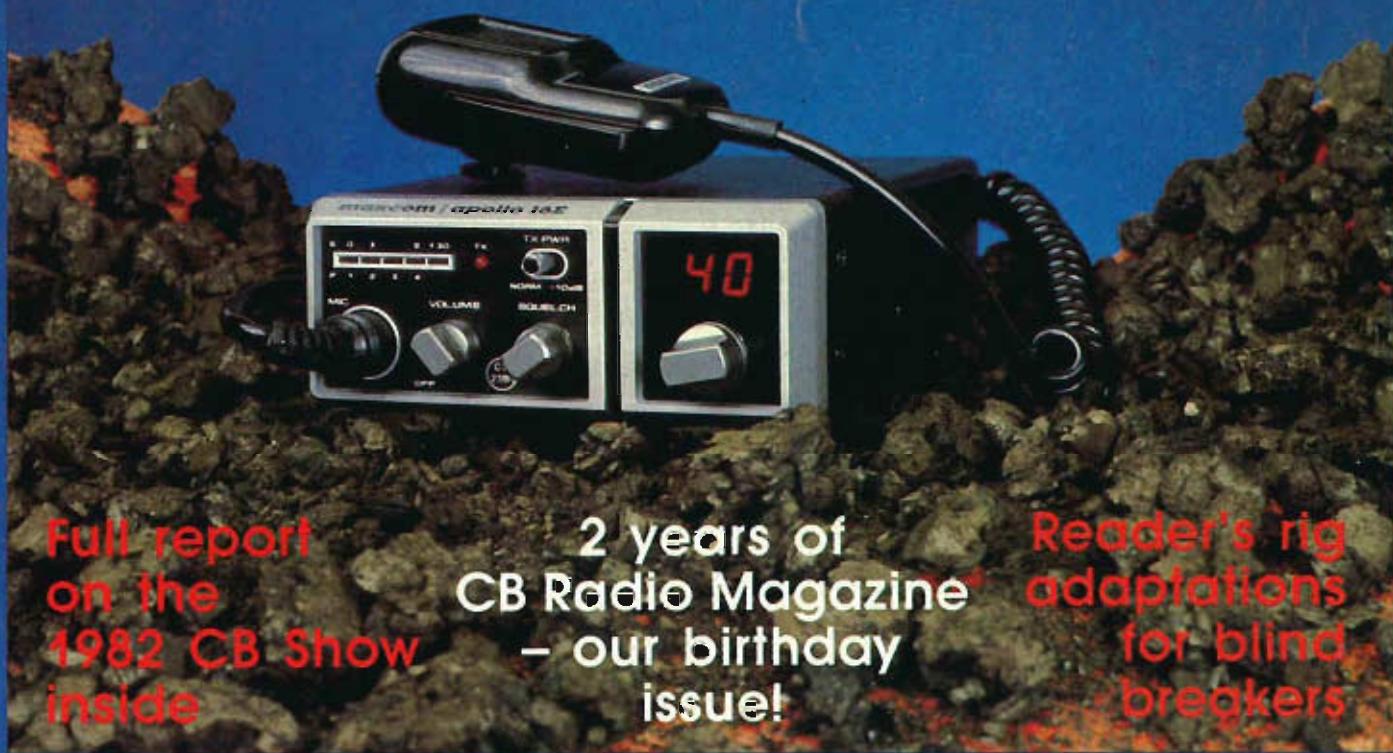


CB RADIO

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inside

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— our birthday
issue!

Reader's rig
adaptations
for blind
breakers

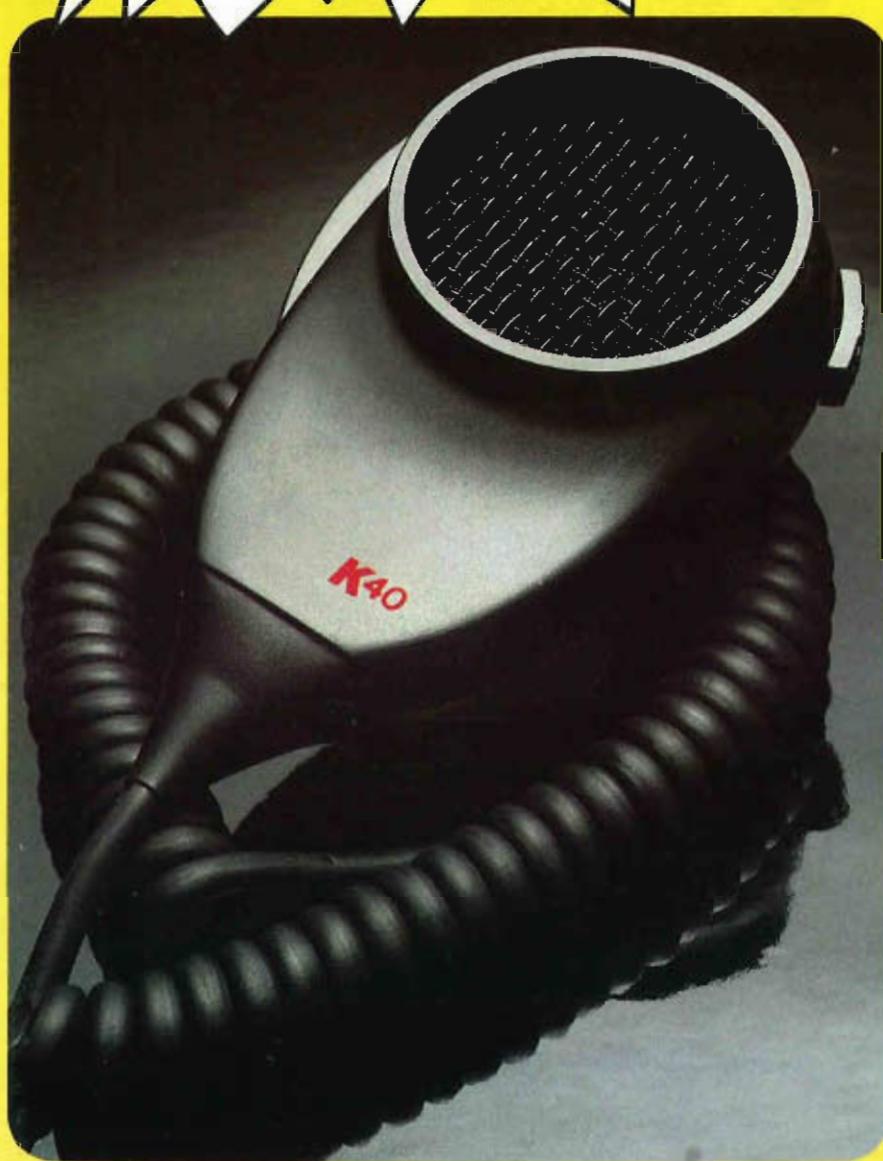
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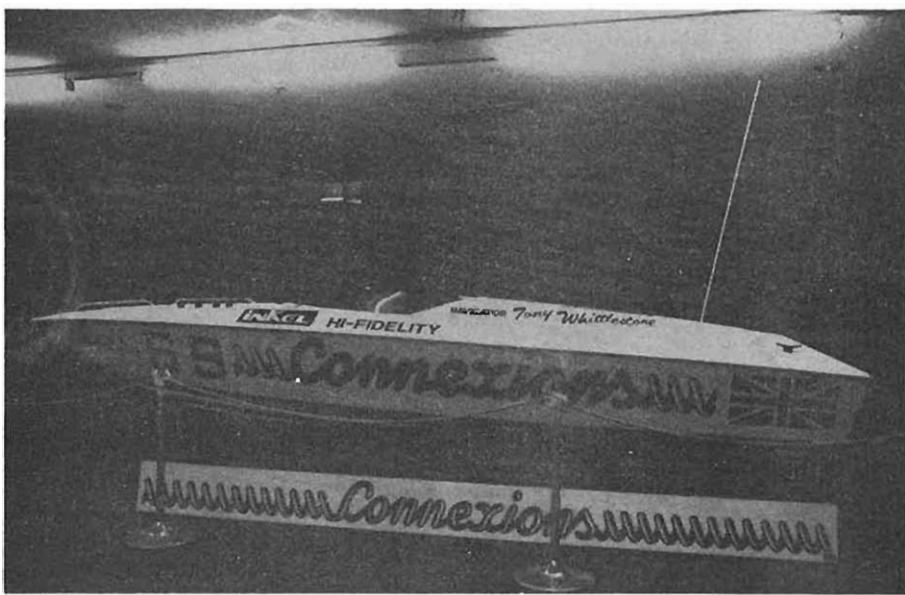
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COMPETITION

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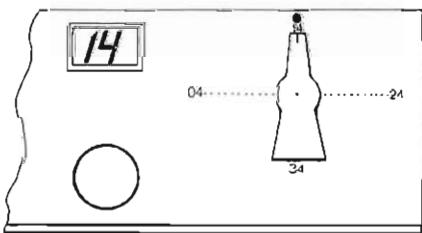


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Editor: Carol Robinson
Executive Manager: Tim Englishham (104)
Editor: Paul Carter
Assistant Editor: Martin Kelly
Editor's Secretary: Mark Spalding
Advertisement Manager: Ian Sharp
Photography: Colin Davies
Production Manager: Andrew Lawrence
Production Assistant: Steve Evans
Photocollating: Alan Biggs
Design: Ian Franklin
Technical: Ian Franklin
Layout: F. C. Judd, ISTD, MPA, Astar IPRA



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Two years, CB and us

A retrospective look

Birthdays are funny things. As well as giving you something to celebrate, they also make you look back at past achievements (and sometimes non-achievements). A magazine birthday is very similar as it sets you thinking about all the things that have happened since that very first issue.

Looking at the overwhelming selection of magazines, books and general information on CB now available in any newsagent or CB shop, it seems incredible that two years ago there was next to nothing for the then highly-illegal breaker to read about his hobby. This magazine was created by breakers to fill that hole.

The editor and publisher of CB Radio Magazine took a brave step in starting the magazine but the first edition, in May 1980, met with considerable success. It wasn't, of course, an overnight sensation as there were still hurdles to be taken like national distribution, actually getting the information in and all the teething problems of a new magazine. It didn't take that long to build up a good circulation and subscription list.

Being the first magazine gives you a certain responsibility. We have always tried to keep in touch with what's actually going on and what attitudes really are, not just sit in an office and play at being journalists. We have always tried to present the truth, too. Our success in doing so is reflected in our sales figures and the loyalty of our readers.

Obviously the biggest situation and possibly the most difficult, although in some terms it was a success for CB, was the legalisation issue. We have always been a campaigning magazine – right from the beginning we were actively lobbying for a legal CB system and we published petitions, rally news and demonstration reports which put us in an awkward position when legalisation actually came because we knew it wasn't what the campaigners wanted but we also knew it was a damn sight better than what had been offered at one time. So we have carried on still offering basically the same content but covering both sides of the fence. Again, the combination has worked since the magazine is still every bit as popular.

So, in two years we have seen a lot. The emergence of CB from out of the shadows and establishment as a national pastime – and big business, the recognition of CB as fun, useful and



socially helpful, the monitoring organisations up and running, the CB trade becoming more respectable, etc. Some things, unfortunately, never change; wallies, bucket mouths and channel hogs. The company has also altered a lot; new staff, new premises, new equipment – a new publication in CB Trade Magazine and a new sister printing company, Laser Litho. But the same aims and ideals – to present a breakers' mag for all breakers covering the things breakers want to read about. To a certain extent we rely on you for this. We need your letters,

news and information. As clever as we may be, we can't know about everything. Besides, it's your magazine, so we need your contributions.

Two years have seen a big change in CB and CB Radio Magazine. We haven't got a crystal ball, so we can't say how the next two years will go. We can say that, contrary to some newspaper items, CB is not dying off, that the 'boom' that never happened hasn't meant the end of CB and that CB, be it AM, FM, SSB or 934MHz, will be around for a long time yet. Us, too!

SS

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NEWS REVIEW

Badgers by owl-light!

Those of you who watched the recent thriller series on television called 'Badger by Owl-light' will realise that it has absolutely nothing to do with CB but now I have gained your attention it does tie in rather well with a news clipping about a group of villagers using CB to watch a badger's sett. Other topics covered this month are bucket-mouths, bungled emergency calls and interference by the legal FM system.

The Sun Sexy Mermaid is sunk in her bath

"A saucy divorcee used the call sign Sexy Mermaid to chat to CB buddies from her bath," said The Sun, "but her bathtime fun landed her in hot water with Telecom's officials for using an illegal AM radio."

The British Telecom's officials listened to 29-year-old Yvonne's transmissions and could tell she was in the bath because of the background noises. "It must have been the taps running," said Yvonne, who was disturbed from her bathtime chat by a visit from the Telecom's officials.

Naughty Yvonne's bathtime habits were revealed at Leominster magistrates court - where she admitted using an illegal transceiver without a licence and was fined £40 with £20 costs. The same evening, though, Yvonne was back on the airwaves at her home in Leominster. "I love lying in the bath and chatting to people," she said. "I wasn't doing any harm and I was certainly giving a lot of people a lot of fun."

Mother-of-three Yvonne has even had sweaters made with Sexy Mermaid on for when she's not in the bath. She said, "Until they actually come and take my rig away, I'll be broadcasting at bathtime as usual."

Daily Telegraph Boosted CB hinders police

London police are facing severe problems of interference from the new, legal CB radio equipment because many owners are making their set illegal by fitting additional equipment. According to Scotland



CB BOOSTS JAM POLICE CHANNELS

By T. A. SANDROCK
Crime Correspondent

OWNERS of citizen band radios are causing serious interference to emergency service channels by fitting illegal boosters to their equipment, Scotland Yard said yesterday.

The boosters almost block out police communications when used near any of dozens of police transmitters in London.

Urgent talks are being held with the Home Office and British Telecom, in an attempt to overcome the problem.

Police cars have been picking up CB chat, instead of messages on their own system. The delays this involves, could, it is pointed out, mean the difference of life and death to some traffic accident victim, or enable a criminal to escape.

Dead spots

Problems seem to be worse in city areas where dense building requires the use of more transmitters and boosters to eliminate "dead spots."

Fire Brigades have also reported interference on their frequencies.

A Home Office spokesman said every effort was being made to deal with the matter. "The real answer is for people to use only what is legal, which is why the new sets and the specific wavebands were brought in."

"Many do not realise that by adding a booster to a legal set, that equipment then becomes illegal."

Yard, serious interference is being experienced by the Yard's information room, which deals with calls and to the traffic car channels which deal with accidents.

Urgent talks are now being held with British Telecom in an attempt to overcome the problem. It is thought that many CB'ers do not realise that their equipment becomes illegal when they attach it to the boosters which are causing the trouble.

Reports have been received that police cars are picking up CB chat instead of their own messages. Delays of several minutes have been experienced. Scotland Yard pointed out that in dealing with crime or serious traffic accidents, those minutes lost can mean the difference between life and death or the capture or escape of criminals.

Birmingham Evening Mail Death crash driver was using CB set

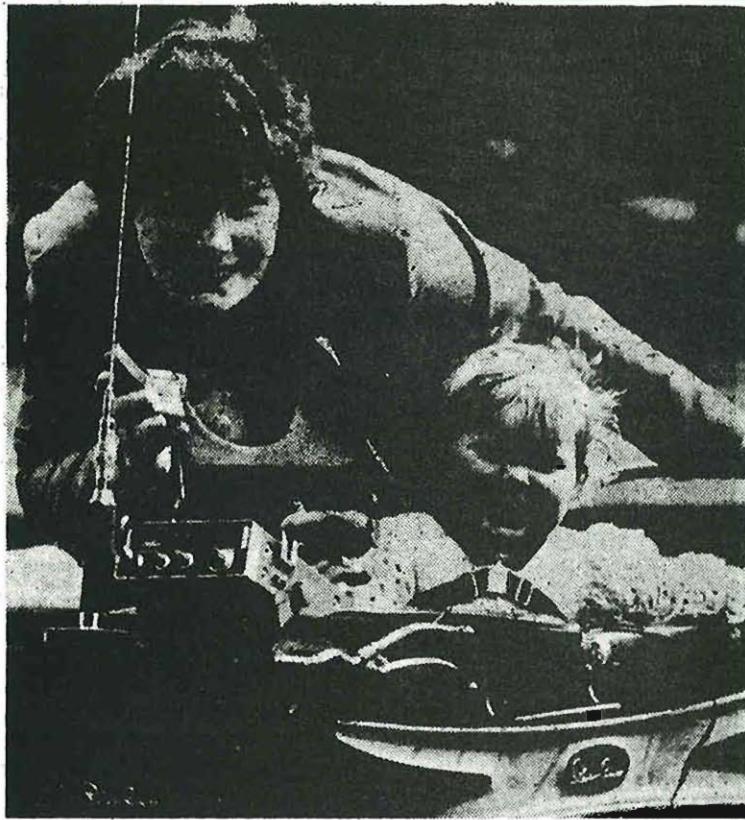
A young CB radio enthusiast was killed after he lost control of his car whilst broadcasting. The car hit a kerb, did a double somersault and landed upside down on the roadside.

When firemen jacked up the wreckage, they found the body of Michael Bailey, 21, with his CB radio microphone still in his hand. He was rushed to Warwick Hospital but died a few hours later. The coroner said that "It is quite clear that this young man caused his own death. It may be that while he was using his CB he allowed his mind to wander and lost control of the vehicle."

Medical evidence showed that there was no alcohol in the blood and the cause of death was a fractured skull. A verdict of accidental death was recorded.

Glasgow Herald Anger as CB link is blocked

CB fans throughout Britain are now counting the cost of a "wally breaker" who blocked a sponsored radio link-up from John O'Groats to Lands End. Richard Sneddon, of Glenrothes, Fife, who organised the link-up for charity, said: "This idiot persisted in playing



LITTLE Donna Shorter is never out of touch with her dad... he's fitted a full-scale CB rig to her pram:

And the toddler's mum, 23-year-old Pauline Shorter, is happy to join in the airwave babble.

Doting Dad Barry gives Donna—call sign Little Weed—a call any time he feels lonely.

"At first we got a few strange looks, but the locals are getting used to us now," says Pauline.

The radio is in the pram's shopping basket and the aerial is fixed to the hood. At the moment,

Donna knows only one word, dadda, but that's all lorry driver Barry, from Redcar, Cleveland, wants to hear.

He reckons one-year-old Donna must be a real record "breaker" as the youngest CB fan ever!

CB tot's a record breaker!

country and western music on channel 30 when we were trying to establish the link. As a result clubs who were being sponsored for hundreds of pounds will now only get a few donations."

The money raised was to have been used to buy CB sets for disabled housebound people.

East Anglian Daily Times

Sugar Puff defiant after new move

Sugar Puff is defiant after hearing Suffolk County Council's move to oust her roadside tea service at Haughley. Sugar Puff, also known as Mrs. Irene Pert, has been running a mobile tea shop for lorry drivers since CB was legalised last November but Suffolk highways committee has now decided to ask its legal department to take the appropriate action to secure the

removal of the mobile canteen from the roadside verge. Sugar Puff could now face a High Court injunction.

County surveyor Mr. Eric Williams said that the presence of the canteen gives rise to traffic movements on the trunk road which could lead to a serious accident. Sugar Puff said that she would have to be dragged off by the scruff of her neck and that she would not give up without a fight.

Manchester Evening News

Revenge raid of CB bad buddies

Heated words over the CB air waves led to some bad buddies meeting up, armed with pickaxe handles and hammers to sort each other out. Warrington magistrates heard that the three men in their early twenties had been out drinking and had then returned to Liam Whittaker's home to use his CB radio.

An argument soon developed over the use of a particular channel which led to the three men going round to sort him out. The man appeared at his door brandishing a cross bow. The three were found guilty of carrying an offensive weapon and were remanded on bail for seven days for reports.

Daily Telegraph

Villagers fight off badger hunt

Villagers in Saughall, Cheshire have set up a 24-hour watch on a badgers' sett to save its occupants from hunters. The mother gave birth to three cubs recently and in one week alone the sett was attacked at least six times by diggers with dogs. On each occasion the community, which is equipped with CB radio, have been able to drive them off before they could reach their prey.

Mr. Bernard Brady, vice-chairman of the Wirral and Cheshire Badger Group, said that there are more than 30 villagers watching the sett 24 hours a day on a rota basis. They have seven base stations to which people can relay messages and ask for assistance.

Merseyside County Council has donated £600 to help with the scheme and Mr. Brady himself has donated £200 out of his own pocket. Fines for badger digging can be as much as £7,000.

Western Daily Press

Way-out fire calls by CB

Firemen have criticised CB radio users for panicking when reporting emergencies. In one incident, two CB'ers who inaccurately reported a car fire on the M5 caused fire engines and ambulances to go in the wrong direction to the blaze. The fire, in which no one was hurt, was on the northbound carriageway and was reported by Woodspring council workmen passing in a van equipped with radio but the call from the CB'ers told firemen the blaze was on the southbound carriageway. One of them made an error of 25 miles in reporting the fire's location.

A fire service spokesman said that they were keen to receive calls from CB'ers but unfortunately they are rushing it and not giving the correct details.

Daily Telegraph

Radios hinder lorry checks

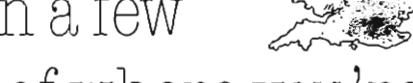
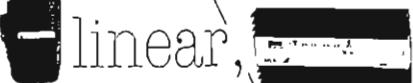
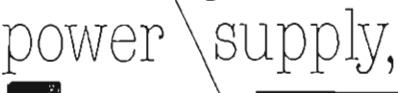
Lorry drivers are using CB radios in their cabs to bypass roadside weight inspections in West Sussex, which has stepped up its stop checks because of dangers from overloaded lorries.

The County Trading Standards Officer, Mr. Peter Green, said that drivers used to flash lights to warn each other but now they are apparently using CB radio and that they have noticed a considerable interest in the number of two-way radios in lorry cabs.

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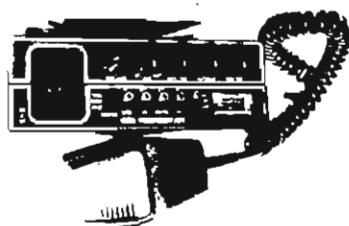
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Readers' Rig Adaptations

A selection of readers' ideas to help disabled breakers

In the April edition of CB Radio Magazine, under Readers Write, we published a letter from Peter and Mark Taylor (Tango and Music Man). They were asking for any helpful suggestions for rig adaptations to enable blind breakers to get the maximum use and enjoyment out of their rigs. The two major problems are channel identification and giving signal or meter readings.

Idea No. 1

This came from Mr. K. L. Dean, of Salisbury, Wiltshire and is one of the simplest we had. Mr. Dean, or Nikon, writes:

"Replace the channel knob with a large, unsymmetrical pointer-type switch which is set to vertical when on channel 14. This will indicate 24 when horizontal to the right, 04 when horizontal

Unfortunately, we didn't receive any answers to the second problems as the technical considerations of adding bleeps of varying strengths to indicate signal strength are very involved but we did receive some suggestions for mechanical (rather than electronic) solution to the first problem of channel indication. We have not yet had any positive notification of audio channel announcements on rigs yet

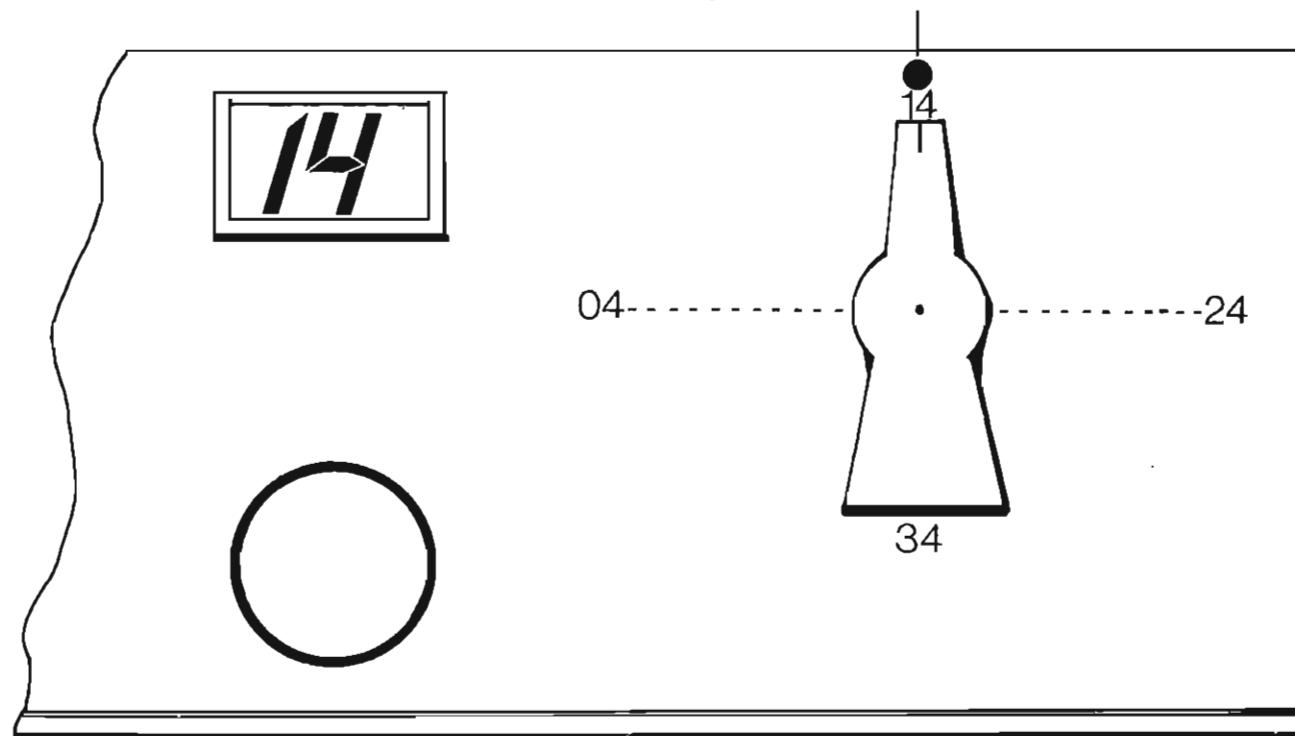
but indications are it is on its way. In the meantime, here are some of the ideas we were sent that might be of help. Once again, we are amazed at the ingenuity and resource of our readers and our thanks are passed on to them on behalf of the disabled breakers their efforts might help. If you are handy with tools and know a breaker who could appreciate these adaptations then why not offer?

to the left and 34 when inverted. Trials with both sighted and blind operators indicate within minutes of practice these four positions can be easily found by touch. Selection of intermediate channels is then a simple matter of counting clicks clockwise or anti-clockwise with a maximum of five clicks to reach any channel. Opera-

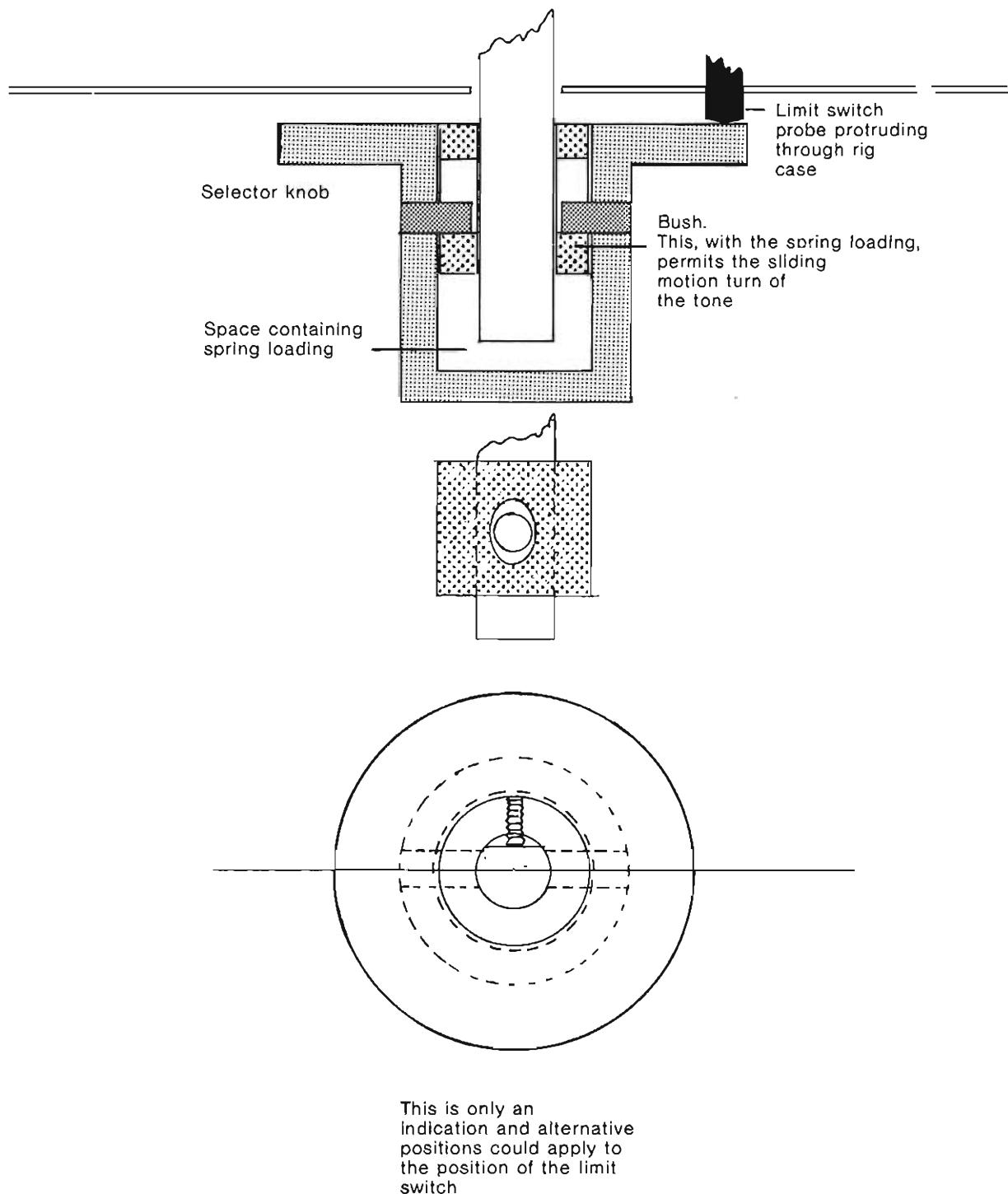
tors who have tried this system can change channels as quickly as by sight after very little practice and the total cost is about 15p."

Mr. Dean also comments that it's not a bad idea to modify rigs anyway if they are used in cars to enable channel changing without taking your eyes off the road or hands off the wheel.

Small marker (e.g., round head of screw)
glued to case if required



Idea No. 2



This next idea is more complicated than the description and drawing show but might be preferred by some as it gives an audible indication of channels and their selection.

Mr. Newton, near Peterborough, sent in this solution and has obviously given it a lot of thought. He suggests utilising a channel select switching device, normally used for providing current to activate LED numerals, to provide current to operate an oscillator to give a tone through a speaker. One tone could indicate individual channels between 1-5, 5-10, 10-15,

etc., on up to 40 with an entirely different tone to indicate the fifth division throughout the range. This should give a simple method of counting, i.e., channels 1, 2, 3 and 4 would be counted as either one, two, three or four distinct notes of the same tone. Channels 5, 10, 15, 20, etc., would have a different tone. If channel 19 were required, one would listen for the fourth low tone and then turn back one high tone or listen to three low tones and count forward four high ones.

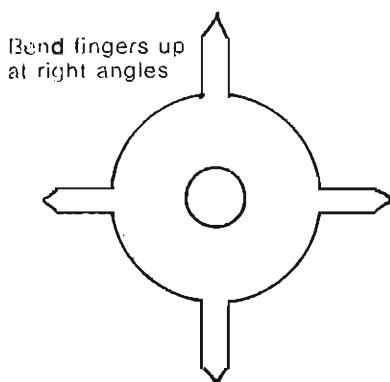
Having got the required channel, it

would be possible to have a control knob that could be pushed forward towards the rig, spring loaded to return the knob to its original position. This would prevent a continuous tone. The knob would need to be flanged to enable it to operate the probe of a limit switch, protruding through the panel.

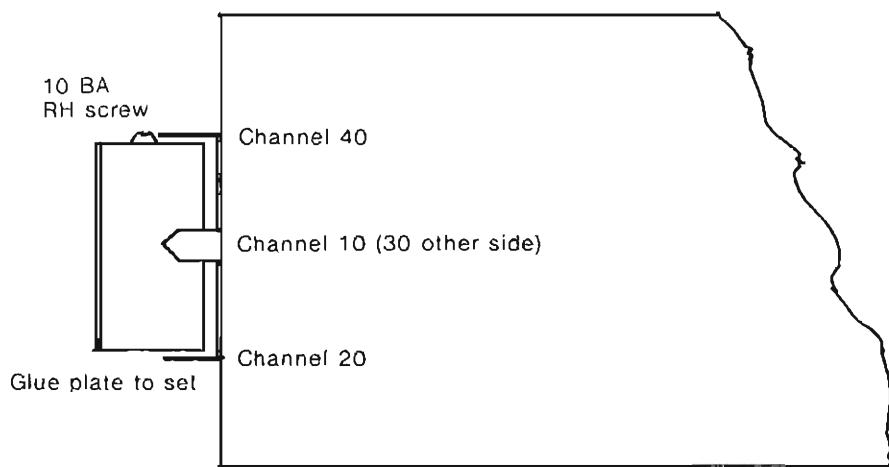
This adaptation would be easiest on rigs that have the channel control situated central to the height of the front panel as it would accommodate the diameter of the altered controls.

Idea No. 3

INDICATOR PLATE

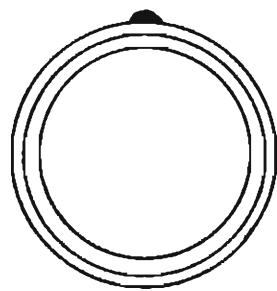


GENERAL ASSEMBLY



Diameter = diameter of knob + 1/16in.

Drill and tap for 10 BA screw



CHANNEL SELECTOR KNOB

From Sunderland, E. T. Swaine echoes the first writer in suggesting that these adaptations are just as suitable for sighted breakers. He does a lot of travelling by car and is conscious of how easy it is to lose control during a moment's inattention.

This idea is nice and easy. The selection knob is removed and drilled and tapped to receive a 10 BA brass round-head screw. The position of the screw needs to be carefully chosen so that when the knob is replaced the screw is located at the top when on channel 40.

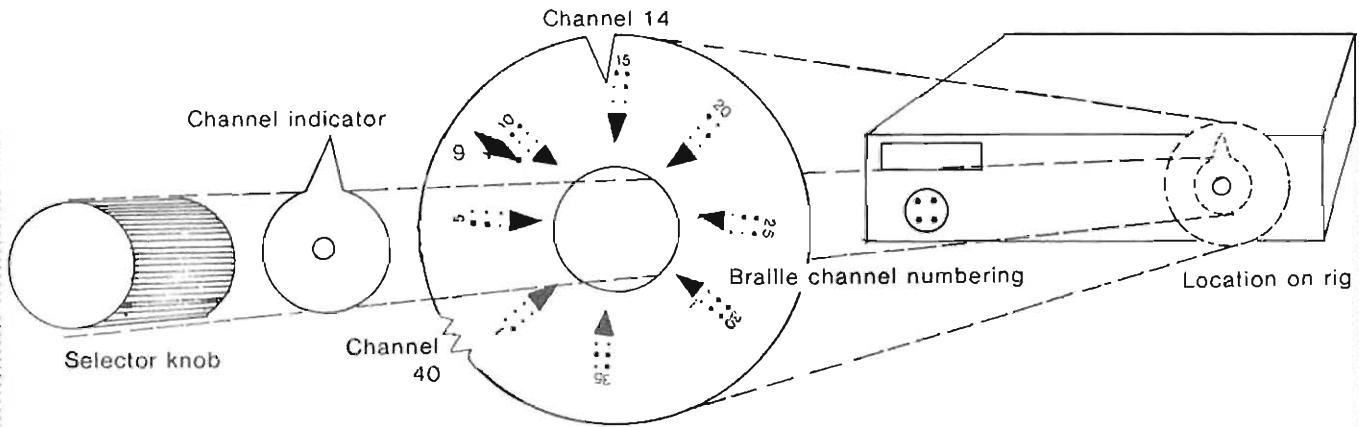
Next make a circular indicator (the writer suggests brass plate) with four 'fingers' bent at right angles. The fingers should be equally spaced at 12, 3, 6 and 9 o'clock and a clearance hole drilled in the centre of the plate to allow fitting over the selector spindle. The plate is placed over the

spindle and the knob replaced and turned to channel 40. The brass fingers are then aligned to meet with the brass screw on the knob and the plate secured to the rig body with a couple of spots of glue.

To find a channel it is now only necessary to count no more than five channels from one of the four fingers. Channel 14 is four channels from 3 o'clock (channel 10), channel 9 is one back from 3 o'clock and channel 27 is three back from 9 o'clock (channel 30).

Idea No. 4

Robin Hood, or Tango Delta 33, otherwise known as G. D. Pieri, of Tonnes, has let his diagram speak for itself. His design involves a large plate behind a pointer selector knob with braille channel markings for every five channels, with separate markings for channels 9, 14 and 40.



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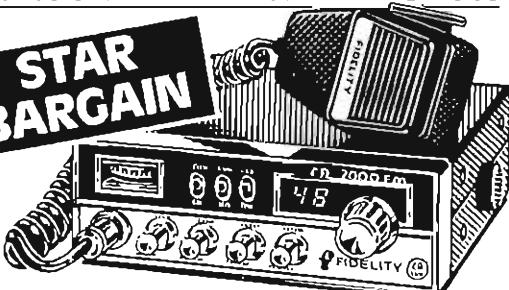
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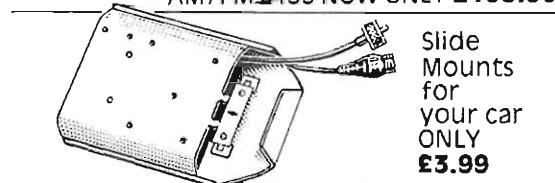


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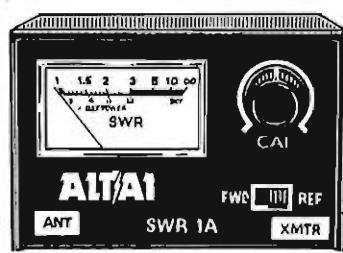
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Rig Test

The Supertuned DNT M40 FM

Although we have already tested the DNT M40, this was before Radiotechnic took on 'supertuning' to improve reception and prevent any cross modulation. Since Radiotechnic have improved the set, we thought it only fair to re-test the set in view of the alterations made. The results given are slightly briefer than in the past, since the basic set has already been reviewed once (in March 82 issue).

Microphone

The microphone supplied with the DNT M40 FM is of similar type as supplied with the other sets we have tested and is of a convenient shape and size, without any sharp corners and is comfortable to hold. The only real complaint about the microphone was that while driving round with it mounted in a vehicle, the microphone plug came loose from the set a number of times while being used.

Construction

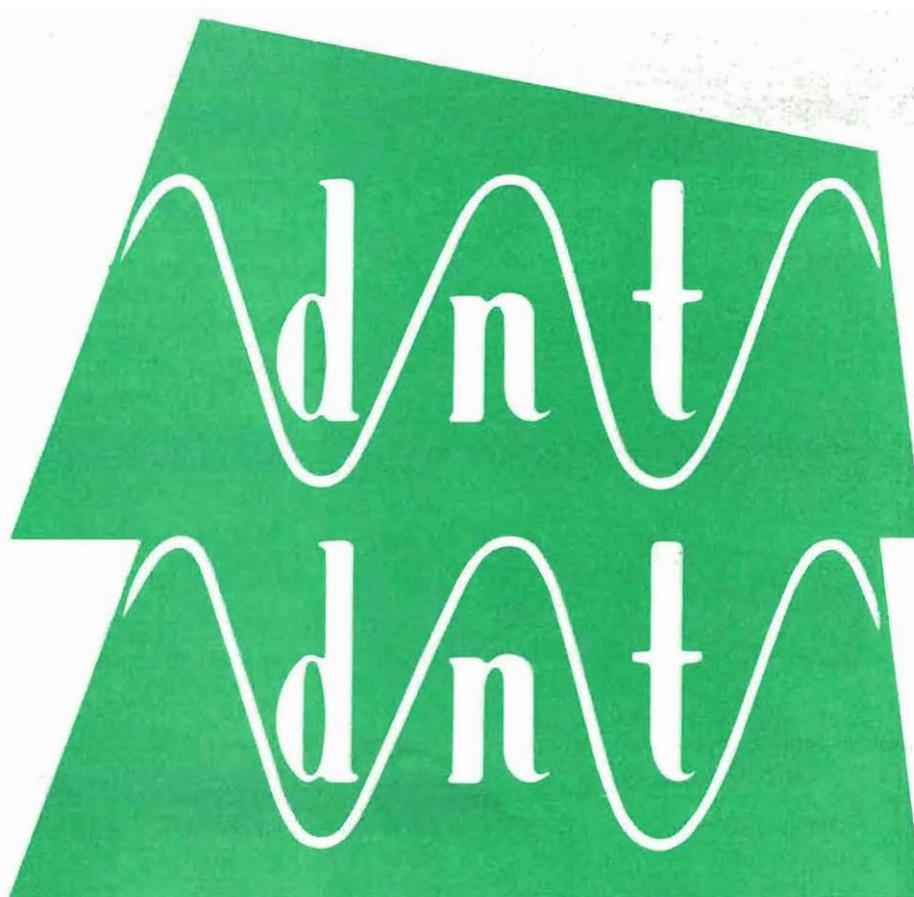
This set is not as deep as most sets, making it easier to mount in cars with little space. Its size makes it easy to mount in the glove compartment.

The case itself is of standard top and bottom construction, finished in black crackle stove enamel. The front panel is made of moulded black plastic with raised sections around the controls, with silk screen lettering in white.

The control knobs are of the flat-sided type which aid in judging the setting of controls while driving at night. The channel display is green and not the usual red. Also, on the front panel is a local DX switch for varying the receiver sensitivity and also a high-low power switch. These are mounted either side of the signal strength meter which was quite easy to read while in mobile use.

The printed circuit board is of the double-sided type but, unfortunately, does not have any component identification but the printed circuit board layout, with component identification, is supplied in the handbook. We feel that the printed circuit construction tended to bunch up the components in certain areas which could cause problems in servicing.

One unusual but very useful facility on this set is the 'Channel Free' indi-



cator which lights up if the selected channel is free of traffic.

Transmitter test

As usual, the standard equipment used for the transmitter test was:

Racal 9081 and 9082 signal generators

Marconi TF 42F distortion meter

Marconi TF 340 audio power meter

Racal 9916 frequency meter

Racal 9101 and Bird 43 power meters

Racal 9009 modulation meter

Levvel TG 150D audio generator

Solartron AS 1412 power supply.

Power output

This test is done to ensure the power output of the set remains usable over the full voltage range that a set will encounter while in mobile or home use. These tests are done at minimum, normal and maximum volt-

age in the low and high power position.

The results of this test seem to be similar to most of the sets which we have tested but while the test was being done we found that the power output would not stay constant: it drifted upwards as the transmitter was kept on, possibly due to the heatsink not being large enough.

Frequency

This test is done at two different temperatures, 48°F and 68°F to check the frequency stability with changes of temperature.

Temperature Stability

Temp.	CH1	CH40
48°F	27.60124	27.99126
68°F	27.60136	27.99137

Over the temperature ranges that the set was tested at, the set drifted 120 cycles in frequency. This is not a bad result but seemed slightly worse than the majority of sets tested.

Modulation

The modulation tests are done to check the ability of the set to give a

Power Output and Attenuation

Atten.	10.8v	13.2v	14.5v
High	2.3W	3.6W	4.0W
Low	0.090W	0.35W	0.39W

good modulation level and quality over a range of different input conditions.

Modulation		
Input Level	Input Frequency	
500Hz	1125Hz	2500Hz
0.5mV	1.43KHz	0.75KHz
1.0mV	1.2KHz	0.76KHz
2.0mV	1.4KHz	0.76KHz
50mV	1.5KHz	0.78KHz
200mV	1.5KHz	0.80KHz

We can see from the table that the set conforms to the recommended frequency response curve, which is 6dB per octave but unlike some sets it displays very good results on the modulation limiting tests which means that this set would not benefit from having a power microphone fitted to it.

Receiver test

Audio output

This test is done to check the speech quality of the receive signal. To do this test, we feed into the antenna socket a carrier modulated by a 1,000-cycle tone using a Racal 9002 RF synthesize signal generator.

Measured Distortion	
1.0 watts	2.3% distortion
2.45 watts	10% distortion
3.10 watts (max)	26% distortion

The results we got were of average values except at maximum setting

where the reading was slightly better than average.

Squelch level

The threshold of the squelch was found to be 0.11 microvolts and fully muted was 0.6 microvolts. When fitted in a mobile installation it was found to be impossible to close the squelch at all due to the high level of background noise which consisted of other weaker stations on channel and 'skip' (during the day time).

Receiver sensitivity

This test is done to check the sensitivity of the receiver.

Sensitivity	
10dB quieting	0.15uV
20dB quieting	0.52uV
30dB quieting	1.40uV

From the figures in the table, we can see it has a very sensitive receiver and rates as one of the most sensitive receivers of any of the sets we have so far tested, even the previous DNT set.

AM rejection

The AM rejection on this set was

found to be 37dB, which is about the same as the previous set tested. This result was about average of the sets we have tested so far.

Adjacent channel rejection

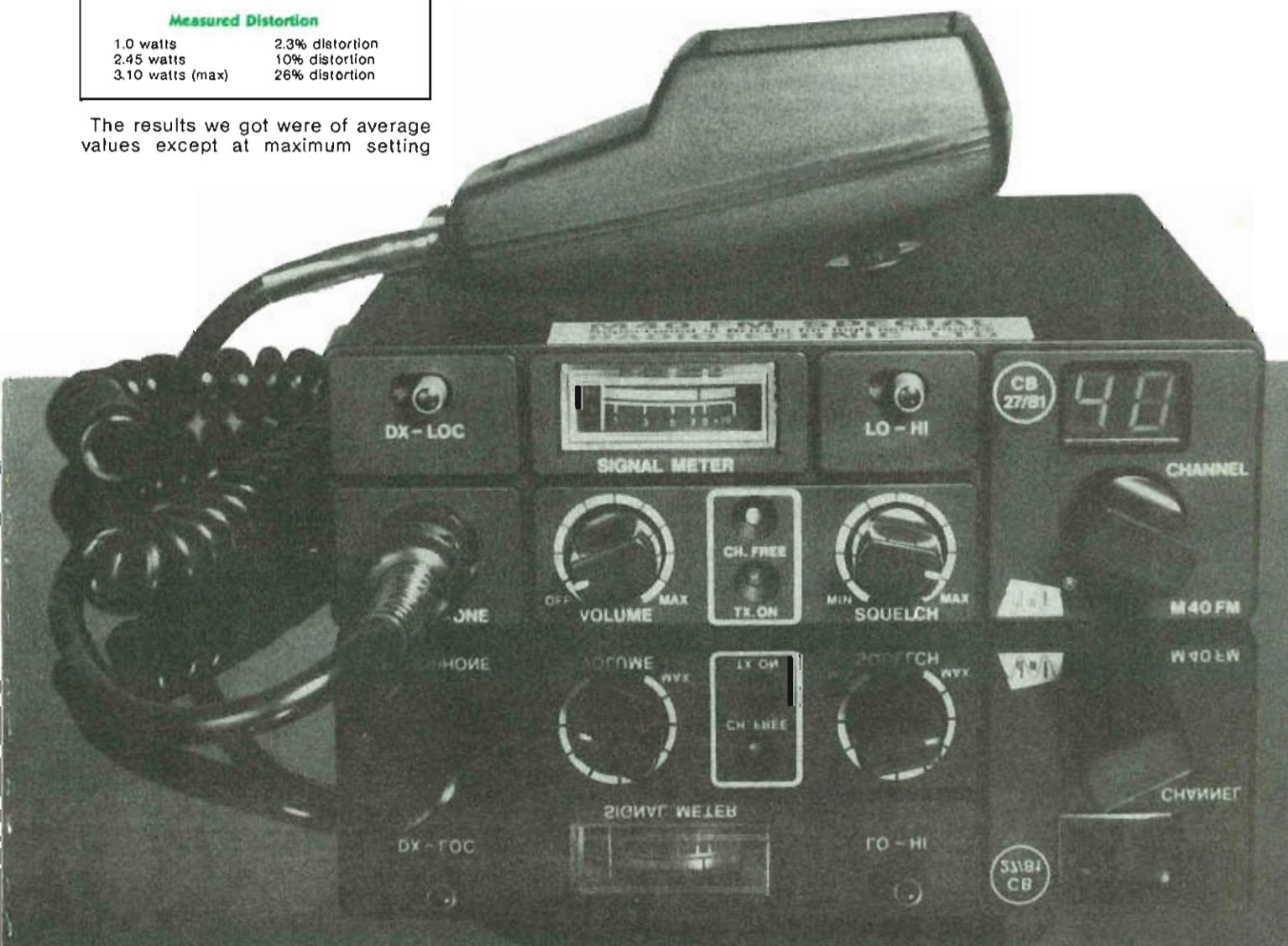
The adjacent channel rejection was found to be .95 millivolts for 3dB degradation. This result is far better than the one taken from previous sets tested, which proves that modifications done to the set have improved it.

Conclusion

The Supertuned DNT M40 FM test results were fairly good with a vastly-improved adjacent channel rejection. The only points to worry about are the temperature stability in the transmitter (possible fault in this set only) and the fact that the squelch control does not have sufficient range.



We have not repeated the manufacturer's specifications and symbols box that were originally published in February's magazine. For this information please refer back to that edition.



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THE 1982 CB SHOW

Show report

It's always a bit of a gamble staging an event the size and nature of the 1982 CB Show but thanks to you, our loyal readers and our exhibitors, this year's Show proved beyond any doubt that CB the hobby and CB the business are still alive and kicking. Contrary to popular belief (normally propagated by the national press) the CB industry is still growing and breakers are still as enthusiastic as ever.

On show

The quality and variety of CB goods and services available at the Show was very high. Many new products were available for the first time as well as extensions of existing ranges - 934MHz equipment, CB TV, new base stations, in-car entertainment, new mobile rigs and accessories, naughty but nice AM multimode sets, new aerials, rig conversion kits and loads of electronic goodies all combined to give the best display of CB-related goods ever seen under one roof.

Not only was the selection of goods high but for the first time in CB a high percentage of the exhibitors had put a lot of thought and money into preparing their stands. Whole concepts were created just to present a minimal amount of products. Manufacturers' representatives from all over the world were present to give help and advice to their UK agents.

BBC disc jockey Tony Blackburn opens the 1982 CB Show.



Eyeball, eyeball!

For the male breakers attending the Show there was certainly a lot to see apart from the more orthodox CB delights. Eyes were continually assaulted by scantily-clad females handing out price lists and sticking on stickers. Young ladies could be seen wearing swim suits, mini skirts, wet T-shirts and risqué undies. I'm sure that some visitors must have thought that they had arrived at the wrong Wembley Conference Centre. However, in the words of the inimitable Cuddly Ken, it was all done 'in the best possible taste'.

A practical demonstration of 934MHz equipment by Jeff Smith of Reftec.



Fun and games

Another first for a CB show was the inclusion of an eyeball room at Wembley. There can't have been many people who at one time or another didn't visit the eyeball room for one reason or another. Many went in to take part in the raffles or to view the wet T-shirt competitions. Others went in to ride the bucking bronco or try their luck on the Space Invader machines. Some just went in for a drink and to listen to the music provided by our deejays. Whatever reasons they went in for, all breakers who did so certainly entered into the spirit of things, especially when it came to raising money for charity.

Help A London Child

The public-spiritedness of all breakers couldn't have been better affirmed than at the 1982 CB Show. Every Easter, Capital Radio has a marathon



fund-raising event to 'Help A London Child'. As the timing of this appeal coincided very nicely with the Show, we decided to adopt Help A London Child as our charity for the weekend.

Virtually without exception, the exhibitors at Wembley donated prizes for competitions and many of them dug deep into their pockets for cash contributions. To win these prizes our visitors either had to enter daily raffles or sponsor or even enter the wet T-shirt competitions. With a lot of help and support from everyone, £2,000 was raised over the whole weekend and a cheque for this amount has already been presented to 'Help A London Child'. Thank you all!

Proving that 'Wet is best' in aid of Help A London Child.



Who was d



CB Centre played host to Phil Eckhart



Two Mega breakers with promotional literature



Apollo - seen for the first time at Wembley.



Phil Eckhart of K40 over from the U.S.A. for the show.



Radiotechnic with their distinctive green stand.

going what?



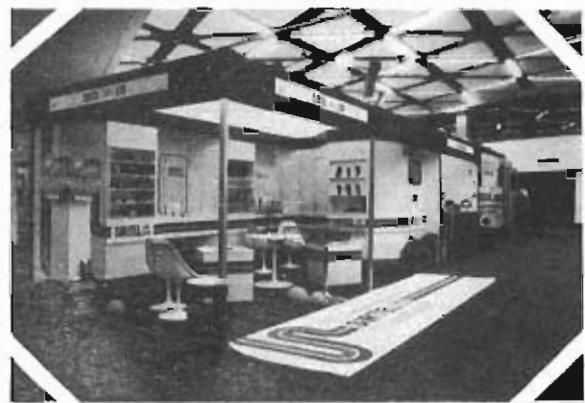
Great interest in The Marginplan stand



Crowds around the Acorn stand



The Harvard Cruiser



A preview of satellite TV at Sirtel



The Bandit antenna prominent on Telecoms display



Some guys have all the luck!

On the side

Apart from equipment manufacturers, importers and retailers, there were quite a few other exhibitors who were at Wembley to further a cause.

Representatives were present from monitoring groups, a DX QSL club, various committees and CB pressure groups, free radio campaigners and even Windsor Safari Park, who are putting on their own CB show in July. Raising money was the team from the National Foster Care Association, who are organising the National Care Convoy.



John Walton, of Radiotechnic Ltd., presenting a DNT walkie-talkie to a Wet T-shirt Competition winner.

Corey Duncan, country music star, who has released a record to promote the UK CB Care Convoy for the National Foster Care Association.

A look at the photos on the previous two pages will give you some idea of the wide range of interest that could be found at the 1982 CB Show. If you didn't attend this time, make sure you get to the next one. If you did come, thank you and we hope to see you again. Watch this space for details of the next CB Show, it could be sooner than you think!



A sponsored 'buck' by a member of our own staff in aid of Help A London Child. (I don't know who's most frightened, the rider or the machine).



The Flint Town Breakers Club presenting a bottle of Bacardi – the prize in their own fund-raising effort at the Show.

The winner of the advance ticket draw

A valuable prize will soon be on its way to Mr. S. Pratt, of Banbury, who's ticket stub was pulled out of the hat. Mr. Pratt's ticket number was 5996.

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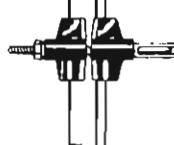
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FREE RADIO

Community radio – the next fight?

Most of the people involved in alternative or free radio do it for the fun and satisfaction of broadcasting, or listening to, a good programme. However, some hobby broadcasters are on the receiving end of the same criticism being levelled at both the BBC and Independent Local Radio (ILR) – that they provide 'musical wallpaper', a bland, unimaginative format that doesn't really say much or cater to the needs of the society around them.

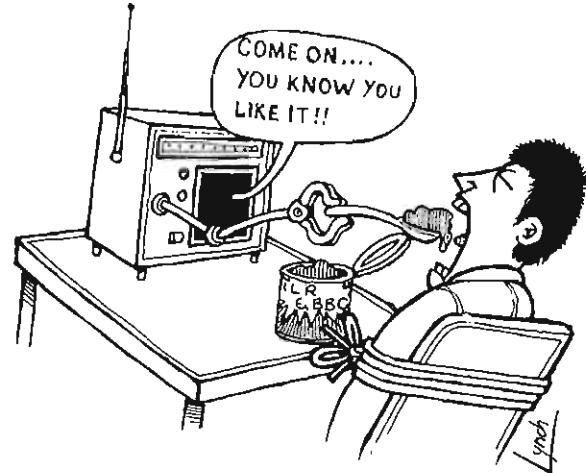
There is a growing trend of dissatisfaction amongst those already participating in broadcasting, both official and illegal and other concerned parties, that listeners are just not getting what they want from radio and that minority or community interests are all but ignored. The principle argument

most free radio stations have used to defend their position is that they are trying to break away from the accepted format and monopoly of official broadcasting – but there is a lobby that maintains many of them are just remixing the standard presentation and rebroadcasting it – with the added spice of breaking the law. They are advocating 'community radio' – a station (or stations) broadcasting to a much smaller section of the local community than the official stations cover and specifically covering what that area needs – in entertainment, minority interest and items that don't receive much coverage otherwise – drama, poetry, legal and social advice and help for the disabled.

Looked at objectively this makes good sense. Taking a city like London,

with a population of nearly eight million, there are only three local stations to cover an area of 610 square miles. BBC Radio London, ILR London Broadcasting Company and ILR Capital are all well-intentioned, professional stations but have no chance of satisfying the needs of such a large population and have to opt for a very general approach to any community needs.

The pressure for community radio has two distinct dimensions. One is for the legalising of small, low-power stations based in the community itself and run almost on a voluntary basis and the second is the amalgamation of local pressure groups and interests to bid for the franchise of ILR stations when they become available. The first



RELAY

THE OTHER MAGAZINE ABOUT THE AIRWAVES

Relay – the other magazine about the airwaves. This magazine focuses the dissatisfaction with the official broadcasting authorities (see their cartoon above!) and is campaigning for the relaxation of the broadcasting restrictions. Their history of how the airwaves were lost pulls no punches and is scathing about the BBC's position with the Government and Home Office.

STARRING...



is perhaps more within the scope of the free radio scene and some unofficial stations have always considered it part of their purpose to provide a community service.

Such a station is EST (Electronic Sound Transmission) of Birmingham, who broadcast on 94.3 FM. Reading their station publicity literature, their aims and attitudes are obvious:



EST

"EST is a free radio station which operates independently and is not responsible to the BBC or IBA... We simply believe there should be a wider choice and more opportunity to specialise... EST believes that in and around Birmingham there is potential for stations concentrating on programmes for different sections of the community... The format of the station is interspersed with comedy, local information and local bands... A local station was decided on, mainly because it could offer an alternative service to a potentially large audience in the area... The important part of EST is information and participation."

A bit disjointed (our fault!) but it is clear what EST believes in. Such stations and opinions are growing with the prevailing attitudes towards the monopoly on radio and the paranoia of the authorities regarding frequency use. Wrekin City Radio, in Telford, Shropshire, shares the same feelings:

"We do try to cater for the needs of the listeners... and special plugs will be given for local groups and charities... we will continue as long as there is a need for this kind of station."

Other stations, such as Cambridge Community Radio, have a specific community bias as its name suggests.

Of course, community radio already exists in some forms. University or college campuses and hospitals have stations, usually staffed by volunteers, operating on a loop system. These are very definitely geared to the particular needs of a group of people in rather unusual circumstances. Cable radio has also been used in towns such as Milton Keynes that have a communal television reception system as this is utilised to broadcast the radio programme. It has had limited success, one of the biggest problems being that radio is listened to all round the house and the TV is usually static in a living room - funding has also been difficult.

Radio workshops, run by community or pressure groups, are very popular and make their own programmes on items they feel particularly strongly about. These are often submitted to the BBC or ILR stations and are increasingly getting airplay as the authorised stations wake up to the knowledge that people care about what they listen to.

One of the most active campaigns is run by Relay, 'The other magazine about the airwaves'. The magazine takes a scathing look at what it calls the 'duopoly' - the BBC/Independent Broadcasting Authority (IBA) grip on the airwaves. It was launched fairly recently and hopes to give a voice for all those struggling to develop new forms of radio. The pages are open to anyone wishing to contribute and the magazine hopes to present the full range of debate. They are not over keen on the phrase 'community radio' as they think it suggests an artificially united agreement of interests and their editorial certainly doesn't agree with that! They are most active in lobbying for immediate authorisation of a pilot scheme making frequencies and broadcasting licences available to community groups and the setting up of a community radio working party.

The official resistance to these proposals has much the same background to CB. The institutions which regulate radio use - the Home Office, the IBA and the BBC - all have an interest in keeping things the way they are and the Home Office is traditionally jealous of its control of broadcasting. "The trouble is," as one cam-

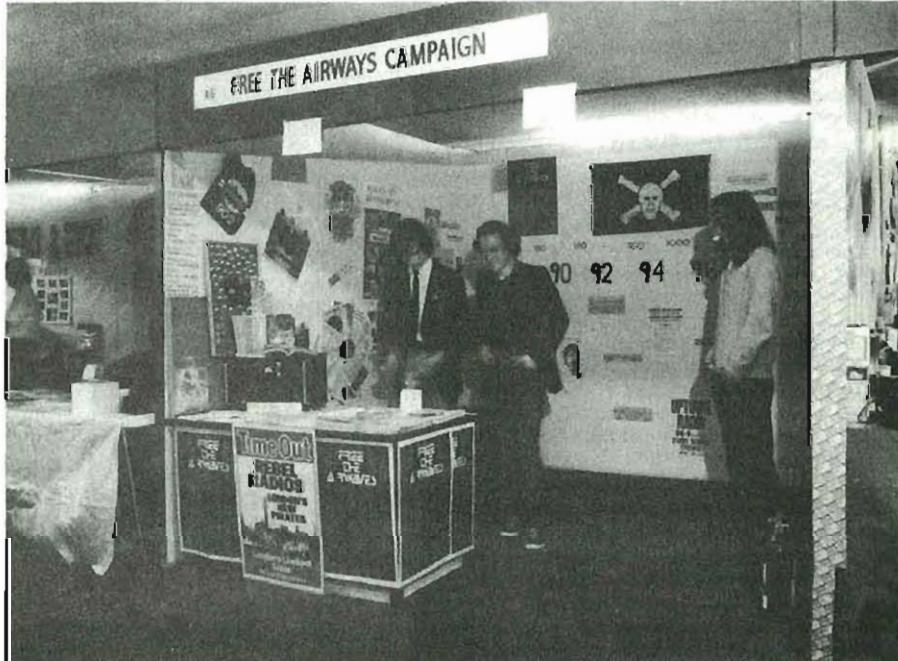
paigner I spoke to said, "it's no good asking people what they want because they don't know until they hear the alternative - and they never get to hear the alternative!"

There are groups trying to ensure that people at least get to know that there is an alternative. One of these is ComCom, the Community Communication group which was formed in the late seventies. They are particularly trying to tackle the two big problems of any small-scale broadcasting - frequencies and finance. We have all heard (too many times) the official argument about the lack of frequencies has been rather disproved by the CB campaign. Finance is another matter as equipping even a basic studio can run into tens of thousands of pounds. But considered on a wider scale it is an insignificant amount compared to other projects which are funded by either Government, charity or endowment or public subscription - and just as worthwhile.

The Community Communications Project, Calouste Gulbenkian Foundation, helped sponsor a community radio conference in Cardiff in April. The conference included programming, workshops and a consideration of the situation now and what has been learned. The conference sent a resolution to the Home Secretary asking for the rapid launch of community stations and to consider the working and financing of cable facilities for local networks.

As the free radio people say, "You thought getting CB was hard...!"

SS



The Free The Airwaves Campaign had a stand at the 1982 CB Show to promote their cause. They had a lot of interest from CB'ers and collected plenty of signatures for their petition calling for a change in the broadcasting restrictions.

High spot of the Show on the stand

was the live broadcast for Radio Zodiac featuring a session from the saxophone player from Hawkwind and an interview with yours truly! There was a comprehensive display of station photos, literature, stickers, T-shirts and posters plus some revealing pictures of Busby in his natural habitat.

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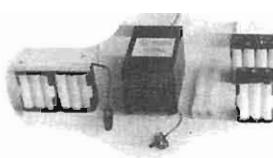


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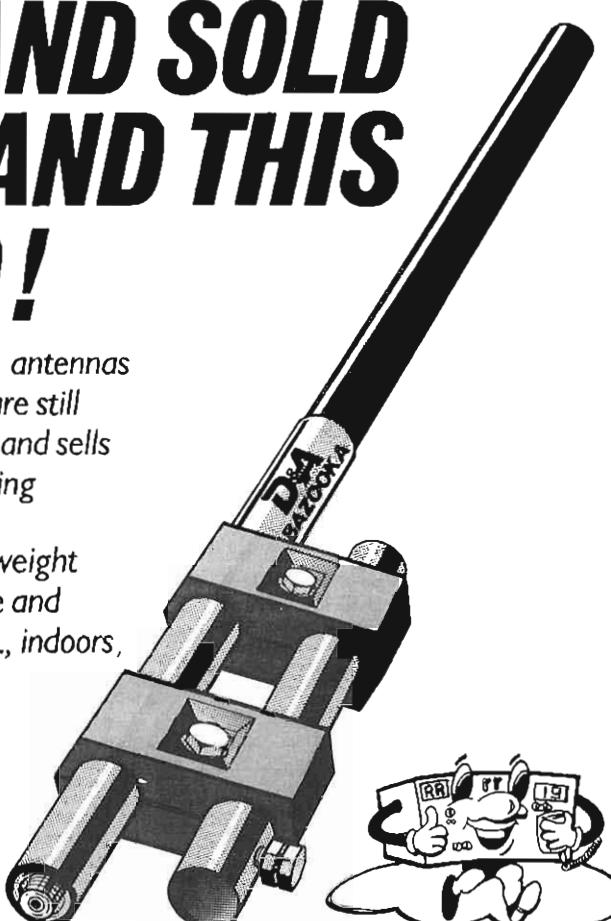
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THE LAW AND YOU

Consumer protection – you're not alone

Regrettably we are hearing more and more stories from people who feel they have been badly treated or let down over their rig by a shop or trader. Although this is bad news for CB in general, there is good news for the disgruntled customer. In the old pre-FM days, a dissatisfied buyer had very few options since he was involved in an illegal activity and was purchasing goods which had, in all likelihood, been illegally imported into the country. Many dealers were cowboys, knew they were in a seller's market and didn't see why they should conform to any trading standard requirements.

Now, at least for the FM buyer, things are different. Sets are sold by reputable companies and bear brand names of established British organisations and even the small CB traders are aware that they are in a buyer's market and have to offer a proper service. The consumer can now make his own choice and can be influenced by service, reputation, price and reliability.

So what happens if you buy a rig (or accessories) that are faulty, dangerous, unreliable or just don't do what the seller or manufacturer claims? (I make no apologies for reproducing almost exactly from the leaflet prepared by the Office of Fair



Trading as it sets out very clearly your rights and liabilities).

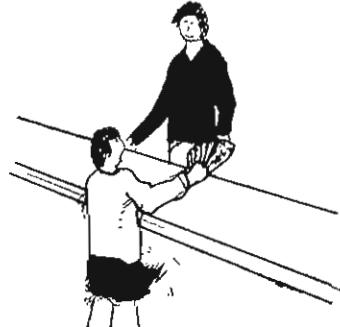
What the law says

First of all there are three very clear rules:

1. Goods must be of merchantable quality, i.e., be reasonably fit for their normal purpose. A new item must not be broken or damaged (unless in a sale and it is drawn to your attention). It must work properly but bear in mind if it is very cheap you cannot expect top quality.

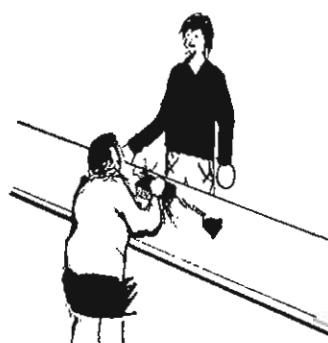
2. Goods must be as described – either on the package, a display sign or by the seller. You have an added safeguard in the 27/81 marking as sets must meet the Government requirements.

3. Goods must be fit for the particular purpose made known to the buyer, i.e., if the shop says a particular glue will mend china then it should.



Exactly what you are entitled to by law depends on how serious the complaint is and how soon you notify the seller. If any of the three rules are broken you need not accept a credit note. However, you are not entitled to anything if you:

- ★ examined the item when you bought it and should have seen the fault;
- ★ were told about the faults;
- ★ change your mind about wanting it;
- ★ got it as a present (It is up to the buyer to make the claim).



What to do if things go wrong

If there is something wrong with the goods you have bought, you should contact the seller as soon as possible. The seller, not the manufacturer, must sort out your complaint. If any of the three rules have been broken you may be able to

- a) get a complete refund or a cash payment to make up the difference between what you paid and the reduced value of the item, or
- b) have a replacement or free repair if you both agree.

What next?

If the shop is not helpful, where can you go for advice?

Trading Standards or Consumer Protection Departments

These local authority departments investigate false or misleading descriptions or prices and some aspects of the safety of goods. With dangerous goods, particularly electrical items like rigs, these should be the people to go to. In those conditions you are probably more worried about

yourself or others getting harmed rather than the immediate problem of getting your money back - the Trading Standards or Consumer Protection people have the muscle to deal with it.

Citizens' Advice Bureaux

They are found in most areas and can help with complaints. A phone call from them will often nudge a shop into rethinking its attitude.



Consumer Advice Centres

Some local authorities run these centres close to main shopping centres. Unfortunately, with Government spending cuts, they are disappearing but they will deal with problems and complaints.



Going to Court

If all else fails, you can sue for the return of your money, compensation of costs and extra compensation if you have suffered loss from a faulty buy. There is a simple, low-cost, do-it-yourself system. Further advice is obtainable from a local consumer advice centre, the County Court or a free booklet, 'Small claims in the County Court'.

Other important things to know are:

Guarantees

Often the manufacturer gives a guarantee for, perhaps, 12 months after purchase of the product. This does not take away any of your legal rights and is usually worth signing

(after reading it carefully). It gives you the choice of complaining to either the seller or maker. The maker cannot use his guarantee to limit his liability for damage or loss resulting from a defect in his product caused by his neglect.

Goods on order

If you order something not in stock, you may give a date by which you must have it. If it doesn't arrive by that date, you can refuse to accept it but even if you do not name a date it should be supplied within a reasonable time. If you do not want to wait any longer, tell the seller and give him a time limit (perhaps another 14 days). Say you would like your money back if the date cannot be met. However, if you agree to wait longer, you cannot cancel in that time.

Deposits

If you pay a deposit and later refuse the goods, the seller may be able to claim damages from you (which could cost more than the deposit). This does not apply if goods are not delivered on time. If a deposit is agreed as returnable, ensure this is on your receipt.

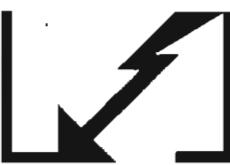
NOTE. Most of these guidelines would apply to AM rig purchases if **they have been legally imported into the country**. You are in a more awkward situation, though, as you may not feel free to more or less confess to your illegal hobby!

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CARRIAGE CHARGES: Small accessories £1.00; Mobile rigs & twigs £2.00; Home base twigs £3.00; Home base rigs £5.00; (next day Securicor £9.50). Orders over £350 carriage free.
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THE BIG FEATURES!

Silverstar home base antenna (Fully legal, a super twig).....	£17.95	SWR meters, from	£4.95
Patch leads.....	£1.00		
ACCESSORIES		EVERY ITEM SOLD BY US IS FULLY GUARANTEED	
Echo Box	£31.00	If not completely satisfied, return to us	
Echo Mike	£27.00	in original condition for exchange or refund!	
3-5 amp power pack (converted mobile to home base)	£9.95	All goods are despatched to you, FULLY INSURED, by the fastest available means.	
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25 watt amplifier (boosts your outgoing signal)	£22.95	(CASH OR CREDIT CARD ORDERS)	
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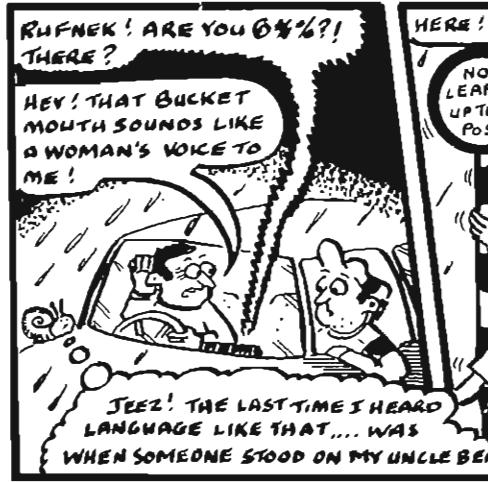
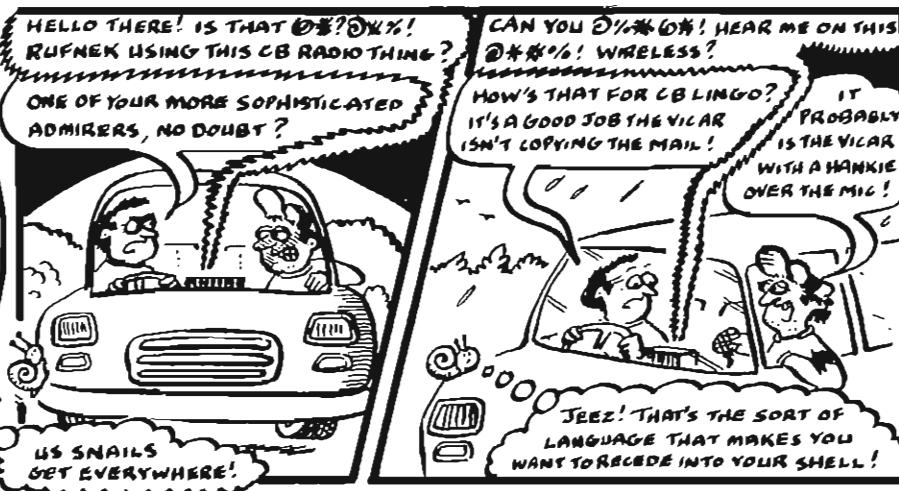
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I enclose Cheque/PO value £ Payable to Marginplan Ltd.
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Drive through seven Game Reserves - Dolphinarium and Killer Whale Show - extensive Picnic Areas - Parrot Show (subject to availability) - Children's Farmyard and Play Area - Amusements, Restaurants and Licensed Bars - and all at a special all-inclusive 'CB Safari' price of only £1.30 per head (adult or child).



**Windsor
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and SeaWorld

Planned in conjunction
with **CB RADIO**



Weekend

To make your booking please complete this form and send it with full remittance to:

**The Party Booking Office,
Windsor Safari Park,
Winkfield Road, Windsor,
Berkshire SL4 4AY**

Date of Visit

Name

Address

..... Tel. No.

No. in Party at £1.30 per head per day

* Disco Booking Form
(Tick if required)

Total amount of cheque/P.O.
enclosed (prices inclusive
of VAT)

.....
(Payable to:
Windsor Safari Park)

No refunds
will be
given for any
cancellations

C.B.C.

Trucking America

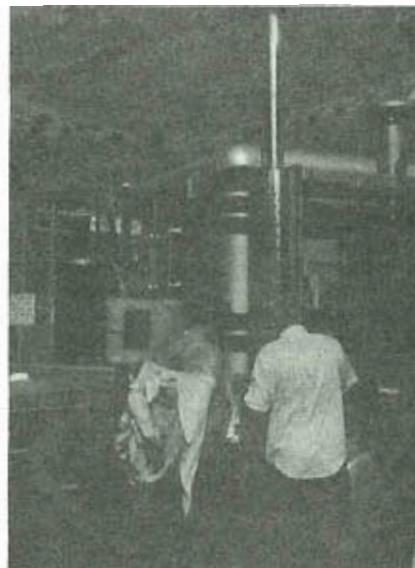
Not all plain sailing for the heavy-weights

Whilst CB for the professional driver took on a meaningful and, for them, essential role of avoiding speeding tickets, there remains one aspect of American truck driving which was briefly touched on in the now practically-immortal C. W. McCall's Convoy, the weigh station. As in Britain, the Stateside truck driver has to carry a log book ('swindle sheets') but that's not all.

With a country the size of America, the average mid haul is the equivalent of driving the whole length of Britain and to drive from New York to California is over 2,700 miles as the crow flies. One can easily see that a vehicle starting a journey in good condition could easily be in need of a service after only one round trip, let alone a month's haul. Naturally, for the businessman, time is valuable and, in some circumstances, corners need to be cut. The time taken to service a truck could often lose the company the contract and it is all too easy to 'service the truck next time'. For those of you who have followed us and our look at America these past few months, you may recall the seemingly-relaxed police view to vehicles that would have failed our British MoT test, something which they do not have in California. You may also remember our reference to cost effectiveness of police legislation and their findings that few accidents are caused in America by faulty vehicles. In total contrast to private transport, the police found that a large truck in disrepair could and indeed often did cause accidents.

Safety inspection

California's Highway Patrol, having evaluated the need to check heavy goods vehicles, operates inspection depots. The principle is simple - every single truck trailer or even car and trailer has to pull in to the weigh station and halt on the scales. Inside the depot the truck's weight is noted and checked against allowance charts, at the same time the skilled eye of the inspector runs over the vehicle looking for obvious faults. At this point the truck will be pulled in if it is over weight or if an obvious fault shows. Simultaneously the inspector is looking at the cab window to see if the CHP Safety Inspection sticker is visible.



Above.
A driver resigning himself to inspection.
Below.

The weigh station is well signposted on the highway.



Colour coded to the quarter year, the stickers are placed on a truck's window to indicate which quarter of the year it was last stopped and checked. To further indicate which month, the top corners of the sticker are removed or not depending on the month. A truck stopped in the second quarter on the first month would have a green sticker with both corners removed whereas a vehicle stopped at the end of the quarter would have no corners removed.

If a truck is due for inspection or is pulled in by the inspector, the first thing checked is the vehicle licence and state, then a critical item inspection is performed. This is mainly aimed at the essentials, brakes, steering, wheels and tyres. The failure rate of most vehicles inspected is surpris-

DEPARTMENT OF CALIFORNIA HIGHWAY PATROL
CRITICAL ITEM INSPECTION

1A. TIME START	2. LOC. CODE	3. BEAT	4. DATE						
1B. TIME END	5. INSPECTED BY								
I.D. NUMBER									
6. VEHICLE LICENSE AND STATE									
1. 4-L3C	2. 7-AV3C	3.	4.						
7. EQUIPMENT NUMBER									
1.	2. 14	3.	4.						
8. BRAKE ADJUSTMENT									
RIGHT	2 1/4	2 1/4	2 3/4	1 3/4	1 3/4				
FRONT	AXLE 1	AXLE 2	AXLE 3	AXLE 4	AXLES 5	AXLE 6			
LEFT	2 1/4	1 1/2	1 1/2	1 3/4	2 1/2				
9. COMPLIES		YES	NO	OS	COMPLIES		YES	NO	OS
AIR LOSS	UNAPPLIED	<input checked="" type="checkbox"/>			15. WHEELS	<input checked="" type="checkbox"/>			
	APPLIED	<input checked="" type="checkbox"/>			16. TIRES	<input checked="" type="checkbox"/>			
10. LOW AIR WARN. DEVICE		<input checked="" type="checkbox"/>			17. CONNECTION DEVICES	<input checked="" type="checkbox"/>			
11. BRAKE HOSES		<input checked="" type="checkbox"/>			18. DRIVER'S LOG/HOURS	<input checked="" type="checkbox"/>			
12. BRAKE DRUMS		<input checked="" type="checkbox"/>			19. REGISTRATION	<input checked="" type="checkbox"/>			
13. BRAKE SHOES		<input checked="" type="checkbox"/>			20. OTHER	<input checked="" type="checkbox"/>			
14. STEERING, COMPONENTS		<input checked="" type="checkbox"/>			21.	<input checked="" type="checkbox"/>			
22. COMMENTS									

V-I 4/5 11X2 126.5H 200.0 13.8KVA

23. HAZARDOUS MATERIAL	24. SPECIAL SURVEY
<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
25. DOCUMENT NUMBER	26. I.D. NO.
NC 7-147 X 6443	27. O.R.
CHP 407B (Rev 1-81) OPI 062	28. VEH. TYPE CODE
	29. YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
	30. 25: 31
	20742 - 456 750 2 1/2 - 1/2

The Critical Item Inspection form.

ingly high. Some 30% are cited and given 14 days to correct the fault then take the truck back to an inspection depot for verification of the repairs.

Once a truck has been pulled up, if the failure is serious then adjustments to brakes or steering play can be made immediately, otherwise the inspector can actually detain the vehicle until it is towed away or the fault fixed.

Avoidance

As is always the case, once one person uses a CB to avoid the police

when speeding (Or should we say more to even up the odds?) then there are equally as many people prepared to imagine that if CB was used to avoid the police once, it must be used to avoid them or authority regularly. Therefore, there was at one time vast talk of truckers using the rig to slip past or avoid the weight stations.

In actual fact, this is not totally unfounded. CB has obviously been used by more than one trucker who knows that he is over weight but this does not prove that avoiding weight stations is common practice. How-

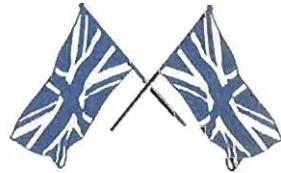
ever, most trucks wishing to slip past the station normally do so by taking the back roads and here the only use CB really has is to locate the side roads if the area is not familiar. Now this application of direction finding is really what CB is all about for the truck making deliveries or dropping off his load in unfamiliar areas and every truck driver will be quick to tell you this.

Old hands

Pictured In the cab of his employers' (Edward Bros. Inc., of Idaho Falls) 'Mack' is Jim McCullough. He is certainly not new to the trucking life. For over 15 years he's been on the road



and swears by his CB. He claims it has helped him out of a spot or two on more occasions than he cares to remember. He is a classic example of an American driver. It is his livelihood. He enjoys it and CB is, for him, the professional tool for the professional driver.



British truckers

In comparison, the UK driver has smaller distances to cover and, as yet, CB is by no means in abundant use. That is not to say it is not used at all by truckers. There are quite a few British lorry drivers who have found CB useful and now use it regularly. Whilst on the subject of which, a few months ago we came under pressure (probably quite rightly) to cover more of the British trucking scene. However, apart from the group applying the pressure, there has been little or no interest shown from any other professional drivers. So now's your chance. If you have had an interesting situation where CB could have, would have or has helped, let us know, especially those transcontinental drivers.

Readers Write

Dear Sir,

Having read some of the comments sent in by various members of the breaking fraternity, might I suggest a simple motto that all CB'ers should read before they key the mike or write letters to magazines: EYBBOYM. Not, as you might think, a meeting between two inebriated breakers but Engage Your Brain Before Opening Your Mouth, which few people seem to do before putting pen to paper. One letter of note is that from Sam (Radio England 404), who - no doubt - is one of those who will go to his grave still shouting for 27MHz AM. There is, of course, the advantage that the rest of the world uses the same system and compatibility helps if you are touring Europe or the States but what Sam - and many others like him - does not realise is that things tend to change, it's called progress. In the early days of CB, the basic component - the transistor - had only just come into mass production, not to mention the large number of problems that it suffered due to poor response (30MHz was about the maximum). Nowadays, we are lumbered with this archaic system right across the world and with little possibility of changing it in the near future, although the Government here in the UK has at least done something by giving us a technically superior system (though the frequencies chosen are far from ideal).

Finally, a few points that Sam might care to ponder:

1. AM is dead: it has been stated that the European standard will be FM for obvious reasons, interference being one of them. No frequency has been named.

2. AM tends to cause considerably more interference than FM: I take the case of a London pirate station that was raided a few months ago. The station was transmitting on FM with an ERP of about 250W, using a tape recorder and transmitter located a few yards from the aerial. This arrangement worked fairly well until they were raided by the Home Office, who use AM walkie-talkies and, as the unfortunate GPO official told his mates over the air about the site, it was picked up by the tape recorder and re-broadcast across the whole capital with 50 times the power! Even AM transmissions by the BBC are not immune: Radio 4 MW blocks out about 30% of the MW band in SW London and Radio 1 has been heard on short wave due to the sixth harmonic of their 275M broadcasts.

3. I have been breaking on AM for some time now as well as UK FM and I have yet to get an AM copy farther than six miles, although on FM - using the same aerial and power supply - I regularly go up to 20 miles and farther, depending on skip from side-banders (which also occurs on AM!).

4. In the (highly) unlikely event of 40 channels AM and SSB being legalised, could Sam tell me whether he would mind paying extra for interference filters to be installed in his TV and radio, as well as extra tax to pay for the removal (urgent) of existing hospital, paging and other services currently occupying the AM channels and could he tell me how he would continue a conversation with, say, somebody in the USA (even though CB is supposed to be a LOCALISED two-way radio system) from the centre of London where just about every channel would be in use and co-channel interference would be immense? Remember, the FCC states 4 watts as the AM power, so no burners allowed.

5. Has it ever occurred to him that some people might just LIKE the legal system? Taking the case of my home town, Lighthouse City, where you can have a game of chess/draughts/battleships/bingo/anything on channel, where CB is used for INTELLIGENT discussions such as a series on Christianity each Sunday at 9.30pm and others, where almost everybody has changed to the 'stupid, illegal FM channels' leaving AM to the wallies and wind-up merchants (not that I am implying that ALL AM'ers are wallies but they are a majority on AM in our area). OK, so there are some hitches with the FM system (e.g., the aerial and attenuator, although the latter is useful if you want to talk to the bloke across the road without blowing up his meter) but it is better than nothing.

Isn't it time people caught up with the times?

Yours sincerely,

Pirate (aka Andy from Salisbury)
London

Dear Sir,

At a recent CB exhibition, I had the misfortune to see the THAMES Monitoring Group in evidence.

Misfortune - yes, because as a member of the professional emergency services and a keen CB'er, I very strongly object to their pathetic attempts at dressing up as police officers, even down to bush shirts with epaulettes and even police numerals on the shoulders. What a quick way to bring any attempt at sensible recognition of CB into rapid disrepute.

May I say two things to any THAMES Monitor who impersonates a police officer in this way - first, if this is THAMES, I will call for a REACT Monitor when I need help, second, let me see one of them dressed up like that when I'm on duty and I'll give them a ride in a real police car!

This is all we need for the good name of CB and they can't even monitor properly yet!

Friendly Bear (not for long, though)
Name and address supplied

Dear Sir,

I write with reference to the letter sent to you by Fireman (Joe Faraday) of Hammersmith and published in the May edition of your magazine. I really do think that Mr. Faraday should get himself better informed before he starts spouting his mouth off about the THAMES paramedico teams. First and foremost, they are not staffed by over-enthusiastic amateurs and, as a matter of point, this part of the organisation was set up by Mr. Phil Costello, himself a London ambulance man. He then approached a medical team at Bromley Hospital, who had purchased CB sets for their doctors, who attended accidents when called out by the emergency services.

The aims and objectives of the THAMES paramedico teams and I quote, are 1. The preservation of life. 2. The provision of medical and rescue assistance to the emergency services in the event of a major disaster or incident. 3. Medical advice to other organisations. 4. First aid training to monitors.' I fail to see anything wrong with this so far.

As for Mr. Faraday's other comment about channel 9 station announcements, I cannot see for the life of me how other monitors already on duty can possibly know you are there unless you tell them and again I see no harm in this as long as it is kept to the minimum. Also, when it comes to professionals, I have known them to make a 'cock up' - emergency vehicles going to wrong locations because of sound-alike road names and, in one case alone a number of years ago which involved an ambulance, the patient, in fact, died on the way to hospital and this need not have happened had they gone to the correct address the first time.

Yours faithfully,

Happy Wanderer (Philip Day)

THAMES Area Co-ordinator

Alpha Charlie 15

Aldershot

Dear Sirs,

I agree with all that was said by Admiral in your April issue. We must carry on fighting for the AM. I belong to a club and am an active AM breaker and also a DX'er. I think we must fight hard for a legal AM. After all, it is the AM that other countries use. Why should this country penalise foreigners here on holiday or business for using rigs that they can use in their own country but are illegal in this country? Surely a breaker can find out more about the country he visits from the inhabitants than he can from a brochure? I have spoken to truckers who have had their rigs taken from them before when visiting this country and they have said 'Surely, since we belong to the EEC we should have the same types of rigs as them?' Even

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Readers Write

some of the FM breakers in my area agree that AM should also be legal because without our fighting there would be no CB at all in this country.

Yours sincerely,

Skipper (Bob Smith)
Merseyside

Dear Sir,

I am writing in reply to letters from Mechanic and Mac Skeet in CB Radio Magazine Vol. No. 2 Issue No. 20 February 82 in which they say that FM 27MHz CB is a joke and that 'anybody purchasing a licence . . . is just giving in to the Government'. I have operated an FM rig since Legalisation Day as a trial to compare with AM CB and I found that neither was any better or worse than the other. I have now gone straight FM and I am getting a little bit annoyed with AM breakers constantly running FM down when they obviously have not even bothered to test out an FM set-up. Mechanic came up with the line 'Is one mile enough on the FM band?' and I would be interested to know where he gets his information from as I can cover a range of between 40-50 miles around my home 20 in Canning Town and regularly modulate over that sort of distance. I will sign off with the last message to Mechanic and Mac Skeet and any other AM breaker thinking of running FM down that before opening their mouths they give FM CB a month's trial on a decent set-up and then raise their objections.

10-10, QRT.

Smokey Bubbles (Brian Whyte)
Canning Town

Dear Sir,

I have read with some interest the reply by The Rat to my letter which appeared in the February issue and I would be grateful if you would grant me the space to reply to The Rat's letter and clarify my position.

Firstly, The Rat makes the point that the bucket mouths are not worthy of being called breakers. I do concur but The Rat is certainly guilty of nit-picking, since they are, by definition, breakers in the same way that bad drivers are, nonetheless, motorists. A fair analogy, I think.

Secondly, it is clear that The Rat has not read the last paragraph of my letter in context. If I shopped all my fellow breakers on the FCC channels, I'd have no one to communicate with. This is hardly productive from the CB point of view. The only kind of interference which I am interested in reporting are incidents of bucket mouthing and deliberate jamming, from which we have all suffered and which we deplore. If I find such a person operating in my area then I will report him. I am not interested in his motives, CB politics or his mode of transmission, though it must be obvious that one would be unwise to complain to Buzby that a bucket mouth is ruining one's enjoyment of illegal CB equipment. Or perhaps I have overestimated the intelligence level of some of the CB readership. Clearly,

one can only legitimately complain of such interference of this kind to legal CB services, hence my statement in my previous letter.

I am glad to report that the frequency(!) of jamming of the UK FM channel 14 in my area (SE London) has dropped considerably, though for The Rat's benefit I would make the obvious point that the perpetrators were not jamming me in the personal sense but were jamming the system. I was merely unlucky enough to come into contact with it.

Thirdly, I don't object to any breaker using AM or SSB modes of transmission but it is surely a matter of good operating procedure not to interfere with legal radio services, including legal FM CB. I know that the majority of UK sidebanders avoid frequencies which clash with legal FM channels so as not to spoil their own DX'ing but many straight AM users don't show the same respect. As I have a multi-mode, I can ask illegal users to move off the channel if my FM copy is being blotted out. However, most people don't have that facility. If anyone thinks that this is a rather petty attitude to take, bear in mind that the legal FM users have only 40 channels to operate on and all of these are very busy. Many AM operators have at least 80 channels and some up to 200 and a KC shift to boot! Need I say more on that point?

In the final analysis, the main benefit for an operator of an illegal CB in this country is that he gets greater range because there are fewer users. If all the illegal frequencies from 26.065-27.995 (Lo-Lo to Hi-Hi) were as crowded as are the legal FM channels in our major cities then there would be no benefit obtained by operating such a system, as the range would fall off considerably.

I hope that I've cleared up the matter sufficiently or maybe I've introduced more controversy. Anyway, keep it clean and be careful out there.

Yours faithfully,

Papa Bravo (Pete Braybrooke)
Keston, Kent

Dear Sir,

My profession takes me to many different towns and areas in the UK. Since fitting CB in my car, I have not had to buy and/or use a local street map, as upon entering an area I put a '14 for directions' and very quickly, if not immediately, back comes a breaker to assist - that is, until I reached Leicester!

I must have been calling for directions for a good 10-15 minutes (without hogging the channel) but none of the many breakers calling for a copy cared to assist. My rig was working, as one breaker told me to go away in two short words. When I asked him to assist, he used three short words to repeat his message!

When, at last, I did get a breaker to assist, some bright spark found it amusing to key his mike over the critical points of the directions.

It was not the easiest of channels to break on. Two breakers were having a ratchet and despite requests from all sides did not move up or down and two CB shop proprietors were having a real barney over competition, etc., which ended when one announced that he was 'pulling the plug and coming over to smash his competitor's face in'!

I had three calls in Leicester and I am gratified to report that after a considerable time I did find three helpful breakers who assisted.

My next call was in Northampton, about 30 miles down the superslab. What a difference! Breakers were fighting over who should assist me. When I asked them to leave it to the first breaker who copied me, they all left the channel, apologising for confusing me, etc.

So, Leicester breakers, do I really have to buy a street map of your city in time for my next visit?

Red Gunner (D. M. Noble)
Skipton, N. Yorks.

Dear Ed,

I've had my rig on my pushbike for over 18 months now and thought it might interest you and your readers.

My present rig, a Uniden Uniace 1000, is slide mounted on the handlebars using U-shaped clamps (I tried bolts fitted through holes in the handlebars but the constant bouncing tended to snap the bolts).

I fixed a thin sheet of steel to the top of my pannier carriers (Ground plane?) and a DV27-type antenna mount with a Rubber Duck.

Power comes from a 12-volt motorbike battery carried in my pannier and encased in a cut-down polythene one-gallon container. Using the rig a couple of hours a day, the battery will go about a fortnight before it needs recharging.

I have received stations from up to 10 miles away and copied up to five miles.

Pedal Pusher and Big Mama
Kilmarnock

Dear Sir,

As an FM breaker who has only been on channel since legalisation, I realise that if it was not for the efforts of a great many AM breakers we would not have a legal system at all. It is also very clear that the FM system is far from efficient in its present state.

Even so, I find that a lot of the AM breakers around my home 20 now also have an FM set alongside their AM rigs, if not an illegal rig which has the capability of transmitting on legal frequencies. I also detect a drift of FM breakers towards AM and SSB. When breakers get together (even radio hams, who have been known to throw a fit when CB is mentioned) and talk turns to rigs and twigs, you soon realise that radio is radio whatever frequency it's on and that's what it's all about.

Red Beard
London E17

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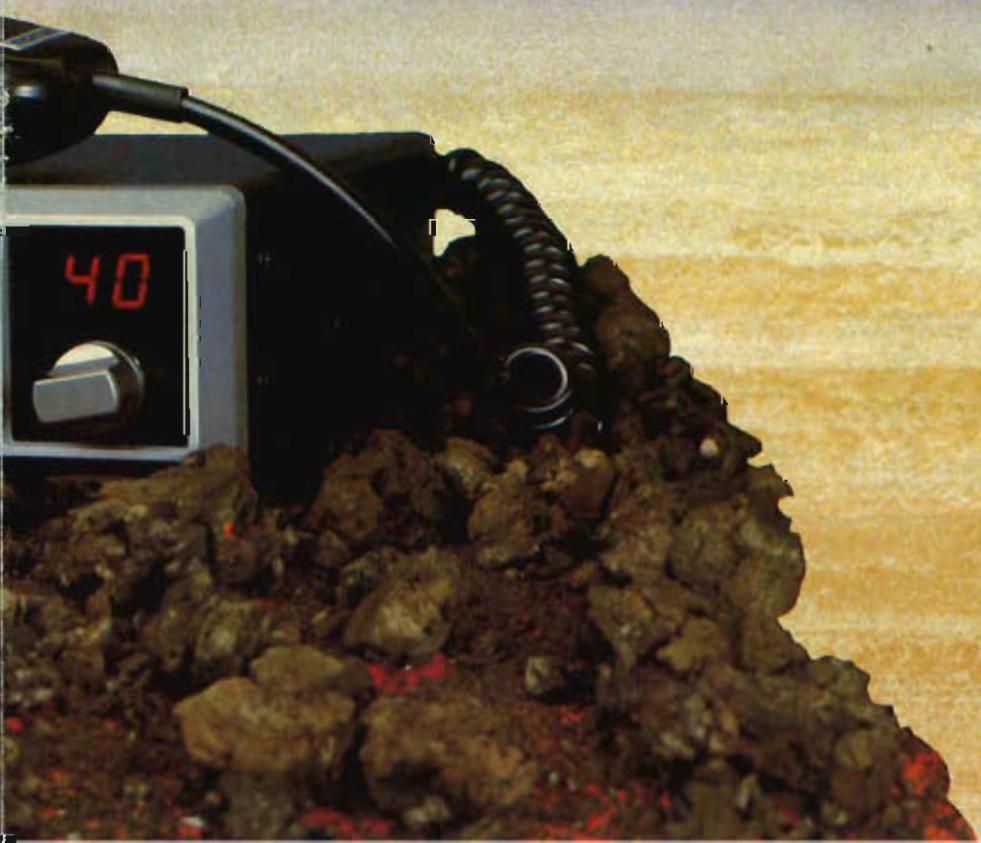
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Parliamentary Review

CB can kill!

One of the most commonly-used slogans during the lobby for the legalisation of CB in Britain was 'CB saves lives'. It is very true, of course, that the early notification of accidents can save lives if the notification is carried out precisely and responsibly. If, however, a message is relayed without the necessary attention to detail the resultant effect could be disastrous. Another incidence where CB can cause hazard to life instead of saving it is the use of a CB transceiver whilst driving. (See News Review). So many incidents have occurred that a question has been asked in the Commons about the introduction of legislation to prevent the use of microphones whilst driving.



Drivers (hand-held microphones)

Mr. John Wells asked the Secretary of State for Transport if he will introduce legislation to prevent drivers of moving vehicles from using hand-held microphones.

Mr. Eyre: I see no reason at present to introduce legislation but I shall keep a close watch on the situation. The code of practice on the use of citizens' band radio issued by my right hon. Friend the Home Secretary warns drivers against using their equipment in such a way as to impair their ability to drive safely.

How many unlicensed sets?

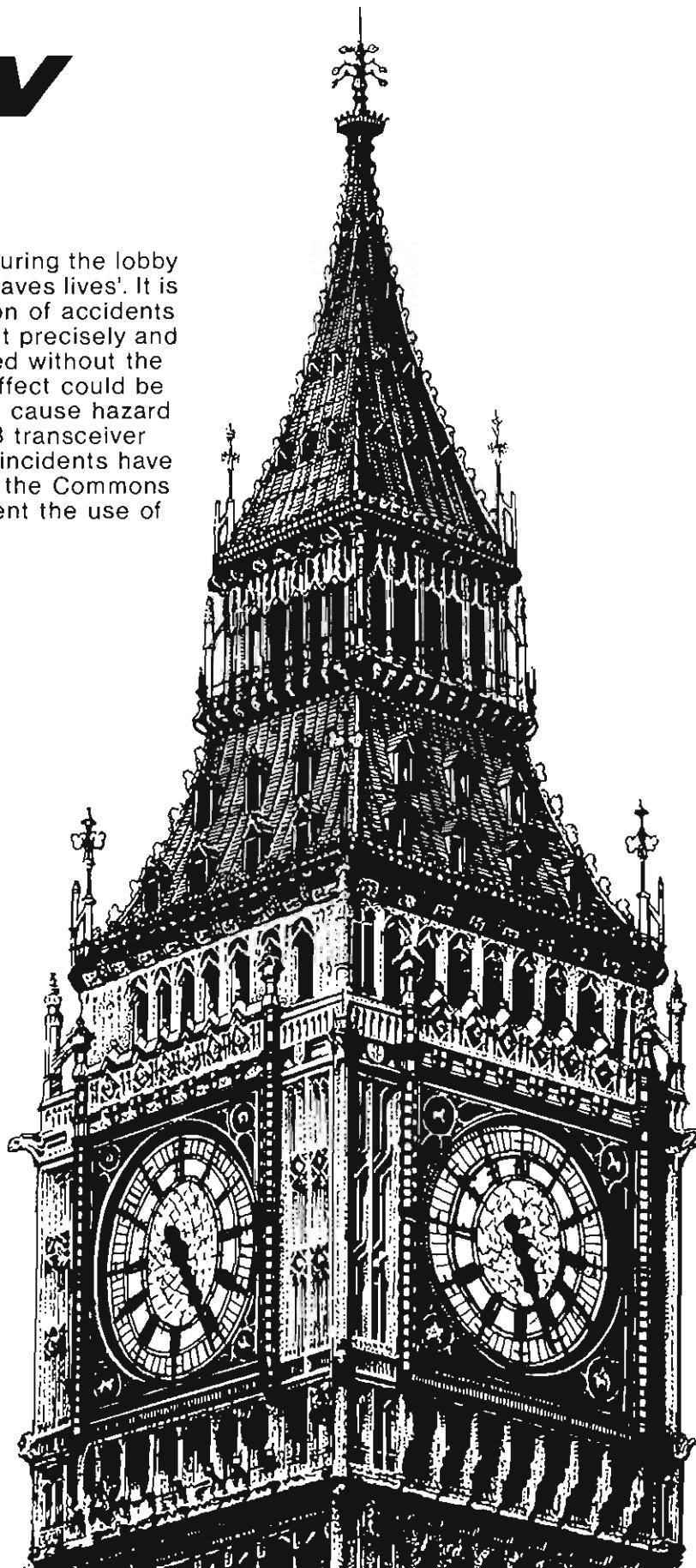
Mr. Hal Miller asked the Secretary of State for the Home Department what is his latest estimate of the number of unlicensed citizens' band sets.

Mr. Raison: We do not have sufficiently reliable information on which to base an estimate.

Licence fee?

Mr. Freud asked the Secretary of State for the Home Department if he plans to make the £10 citizens' band licence fee subject to periodic review.

Mr. Raison: Yes; in the same way as all other fees under the Wireless Telegraphy Acts.



WIN A RIDE IN A POWER BOAT

and help the Cancer Research Campaign at the same time

This has got to be one of the most exciting prizes ever to have been offered by a CB magazine and if you enter this competition you will be helping a very worthwhile cause.

Every year in August, approximately 40 power boats leave Poole to race for approximately 44 nautical miles in aid of the Cancer Research Campaign. The charity (Reg. No. 225838) raised some £5,000 from last year's race which came from competitors' fees, sponsorship of the boats and the sale of programmes on race day. This year, you can help as well and perhaps win the ride of a lifetime.

If you are wondering what all this has got to do with CB, the answer is very simple. One of England's leading wholesalers of CB equipment, Connexions, are sponsoring a Class III, 18ft.-long power boat which is owned by them and will be driven by Dave Lees. Not surprisingly, the boat itself is called 'Connexions' and it has already been entered for this year's Cancer Research Race which is on Sunday, 1 August. A competition of this nature also continues the tradition of CB strongly supporting charity.

What you have to do

As with any competition, there has to be some rules and because of the physically demanding nature of this superb prize, some extra conditions have to be applied. If you've ever seen a power boat flying across the crest of a wave, you will understand why the following provisos must be made.

1. All applicants must be over 17 years of age.
2. All applicants must be physically fit.
3. All applicants must have good eyesight to undertake simple navigational duties (training given).
4. All entries must be accompanied by a donation, however large or small, to the Cancer Research Campaign. (Cheques and PO's made payable to Cancer Research Campaign, Poole Branch).
5. All applicants must understand that they enter this competition entirely at their own risk and that no liability can be taken by either Connexions, CB Radio Magazine, Dave Lees or the Cancer Research Campaign for any injury or death resulting

from the competition, howsoever caused.

6. All entries must be received by 7 June, 1982 to qualify.

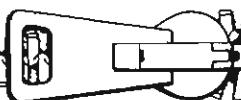
7. The winning entry will be drawn on 11 June, 1982 by a representative of the Cancer Research Campaign.

8. The winner will be notified by post and his or her name will be published in the August issue of CB Radio Magazine.

9. The winning entry will be the one that in the opinion of the judges has the correct answers to all the five questions and has come up with the most unique use for CB in no more than 25 words.

Some of these rules do sound a bit daunting but, remember, the winner will be supplied with a crash helmet and life jacket for the race and the course of the race will be very well monitored by life boats for the duration of the event. The winner will have the opportunity to get used to power boat racing on the weekend prior to the race, by arrangement with Dave Lees.





WIN A RIDE IN A POWER BOAT!

COMPETITION ENTRY FORM

If you don't want to cut up your copy of CB Radio Magazine, this form may be copied.

1. Who invented CB and when?

2. What is the maximum permitted output of a legal CB transceiver (MPT 1320)?

3. On what date was 27MHz FM CB legalised in the United Kingdom?

4. What do the initials SWR stand for?

5. What is the legal maximum length of a mobile CB antenna?

Describe in your own words (no more than 25) what you feel is the most unique use for CB.

I enclose £ _____ as my donation for The Cancer Research Campaign.

Name _____

Address _____

I have thoroughly read and understand the rules and conditions which apply to this competition.

Signed _____

Entries by post only to CB Radio Magazine Ltd., Tudor Works, Beaconsfield Road, Hayes, Middlesex.

OVER THE COUNTER

M40 supertuned

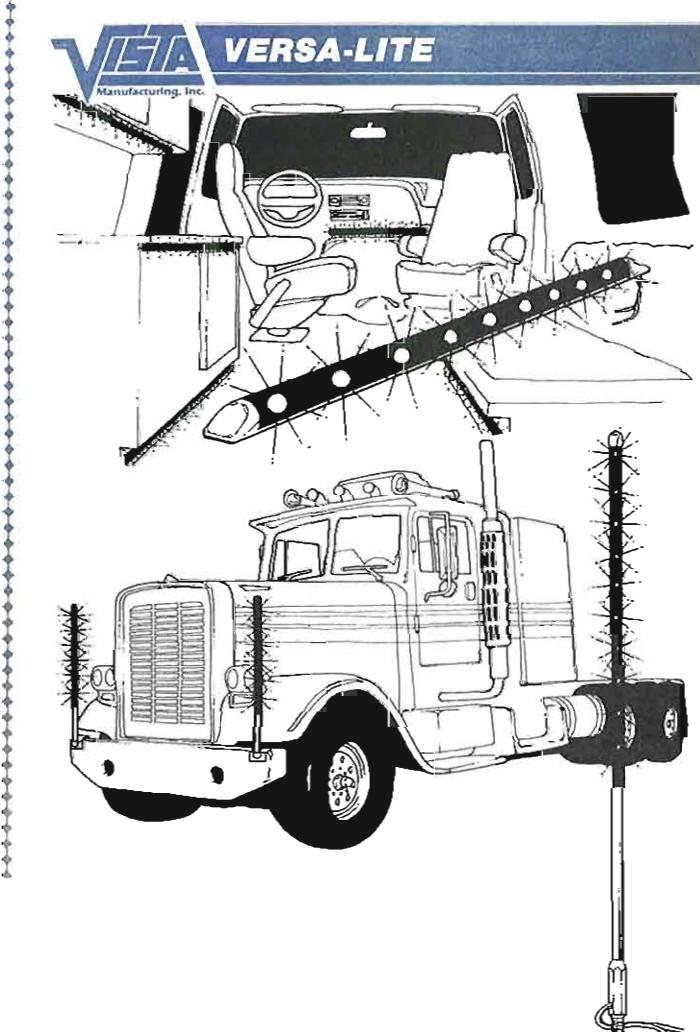
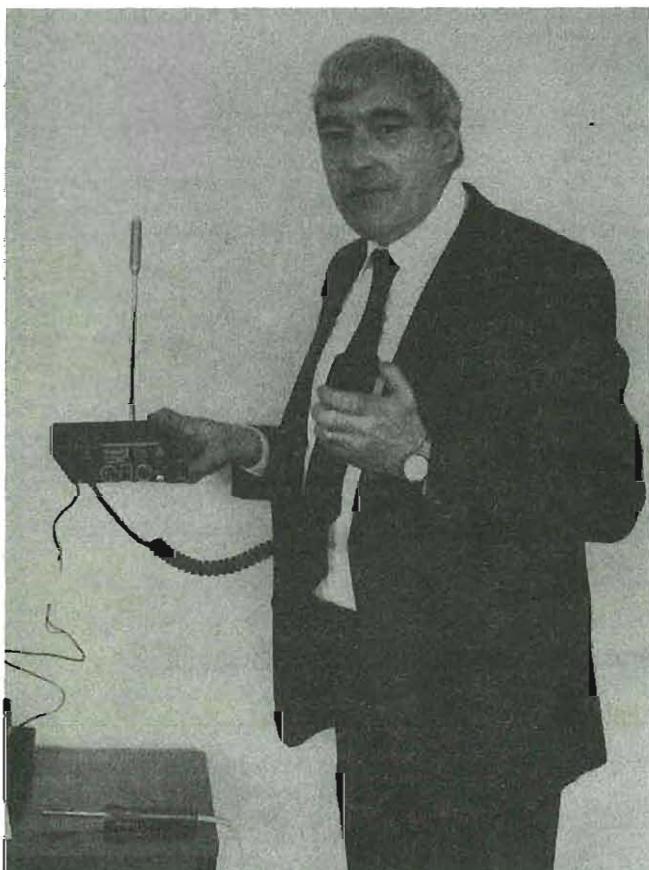
For those of you that were not able to attend the 1982 CB Show at Wembley, we bring you news of the DNT M40 special. The new super rig is a modified version of the M40 which has been modified by circuitry to cut out cross modulation and to minimise blocking. The modification is expected to set new standards for CB communications. The supertuning will be carried out by Cleartone Electronics, an associate company of Cleartone Telecommunications, who will check and test every rig minutely before attaching a Radiotechnic 12-month seal of guarantee. Exhaustive tests by Cleartone have confirmed a drastic improvement in reception over the standard M40.

Over the past couple of months we have been drawing your attention to some of the vast number of accessories that are available for use with your CB system and have, to a certain extent, refrained from covering all but the most interesting transceivers. Although we are not about to change this policy just yet, you will notice that there are a large number of transceivers featured this month. This is solely due to the fact that a large number of CB manufacturers are releasing new up-market models to their ranges to cater for the enthusiast who uses CB as a hobby rather than just to pass the time. We have also featured some accessories that may be of great interest to many of you.

Versa-Lite

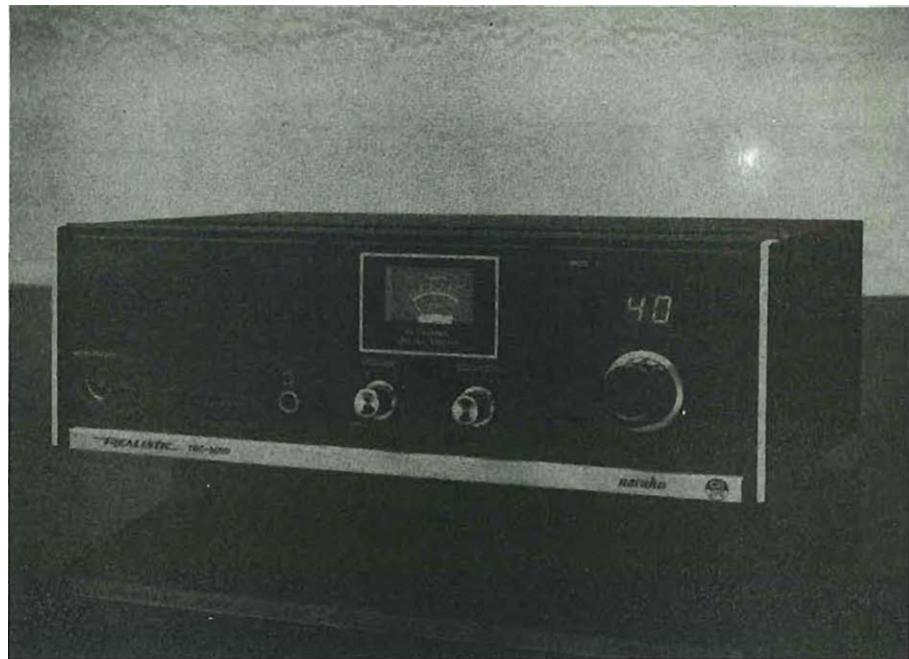
Lucky Numbers, of Hayes, Middx., are marketing a new product which is destined to be very popular with British breakers. The product is a range of illuminated coloured plastic tubes for sticking just about anywhere within reach of a 12-volt DC supply. Intended as decoration for cars and lorries, they are available in several different lengths and colours, including red, clear, blue, amber and green. Different types are also available for flat surface mounting, bumper and mirror mounting and as a helically-wound antenna, with tunable tip. A flexible version is also available for mounting around wheel arches, etc.

Keep an eye out for them at your local retailer.



Domico walkie-talkie

Domicrest Ltd. have released a new 27MHz FM walkie-talkie to their range of CB equipment and accessories. The range already includes two transceivers, a regulated power supply, two antennas and an SWR meter. The walkie-talkie has two channels, equivalent to channels 30 and 14 on a 40-channel set and puts out more than 100mW at RF power. It has an integral telescopic antenna and operates on four size AA batteries. Full instructions are included, as is a list of CB slang and codes and a schematic wiring diagram.



Realistic home base

The Tandy Corporation are shortly to introduce their new Realistic TRC-3000 40-channel base station to their extensive range available at all Tandy stores and dealers in Great Britain. The TRC-3000, which has been designed in compliance with MPT 1320, is designed for many years of reliable performance. Features include:

★ Two ceramic filters for superior selectivity and freedom from adjacent channel interference.

★ LED modulation indicator shows how fully your voice is modulating the carrier wave.

★ Fully compensating variable squelch circuit.

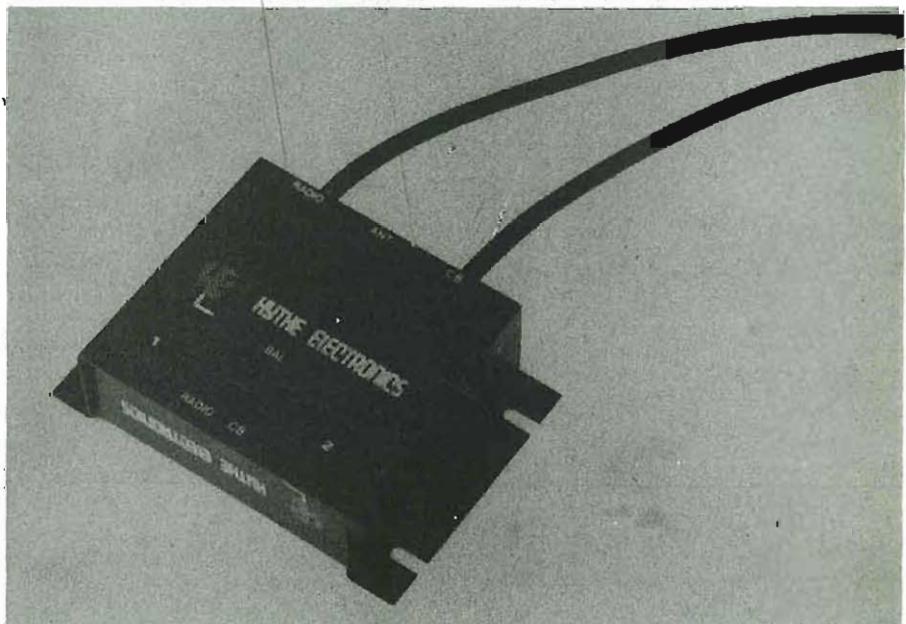
The TRC-3000 will be available at all Tandy branches.

Aerial eliminator

Hythe Electronics have released a device which eliminates the necessity to have separate antennas for CB and car radio. The advantages of such a unit are to avoid the damage of car paintwork by clamping on an antenna and to avoid drawing attention to the fact that there is expensive CB equipment in the vehicle. The eliminator has been tested on all sorts of cars and aerials and has been found to

give excellent range and reception with an SWR of 1.5:1 and even 1.2:1 being achieved. Although performance cannot match that achieved by a purpose-made antenna, it has been proved to be adequate in most situations. The retail price is £19.95 inc. VAT. Enquiries to:

Hythe Electronics
13 Marsh Parade
Hythe
Hants.
Tel: Hythe (0703) 844646





Murphy base station

A new base station has been released by Murphy Electronics Ltd. after the overwhelming success of their mobile rigs which have completely sold out and are awaiting fresh deliveries. The unit is attractively finished in matt black with teak trim and will retail for less than £100. It features separate power and SWR meters, volume, squelch, RF gain and delta tune controls and will shortly be available at your usual retailer.

CTVR40

If you are looking for **private** long-range communications, the CTVR40 is for you. At around £146.95 inc. VAT, it is substantially cheaper than PMR and far less crowded than CB. The CTVR40 modulates on 46.000-46.390MHz with 40 channels at 10Hz spacing and puts out 4 watts of RF power into a 50-ohm load using frequency modulation.

The 46MHz band is not used by any

other service in the UK and is far less susceptible to skip than the 27MHz band. We must point out, however, that 46MHz equipment is not licensable in this country and is illegal to transmit on. Nonetheless, enquiries should be directed to:

CTVR
35 Oxford Street
Grantham
Lincolnshire
Tel: (0476) 66869
Telex: 377745 STEEL

the CTVR40 - the CTVR40 - the CTVR40 - the CTVR40 - the CTVR40



Selmar CB power supply

Stellar Components Ltd., manufacturers of the well-known range of Selmar battery chargers, have announced their Selmar CB power supply. Specifically designed for the UK market, the set is carefully stabilised to ensure smooth output essential for peak performance. With a maximum loading of 3 amps at 13.8 volts, it is double insulated for optimum safety. The unit is also fitted with a noise filter and is suppressed against outside interference. The recommended retail price is £12.60 and it is available through usual retailers.

Automatic antenna switch

If you would like to improve the reception of your CB set whilst keeping it within the limits of the legal specification, an item manufactured by BG Electronics may be of great interest to you. The automatic antenna switch (Model No. 9382) facilitates the use of separate antennas for transmit and receive. This set up has been proven to make a marked improvement to performance, especially if a gain antenna is used for receiving and a legal antenna is used for transmitting.



B G

FIDELITY

Fidelity base station

Following the success of their in-car CB units, Fidelity Radio have announced the introduction of their new base station. The CB 3000 meets the full UK specification and it has the following features:

- 40-channel selector with LED indicator.
 - Channel 9 facility.
 - Integral SWR meter.
 - Headphone socket.
 - Tape recording facility.
- The CB 3000 has an unusual but nonetheless attractive design which is intended to look at home in your lounge/bedroom.

The new Fidelity is available at your usual CB retailer.



PRACTICAL ANTENNAS

Part 3 — Practical CB Antennas by F. C. Judd

CB'ers are frequently heard complaining that the antenna they have purchased does not give the results expected or is poor by comparison with some other antenna used by another operator. True, there are antennas on the market that are extremely inefficient but equally there are others that perform well and as the makers claim.

Poor results are more often than not due to the user who may have either badly sited the antenna, set the VSWR wrongly with an inaccurate meter or have used co-axial cable that is cheap and consequently may have a high loss factor. Unfortunately the Home Office specified antenna of 1.5 metres in length and base loaded only does not help for this is a poor and inefficient design anyway. Therefore, bad siting, e.g., in a loft or in a position badly screened by other buildings, poor matching, co-axial cable with a high loss factor will, of course, only make the performance of such an antenna even worse. There are also known cases where the antenna feed point impedance and/or the output impedance of a CB transceiver is not to the 50-ohm standard and this too can result in poor performance.

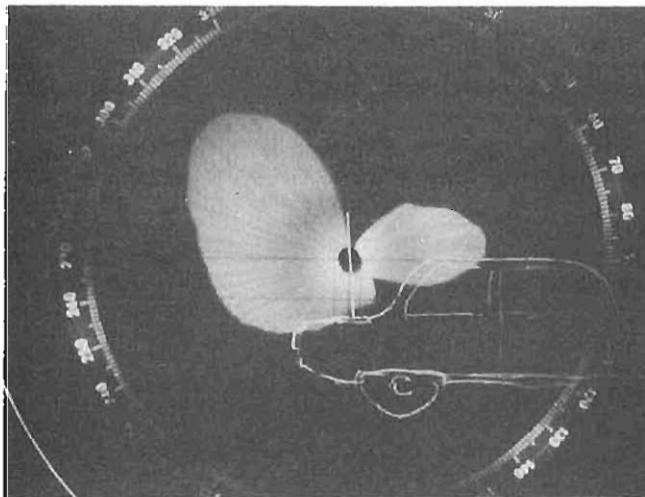


Fig. 1. Effect on vertical angle radiation when a mobile antenna is mounted on the boot lid of the car.

It is quite useless to try and verify the performance of one antenna by comparing it with another unless such comparison is carried out under controlled conditions in clear space and with expensive and accurate measuring equipment which any antenna manufacturer of merit will confirm but there are manufacturers who do not have these facilities and cannot accurately specify the performance of their antennas anyway. However, I would like to

quote from a small booklet issued by one of Britain's best manufacturers of both TV and CB radio antennas. The question they pose is "Can you compare gain figures from two manufacturers?".

They refer to antenna gain figures of course and their reply to this question, which I endorse, is as follows:

"The straight answer is NO – brand to brand comparisons of gain figures (and performance) are futile. The prime reason is that there are so many disparities in how antenna performance measurements are made and interpreted."

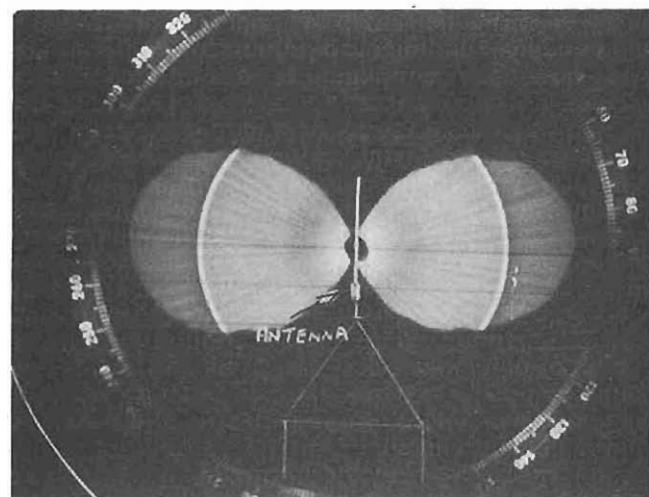


Fig. 2. Perfectly symmetrical vertical angle radiation from a vertical half-wave antenna in clear surroundings.

This comes from a booklet issued by Antiference Limited who now distribute ASP CB radio antennas and they are quite correct in what they say. This booklet is available to anyone interested. See note at end of article.

Mobile antenna performance

Most of those available are of necessity of small dimension, e.g., about 1.5 metres long and base loaded. The overall efficiency of such antennas can be very low, especially when the inductance at the base has a low 'Q' and the radiating portion of the antenna itself consists of thin hardened steel. It must be emphasised that this is the only really practical form of mobile antenna for reasons of safety but all too often is not given much opportunity to radiate efficiently because to begin with the average vehicle provides a very poor ground plane. There is little that can be done, however, except to

locate the antenna directly on the roof of the vehicle so that the largest area of ground plane is provided and which also means that the antenna is at the highest point above ground. Even so the vertical angle radiation can be high enough to cause a reduction in signal along a path parallel to ground where it is obviously most needed. Antennas mounted on wing sides, front or rear, or mounted on the boot lid suffer the greatest loss in efficiency as the radiation pattern as a whole can be considerably distorted. The photograph Fig. 1 shows the actual vertical angle radiation from a 1.5-metre base-loaded vertical mobile antenna mounted on the boot lid of an average-sized car. As can be seen, the largest amount of radiation is to the rear and at a high angle with respect to ground, whilst in the forward direction the radiation is considerably attenuated because of the bulk of metal (car body) in front of it. The result is that signals travelling out from the rear and rear sides are reasonably good but poor in the direction of travel of the vehicle. Antennas on wing sides are not quite so badly affected but the radiation pattern can nevertheless be distorted and this also results in some attenuation of radiation in one direction or another.

Base station antenna performance

Now let us look at the performance of an ideal antenna at reasonable height above ground and in otherwise clear surroundings. The photo Fig. 2 shows the actual vertical angle radiation pattern from an omni-directional vertical half-wave antenna (length of approx. 17ft. 5ins.). The antenna has 'free-space' property, i.e., no ground plane is used or needed and the radiation is at right angles to the antennas with the maximum in a direction along a path parallel to ground.

Now let's see what happens when the same antenna is used at the same height but this time with high buildings, etc., in close proximity. The radiation pattern is now very distorted and greatly attenuated at most angles around it. This is due to anti-phase reflection from the nearby high buildings. Note that the tree has little effect although a large tree in full leaf will cause considerable loss especially when the leaves and the tree are wet. The only

way of overcoming this problem is to raise the height of the antenna. All too often CB'ers in this situation try antennas of different makes and, of course, the results are no better. They then blame the manufacturer for what they consider to be a poor antenna.

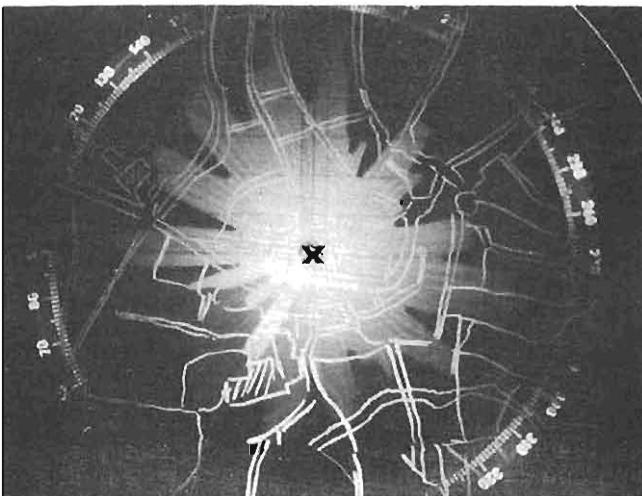


Fig. 4. How radiation from an omni-directional antenna can be affected in a built-up town area (see text). Transmitting station at 'X'.

Effect of environment

Those who live in open country have the greatest advantage so long as the antenna is as high as conveniently possible and not badly shielded by large trees in close proximity which can cause attenuation of both transmitted and received signals especially when the trees are in full leaf.

The town dweller is in the worst situation and can be completely surrounded by buildings of all heights, shapes and sizes. Examine now the photo Fig. 4. The roughly-drawn map on the cathode ray display screen represents the streets of a typical well built-up town area of about 20 square miles. The CB station is at the exact centre (marked X). Using an omni-directional antenna the radiation would normally be exactly equal in all directions around it. Note in this photo, however, how the radiation is broken up by attenuation and screening by the buildings and by reflection from buildings which can occur especially when these are constructed from steel reinforced concrete. Radiation is therefore weakened in many directions resulting in poor signal reports from other CB'ers in the shadowed area.

If the buildings had no effect whatsoever on radiation, i.e., caused no attenuation by screening and no anti-phase reflection, then the omni-directional radiation pattern from the vertical antenna would be completely circular and the radiation would be equal in all directions as shown in the photo Fig. 5. Obviously the radiation becomes weaker as distance increases but that is a natural function of radio waves over a ground path. So if you are located in a town area don't blame the antenna if you get conflicting signal reports. A station at say three miles away from you could well give you a report of S9 plus (breaking the windows) signal, whereas another at the same distance but in a different location might well report an S1 noisy signal and difficult to read. Remember that all antennas are prone to apparent differences in performance but which can be entirely due to environment.

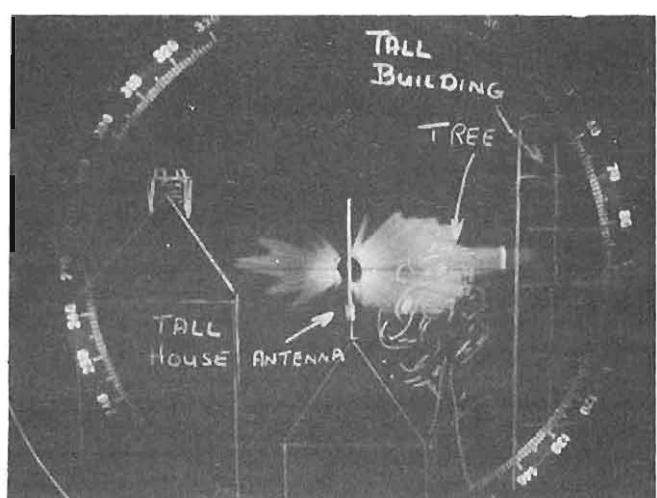


Fig. 3. How the vertical angle radiation of an antenna (as in Fig. 2) can be distorted by the close proximity of tall buildings especially when the antenna is at low height.

PRACTICAL ANTENNAS

The HO specified antenna

You may have a good location, well clear of any obstructions likely to attenuate your signals but you find that results using the specified or so-called legal antenna are not very encouraging. This is because an antenna based on this design is not very efficient. The technical reasons for this were discussed in previous parts of this series of articles, one of which is the low radiation resistance of the

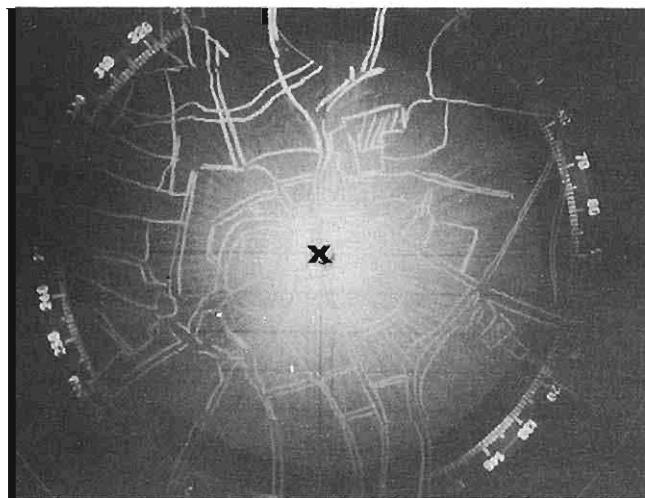


Fig. 5. Assuming no effect whatsoever from buildings as in Fig. 4, radiation from a vertical antenna would be exactly equal in all directions around it. Hence the term omni-directional.

system. The other and equally important reason is illustrated in the photo Fig. 6 which shows that radiation in the vertical plane from a specified ground-plane base station antenna is too high and therefore there is very little travelling outward along a path parallel to ground and which means poor signals to local areas. On the other hand it is the high angle radiation property that makes such an antenna quite efficient at bringing in all those Italian and other Continental high-powered SSB transmissions that arrive at the antenna from steep skyward angles, i.e., by short skip conditions and which, as everyone now knows, has the obnoxious affect of

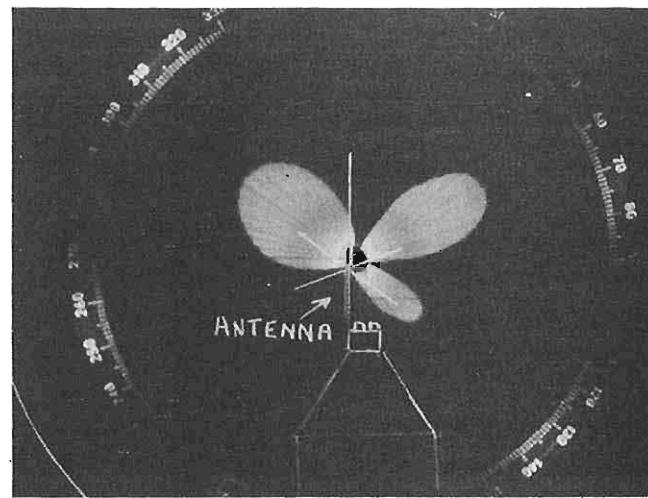


Fig. 6. Radiation pattern (vertical angle) of an omni-directional ground-plane antenna constructed to the Home Office specification with a base-loaded radiating section 1.5 metres long. Radiation is at an angle too high to be of any real use. The small lower lobe is due to radiation from the ground plane.

flattening even strong local FM transmissions on CB.

It would seem logical, therefore, that FM CB radio would be a far more viable proposition if efficient fully resonant antennas were allowed, that the height versus power ruling was eliminated and the 2 watts ERP requirement abolished. If this were so then many CB sets at present being sold would also need some improvement in performance, for example greater suppression of spurious signals, e.g., harmonics of second, third and fourth order, etc., when transmitting, as well as better selectivity and a higher degree of frequency stability.

NOTE: The radiation patterns shown in Figs. 1-6 are from real antennas. The booklet referred to earlier is called "CB Antennas in the UK. Facts you need to know." A free copy is available from Antiference (ASP Antenna Department), Antiference Limited, Aylesbury, Bucks HP19 3BJ. PLEASE SEND A STAMPED ADDRESSED ENVELOPE.

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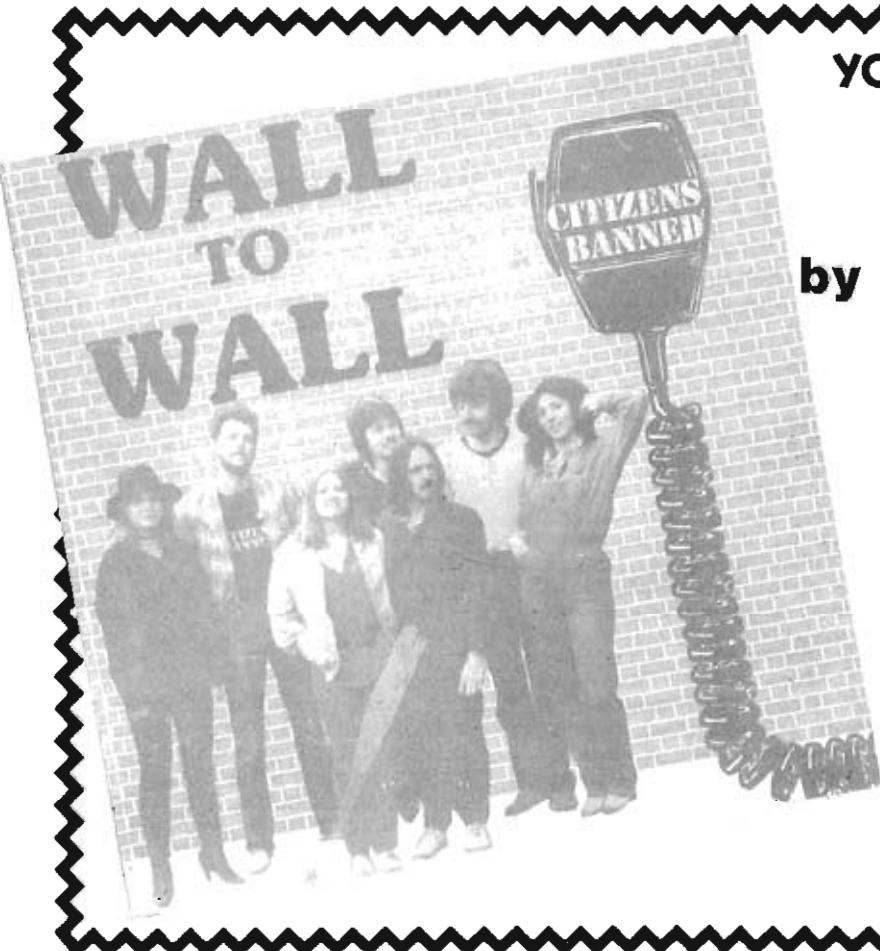
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DX QSL

INTERNATIONAL CLUB SPOT



There seems to be no end to these mysterious number sequences, does there? I received a card the other day with yet a new combination printed on. This one was 73-88-44 in that order. Happily, though, I think I can crack this one. Using the '10' code, 10-44 represents "I have a message for you". At least this combination makes sense. I'm still awaiting a full interpretation of the dreaded 51's, 55's, 105's, etc. Hope somebody comes up with it soon.

A possible word of warning for you. The Barong Bali Club of Bali, Indonesia is a club I very much wanted to join. On 26 November, 1981 I posted off my application form and an International Money Order for US\$18. By the middle of February, 1982 I still hadn't heard anything from them so, on 25 February, I wrote off to them to see what was going on. Well, I still ain't had either an acknowledgment or my club package, so if you find a Barong Bali application form in your mail and you fancy joining up, be careful. The annoying thing is, I know people who joined last year and they were very pleased with the club package which they received. Either Barong Bali has since folded up or they've got a boycott against me!

Lately there appears to be a real feeling of friendship developing amongst UK DX QSL clubs.

Recently both the Happy Cobblers and Big Ben DX QSL clubs have been abroad visiting Dutch clubs. What's more, both groups have issued very interesting cards to commemorate the event. Good cards, well worth looking out for. Not only is the hand of friendship being extended overseas but also internally. The Bravo Bravo Club (BBC) CB/DX club of Boston, Lincolnshire (more about them later) recently held a bit of a shindig. Amongst the guests were a couple of reps of Little Puppy QSL Club and our own, our very own, Chris Darlington, Happy Cobblers President. Chris certainly knows how to enjoy himself, he's like the proverbial bad penny. From what I gather, a good time was had by all.

I've received a very nice and interesting letter from Sandy MacKenzie of Washington, USA. Sandy is probably better known to most QSL'ers as

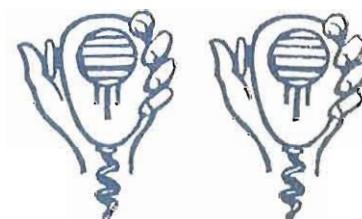


Sandy MacKenzie's (otherwise known as Flash Cadillac) QSL cards by the infamous Dirty Doodler. Can anyone help Sandy in locating one of his colour 548 cards, which unfortunately he forgot to keep for himself? He has one of the rare black and white cards - but not the colour.

Flash Cadillac; Dirty Doodler cards 548, 764 and 958. Strange as it may seem, Sandy hasn't any of DD card 548 left to swap. All that he has is one only which he naturally needs for his own collection. No. 548 is a colour card but Sooper Snooper also ran off a run of about 10 black 'n' white cards which makes them a real rarity and a definite collector's item. The 548 which Sandy has in his collection is a black and white card. Crazy, ain't it? He gave away all his coloured ones and forgot to retain one for himself. Seems he screwed up badly somewhere along the line. As it happens, Sandy was talking to Snooper a month or so ago about the possibility of doing another colour run on 548, so, with any luck, this fine DD card may soon be circulating again. Sandy also sends his best wishes to Andy 'Edbanger' Cookson, President of Papa Bravo DX/QSL club and a request to Alan Booth of Bristol. Sandy would very much like to swap your AD (A long story I'll not bother you with here). If possible, can you please send another card on to Sandy and he will reciprocate?

When you're busy stamping up your cards and envelopes, have you ever wished for a personalised rubber stamp or had a sudden brainwave for

a design but not been sure how to go about getting one done? Well, your problem is now solved. A very clever breaker from Skelmersdale, known as Colt 45 to his mates, can make you virtually any stamp you want. He can even do a stamp of your signature. Clever stuff. He has made several stamps for me and I can guarantee the quality of his work - first class. He, in



fact, made my Charlie Hotel Echo India 25 stamp and it's never let me down yet. If you want a stamp to illustrate your handle, he can do this as well. If anybody has any ideas and stamp they fancy being 'done up', jot a rough sketch down on a bit of paper, send it to me and I will forward it on to Colt 45.

After you've been swapping QSL's for a while, have you ever got to the stage where you're thinking "It might

Wolfgang & Thea
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Sandy Mackenzie
(Flash Cadillac)
PO Box 782
Aberdeen
Washington
USA 98520
(Dirty Doodler cards)

Paul
(The Painter Man)
1 Russell Court
Stoke Hill
Guildford
Surrey

Paul Kennedy
(Echo India 976)
47 Climpay Road
Forth
Lanark
Scotland
ML11 8DG



be nice and just that bit more interesting and challenging to specialize in some way". As you know, I lean towards Dirty Doodler cards in this respect but lately I've taken a great interest in the collecting of four-part cards. What these are, as the name implies, are one huge card, split into four separate QSL cards.

I only know of three four-parters at the moment but I'm sure it's only the tip of the iceberg. I have a complete set of Sundown Nos. 845/46/47/48, the complete set of Radar Nos. 19/20/21/22 (Happy World QSL Club, Holland) and the top left-hand corner of Dirty Doodler No. 951 (Good old Ian Schrader). Don't know yet who Nos. 952, 53 and 54 belong to but I will eventually. If you fancy a go at this specialised form of QSL collecting, try Wolfgang and Thea on this month's list of Genuine 100% QSL'ers. If you ask specifically for Radar Card No. 20, you'll receive a fine example of a four-part card. It might even get you hooked the same way as I am.

A rather special event took place within the Eng Int DX Club in March. Vic Wallace, of Maryport, Cumbria became Echo India Unit 1000. We're very proud of this event, even more so when you realise that this is 1,000 genuine individual members, not members plus XYL free, to boost up membership numbers. Vic also received FOC membership of Big Ben DX QSL Club, courtesy of Jim 'The Duke' Glavin, a gesture very much appreciated. A similar event will take place when Big Ben gets member 1000. Not

too far away now, I gather. Big Ben Unit 1000 will receive free membership into EIDXC.

Now for something which I hope will be of interest to everybody in general and President radio operators in particular. Did you know that there is a Sideband Club formed exclusively for President radio operators? You didn't? Right then, I'll carry on. Back in 1977, Patrick Le Roy Van Antwerp, Founder and President of The President Sidebanders, was running a President Washington base. Pat noticed, as we all have, that he was contacting lots of people all using different club unit numbers. Thinking it over, he thought it would be rather neat to have his own exclusive number, so he decided to form the PW club, this standing for President Washington. The club was initially for owners and/or operators of that particular type of radio only. Unlike the majority of club Presidents, Pat didn't want to use Unit 1 as his call sign. Instead he chose to operate via the call sign of Unit 8, the reason being that Pat has always looked upon eight as his lucky number. Everybody told him he should use Unit 1, seeing as how he was the President but Pat was having none of that. In fact, he's so hung up on 8's that he even goes by the call of "The many 8's". As time went on, Pat decided to change the name of the club to The President Sideband Club and to include operators and owners of ANY President sideband radio.

Much to Pat's amazement and delight, what initially started out as just a small local joke has turned into

an international CB club with over 2,400 members, both local and international but even after all that expansion the club is still run on the same easy-going lines. The President Sideband Club is a non-profit making club. The only cost for the club package is the postage fee of \$3.00.

In your package you will receive a nice diploma, ID card, club roster and what has to be THE DEFINITIVE Q Code list. Once you've seen this Q Code list, you will use no other.

Also available as extras are a superb embroidered patch showing the President symbol (\$3.00) and two sizes of rubber stamp, the larger costing \$3.00 and the smaller \$2.00. To qualify as a President Sidebander, you must own and/or operate a President sideband radio, so if you're interested in becoming part of "All the President's men" why not drop a line to Pat L. V. Antwerp (PS 008), 2079 F. Tucson Avenue, Andrews AFB, Maryland 20335, USA?

There is an acceptance of four family members per application so it's quite possible to get all your family into the act. By the way, don't forget to mention which President radio you run. As it happens, Pat's working conditions are the same now as when he founded the PW Club.

Just for the record, it is a President Washington base and a Turner Super Sidekick mic. Antennas are a PDL II beam antenna, also a Starduster ground plane antenna. Quite a tasty little set up. Pat runs on the upper side of 27.375, so listen up and you may hear the PS Unit 8 or the Liberty Unit 8 or, if you're very lucky, "The ol' many 8's out of the State of Maryland".

Well, that's about it for this month. My sincere apologies to anybody who has written to me and is still awaiting a reply. Just recently I've had that much mail that not only are my postman's legs worn out but so are my pens. It's phenomenal the amount I'm getting lately but just hang on. I'll get around to you all eventually. One last thing, quite a lot of you have asked my advice on Q codes and other DX'ing info. I am not an expert on this nor have I ever professed to be but, if anybody is interested, I have put together quite an interesting collection of bits and pieces comprising Q code, RST code, hints on how to make out reports and a time zone listing. If you want a set, let me know. An sae would be appreciated. These sheets are A4 size, so if you want them uncreased, try and let me have an A4-size sae.

I've no idea what may turn up in next month's article, the reason being between writing this one and doing next month's, I'll have paid my visit to CB Radio Show, so there's a chance that a lot of your thoughts and comments may appear in print!

Till next month, take care and those dreaded 51's, 55's, 73's, 88's and 105's to you all!

Ta, ta.

Charlie Hotel Echo India 25

CLUB SPOT

Forest Park Breakers Club

We are a breakers' club in China Town (Stoke-on-Trent). We have our eyeballs, every other Tuesday, at the Sneyd Arms brown bottle shop in Sneyd Green, near the city centre. Our name comes from a nearby land reclamation local to our eyeball spot. We have run highly successful disco's, treasure hunts and a pool championship. We have a steadily growing membership of breakers over 14 years old and are going ahead with plans for a Junior section to the club quite soon.

So if any breakers are visiting China Town put out on 14 for a Forest Park breaker and be assured of a warm welcome.

All the golden numbers,
Birdman (PRO)

Open Channel Breakers' Club

Our club is called the Open Channel Breakers' Club and is growing week by week and meets at The Jolly Sailor in Tamworth town every other Friday evening.

Membership is only £1.50 a year and then 30p at every eyeball (50p for non members). Although I am not a committee member, I thought we deserved a mention as we are a more serious club dealing with the problems involved with CB, etc., rather than just another place for a disco.

So any Tamworth breakers out there, we hope to see you soon.

10, 10 from
Jukebox

TURBO

I am writing to you to tell you about our club, TURBO - The United Radio Breakers' Organisation. We are a recently-formed club in High Wycombe for any breakers over 16, whether AM, FM or SSB users. Our meeting place is the function hall of the Bird In Hand public house every Monday from 8.00pm. Membership is £2.50, with a weekly fee of 25p or 35p for visitors. We have already taken part in a number of activities and have many more lined up for the future including disco's and trips. We are also doing a great deal of work for a local charity.

Peter Pan (President)

Palace Breakers' Club (Patrington)

The Palace Breakers Club was formed in the spring of 1981 to unite breakers in the Patrington area of North Humberside.

Our membership is restricted to just over 60 members and this keeps us a friendly, close-knit group.

We are a very active club and have,

had many and varied functions and activities ranging from charity football matches (in fancy dress!) to 'Buzby' and clay pigeon shoots to 'Give Us A Clue' competitions. Other events include treasure hunts, convoys, free video evenings (Thanks, Big M) and the inevitable country and western evenings and disco's.

Club meetings are held every other Tuesday evening at the Watts Arms brown bottle shop in Ottringham. Guests are always welcome, as are any challenges from any other breakers' clubs. No reasonable challenge refused.

Signing off with 73's and 88's,
Green Manalishi

Big A CB Club

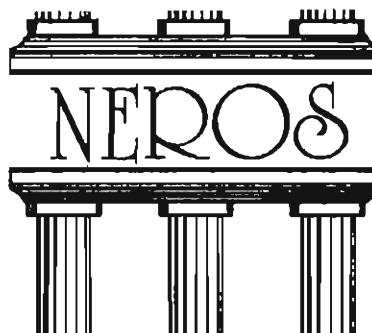
The above club was formed in April 1981 and now has over 100 members. We hold our eyeballs every fortnight at the Marine Hotel, Aberystwyth.

Like many other clubs, we raise money for charity and also disco's, treasure hunts, fox hunts, convoys and various other activities. If any breakers are down this way, give us a shout. We break on channel 14 AM.

We do our utmost to cover 10-33 calls and relay messages to the different emergency services.

Well, I've ratcheted long enough, so this is Shoestring going down. All the 73's and 88's to you all.

Shoestring (Chairman)



Neros Breakers' Club

We are pleased to note that you advertise CB clubs and have decided to let you know about the Neros Breakers Club.

We have been operating as a club on Tuesday evenings for several months and have to date 160 members. We are considering running a raffle for a rig every other week (value about £200) depending on the turn out. Next year we hope to run outings to the coast in the spring and summer. For just £1 all members receive their own club badge and membership card.

We are all for AM legalisation, SSB and hope that you can mention us in your magazine.

10-4, 77's, 55's,
Sierra Lady and Red Devil

EKBA

The East Kent Breakers' Association has been in existence for 18 months and covers the whole of East Kent. The Chairman of the nine-strong Committee is myself, Les Johnson or Jaffa.



The club meets every Thursday night at the Ship Inn, Upstreet, from 8.00pm till late. The membership fee is £1 and weekly subscription is 50p. Technical and legal advice are free to club members. We also have plenty of sports and social activities, i.e., football, cricket, darts and table tennis, to name but a few.

According to our barrister, the EKBA is involved in the first-ever High Court action against the Home Office to recover equipment seized by British Telecom. Win or lose, the case should set a precedent for use in subsequent similar cases.

Yours sincerely,
Les Johnson (Jaffa)
(Chairman)

Canyon Breakers

Just a note to inform you that the above club, Canyon Breakers, have moved premises from Hilltown Miners Welfare Club to the Sportsdrome Club, Bolsover. Meetings are now held fortnightly on each alternate Monday. The venue is first class and both the members and committee feel very much at home. Any breakers wishing to pay us a visit, shout for any Canyon member in the Chesterfield area on breaker channel 14 (FM).

Yours faithfully,
Ian Davies (C7)
(Chairman)

Bramley and District Breakers' Club

We are not a new club in our area as we've now been going for over a year and have over 200 members on our books. Meetings are held every Monday starting from 7.30pm until last orders at the Bramley Rugby Club, Town End, Bramley, Leeds.

73's and 88's, bye-bye, we're gone.
Charlie's Angel

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CLUB SPOT

WGBA

With reference to the West Glamorgan Breakers' Association, Port Talbot: we have a breakers' club, with a membership of approximately 220 breakers and would like to introduce ourselves to you.

We are strongly in favour of AM and sincerely hope that in the future it will be made legal and seen in its true light as not the problem it has been made out to be.

We have a crowd of youngsters who strictly abide by the rules of airwaves around this area. A 10-33 is quickly answered and channel 9 is treated, with reverence, as an emergency channel.

Bucket mouths are reported to the Club and each and every breaker tries to keep the airways clean. A month's ban from the Club hurts. Treasure hunts, disco, films, trips to other CB clubs are arranged with barbecues, etc.

The enthusiasm of the young breakers is great to see. Keeping them interested this way has stopped a lot of boredom creeping in, especially in this area where the unemployed are concerned and the figure so high. It is a great pity to hear so many youngsters of both sexes who want occupations and, of course, com-

plain of their lack of 'Green Shield stamps'.

If there were not these 'illegal' breakers having their CB sets we firmly believe the vandalism would be at its peak.

We are striving to see that we can occupy their minds in our small way.

Sincerely yours, on behalf of WGBA,
Green Finger (Mrs. J. Phillips)
(Secretary)

The County Town Breakers

I would like to inform you of our club, which is called The County Town Breakers. We meet every Thursday at the Britannia, in Aylesbury, at 8.00pm.

We have our meetings on a rota of four weeks, one being a disco, the other three consisting of two meetings and one eyeball.

We recently held a pram push at a local sports field to raise money for the local maternity hospital in our 20. We also have fox hunts, disco's and convoys to keep our members interested in the club activities.

Any enquiries, will you please contact 14 Wingate Walk, Aylesbury, Bucks, tel. Aylesbury 22525 and ask for Barry.

Yours faithfully,
Lamb Chop (Secretary)

Avanti Breakers' Club

We are a club for the Howe of Fife area called Avanti Breakers' Club.

We eyeball every second Monday night in the Pitlessie Arms Hotel.

We are organising treasure hunts, pool, darts, five-a-side football and 10-pin bowling for our membership.

Our postal address is Avanti Breakers' Club, c/o Post Office, Newton of Falkland, Cupar, Fife.

Breakers visiting the Howe of Fife area will be very welcome at our eyeballs and can catch us on the 12 channel.

Saxon (Secretary)

Pershore CB Radio Club

Just thought we would write to inform you breakers down there of Pershore CB Radio Club, in Pershore, Worcestershire, which has evolved from Plumtown Breakers' CB Club.

We have a committee of nine and at present time we are looking for all new FM breakers or breakers-to-be as well as anyone who is interested in CB generally.

All are welcome at the Royal Three Tuns in the centre of the town where we will be pleased to see you all.

Henry Brown (Mister Six)
(Press Officer)

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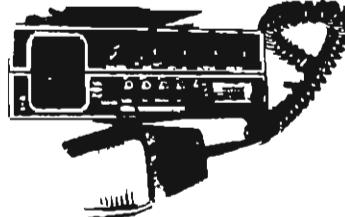
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Inside fuse 3 Amp Price £15.44 (p&p £2.00)

MOD. DL 150 DUMMY LOAD WATT METER



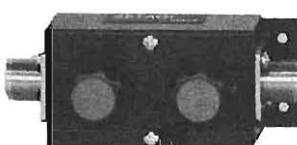
Frequency range: 3-500 MHz
Max power input: 150 Watt not more than 10%
100 Watt continual service
SWR: 1.2 — Accuracy Wattmeter: ±10%
Reading range: 3-15-150 Watt F.S.
Impedance: 50 Ohm Price £39.00 (p&p £2.00)

MOD. 500 SWR WATT METER



Frequency range: 3-200 MHz
Impedance: 50/75 Ohms Switching
Type: directional coupler
Insertion loss: 0.2 dB
Max power input: 2 KWatt PEP
Price £29.75 (p&p £2.00)

MOD. MM 27 MATCHBOX



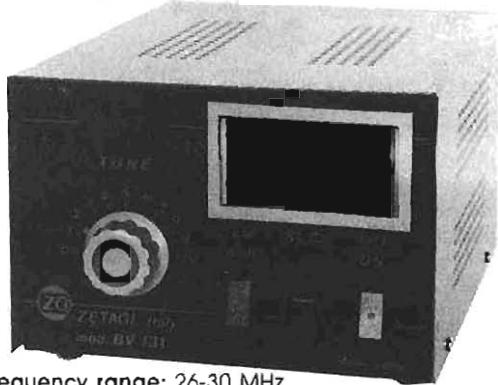
Frequency range: 26-28 MHz (CB)
Insertion loss: 0.2 dB
Max power input: 100 Watt AM
Price £7.95 (p&p £1.00)

MOD. M 27 D MATCHBOX



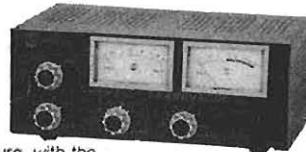
Frequency range: 26-28 MHz (CB)
Insertion loss: 0.2 dB
Max power input: 500 Watt AM
Size: 160 x 120 x 80 mm
Shipping weight: 0.8 Kg
The MATCHBOX M 27 is necessary where there are problems with SWR antenna. It acts also as a band pass filter to reduce radio and television Interference Price £11.90 (p&p £2.00)

MOD. BV 131 POWER AMPLIFIER CB BASE STATION



Frequency range: 26-30 MHz
Power supply: 220 Volts AC +10%
Input power: 0.5 ÷ 10 Watt
Output power: 100 ÷ 130 WRF 200 ÷ 250 WSSB
Power gain: 14 dB
Mode: AM FM SSB
Inside electronic switch tubes used: 6KD6
Lighted meter Price £84.53 (p&p £8.00)

MOD. TM 1000 TRANSMATCH



The model TM 1000 is for CB use, with the following characteristics: antenna match, SWR meter, power meter and switch for two antennas. They are all contained in one single box. For the technical characteristics see:
M 27-201-V2 Price £39.95 (p&p £5.00)
The two meters are lighted by external 12 Volt

MOD. BV 2001 POWER AMPLIFIER CB STATION BASE

Frequency range: 26-30 MHz
Power supply: 220 Volts AC ±10%
Input power: 1-6 Watt AM 1-15 Watt SSB
Output power: 80-200-600W AM selec 1 KW SSB
Power gain: 22 dB
Mode: AM FM SSB
Preamplifier
Modulation control
Inside electronic switch
Tubes used: N° 4 EL 519
N° 2 lighted meter
Adjustable SWR Input
Price £299.00 (p&p £8.00)

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Electricity made Easy

Electrical test meters – how they work and how to use them

Of course, it is possible to maintain and repair electronic equipment without any test gear at all but it is very difficult to trace faults by just poking around, hoping to find a broken wire or obviously-overheated part of the circuit. Not only is it difficult but this approach is, to say the least, a very untechnical one in a technical hobby!

Test instruments are not only useful in tracing breakdowns. Even assuming that a piece of equipment works in the first place, how can the user be sure that it is running at optimum efficiency? Come to that, how many rigs are there at this moment working at their peak of performance?

When it comes to actually building your own circuits (most people do, eventually) the situation gets impossible. Resistors and condensers, for instance, sometimes get wrongly coded during manufacture. They may even be downright faulty. Transistors, diodes and IC's can be damaged by careless handling and often need to be tested before use.

Broken wires, faulty plugs or sockets, blown fuses, all happen frequently and can be the most irritating and difficult faults to find without the right gear.

So, having decided that some test equipment at least is going to be

necessary, almost everyone starts off by buying a multimeter for the very good reason that it's the most useful test instrument a CB'er can own. In one case you get a voltmeter, an ammeter and even an ohmmeter, usually with several switched ranges. It isn't even necessary to buy an expensive one to make useful measurements. In fact, it is probably best to buy a cheap one at first which can be used later on for knockabout use when you don't want to risk damage to your real grade 1 instrument.

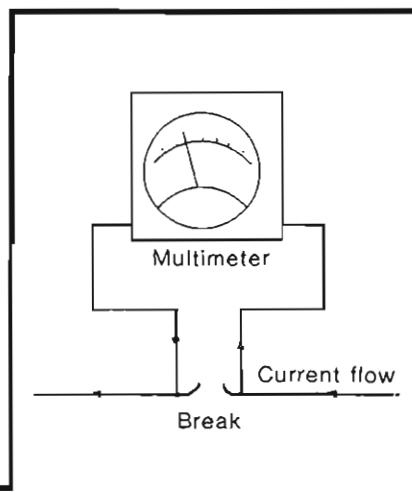


Figure 2. Measuring current with a multimeter.

Moving coil

The common type of electrical meter is known as a moving coil meter because the indicating needle which moves across the scale is driven by a rotating coil of wire. This coil of wire is turned into an electro-magnet by the electric current passing through it, so it turns to line up with a strong magnet alongside. A fine hair spring makes sure that it turns only so far, depending on how strong the current is. Figure 1 shows the mechanism of this meter movement.

On its own, this basic meter only measures current, from zero amps up to one-thousandth of an amp or less but by using wires with just the right electrical resistance to block some of the current, it is possible to measure larger current or even voltage and resistance.

Measuring current

To measure the current flowing through a circuit, the multimeter has to be connected so that all the current flows through it. (Figure 2). This means that the circuit has to be broken first. This isn't always as easy as it sounds because the part of the circuit being tested is often a printed circuit board.

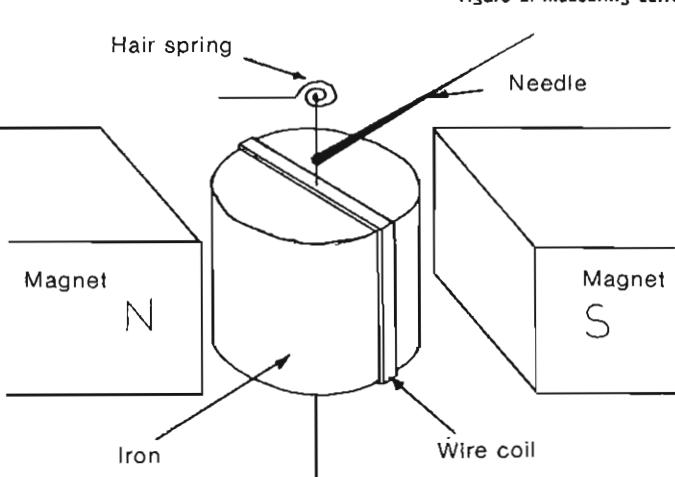


Figure 1. Moving coil meter movement.

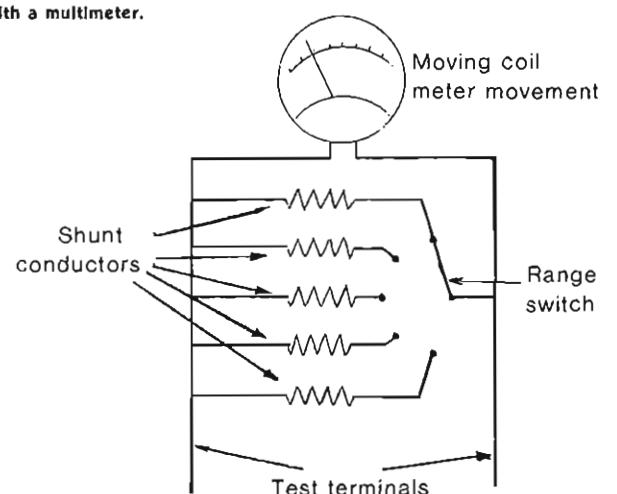


Figure 3. How a multimeter measures higher currents.

These have copper tracks on an insulating base instead of wires. In those cases where it is possible to break the circuit easily, it's best to do it with the power switched off. This avoids putting unusual strain on other parts of the equipment which might have to take higher voltages and currents with the test circuit opened up in this way. Having put the meter in circuit, the power can be turned on again.

When testing for current in a circuit, most engineers start with the meter switched to its highest amp range to avoid the danger of overloading the meter. In extreme cases it's possible to get several amps of current flowing round a circuit where there ought to be only a milliamp or so (milli = a thousandth). This is the most common method of destroying a meter.

Changing from one range to another on the multimeter switches special by-pass conductors called 'shunts' across the meter movement. This is shown in Figure 3. Each of these shunts is designed to divert a known fraction of the current past the meter so that its sensitivity is reduced. This way it can measure high currents.

Measuring voltage

Using a meter movement to measure voltage involves a crafty trick with Ohm's Law.

$$\text{Resistance} = \text{Voltage} \times \text{current}$$

or

$$\text{Voltage} = \text{Resistance} \times \text{current}$$

In plain language, this means that we can measure a voltage by letting it push a current through a known amount of resistance. Reading the current with a meter then tells us how much voltage is involved. In this way, the meter can be calibrated directly in volts even though it is really measuring current. Figure 4 shows this a little more clearly. Notice that the meter movement actually reads current up to one amp for full deflection of the needle. The total resistance in the circuit is just 10 ohms, so the needle moves right across the scale when 10 volts are put across the leads. Five volts would give $\frac{1}{2}$ amp in the circuit so the meter would read half scale. Hey, presto! A voltmeter.

Using a voltmeter is much easier than using an ammeter. The circuit does not have to be broken to take a voltage reading.

All we have to do is to connect the meter test prods across the two points we want to measure. The meter then reads the difference in electrical pressure between the points in volts. Simple, eh? There's a snag.

Dropped volts

When current is being measured in an electronic circuit involving high resistance, the extra resistance of the meter doesn't matter very much. But, when voltage is being measured, the effect of the meter can be so great that the readings obtained are almost useless. This problem is caused by the fact that the voltmeter has to draw some current out of the circuit to move the meter needle. If the circuit

only has a small current flowing any way, the diverted current causes a voltage drop. This situation often crops up with electronics where resistors of many thousands or even millions of ohms are used. Take the example given in Figure 5. This circuit is often used in electronics and is known as a potential divider because it is used to split electrical potential (voltage) into two parts. The divider shown in the figure has two identical resistors across the 10-volt power rail so the point marked 'A' between the resistors will sit at exactly 5 volts above ground.

Suppose now that I try to measure this voltage with the voltmeter of Figure 4. Remember that the voltmeter has a resistance of 10 ohms in this case. Figure 6 shows the voltmeter in position to read the voltage. Now you can see the problem, the voltmeter short circuits the bottom resistor of the potential divider with a resistance of only 10 ohms. This hopelessly unbalances the divider circuit to a ratio of 9 volts to 1 volt instead of 5 to 5.

This happens every time. A voltmeter always distorts the voltage in a circuit under test. The amount of distortion that occurs depends on two things: 1. The circuit resistance between the test points and 2. The internal resistance of the meter. The difference between a cheap meter and an expensive one is the internal resistance on the voltage ranges. A good meter has a very high resistance, given in terms of 'ohms per volt'. For the range you are using, the meter resistance is got by multiplying the scale maximum voltage by this figure. A cheap meter might have a rating of 1,000 ohms per volt, giving

10,000 ohms on the 10-volt range. When dealing with circuits containing resistors greater than 1,000 ohms, you have to do some pretty smart calculations to use one of these effectively. It isn't impossible, just frustrating. On the other hand, a good meter will be about 20,000 ohms per volt, which makes life a lot easier.

Ohm on the range

Most multimeters have a range of measuring resistance. This is another crafty use of Ohm's Law. Inside the multimeter is a battery which delivers a set voltage at the test terminals. When a resistance is put between these terminals, a current is driven through the meter by this voltage. The current depends on the resistance so the meter can be calibrated directly in ohms. The current is large for a small resistance and small for a large resistance, so the scale on the meter runs backwards from infinity to zero ohms.

Because the battery inside the meter loses strength as it gets old, there is always a knob on the meter to adjust the ohms range before use. You simply connect the test prods together and twiddle the knob until needle reads zero ohms. The meter is then ready for use.

Measuring resistance has to be done with the part to be measured separated from the rest of the circuit to avoid false readings. These can be caused by alternative pathways for current flow or other voltages and currents in the circuit. (Even when the circuit is switched off, some components can hold electricity like little batteries).

Figure 4. Measuring volts.

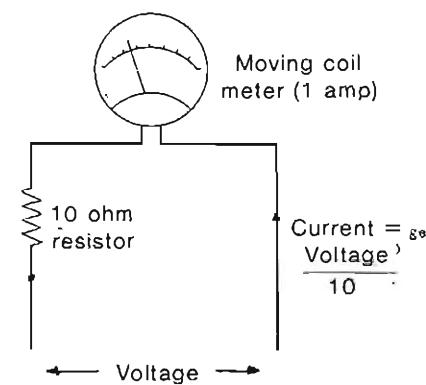


Figure 5. A potential divider.

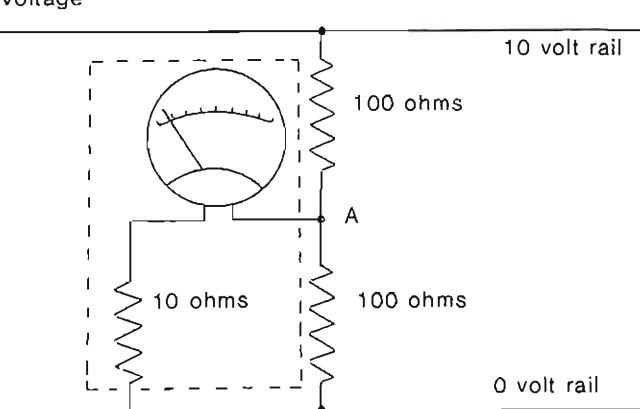
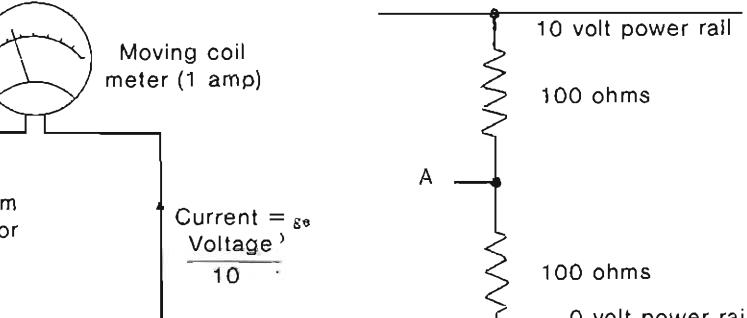
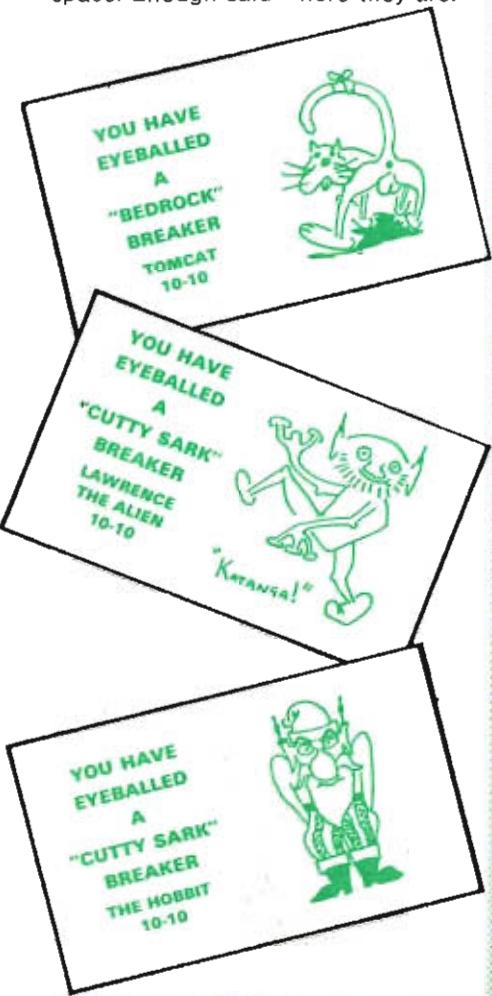


Figure 6. Potential divider unbalanced by a voltmeter.

Round Up

We promised three Scottish breakers at the Show that we would try to publish their eyeball cards if we had the space. Enough said - here they are.



Easter bonnet

Kim Lewis, from Chiswick in London, appeared at the Wembley Conference Centre for the 1982 CB Show wearing the most amazing Easter concoction on her head. One of the entrants for the Easter bonnet competition, nine-year-old Kim had a rabbit, flowers, feathers and all sorts perched atop of the frills of net that formed the base of the hat. The picture shows Kim being presented with her Easter egg prize.



controls mounted on the handset. Another reason why I held back on the installation was that I was just about to take delivery of a new Volvo Estate, so quite early on a Wednesday morning in January (remember the snow?) I picked up the car, drove it home and prepared for the installation that would put me in touch with the outside world again! A quick visit to Tandy got me a disguised CB/FM electric twig (Yes, I know it's centre loaded and therefore not 'approved'). I wasn't going to advertise the fact I was on channel - one stolen rig a year is enough! With the installation complete (see the March edition of CB Radio Magazine), out came the SWR meter and there my problems really began!

As you know, Tandy and their associated companies (Radio Shack, Realistic, Micronta, etc.) are of American origin and most of their products have been developed specifically for the market in the US, with the UK and Europe being a nice bonus. When the legal specification for CB rigs became known, Tandy started developing and modifying their CB range to incorporate our standard and succeeded very well. However, a small cloud has crept on the horizon and it concerns the accessory range; in fact the very two items I had purchased from them, No. 21-522 an SWR meter and 21-9501 the 'disguise' twig.

Both these items were specifically designed for the US (AM) market and as such are fine if you are using equipment *not* to the MPT 1320 specification (or to be blunt, illegal rigs!). The first problem encountered with the SWR/modulation meter is that you can SWR without too much difficulty, however, there is an extra 'modulation' meter which acts like a recording level device on your cassette deck. This meter derives its information from the amplitude of the transmitter carrier - on FM, however, this method of measurement is less than useless and the meter cannot be easily modified. The second problem concerned the twig. As Tandy are the only man-

ufacturer of an electric retractable combined aerial and the fact that as it is centre loaded, this is being conveniently forgotten by the legal breakers I spoke to. Whilst it is true it doesn't matter to an aerial whether it's operating on AM or FM, the Tandy aerial is a 'tuned' system which is optimised for the US AM band. As the UK FM frequencies are slightly higher, the twig needs to be slightly shorter. The method of SWR'ing this aerial is quite novel, as one simply moves up or down a little aluminium pod which is at the tip of the twig and it also acts as a cover when the twig is fully retracted. Now, to SWR for UK frequencies, the 'pod' has to be lowered some 5in., so when the aerial retracts into the wing, you are left with 4in. of 'coathanger' wire above the wing and an electric motor going bananas as it knows that there is still a bit of it to wind down!

Back at the car (Remember that!) the next trip was back to the shop for a refund and with a K40 twig later, Videostar hit the airwaves with a whimper. Yes, that's right, whimper! Not being one to boast but when you've got a new car that has an overdrive control, one does like to use it and me being no exception discovered that by pressing the button to engage the overdrive gear, the rig leapt from channel 14 to any other (Pick a number between 1 and 40!). The nuisance value was offset by the fact that it was better than roulette and many a passenger lost a bob or two deciding what channel it would jump to next. The reason why it was doing this was that the relay in the car caused a surge to be induced in the multi-wired handset, so it thought it was getting instructions to up or down. The only solution would be to move the CB or don't use the overdrive. I came up with another one, the rig went back to the shop and I got a common-or-garden York. Peace reigned, so still basking in the delights and warmth of the CB fraternity, I decided to become a channel 9 monitor. More next month!

10-10.

Confessions of a CB enthusiast

Part 4 from Videostar
(Raymond E. Orr)

Last month, I told you about the scrapping and saving, not to mention sacrifices, that had to be made after my Fidelity rig was stolen and cash was saved up for a replacement. To stop my new rig going AWOL, the only rig available that didn't look the part was the Binatone Breaker Phone. With only a telephone-type handset on view, the desired 'low profile' was achieved.

I'll not bore you with a description of the rig, you've either seen it and know what I'm talking about - or you haven't. There is no channel change knob as such, just two buttons marked 'Up' and 'Down' - with all the usual



Charity presentation

Binatone are gaining a good reputation in the CB field for their charitable attitude. Recently Tony Blackburn, the Vice-President of the Citizens' Band Radio for the Blind Club and enthusiastic CB'er, presented a Binatone Speedway rig to Herbert McDermott, a 78-year-old blind operator. The Speedway is a good set for a blind person as the controls are simple and easy to use and 10 more Binatone sets are also being presented in the near future to blind breakers.

Priority is being given to aged blind people living on their own. The Club is co-operating with the Royal National Institute for the Blind and emphasizes the social value of CB in the lives of the blind.

Bludners Department

Many apologies to Radiotechnic Ltd. for getting their phone number wrong in their advertisement in April's edition. Number is (0534) 78831 not (0534) 0288.

Fly the flag but not the aerial

An extract from the British Airways 'Ground Safety News' reads:

"Unauthorised Use of Radio Equipment . . . Users of either the recently legalised CB system or any illegal system, should be aware of the dangers their equipment could cause:-

a) Use of an unauthorised transmitter near one of the many radio communication and navigation facilities could cause interference, jeopardizing flight safety.

b) Use of a transmitter, for example near an aircraft refuelling operation, could generate sparks which might ignite flammable vapours, leading to fire."

It's worth emphasizing the dangers of this, as our article 'Breakers and petrol don't mix' pointed out the same dangers some six months ago.

The only thing that confuses me is, what about all their own transmitting equipment?



These feet were made for walking

Two intrepid walkers set out from Swansea in Wales at 4.00am on Thursday to walk to the Show at Wembley. They were expected to arrive on Sunday but beat everyone's expectations by completing the 256 miles by 2.00pm on Saturday. This included a 'pit stop' at Wexham Park Hospital (about 15 miles from Wembley) with leg trouble. They were advised by the Hospital to call it a day

but having got so far they were determined to finish.

The walkers weren't alone as two other breakers followed in a car to provide back up. They all met great hospitality and help along the way from other breakers who heard about the attempt. The walkers, both THAMES members, needed the attention of the Paramedic team when they arrived but after a beer and a sandwich they quickly recovered. They were sponsored for approximately £1,000 for their attempt.

British airways

FACTS

Part 6 by E. A. Rule

Recently in this series the writer dealt with the problems of RF intermodulation caused when more than one signal arrives at the receiver at the same time and many readers will already be fully aware just how big a problem this can be. As more and more transmitters start to operate closer and closer together this particular problem will become much worse and indeed in some places has already made operation almost impossible at certain times of the day. If a receiver is designed to receive very weak signals its performance regarding RF intermodulation is decreased, if its RF intermodulation performance is good then it tends to be insensitive. These two requirements are directly opposed to each other and receiver design tends to be a compromise between the two. In other words the receiver has a reasonable sensitivity and a reasonable RF intermodulation performance, neither are at optimum.

So what can be done to improve matters? One way is to fit an RF gain control so that the sensitivity of the receiver can be adjusted to suit the conditions prevailing at any particular time. With practical receivers it is not possible to have both high sensitivity and high RF intermodulation rejection at the same time without very special (and very expensive) filters and in any case (as far as the writer knows) no such filters are available on the CB market. But what about the receivers without an RF gain control, what can be done for these? Recently the writer was offered a pre-amplifier to try out and you may recall this is the very thing certain to make the RF intermodulation problem worse. However, this was a pre-amplifier with a difference and after tests proved to be the exception to the rule that pre-amps make matters worse. The reason why this pre-amplifier is able to cope is that not only is it fitted with an RF gain control but also has coupled with this an RF attenuator. It can therefore not only improve the receiver sensitivity when conditions permit but also enable the input to the receiver to be reduced when band conditions are crowded with strong signals.

The pre-amplifier in question is the RA.MA RF control pre-amplifier, type RP-20. It is compact, measuring approximately 80 x 60 x 75mm and very well constructed. On its front panel is a switch for switching the unit 'off' and the aerial directly to the receiver or 'on' and the aerial via the pre-amplifier. It also has two LED indicators to show that you are receiving or transmitting through the unit. An RF gain/attenuator control completes the front panel. The RF gain/attenuator control is calibrated from -20dB to +20dB with the unity gain position clearly marked. This range of control permits the sensitivity of your receiver to be either increased or decreased by a factor of 10 times (more about this later). The unit also has an RF sensing circuit which controls an aerial change-over relay so that when you switch

your transceiver to transmitter the pre-amp section is by-passed. In other words, the pre-amplifier is automatically switched in or out of circuit as you receive or transmit.

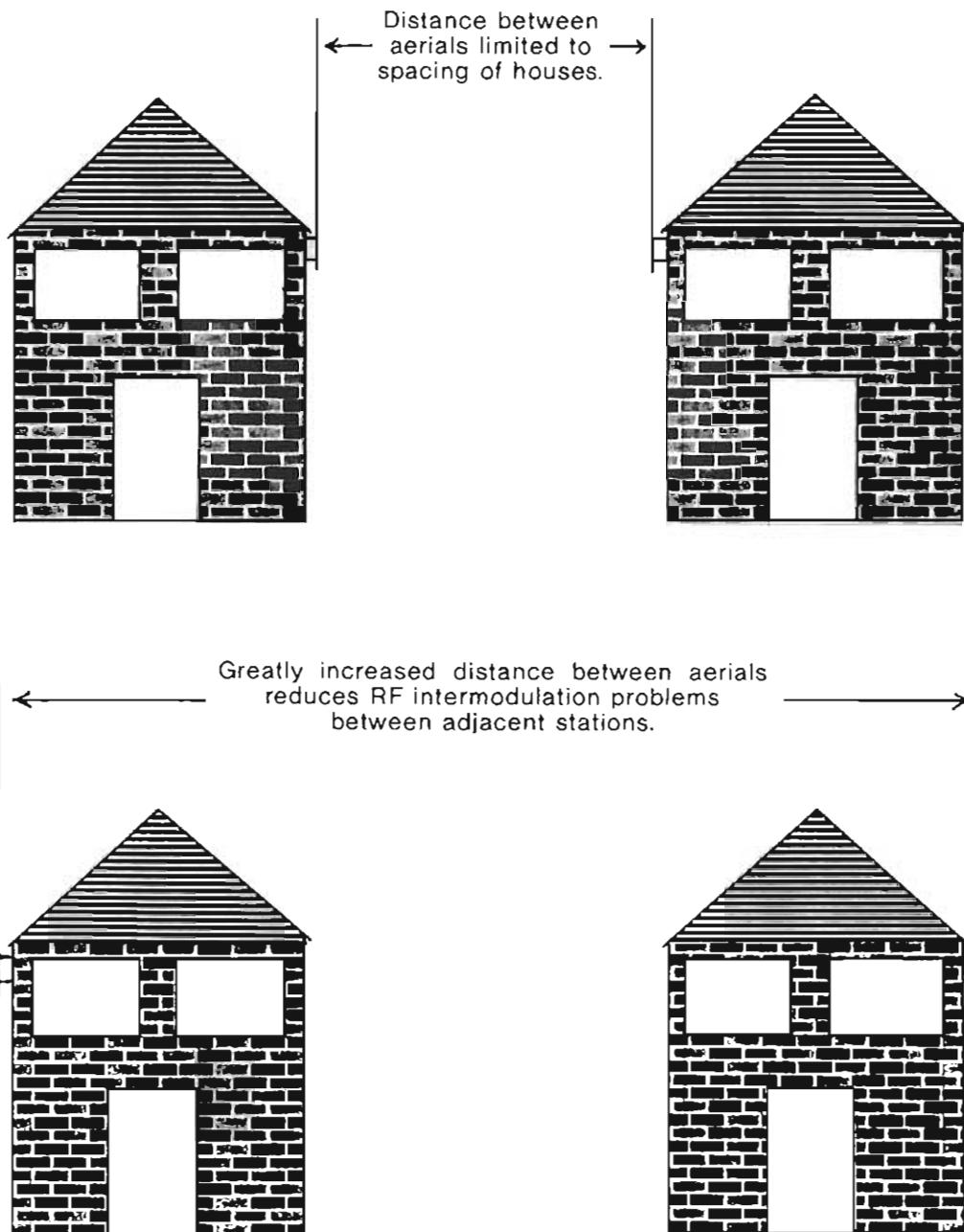
Without this automatic change-over the pre-amp would be damaged the first time the transmitter was switched on. Because of this automatic change-over there is no risk of damage when used with transmitters running legal power.

The unit was subjected to tests to find out if it would improve the sensitivity and RF intermodulation performance of a typical transceiver under practical conditions. A pre-amplifier that simply increases the overall gain may not in fact improve the readability of a weak signal, for if a pre-amplifier with a high noise factor was used it could make matters far worse, in spite of increased 'S' meter readings. The tests used to check this point was to inject a 0.1 microvolt signal (PD) into the receiver and measure the signal to noise ratio and then to carry out the same test with the pre-amplifier in circuit. This test would quickly show if the signal to noise ratio improved or if all one got was a boosted 'S' meter reading.

With the signal connected directly to the receiver the signal to noise was measured at 1dB for a 0.1 microvolt input, with the pre-amplifier in circuit the signal to noise measured 3dB, a very positive result. The actual gain on the sample tested measured 21dB which means, of course, that very weak signals would be increased to a level where full limiting could take place (see previous part of this series regarding limiting). With the RF control of the pre-amplifier set at -20dB the measured attenuation was, in fact, -38dB on the sample tested and although more than specified is a worthwhile bonus. Under practical conditions the pre-amplifier lifted weak signals out from the noise and improved their readability and when the band was full of strong signals the ability to attenuate the signals means that the receiver can operate at optimum conditions all the time. Summing up, this pre-amplifier should prove to be an advantage under almost any band conditions and can be recommended. It currently retails at around £15.00.

While the equipment was set up for the above tests it was decided to also run tests on some other items to see how they performed. One of these was the RA.MA power reducer type PC-5. The unit measures approximately 90 x 50 x 100mm and has a front panel fitted with a five-position switch and a meter. It is well constructed and, like the pre-amplifier, has an RF sensing change-over relay so that the power reduction is only effective when transmitting, it automatically switches out of circuit when receiving. The five-position switch is marked 100%, 50%, 20%, 10%, 5% and the meter scale is calibrated from 0-10 watts. Tests show that the calibration was quite

MISSIONS



Sketch (not to scale) showing how the position of aerials can bring about an improvement in the RF intermodulation problem. A similar improvement can be obtained by one operator placing an aerial at the far end of a garden with the other one left at the house end.

Fig. 1.

FM TRANSMISSIONS

reasonable although at the lower powers tended to show more power than was actually present. Tests were also made to see if it affected the SWR readings and this proved to be minimal, less than 1.2:1 when used with a dummy load (in practice, of course, an SWR meter should always be fitted after the power reducer as we would only be concerned about the actual aerial SWR). Verdict? A worthwhile addition to a station although in the writer's opinion five different power reduction levels would not be needed in practice, coupled with the RA.MA pre-amplifier they should handle almost any practical situation likely to arise. Equipped with these two items and a reasonable aerial installation should ensure the best possible communication under most practical conditions but it will not completely cure the RF intermodulation problem. Regrettably this is something we have all got to live with. As more stations come on the air the more likely it is that one will be close to you and under these conditions even if low power is used the amount of signal reaching the receiver may still be too much for it to handle. (This was discussed at length in a recent issue of CB Radio Magazine).

Sometimes the problem will only appear when two or more stations are close to you and transmitting at the same time, as already stated there is little one can do except to be patient and wait for conditions to improve. One thing that may help is in the careful siting of the respective aerials. These should be as far away from each other as possible and, if possible, sited so that a building or, perhaps, trees are between the two positions. These objects will 'soak up' some of the signal between the two aerials and may help reduce the RF intermodulation problem. It's really a matter of common sense, if your aerial can 'see' another aerial then you are almost certainly in deep trouble. Distance, of course, plays an important part in all this, a signal will fall in strength inversely to the square of the distance. In simple terms, each time you double the distance between your aerial and your neighbour's the signal will drop by a factor of four. Taking a typical housing estate, if two aerials were mounted on the sides of the houses closest together, say about 10ft. apart for a detached house and the aerials were then moved to the farthest side of the houses (say around 50ft.) the

signal between the two will have dropped by about 16 times and this could be more than enough to solve the problem (see Fig. 1).

Of course, if a linear amplifier is in use, the remedy is obvious... Finally, to keep this problem to a minimum, ALWAYS use the minimum of power for transmitting and ALWAYS keep any RF gain control fitted to the receiver to the lowest gain setting consistent with obtaining reliable copy. Keep all transmissions short in duration and don't indulge in irrelevant chatter. If all operators did these simple things it would surprise you just how much room there really is on 40 channels! Sorry if we seem to have gone on a bit but judging by the talk in our local shop, this RF intermodulation problem IS the main one.

Two SWR meters were also tested. These were the Skipmaster type SK-10 retailing around £7.00 and the AEC SWR 50A retailing around £15.00. The Skipmaster is a fairly basic SWR meter measuring 50 x 80 x 45mm with a front panel consisting of a meter calibrated in SWR and relative power, a 'set level' control and a 'forward'/reverse' switch. The unit was tested using a number of matched and mismatched dummy loads and found to be accurate. At £7.00 it must be considered good value where only a basic SWR meter is required.

The AEC 50A is a more advanced unit and is fitted with two meters. The overall size measures 120 x 50 x 60mm and its front panel is fitted with two meters and a 'set level' control. One meter is calibrated in watts output, with two ranges, 0-50 and 0-100 watts, the scale is approximately log law and powers around 1-10 watts can be measured without difficulty. The other meter is calibrated in SWR and percentage reflected power. Its scale is very easy to read with large, clear numbers and calibrated 1, 1.5, 2 in black and 3, 5, 10 and infinity in red. Below 2 scale marks are at every 0.1. Full operating instructions are provided. Tests showed the meter to be accurate and capable of measuring SWR up to frequencies in excess of 150MHz, so it could also be used by those who become amateur radio operators licenced for other bands.

At £15.00 it is excellent value and recommended.

The writer is indebted to Brookes Electronics of Norwich for the loan of these items for testing.

STARTING NEXT MONTH . . .

A new series by E. A. Rule on the practical aspects of FM CB. July's article will look at power supplies and that unappreciated black box under the bonnet - the battery! So, if you don't know your anodes from your cathodes, read FM Feedback.

Now you can have all the freedom of a hand-held, without the cost of batteries

with the Radiotechnic
HF Series charger
and nickel cadmium batteries



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Radiotechnic

CiBTA,
CB Trade Association,
PO Box 6,
Hayes,
Middlesex
UB4 0SS



PLEASE ACCEPT THIS APPLICATION FOR MEMBERSHIP

COMPANY NAME
(TRADING NAME IF DIFFERENT)

ADDRESS _____

TEL: _____ TELEX: _____

BANK _____

ADDRESS _____

1ST REF _____

2ND REF _____

TYPE OF BUSINESS _____

NAME _____ POSITION _____ SIGNATURE _____

Please find enclosed cheque for £55.00, which I understand will be returned if my application is refused.

Understanding CB Technical Specs

Looking at transmitter specifications

by Lou Franklin (Supersparks/USA)
Author, The 'Screwdriver Expert's' Guide

Again, these specs are merely legal requirements. If the legal AM (or FM) power limit is 4 watts, you can be sure that's exactly what the specs will claim! Same with SSB, where the power is usually limited to 12 watts 'PEP'. Naturally no manufacturer is going to advertise the fact that his equipment is capable of exceeding legal specs, even though in reality most rigs will easily do so.

Modulation: For AM, most CB's employ what's called 'High-Level' modulation. This means that an actual voice power of up to several watts is being added to the RF carrier power. In fact, for 100% modulation of an AM transmitter, 2 watts of audio power must be added to the 4-watt RF carrier. Although this adds up to 6 watts total, the *legal* power is defined only by the unmodulated RF carrier. AM rigs generally specify their modulation method as 'Class B', 'High and Low Level' or 'Collector-Modulated'. These all mean the same thing and indicate that the rig is using the most powerful form of Amplitude Modulation. This also explains why you'll see the rig's S/RF panel meter jump upwards when speaking into the mike. Again, the fact that the specs claim modulation capabilities are limited to '90%' or '+90%, -100%' is really meaningless since such limits can easily be defeated by a simple internal adjustment or part removal.

SSB is actually a more sophisticated and efficient form of AM but the modulation method is different. With SSB, there is no RF carrier output until you speak into the mike, hence the term 'PEP' is used for defining SSB power. 'PEP' or 'Peak Envelope Power' refers to the highest RF output obtainable when modulated by the highest-powered voice signal. The SSB signal mixes with the voice signal very early in the signal generation stage and that's why for AM/SSB rigs you'll often seen the term 'High and Low Level' modulation. High Level

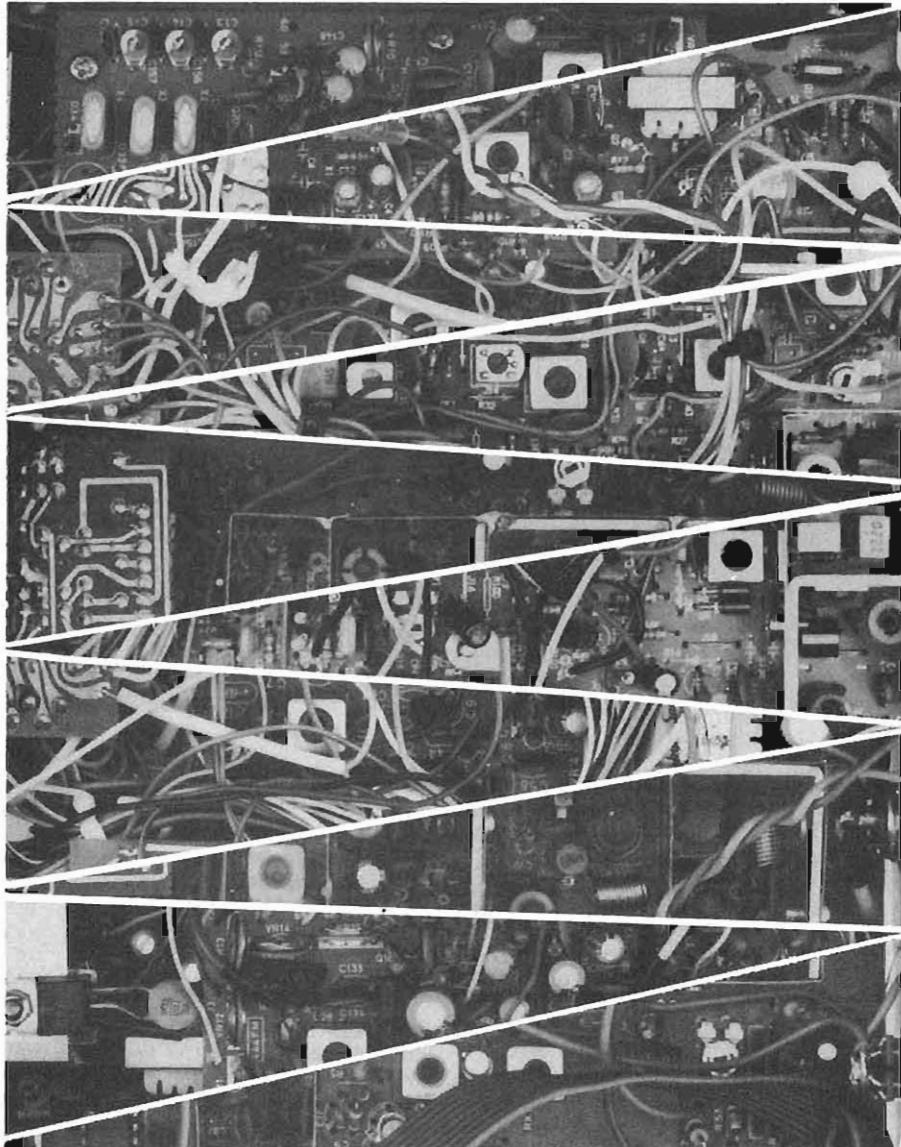
refers to straight carrier AM; Low Level refers to SSB. These rigs use exactly the same power amplifiers but they are connected differently when you change the Mode selector switch from AM to USB/LSB. Since SSB is a much more powerful signal, it requires more current consumption so once again check for excellent voltage regulation in this mode. One of the most common SSB problems related to voltage regulation is that (assuming the transmitter section is wired to 'slide' frequency a bit) the voice has a chirpy sound because the voltages which determine the operating frequency are actually changing value slightly.

FM by definition is very different. The RF carrier power never changes regardless of whether or not you speak into the mike; this explains why you'll not see the S/RF panel meter moving in this mode. In fact if you should notice either the meter moving or the lights flickering during modula-

tion, this indicates either the presence of some AM components to the signal or poor voltage regulation. Both indicate poor transmitter design.

Frequency Modulation is measured by 'Deviation' because on FM the carrier signal simply shifts a bit, (+) and (-), from centre frequency when you talk. FM Deviation is basically an arbitrarily-selected figure; however, this figure will determine the audio fidelity as well as the total amount of space occupied by the FM signal. For voice radio communications, voice frequencies are purposely limited in range from about 300-2500Hz. CB deviation limits of perhaps $\pm 5\text{KHz}$ maximum give excellent voice quality without taking up too much room in the radio spectrum. Remember, CB channels are spaced 10KHz apart. If deviation as high as $\pm 5\text{KHz}$ were used (for a total of 10KHz) there is a great likelihood of mutual interference from adjoining channels. The British spec calls for a maximum deviation of

Spurious output: $\times 0.3 - 20\text{KHz}$	Less than 50nW above 90MHz Less than 250nW at all other frequencies	Power Output: less than 10uW Adjacent channel power	Deviation: $\pm 2.5\text{KHz}$ maximum Frequency Response: $< 10\text{ microwatt}$	300 - 3000 Hz. $\pm 2.5\text{KHz}$ maximum 4 watts/0.4 watt.
Audio Freq. Response 12.0V	Frequency response Freq. deviation (at 1kHz) $\times 2.5\text{KHz max.}$	500 to 2,500Hz $+4/-12dB$ 1dB referred to 1kHz 50Hz to 5kHz 6dB referred to 1kHz Response falling at 2dB/octave above 2kHz	Adj. channel power Speech processing: 4 watts (MPT-1320)	$< \pm 1.5\text{KHz}$ Audio freq. response Adjacent channel power Speech processing: Less than 3dB change in output for 20dB change in input level
Audio response: Freq. deviation Impedance Frequency stability: Adjacent channel Frequency deviation 10K ohms	2A nominal 1dB, then 50nW $\pm 2.5\text{KHz max.}$	RF output power Modulation: $> 1.5\text{KHz}$ audio $> 1.25\text{KHz}$ audio	Spurious emission Spurious Emission 80 - 85 MHz 87.5 - 118 MHz 135 - 136 MHz 174 - 230 MHz 470 - 862 MHz	$< 1.5\text{KHz}$ RF power output 4W Adjacent channel power Speech processing: Less than 3dB change in output for 20dB change in input level
Freq. dev. (at 1KHz) $\times 1.5\text{KHz}$ (MPT-1320)	$> 10\text{dB}$ Less than 10mV for rated system deviation	Crystals: 9MHz fundamental HC18/U	Spurious Emission 80MHz-85MHz 87.5-118MHz 135MHz-136MHz 174MHz-230MHz 470MHz-862MHz (2) < 0.25 microwatts any other frequency	$< 1.5\text{KHz}$ RF output power Narrow-band FM 9MHz fundamental HC18/U
Microphone sensitivity: $\times 100\text{mV}$ (MPT-1320)				Frequency tolerance



$\pm 2.5\text{KHz}$, which can be defined as 100% modulation for FM. The CB signal will thus occupy a maximum bandwidth of 5KHz ($2 \times 2.5\text{KHz}$) which therefore allows a bit of a guard band between channels. Of course, as with AM or SSB, FM deviation can also be easily increased by adjustment of an internal control. Important! All similarities to AM end here! Overmodulation on FM (actually, over-deviation) in an attempt to get more 'talk power' could possibly make your signal disappear entirely at the received end! Once the signal deviates further than the receiver bandwidth, it won't even be detected. Sort of like trying to fit a Roller in a Volkswagen parking place; it won't 'fit'! With a multimode AM/FM or AM/FM/SSB rig, you might sneak by with a bit of over-deviation because the receiver by design is capable of passing the widest-mode signal, which is AM. (Typically 5-6KHz wide). Remember also that such deviation may not be compatible for reception on very narrow-band FM-only (i.e., British) rigs. The Deviation spec is normally stated as \pm so many KHz, at some modulating audio frequency (such as 1200Hz) and at such-and-such an audio input level. (Such as

20mV). Such figures typify the average voice/microphone characteristics.

Carrier Suppression and Unwanted Sideband Suppression: These refer to SSB transmission only. An SSB signal is created by first generating a carrier, mixing it with the voice signal and then balancing out the carrier in a circuit called a 'Balanced Modulator'. Then one or the other sideband, Upper or Lower, is eliminated depending upon the setting of the AM/USB/LSB mode switch. The unwanted sideband is normally removed by passing the double-sideband signal through a very sharp crystal filter. This filter (which by the way is also used during SSB reception) is so selective it is able to pass only one of the two sidebands. Therefore these SSB-only specs are an indication of the quality of an SSB signal. For example, if the carrier itself were not fully suppressed, a listener might hear a very annoying squeal or whine ('heterodyne') from the SSB transmitter. An approximate test for Carrier Suppression is to simply key up the rig into a dummy load antenna, USB or LSB, and without speaking, observe the S/RF panel meter for any indication of RF output. There should be none.

Switch to the opposite sideband and repeat; results should be the same. If not, this may indicate a poorly-designed SSB rig but is more likely a simple misadjustment easily cured by a qualified technician. This test is particularly important when buying a used rig; many breakers try 'peaking and tweaking' without proper knowledge! Unwanted Sideband Suppression is difficult to check without special test equipment but use of a second SSB rig tuned to the opposite sideband might reveal excesses in this area. Carrier Suppression and Unwanted Sideband Suppression are both specified in decibels or 'dB'. A good SSB rig will quote at least -50dB Unwanted Sideband Suppression and at least -50dB to -60dB Carrier Suppression. The higher the dB number, the better.

Harmonic Suppression: This is the nasty spec that has to do with causing TVI and RFI! At this time I know of no specific figure for the British FM CB system; however, FM by its very nature is much less likely to cause these problems. The figure deals with AM and SSB and basically indicates how weak the 'harmonic' signals are as compared to the intended signals. A 'harmonic' is simply a multiple of the main frequency; i.e., 54MHz is the second harmonic of 27MHz, and so on. In the US, TV Channel 2 operates near 54MHz so it's obvious what poor harmonic suppression can do here! In the UK this is not as big a problem unless operating one of the popular European-made AM/FM/SSB rigs. American specs call for at least -60dB Harmonic and Spurious Signal Suppression, which is achieved through a combination of tuned circuits and extra metal shielding in critical areas. With this spec, the larger the number the better the suppression.

Frequency Response is an oft-quoted spec for both Receive and Transmit modes. This indicates the band of voice frequencies permitted to pass through the rig's audio section. For radio communications, the voice range is typically limited from about 300Hz to 2500-3000Hz. The human voice is a very complex signal but its greatest power and readability are completely within this range, unlike music which must extend far beyond the 3000Hz limit for good fidelity. But even more important, by placing limits on the transmitted voice frequencies, we help guarantee that the CB signal cannot occupy so much bandwidth that it interferes with adjacent-channel signals. (Remember, CB channels are spaced at 10KHz intervals). The way in which AM/SSB signals differ from FM signals with regard to occupied bandwidth is technically complicated but the intentions are the same; voice frequencies regardless of transmission mode must be limited to prevent co-channel interference. The audio specs mentioned here are those you'll most likely see advertised by the rig manufacturer.

Next month Lou will be looking at receiver specifications.

Rig Test

The SMC CBM271

You are probably thinking by now that you are reading an old magazine or that we have run out of things to print, since we have already featured the Oscar as well as the DNT M40 earlier in the magazine. To explain why the SMC set appears again needs a bit of history explaining. In the past, all our sets for testing were sent to an independent testing house for evaluation and they sent a report back. The report itself couldn't be published as it consisted mainly of tables and the odd written comment. Then our journalists would write it up in a form suitable for publication. Of course, with all the things going on in a magazine, it wasn't always the same journalist doing the write-ups. SMC thought this was a bit unfair, as one journalist might think a result was 'good' and another think it only 'fair'. We agree, so all our tests will now be written by the one technical writer using the test house information.

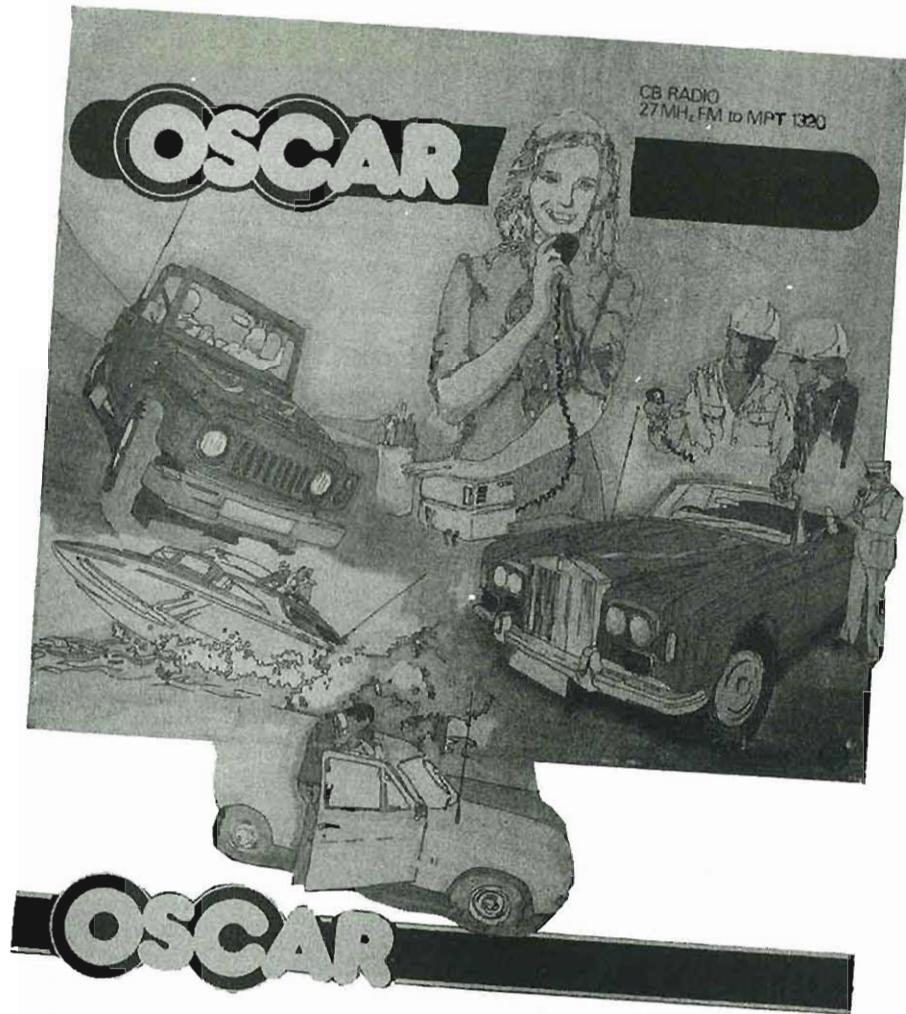
As SMC were unhappy with the previous arrangement, we have offered to review the Oscar again - done by the technical writer. If bits of this review sound familiar, then the writer has agreed with what we originally wrote!

However, we won't repeat the introduction that appeared in April's magazine, except to say that we were particularly impressed by the packing and documentation that went with the set - certainly the best we have seen.

Microphone

The microphone, unlike some supplied with other sets, has had a lot of careful thought put into it. It has a good shape, is not too large and has no sharp corners which makes it comfortable to hold. For connection to the set it uses a five-pin din plug instead of the normal lockable four-pin. However, to solve any problems of the plug being pulled loose, a raised surround has been fitted to relieve any strain on the actual socket. To check this, the set was fixed and the microphone lead was stretched to its fullest limit and shaken while the set was being operated and it displayed no signs of coming out of its socket.

The only other point that readers tend to complain about is that the microphone socket is mounted on the left-hand side of the set. Looking at it practically, if the set is mounted towards the centre of the car under the dashboard or in the centre console it



will allow freedom of use by a passenger without the lead dragging across the set's controls and changing their settings.

Construction

The set comprises a top and bottom cover painted with a hard-wearing, flecked black stove enamel paint, which displayed a very good resistance to scratching and scuffing.

The Cybernet printed circuit board, built to SMC's specifications, is of proven good design and all the components are clearly identified. The printed circuit board is mounted in a plated pressed steel chassis with the control mounted on the front section. The front panel is a silver plastic moulding with black inset panels and matching silver knobs.

One problem found with the set when mounted in a vehicle is that the meter was very difficult to read, especially at night.

Transmitter test

As usual, the standard equipment used for the transmitter test was:

Racal 9081 and 9082 signal generators

Marconi TF 42F distortion meter

Marconi TF 340 audio power meter

Racal 9916 frequency meter

Racal 9101 and Bird 43 power meters

Racal 9009 modulation meter

Levvel TG 150D audio generator

Solartron AS 1412 power supply.

Power output

These tests are to ensure that the output power from the set's transmitter conforms to Home Office specification MPT 1320, which states that the transmitter output power must not exceed 4 watts. This reading must be taken with the supply volts to the set at maximum. That is to say, a fully-charged car battery can read as high as 14.5 volts. Due to the fact that a car battery voltage will vary with load and state of charge, these tests are done at three different voltages, simulating a battery with a low charge (10.8 volts), normal charge (13.2 volts) and full charge (14.5 volts) and are done first in the high power position and then repeated with the 10dB attenuator switched in.

NB: 10dB = 1/10th.

Power Output and Attenuation

Atten.	10.8v	13.2v	14.5v
High	2.2W	3.6W	4.0W
Low	0.18W	0.33W	0.39W

As one can see from the test results, the set gives maximum legal output for maximum supply voltage. The slight discrepancies in the low power reading are normal and caused by component tolerances.

Frequency

The 27MHz citizens' band consists of 40 channels with 10Kc/s between each channel, starting with channel 1 on 27.601250MHz and finishing with



channel 40 on 27.991250MHz. It is very important that the results of this test are good, because poor stability will result in bad audio quality by the station receiving your signal. This will also cause bleedover onto the next channel higher or lower dependent on direction of frequency drift. The most common cause of frequency drift is changes in temperature. So we check the set at two different temperatures. The first check is done at 48°F (cold morning) and the second check at 68°F (room temperature).

Temperature stability

Temp.	CH1	CH40
48°F	27.60131	27.99131
68°F	27.60124	27.99124

It can be seen from the table that at 68°F the frequency is only 10 cycles low and for a reduction in temperature of 20°F it only drifted a further 60 cycles low. These results are very good and are comparable to transceivers of a professional standard.

Modulation

Modulation is measured at three spot frequencies in the recommended NBFM (narrow band frequency modulation) spectrum which is 300Hz to 3Kc/s. To do this test, the microphone is replaced by an audio signal generator Levell Type TG 150D. This injects an audio signal into the microphone socket at the three test frequencies which are 500Hz, 1125Hz and 2500Hz. The result of this test determines whether the modulation sounds bassy like you are talking through a pillow or to the other extreme very trebly like you are talking through a tin can. So you can see, the result of this test is very important.

These results were measured by a Racal 9009 automatic modulation meter which can read to an accuracy of better than 2%. The ideal results are when the 500Hz and the 2500Hz are slightly under half of the 1125Hz. The Oscar's test results, as one can see from the table, are very good.

Modulation

Input Level	500Hz	1125Hz	2500Hz
0.5mV	0.20kHz	0.4kHz	0.27kHz
1.0mV	0.35kHz	0.6kHz	0.29kHz
2.0mV	0.5kHz	1.25kHz	0.4kHz
5.0mV	0.7kHz	1.42kHz	0.6kHz
200mV	0.8kHz	1.5kHz	0.65kHz

Receiver test

Audio output

To do the measurements of this test, the speaker wires are disconnected from the speaker and wired to a Marconi TF 340 audio power meter with a Marconi 42F audio distortion meter connected in parallel. An RF signal modulated with a continuous tone of 1125Hz is fed into the Oscar's antenna socket from a Racal 9002 signal generator. The volume control is then set to two different output levels and maximum. The results are recorded in the following table.

Measured Distortion

1.5 watts	1.4% distortion
2.4 watts	10% distortion
3.3 watts (max)	25% distortion

The table shows a set of figures which seem to reflect most of the sets tested up to date. The important figures in the table are the distortion figures; the lower the reading, the better the audio quality.

Squelch level

To check the squelch, we first set the squelch control to the point where it has closed then, using the Racal 9002 signal generator, we inject a signal into the antenna socket then, increasing the signal level, we record at what level the squelch opens. This is called the threshold; on SMC Oscar it measured 0.12 microvolts. We then set the squelch control to the maximum setting. We then increased the carrier from the Racal 9002 until the squelch opened, this told us the strongest signal you can squelch out. The fully muted signal level was 9mV. The squelch was found to be very adequate unless you live in a densely-populated CB area but, even so, it was found to have plenty of adjustment inside the set.

Receiver sensitivity

Sensitivity

10dB quieting	0.12uV
20dB quieting	0.30uV
30dB quieting	1.10uV

The SMC Oscar displayed a better-than-average receiver sensitivity which will allow the set to receive signals from greater distances (possibly a good set for DX fiends).

AM rejection

To test for AM rejection, a fully limited FM signal (10uV) is fed into the receiver and modulated with a 1KHz tone (1.5KHz deviation). The receiver audio output is then noted. The FM modulation is then changed to AM, still with a 1KHz tone but 30% modulation. The audio output from the receiver is then measured. It should be noted that this rejection is only true for signals that are exactly on the received frequency and that if the AM signal is slightly off frequency then a completely different result would occur.

For the SMC Oscar, 36dB was the given result and this is considered to be good. It is very important, especially in mobile operation, that these figures are very good. As nearly all interference is of an AM nature, so the better these results the better the set is at rejecting electrical interference.

Adjacent channel rejection

When tested for adjacent channel rejection, the SMC Oscar was 242mV for 3dB degradation. In CB language, this means that a station one channel away will have to be hitting you at +9 pounds before the bleedover will start affecting the station you are working. This test is done to see how good the set's receiver is when a strong station starts transmitting one channel away. If the set is poor, you will get bad bleedover, if it is good, you will hardly notice it is there.

Summary

The packaging, presentation and, in particular, the booklet supplied, are very good. The set itself performed well and its construction is certainly up to standard. There are a few items worth considering if this rig is to be your choice. Firstly, the five-pin plug may give the operator problems, more so after a lot of use. Secondly, the signal and power meter is very small, making it very difficult to read in mobile installations. We still aren't 100% happy with the nylon screw retaining the PA transistor but SMC have assured us that the temperatures needed to melt the screw are very high indeed and they don't foresee it causing a problem. All of these possible problems may never occur. One thing is certain, though, if any problem should ever arise, you should have no trouble identifying or obtaining spares. SMC stock a full range of CB accessories and spares and have been in the communications business for quite a number of years selling amateur radio equipment.



We have not repeated the manufacturer's specifications and symbols box that were originally published in April's magazine. For this information please refer back to that edition.

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PROGRESS

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1977 K40
1982 Z27

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