been quietly working away trying to influence the Home Office to legalise a workable c.b. radio system. Yet only a couple of months ago I listened furiously whilst all this work was ridiculed by a small group whose loud voices mask their small number.

How long must the majority listen to their idle threats knowing that they really prefer to remain outside the law? **They would have opposed the introduction of the telephone if it had been on FM instead of AM.**

If you really do want c.b. legal in the U.K. isn't it time you used some female logic fellers? Take all you can get now and just keep nagging away quietly until you get the rest!

Heard the latest c.b. record from the USA this week. I must admit the first time I had to fight back the tears but by the second and third listening I thought ugh! why do the Americans love this kind of 'mush'? Whatever happened to our C.B. Independence? I don't understand how the BBC in banning the two British c.b. records have

diminished the campaign one jot. Actually it made me more militant.

Is there any truth in the rumour that the CBA are presenting Charles and Di with a rig as a wedding present? They cannot be serious! Perhaps the CBA should also present them with a copy of the Big Dummies Guide as well.

Don't you hate being chatted up on channel? It really makes me cringe being called a seatcover too. *C.B. World* should offer a prize for the most chauvinistic term for the male breaker. How about it? ● JHG

C.B. World donates this page every month to the female breaker. Why not air your views, your likes and dislikes. Don't say you haven't been given a chance!





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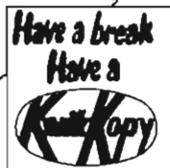
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Why not become an amateur radio operator?

by Richard Graham

With a bit of effort, you can really make your self heard

AFTER a long, frustrating campaign for the legalization of c.b., and only a few months away from the start of a British citizens' band which will be open and above board, and just when lots of citizens are about to pay rather a lot of money for a shiny new rig, you might think it nothing less than perverse to start pointing out the limitations of c.b.

Well, you may be right, and I have to admit that, for a lot of people, c.b. is very useful. It can be a life saver and is an awful lot of fun. All the same, before you commit yourself to c.b. by shelling out for a rig, just give a thought to the alternative — amateur radio. Now, hold it! Hold on just a minute! I'm only suggesting you think about it — if you don't like the idea, just forget I mentioned it, and no hard feelings.

It all depends on the form your interest in radio takes after the first few months. Most activities that entail the use of complicated equipment, be it cars, photography, sailing or radio can be enjoyed in two ways, at least. If you're keen on cars, you can adopt one of two positions — in the driving seat or flat on your back underneath poking about the gearbox. Take up photography and think in

terms of beautifully composed pictures or spend all your time in the darkroom trying out new methods of printing.

It's exactly the same with radio. If you're happy with a limited range, just one h.f. band and a u.h.f. one and only want to chat, then stick with c.b. If, on the other hand, you would like to work contacts thousands of miles away, using different methods of signal propagation including satellites and repeaters, a range of frequencies on selected bands from 1.8MHz to 24,250MHz, perhaps transmitting television pictures, teleprinting and using Morse, it could be that you'd be better off as a licenced amateur.

To compare the two, I'd say that a c.b'er was interested in radio as a means of talking to other people he wouldn't normally meet, the use of c.b. in emergency or for information and to pass the time on long journeys. An amateur uses his equipment for all that, too, of course, but is also keen on the technical side, on improving his technical knowledge, on making equipment and in the investigation of, for example, propagation conditions. An amateur has a far greater degree of flexibility in his choice of

equipment and type of transmission.

The licence

A very few loutish c.b. operators can create all kinds of chaos, not just among neighbours, but over hundreds of miles. If c.b. can do that, on just the one band and a fairly elementary aerial, a clueless amateur operator with all those bands and powers to hand could really make himself unpopular, which is why amateurs have to have a transmitting licence, obtained by way of examination. Having passed that exam, they can at least be assumed *capable* of operating properly, and the majority do.

There are two kinds of licence. If you want to operate a transmitter on all the available bands and modes, you need an 'A' licence, for which you have also to pass on a Morse code test. It's easy enough to learn — all it needs is practice. Some amateurs transmit slow Morse to give learners a bit of assistance. A 'B' licence allows you to operate, using telephony (speech) on the 2m band (144MHz) and shorter wavelengths (higher frequencies). The exam is not a



An HF transceiver used by licenced radio enthusiasts. Retail at around £560.

Why not become an amateur radio operator?

highly technical affair and consists of multiple-choice questions in two papers — licensing conditions and interference, and practice, procedure and theory. Questions are set out like this:

In the international telegraphy 'Q' code, the symbol referring to interference is:

(a) QRL (b) QRV (c) QRM (d) QSZ or

A crystal oscillator is used for one of the following reasons:

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- (c) low power consumption
- (d) low cost

You can see the sort of exam you will have to take by asking for all the details and a specimen exam paper from City and Guilds of London Institute, Electrical and Telecommunications Branch, 76 Portland Place, London W1N 4AA. All the information you need on becoming a radio amateur you can get, free of charge, from the Home Office, Radio Regulatory Division, Licensing Branch (Amateur), Waterloo Bridge House, Waterloo Road, London SE1 8UA. As to how to study; everyone has their own way of doing things. You can read books, go to

evening classes at the local technical college or amateur radio club, or take a correspondence course. But read all the stuff from the above organizations first and then you'll see how to go about it.

A good way of getting yourself involved in amateur radio is to join the Radio Society of Great Britain (R.S.G.B.). You don't have to be a qualified amateur to join — if you're keen to learn but can only, for the present, receive other people's transmissions, you can still join and be a B.R.S. (British Receiving Station). You will probably find it much easier to pass the exam also by being in contact with experienced amateurs. If you're interested, write to the R.S.G.B. at 35 Doughty Street, London WC1N 2AE.

Why be an amateur?

If you like the idea of c.b., you can probably answer that question for yourself. There are all kinds of reasons for taking up radio



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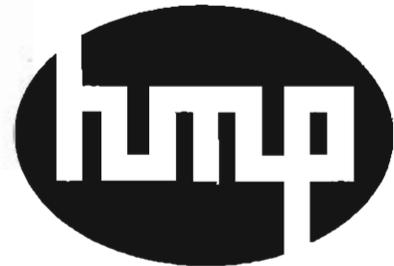
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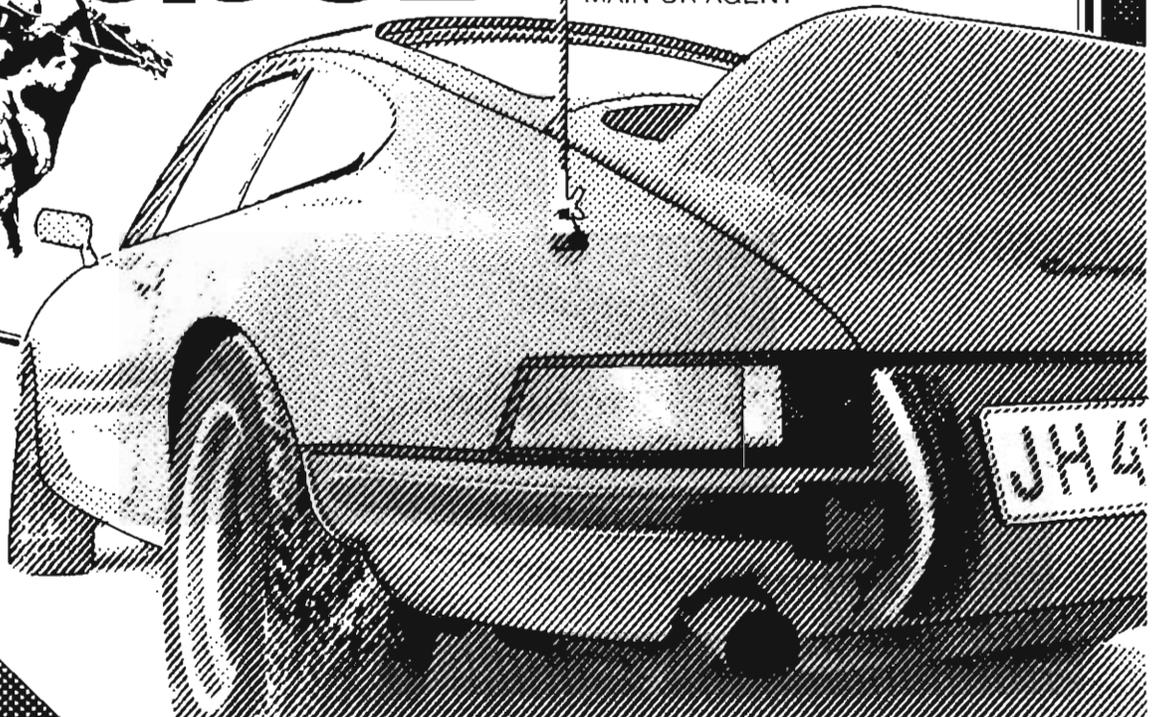
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Typical 2 metre transceiver Access codes to repeaters is automatically provided.

communication as a spare-time interest. There's the equipment itself, there's the technical fascination of building and experimenting and what is logically the reason for it all — talking with people.

You can talk with the very limited citizens' band, but as an amateur, your horizons are considerably extended. The technical aspect of radio instantly becomes far more interesting: you can experiment with aeriads and circuitry and try different ways of obtaining DX (long distance) contacts — perhaps by bouncing your signals off meteor trails or satellites put up by NASA and built expressly for amateurs by amateurs. The moon has been known to function as a very serviceable communications satellite. Repeater stations have been erected by amateurs so that low-powered

transmitters can 'access' them by sending a tone and have their signals boosted and retransmitted. By using Morse, the 'Q' code and a number of international telegraphic abbreviations, you can communicate with someone in Japan almost as easily as with Blue Knight down the road.

The gear

While the cost of, say, a professional-quality h.f. transceiver would be several hundreds of pounds, don't think you have to plunge straight in at the deep end. A very large number of amateurs begin in a far less ambitious way than by marching into a shop with a wad of tenners in their hot little hands. No, most people start with used equipment — either second-hand civvy stuff

or Government surplus. Or, depending on how handy they are, they can start by making very simple receivers and transmitters and then progress to instruments that would stand comparison with professional equipment.

You need test gear as well, which you can either make or purchase. All kinds of equipment appear every month in magazines like *Wireless World* and you can buy kits of parts to make all you need, though kits can be expensive.

All I wanted to say was — why not think about it, at least? If you've read this far, you must have a flicker or interest, so maybe if you have a chat with a licenced amateur, you might find yourself a whole new set of breakers — and not just from you own twenty, either. ●

EXPLOSION IN BREAKERS WANTING TO BECOME HAMS

MANNERS maketh man — that old adage which grated in my ears as a child could be re-written as cb'ers maketh hams according to the latest figures just released from the City & Guilds of London Institute.

C & G who run the twice yearly radio amateurs examination — known as the RAE — report a doubling of the number of candidates entering. In 1978 there were

1,872; in 1979 2,800; in 1980 some 3,700 but for last May's exam alone a staggering 5,500 candidates entered. The numbers of "good buddies" becoming "old man" as hams call each other is really taking off.

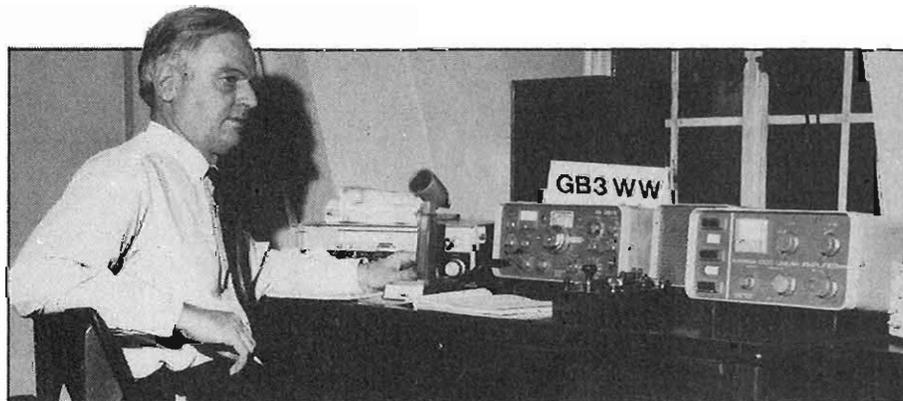
CB World believes that this is due almost entirely to the increasing numbers of people using and having fun with cb radio for the first time so . . .

Starting next issue *CB World* will, month by month lead you gently through the radio amateurs examination course with easy to read diagrams, a set of course notes and example, test yourself set of actual questions to calm your exam nerves. Our expert technical staff will be on hand to answer your letters and to give you whatever assistance we can so that you will get your own call sign.

So why be hamstrung? Instead of being restricted to forty channels f.m. why not work all modes, all bands with up to 130W d.c. input power? Actually there's even a ham band where you can work 2.5 kilo watts peak power.

CB World's radio amateur examination series "From breaker to ham" starts in the next issue.

Why not take out a subscription? We'll even get the Post Office to deliver each issue through your letter box. How's that for sweet poetic justice? ●



A picture from the first issue of *CB World*, contributor Pat Hawker operating the *Wireless World* (our sister magazine) amateur radio station.



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SO YOU FAILED TO SWR A MOBILE ANTENNA

After reading this month's feature 'Understanding SWR' (Page 18) many of you probably thought that it would only take minutes and decided to have a go "just before lunch".

Finally, after about three hours of tuning, pruning and cursing, notwithstanding the threats of divorce and remarks that charcoal is good for indigestion, the antenna is finally ripped off the vehicle and the vehicle repeatedly driven over it.

This is because, according to you, there is something wrong with the antenna, it is useless and the shopkeeper should be hounded out of town for selling faulty goods, etc. etc. and all because you couldn't get a SWR below 3 to 1.

Here at *CB World* we receive a large number of pleas for help. Upon investigation we have been able to identify the most common reasons for SWR problems. These are listed here starting with most common and finishing with the more obscure.

When you experience mobile antenna SWR problems and you can't get the reading down to at least 1.5 to 1 then read through the list. The answer will be there.

1. **Antenna mount not centered within the ground plane.** This is most common with 9ft. whips mounted on rear bumpers or truck rear view mirrors particularly when a GRP cab or roof is fitted.



So where would you put the antenna on this vehicle? Remember various ground plane heights can cause SWR adjustment problems as well as giving an unsymmetrical radiation pattern.

2. **Side mounted antenna** located too far below the top surface of vans and pickups.

Alternatively the lower section is too close to other metals on the same vertical plane.

3. **Antennas mounted at rear** of pick up cab that experience two different ground plane levels. One is the roof of the cab and the other being the pick-up bed.

4. **Insufficient ground plane** particularly when antennas are mounted on GRP panels.

5. **Springs, quick disconnects** or a combination of both make the antenna too long, and not enough adjusting was done to compensate for this.

6. **Centre loaded** antennas with the top tip missing.

7. **Poor ground connections** at the base of the antenna.

8. **Checking the SWR** near a metal building, brick wall or concrete structure.

9. **Excess coax cable** wound into a coil less than 10 inches in diameter.

10. Pinched or kinked coax cable.

Installation is important, and the effectiveness of the ground plane will determine the efficiency of the aerial. Before removing the antenna and driving over it or using it to support the tomatoes check the mounting and ensure that the ground plane will be sufficient.

If there is any doubt it will be necessary to either decide upon a new location or purchase an antenna with built in ground plane. ●

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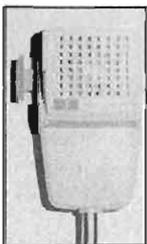
You can be shaking the windows on the hottest rig since Marconi requested a copy, but if you're driving a hen-house you feel like a turkey. Wise up to what's happening on the wheels scene with Autocar the mag that talks cars straight from the cam-shaft. It's the leading journal in the field of in-car-entertainment and it's the mag that tests the best and rest of today's cars as well as printing all the road and sports news, interviews and comment from Daytona Beach to Dagenham High Street. Our August 12 number carries a special feature on CB, covering the history, legal angles and hassles and general information. Check out Autocar for sure -- before your wheels check out for good.

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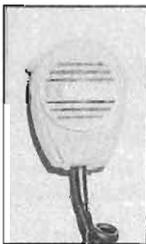
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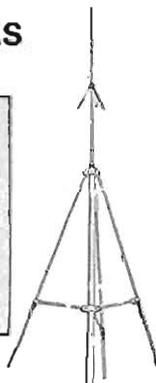
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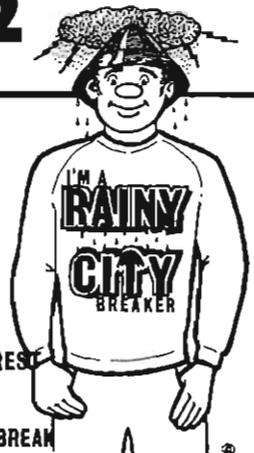
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The new equalisers have just

The first of a regular monthly series giving the latest information on what is available in the In Car Entertainment market. All equipment described should be readily available from your local ICE specialist. If in difficulty, contact the manufacturer direct.

been introduced by Audioline who claim to be leaders and innovators in the field of boosters and graphic equalisers.

The new 307 is a seven slide 40 watts graphic equaliser which will deliver a clear 16 watts per channel RMS. It has a wide range of 60Hz

to 15kHz and can operate with two or four speakers. The unit is equipped with a fader control for use with a four speaker installation.

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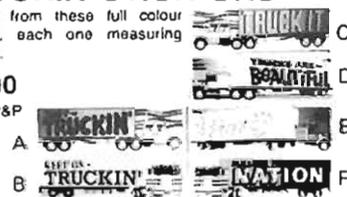
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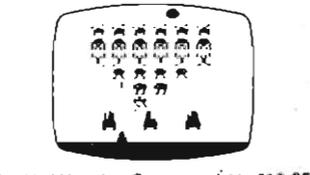
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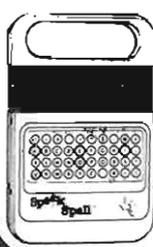
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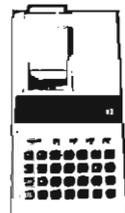


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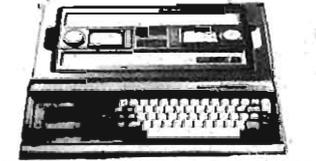


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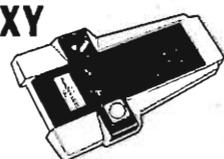
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bleepers (£13 each) this facility can be extended to colleagues and members of the family. Using a C90 standard cassette you can record as many as 45 messages. The announcement can be up to 16 seconds long and the incoming message up to 30 seconds long. The machine is easy to install and comes with full instructions. It is easily wired to your junction box with the spade connectors provided or alternatively a jack plug can be provided to plug into a jack socket. Most important, of course, is the fact that it is fully POST OFFICE APPROVED.

The price of £135 (inc. VAT) includes the machine, an extra-light remote call-in Bleeper, the microphone message tape, A.C. mains adaptor. The unit is 9 1/4" x 6 1/2" x 2 1/2" and is fully guaranteed for 12 months. The telephone can be placed directly on the unit — no additional desk space is required.

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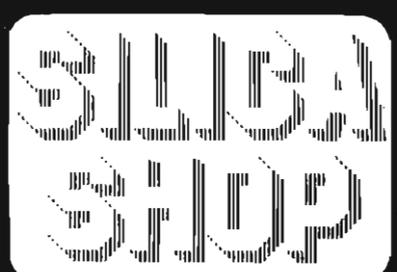
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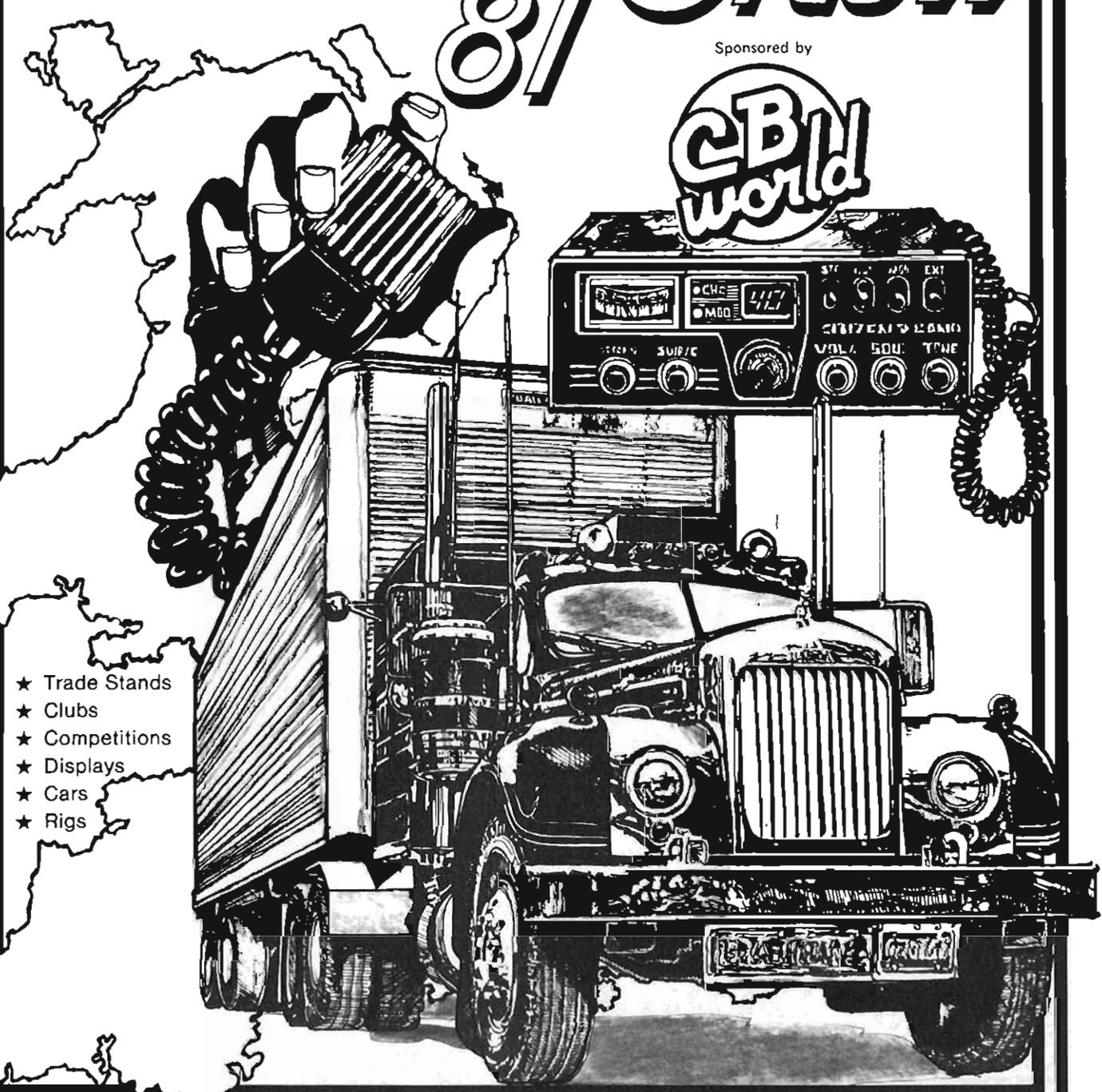
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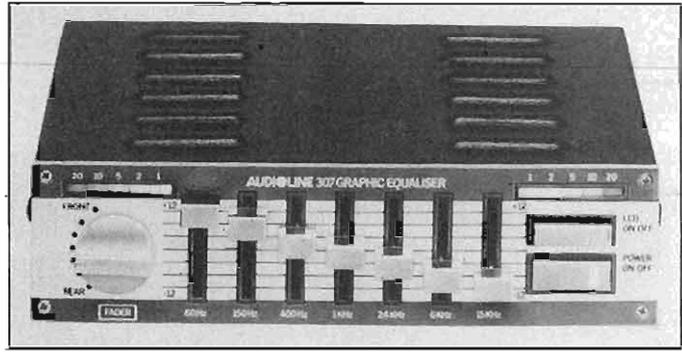
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Audioline's new 7 slide 40 watt graphic equaliser.

Specification and features include an output power of 20 watts per channel (max.), 16 watts RMS, frequency response: 60Hz to 15kHz, and impedance 4 ohms. A speaker requirement of 4 ohm 20 watts, 4 or 2 channel output is required.

Controls include front/rear fader, power on/off switch with built-in LED, seven slide controls for 66Hz, 150Hz, 400Hz, 1kHz, 2.4kHz, 6kHz, 15kHz and 10 LED output power indicator lights: five left, five right, LED lights and an on/off switch.

Harry Moss International Ltd.
424 Kingston Road, London SW20 8LJ
01-540 8277

HITACHI

Hitachi has introduced a new high specification mono car radio which is equipped with three wavebands — FM, MW and LW — instead of the two bands usually associated with non-stereo equipment. The Hitachi KM 1003 radio has an output of 6 watts RMS and incorporates Hitachi's special noise-cancelling circuit to enhance

the quality of weak or poor signal reception.

For pre-set tuning on all three wavebands, there are press-buttons for three FM stations, two MW stations and one LW station. A tone control is included together with an aerial trimming facility on the front panel.

The radio frequency ranges are: FM (VHF) 88 to 104MHz; LW 150 to 300kHz; and MW 530 to 1,605kHz.

The KM 1003 has a black matt finish to blend unobtrusively with any vehicle fascia.

The new in-car stereo cassette players from Hitachi will appeal to motorists with differing audio requirements in mind.

At an RRP of under £60 including VAT, the Hitachi CS430 unit offers value-for-money specification and performance for

the motorist with a modest budget available to spend on in-car entertainment. For the hi-fi enthusiast, the Hitachi CS390 provides high quality sound reproduction and a host of operational features at a recommended retail price of under £80 including VAT.

Equipped with auto-ejection at the end of tape play, the CS430 has an audio output of five watts RMS per channel, with a frequency response of 50Hz to 10kHz.

Insertion of a cassette automatically switches on the player and a green LED light indicates that the tape is running.

Slider controls are provided for tone, volume and balance, together with a lever for fast-forward action.

The Hitachi CS430 has a dark brown matt finish and designed for

mounting beneath the dashboard. The unit is supplied complete with standard fitting kit and comprehensive installation instructions.

A Dolby noise reduction circuit and a metal tape facility are key features of the higher-priced Hitachi CS390 player.

This powerful six watts RMS per channel unit automatically switches tape channels at the end of each side, to give non-stop entertainment. Manual push-button switching between tape channels is also provided.

Rotary controls ensure fine adjustment of tone and volume, plus a slider switch for balance. Fast forward and rewind with lock-on are a standard feature, and there are controls for normal or chrome tape and Dolby circuit selection.

The satin-chrome finished CS390 unit has a frequency response of 50Hz to 12kHz (normal tape) and 50Hz to 14kHz with chrome tapes.

This new Hitachi player is supplied complete with standard fixing kit and installation instructions.

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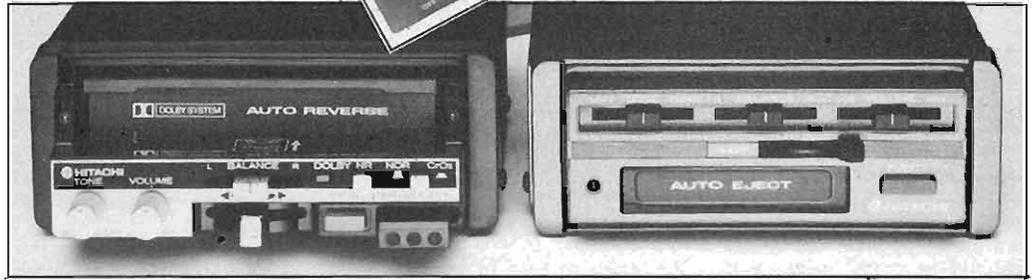
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M/Ms/Ms Address

Let there be music!

Two of the latest car stereo cassette players from Hitachi.

The economical Hitachi KM 1003 3-band mono car radio retails at under £60.



for car audio systems has been introduced by Hitachi to minimise the interference created by a vehicle's electrical equipment which may be transmitted along the power supply cable.

The Hitachi NF2 is a dual suppressor and choke filter unit which fits simply between the power lead and the car radio or cassette player. Although all in-car audio equipment may incorporate noise filtering circuits, in many instances, these cannot fully suppress this type of interference. The Hitachi NF2 suppressor, therefore, represents an effective method of improving audio quality at minimal cost.

The NF2 unit has a recommended retail price (including VAT) of under £4 and, according to Hitachi, it is virtually half the cost of any similar devices on the market.

It was designed and developed by Hitachi's own in-car audio specialists in the UK. This small device comprises an iron core choke and electrolytic decoupling

capacitor, sealed-for-life in an epoxy resin encapsulation.

Hitachi Sales (UK) Limited
Hitachi House, Station Road,
Hayes, Middlesex UB3 4DR
01-848 8787

LUCAS

Lucas have recently announced their new audio unit to be known as the LS272 stereo manual radio/stereo cassette player.

This new sophisticated combined unit, designed for 'in dash' fitment, is the very latest addition to the comprehensive range of Lucas advanced audio.

The radio offers the choice of LW, MW and stereo FM at the flick of a switch. The high fidelity of FM radio is further enhanced by

an interference suppression circuit. Automatic stereo to mono changeover, supplemented by a manual override switch, optimises reception of distant stations..

The LS272 embodies: a stereo auto eject cassette player incorporating an automatic radio-to-cassette changeover upon insertion of a cassette, and a locking fast-forward and fast-rewind control for convenience and safety.

For the discerning ear a chromium dioxide switch provides tone compensation for the fullest enjoyment of top quality tapes.

Cassettes are ejected automatically either at the end of the tape or when the unit is switched off. Alternatively, simply pressing the eject button instantaneously

switches from cassette back to radio.

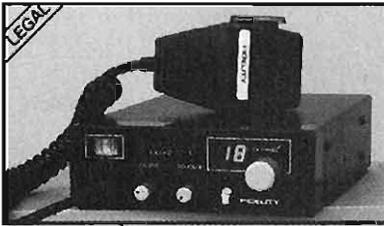
Performance specifications include polarity negative earth only, supply voltage 11-16V DC, audio power 6 Watts per channel, device complement five IC's and eight transistors.

A speaker impedance of 4-8 ohms is recommended. The frequency response is 50-10kHz, wow and flutter less than 0.4% WRMS, crosstalk better than 35dB, S/N ratio better than 40dB, radio superheterodyne circuit with RF amplifier and permeability tuning.

The tuning ranges are LW 1034-2,000m (290-150kHz), MW 185-583m (1,620-514kHz), FM 87.5-104MHz.

Tape Playback specifications

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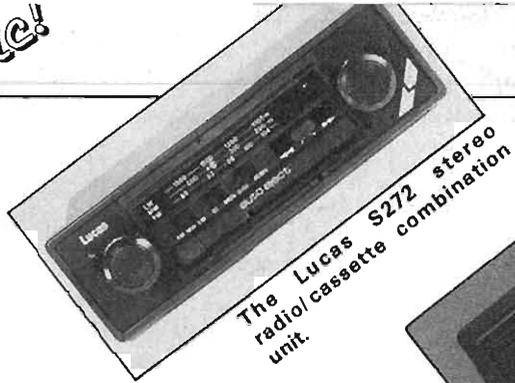
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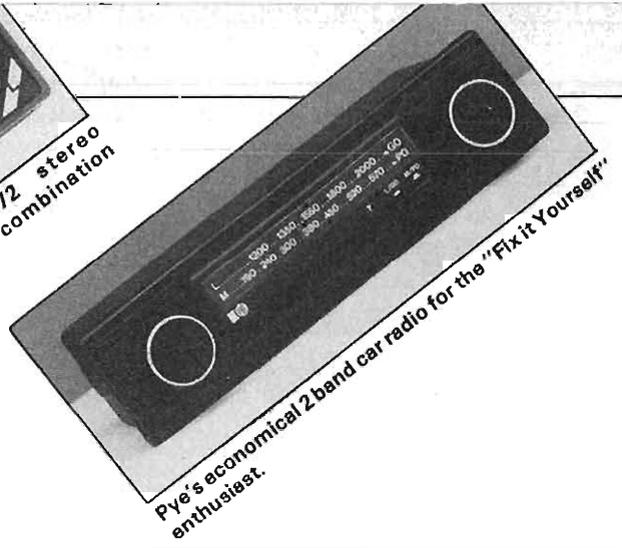
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Let there be music!



The Lucas S272 stereo radiol cassette combination unit.



Pye's economical 2 band car radio for the "Fix-it-Yourself" enthusiast.

include: tape system-compact cassette, tape speed — 4.75mm/sec (1.87in/sec), fast wind — less than 100 sec for average pre-recorded cassette.

Special features include auto-eject — at the end of the tape or when supply switched off, locking fast wind in both directions, stereo beacon and interference absorption circuit.

Lucas Electrical Limited
Great Hampton Street,
Birmingham B18 6AU
021-236 5050

Styling makes full use of satin chrome and black, in line with the Supersound range.

Coverage (nominal) is, MW 1620-520kHz, LW 300-155kHz, FM 87.5-104MHz. Supply 12 volts, negative earth only. Controls comprise: on-off, volume, tone, balance (push to engage), radio tuning, preset buttons, 1xLW, 2xMW, 2xFM, mono/stereo switch, tape eject, tape fast forward, tape rewind and tape programme change. The 536 is capable of driving up to four Radiomobile 4 ohm speakers. (Two per channel connected in parallel.) It has a power output of 7.75 watts peak per channel with both channels driven. (Six watts peak per channel with 4 ohm speaker.)

Radiomobile Limited,
Goodwood Works, North Circular Road,
Cricklewood, London NW2 6JN
01-452 3333

PYE

A two-band car radio for the 'Fit-It-Yourself' enthusiast is now being marketed by Pye Limited.

This radio, model 4192P, includes a basic fitting kit which is suitable for installing in all popular makes of car, either in, or beneath the dashboard, and a loudspeaker.

Tuning to the long or medium wavebands is by manual control but the 4192P boasts a push-button waveband selector.

A powerful 6W output provides easy listening under the most noisy road conditions.

The aerial trimmer is front mounted for easy access and the power supply for the 4192P is 12 volt DC negative earth with a polarity protection diode.

A similar model, the Pye 4192 is available but without loudspeaker or fitting kit.

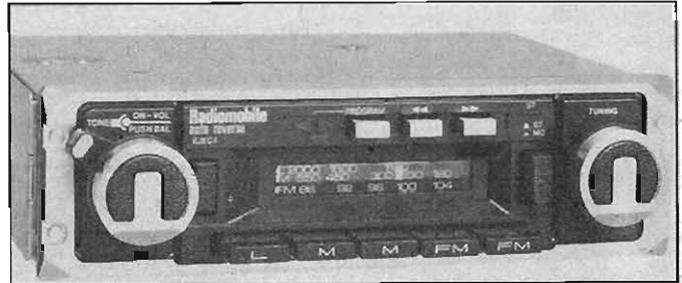
Pye Limited
137 Ditton Walk,
Cambridge CB5 8QD
02205 2781

SANYO

The FT4507ME is Sanyo's top of the range stereo tuner/cassette deck with remote control. The tuner features a phase locked loop synthesizer digital tuning readout and 24 hour quartz clock. Six sensor touch buttons allow selection of pre-set stations over LW/MW/FM plus the latest Sanyo noise canceller control. The auto-scan tuning/band selection can be remotely controlled. FM tuner features Sanyo developed soft muting circuit and automatic tone quality control. Dolby cassette deck features auto reverse and automatic music select system memory and metal/normal tape selection. Facilities include bass treble loudness, fast forward and fast rewind. Output is 20 watts RMS per channel from a separate amplifier which is included in the price.

The FT4727ME stereo car radio cassette features LW/MW/FM stereo radio with five pushbutton tuning. Sanyo's FM soft muting circuit has automatic tone quality control, stereo noise control and Sanyo's noise canceller for quality sound. The stereo cassette section has auto reverse AMSS fast forward and rewind together with rotary controls for bass/boost, tone, volume and balance plus an FM stereo indicator light. Output is 7.5 Watts RMS per channel.

Sanyo Marubeni (UK) Limited
8 Greycaine Road, Greycaine Estate, Watford WD2 4QU.
Watford 46363



The Radiomobile 536 combined auto reverse car stereo cassette player and radio covering L, M, and FM wavebands.



Sanyo's top of the range stereo tuner/cassette deck with remote control.

RADIOMOBILE

Radiomobile's Model 536 is a combined auto reverse (continuous play) car stereo cassette player with radio covering W, MW and FM wavebands with manual tuning and five button preset station selector.

The FM radio incorporates a stereo decoder with manually operated stereo/mono switch and an active interference rejection circuit. Stereo reception is indicated by a beacon.

The cassette tape deck incorporates automatic switching from radio to tape play on cassette insertion, lockable fast forward and reverse wind and automatic reverse at end of tape giving continuous play through both sides of the chosen cassette. The direction of tape play may be changed at any time during cassette playback.



The Sanyo FT 4727ME stereo car radio cassette player has an output of 7.5 watts per channel.

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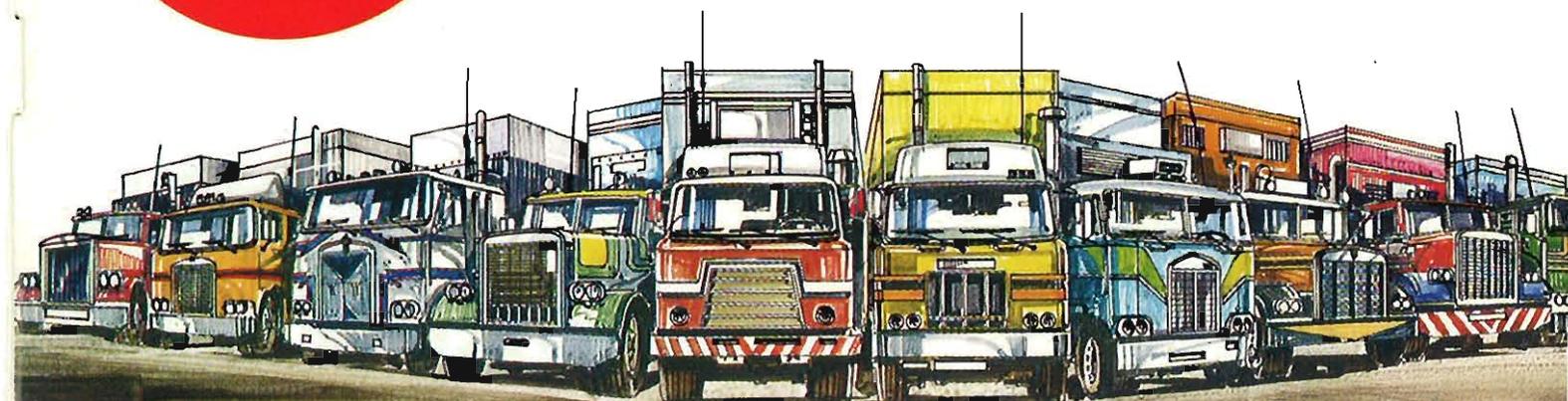
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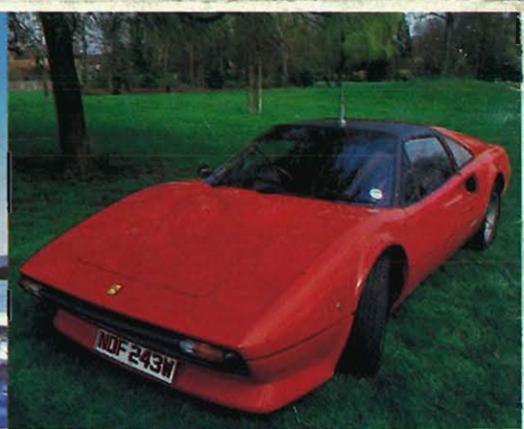


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