

CB RADIO

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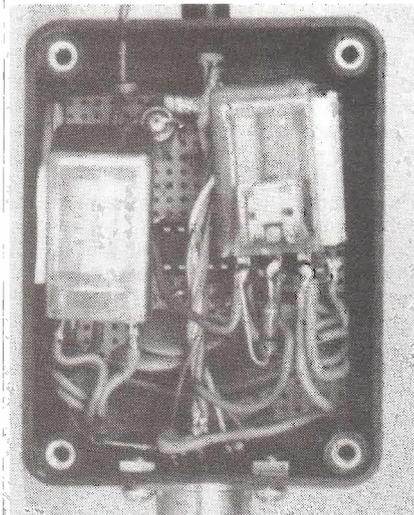


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What comes next?

A look back and a look forward

The fuss of Christmas and New Year is over and done now for another 11 months. Although looking back is traditionally done on New Year's Eve, this is the first opportunity we've had to stop and reflect over the past year and consider what we will be doing over the next. Our production schedule before and up to Christmas was so hectic we got so that we didn't know if we were working on December's issue or July's!

Nineteen eighty-one at least saw the legalisation of Citizen's Band Radio. Although it was gratefully received by some, many of the existing AM breakers feel that they have been fobbed off with a system that they didn't want and that won't work satisfactorily. This put us in a difficult position as a magazine.

Since our first issue in June 1980, our readers have been remarkably loyal. Their support has enabled the magazine to grow and prosper and, in turn, we had tried to present what you, the reader, wanted to read. With that in mind, we always covered demonstrations and rallies where possible (even when it meant getting up at 6.30 in the morning!), legal developments and all aspects of AM breaking. We also hoped (and still do) that we kept our fingers on the pulse of CB'ing and really knew what was going on.

FM Legalisation

With legalisation we realised that the magazine would have to alter. As a company we have to survive financi-

ally and the potential FM breaker readership could not be ignored. Also, from a journalistic point of view, we have to publish NEWS and FM CB was news. So we have tried to cover both. There are still all the articles and information that AM breakers buy the magazine for and there are items for FM readers too. Obviously in the office we have our differing personal opinions on what we think is best but the magazine reflects what is happening in CB at the moment - not private opinions. So whilst there are AM breakers there will still be AM articles. However, we want to deal with the subject as a whole and not add further to the sharp division between AM and FM as, for better or worse, FM CB is the system we have at the moment.

The legalisation of CB has also meant that trading standards are changing. Larger and reputable companies are now involved in CB and the 'cowboy' element are either withdrawing or realising they must offer a proper service to the customer. This can only be good for the breaker. To encourage this, eight months ago we started a trade magazine to aid and encourage good business practices and to help the trader offer you a better service. The fact that the distribution of CB Trade is so high indicates that we are succeeding,

What next?

So what of next year? We always joke that we can never advertise what will be in the next issue because we

don't know ourselves. And to a certain extent that's true. We don't commit ourselves too far in advance because things change, news comes in at the last minute and to be up to date you can't prepare a magazine too much in advance. Simply, we hope to offer more of the same; an interesting, accurate and informative magazine. You can help by filling in our Readership Survey. Although forms like this look like '1984' approaching, you need not identify yourself too closely and all information is in strictest confidence. You can tell us what you like and dislike about the magazine and what you would like to see and if enough of you want it then we'll try to do it.

We would like to continue with articles such as Free Radio - not because we want to change the emphasis of the magazine but to put CB into a broader spectrum. We also hope to produce more articles on practical aspects of CB, such as community use, as it becomes an accepted thing.

Unfortunately, the current economic situation and recession has affected us too. As I mentioned earlier, the magazine has to survive financially and this has resulted in us having to increase the cover price of the magazine to 70p. We don't like asking for more of your hard-earned cash but we have to eat too and the rise is necessary to maintain the standard of the magazine (and to send the Ed on a skiing trip to Andorra!).

SS

COMPETITION RESULTS AND THIS MONTH'S CONTEST

Just to let you know that we haven't forgotten our competition winners, here are the results.

In December's CB Radio Magazine we started the hunt for the first licence for British CB that was issued. Now, despite rumours and telephone calls to the contrary, the first 'proven' licence to be issued was on 27 October 1981 in Nottingham. The person who got this licence and as a result won our competition was Mr. N. R. Parr, of Beeston, Nottingham. Now Mr. Parr was somewhat confused by our two questions but as his answers were pretty amusing (but unprintable) he will soon be getting a brand new DNT M40 transceiver (generously donated by Radiotechnic of Jersey).

January's competition was somewhat easier as the answers were there for everybody to see. Needless to say, lots of people spotted things that we hadn't noticed ourselves but the right answer came from eagle-eyed Paul Hollaway, from the West Midlands. Paul rightly pointed out that we had mixed up the photographs relating to the Supernational Custom Car Show and Motorfair '81 in Round Up and for this bit of alertness Paul will also be getting a DNT M40 transceiver.

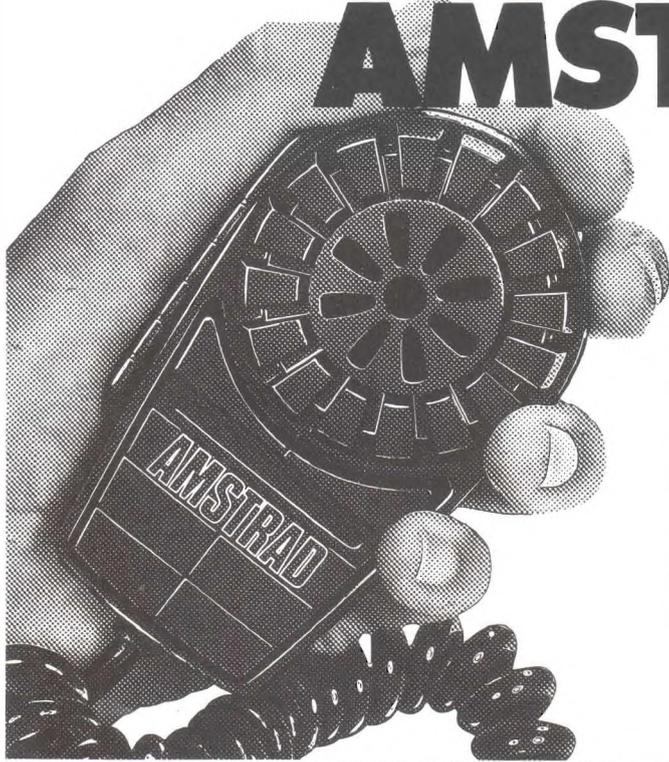
Win a gold-plated K40

One of our advertisers has kindly offered a gold-plated K40 antenna worth about £70 for the first person to spot the deliberate mistake on his advertisement. The following clue should give you a lead

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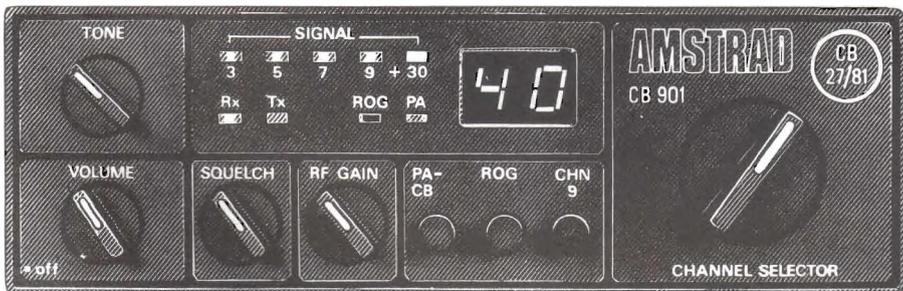
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Antennas and Transmissions on CB frequencies

The grounded antenna

by F. C. Judd, FISTC, MIOA, Assoc. IPRE - Part 15

My article last month made special reference to the low efficiency of the 1.5 metre base loaded antenna for 27MHz CB radio as specified by the Home Office and according to Schedule 3 (e) in the CB licence. This antenna will only function with a ground-plane which may be the metal body of a vehicle when used for mobile operation, or a radial ground-plane system when used for base station operation.

The optimum omni-directional antenna for 27MHz that has vertical polarisation and a low angle of radiation is the vertical half-wave dipole which, if well constructed, has a radiating efficiency approaching 100%. However, a grounded quarter-wave antenna as shown in Fig. 1 (A) will also function with a high degree of efficiency providing and only providing, it has no self resistive loss and that the 'ground' or ground-plane beneath has perfect conductivity. On this basis the directional characteristics would be the same as for a vertical half-wave antenna, i.e., omni-directional with radiation at low angle.

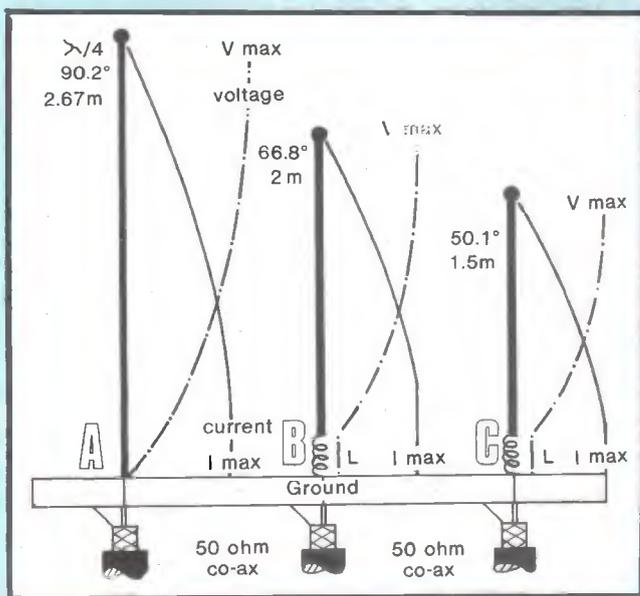


Fig. 1
 (A) Quarter-wave grounded antenna.
 (B) Base loaded and grounded antenna.
 (C) Base loaded antenna to Home Office specification (see text).

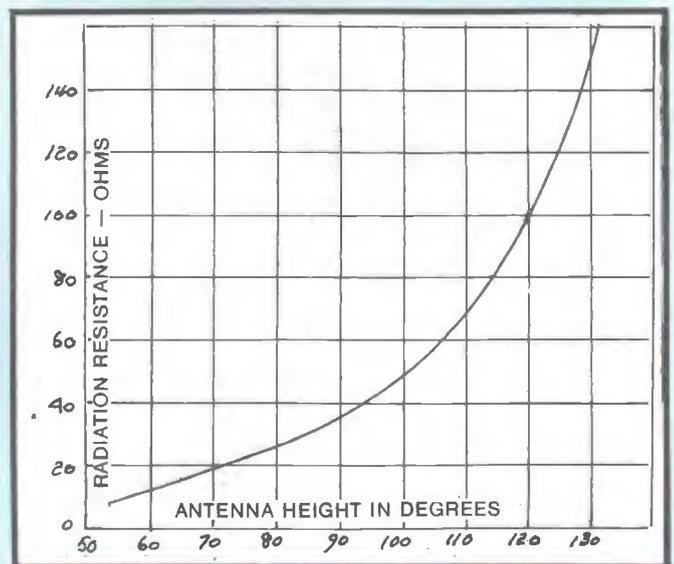


Fig. 2
 Radiation Resistance v Antenna height above 60°. (Example) a quarter-wave antenna has an electrical height of 90° and a radiation resistance (R_r) of 36 ohms.

Inductive loading

A grounded antenna may, however, be made physically smaller than a quarter-wave length providing it is tuned to resonance by artificial (inductive) loading at the base as shown in Fig. 1 (B). Such an antenna may be even smaller still as in Fig. 1 (C) but still tuned to resonance by inductive base loading.

Fairly short antennas are, of course, necessary for mobile operation for reasons of safety although there would be some advantage in terms of greater efficiency by having the loading coil at the centre. It must be fully understood, however, that as the radiating portion is made shorter, so more inductance must be included in order to maintain resonance.

The antenna shown in Fig. 1 (A) has no loading coil so all the current from the power supplied is flowing in the radiator. The power radiated is in fact due to I^2R_r where I is the current flowing and R_r is the radiation resistance of the radiator itself. Referring to the graph, Fig. 1, it will be found that the radiation resistance (R_r) for a 90° (quarter-wave) antenna, is approximately 36 ohms. *If the antenna has no self-*

resistance loss and no ground loss then the current flowing will be

$$I = \sqrt{\frac{W}{36}}$$

If we take $W = 4$ watts, then

$$I = \sqrt{\frac{4}{36}} = 0.333 \text{ amps.}$$

The power radiated will be I^2R_r or $0.333^2 \times 36 = 3.99$ watts, which means that the antenna is near enough 100% efficient, i.e., all the power supplied is radiated.

Now let's take the antenna as in Fig. 1 (B) which is less than a quarter-wave in physical length but is base loaded to obtain resonance. The radiating section is 2 metres long or 66.8° of the wave-length. From the graph Fig. 2, the radiation resistance is about 17 ohms. *Again assuming no self-resistive loss and no ground loss whatsoever* then the current flowing in the radiator will be

$$I = \sqrt{\frac{W}{17}}$$

With a power of 4 watts as before, the current flowing in the radiator will be

$$I = \sqrt{\frac{4}{17}} = 0.485 \text{ amps.}$$

The power radiated will therefore be $I^2R = 0.48^2 \times 17 = 3.99$ watts. Again virtually 100% of the power supplied is radiated. Finally we take the shortest radiator of 1.5 metres as in Fig. 1 (C) and which is 50.1° of the wavelength. The radiation resistance from the graph Fig. 3 is 8.7 ohms. Again using 4 watts of power the current flowing in the radiator would be

$$I = \sqrt{\frac{4}{8.7}} = 0.67 \text{ amps.}$$

From I^2R the power radiated is $0.67^2 \times 8.7$ also virtually 4 watts. Again an *apparent* 100% efficiency, i.e., all the power supplied is radiated. *Ideal, of course, if this really did happen, but it doesn't* and the reason is as follows.

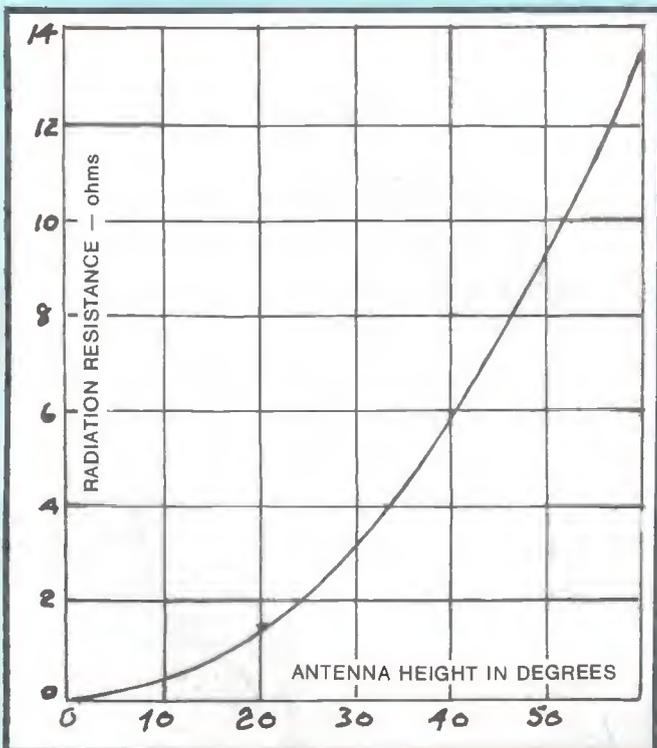


Fig. 3 Radiation resistance v Antenna heights less than 60° . For example, a one-eighth wavelength antenna has an electrical height of 45° and a radiation resistance of approximately 6.7.

Antenna efficiency

The power actually radiated from an antenna is due only to the current flowing in the radiating portion which itself provides the all important radiation resistance. There are unfortunately other resistive components in an antenna which dissipate power and these include resistance in conductors and dielectrics (insulating materials) any loading coils that are used, the total resistance of these being (R_{dc}). There is also the resistance of the ground or ground-plane system, usually called the ground resistance (R_g). Although these factors were referred to in the previous article, the diagram in Fig. 4 may help to clarify. The circuit represents an antenna coupled to a transmitter, the power from which must flow in the whole circuit. The total power dissipated is the sum of I^2R_{dc} , I^2R_r and I^2R_g . The only power that is radiated is due to I^2R_r , the rest is dissipated in the coil and conductor resistance and ground conductor resistance and which is power lost from the total supplied to the antenna from the transmitter.

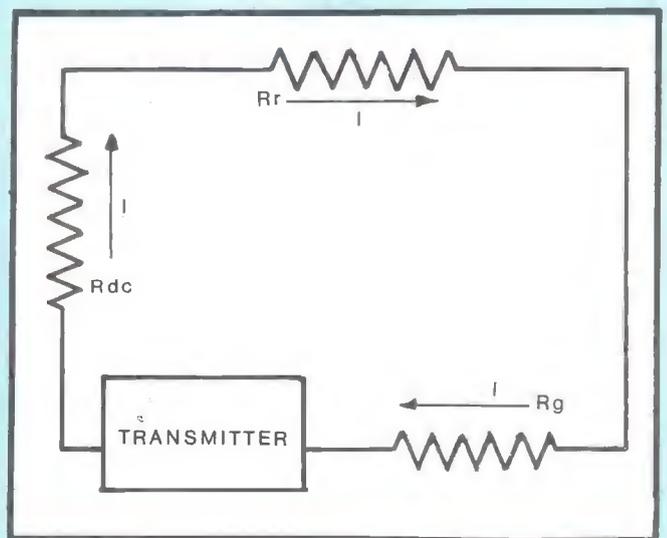


Fig. 4 Electrical circuit representation of an antenna (see text).

If these resistive R_g and R_{dc} are larger than the radiation resistance R_r , then the power radiated by R_r becomes much less. As an example, if the total power supplied to the antenna is 4 watts and 3 watts is dissipated by R_g and R_{dc} then only 1 watt is left for R_r to radiate.

Let us now return to the short loaded antenna as in Fig 1 (C). It has a radiation resistance (R_r) of 8.7 ohms and *with no other losses whatsoever* would radiate all the power supplied to it. But a loading coil is necessary to provide enough reactance to make the 1.5 metre long antenna resonant. This loading coil contributes nothing to the radiation so any power in the coil is wasted. The coil resistive loss (R_{dc}) may be as much as 20 or 30 ohms and the power lost will be I^2R_{dc} . Next we have ground loss (R_g) and this can amount to at least 30 ohms or can be as high as 50 ohms. This loss amounts to I^2R_g . The radiation efficiency of the antenna Fig. 1 (C), the 1.5 metre base loaded system prescribed by the CB licence, will be in the region of:-

$$\frac{R_r}{R_r + R_{dc} + R_g} = \frac{8.7}{8.7 + 30 + 30} = \frac{8.7}{68.7} = 12.6\%$$

but this is assuming the lowest possible losses due to R_{dc} and R_g , for example, where the loading coil has a 'Q' of at least 300 and a large number of ground plane radials to keep the R_g loss as low as possible. In practice the use of a thin radiating ele-

Antennas and Transmissions on CB frequencies

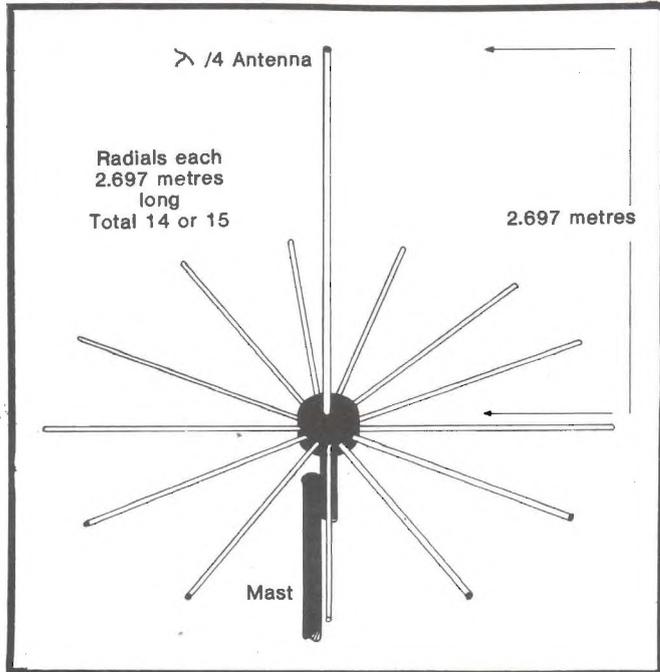


Fig. 5 Design for a ground-plane antenna for 27MHz with a radiation efficiency of 50%.

ment normally necessary for a mobile antenna, the low 'Q' coil that such antennas normally have and the poor ground-plane afforded by an ordinary vehicle, will bring the radiating efficiency down to about 5%. As shown in the previous article an efficiency of 5% means that out of the 4 watts supplied to such an antenna only 0.2 watts or thereabouts will actually be radiated.

Ground systems

It was stated earlier that a half-wave antenna operates at high efficiency because all other resistive losses, e.g., Rdc and Rg, are negligible by comparison with the radiation resistance Rr. In the case of grounded, or ground-plane antennas, the

ground resistance (Rg) is relatively high and the resistance due to other factors such as dielectric loss and any loading coil (Rdc) also become appreciable. In order to maintain high efficiency from a grounded antenna of a quarter wavelength or less it is vital to keep all resistive losses to the lowest possible level. For instance, without a fairly elaborate ground system the efficiency of a full length quarter-wave antenna is not likely to exceed 50% and will be much less for antennas of shorter physical length.

First we must examine the ground system, or ground-plane and remember that the Home Office specified antenna cannot operate without a ground-plane. An ideal and virtually lossless ground system would consist of about 120 radials each a half-wavelength long which at 27MHz is about 17 feet. This is just not practicable. Unfortunately the ground system resistance increases rapidly as the number and length of radials is reduced and even with as many as 15, each a quarter-wavelength long (8.5 feet at 27MHz), the ground resistance rises to about 30 ohms. In normal practice there will also be self resistance loss in the antenna conductor and insulating materials amounting to around 5 ohms.

2 Watts effective radiated power

In order to achieve an ERP or effective radiated power of 2 watts allowed by the Home Office for 27MHz CB you will need an antenna that is at least 50% efficient. This means that out of the 4 watts allowed from the transmitter, 2 watts would be actually radiated. The antenna would be a ground-plane like that shown in Fig. 5 which consists of a quarter-wave radiator 2.697 metres or 8.7 feet in length operating over a ground-plane consisting of 14 or 15 radials each of the same length (no loading coil is used or necessary).

With this antenna the radiation resistance would be 36 ohms, the ground loss (Rg) about 30 ohms and with a fairly large diameter radiator the DC resistive loss (Rdc) would be in the region of 5 ohms. The efficiency would therefore be:

$$\frac{R_r}{R_r + R_g + R_{dc}} \text{ OR } \frac{36}{36 + 30 + 5} = \frac{36}{71} \text{ or } 50.7\%$$

With a power of 4 watts fed to the antenna the current flowing would be $\frac{4}{71} = 0.237$ amps.

The power radiated would be due to $I^2 R_r$ or $0.237^2 \times 36$ which is 2.02 watts or just about the effective radiated power allowed.

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- ANTENNA BOOK. A.R.R.L., U.S.A. (Staff)
- RADIO DESIGNERS HANDBOOK. F. Langford-Smith, Iliffe

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FM TRANS

Part 2 by E. A. Rule

Last month we dealt in general terms with the FM system and it was intended this month to deal with the circuits used. As circuit details of the rigs on the market are not readily available at the present time we shall leave this aspect for the present and deal with the specifications used instead. Each manufacturer will publish a technical specification of their equipment and their sales staff will most likely pick out one or two items for special mention as being better than the competition. These specifications can be very useful as they enable the informed buyer to compare one rig with another and decide which suits the requirements at the time of purchase. The difficulty is that it is not easy to find out what standard has been used to obtain the published specifications and it is possible to take a particular test, and depending on the actual method of measurement used, to arrive at a number of different answers. The sales staff can then pick the method which suits their product the best.

Even a seemingly simple sensitivity figure is not all it may seem and two rigs with the same published sensitivity figures can have very different performances in practice. We shall attempt to steer the reader through this technical maze and examine how these differences come about and how to watch for them when comparing rigs.

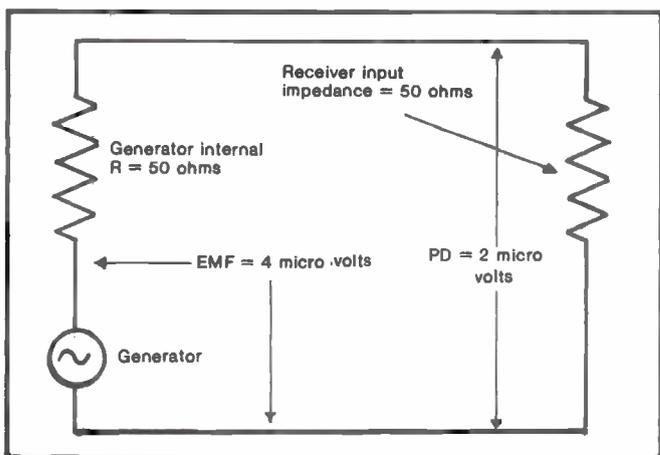


Fig. 1
The generator EMF is split between the two impedances by an equal amount when the impedances are the same. (Matched conditions). The EMF voltage from the generator is equivalent to the EMF voltage from an actual aerial.

With the AM and SSB systems, sensitivity was normally stated in microvolts input at the aerial terminal for a given signal to noise ratio at the output of the receiver. The FM system can be stated in the same way or it may be stated in microvolts for a given quieting ratio. It is in arriving at the actual figure for microvolts input required, that we run into our first difficulties. There is room for possible error (intended or otherwise) in the figures in the ratio of two to one. The actual voltage present at the receiver input terminal could be stated as EMF or PD. EMF is the 'open circuit' voltage present from the source (i.e., signal generator or aerial) and PD is the actual voltage across the

receiver input impedance. As this impedance may not be 50 ohms as often assumed it puts a third variable into the calculation. Assuming that the impedance is 50 ohms (unlikely in practice) and that the receiver under test requires 2 microvolts PD for say a signal to noise ratio of 20dB, we can measure it as shown in Fig. 1. The signal generator output EMF will be split between the generator internal impedance and the input impedance of the receiver as shown.

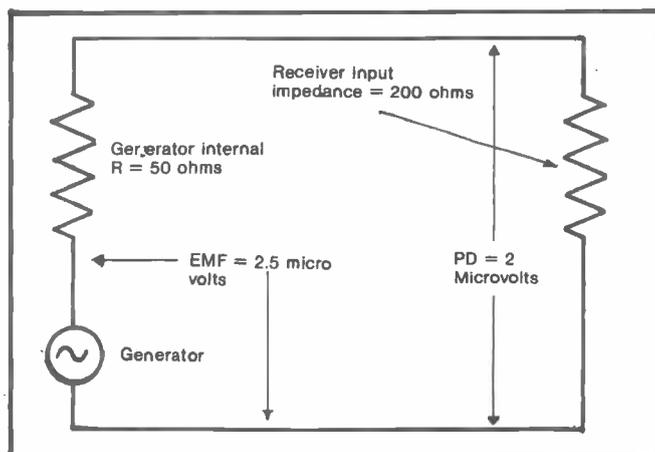


Fig. 2
When the receiver impedance is not matched to the source the output EMF is no longer split in equal amounts between the two. This would at first sight seem to imply that this receiver was the more sensitive as the actual EMF required is less. However, it in fact requires four times as much power for the same result as the receiver in Fig. 1.

Under these conditions of matching (both generator and receiver 50 ohms), the sensitivity will be 2 microvolts PD or 4 microvolts EMF. Either figure could be stated and either would be correct. Obviously 2 microvolts looks better than 4 and this may be the figure used, without any reference to either PD or EMF or impedance. Without these references the figure would be meaningless. Supposing our receiver has an input impedance of 200 ohms, referring to Fig. 2 we can see that in order to get our 2 microvolts PD the actual EMF can be reduced to 2.5 microvolts. As the EMF from a generator is the equivalent to the voltage produced by an aerial and this EMF is less, it would seem that raising the input impedance of the receiver input makes it more sensitive! This would be true if the receiver depended on only the actual voltage present but in fact it depends on the power produced across its input impedance and if we consider the power produced we get a completely different picture. Two microvolts across 50 ohms will produce four times the power as 2 microvolts across 200 ohms. Maximum power can only be transferred from one circuit to another when the two impedances are the same. This is why matching is so important, both in receiving and transmitting.

If we assume that we require the same power for each receiver for a signal to noise ratio of say 20dB, then receiver A will require 2 microvolts PD and receiver B will require 4 microvolts PD. Taking EMF instead, we get a = 4 and B = 6 microvolts. In an attempt to remove this ambiguity between EMF and PD, sensitivity should be

MISSIONS

stated in terms of available power. This has been standardised on the femtowatt (10^{-15} watts) equal to 0dBf. With 300 ohms as the standard impedance $1\text{dBf} = 1.1$ microvolts EMF and $120\text{dBf} = 1.1$ volts EMF. By stating the receiver sensitivity in dBf (available power) *all* ambiguity is removed and one receiver can be directly compared with another. Regrettably this standard has not yet been used for CB equipment although it is now the standard method used with hi-fi equipment.

FM receivers can also have their sensitivity stated in microvolts for a given quieting figure. This can also be very misleading in practice as the figures obtained will depend on the receiver bandwidth (selectivity). Receivers with a narrow bandwidth (or even with instability present) will give a very impressive sensitivity figure. Taking an extreme example, a receiver with a bandwidth of 100Hz will have a quieting sensitivity of fractions of a microvolt but be useless as its bandwidth is too narrow to receive the modulation on the carrier. The quieting figure is obtained by measuring how much the receiver *noise* falls when an *unmodulated* signal is applied to its input.

A better method used to state receiver sensitivity, is to take into account the actual distortion produced by the receiver circuits and to state the microvolts input required to produce a given signal to noise *and* distortion ratio. The way this is done is shown in Fig. 3. The basic set up is the same, except that a harmonic distortion meter is added to the output. The signal level is adjusted as before until the signal to noise *plus* distortion is at the reference level. This method gives a true picture of the receiver performance and takes into account the modulation deviation, receiver bandwidth and overall distortion produced in the receiver. Fig. 4 shows a typical graph obtained using this method and it gives a fairly complete picture of the receiver's performance as regards sensitivity. In practice when this method is used, the microvolts input required across the receiver input impedance would be stated for a signal to noise plus distortion ratio of 30dB. A typical specification might read, Sensitivity, 0.5 microvolts PD, 50 ohms, for 30dB S/N+D. This type of specification may be directly compared with others made using the same method and until the *available power* method is used is the next best way to evaluate receiver performance.

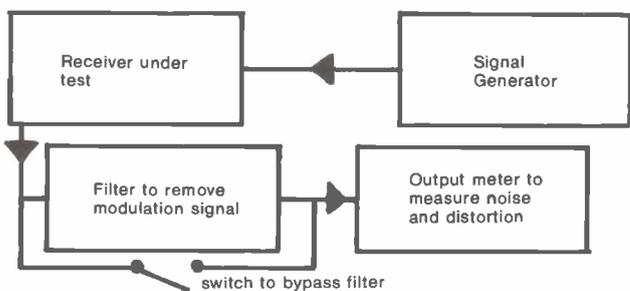


Fig. 3
The signal generator is set to produce a fully deviated signal with a modulating frequency of 1KHz. The filter is adjusted to remove the 1KHz signal from the output, leaving only the noise and distortion to be read by the meter.
The generator output is then progressively reduced until the noise and distortion residual is 30dB below the signal level compared with the filter switched out.

Fig. 5 shows a graph which enables direct comparisons to be made between microvolts EMF and dBf for the standard 300 ohms impedance and the 50 ohms impedance used for CB equipment. Correct matching is assumed in both cases. Remember it is the amount of *power* required into the receiver's input for a given signal to noise that is important and a receiver that requires less power will have the better sensitivity. A figure in microvolts on its own means nothing without the method used to measure it being stated.

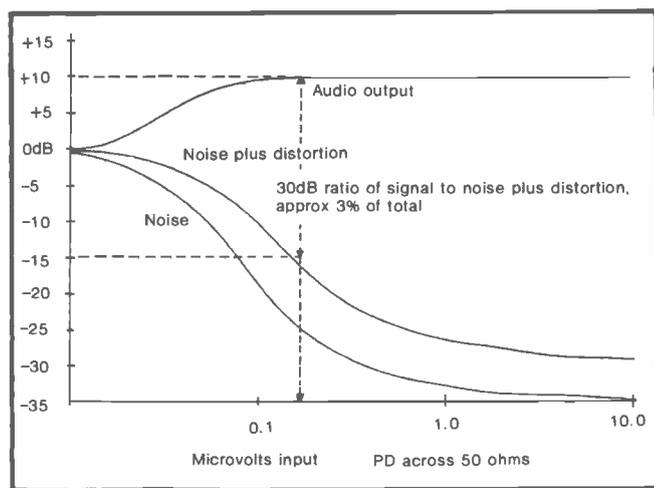


Fig. 4
Typical graph showing how the audio signal recovered from the modulation, harmonic distortion and noise vary with microvolts input. It shows that full limiting is reached at around 0.1 microvolt. 39dB signal to noise plus distortion is reached at around 0.2 microvolts. 20dB quieting is reached at around 0.1 microvolt. It also shows that the best signal to noise that can be expected from this particular receiver is about 40dB with inputs above 10 microvolts.

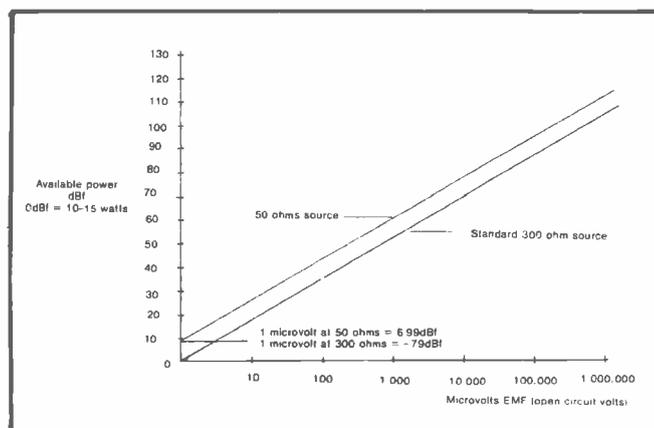


Fig. 5
Graph showing relationship between EMF and available power in dBf into the 300 ohm standard impedance, with the 50 ohm impedance shown for comparison. Note that for a given EMF the power into 50 ohms is 7.78dB (six times) more than for 300 ohms. This shows the importance of correct matching between aeriels and receivers, etc.

FM TRANSMISSIONS

The next important specification is for selectivity. This is the figure which tells us how good a receiver is at rejecting signals in channels other than the one we are tuned to. There may be two figures given, one for adjacent channel and/or one for alternative channel, sometimes other figures may be given but these are the main ones. A number of manufacturers give the selectivity in dBs down for so many KHz off tune and we can work out the adjacent and/or alternative channel selectivity from these. Fig. 6 shows a typical selectivity curve, along the bottom is the number of KHz each side of the centre tuning point and down the side of the graph is shown the amount in dBs that the response falls. Two curves are given and note that both are the same bandwidth at a point 10dB down from maximum. If the specification only told us that the selectivity was 5KHz at 10dB it would not tell us that in fact receiver A is much better than receiver B. Compare the two curves at a point 60dB down from maximum. Receiver A has a bandwidth of only 10KHz whereas receiver B has a bandwidth of 60KHz and would clearly let strong signals on adjacent channels get through resulting in interference which receiver A would not be suffering from. Normally, selectivity should be stated for points which are 3dB and 60dB down from maximum and this enables the 'shape factor' of the filter to be calculated. The better the shape factor, the better the overall selectivity. Good filters are expensive and a receiver which has a good shape factor can be expected to cost more although its outward appearance will not show the difference in performance.

The shape factor is calculated as the ratio between the selectivity at a point 3dB down and 60dB down. Receiver A has a shape factor of 2:1 (5KHz at 3dB and 10KHz at 60dB), whereas receiver B has a shape factor of 6:1 which is very poor.

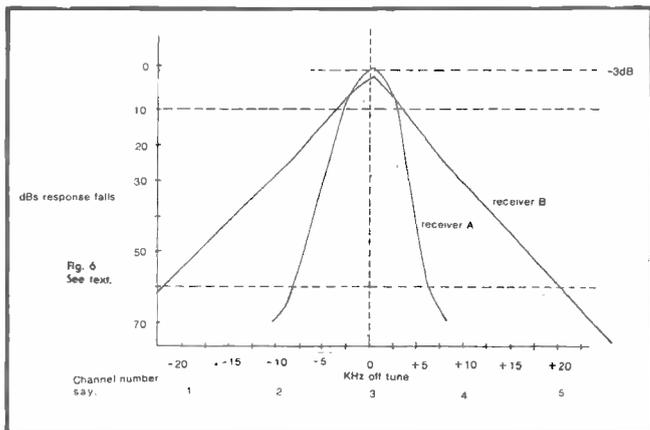
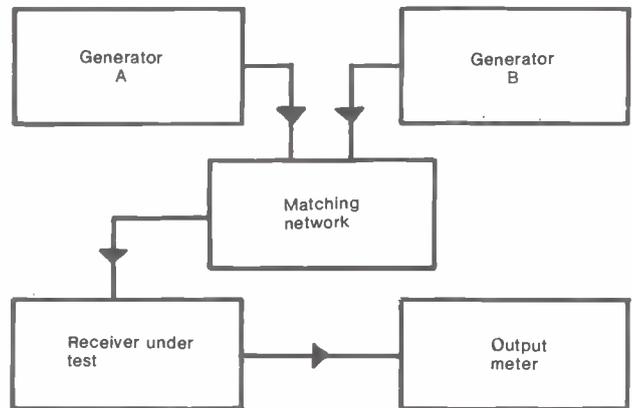


Fig. 6
See text.

Like all things, selectivity is a relative factor. The amount of rejection obtained will also depend on the actual strength of the signals in the adjacent channels. Taking receiver A in Fig. 6 as an example, the channels either side of the one we are tuned to are 60dB stronger than the one on our selected channel, it will be received at the detector stage at the same strength. On AM or SSB it would be heard at the same strength as well as making reception of our wanted signal impossible, but with the FM system we also have an effect called 'the capture effect' (which we shall be dealing with later) which greatly reduces the interference from this cause. However, in practice the signal would have to be very strong and the wanted one very weak by comparison to cause any problems. If we assume our wanted signal is at a strength of 1 microvolt, a signal 60dB stronger would be 1,000 microvolts, probably at about the limit the RF stages could handle in any case. Taking receiver B, however, the situation is very different. Our adjacent signal need only be around 30dB stronger to cause the same amount of problems; this would be a signal

level of 31 microvolts and there would be many of your local stations putting in signals greater than that. So taking a typical centre of town situation, receiver A would perform without any problems whereas receiver B would be next to useless and appear to suffer from constant interference on all channels.

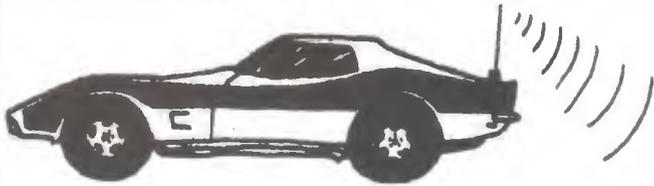


Generator A and the receiver are tuned to the same channel. Generator B is tuned to each channel either side of A in turn. Start with generator B off. Fully modulate generator A and set the input level into the receiver to 100 microvolts (EMF), note the output on the meter. Switch the modulation off but leave carrier on. Switch generator B on with full modulation. Adjust its input level until the output obtained on the meter is 30dB down on our noted output from A. The ratio (in dBs) between the two inputs is the adjacent channel selectivity. Repeat for the alternative channel (next but one channel each side of the main one). (Note. The generators are modulated to full deviation, ± 5 KHz, with a 1KHz tone).

Fig. 7
Two generator set up for measuring selectivity.

As with sensitivity, there are a number of different ways that figures for selectivity could be obtained and unless the method used for measurement is known the published figures may not mean very much. One method is to inject a signal on the adjacent channel to the one the receiver is tuned to and to increase its strength until it produces an output on the selected channel equal to the one produced with an input of rated sensitivity, the ratio (in dBs) between the two is the adjacent selectivity in dBs. For example, if 1 microvolt produces 30dB signal to noise and is the rated sensitivity figure, and the adjacent signal has to be increased to 500 microvolts to get the same signal to noise (leaving the set still tuned to the main channel, of course) the ratio would be 500 to 1, or 54dB. This particular receiver would be said to have an adjacent selectivity of 54dB. However, this is not the full picture as the signal is only applied to the adjacent channel. In practice we would have a wanted signal on the channel we are tuned to as well. A better method of measuring selectivity which gives a result nearer to the results obtained in practice is to use two signals. First a signal is injected on the main channel at a set reference level, normally 100 microvolts. This signal is modulated to full deviation and the output noted. The modulation is then switched off. A second signal with full modulation is injected into the adjacent channel and its strength adjusted until it produces an output which is 30dB below the reference output already noted. The ratio between the two input signals in dBs is the adjacent channel selectivity. The test is then repeated on the next but one channel and this gives the alternative channel selectivity figure. The two generator test set up is shown in Fig. 7 and is the standard method used by many equipment manufacturers although not always for CB receivers. For the narrow band FM system used for CB the bandwidth should be around ± 5 KHz at the -3dB points and around ± 12 KHz at the -60dB points. If it is narrower than this it may reduce the amount of modulation recovered from the signal and also cause distortion, if it is much wider it will increase the risk of interference from stations on adjacent channels. Receivers in the higher priced rigs should meet this specification or better but the cheaper rigs can be expected to have a wider bandwidth, particularly at the -60dB points where it could be as wide as ± 30 KHz.

To be continued



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C-B-A

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The 1982 CB Show

Still time to book your advance tickets

At the risk of repeating myself, let me remind you of the biggest ever CB show which we are holding over the Easter period this year.

March 10 is still a long way off (the time by which advance discount tickets have to be booked) and response from breakers, clubs and groups has been overwhelming – which has caused a slight delay in our ticket distribution schedule. Do not be disheartened. Every ticket will be with its purchaser well before the Show. Our recently-installed computer is working 24-hour shifts to cope with your requests. If you and your friends want to come to the Show but haven't booked yet, now is the time to do so.

Who will be exhibiting?

Good question and one which we can now give you some idea about. Writing this article prior to Christmas (which I am), to date no less than 20 major distributors and even more retailers have either definitely booked exhibition space or give us verbal instructions. So already, basing our information on firm bookings, the 1982 CB Show will be larger than any other previously staged in the United Kingdom. Interest from foreign manufacturers is also very great, giving you, the CB enthusiast, the opportunity to meet the people that actually make the equipment for your hobby.

The Eyeball 20

Plans for your recreation during the Show are also coming together well. We are organising daily wet T-shirt competitions for the ladies (Well, for the men actually) and it's even been suggested that the men should be given the chance to show their 'interest' by taking part in a wet Y-Front contest. As yet none of us men have plucked up the courage to get that little event under way. We are negotiating for a 'Bucking Bronco' machine to be present and we will be able to see if breakers really do stay on longer. The most up-to-date video games have been organised for your entertainment and the highest score recorded during the Show will gain a prize for the competitor who achieves it.

Our supervised children's play area is being organised and run by quali-

fied nursery nurses who are trained to look after your children in any eventuality.

More news of this event will follow

in next month's magazine, so watch out for competition prize details, open times and a list of exhibitors.

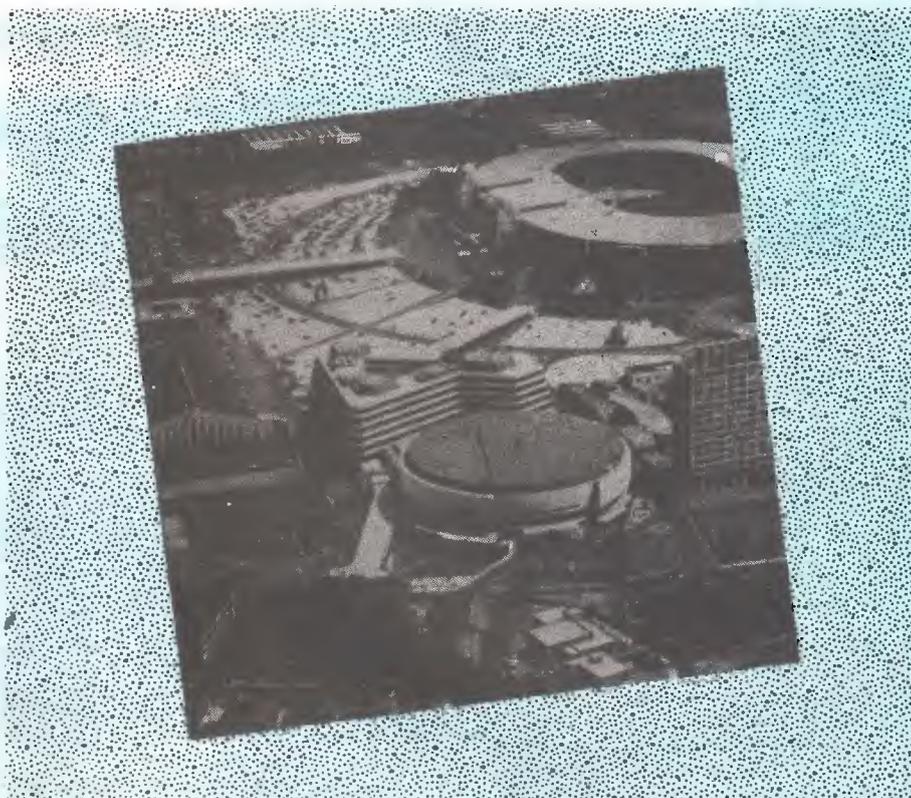
PCC



Wembley
Conference Centre London

9, 10, 11 April

The 10th of April is the anniversary of the first legal CB transmissions being made in America on that day in 1947. Anyone quick enough mathematically will have worked out that 10 April 1982 is the 35th anniversary of that occasion. Celebrate with us, whether you be an AM or FM breaker. Come to Wembley over Easter '82.



75 tickets or over 100 tickets or over
£1.25 each. £1.00 each.

Price on the day

The entrance price will be £2 per person, per day on the door, so it will be beneficial for you to organise a party booking and pay in advance.

OAP's and the disabled

People who can produce documentary evidence of either being an Old Age Pensioner or disabled will pay £1 and there is no need to book in advance.

Facilities for the disabled

Wembley Conference Centre is a modern building and as such is well equipped with ramps, lifts and suitably designed toilets. These facilities make us able to offer a full welcome to people in wheelchairs as well as the able bodied.

Express entrance

We will have a separate express entrance for people in possession of advance tickets which Old Age Pensioners and the disabled will be able to use. People buying tickets on the day will have to queue in the normal way.

Children

We welcome children to the "1982 CB show" and if you are under the age of 12 you will get in for half price (£1). Infants under the age of three will get free admittance.

Advance booking conditions

Advance tickets are sold at a flat rate regardless of the user, i.e., adult, child, etc. Therefore having purchased a discounted quantity of tickets additional children, etc., may gain entry with the party through the express entrance at the £1 rate.

Entrance Charges

"The 1982 CB Show" will be good value for money. We are offering substantial discounts for group bookings made in advance. The following prices apply only to bookings made before 10 March 1982.

25 tickets or over 50 tickets or over
£1.75 each. £1.50 each.

Please send me.....tickets, which are valid for any one of the three days.
We are hoping to come on 9/10/11 April (delete where necessary).

Name.....

Address

Tel. No.....

I enclose a cheque/PO for £.....

Please make cheques/PO's payable to CB Radio (Exhibition).

Return to CB Radio Magazine Ltd., Tudor Works, Beaconsfield Road, Hayes, Middx. UB4 0FL.

Readers Write

A million to one copy?

Dear Sir,

The proud owner of a brand new legal FM rig for all of 12 hours, and not a copy to my handle! I set out from my home 20 in Bracknell at 8.30 on the morning of 9 November and headed for the M3.

Just before joining the Super Slab, I heard a fellow breaker (I felt I could call him that now) call "Fourteen for a copy".

Pity no one wanted to modulate with him, I thought, he was putting the S meter on my rig well over nine.

I'll have a go and christen my rig and see how we make out.

"Come back, Silver Fox. You have a copy, pick a window."

A nice quiet channel near the top of the shop was selected, greetings exchanged and my first copy was established. The four watts at 20 notes a watt were getting me a wall to wall report and my first breaker friend.

It was obvious that Silver Fox was following me in my roll eastwards towards The Smoke and our exchange soon disclosed that it was a first copy for us both. I mentioned that I was going to park my wrapper at Richmond and use the dreaded Tube to get me to the West End. Silver Fox said he had a garage near his office in Mayfair and offered me a ride to town in his wrapper. At least, he said, it would use a chance to chew over the vast experience we had gained from our first copy. This seemed a good idea and enough information was exchanged to ensure an eyeball and high numbers and a few 10-10's were exchanged leaving me to continue the journey to my selected car park with the feeling that truly I had joined the happy band of breakers.

Some 20 minutes later, I saw Silver Fox's wrapper draw up clearly identified by his shining new twig. When the eyeball happened, we were both completely speechless for a minute or two.

Silver Fox was a past neighbour and colleague of mine when we had both worked in Nigeria 21 years ago. What is more, neither of us had met, or heard of each other, since that time in 1960!

In the next half hour we didn't notice the traffic jams and two very contented new breakers exchanged enough verbage to occupy all 40 channels for a considerable time to come.

The White Avenger (Ken Davies)
Bracknell 20

Dear Sirs,

I would like to bring to your attention a very urgent matter. A young friend of mine who knew nothing about CB radios, purchased a

rig and asked for my help to set it up.

This presented no problem until I reached the SWR'ing stage, when a very irate voice asked me to refrain from keying the mike on Channel 20. I reminded him that channels 20 to 25 (in this area) are hospital channels only on AM, to which he replied "This is AM, you fool!". Further tests on other channels with this same gentleman made us QRT and beat a hasty retreat to our local rig doctor.

The operation was swift and simple. A pair of fine tweezers removed a small self-adhesive CB 27/81 label which adorned the front of the rig, thus disguising a perfect Colt 210 AM.

The pain was my friend's when he realised that his wallet had been lightened considerably by some shark in his local barley-pop shop.

The point I am trying to make is this - what would have happened if a not-so-friendly Buzby had happened along before our rig doctor spotted the deformity?

Yours faithfully,

Karaya No. 1

Dictator 81

Willie Whitelaw is a very funny man, On CB AM he has put a ban.

He has given us FM in his directive And that is a joke with which we cannot live.

The poor fool thinks he's doing right But he'll soon learn we mean to fight. He makes decisions, he does not understand,

He has to rely on advisers, a queer sort of band, They may be technical, YES, but practical NO,

They've messed things up from the very word 'Go'.

They advise, of course, but to suit their own ends

But they will find it pays no dividends. Japanese production has us beaten

hands down Because for two years the HO acted the clown.

THREE MILLION breakers must be right

They OPERATE rigs by day and by night.

They are the ones who know the score And that's what makes them so bloody sore.

Ask the BIG WHEELERS who roam our land,

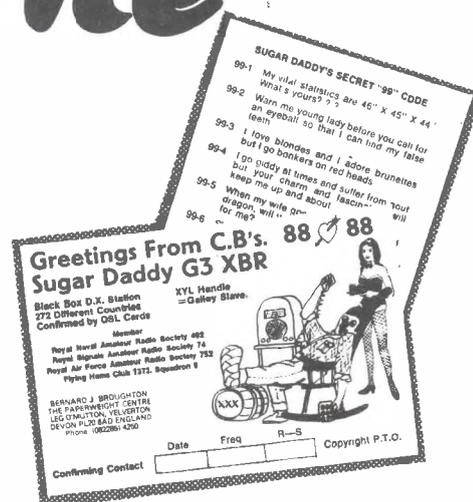
Is one mile enough on the FM band? If you want more, your luck has run out.

To get a good copy, open your window and shout.

We are supposed to be living in a land that's free.

Whitelaw says, "It is, if you agree with ME".

Mechanic, MCBA Wirral



Dear Sirs,

This QSL card is of my own origination. I thought you might like to include some humour in your publication by reproducing it.

I might add that I have held an amateur licence for 14 years and have been a member of The Radio Society of Great Britain for a like period. In view of their dry as dust publication, I am losing all my interest in ham radio.

Yours faithfully,

Bernard J. Broughton

Dear Ed,

I thought I would drop you a line to let you know what CB has done for me.

I first heard a rig back in June of this year, 1981. I was suitably impressed to think about buying one. I didn't really bother until August, when I was out shopping, saw a rig for sale and decided to buy it.

At first I felt a bit foolish talking to someone I did not know but as I got to know people and eyeball people I became hooked. My job is one that leaves little for a social life as I work nights, weekends and long hours.

I have found that I can talk to someone different as soon as I get in my car instead of the usual people from work.

It has opened up a new and different world for me and I am so grateful.

My rig is AM as I have been on the air for about four months now. I do not know enough about FM to decide whether to change or not, that is why I read your excellent magazine.

I am even trying to get my boss to invest in a rig and I may soon succeed.

Because of my job we often have the police around but no one has said anything to me and in fact I have copied some with their own rigs.

CB is excellent, I hope it is here to stay. If it does for others what it has done for me it can only be good.

Yours,

Switch Bitch (The Big E)
Lyn Eveleigh, Exeter, Devon

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Readers Write

CB or not CB

My husband's got a new CB
He says it's meant for him and me,
Though when I try to use it, too
He says, "That copy's not for you".
Jack o' Diamonds is his name
And playing with a rig, his game,
He speaks a funny language now
As for English, he's forgotten how.
It's code words now like Smokey Bear
Or 'Breaker 1-4, are you there?'.
He talks of rigs and twigs and things
I often don't know what he means,
He'll answer questions with '10-4'
And then he'll 'modulate' some more.
No longer do I hear of John or Ted
Now it's Black Knight or Jaws instead.
Late at night he'll come in bleary-

eyed,
I'll never understand him, God knows
I guess I'll have to join in too
One day, when I know what to do.

I'll need a handle like Snow White
maybe

Or perhaps I'll just be Jelly Baby.
Jelly Baby (Wilts)

Dear Sirs,

My reason for writing this letter to you is to correct an oversight of Mr. Reason, to wit, the British frequencies are NOT international frequencies and recognised as such.

As a result, our channel 9 (Frequency 27.68125MHz) is not recognised as a 'Distress' channel. Now whilst some 'almost' legal CB'er, say in Italy, might be having a very enjoyable DX QSO with a friend far away, he might also be using some amount of 'Whiskies' . . . up to 500 (or more), and if by some tragic coincidence a *feeble*, yet *desperate* MAYDAY call was made at the same time, it would be very effectively swamped, thus resulting in Terminal Skip for the victim.

To avoid this dilemma, I appeal to you to suggest that in the spirit of common humanity, all international users of our radio spectrum agree on a suitable frequency to be used for these occasions.

Is it also possible that we could contact CB magazines in other countries to ask for their co-operation? After all, we all know that USB and LSB will swamp even FM.

Yours hopefully,

Karaya

Dear Ed,

As a fervent CB'er for the past three years, I feel it is time that I put pen to paper and aired my personal views. The fact of the matter is that Citizens Band radio can only be called CB when the frequencies used are 27 megs AM and SSB.

Items that I have read most recently in magazines and newspapers pertaining to FM cannot be classed as Citizens Band Radio.

I feel that CB'ers in this country have been sold down the river by the Home Office, Post Office, Government and anybody else that supports the FM campaign in this country.

Recent reports that certain firms manufacturing FM equipment are causing havoc to Heathrow and Gatwick airport equipment, the outcome of which was reported in the papers as being caused by CB'ers, is completely and utterly out of order. I think, personally, that anybody purchasing a licence for the new legal equipment in this country is just giving in to the Government.

Yours sincerely,

Mac Skeet

Dear Sir,

Legal 27MHz CB has been with us for a little over two months and I must say it seems to work. It would work a lot better if it were not for the sidebanders and others using Hi and HiHi channels on AM, creating interference and blotting out legal operators.

I expect that many CB'ers will be unaware that they are causing interference to the new system. For those who don't know, and don't want to interfere, please stay below channel 56 (16 High) which is 27.605MHz and above channel 11 on the HiHi band, which is 27.985. If you stray onto the 28MHz band, you'll annoy the hams. Some ham operators have already threatened to jam 27MHz if this occurs.

I have had experience during these last two months of breakers who are deliberately jamming channel 14 of the legal system in the south London area with powerful transmitters. One expressed his feeling that he didn't like the new system, and was going to jam it, only in more colourful language. If this happens, I suggest that you use the next highest available channel as the calling channel (listen before you speak), until you have cleared the area or the problem ceases. Then report the matter to the GPO. Such people deserve to be caught and heavily fined, as they are doing no favours for the cause of AM CB either.

I have no quarrel with the AM CB'ers. I have been on AM myself for over a year. I have checked out the range of both systems, communicating mobile to mobile, and found the difference to be insignificant. No longer do you need to be a closet breaker!

If you must stay on AM, please keep off our frequencies. If you want to DX then become a licensed amateur radio ham.

I won't hesitate to report interference in my area and other local legal breakers should do the same.

Yours faithfully,

Papa Bravo (Peter Braybrooke)

Dear CB Radio,

As a legal FM breaker, I would like to make a plea for a united front in any campaign for an even better system. For years I campaigned to get an acceptable legal CB service and, despite the strange frequencies and antenna restrictions, I think that 27 FM is fine for the time being.

What we now have to look at is the European dimensions. From the legal systems of other EEC countries, this seems most likely to be an allocation with the FCC40 and probably on FM. The current legal channels are likely to become overcrowded in the next year or so and I would suggest that the future campaign should be for legalisation of the FCC40 in addition to the current UK 27 FM 40. To avoid arguments with AM breakers, I am quite prepared to press for the additional frequencies without mentioning the type of modulation to be used there. This would leave AM breakers free to campaign for AM without opposition. Unfortunately, I think it will be another long slog since the Government has to consider the rights of legal users of that band.

Following that plea for unity, I will now go on to start a bust-up. All FM breakers recognise the debt they owe to AM breakers in the campaign for legalisation. AM breakers should similarly recognise that some of their former good buddies prefer to act within the law and so have switched to FM. Also that a lot of the more open pressure for legalisation came from people who were not prepared to act outside the law. I do not recall pressure for 27MHz frequencies outside the FCC 40, so why are some AM and SSB breakers out to cause deliberate and malicious interference in an attempt to destroy the legal 27 FM service. I have no quarrel with users of the FCC 40 and I am quite happy to share the legal channels with any breaker who doesn't use excessive power and whose transmissions are compatible with mine but these turkeys seem bent on setting AM and FM breakers against each other. All CB clubs should condemn their actions.

Yours sincerely,

Jaybird (D. J. East)

Readers are always welcome to write to us about something they feel strongly about.

We cannot guarantee to print it, especially if we read it elsewhere in the meantime, but we are always interested in reading your letters.

HANDS UP. WHO'S GOT SQUELCH?



If you don't know CB jargon, you'd better start learning fast. (The squelch control on each set reduces noise and hiss between transmissions.)

Because any day now, you'll be overwhelmed with enquiries from CB enthusiasts, asking about Rotel in particular.

All the Japanese know-how

which made our hi-fi so popular, has been put to good use in our CB rigs.

Every set in our range carries the hallmark of Rotel quality.

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Or you could be throwing your hands up in despair.

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Parliamentary Review



No more channels and no AM

It seems to be taking our honourable Friends in the House a considerable time to agree on a common policy for the future of CB in this country. Speculation that 27MHz AM will be legalised has been with us for over a year now and it is still getting the occasional mention in the House of Commons. Another matter that gets considerable 'air play' is the question of a revised service to bring together an internationally compatible service, especially where Europe is concerned. Taking the past record of our honourable Friends into account, it is quite likely that we are to be kept waiting for any of these items to be finalised.

Comparable licence fees

Mr. Moate asked the Prime Minister if she will take steps to make comparable the licence fees applicable to yacht radios and citizens' band sets.

The Prime Minister: The fee for each group of licences under the Wireless Telegraphy Act 1949 is set with regard to the costs involved. Since the costs differ, so do the fees.

The sale of illegal equipment

Mr. Henderson asked the Secretary of State for the Home Department, in view of the introduction of a legalised citizens' band radio channel, whether he is taking any steps to discourage the sale and use of illegal equipment.

Mr. Raison: Proceedings will continue to be brought under the present statutory provisions against users of equipment which does not comply with the relevant technical specification. We hope that when parliamentary time permits, it will be possible to introduce legislation under which the sale of such equipment would be prohibited.

Legal AM?

Mr. Allen McKay asked the Secretary of State for the Home Department (1) if he intends to legalise AM transmission on the 27 metre band, or any other frequency, in either the normal or single side band mode; (2) if it is now the policy of Her Majesty's Government to confine citizens' band radio to FM transmissions and to exclude the possibility for the foreseeable future of amplitude modulation - AM - transmission.

Mr. Raison: Amplitude modulation is permitted in certain services where it will not cause widespread interference, but it is not an appropriate method of modulation for citizens' band radio. We have no intention of authorising the use of AM for the citizens' band service.

More channels

Mr. Allen McKay asked the Secretary of State for the Home Department if he intends to allocate additional bands to the 40 already allocated on the legal FM system to alleviate the overcrowding already becoming apparent in some parts of the United Kingdom.

Mr. Raison: No. We have no reason to suppose that the 40 channels allocated are insufficient. They represent the highest number allocated in the 27 MHz band anywhere in the world.



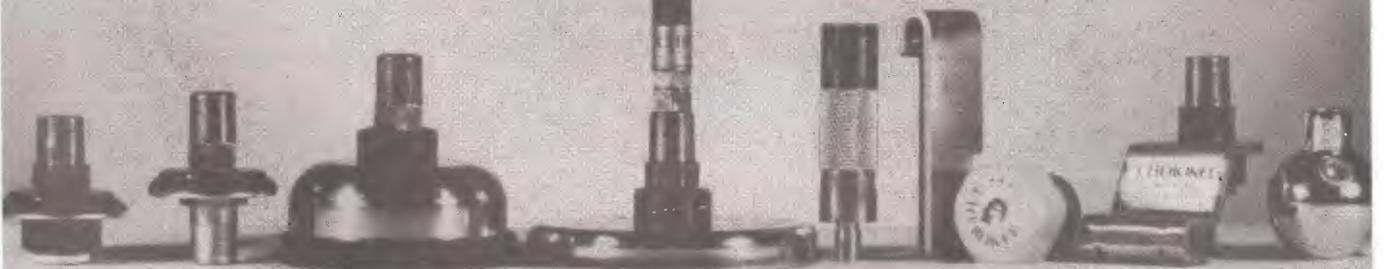
Illegal SSB transmissions

Mr. Allen McKay asked the Secretary of State for the Home Department what steps are being taken by his Department and other enforcement authorities to stop illegal AM and single side band transmissions which cause serious interference on other domestic appliances as well as on the legal FM bands.

Mr. Raison: Within the limitations on manpower and resources, the radio interference service of British Telecom, which acts as our agent in these matters, is doing everything possible to trace users of illegal CB sets with a view to prosecuting them. The importation of CB sets which do not meet the requirements of the legal service is prohibited, and large numbers of such sets are seized by Her Majesty's Customs. We are considering the need for legislation to strengthen the existing enforcement powers.

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HAD THE BEST MOUNTS**

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CHEROKEE MOUNT**



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NEWS REVIEW



A further decline in CB press coverage has occurred this month, although the articles that have appeared have been of a higher standard than is usual. A pleasant surprise is the lack of those awful 'Rubber Ducky' articles that I commented on last month. Instead we have received a small amount of relevant press clippings relating genuine CB activities and incidents. It's good to see that charity events are still playing a major part in the activities of CB clubs and that legalisation has not encouraged the clubs to abandon their Good Samaritan image.

East Anglian Daily Times

Griffiths attacks CB radio delay

Whitehall's handling of CB radio has been criticised by Bury St Edmunds MP Mr. Eldon Griffiths. Although he has no personal interest in CB, Mr. Griffiths said that the manner in which legalisation has been handled dismays him. He has told Home Secretary William Whitelaw that if he cannot handle a small matter of this kind more effectively, why should the new generation have any confidence in its management of the wider issues of the economy or any other aspect of technology. Mr. Griffiths wrote to the Home Secretary after receiving a letter from the Managing Director of Pye Telecom, Mr. Graham West, saying that none of the company's advice given to the Government had been

heeded when CB was legalised. Mr. Griffiths said that there is serious evidence that the Government's handling of CB has had serious consequences, and that the future of CB in this country remained unsatisfactory and confused.

Western Mail

Watch that rig, CB owners are told

Police forces throughout Wales are suffering from a minor crime wave with thieves stealing CB radios and antennas from cars. They warned that the CB sets should have a crime prevention alarm fitted to them. Detective Chief Inspector Merwyn Bowden, crime prevention officer for South Wales, said that the thefts were being committed in all South Wales divisions. He also said that whilst the crime wave was not an epidemic, it is fairly obvious that there is a market for the would-be CB thief. Owners should put an identifying mark on their sets besides taking a full description so that the police can return the sets to their owners if they are recovered.

Manchester Evening News

These breakers could be citizens banned

Disgruntled Citizens' Band radio users in Manchester will begin breaking the law again after Christmas by switching back to their old

sets, says Ron Dutton, chairman of a Manchester-based CB club. He said that so many children will be getting FM sets for Christmas that the airwaves will be swamped. "It is already getting increasingly difficult to find a free channel," says Ron's wife, Maria, whose handle is Gemini. "By Christmas we'll have reached saturation point."

Ron is also appealing to breakers to scrap the emergency channel idea and leave the police, fire and ambulance services to deal with emergencies. He also says that the provision of more legal FM channels would enable experienced breakers to dodge what they call "The Muppet Show", the beginners who used to monopolise the basic 40 channels on the old AM system.

East Anglian Daily Times

A45 pushchair trip is attacked by police

A sponsored wheelchair push along a busy main road is to go ahead despite protests from police.

It has been organised by a Stowmarket CB club and will last for at least 10 hours and cover 42 miles, much of it along the A45.

The police say that the participants will be taking their lives in their hands. A spokesman for the police said that they are primarily concerned about the fact that they are travelling along a major trunk road, starting off in the hours of darkness: which means they

BREAKER, BREAKER — BROKEN!

TIRED of being constantly kept awake by the chatter of a CB radio enthusiast outside his home, Donald Brooking took the law into his own hands and snapped off an aerial on the car belonging to the offending "breaker."

Appearing before Kingsbridge magistrates yesterday, Brooking, of 46, Rack Park Road,

Kingsbridge, pleaded guilty to damaging a car aerial worth £11.75, the property of Tony Covachich.

Mr. Neville Jennings, prosecuting, told the court the offence arose from an incident on the evening of August 30, when Brooking had words with a neighbour, parked outside his home.

The exchange resulted in

Brooking snapping an aerial from Mr. Covachich's car.

In a statement, Brooking, a lorry loader, said he had to get up at 6 a.m. for work each day, and in recent weeks had been increasingly disturbed by two neighbours — both CB radio enthusiasts.

"Sometimes the noise from their CB sets goes on until four in the morning," said Brooking, 51,

who claimed the CB equipment also interfered with his television and record player.

On the night of the offence, said Brooking, he told Covachich to stop transmitting. When Covachich denied he had been transmitting, Brooking damaged his aerial.

"I just 'lost my rag' and that was it," said Brooking, who was given a 12-month conditional discharge.

are putting themselves and other road users in possible danger.

A spokesman for the CB club said that members have pledged their 100% support and have decided to ignore the police warnings. Club chairman Tallboy explained that the plan was to push two club members, who are paralysed from the waist down, from Newmarket to Ipswich. The club members are confident that £1,000 will be raised for the Stowmarket Target Club for the mentally handicapped. We look forward to seeing this figure confirmed.

The Standard

Have a care, says the CB churchman

Churchman Peter Law hopes CB radio will help people to do a "most un-English thing" – talk to each other.

He is compiling a list of fellow breakers in his area and has formed friendships with motorway drivers, businessmen and out-of-work youngsters.

"It's a sad fact," said Mr. Law, "but people find it harder to talk to each other these days. If you say hello to someone in the street, people think you are a nutter but if it's done over the airwaves they find it acceptable.

Mr. Law, Secretary of the Diocese of Rochester, has taken the name Southern Cross after the star constellation. His daughters, Rosaline and Victoria, have taken the names Semi-Quaver and Sticky Toffee. He said that it has been gratifying to talk to some young people and try to help them with their problems and that through CB he has met some of them face to face and they seem to appreciate that someone cares.

The Journal

Illegal CB still on the air

Hundreds of illegal CB radios are still being sold in the North East despite the opening of a new legal channel less than a month ago. Many CB enthusiasts claim that reception is so bad that they have refused to change over to the legal FM waveband from AM. A CB enthusiast from Sunderland said that many electrical stores are stocked up with AM sets which are still selling well. The sale of AM sets is not illegal providing VAT and import duty have been paid but it is a criminal offence to import or use them. The owner of a CB shop in Newcastle said they were concentrating on selling the FM equipment but if anyone wants to buy AM sets he made sure they understood the implications because they will be breaking the law.

The increased interference from CB radios is creating problems for the emergency services in the region. A spokesman for Northumberland Fire Brigade said CB users blacked out one channel completely for one hour last month. "It's a bit worrying and things have got a lot worse since legalisation," he said.

Have a care, says the CB churchman

CHURCHMAN Peter Law hopes Citizens Band radio will help people to do a "most un-English thing . . . talk to each other."

He is compiling a list of fellow "breakers" in his area, and has formed friendships with motorway drivers, businessmen and out-of-work youngsters.

"It's a sad fact," said Mr Law, 41, "but people find it harder and harder to talk to each other these days.

"If you say hello in the street to a stranger, people think you are some kind of a nutter. But if it is done over the CB airwaves, it is acceptable."

Mr Law, secretary of the Diocese of Rochester, has taken the name Southern Cross after the star constellation.

His daughters Rosalind, 12, and Victoria, 10, are "on the air." Rosalind has the name Semi-Quaver and Victoria Sticky Toffee.

Mr Law said: "It has been gratifying to talk to some young people and try to help them with their problems. Through CB I have met some of them face to face, and they seem to appreciate that someone cares."

The Sun

CB fans help coma 'buddy'

"Citizens' Band radio fans turned 'good buddies' to save a road crash victim stranded in a German hospital," we are told by the Sun. CB enthusiast Lindsay Bolt, whose handle is Stargazer, was in a coma after a motorway pile up and his family could not raise the £5,000 to bring him home.

The Beachcombers Breakers Association, which covers Dorset and Hampshire, came to the rescue by raising the cash to airlift him to a Southampton hospital.

Western Morning News

Breaker, breaker – broken!

Tired of being constantly kept awake by the chatter of a CB radio

outside his home, Donald Brooking took the law into his own hands by snapping off an aerial on the car belonging to the offending breaker.

Appearing before Kingsbridge magistrates, Mr. Brooking pleaded guilty to damaging a CB antenna worth £11.75 belonging to Tony Covachich.

Mr. Neville Jennings, prosecuting, told the court that the offence arose from an incident on 30 August, when Mr. Brooking had words with a neighbour parked outside his home, which resulted in the antenna being broken.

In a statement, Mr. Brooking, a lorry loader, said that he had to get up at 6.00am for work every day and in recent weeks he had been disturbed by two neighbours, both CB radio enthusiasts. Mr. Brooking said that sometimes the noise would go on until 4.00am and sometimes their equipment interfered with his television.

On the night of the offence, Mr. Brooking asked Mr. Covachich to stop transmitting. When Mr. Covachich denied that he had been transmitting, Mr. Brooking snapped off his antenna. He was given a 12-month conditional discharge.

Sunday Mercury

A double warning to CB fans

"CB fans beware, your hobby could land you in hospital or in court," warns the Sunday Mercury. The Midlands Electricity Board has issued a warning about tall CB masts after one of its engineers found two 40ft. antennas perilously close to overhead power lines carrying 132,000 volts. The antennas had been erected in the back gardens of Droitwich homes and the power had to be cut off before they could be removed.

The MEB warns that even car aerials could touch some rural power lines if they are too tall.

Manchester Evening News

Buddies, be wary of bogus rigs

CB radio enthusiasts in the North West are being warned by authorised manufacturers to be wary of bogus equipment.

This follows reports to an approved distributor that they had been offered illegal sets which had been doctored to resemble genuine FM equipment. One Manchester customer was offered a Major 500 FM set. He was suspicious and contacted the firm's Managing Director, Mr. Alan Sporn, who told him that it was impossible to buy a Major 500 in the UK as yet. He said that the set must have been of European or American specification. The set had a CB 27/81 approval mark on its front panel which must have been stuck on and not die stamped.

In a further abuse of the regulations, dual AM/FM equipment is being offered for sale in Britain. The sets are imported through the Isle of Man but are still illegal.

EYEBALL ON THE FRENCH RIVIERA

Hey good buddies...ya think ya've seen and heard it all? You're wrong! There's nothin'-no nothin' to compare with an eyeball on the French Riviera.

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You can have 2 great weeks on the Riviera for as little as £69.50. The price covers both travel and accommodation.

You'll travel by luxurious continental coach (each coach has video film entertainment, built-in toilets and a courier service).

You'll stay in fully equipped ready erected 6 berth chalet tents or 4 berth caravans (Continental breakfast is also included).



You'll have first class beach sites and enough eyeballs to send you wild with delight...mmm those bodies on the beach!

Send for a brochure and ask for the special CB Group rates. Departures from Newcastle, Sunderland, Carlisle, Leeds, Liverpool, Manchester, Birmingham and London.

See you at our 20 in the South of France. 10.10 Breaker Break 123 down on the side We're satisfied, I've gone.

The Holiday Man.

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Base Load GPO	£16.45
Mag Mount GPO	£16.45
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New B27	£16.50
Avanti 241	£18.90
Avanti 241M	£23.90
Avanti 241T	£26.65
CB 500	£21.95

AMPS - NOT GOVERNMENT SPEC.

25 Watt	£21.45
50 Watt	£48.70

ACCESSORIES

PA Horn	£4.50
Mag-Mike Holder	65p
Ext Speaker	£3.75
SWR Meter	£6.50
SWR/Power Meter	£10.00
SWR/Power/Matcher	£16.50
Standard Eyeball Badge	50p
Electric Flashing Eyeball Badge (state handle)	£2.50

POWER SUPPLIES

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7A	£16.50

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FREE RADIO



A closer look at a Free Radio station

Our past two articles on Free Radio have been rather general – an introduction to the subject rather than a deep insight. To give a more detailed picture of how a Free Radio station operates, Radio Krypton kindly opened its usually firmly locked doors to us to take a closer look. Names and locations have been changed to protect the innocent!

The beginnings

Radio Krypton is mainly the work of three people – Dave, production and engineering, Kevin, original presenter and Jimmy, a presenter who joined a year after the station started. Mike Skater presents an additional Top 40 programme each month and Clare and Sue help with occasional programmes and form the jingle department. They also get roped in for the annual bout of Christmas lunacy.

Krypton first began broadcasting on 18 March, 1979 on 6230KHz in the 48 metre band (short wave). Original broadcasts were an hour and a half long, presented by Kevin Kent. The broadcast frequency was quickly changed to 6225KHz as it became obvious that the station was too close to other stations' broadcast frequencies for a clear signal. So on 15 April, 1979 Krypton moved to the frequency it has occupied ever since.

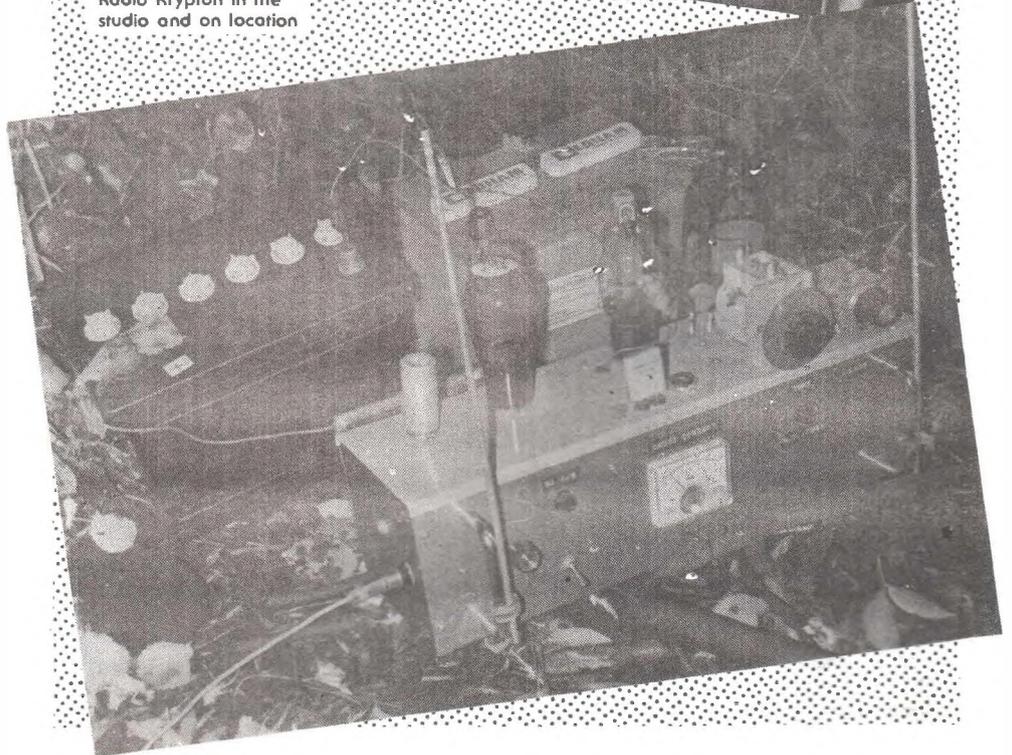
In common with many other short wave stations, Krypton broadcasts on Sundays. All programme schedules are on GMT and run from 11.00-12.00 with Kevin Kent and 12.00-13.00 with Jimmy Daniels. Krypton is restricted to Sundays only, although other free radio stations transmit for several (or even 24) hours over the weekend.

Programming style

Krypton plays a selection of contemporary music and 'golden oldies', usually alternating the two. Although this sounds very middle of the road, they also offer more ambitious programmes, such as the serialisation of the Motown story and Rock 'n' Roll of the 20th Century. Their presentation is very informal and their occasional special programmes (like their Christmas radio pantomime Cinderella



Radio Krypton in the studio and on location



STUDIO EQUIPMENT

2 x Goldring GL75 turntables fitted with Stanton 500 broadcast series cartridges
AKG D202 and D24E microphones
SIS S130 cartridge player
Allen and Heath six channel stereo production mixer technics RS631 cassette deck (with Dolby)
Sony TC266 open reel tape deck

TRANSMITTERS Both types crystal controlled

1. Valves TX, output 15 watts
Valves – ECC81 audio preamp; 6L6 audio power amp;
807 crystal oscillator and power amplifier
2. Solid state TX, output 3 watts to 100 watts
Semiconductors – 2N3819 FET oscillator, TBA 810 Integrated circuit
BFY52 amplifier, VN67 AF VMOS driver
2 x SD1452 high power linear amplifier

ANTENNA

Horizontal half wavelength dipole with toroidal unbalance to balance transformer. At approx 50ft. above ground level, fed with co-axial cable



**RADIO
KRYPTON**
Information
Sheet



Krypton send out an information sheet and QSL to correspondents and QSL'ers .

Boots) reach new heights (or plumb new depths!) of radio comedy. The staff at Krypton do not regard themselves as trail blazers in programming or presentation but hope they offer an entertaining, enjoyable programme and although informal and light-hearted their presentation is always professional. They are always careful to observe the unwritten 'no play' list as records such as Catch Us If You Can can be regarded as direct provocation by the Home Office. They also go to great pains to avoid being controversial or political as this would also guarantee close investigation by

the powers-that-be. By following these fairly basic rules they have been able to operate for nearly three years without any problems at all. This discretion also extends to their actual transmitting.

Although the programmes are broadcast on Sunday, they are actually recorded on Thursday. The studio is set up, the play list and a rough script already prepared and the list of do's and don'ts are prominent in front of the DJ. The clock is set to 11.00am to allow the accurate time checks and the jingles are ready. Bearing in mind such appropriate

mottos as "Don't open your mouth until your brain knows what to say", Kevin Kent launches into his show. The show is taped straight through without any stops to prevent any hiccups with the time. For special events, programmes can be extended up to four hours and programmes are also geared to any particularly interesting items. (For instance, the week after my visit to Krypton they presented a CB special, involving CB music, slang and news).

Studio facilities

The studio set-up, although limited to a spare bedroom, is very organised and fairly comprehensive. Some of the smaller local radio stations could be envious! The record collection takes up any space not taken up by equipment. The station identifies itself clearly every 15 minutes as up to 50% of its listeners are European 'hobby listeners' from whom they receive a large amount of letters and QSL cards.

On the Sunday of transmission, the transmitter, batteries and cassette player are taken out to the location and the aerial erected. The equipment is located discretely and the recording started exactly on 11.00 GMT. Dave and whoever is accompanying him withdraw some distance to monitor the transmission. They reckon it's less painful to lose £50 worth of equipment than to risk large fines themselves! Radio Krypton uses 15W transmitter power (10-30W is typical for this type of station). They do have a 100W transmitter but very rarely use it – they find their 15W enough to reach Europe and most of the UK although obviously they are affected by weather and atmospheric conditions. Their transmitting equipment is home built and they have a spare as a back-up.

The station is entirely financed by the staff and they accept no advertising. They obviously get no financial benefit from the station (in fact quite the reverse) but do it for the fun of it and presenting a satisfying programme. They also get a lot of feed back from mail (including signal reports from Europe) that makes the hard work worthwhile.

The staff at Krypton feel that Free Radio has definitely grown in the past few years and that CB is contributing to its growth as the listeners and broadcasters are often interested in CB too. As technology develops, people are getting more directly involved instead of passively accepting it and broadcasting of any kind, whether building the equipment, actually hosting a programme or 'breaking' is an involvement in a new technology as it grows.

Our thanks to Krypton for their help and willingness to be put 'under the microscope', especially as they value their privacy. (Not paranoia as it means they have been very trouble free through their three years).

Next month we shall look at Europe.
SS

Simply C.B.



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IPB INTERNATIONAL, ELECTRONICS DIVISION, BELLE VUE WORKS, CHINLEY, STOCKPORT, CHESHIRE.

Round Up

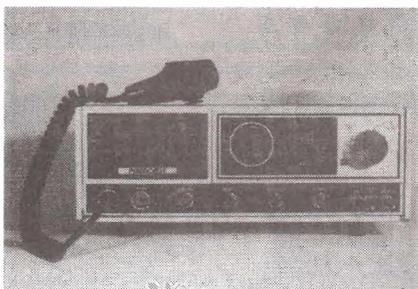
Photocall

These two ladies are Lady Grecian and Sapphire and are monitors on channel 19 in Wakefield, West Yorkshire. They spend a lot of time giving the latest traffic and weather reports to the truck drivers on channel. The ladies also help with emergency monitoring on the M1 and M62.

They rarely get to meet the drivers they help and have made friends with so they wrote and asked us to publish the photo so the drivers have an idea who they are. Say no more, ladies, here you are!



President base rigs (through various devious means) are also available in this country. The President KP77: the brushed aluminium case features a brite/dim switch, tone, mike gain as well as the more usual features. It looks more spartan and functional than the Diplomat but costs £155 approx.



The well-known brand name: President KP 77.

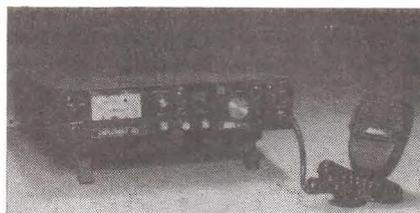


Green Meanie of the Dagnet Club, minus half a beard. One of the fund-raising events organised by the club.

Base rigs at last!

In their hurry to bring out legal mobile rigs, manufacturers seem to have neglected base stations. Now the market is saturated with legal mobile FM sets, base rigs are beginning to appear.

The JWR (John Woolfe Racing) Diplomat 40 is a purpose-built home base rig and features a switchable filter, squelch, RF gain, SWR, head-phone jack and a host of other goodies. It also has an option for Sel. Call (which is not included in the purchase price of approx. £194). The set runs on mains voltage (220-240V 50Hz) and can be used with a base mic. or hand mic.



The JWR Diplomat 40 Base Rig.



Project Angel

The Dagnet DX Club of Hayes are organising a project to bring over to this country a disabled lady DX'er from America.

Angel is blind and suffering from multiple sclerosis. She has always wanted to travel to this country and is able to get a vivid mental image of the place she is visiting if someone describes the scene to her. Angel is well known in international DX'ing circles, as CB is her one link with the outside world and she has made many 'radio' friends.

The Hayes-based club are very organised and have contacted many British clubs and international DX clubs to appeal for funds. They have also spoken to the British Multiple Sclerosis Society for advice on how to care for Angel during her trip. Other clubs are also organising social events to raise money to boost the fund.

Angel comes from Springfield, Ohio and is known as India Romeo Sierra 44. She has been on channel some months and uses the radio at least three hours a day as she is at home on her own. For all her disabilities, she is always cheerful, which is the thing that always impresses her contacts most.

The idea started from one of the Dagnet members who has talked to Angel several times on channel and felt that this was a very worthwhile cause and could also bring beneficial publicity to AM/SSB CB. Clubs or individuals wanting to donate to the fund should send it to The Dagnet Club, PO Box 46, Hayes, Middlesex.

S.C.R.E.A.M. Channel 9
C.B. Monitors
STOCKPORT CITIZENS RADIO EMERGENCY ACTION MONITORS

Help on the air waves

Two new monitoring systems have started up recently, one in London and one in Cheshire.

"Base Station One" is in West London and concentrates on traffic information during rush hours in the evening between 16.30 and 18.30 hours. It is manned by eight base stations who receive up-to-date information from mobile breakers which is in turn forwarded on to road users asking for traffic reports. Channel 17 is used and so far has proved to be very successful.

The organisers are hoping to introduce early morning coverage. Contact Base Station One at 54 Weltje Road, Hammersmith, London, W6.

SCREAM, or Stockport Citizens Radio Emergency Action Monitors, are in Stockport, Cheshire and have an original approach to monitoring. They are purchasing CB equipment which will be given to disabled people so they can in return help by monitoring the emergency channel. They need some help, either by sponsoring or by being able to buy rigs at cost price. If anyone can help contact SCREAM at 25 Hollowend Towers, Brinnington, Stockport, Cheshire.

Staff stories

We're a fairly secretive bunch at CB Radio Magazine you know. We just get on with our job, write our articles, take our pictures, put together the magazine and go home at the end of the week with the satisfaction of a job well done (we hope!). No great social scenes, ambitions or mad desires to get our pictures or personalities into the mag. No wild parties either, or until now that is. So a small item to prove that we are human really.

It was JOH's birthday recently. He's not saying how old or anything silly like that but we've all been working together for a while now so we thought "What the hell, give the old boy a bit of a party".

We've got a big graphic camera at the office (not idle boasting - it's relevant to the story). The camera operator made a load of life-size prints of the Editor's head and made them into masks. Enough to scare a schoolful of kids. We had a big birthday cake made and put a large amount of candles on it (not saying how many again!) and ordered a singing telegram. A Miss Piggy and Kermit singing telegram actually.

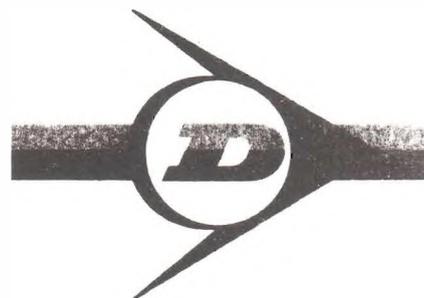
On the big day we all went down the pub whilst one person kept JOH in the office talking about boring things like production schedules and they followed later - only to walk in and find the best part of the pub wearing the boss's face. We thought that was pretty funny because we had already had a few brown bottles by then. It

was getting very unruly when the telegram arrived. Ever been sitting in a pub when Miss Piggy and Kermit walked through the door? Makes you wonder what the barmaid's been putting in the bitter. Anyway, Miss Piggy and Kermit sang a song about JOH (written with all the secret information we supplied) and brought the pub to complete chaos. Then we had spray streamers, booze, birthday cake, drink, presents and more alcohol.

Looking back, it was returning to the office that was the big mistake. There was a sizeable amount of people and drink taken back. We put some music on, opened the cans and bottles and carried on - which leads in a round-about way to the purpose of this item. Sorry if you tried to phone us that afternoon. In fact, very sorry, as you probably either got the engaged signal where we took the phone off the hook or you got an incoherent member of staff, politely but with a rather slurred voice, asking you to ring back next week, or next year, or something.

Here are a few photos of the day's disgraceful events. No names, no pack drill as we've still got to make a living. Won't happen again, I assure you, although it is Carole's birthday soon . . .

Whilst we're on this insight into CB Radio Magazine, you might like to know that Paul's wife had a baby girl called Maria very recently (mother and daughter fine), Colin's getting married in the summer and Sue's cat is feeling better. See, we are human.



Dunlop CB Truckers Club

That well known 'doughnut' manufacturer, Dunlop, has started a not-very-exactly-named club called the Dunlop CB Truckers Club. The name's not very exact because it is open to all breakers, whether car, truck or base but to quote from the press release "is designed to unite good buddies all over the country under one flag".

The club operates from Fort Dunlop in Birmingham and is on channel as Flying D. Breakers in the area on the M6 should be able to copy them as they pass.

Club members will have to pay £2 for life membership and this will entitle them to discounts on rigs and accessories, a newsletter, membership card, T shirt and sticker. Information on tyres will also be available! Further details are available from the Membership Secretary, Dunlop CB Truckers Club, PO Box 37, Leamington Spa.

SOS

A quick appeal for help for a Dr. Barnardo's Home for Disabled Children. A group has become involved, through the Duke of Edinburgh's Award Scheme, in setting up a CB system for the children. Because a lot of them are in wheelchairs, equipment has to be modified to make it suitable and the group need help in information, equipment and, I suspect, money. If you can help these kids lead a less restricted and more interesting life, then contact Philip Clarkson, 5 Greenway, North Curry, Taunton, Somerset.



CB for the community

Help in more ways than one from CB

Illnesses that are obvious nearly always gain sympathy - everyone can pity someone visibly suffering, or with a cold or measles. Other, less physical, illnesses can be as severe and even more disabling but don't attract the public condolences. In fact just the opposite, as many people judge harshly and offer such helpful advice as "Snap out of it" or "You're not trying to help yourself".

But just for a moment, forget your usual life and imagine what it must be like to actually be afraid of going outside your front door. No pints down the pub, no shopping for a new rig or groceries, no taking the kids down the park. No driving or going to visit friends and relatives - and no real obvious sickness. Frightened? That's only imagining it - consider what it must be like to actually suffer from agoraphobia.

The situation is not as bleak as some years ago - phobias are now more generally accepted and more aid and sympathy is extended towards phobics.

Tony Elliott of the Nottingham and County Phobic Association knows just what its like - he suffered himself. Because of his personal experience Tony felt he could help people in a similar position to come to terms with their illness and help them to get over it. In 1974 he made his first tentative contacts and his scheme quickly grew. Often dizzy and perspiring from his own illness he appeared on radio and television explaining his therapy could help similar people. Tony was able to go back to work but other medical problems meant he had to give it up.

Tony returned to the Association as its Founder President and all his energies have been directed into strengthening its position. Encouraged by the support he got and financial aid from the local authority, he has opened a rehabilitation centre in Nottingham, open daily for therapy and help for any phobic sufferers. The organisation is completely voluntary and no fees are charged.

So what has this to do with CB? Quite a lot, and in several different ways. If you are agoraphobic how do you get to a bus stop or catch a train? Transport was a problem until the local breakers' clubs and the Nottingham Grand Council of CB Clubs

The Nottingham and County Phobic Association

(Registered Charity No. 504951 - 1974)

(Hon.) Founder President: Mr. Tony Elliott

1 OBAN ROAD, CHILWELL, NOTTINGHAM NG9 2IK

CB BID TO BEAT PHOBIAS... 'Lifeline' for the housebound

BY DAVID LOWE
A CITIZENS BAND radio service to aid the elderly, depressed and disabled is to be launched in Nottingham.

Messages go on the air in the Citizens Band (CB) system when the Government has agreed to fund the service.

And the service will be available to all those who are housebound.

Two local people who have suffered from this kind of illness are Tony Elliott and Mrs. Eileen Elliott.

Mr. Elliott has been unable to talk about his problems and Mrs. Elliott has been unable to leave her home.

Now, if I had my way, I would like to pick up the radio and talk to you.

Mr. Elliott is now able to talk about his problems and Mrs. Elliott has been able to leave her home.

Mr. Elliott is now able to talk about his problems and Mrs. Elliott has been able to leave her home.

People who are not in the car and who have no other means of transport can use the service.

Mr. Elliott is now able to talk about his problems and Mrs. Elliott has been able to leave her home.

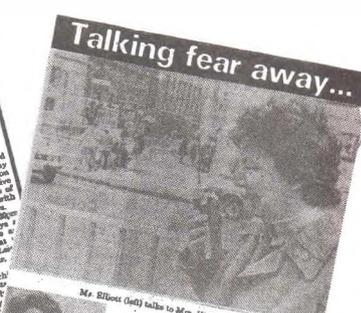
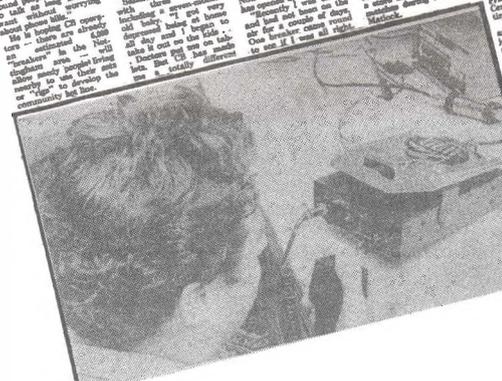
Mr. Elliott is now able to talk about his problems and Mrs. Elliott has been able to leave her home.

Mr. Elliott is now able to talk about his problems and Mrs. Elliott has been able to leave her home.

In the past few years Mr. Elliott's condition has become worse and Mrs. Elliott's condition has become worse.

Mr. Elliott is now able to talk about his problems and Mrs. Elliott has been able to leave her home.

Mr. Elliott is now able to talk about his problems and Mrs. Elliott has been able to leave her home.



decided to do their bit. Through fund-raising events and functions they have bought two cars for the Rehabilitation Centre, one within six months of being notified of the problem. They are now working towards a mini bus and collecting money for a residential home. So number 1 - transport through CB.

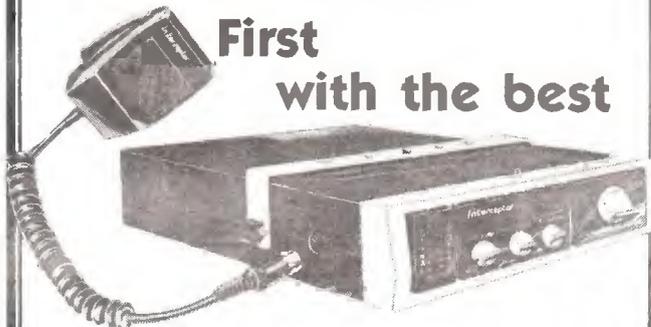
The legalisation of CB also means that an inexpensive communications system is available. Tony had started using very expensive donated walkie-talkies to help people advanced enough in their therapy to go out into the local shopping centre. As they make their way around the shops they are in constant contact with someone giving them support and encouragement. They are fortunate in that a local business lent the walkie-talkies but with legal FM walkie-talkies they can afford their own and many more of them. Number 2 - communications through CB.

The other big positive benefit is for people who are home bound or too frightened to meet and converse with others. CB gives these people contact with others without the worry of mounting telephone bills. Patients and local people in this position have been able to talk about their problems and get over their reluctance to make friends and meet people. It also gives them immediate contact with the outside world in case of emergency. Number 3 - therapy through CB.

The Association see CB as becoming an essential tool in their treatment and help for phobic sufferers. So instead of just hearing about how good CB is for the community, here's positive proof of its benefits. (It's also worth remembering that whilst you might enjoy using the rig for a wind up and talking to your mates on the pub, it can mean something very much more serious for quite a lot of people).

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**You've got to
go some to be
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in the States.**

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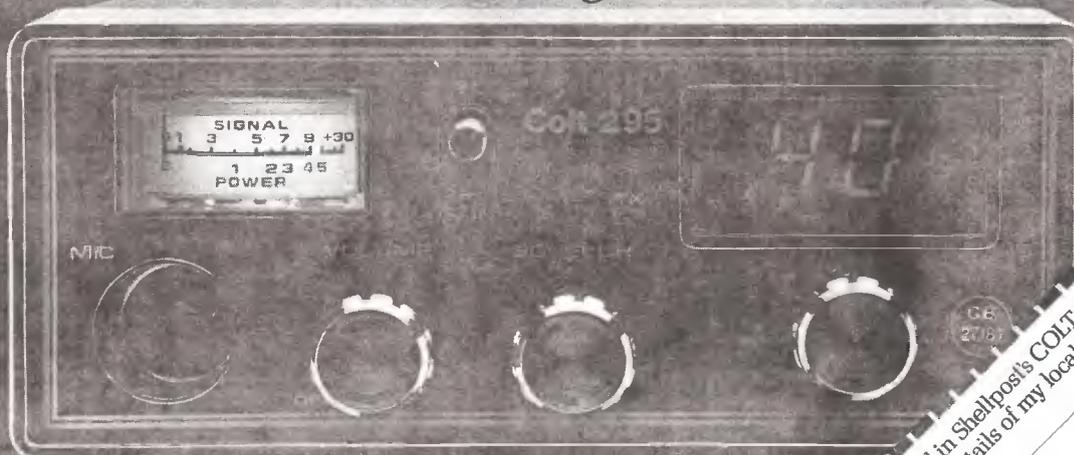
And now that COLT has at last been released here in Britain, there's going to be some stampede among British CB'rs.

So beat everyone to it—post the coupon below to Shellpost for details of your local dealer.

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WHEN YOU FOR A SQUARE DON'T COME WITH A



It's the easiest thing in the world to walk into a CB store and walk out with a rig.

But, be warned!

Some are good. Some are not so good. And some are strictly for the birds.

So get it right. First time.

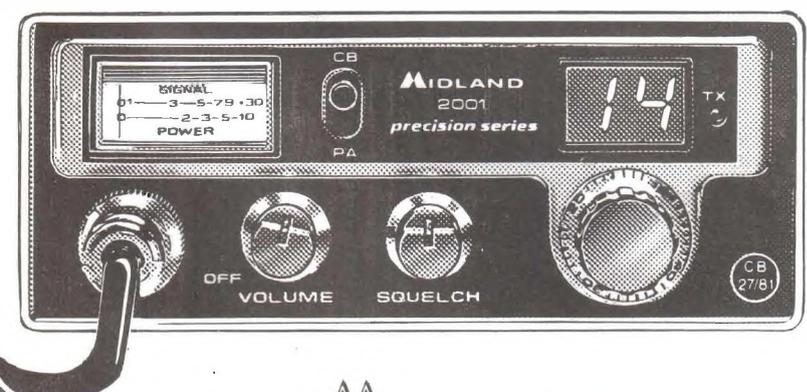
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THE LAW AND YOU

Does a CB 27/81 sticker make an AM set legal?

Firstly one must define the origination of the CB 27/81 logo and in particular whether or not it is an embossed stamp, silk screened or just a sticker.

If the latter is the case then the set is most likely to be an illegal AM set falsely disguised as a legal FM. For the owner who is aware of this no immediate problem exists. If he sells the set without informing the potential new owner of this disguise, then whilst the goods have been misrepresented (assuming the vendor is an individual) no offence has been committed. On the other hand, if the vendor is retailing, trading, wholesaling or importing disguised sets then he is committing an offence. The Trade Descriptions Act gives some protection to the purchaser and if the equipment is not described correctly, in this case as an AM set with a sticker, the purchaser can either: return to the shop or vendor and pointing out the problem request that his original requirements be met (in other words supplied with a comparable legal set) or he can take his complaint to the local Officer for Fair Trading at the Town Hall, in which case they are empowered to make investigations and pursue the matter on your behalf. If the case is serious or the investigating officer finds that the trader has committed an offence a prosecution may be forthcoming.

The genuine logo

Recognising the real or official logo can be slightly difficult. Unfortunately, the Government's stipulation on its design and appearance are, to say the least, simple. Because of this and the lack of any serious attempt to prevent its duplication, many fake symbols are appearing. Some make no attempt to disguise the fact that they are false and are sold openly and honestly with no attempt of deception.

The Commtron CXX or Commtron Nato FM is a perfect example. It is an illegal set, imported via the Isle of

Man, which means that duty has been paid and the purchaser will have a VAT receipt. With both FCC and UK channels the set is totally illegal, yet the legal 40 channels UK spec are on the set. The rig comes complete with an interchangeable facia panel designed to be used by the purchaser, if he chooses, and intended to make the rig look like a legal FM set. Legally the set does not meet the British specifications as laid down in MPT 1320 and therefore the user would be liable for the same penalties as an AM operator, regardless of which frequency he was using, i.e., illegal AM or FM.

Licences

Perhaps the stupidest thing that can be related to illegal operation, now with the availability of FM licences, is illegal AM users purchasing licences yet with no intention of purchasing a legal set.

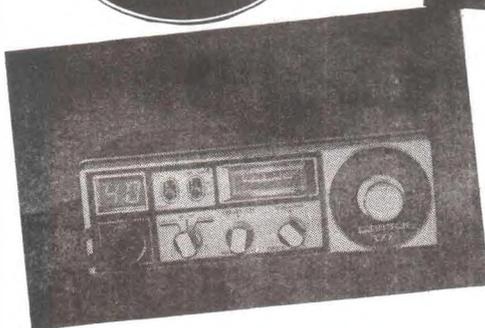
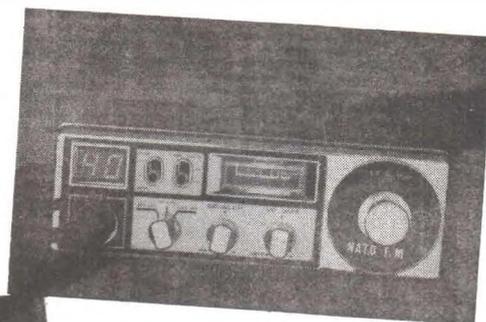
Quite simply they are giving the Government £10 to help the Authori-

ties catch them! Not only this but every ardent AM operator who buys a licence is becoming an FM statistic, to be quoted by the Government as the FM system having a large amount of users and thus a successful system.

Do not be misled. Holding an FM licence does not make it legal to use an illegal AM set. Nor does it lighten the penalty of illegal operation.

If the equipment you are using does not meet the Home Office Specifications as published in MPT 1320 or 1321 then its installation use as a receiver or transmitter is an offence under the Wireless Telegraphy Acts.

Should you be in any doubt about the set you are thinking of purchasing or have purchased, the shop from where you intend to purchase or have purchased the set from should be able to allay or confirm your fears. A final and perhaps simple check, although perhaps not flawless, is to look for the 10dB attenuation switch which must be fitted to all legal FM transceivers.



CB RADIO » ANTENNAS «

BOOKS

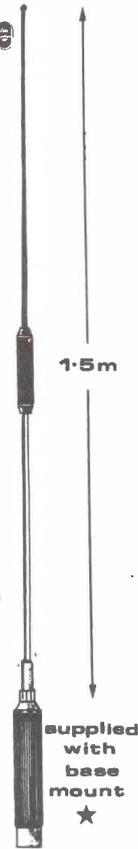
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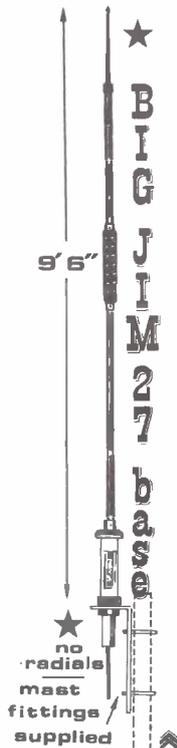


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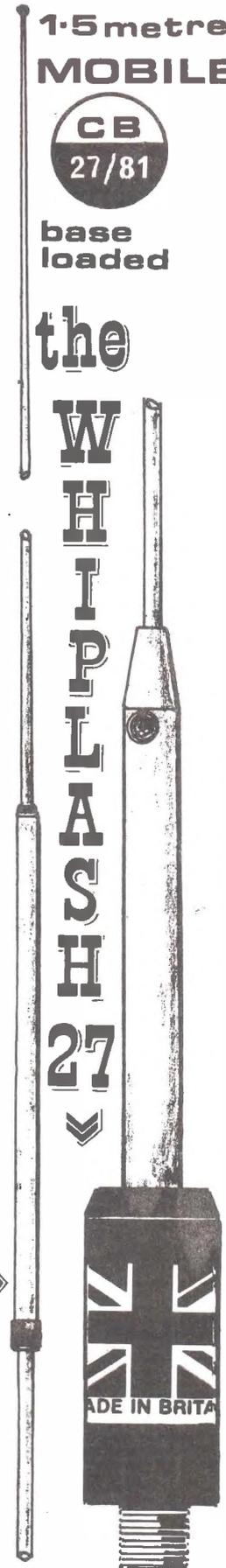
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Rig Test



TRANSCOM

The Transcom GBX 4000

For us this was our second look at the Transcom rig, not that we could boast having tested it before. The first time we handled their prototypes and a test on them would not have been altogether fair. After all, at the time CB was not legal and almost everyone had poked their nose into the sets we saw.

This time it was nice to see production models smartly presented and know that we were not the umpteenth-hundred person to take a look inside.

Transcom International

Transcom International produce two transceivers, the GBX 2000 and the GBX 4000. At present the 4000 is the top of their range with Vol/on/off, Squelch, Tone and RF Gain as the major controls, PA and a channel 9 select making up the extras. Based in Bracknell, the company is relatively new to the CB market, yet they have managed to establish their name with many legal CB'ers and their sets are available through a large amount of retail outlets.

Our guarantee

As with all the tests conducted on transceivers, we assure both readers and the supplier alike that every care is taken to collate the correct information. Each article or review is carefully compiled from figures ascertained by testing the equipment on the bench, not dreamed up to satisfy the author's whim nor designed to enhance the product.

GUARANTEE to readers and manufacturers

Any information printed as a review bearing this guarantee will have been carefully obtained and based on facts.

The equipment tested will have been inspected to ensure it has not been tampered with or modified to improve its performance in any way. Any faults and/or modifications will be noted and depending on the severity reported on. Equipment for testing that was found to be seriously faulty will not be reported on and the manufacturer will be asked to supply a second item for testing.

The information contained in this article is for general information only. It is not intended to be a substitute for professional advice. The publisher, author and printer accept no liability for the consequences of any action taken on the basis of the information contained in this article.

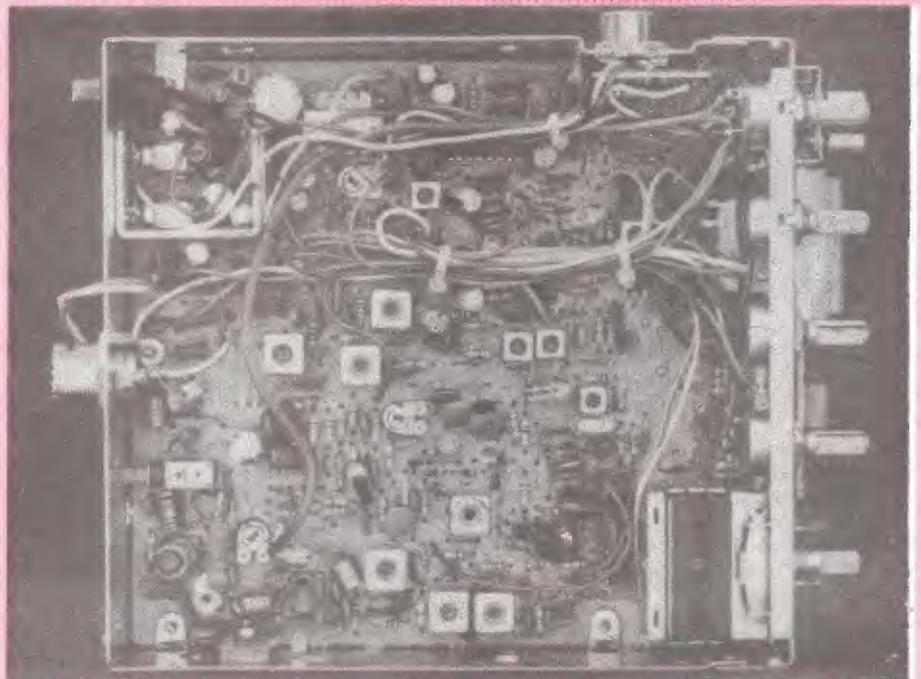
Microphone

By now most CB'ers should be aware that the PTT (Push To Talk) microphone is practically standard with the greater majority of CB transceivers. It is also standard procedure for this microphone to control all transmit and receive switching, this means that the receiver will not operate without the microphone plugged

in. For this reason a screw connection is somewhat beneficial, especially in the case of rigs with sockets on their casing's left side like the Transcom; where if the set is to be mounted on the driver's left and operated by the driver it could be possible to stretch the cord, without the screw plug then contact could be lost. This socket is

flashing lights and gimmick CB'ers who want a rugged set.

Internally the connections are of a good quality and the general appearance is of a clean, reasonably well-assembled set. The main frame is of a standard construction and if required by the manufacturers various updates could easily be undertaken.



the standard four-pin type and readily interchangeable with other microphones with the similar circuitry. Its only departure from the more common microphones being that the PTT switch hinges from the top. On some models this can require either a little getting used to physically or simply more pressure to operate.

Construction

Externally the set is quite robust with a coated metal case finished by a brushed aluminium fascia housing the controls, which are easily reached and widely spaced. The meter is also centrally placed and easy to read with the channel change offsetting it on the right.

The style of the set is somewhat reminiscent of the earlier American sets and is of a proven design. This could certainly appeal to the anti-

Transmitter test

The standard equipment used comprised of:

A Racal 9081 and a Racal 9082 signal generator

Marconi TF 42F distortion meter

Marconi TF 340 audio power meter

Racal 9916 frequency meter

Racal 9101 and a Bird 43 power meter

Racal 9009 modulation meter

Levell TG 150D audio generator and a Solartron AS 1412 power supply.

Power output

At 13.2 volts (the standard 12v car supply) the power output from the Transcom GBX 4000 was found to be pretty reasonable and at 14.5v smack on the legal maximum allowance. However, the Lo power attenuated signal was actually more than the required 10dB, working out to be just

over 11dB.

As can be seen from the table, with a weak or low-powered battery almost half of the power out can be lost. This again is not uncommon and the Transcom was actually putting out a slightly higher reading than expected.

Power Output and Attenuation			
Atten.	10.8v	13.2v	14.5v
Hi	2.3W	3.7W	4.0W
Lo	0.1W	0.2W	0.35W

Frequency

Channel spacing was reasonably accurate at 10KHz. The fluctuation caused by temperature, off frequency, was a 120KHz and higher than similar equipment but still within a good range.

Temperature Stability		
Temp.	CH1	CH40
48°F (cold morning)	27.60126	27.99128
68°F (room temp.)	27.60114	27.99116

Modulation

Measuring the peak deviation with an audio tone fed into the microphone socket the limiting was discovered to be very reasonable with a good response at the lower input levels.

Input Level	Modulation		
	500Hz	1125Hz	2500Hz
0.5mV	0.25KHz	0.8KHz	0.3KHz
1.0mV	0.3KHz	1.1KHz	0.32KHz
2.0mV	0.5KHz	1.3KHz	0.8KHz
50mV	1.0KHz	1.5KHz	1.1KHz
200mV	1.25KHz	1.5KHz	1.2KHz

Receiver test

Audio output

Measured into an 8-ohm load at 13.2 volts supply, equivalent to a well-charged car battery, the speaker gave a surprisingly high level of distortion at the low 1.5-watt input. Almost twice that of previously tested sets yet the distortion did not rise by the same percentage as the input was increased, to the extent of giving comparable readings at the 2.0w and 3.4w input level.

Measured Distortion	
1.5 watts	5.5% distortion
2.0 watts	10% distortion
3.4 watts	23% distortion

Squelch level

Threshold - 0.2uV.
Fully muted - 10uV.

Quite honestly, this range is adequate and in fact will probably give the operator more adjustment than required. So much so that all but the worst FM stations could easily be cut out.

Receiver sensitivity

Fair reception of the weaker stations should be obtained and the results show an average result which in practical terms would give the user good range in the absence of interference.

Sensitivity	
110dB quieting	0.2uV
20dB quieting	0.5uV
30dB quieting	0.8uV

AM rejection

A result of 33dB was obtained by feeding a fully-limited FM signal (10uV) into the receiver, this is artificially modulated with a 1KHz tone (1.5KHz deviation). At this stage the receiver's audio output is noted. Then the modulation is changed from FM to AM but with 30% modulation. Now the audio output is measured again and a figure relative to rejection is obtained.

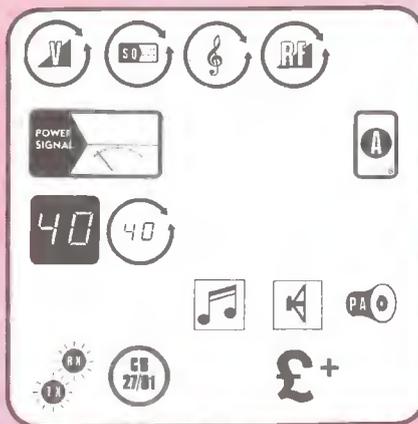
The Transcom again managed to give a reasonable result, although once more one must understand that the rejection is normally of signals that are exactly on frequency, not AM signals that are off frequency - they would give a different result.

Adjacent channel rejection

Obtaining a relative indication of rejection by feeding two signals into the set, one on channel 19 the other on 20, the output of one generator can be gradually increased until the receiver starts to hear a deteriorating unwanted signal of exactly 3dB. This is readable on the generator's output and gives good indication as to the set's capability. 273uV for 3dB is the reading for the GBX 4000 and once more this figure is considered to be fair although marginally higher figures have been achieved in the past with similar sets.

Summary

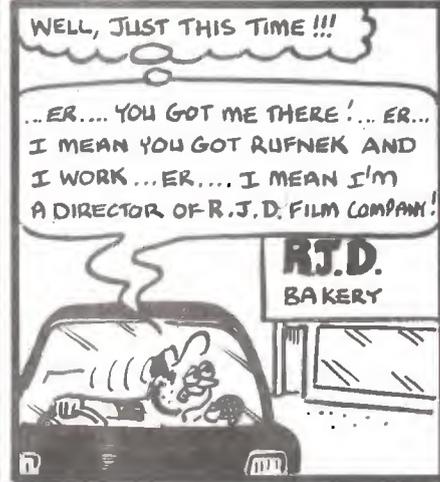
The results gained from testing the Transcom GBX 4000 are on the whole in line with the majority of reasonable



Manufacturer's Specifications	
Channels	40
Frequency range	27.60125-27.99125
Type of emission	F3
Channel spacing	10KHz
Frequency composition	PLL Synthesizer
Power source	12V DC negative or positive earth -5°C-+45°C
Operating temperature range	
Electric Specifications	
Receiver section	
Receiver system	Dual conversion superheterodyne
Intermediate freq.	1st IF 10.695MHz 2nd IF 455MHz
Sensitivity	0.5uV (20dB S/N) nominal
Adjacent channel selectivity (@+10KHz)	45dB nominal
Squelch threshold sensitivity	less than -10dB NO level nominal (approx 0.15-0.2uV)
Squelch tight sensitivity	50uV maximum nominal
Spurious response attenuation	60dB nominal
Image rejection	45dB nominal
Receiver spurious emissions	less than 20nW
Audio output power (@10% THD at 1KHz)	4 watts at 4 ohm 2 watts at 8 ohm
Audio freq. response	+2/-8dB per 6dB/OCT at 0.3-3KHz
Current drain	Stand-by 0.25A nominal Receiving max. 0.8A nominal 4 watts (MPT-1320)
Transmitter section	
RF output power	
Freq. deviation (@ 1KHz)	±2.5KHz max.
Audio freq. response	+2/-5dB per 6dB/OCT at 0.3-3.0KHz pre-emphasis
Spurious emission	
80-85MHz	less than 50nW.
87.5-118MHz	
135-136MHz	
174-230MHz	
470-862MHz	
Other freqs.	less than 0.25uW
Adjacent channel power	less than 10uW
Current drain @12.0v	2A nominal

transceivers tested to date. Whilst it cannot be classed on its own as leading the field or anything equally as spectacular, the set does have what can be described as reasonable performance figures, not above average but certainly on par with other transceivers that we have tested. Perhaps its major selling point, or drawback, depending on your point of view, is its styling. As previously stated, it is somewhat reminiscent of earlier sets and as such may be passed over.





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Address

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BACK to BASICS

Two of the most basic operations to CB are installing and SWR'ing a rig and these are the operations that cause most grief to a CB'er - and the most damage to a rig! This feature will give some basic advice on how to cope with installing and SWR'ing and we shall be repeating it regularly for new breakers.

Having purchased your rig, the next decision is the antenna. This is a personal choice (and fairly restricted if you are sticking to the legal types). From our point of view the decision you need to make is whether you want to mount the antenna on the bodywork and actually drill holes, etc., use a mag mount (an antenna with a magnetic base which will 'stick' to the metal bodywork of a vehicle) or a gutter mount which clamps on to the gutter of the car. The problem with the

last two is running the cable into the car. The location of the antenna on the car will influence the radiation of your signal - see diagrams: Location of the set is also down to you but remember you need to change gear, your passengers might want to use the set and you should be able to reach it easily to change channels without running down the pedestrian population of your area. Some breakers leave the rig loose on the parcel shelf or use a slide mount for easy access.

The basic instructions for connecting your rig and/or antenna will be included with them and you must go by their recommendations. The following points are to give some extra help but they are only general and if you really have problems then go to a professional or 'someone in the know'.

Using the patch lead connect the meter terminal marked CB or TX to the rig antenna plug.

4) Switch on the set and turn to channel 20. (It is anti-social to SWR on any of the breaking channels). Switch the SWR meter to 'Forward'. Press the transmit button. The needle on the dial will move. Adjust the knob on the meter until the needle swings over to give the maximum reading (often marked SET or CALIBRATE).

5) Now switch the meter to 'Reflected' and key the transmit button. The needle should drop back and give a reading along the marked scale. If less than 2:1 there is no real need to worry

You will find on all antennas a provision for adjusting the mast length. To find if it needs lengthening or shortening take two readings, one on channel 1 and the other on channel 40. If the reading on 40 is higher than on 1 then the antenna needs shortening. If lower on 40 than on 1 the antenna needs lengthening. MAKE VERY SMALL ADJUSTMENTS each time until the reading is satisfactory. If you need to actually trim the mast with a hacksaw, as opposed to sliding the mast up and down, cut off a minute amount each time. It is very easy to cut off/adjust too much.

SS

Fitting the rig

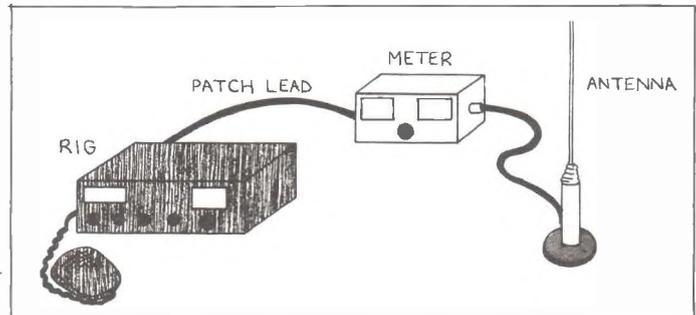
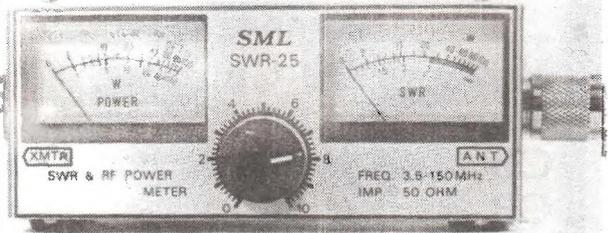
- 1) Make sure the mounting area is suitable and strong enough.
- 2) Ensure that you don't drill through the wiring or instrument panel.
- 3) Check that the wire carrying the power comes from a fused source or that an in line fuse is fitted.
- 4) Don't try putting a 12V rig in a 24V lorry or a 6V car. They don't mix!
- 5) Connections direct to the battery ensures no voltage drop and helps eliminate engine noise. You can run the feed from an ignition switched accessory terminal on the fuse box.
- 6) Check there is provision for the power feed in the bulkheads you pass through or that there is free space for a hole.
- 7) Cars are either positive or negative ground. CB's are also positive or negative earth (although some sets are dual polarity). Most modern cars are negative. Negative sets cannot be installed in positive cars and vice versa. Consider this when buying a rig.
- 8) When connected do not try to transmit without the antenna correctly installed, sited, in circuit and SWR'ed. (Transmissions whilst SWR'ing should be as brief as possible).

SWR

SWR stands for standing wave ratio and gives a reference figure for how much of the transmitter power is actually radiated away from the antenna and how much is reflected back down the co-ax to the set. How much is radiated away depends on the physical or electrical length of the antenna and it must be tuned correctly to cover the frequency used. The figure is expressed as a ratio, i.e. 3:1, 2:1 or 1.5:1. You should concentrate your efforts into getting it as much below 2:1 and near to 1:1 as possible. If substantially higher you won't 'get out' too well and you could permanently damage your set.

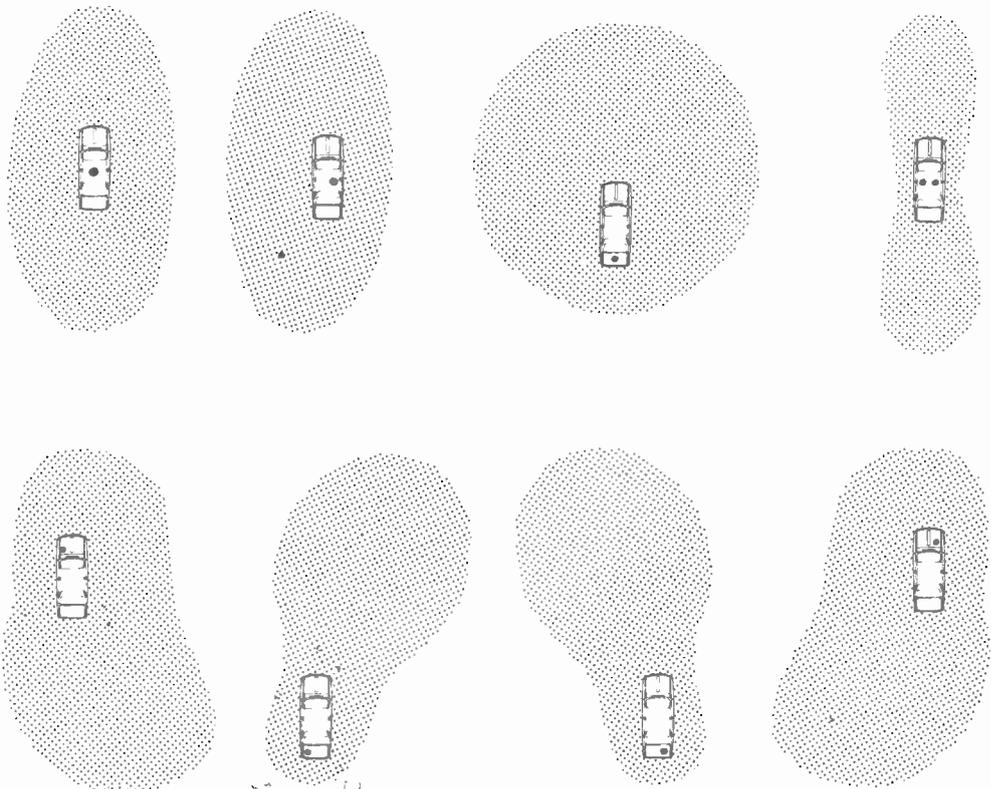
You need:
SWR meter (some rigs have a built-in meter - instructions will come with the set); a patch lead - a short piece of cable with PL259 connectors at both ends.

- 1) Park the car in a relatively open space, away from large amounts of metal, lamp-posts, trees or buildings.
- 2) Make sure car doors, boot and bonnet are closed.
- 3) With the rig switched off, disconnect the antenna co-ax and connect it to the meter terminal marked ANT.



Installing the antenna

- 1) The antenna should ideally be mounted as high as possible. The higher the percentage of the antenna length mounted above roof-top the better the performance.
- 2) Put the cable as far away from noise sources as possible (ignition systems, etc.).
- 3) Mount antenna with a good metal to metal ground, removing paint, mud or rust where the antenna is to be mounted.
- 4) AVOID ANTENNA CO-AXIAL CABLE DAMAGE. This is the problem with mag or gutter mounts as the cable will need to pass through the window or door opening. Shutting the window or door on the cable can cause damage to the cable and consequently to the set.
- 5) Again, before drilling, check that you aren't damaging anything (like the petrol tank!) and that there is enough free space for any mountings.
- 6) Make sure that the cable can lead to the rig without kinking, stretching or working against anything. DON'T WIND UP EXTRA CABLE INTO A TIGHT COIL. This can drastically influence the performance of the antenna.
- 7) Use proper, soldered connections and make sure that all plugs, etc., are screwed tightly. Don't leave cable and connections hanging or where they can be pulled or damaged.
- 8) If you need to lengthen the existing cable or buy new co-axial cable it must be RG58U 50 ohm cable.
- 9) Still don't transmit! Wait until you have SWR'ed and are satisfied with all the connections and installation.



BACK to BASICS

In an effort to aid the newcomer to CB and answer some of the more obvious questions often asked of us, this second part of Back to Basics will run for a little while.

Why do I need an antenna?

In America, as many of you will know, different words describe similar items as used in Britain. One example is what in Britain we call an aerial in America is known as an antenna. Because CB originated in the United States it has become the standard to

refer to CB aerials as antennae.

To transmit the antenna used needs to match the frequency (see SWR opposite), to match the frequency the antenna used has to have an electrical length.

Therefore, for CB signals to transmit, the antenna used must have been specially designed to suit the frequency, i.e., 27MHz or 934MHz. Do not be mistaken or misled – an antenna is the most important part of your equipment. Forget the cost of the rig, if you cheat on the quality of your antenna the performance will be reduced.

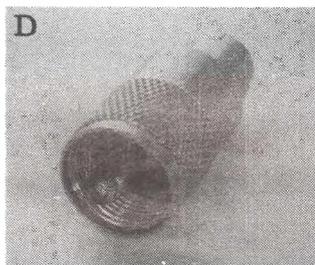
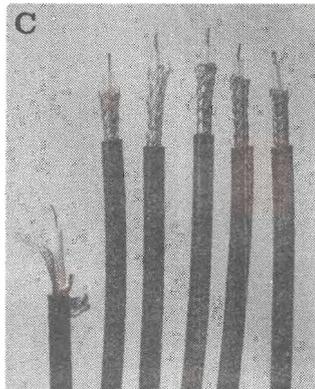
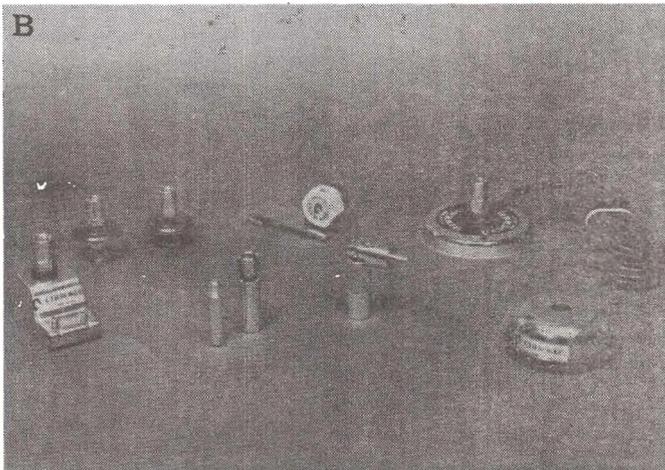
But which antenna?

OK, you now know that the antenna is vital, it must be of good quality and that it must be base loaded with a wire rod or element not exceeding 1.5 metres. But which make shall I choose?

Personal preference must really

come into this choice as well as your specific requirements. For instance, do you intend to drill a hole in your vehicle or will you use one of the various other alternatives, i.e., magnetic mount, gutter clip, boot clip, bumper clip or even a mirror mount.

The reason for considering the mounting first is simple: many large



shops sell only pre-packaged antennae complete with cable antenna and mount. For this reason, you should make sure the package contains the particular mount you have chosen or if not that accessory mounts are available separately.

Then in all honesty all you can judge is the quality of the goods. Look for cable which has RG58 printed on it. Various grades are available. An average or reasonable quality is RG58 C/U. Beware of coaxial bearing no identification, coaxial cable is as important as the antenna itself.

Then examine the connectors, called PL259's. They should be clean, sturdy looking and durable. With the antenna itself, look for a strong whip. If metal, look for the unmistakable sheen of steel. Well insulated connections around the loading coil are important – either heat-shrink plastic or a similar waterproof casing. If water does get into the loading coil it can affect the performance and even damage the set.

Ground plane

When sighting the antenna (see opposite for positions) ensure that you have a good connection to the metal surface (unless you are using a magnetic mount). This connection is vital. Imagine your vehicle as a mirror – it forces the signal to travel up through the antenna and out. The larger the ground plane the more effective that reflection or radiation. Without a ground plane your signal will not get out and your set could be damaged as a high VSWR will exist. All base loaded antennae are known as "ground plane antennae" because the ground plane affects their operation.

What sort of antenna?

To comply with an FM licence it must be a single wire rod or element base loaded (loading is a series of coils, wound to increase the electrical

length to that required for the frequency).

The wire rod or element must not exceed 1.5 metres (4ft. 11in.). This measurement is taken from the top of the loading to the tip of the antenna, not the whole length of the antenna.

Antenna length

At this stage the 'loading' really requires a little more explanation. There are four possible lengths of antenna, full wave, $\frac{3}{4}$ wave, $\frac{1}{2}$ wave and $\frac{1}{4}$ wave.

As we have just mentioned, the frequency determines the length because the antenna must match the frequency's electrical requirements.

To determine this length there are precise mathematical formulae. For 27MHz the equation is:

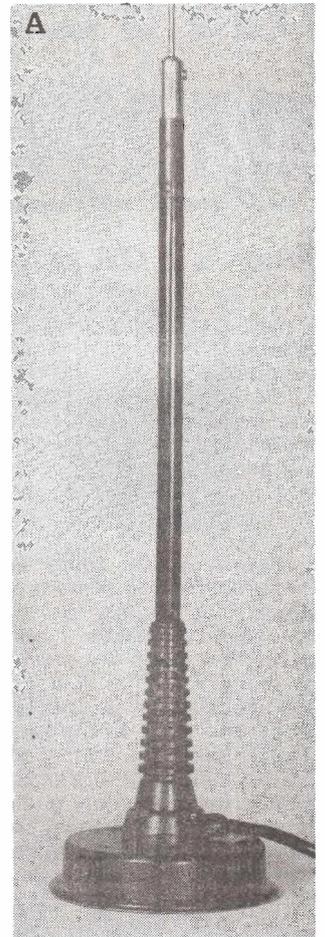
$$\frac{300 \times 10^6}{27 \times 10^6} = 11.11 \text{ metres}$$

This gives you the electrical length required for a full wavelength, however, as 11.11 metres (36+ ft.) is highly impractical, not to mention illegal under present licencing, the physical length must be reduced. A half wave, therefore, would be 5.55 metres (18+ ft.) – exactly half a full wave – and $\frac{1}{4}$ wave 2.77 metres (9ft. 1in. or 109in.).

Any antenna used must be either full wave, $\frac{3}{4}$ wave, $\frac{1}{2}$ wave or $\frac{1}{4}$ wave.

Whilst the physical length of the most practical antenna for use 'legally' is $\frac{1}{4}$ wave, it is still too long; the licence requires a maximum length of 1.5 metres. To reduce the physical length an inductive loading is used. A loading coil is really only the extra length of wire that could not physically be used, i.e., 2.77 metres ($\frac{1}{4}$ wave) minus 1.5 metres (legally allowed). In a simple antenna, 1.27 metres of wire would make the loading coil. However, in reality this can be reduced but for the purposes of this simplified explanation we will not complicate the matter.

The problem with reducing the physical length is that the efficiency is also reduced.

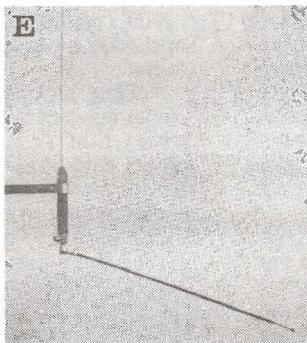


Home base antennae

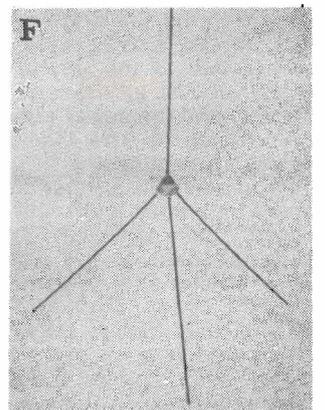
As yet very few legal FM antennae exist specifically designed for home installation.

What is more, a ground plane antenna, i.e., conforming to Home Office specification, needs exactly that – a ground plane. Very few houses have metal roofs, therefore an artificial ground plane must be used.

The physical length of artificial ground planes vary according to the same wavelength formulae and are dependent on the radial section, i.e., the antenna itself. With our limited $\frac{1}{4}$ wave ground plane legal obligation, the simplest form of base antenna is to mount a normal mobile antenna on an artificial ground plane of $\frac{1}{4}$ wave lengths, i.e., two lengths of metal both 109in., crossed at 90°, firmly attached and the antenna placed dead centre. Of course, other ground planes can work quite efficiently and the water-tank in the attic is not just a wind up, it can actually work.



As can be seen from the diagrams opposite, the ground plane affects the radiation pattern of your signal. An antenna mounted on a front wing pushes the signal back and diagonally opposite to its position.



Photographs

- A) Base loaded antenna
- B) A selection of available bases
- C) The various grades of RG58/U
- D) PL259 plug
- E) Ground plane antenna
- F) Base station antenna with ground plane

DX QSL

INTERNATIONAL

CLUB SPOT



When is a QSL card not a QSL card?

Well, I've been advised by several different clubs and have read in various CB magazines that the answer to that little riddle is when it's either just a name and AD on a piece of paper, a black 'n' white card with the message "Return for full colour card" or, horror of horrors, a photostat card or any one of several other 'misde-meanours'.

Apparently the thing to do with these 'despicable items' is to put them where they belong, i.e., the dustbin! I've never done this, I normally just pass them along the chain and think no more of it. That is, until the other day when I got a couple of paper QSLs and I got to thinking "Why do people send this sort of thing out?". I've no idea but there must be some reason for it. I'm only guessing but I would think money must come into it. After all, we're not all made of money and QSLing can be expensive. Perhaps this is their way of economising.

Well, to cut a long story short, I decided to send my QSL, etc., on to these two AD's and am now awaiting results. One of two things is going to happen.

1. I'll receive nothing back and concede that, indeed, these things should be consigned to the dustbin or;
2. My faith in QSLers will be strengthened because I'll receive some smashing QSLs in return.

Check out next month's article to see the outcome. I'm putting my money on Answer No. 2.

Speaking of QSL cards, it's nice to see that UK QSL designers and printers are slowly but surely coming to grips with the thinking and construction behind a QSL design. This is mainly due to the efforts of established UK QSL artists such as Demon Doodler and the newer arrivals on the scene such as The Mad Monk and Mushy Peas series.

No disrespect is intended but I've got to be honest and admit that in my opinion their cards AS YET don't compare to some of the world-famous QSL artists and printers such as Runnin Bare, Sundown, Cariboo, Select and Dirty Doodler/Soooper Snooper. Cards by these artists are known and collected the world over, hardly surprising when you consider

the detail and colour schemes involved.

Dirty Doodler and Soooper Snooper

Of all the QSL card designers and printers on the go, my favourite out of the whole bunch is Dirty Doodler/Soooper Snooper cards. I, personally, think that their cards rate as some of the best designed cards in the world.

It came as a rather pleasant surprise to find out that there are now three UK QSLers using DD/SS cards.

The first ever DD/SS card in England belongs to Alistair Southeby. Alistair's card is a black 'n' white SS printing.

The first ever colour DD/SS card in the UK is that of Harry Black (Sandpiper) of Antrim, N. Ireland.

The first ever colour DD/SS card in England is the proud possession of Clem Bains (Music Man) of Sunderland, Tyne and Wear. You may be interested (and astounded) to know that Clem's card contains no less than 12 different colours and shades. One other first for Clem's card is that it was the world's first ever DD/SS 'double' colour card in the world (double meaning like a birthday card, it opens out).

Three unique and highly collectable cards which I am convinced will become highly sought after in the not-too-distant future.

To find out more about DD/SS cards, I got in touch with the UK outlet and found out some very interesting facts.

A Dirty Doodler card is something really special and unique. The reason being that ALL the artwork is designed and drawn up by DD himself, unlike some of the other big name series which in fact are different designers working under the same name.

All DD artwork is a one-off job. There are no catalogue cards. Every card is unique to its particular 'handle'. DD designs your card from start to finish and it is then subject to the approval of the QSLer placing the order. Naturally, of course, any special ideas or requests of the QSLer are incorporated into the design by DD.



Once the QSLer is satisfied with the artwork, the card is numbered and the design registered in his/her name. It's almost like a copyright system. Incidentally, only genuine Dirty Doodler cards carry the Magic Mushroom symbol and numbering system.

To ensure that each card remains a 'one off' exclusive, the master drawing becomes the property of the person placing the order.

That's one half of the team. The printing of DD cards is handled by Sooper Snooper (JP Printing). Once again, a unique service is offered. Sooper will work out a colour scheme for the card and print them up accordingly. By the way, the same thing goes here as it does for DD. Any special preferences which you may have are worked into the colour scheme by SS.

Not for SS the standard run of the mill two or three colours. NO SIR. If Snooper thinks the card requires five colours, you get five. If six is needed, you'll get six and so on. I particularly like SS colour schemes. I find them very complementary and effective.

Now for the most interesting and amazing facts of all. Until recently I was under the impression that a DD/SS card was liable to cost a small fortune. How wrong can you be? I am now going to astound you with one of the best QSL card bargains of all times.

Dirty Doodler will personally design a QSL card, flyer, eyeball card, handle card, you name it (but please, no X-rated requests) for only \$25 complete. Sooper Snooper will then print 1,000 cards as follows.

Black 'n' white at only \$25.

Full colour cards at only \$110.

Postage on the cards is \$9 sea mail or \$35 air mail.

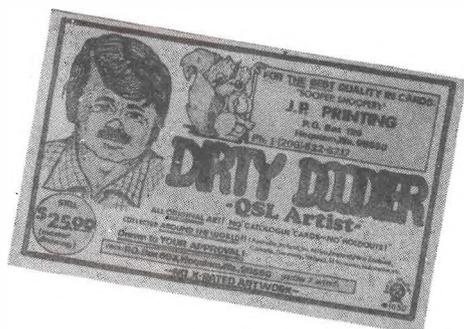
To sum up:

1,000 black 'n' white cards - \$50 plus postage.

1,000 full colour cards - \$135 plus postage.

You know, it just doesn't seem to make sense. It's cheaper to go State-side and get one of the best QSL cards in the world than it is to try and get a similar card here. For more information on DD/SS cards I suggest you get in touch with either:

Ian Shrader, Sandcastle QSL Club, PO Box 167, Pacific Beach, WA, 98571, USA; Clem Bains (Sandcastle UK Rep.), 151 Ferryboat Lane, Sunderland, Tyne and Wear SR5 3RS (sae appreciated) or Radioactive GB, 5 Blandford Place, Seaham Harbour, Co. Durham (sae appreciated).



Romeo Delta 22 Group of Scotland



It's nice to see that UK DX clubs are flourishing, unlike their counterparts on the AM side. I guarantee that in a year's time at least a third of the current AM CB club will have vanished into obscurity. It's a completely different world in the DX club scene. Not for them the inane, interminable, boring FM v AM, AM v Buzby and so on arguments. All that a DX club exists for is to operate their radios. And most of them do it very well indeed. One club which really stands out in this respect is the Romeo Delta 22 Group of PO Box 5, Dornoch, Sutherland, North Scotland IV25 3JJ.

The group operate under the call sign of RD22, prefixed by the operator's unit no. which will be from 1 to 5.

As you can guess from the Unit Nos., Romeo Delta is a small group, five members only, no more, no less.

Just because they are a small group this in no way diminishes their status. Indeed, if some of the larger international DX groups observed the same radio techniques and courtesies as Romeo Delta, the international DX scene would be a 100% better place.

Some of the locations into which Romeo Delta Group have hooked up are England, USA, Canada, Spain, W. Europe, Iceland, Norway, Denmark, Finland, Phillipines, Indonesia, West Indies, Peru, Columbia, Brazil, Mexico, Nicaragua and S. Africa.

One last point I must stress is that Romeo Delta Group is not a QSL swap club. Please don't send off a QSL to PO Box 5 requesting a swap and then get mad if you don't receive one. Romeo Delta is a 100% DX group and only QSL to an actual QSO. Seems that the only way you're going to get one of their QSLs is if you blow that dust out of your radio and get working on the frequencies again.

Well, that's it for this month, remember if you think your QSO's are good enough let's have details to Charlie Hotel, c/o 3 West Street, Tyne and Wear SR3 1EU. Next month I'm taking a trip to the land of oil, pineapples and beautiful women - Venezuela. See you there with your sunglasses and shorts at the ready.

Till next month, best regards, take care and remember: if you can't use the mic, use the pen.

Charlie Hotel, Echo India 25 - Clear

Guaranteed Genuine 100% 1-4-1 Swap QSLs

Harry Black (Sandpiper) 10 Drumsill Rd Lisburn Antrim, N Ireland BT28 2TG Dirty Doodler Card	Ken & Sheila Bedford 31 Albany Rd Rothwell Leeds OP. Allan SL001 PO Box 18 Lisburn N Ireland
SP/4 and Mrs. George Wight 551-04-0991 10th Supply & Service Co. Box No. 337 APO New York 09696 USA	OP. Angela SL004 PO Box 18 Lisburn N Ireland OP. Tony SL126 PO Box 18 Lisburn N Ireland
SWL-RX: Mabrouk Mohamed PO Box 1359 Jeddah Saudi Arabia Please note: Name and box only for Mabrouk. Do not mention CB anywhere on your envelope	OP. Jim SL47 PO Box 18 Lisburn N Ireland OP. Les PO Box 26 Ballymoney Co Antrim N Ireland
William Purvis (Brava Papa 03) 3 Coronation Rd Runcorn Cheshire WAT5 5QF	OP. Nuala 1ES 27 PO Box 29 Enniskillen Co Fermanagh
Alec W. Martel (Bonzo Dog) 11 Rockingham Par Uxbridge Middx	OP. Tom CT-TB PO Box 44 Dungannon Co Tyrone
Tony Levinas (The Wizard) 102 Warrenside Deighton Huddersfield W Yorks HD2 1LG	OP. Paddy CT-274 PO Box 44 Dungannon Co. Tyrone OP. Margaret MO-129 PO Box 5 Armagh Co Armagh
Henk. Whisky (Oscar 763) PO Box 122 3430 AC Nieuwegein Holland	OP. Joe 29WW 181 PO Box 5 Armagh Co Armagh
Harrie PO Box 3260 5203 - DG S'Hertogenbosch Holland	OP. Sean IKA-130 PO Box 1 Kilkeel Co Down OP. Martha 1S-1965 PO Box 28 Coleraine Co Londonderry
Worldwide DX'ers	
Hello again from the Sierra Charlie One, Ian Shrader. The DX conditions haven't been the best lately but I did make a short QSO into Vietnam and I heard Ethiopia for the first time. Also made my first contact into Bermuda, heard the Bravo Delta Four in north-west England (she asked me to stand by and then conditions fell through) and received three phone calls from Chris over in Cogh, Ireland (hope to have a QSO with him some time). Be listening for all of you on the frequency or looking for you in the mail. If you'd like some QSL cards for your collection, send me an international reply coupon and your QSL to Ian Shrader, Sandcastle QSL Club, PO Box 167, Pacific Beach, Washington 98571, USA.	
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Rig Test

COMMTRON CXX

Commtron CXX - A naughty rig with legal channels

The Commtron CXX Nato is basically a converted AM rig to meet the new legal frequencies. While the inclusion of British FM to meet MPT 1320 enables the owner to speak to other legal breakers, the rig itself is illegal to operate. This set incorporates in total 240 channels which includes the illegal AM channels which are the norm in the United States of America.

The Commtron Nato is legally imported into the United Kingdom by way of the Isle of Man, which means that VAT and duty have been paid. To give this set a hint of respectability the manufacturers have come up with a crafty little device which can be attached to the set underneath the channel select switch. This circular plate has the CB 27/81 logo stamped on it which at first glance gives the impression that the set is 100% kosher. One look at the mode selector will, to anybody with a bit of common sense, completely give the game away. The addition of the CB 27/81 logo in no way makes the Commtron Nato legal to operate on anything but the FM channels. It is a disputable point whether the law will accept the legality of one part of this set and completely overlook its other capabilities.

home base when the antenna is mounted more than 7 metres above the ground. Obviously the Commtron can be used without an attenuator but for the home base mode described it contravenes the law.

Internal construction

As this set was originally designed for AM multimode operation, the addition of the FM circuitry has made it necessary to rather cram things in. The soldering and chassis construction is much the same as many of the rigs being sold in the UK. Constructed in Korea, imported via the Isle of Man and distributed by ADS of Blackpool.

Transmitter test

The equipment used to conduct this 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
Levell TG 150D audio generator
Solartron AS 1412 power supply unit.

Power output

The power output of the Commtron exceeds the legal limits as it is a converted AM set. However, the manufacturer's claim of 10 watts maximum is optimistic as the most our test could find was exactly half this amount. This exceeds the legal limitations by 1 watt. This output will increase when the set is subjected to any surge in input voltage.

As no attenuator is fitted to the Commtron the output power could only be measured at the HI level.

Supply Voltage		
10.8V	13.2V	14.5V
2.3W	4.0W	5.0W

Frequency

Channel spacing was found not to be 100% accurate, which is true of most of the sets tested to date. In the case of the Commtron the frequencies are not synthesised by one crystal but from a bank of them which is the cause of this slight inaccuracy.

Temperature Stability		
Temp.	CH1 (MHz)	CH40 (MHz)
48°F	27.60134	27.99121
(cold morning)		
68°F	27.60129	27.99120
(room temp.)		

GUARANTEE to readers and manufacturers

Any information printed as a review bearing this guarantee will have been carefully obtained and based on facts.

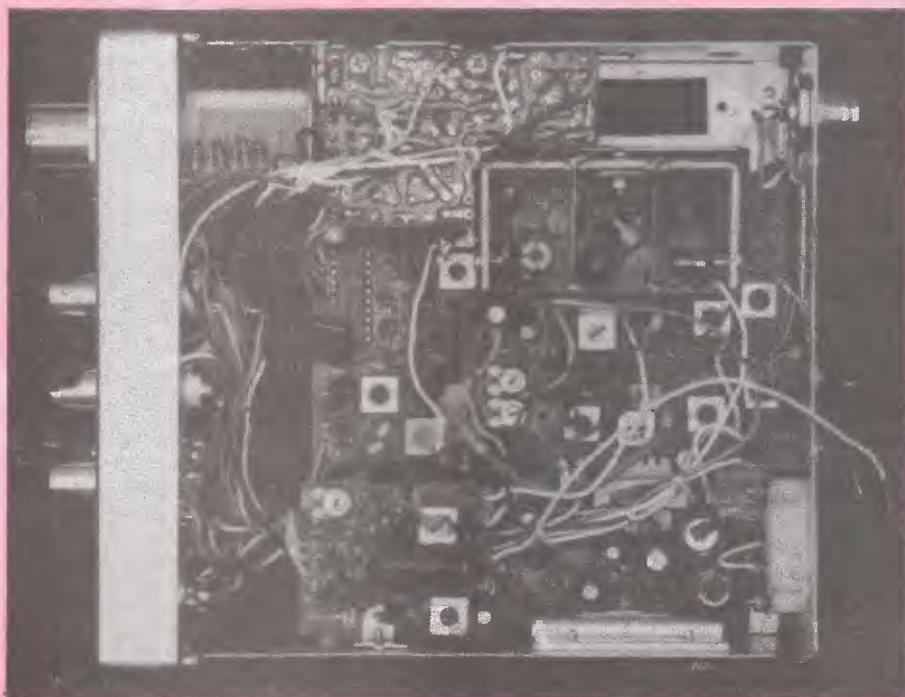
The equipment tested will have been inspected to ensure it has not been tampered with or modified to improve its performance in any way. Any faults and/or modifications will be noted and depending on the severity reported on. Equipment for testing that was found to be seriously faulty will not be reported on and the manufacturer will be asked to supply a second item for testing.

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External features of the Commtron Nato

The Commtron Nato comes well packed, complete with microphone and all the necessary mounting and fitting accessories. Our specially-designed chart will tell you at a glance of all the external controls on the Commtron.

The Commtron is quite conventional in design and resembles a good majority of the more popular AM rigs that we have seen in this country already. You will notice by referring to the symbols chart that the Commtron has no attenuator switch. This automatically precludes this rig being used as a



Stability within differing temperatures was found to be good with very little deviation measurable.

Modulation

It was not possible to measure the modulation response of the Commtron due to a form of instability. This problem has not been encountered on any other rig. With normal speech into the microphone the deviation was peaking over the required amount, which has been true of at least two of the other rigs we have tested. The Commtron utilises a VOGAD (Voice Operated Gain Adjusting Device) instead of the more common limiter to set the maximum deviation.

Receiver test

Audio output

The audio output of the receiver section was measured into an 8 ohm load which is the resistance of the loudspeaker fitted to the Commtron. Powered by a 13.2 volt power supply, the figures of distortion measured up to 4 watts output were good. However, at 5 watts audio output 27% distortion was measured which is not too good.

Measured Distortion	
1.5 watts	3.0% distortion
4.1 watts	10% distortion
5.0 watts	27% distortion

However, at normal listening levels distortion is minimal.

Squelch level

Threshold - 0.6uV.
Fully muted - 2.1mV.

Receiver sensitivity

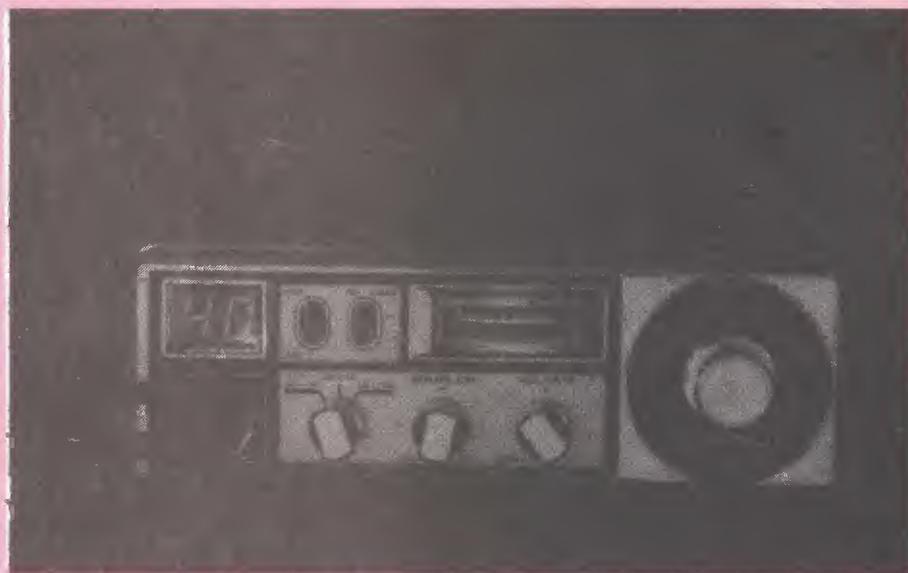
It was not possible to test for receiver sensitivity. The FM section of the Commtron does not quieten because it is really an AM set converted and consequently shows AM characteristics.

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 output is then noted. The FM modulation is then changed to AM, still with a 1KHz tone but at 30% modulation. The audio output from the receiver is then measured. In the case of the Commtron NATO AM rejection was measured at 22dB which is considered to be an average result. It should be noted that this type of rejection is only true for signals that are exactly on the received frequency and that if the signal is slightly off frequency then a completely different result would occur.

Adjacent channel rejection

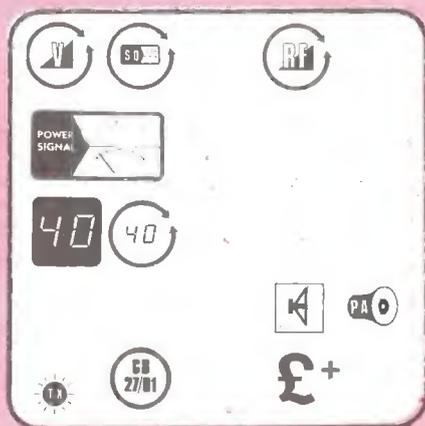
Two signal generators are fed through a combining network into the equipment and are set to adjacent channels on the rig (i.e., 19 and 20). Both are modulated with a 1KHz tone at 1.5KHz deviation and one is set to 1uV output. The receiver is set to this channel and the audio output adjusted to read 10mW. Now the output of the second generator is increased slowly



until the receiver degrades the wanted signal by 3dB. The output from the second generator is noted and gives the relative indication of rejection.

The result for the Commtron was measured at 30uV for 3dB degradation which is a slightly below average result.

who is interested in CB generally (not just FM) the Commtron should be a good buy. FM purists, however, may be a little disappointed with this rig's performance.



Summary

It is obvious that the Commtron Nato is basically an AM set with FM added as an extra. We did not test the AM section of this set. For a breaker

Manufacturer's Specifications

Transmitter section	
Power output	10 watts (AT 13.8V DC)
Modulation	AM, 90% typical FM, Deviation 2KHz
Receiver section	
Circuit type	Dual conversion superheterodyne with RF stage and 455KHz ceramic filter
Frequency	Crystal-controlled PLL, 120 channels in the 27MHz Citizens' Band
Sensitivity	AM, 2.0uV for 10dB S/N FM, 2.0uV for 20dB S/N
Squelch range	0-1mV
Selectivity	70dB down at ±10KHz
IF frequency	1st IF: 10.695MHz 2nd IF: 455KHz
Image rejection	55dB
Audio output	3.5W maximum at 8 ohm load
Current drain	250mA on standby (no signal)
Current drain (maximum)	Less than 1.5A
Antenna	Nominal 50 ohms impedance
Power source	Operates from nominal 12.6 volts DC, negative or positive ground system
Dimensions (overall)	8.59(W) x 10.32(D) x 3.27(H) inches
Weight	4.4lbs.

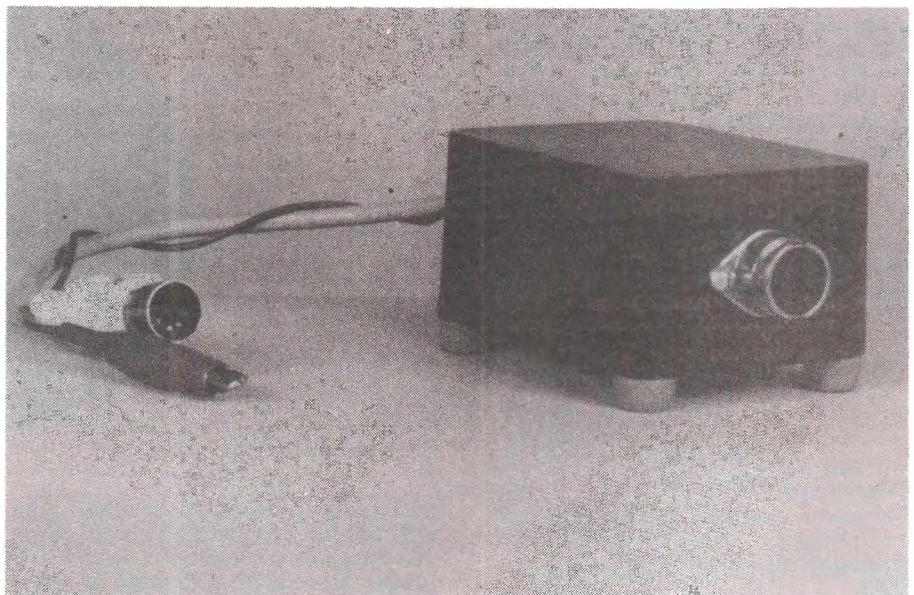
DIY Project Roger Bleep

Easy to build 'Roger Bleep'

The Roger Bleep is a unit designed to transmit a short beep or tone pulse at the end of your transmission to indicate to the other person that you have finished when working sideband or under difficult conditions.

The Roger Bleep described here was designed to fit almost any rig so relay switching was used to 'standardise' the connections. Only one external connection is required to a 12-volt source and no on/off switch was fitted as the unit only consumes 40 mill-amps in the standby state.

Another advantage with this particular unit is that the 'bleep' tone (on most rigs) can be relayed via the loud-speaker in the set itself, which is particularly useful. When working long overs in a lorry or noisy car, when the fingers tend to tire and release the mic switch, when the rig switches over to receive, the bleep is automatically transmitted and also comes through the loudspeaker.



Components List

Resistors:

RX 50 ohms to 300 ohms (see text)

R1 10 kohms

R2 10 kohms

R3 47kohms

R4 10 kohms

R5 1 kohm

R6 100kohms

Capacitors:

C1 40 μ F 16v or greater

C2 100nF

C3 100nF

C4 100nF

C5 40 μ F 16v or greater

IC1 556 (dual 555 construction)

plus 16-pin dil holder

D1 IN4001 or any 1-amp gen. purpose silicon diode

RL1 400 ohms or higher 12-volt relay

RL2 400 ohms or higher 12-volt relay

Other items:

Matching plug and socket to match mic plug and socket on rig.

Two 4BA nuts, bolts and washers to fix above socket in place.

Small plastic case to build finished project in (to suit taste).

Six small double-sided self-adhesive sticky pads to fix board and relays in place.

Small piece of Vero board, 23 holes x 20 strips 1 x 1/4in. grommet.

Short length of 4-core screened mic cable.

Note: All the above components should be readily available from radio component dealers.

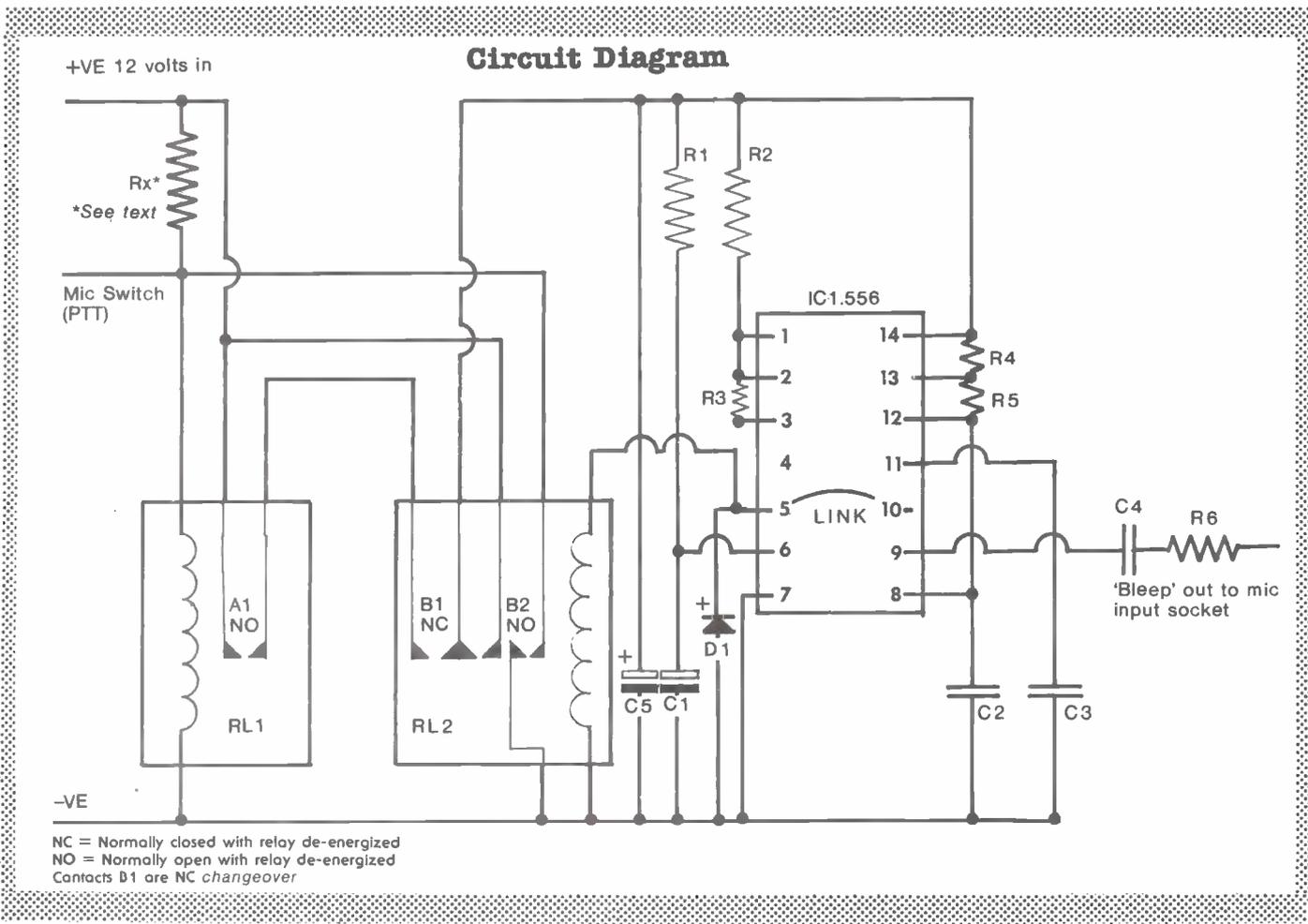
How the circuit operates

With the rig in the transmit mode, RL1 is de-energized and the Roger Bleep is off. As soon as the mic is released, RL1 receives 12 volts from the PTT line and becomes energized closing contacts A1 which in turn feed 12 volts to the circuit.

As soon as the IC receives its supply it generates a short tone and at the same time briefly energizes RL2. With RL2 energized, contacts B2 close shorting the PTT line to earth holding the transmitter on to enable the tone to be transmitted. Relay contacts B1 change over to allow 12 volts to feed to the circuit direct because Relay 1 briefly de-energizes during the bleep cycle and the supply would have been lost.

Resistor Rx may have to be included on some rigs if RL1 switches on the transmitter because of the current drawn through it. This resistor acts as a bleed resistor allowing some of the current to flow directly through it.

The type of relay used is not too critical but ideally should be above

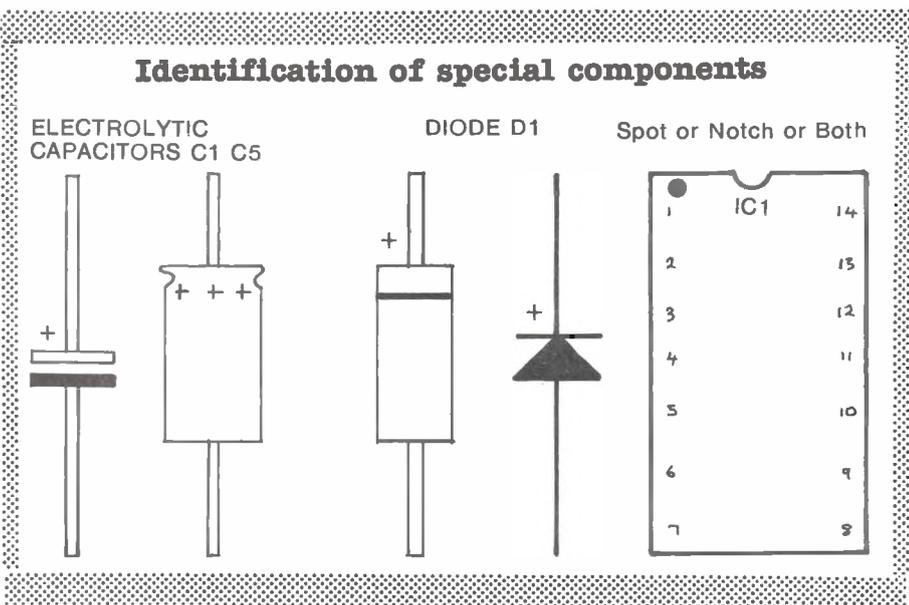


400 ohms coils resistance at 12 volts. If problems are encountered with the unit 'chattering' or failing to switch properly this will be because RL2 has too low a resistance capacitor for the particular rig. To overcome this, C1 can be increased in value. The whole unit is built into a small plastic box with a mic socket and a short lead with a mic plug on it.

Construction

Start by taking the circuit board and cutting the copper strips in the six places as shown in the layout. This is best done with a small twist drill held in the hand and turned. (Please note that the diagram shows the plain side of the board so the position of the cuts will be reversed when looking at the strips). Next solder in place the IC holder, wire links, resistors and capacitors, making sure that the two electrolytic capacitors are the correct way round.

Once the above components are in place the relays can be wired up to the board. The diode D1 can then be mounted onto the coil connections of RL2 making sure it is the correct way round. Once this stage of the construction is reached IC1, which is a dual 555 oscillator timer, can be fitted (noting the connections) into the IC socket. Putting the board to one side, we can now fix the socket and lead into the box. Once the socket is in place take the lead and fix the plug onto one end. The other end is con-



nected to the connections of the socket forming a short extension lead; pin 1 in the plug is connected to pin 1 in the socket, pin 2 in the plug is connected to pin 2 in the socket, etc.

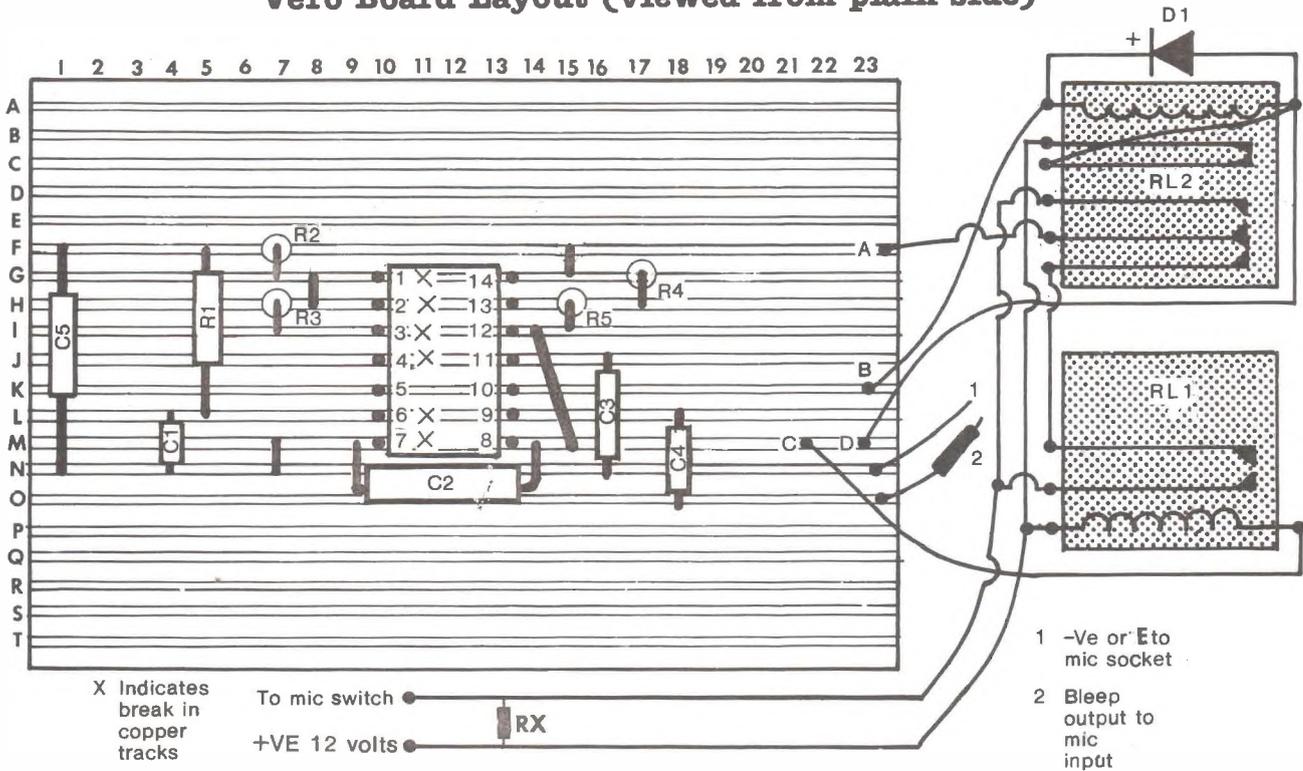
Once we have reached this stage, the Roger Bleep can now be fitted into the box and the relays fixed in place. In the prototype, I used some small double-sided self-adhesive sticky pads to fix both of the relays and the board in place.

Finally connect the board up to the back of the socket. The -VE lead goes

to the -VE connection on the socket, the PTT lead goes to the PTT connection on the socket and the bleep output goes to the microphone line. The only other connection to the board is the 12-volt supply which comes into the box from an external source via the relays.

The above connections were for the Midland range of rigs. With other sets, however, the types of plugs and sockets used will vary but a quick look at the circuit diagram will clear up any problems encountered.

Vero Board Layout (viewed from plain side)



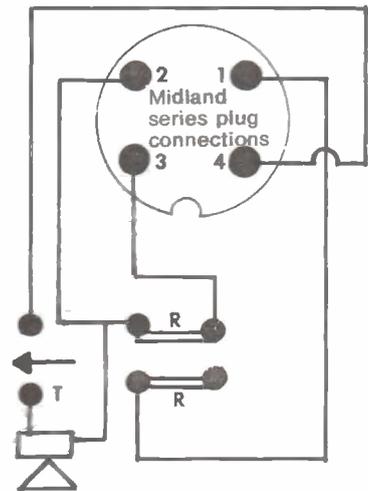
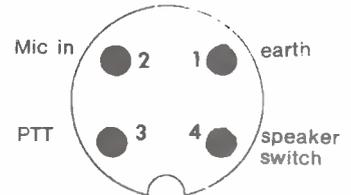
Testing

Before testing the unit out it is strongly advisable to double check all the connections and component positions for any possible errors. Connect up the microphone to the socket on the box and plug the short lead into the mic socket of the rig. The final connection is to the 12-volt supply positive. Please note that this supply must be the same one that supplies the rig because the negative or earth return

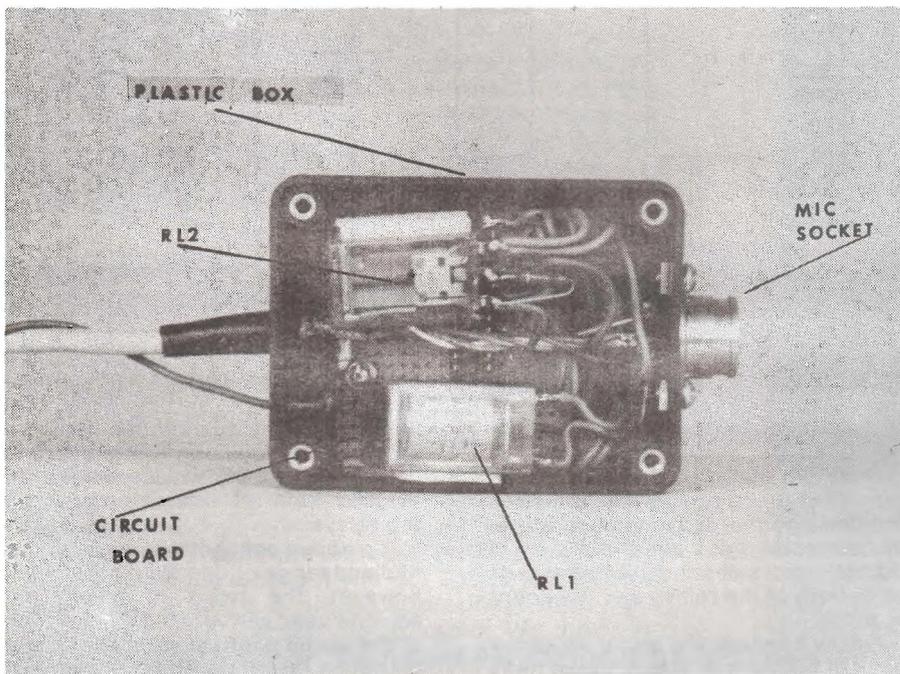
is via the set itself. If, in the case of the self-contained base station with its own built-in supply, a separate supply must be used with the Roger Bleep or a lead run from the power supply inside the rig. In the former case an external negative lead must be run from the Roger Bleep.

In use when the microphone switch is released the Roger Bleep will hold the transmitter on for about half a second and send out a bleep.

Typical internal mic wiring



Note: There is nothing to stop anyone from constructing the Roger Bleep inside their rig if they feel confident enough to do so. It has only been shown constructed in a plastic box for those who do not want to tamper with their sets.



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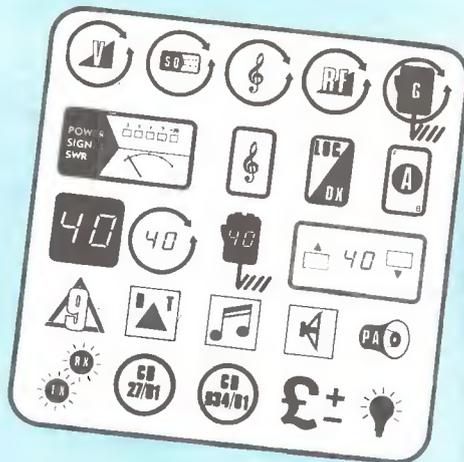
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How We Test Rigs

A simplified insight into our rig tests



For our regular readers the next few lines will seem familiar. However, we make no excuses for this, simply because its importance cannot be over stressed.

The most important thing to look for in any rig review or test is how the information used in the article was obtained. All too often tests or reviews can amount to nothing more than conjecture or personal opinion, so unless facts back up the test, be careful.

In order to verify and reassure both readers and manufacturers, we guarantee that all the tests printed in our publication are carefully conducted and supported by fact. If a transceiver is placed with us for testing, any modifications or adaptations to it in order to enhance its performance would be noted and reported on. However, if there are discrepancies or genuine faults then the supplier would be notified and allowed to submit another set for testing. After all, the odd rogue will always appear just at the wrong time.

To this end any review or test printed by us will bear this guarantee:



The equipment

Most of the test meters and test equipment used are practically self explanatory, as their name normally relates to the task they perform.

On average most tests will make use of the following apparatus, although in some instances, i.e., 934MHz, the equipment will differ.

Two signal generators, a Racal 9081 and a 9082, are used to generate varying levels of almost pure signal, these signals are not modulation but are similar to an empty transmission. Because of its purity modulation, distortion or similar variations can be applied to the signal to produce the desired effect.

A Marconi TF 42F distortion meter: this is practically self explanatory, as is a Marconi TF 340 audio power meter.

The Racal 9916 frequency meter when connected calibrates the output frequency of the set being tested and in particular the channel it is on. For instance channel 20 legal FM should be 27.79125. Testing for channel spacing and temperature deviation using this counter will give a very accurate result.

Add the other essential equipment like a Racal 9010 and Bird 43 power meters, a Levell TG 150D audio generator and a Solartron AS 1412 power supply and you now have a reasonably comprehensive test bench.

First step

Upon receiving a transceiver for testing, our first inspection is to ensure that the set has arrived undamaged and in working order. The quality of the packaging, instructions and accessories along with any other extras are then assessed before getting down to the actual test. One example we were particularly pleased to see on one set was a sticky label covering the microphone transmit button, warning of the possible hazards of transmitting without an antenna connected. A nice, practical touch which could save unnecessary grief for the uninitiated new owner.

Now with the set actually on the bench, a few initial tests and it will soon become apparent if the set is fully operational and capable of transmitting. At this stage the casing will have been peeled open and the general condition of assembly noted. Here we also look for any signs of foul play, in other words a tweaked, specially-prepared and/or modified set. After all, we all accept that no two sets will ever be exactly the same but the intention of our test is to give you a fairly good idea of the average expected working performance, not maximum or false results.

In this initial stage, particular attention can be paid to the quality of soldering, components, layout and design.

The test

This is broken into two major parts, Receiver and Transmitter. Each part then has specific tests designed to determine the set's performance.

Power output

MPT 1320, the Home Office specification for the performance of 27MHz

FM equipment, demands that the maximum power output of the set must not exceed 4 watts. This restriction applies to the maximum supply voltage. That is to say, a car with a well-charged battery of 14.5 volts.

Power output is related to the voltage, hence a lower output will be obtained with a lower voltage. There are three basic voltages: a low battery, 10.8 volts; an average level battery, 13.2 volts (referred to as 12 volts standard) and a well-charged battery, 14.5 volts. Both Hi power unattenuated and Lo power attenuated modes are tests and at this point the 10dB attenuation can be calculated.

This is perhaps not the simplest of calculations so there is no real need for you to work out the result but for those with an interest this is how.

Attenuation wattage can be presented as Decibel Loss or Decibel Gain - dB Loss is calculated by:

- Divide the lower figure by the higher figure
- Calculate the log of that figure (10 log 10)
- Divide the answer by 10.

This gives the answer in Decibel Loss. To achieve dB Gain:

- Divide the higher figure by the lower figure, then follow c) and d) above.

As a practical example of expected results, look at the table headed "Power Output and Attenuation". These figures are not necessarily the optimum or ideal but they should serve as a guide to practical output.

Power Output and Attenuation		
Atten.	Supply Voltage	
Hi	10.8v 2.2W	13.2v 14.5v 3.4W 4.0W
Lo	0.19W	0.34W 0.4W

Frequency

Almost anyone with an interest in CB will know that the legal frequency is 27MHz FM. At present we are only testing FM equipment. This does not mean that we intend to forget AM (the illegal system). Quite simply, until the market has settled and manufacturers or importers have announced totally the range or rigs, the situation is somewhat awkward. Imagine the confusion we could cause if we tested an illegal and a legal rig of the same name?

Twenty-seven Megahertz FM is 40 channels. With channel 1 on 27.60125

and channel 40 on 27.99125, the spacing between channels should be 10KHz. Therefore channel 2 would be 27.61125 and so on. Temperature effects this channel stability and a cold set will not be spot on frequency; nor will a warm set. To detect the stability the set is connected to the Racal 9916 frequency meter and a reading at room temperature (68°F) on channel 1 and 40 is noted. The set is then placed in a cooler and the temperature brought down to 48°F. Once again a reading is taken on channel 1 and 40. A reasonable reading is reproduced in the table - 40Hz maximum drift, which is quite a good result.

Temperature Stability		
Temp.	CH1 (MHz)	CH40 (MHz)
48°F (cold morning)	27.60128	27.99128
68°F (room temp.)	27.60123	27.99123

Modulation

One of the most important things to understand is whilst we refer to speech as modulation, which is correct on AM, with FM the actual process is deviation. Modulation in this respect is merely the voice, pulse or tone, which for our test is artificially introduced.

To conduct the test one measures the peak deviation using an audio tone which is fed into the microphone connections. By doing this the modulation limiting can be realised. Different input levels from 0.5 millivolts to 2000mV are used. The input frequency over 500Hz, 1125Hz and 2500Hz will then give us a reading using the Racal 9009 modulation meter. Looking across the chart, the wider the difference between each column and the higher the 2500Hz reading, then the more natural the transmitted voice will sound. This is a somewhat over-simplified explanation but it can be successfully applied.

Modulation			
Level Input	Input Frequency		
	500Hz	1125Hz	2500Hz
0.5mV	0.25KHz	0.70KHz	0.29KHz
1.0mV	0.30KHz	0.80KHz	0.32KHz
2.0mV	0.6KHz	1.10KHz	0.80KHz
50mV	1.20KHz	1.50KHz	1.20KHz
200mV	1.25KHz	1.50KHz	1.20KHz

Receiver test

The first item measured in the receiver is the audio output.

Audio output

This is measured into an 8 ohm load at 13.2 volts supply which is normally the resistance of most speakers fitted. The distortion figures can now be measured using a Marconi TF 340 audio power meter, a Marconi 42F distortion meter and a Levell TG 150D audio generator. Three different wattages are used to give an idea of the flexibility: 1.5 watts lowest, the maximum wattage which can vary between 3.00 and 3.50 and a half-way wattage between the lowest and the maximum. A percentage



of distortion can then be measured. Again the chart should give an example of a reasonable result. The significance of this test is to determine how much of the received signal is lost at the audio output.

Measured Distortion	
1.5 watts	2.3% distortion
2.2 watts	10.0% distortion
3.5 watts	18.0% distortion

Squelch level

Measured in micro volts, the threshold and the fully muted positions need to be determined to discover the squelch range. With the Racal signal generator connected to the set turned to zero and the squelch at threshold, it is gradually opened until the signal becomes readable. This gives a measurement in micro volts. To determine the fully muted position the squelch is left static and the signal generator is adjusted from zero upwards until readable.

As such a table is not required to express the result, instead two figures are produced with a comment, e.g.:

Threshold - 0.1uV.

Fully muted - 7.0uV.

This example is quite a reasonable adjustment range and it would be possible to set the squelch to cut out all but the worst interference.

Receiver sensitivity

The object of the exercise is to achieve the amount of signal received as a reading in micro volts at 10dB quieting, 20dB quieting and 30dB quieting. To obtain these figures a generated signal of a known strength is transmitted, firstly at a low level 10dB and then at 20 and 30dB.

Sensitivity	
10dB quieting	0.09uV
20dB quieting	0.25uV
30dB quieting	0.85uV

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 modula-

tion is then changed to AM still with a 1KHz tone but 30% modulation. The audio output from the receiver is then measured. In the case of an average rig a reading of around 30dB to 35dB would be considered within acceptable limits.

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.

Adjacent channel rejection

Two signal generators are fed through a combining network into the equipment and are set to adjacent channels on the rig (i.e., 19 and 20). Both are modulated with a 1KHz tone at 1.5KHz deviation and one is set to 1uV output. The receiver is set to this channel and the audio output adjusted to read 10mW. Now the output of the second generator is increased slowly until the receiver degrades the wanted signal by 3dB. The output from the second generator is noted and gives the relative indication or rejection.

Again the result is expressed as a figure and comment as opposed to a table. A reasonable result would be 285uV for 3dB degradation.

Summary

To a great extent this needs no real explanation. Basically any comments or items discovered plus an overall impression would be given here.

Manufacturer's specifications

As a comparison between the results we found and those intended by the manufacturer we print their specifications. Unfortunately not all figures are quoted in the same manner so on occasions a direct comparison can prove difficult.

Features and controls

Finally, we offer you a quick reference set of symbols which detail the features in an easy-to-see manner. They include volume, squelch, tone, RF gain, microphone gain and many other accessories that are common on currently-available transceivers. Unlike many other attempts at charts and feature indications they are simple and specific.

CLUB SPOT

Hayling Island Listening Club

We are a small club of approximately 100 members. We like to boast of our visiting club social life. We hold regular barbecues and disco's to which any breaker who might be staying down on holiday is welcome to come in and join us for the evening.

We meet on Friday nights at this moment of letter writing. We are in the process of moving to a larger premises which will be near the Solent Club, Hayling Island.

The Hayling 20 is known as the Big Dipper.

Captain Birdseye (Secretary)

South West Lancs Breakers Club

Just thought I'd drop you a line to tell you a little bit about our club.

We hold our eyeballs every Monday evening at 8.00 at the Rainford Labour Club.

Well, I'll go down on the side satisfied and hope to eyeball you all soon. 77's and 88's to all.

10-10 breaker break.

Tattoo (Social Secretary)

Beech Breakers Club

Just a quick ratchet to let you know about the Beech Breakers Club in the south-west Essex 20.

We are a club which encourages family participation and, as well as fighting for 27 legal AM, we work on charity fund raising with the emphasis on having *fun* whilst we're doing it.

10-10, breaker break,

Ol' Boot

Windy City Breakers

We are the Windy City Breakers and our club was formed in December 1980. We have 200 members aged from 10 upwards. We meet every second Monday in the New Hotel, Robertson Street, Barrhead at 8.00pm. The breaking channel in Windy City is 14 and the truckers' channel is 26.

We will be pleased to hear from any club to exchange literature and club news.

10-10 till we do it again.

(Honey Bunch) (Secretary)

Sunny B Breakers Club

The Sunny B Breakers Club meet every second Wednesday in the Greenmount Hotel in Burntisland, visitors being welcome for a nominal sum after club business is finished which is usually approximately 9.00pm. The club's existing paid membership

amounts to 71 and increases with every club meeting. Some of the activities which we have arranged for the members already have been: i) a welly throwing contest; ii) a treasure hunt; iii) a fox and hounds; iv) a club disco; v) a raft race.

The turnout for the above events has been reasonable as regards numbers attending in every case.

I will close now saying thank you for your time, ChinChin (Alfred Hitchcock). 10-10 till we do it again, Bob.

Yours thankfully,

Guitarist (Secretary)

Westcliff Breakers Club

Our club formed a few months ago. Up until that time the only other clubs in the area to cater for Westcliff/Southend breakers were approximately 10 miles out of town. Nobody could have dreamed how successful the club would turn out to be and after one early move we are now situated at the Cliffs Pavilion (Maritime Bar) where membership has now grown to approximately 600. Meetings are held every Monday night and new members are always welcome. So once again, we meet in the Maritime Bar, Cliffs Pavilion, Westcliff-on-Sea, Essex. OK, enough said so I will just throw you all some pretty numbers and catch you later.

Bye bye,

Alleycat

Woodley Town Breakers

The Woodley Town Breakers meet at the Good Companions public house every Monday night from 7.30pm in the public bar. The 20 is at Loddon Bridge Road, Woodley and is between the A329 and the A4.

Anyone wanting any further information should contact Andy on Reading 693220 (evenings).

73's and 88's.

Vee Too (Chairman)

Satellite Breakers Club

Just a few words to introduce ourselves, The Satellite Breakers Club, Luton.

We have been formed for six weeks now and have a membership of 40 and growing. The main aims of the club are to involve the family and promote CB, as we feel it should be for everybody. We also have a junior section in the club, 5-15 years.

Our meeting 20 is The Plough at Woodside, just outside Luton. We meet the first and third Thursday of every month and have a barbecue once a month plus the usual treasure hunts, outings, convoys and children's parties.

Our breaking channel is 16, so if any of you good people are in our 20 on eyeball nights, put out a copy for Geronimo, Rubber Nun, Conrod or Python and you'll be more than welcome.

So till we do it again, 10-10 we're down, we're gone, bye bye.

Geronimo (PRO)

Roe Valley CB Radio Club

The Roe Valley Breakers Club has been in existence for over a year and in the past six months our membership has grown to well over 300 breakers. We now have a junior breakers club as well as our senior club. In our area, which is about 14 miles from Londonderry, we have several breakers' club within this radius and we have had some very memorable eyeballs with our fellow breakers. Our club has raised well over £500 in the past six months for local charities. Our recent effort was a jumble sale which raised £100 for our local hospital. We have had a couple of dances and our junior club have had a disco and are at present arranging a sponsored walk.

Our club meets in our local hotel 20 (commonly called The Big G on channel) twice monthly on a Wednesday night and the junior club meets on subsequent Wednesdays, again fortnightly, in the local town hall. We have compiled our own CB Bible and we have club stickers and certificates available to our members when they join our club. As fellow breakers, we read your magazine avidly and enjoy it. We wish you all across the water all the 73's and 51's and thanks to all concerned for producing and publishing such an interesting and informative monthly magazine.

10-10 until we are in touch again, breaker break.

Madam X (PRO)

Grass-Court Breakers Club

Grass-Court is the code name for Haydock and we meet every Sunday at the Waggon and Horses and all breakers are made welcome.

Thanking you,

Small Fry (Peter) (Secretary)

Has your club registered with the CB Radio National Club Register? See our article 'Clubs Unite'. This is a good chance for your club to make a stand for what it believes in.

Those who have already sent in their information will be receiving their certificates in the New Year, when the certificate sender finally finds her way out from under the enormous pile of letters.

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NAME

ADDRESS

Clubs Unite

Certificates on their way

In response to your club registrations, we are now in the middle of sending out certificates to you verifying your club status. This task is taking slightly longer than anticipated due to the vast amount of replies that we received. Do not despair, our new computer has now been put on 24-hour working and the certificates outstanding will soon be with their rightful owners.

Compilation of Directory

February is here as far as you, the reader, are concerned but I'm sitting here in December writing this little gem. So by the time you read this article we will be well on the way to completing the first edition of the National Club Directory. The first edition is proving to be so popular that we will soon be compiling the second edition for which more information in the form of registrations is still required. However, if you manage to work at the speed of light (unlike myself) and want your club details to appear in the first edition, register now.

For the benefit of clubs who haven't seen details of Clubs Unite before – we are running the full information again so that their details can either appear in the First or Second Editions of the National Club Directory.

To everyone who has registered so far, we are enormously grateful for your co-operation and we are sure that it won't be long before you start seeing the benefits of this exercise.



National Club Directory

Regardless of choice and frequency preference, registering your club will be important, new 27 FM clubs will spring up along with 934 clubs, each with its own aims and ideals.

Therefore we have decided to start a totally separate publication intending to register every possible CB club, group or organisation.

FM Clubs will find it an advantage to register their name and address, it should stop confusion & identical names in the same area, it may even prevent them from choosing a similar name in the first place. It will also let other clubs

know of your existence, how to contact you and what channel you break on. Being registered will also have a spin off advantage, for instance many rig insurance schemes now mail the clubs with preferential offers on rig theft insurance.

AM Clubs will find registration essential because the Government want to make you extinct. They will succeed unless you openly proclaim your support, communicate with similar active clubs and unite in any protests or demonstrations. National Club Directory will contain information that an organiser of any demonstration would need to know, how to obtain police permission and who to contact, planning the best possible route, the time scale and how to plan your support, suggested media contacts and promotional hints, tips on money saving with banners and posters, along with artwork for suggested campaign literature, (the most expensive part of any campaign). In other words everything you and your club should need to stage an effective protest or demonstration.

SSB Clubs. Amongst all the other possible clubs, Single Side Band is without doubt the major argument for AM preference. Yet to date the Home Office have never mentioned the subject and totally ignored its existence. True we all know 27AM, SSB, long distance contact is illegal the world over, but is it that far removed from 28 MHz operation that there is no argument for legalisation? Many Hams cast CB'ers aside as unlicensed pirates, yet more and more we have noted a tendency by some amateurs to ask why isn't the RSGB pressing to incorporate it!

Registration for the QSO Club should be an advantage, other local SSB clubs will know your frequency and either give you a clear band or be able to contact or at least try British working with you.

Information listed would be reasonably explicit, i.e. frequency, area, attitude, DX local or long distance, the membership response to QSL, if a purist QSO or DX QSL Swap considered. Whether the club is active, interested in legalisation or just simply here full stop.

DX - QSL Swap Clubs can incorporate information about themselves in a semi advertisement form and enhance their membership, listing their club package, QSL rate i.e. 100% or 1-4-1, enrolment fee and even printing in the register their Club QSL card.

BIRDLINGTON MOSS BREAKERS

Venue: The Castle on the Hill
Birdlington Moss
Castlehill View
Birdlington
Every Tuesday 8.30 - 1.30
Contact: Meril Straight
Evlín Vaughn Green
Ridge Castle Road
Birdlington
Area: Shakey Tree Town
Break: 14
CLUB: 17
Registered: AM ACTIVE

BROOKFIELD MARSH STOMPERS

Venue: The Marsh Inn
Brookfield Marsh
Nr Broadlanders
Every Sunday
Contact: Mike Stalmond
12 The Larches
Oakfield Marsh
Broadlanders
Area: Stompers Green
Break: 14
CLUB: 11
Registered: FM

BUS STOP OX QSL

P.O. Box 32
Flanders
S. Suxeth
Personal: Mike Roger, unit 001 President
Frequency: 27.585 LSB
Registered: SSB PIRATE

The above are examples of how the listings will appear. Please fill in your form with care, think of the details you wish to be printed and compare it with the above.

Certificate of Registration

In order to collate all the information we hope to receive, computer time will be booked, therefore we want to use only genuine and correct information about your club, body, organisation or group.

For this reason there will be a registration fee, this will cover collation of data, issue you with an "Official Wall Certificate" which is proof of registration made out to the registered club showing its official stance i.e. AM-FM, SSB or DX QSL Club, Organisation or fighting group. The registration fee will also allow us to send you a photo-stat of how your listing will appear. This can then be checked to ensure that all the information is correct.

The Registration fee will be £1.00 for all clubs, organisations or groups, additional space will be available for the more prominent clubs, fighting organisations or DX-QSL Clubs wishing to promote themselves.

JOH

CB Radio Magazine

NATIONAL CLUB REGISTER

Please fill in details carefully and comprehensively. Print in block capitals only.

FOR OFFICE
USE ONLY

NAME OF CLUB
VENUE
ADDRESS in full:
Day & Date

Contact/Personal
Address
Phone No

Area or County
Area or County Handle
Breaking Channel
Club Channel

(see below for choice first)
Club Registered as:
Club favours:
DX/QSL/QSO/or 1 - 4 - 1
(Applies only to 100% QSL)

CLUB FAVOURS (either);

FM:	Covers all legal FM
AM:	27MHz Illegal
SSB:	Single Side Band
ALL:	CB Illegal and legal

CLUB REGISTERED AS (either);

ACTIVE:	Fighting for AM or SSB
SUPPORT:	Interested in all demos
LEGAL:	Happy with the legal frequencies
PIRATE:	Illegal to the end

I wish to register the above club and details:

My Name is
Position in club/group etc
Address
.....
Phone No

I understand that this information is personal and not for printing, unless it is the same as above

I enclose the registration fee of £ 1.00p Cheque or P.O. to British Breaker Productions, Tudor Works, Beaconsfield Road, Hayes, Middlesex, USA OFL

Certificates of registration will be despatched with a photo stat 'proof' of your insertion as it will appear, as soon as possible.
Please allow for the collation time involved and expect to see this early in the New Year.
If you do wish to receive your Certificate earlier enclose a large S.A.E. with this form.

FOLD ON LINES ONE, TWO, THREE AND FOUR TO MAKE AN ENVELOPE AND TUCK FLAP 'A' INSIDE POCKET 'B'.

FLAP 'A' TUCK INSIDE 'B' TO SEAL ENVELOPE



FOLD

FOLD FOUR

PLACE
STAMP
HERE

FOLD ONE

National Club Register.
British Breaker Productions,
Tudor Works,
Beaconsfield Road,
Hayes,
Middlesex,
UB4 OFL.

FOLD THREE

FOLD

OPEN POCKET 'B'

LINE DEFINED TO ALPHA TCC

FOLD

FOLD TWO

FOLD



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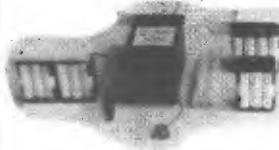
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America, the Way Ahead!

Will Britain follow the American CB trend?

Following our brief look at the CB system that exists in "America today, after the boom", we thought it could be interesting to pose a few questions.

Britain has known legal 27FM for a little over three months. It was expected that upon legalisation there would be an instant boom with people clamouring to purchase the new rigs. To date that boom remains mythical. Instead there was considerable demand on and just after legalisation day with an obvious increase in sales due mainly to the Christmas rush. So will there be a boom for FM or has legalisation merely cleared the coast for AM operation?

Boom or gradual increase?

Britain looks set for a gradual increase in its CB'ing public. Just before Christmas and the impending petrol tankers' strike there was a potential UK-USA comparison. Perhaps if the tanker drivers had gone on strike British CB would have had a boom of sorts. Who knows, as this is naturally written somewhat earlier

than you are reading, a strike of a similar nature may already be under way. However, strikes aside, it appears that the amount of AM CB'ers is certainly not declining, yet legal FM has a healthy quantity of users.

Could it be that almost all the AM users are remaining on their frequency, with the more cautious AM CB'ers turning to FM along with those who held an interest in the subject, but were not prepared to break the law?

If this is the situation then apart from the newcomer to CB practically everyone that wants to use citizens' band radio has it.

Continued illegality

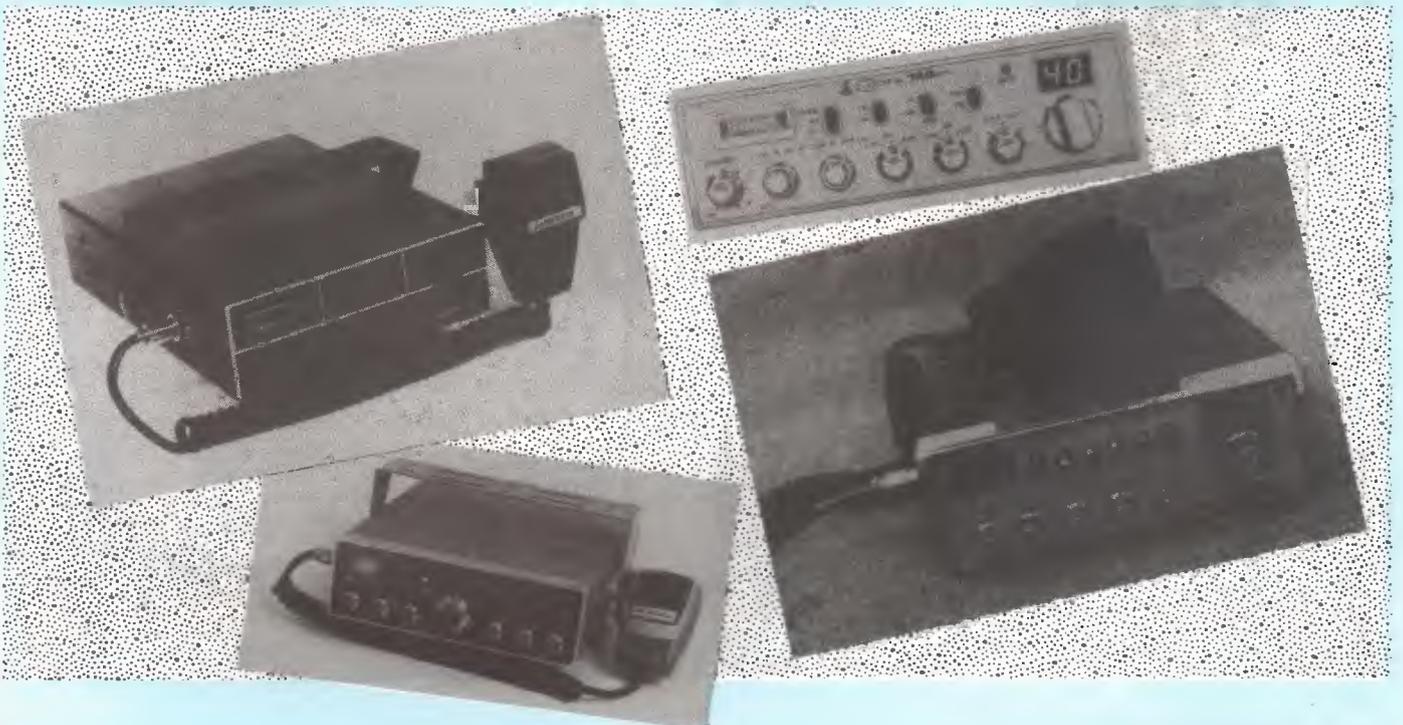
Here in Britain, as in the States, the more enthusiastic CB operator has turned to SSB (single side band) and the long distance communication that such a form of transmitting can produce. Initial introduction to this form of signal generation normally comes from 27MHz AM FCC specification transceivers, many of which vary from basic 40 channels with Upper and

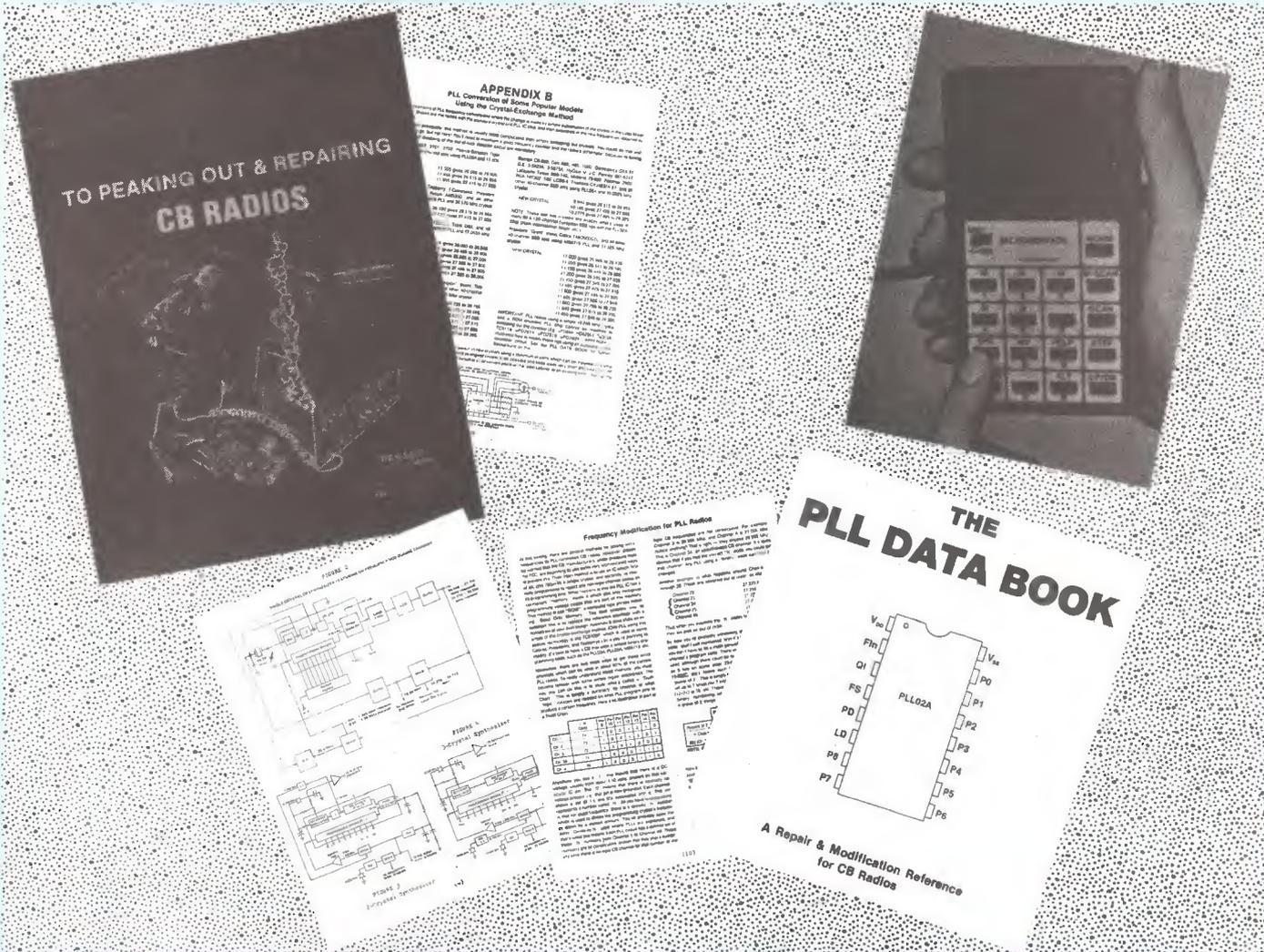
Lower Sideband to multiple variations Hi channels, Lo channels, Hi-Hi channels and Lo-Lo channels.

These latter multiple channel sets are further confusing as non-FCC frequencies can often appear on some sets with higher power than the FCC-allowed 4 watts. Thus those that do use SSB equipment will confirm that the frequency is not short of operators. A point worth mentioning here is that sets, other than those with Hi, Lo or multiples (in other words the basic 40 FCC channel sets) only have 40 channels. However, for ease they are referred to as 120 channels, although channel 20 basic AM is still channel 20 whether it is in Upper or Lower Sideband.

To add further confusion, some more expensive sets have off frequency channels obtainable, i.e., using a kc (Kilocycle, a thousandth of a Megahertz) shift it is possible to dial almost any frequency. Once a CB enthusiast has reached this depth of radio operation he will be investing considerable time, money and effort into his equipment, equipment which could still be confiscated as an illegal

A selection of the multimode and multichannel rigs popular in America and gaining increasing popularity in Britain. The extra channels and alternative modes offer clearer channels for the serious operator.





Do-it-yourself modifications are also popular and there are now plenty of books and instructions for those prepared to face the FCC wrath if caught. PLL modifications are most popular as these give a very high number of channels. For the lazy, frequency expanders like the Micromonitor are available ready built.

import regardless of use or operation. At this stage many SSB CB operators find it more economical to purchase Amateur equipment and have the 11-meter band installed. Whilst operation and installation remains an offence, the equipment cannot be confiscated for non payment of duty and is totally legal to own.

It is enthusiasts of this calibre that will never give up 27MHz. They find SSB working on the 11-meter band to be friendly and a serious hobby. To them 27MHz 11 meters is so close to the 10-meter Amateur band that complaints of irresponsible illegal use, whilst often taken seriously, are met with strong resistance. These ardent SSB operators claim to have considerable, professional and painstaking, careful operators, spoilt only by the few irresponsible people that exist in every hobby, even Amateur Radio.

Add to this expanded frequency operation gained by such equipment, the use of PLL adaptations (Phase Locked Loop) and frequencies from 25MHz or lower to 28MHz and more are easily obtained and used. The main reason for wanting more channels is simply to gain air space. There are thousands of operators using these frequencies and the more chan-

nels one has the more usable the set becomes for the operator. It is probably true when SSB CB users claim more enthusiasts than the Amateur Band, although at present the Government have no intention of including 27MHz in this Amateur Band and allowing legal operation.

The SSB argument has not really surfaced as a tangible subject to be discussed by the authorities with any seriousness. The Government's answer is simply "If people wish to talk over long distance or use SSB transmission then they should become licensed Amateurs, there is adequate allowance for this within existing regulations".

With this sort of stubbornness being taken by both sides, it is highly unlikely that SSB CB users will ever disappear. It is interesting to note that in America the FCC, their equivalent of our Radio Regulatory Department, have virtually given up trying to enforce restrictions on SSB operation and now practically ignore it.

Destined to struggle

Good argument for and against legal 27MHz SSB operation can be made by both sides. It is highly unlikely that our Government could

ever be convinced of its need. Unfortunately, because of the abundance of cheap 27 SSB equipment already saturating the world, even if our Government could see a need for its inception, they could never restrict its use to quality-type approved transceivers.

One must now consider if the Government truly believe that legal CB will offer the incentive to make law-abiding citizens out of these SSB CB enthusiasts or whether the only avenues left for the Government are fight or surrender. In such a situation it is possible that fines for operation could treble and if so the struggle will be well and truly on. The ultimate loser would undoubtedly be the Government, for they do not fully comprehend the quantity of users. Alternatively, surrender would be to either ignore its use, something the Government would find hard to do, or compromise and offer legalisation, amnesty, new frequencies or perhaps easier licensing for the Amateur Band. Any of the latter will meet with resistance and are certainly highly improbable.

Perhaps SSB CB is destined to struggle as it did in its country of origin, America, and their problems are far from solved.

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CB TELEPHONE link £25.00. CB 27MHz FM 40 channel de luxe rigs, built to Home Office specifications, direct from factory to you £43.00 plus VAT. Sae for details. Exrental telephone answering machines £49.00. Johnson Electronics, Star Warehouse, Chalk Farm Road, NW1. 01-286 6119, 01-485 3918.

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MORSE CODE TUITION AIDS. C.90 Cassette 12 w.p.m. for amateur radio examination. Morse Key and Buzzer unit for sending practice. Cassette (including booklets), £4.75. Morse Key and Buzzer, £4.75. Prices include postage etc. MH ELECTRONICS (Dept 7), 12 Longshore Way, Milton, Portsmouth PO4 8LS.

QUALITY LEATHER belts, brown or black. Handles or slogans stamped on. Please send cheque or postal order of £6.50, stating waist measurement, to G. Haines, Compton House, Mariners Drive, Sheyd Park, Bristol BS9 1JQ.

CB RADIO REPAIRS. Repairs to most rigs, burners and accessories. We also stock rigs and accessories and offer technical advice on your needs. A good range of colour TV's are available from £60. Access and Barclaycard taken. Sydenham TV Centre, 4 Wells Parks Road, Sydenham, SE26. 01-291 1435.

HAM INTERNATIONAL JUMBO, 2 months old, boxed as new, complete £255. Alan 01-346 6174.

DISCOUNT CB accessories, mail order only. Rosco Enterprises, The Bungalow, Daldowie Estate, Broomhouse, Uddingston, Glasgow, Scotland. Send sae for price list.

2SC2092 5W-Max 10W 27MHz RF-OP AM-FM-SSB, SIM.2SC1307, 1 £1.50, 5 £7.00, TA7205P £1.40 inc. VAT/p&p. Sae for full TR/IC list. CB/Ham/Pmr/Marine Service Centre. Repairs quickly done to MPT spec. by est. engineers. Large stocks of spares, no job too large or small. Special trade rates on lge qty RW comms. Dept. CR, 245 Stourbridge Road, Halesowen B63 3QU. (021-550) 9324 or (021-471) 1764 any time.

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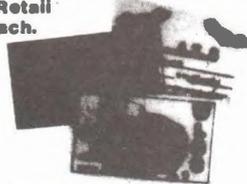
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