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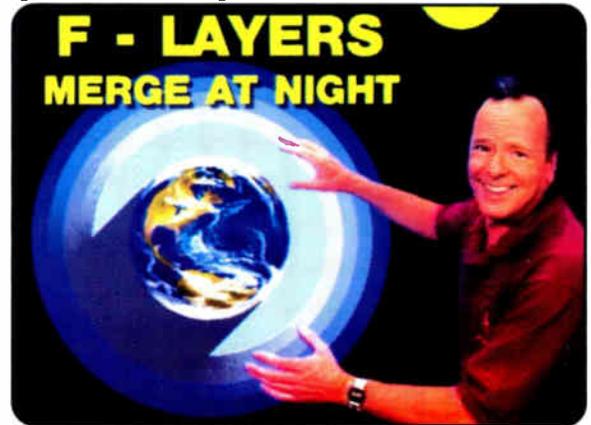


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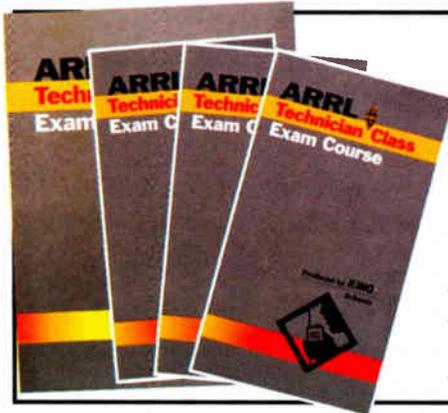
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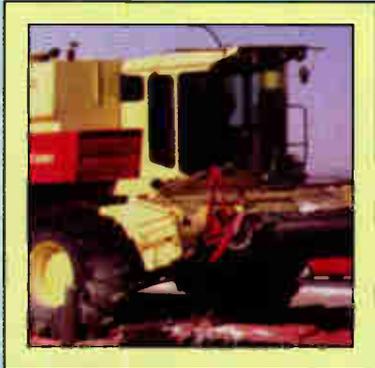


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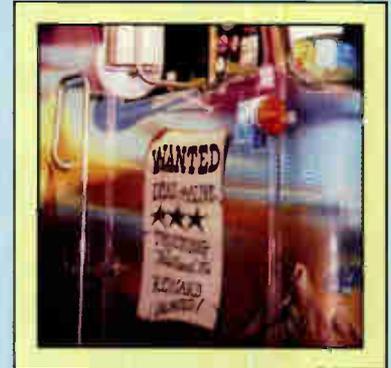
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FEATURES

Curing Those Interference Blues

There are so many causes of interference. Find out what they are and how to limit their effects.

By John Phillips, N2IUJ

That Darned Noise Just Won't Go Away!

It isn't always easy, but tracking down RFI is certainly a challenge.

By Harold Ort, N2RLL

Solving Telephone RF Interference

Some helpful hints and suggestions.

By Industrial Communication Engineers, Ltd.

Citizens Band Radio in Europe

CB radio is booming in most of Europe. Take a look at what's going on in the realm of Euro-CB.

By John Phillips, N2IUJ

Emergency Backup Power— There When You Need It

Sooner or later you'll need backup power for your radios. Here's what to get and where to get it.

By Larry Miller

Protection to Keep You Communicating

Time spent now making a good ground system will pay big dividends if there's a lightning strike.

Roger R. Block and Ron Block

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Young adults in many areas are discovering that CB radio is a viable option for communications. Here's how some of them have incorporated CB into their active lives.

By Bill Simpson, N9NMT

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This month's cover: Louise Myers of Rutherfordton, NC calls for road assistance on her radio. Photo by Larry Mulvehill, WB2ZPI.

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Let's Get Politically Correct: Toss Out the Linears

Linears. Just the mention of the word brings all kinds of reaction from people. You love 'em or you hate 'em. There is no in-between.

I suppose during the height of the CB craze you could have paid someone big bucks to take a survey among active CBers to determine just how many of these "footwarmers" were in the hands of the general CBing public. Guess what? They'd still be counting! But who needs high paid survey-takers? No one, it turns out. For that matter, who needs linears? That's right, no one.

You can do your own informal, yet highly accurate "who's using the linear" survey. Just turn on your CB and listen for a while. There's one—the clown in the next town running a kilowatt on channel 10. Let's color him using a little crayon. Log him in as a the joker trying really hard to be King. He talks, but only to himself. Wait a minute, there's another menace to the radio spectrum. She's got the power mic cranked up so high it'll take 15 minutes for your ears to recover. And she's feeding a few hundred watts into that wiz-bang mobile mag-mount, totally wiping out your reception five channels on either side of her antics.

This sort of child-like behavior is what gives CB a bad name. It did 20 years ago, and it still does. It's a lot like finding a fly in your soup. You bought it once, but you probably won't buy it again—at least at the same restaurant. It's the same with CB—folks know its great value, but bad behavior turns them away.

That's not to say everyone on CB uses a linear. Hardly. Not everyone shoots down the interstate at 90 m.p.h. either. But people that flagrantly thumb their noses at the law, and for that matter, the rest of us, should get what's coming to them. After all, it's *everyone's* radio spectrum, not the private spectrum of a few.

I know a fellow who regularly used a 500 watt linear—sometimes even when talking 15–20 miles. One day this fellow actually made a (oops) skip contact across the Atlantic. It all happened so quick. The contact was over before he knew it, and guess what? The illegal linear was "off."

Why do folks use linears? That's a ques-

tion that has lots of answers, depending of course, on whom you ask. Ask the linear user, but be prepared to read between the lines. It's a lot like asking a politician for a straight answer. "Gotta have one." "Everyone else does—so to keep an even playing field, I got one too." You'll never hear the linear user say, "Well, I got it because it's important for folks to hear me. What I've got to say is vitally important, not just here in town, but around the world. Matter of fact, I think I'll turn it on right now while I'm talking to you, even though we're talking on the phone. I don't really care that others are bothered by my stink, I'm gonna stink anyway."

The bottom line is that linears spell disaster for everyone; other CBers, your neighbors, your pocketbook and Citizens Band radio in general. After all, we're judged by the company we keep.

What's going to happen when a friend or member of your family is calling desperately for help on channel 9, while you're pumping out a kilowatt on a near-by channel, completely obliterating the call? Probably nothing.

Harold Ort has been an active CBER for 30 years, first being licensed as KCS-0447 in upstate New York. He worked as a radio broadcaster before joining the Army in 1971 where he served for 20 years in public affairs, his career culminating with a tour near the Kuwait border during Operation Desert Storm. (He took a handheld scanner along—no one said he couldn't!) His byline has appeared in numerous magazines and newspapers including *USA Today* International edition, *Stars & Stripes* and *Popular Communications* magazine. Harold is a member of the American International CB Club. He also enjoys monitoring international shortwave and all kinds of scanner communications, especially aircraft. Primarily active on SSB, Harold, SSB-596, frequently monitors channel 9 from home, and uses channel 19 when traveling. He is a licensed radio amateur (N2RLL).

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The Questions You Ask . . .

Dear Editor:

I have to agree there are enough fellow CBers to support a CB-only magazine. It should be easy because . . . CBers want to improve their rig and learn about technical stuff. I still want you to know that people in Canada are interested in CB. . . I have VE2 license and my old CB license XM52-3131 are on the wall.

Francis Venne, Quebec.

Dear Francis:

Many thanks for your letter and kind words. Stay tuned—we'll be having articles on topics you've mentioned, and then some!

**Dear Editor:**

I recently picked up a copy of the *CB Radio Buyer's Guide* and was very impressed with it! I've been a CB radio operator here in Hawaii for about eight years. I love the hobby and have enjoyed every aspect of it. I've made a lot of friends and even helped out in times of need. Living in Hawaii, CB radio popularity comes and goes really quickly, and believe it or not we don't have one CB shop here. So you can imagine what it's like getting hold of "decent" equipment. I found a lot of contacts in your publication that could prove to be very helpful. . . I really appreciate what you've done for CB radio and not forgetting us guys on the 11 meter band! Keep the spirit alive! I'll be the first in line. Aloha and 73's from the "Mini-Grass!"

Kalani (O' Man 49, Bruddah Moki)
Mack, Honolulu, Hawaii

Dear Kalani:

Sounds like you're really into CB in a big way. Spread the word! Thanks for the photo of your listening post. I too have many hours behind the controls of Cobra rigs, but without the D-104 mic.

Sirs:

All you're accomplishing is providing

folks . . . another advertising scheme to sell direct to CBers (wholesale) thereby putting locals out of business. But that's the American way isn't it? . . . And how many articles can you provide in your magazine that's new? Zero. Don't you know all that CB buyers are interested in is illegal items such as . . . 10 meter radios and linear amps? Here's hoping . . . *CB Radio* magazine and others . . . flop.

Sid, Fort Worth, Texas.

Dear Sid:

You shouldn't be surprised, but I have to disagree with you. Would you believe I had to call 911 to restrain our Associate Editor when she saw your "Dear Sirs" salutation? She's recovered now, but it was a close call.

What we're trying to do with both the *CB Radio Buyer's Guide* and the monthly *CB Radio* magazine is to help everyday folks make an intelligent buying decision—not one made because of counter confusion, impulse buying, or a salesperson's idea of the right rig for the shopper. It's also our intention, like other magazines in dozens of fields, to provide timely articles, including operating tips, construction, antenna basics, emergency CB use and much more. Nowhere in our magazine will you find how-to articles on illegal CB mods, hooking up a linear, shopping for 10-meter gear, etc. Why? Because the folks who are savvy (if you want to call it that) enough to find and much less illegally use a linear (especially when obtaining a ham license has been made so easy) typically aren't interested in operating legally. Interestingly, Sid, before I'd modify or use a 10-meter ham rig on CB frequencies, I'd sooner upgrade to operate legally. It's our hope that most other legit CBers think the same way. I think they do. It's the "one bad apple can spoil them all" syndrome. Use CB for it's intended purpose, and use ham for it's.

Sid, I really don't think we'll be "putting locals out of business," as you allege. On the contrary, just maybe we will, however, put folks on their toes and open their eyes, just long enough to read lots and lots of columns and articles about the many good things there are to say about CB and GMRS. We'll be providing readers lots of articles that are new. I hope you enjoy the new *CB Radio* magazine!

Dear CB Radio:

Among my problems is that when I use my CB radio my family can't watch the TV.

They tell me my voice comes over the speaker. Any suggestions?

P. Dolan.

Dear P:

Interestingly, among my problems is that when I use the TV, I hear Jerry Seinfeld and Voyager re-runs in my right ear. But that's because the shack door is open. Truth is, P, you can do lots of things to keep your signal from coming over the TV; install a low-pass filter on your CB radio, a high-pass filter on the TV and . . . well, why not read John Phillips article in this issue of *CB Radio* and get the details. Thanks for writing.

Dear CB Radio:

I keep reading about CB costs vs. cellular phone costs. I use both a CB and cell phone . . . both are great, but the one thing you never mention is the cost of the electricity to run the CB. I realize the minutes add up on my cell phone, but let's be honest, too.

Ralph Simmons, Kansas.

Okay Ralph, You've got me on that one. I think most folks would agree that the pennies (okay, maybe dimes) that it costs to use a base CB radio is a whole lot easier to digest than a \$200 cell phone surprise at the end of the month. Don't get me wrong, there's nothing wrong with cell phones, ham radios, or a tin can with a long string. Whatever works for YOU is what's important, right?

Dear Editor:

Congratulations on your first publication of the *CB Buyer's Guide*, it is a long overdue magazine. My copy, a gift from a relative residing in the USA will become a collectors item.

Trinidad is a small, twin island republic in the Caribbean, just off the north coast of Venezuela. Many CB enthusiasts reside here and DX regularly with US citizens. As magazines are rather difficult to source and afford here, my copy has been shared by dozens of delighted CBers.

We build our own base antennas; sometimes a few CBers get together to lend each other a hand over a bottle of rum and curried chicken. It is part of the island culture.

V. Jadulal, "Observer 1"

Dear V:

We hear you and we'll be in touch! By the way, we're flying the entire staff down this weekend to help with more antenna building.



Curing Those Interference Blues

Many of us have it, here's how to get rid of it . . .

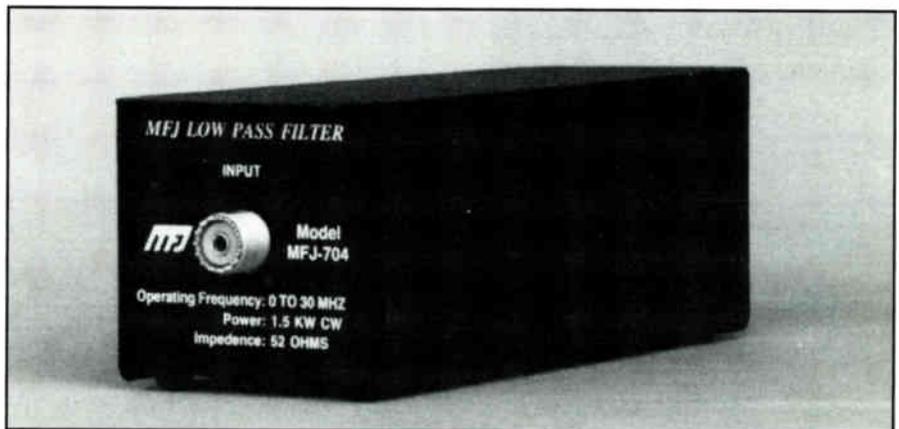
BY JOHN PHILLIPS, N2IUJ

Televisions, telephones, video games, VCRs, computers and other consumer electronic items can all receive interference from nearby CB radio transmitters. Radio frequency interference (RFI) and television interference (TVI) has become more of a problem in recent times due to the upsurge in popularity of radio communications equipment and the proliferation of audio/video equipment and home computers. With a little time and understanding of the how's and why's of RFI and TVI, solving the problem in most cases may not be that difficult.

First Things First

The first thing to do when you are having an interference problem is to make a thorough check of your CB station and antenna system. Is your antenna properly grounded? Are you using 50-52 ohm coaxial cable with at least a 95 percent shield rating? These two points are very important. A roof-mounted base antenna that is not grounded is not only an electrical hazard, but is also much more likely to cause television and other interference problems. A proper earth ground is a U.L. listed ground rod or copper pipe that is at least eight feet long, driven into the earth and connected to the antenna mast with a good quality ground cable. Keep all cables (ground, coax, etc.) as short as possible. Coax cable should be well shielded to keep the signal from "leaking" out of the cable before it reaches the antenna.

If your cable has been outdoors for



A low-pass filter such as this MFJ-704 reduces harmonic TVI signals from a CB transmitter. (Courtesy MFJ Corp.)

more than five or six years, it may be a good idea to replace it. Check all connectors and re-solder or replace any loose or broken fittings. Route the antenna cable away from phone lines, power wires and TV cables. Keep your antenna as far away from and higher than any nearby TV antenna as possible. Also make sure you have a low standing wave ratio (SWR) of 1.5:1 or less. A high SWR reading of 2:1 or more is an indication of an antenna and/or cable problem that should be corrected.

Many TVI problems are caused by CB radios that have been over "peaked", over-modulated or otherwise monkeyed around with by a "radio dentist" that extracts or twiddles with internal components, causing RFI and TVI problems. If you think you are a victim of this problem, have your radio's "molars" correctly

repaired by a qualified tech who can give you maximum legal performance and ensure the radio is not transmitting harmonics or splatter that can interfere with other products.

If you have installed any items in-line with the CB such as meters, switches, etc. disconnect them and run the CB directly to the antenna. Then reconnect them one at a time. Often the interference can be traced to a single component or patch cable radiating harmonic interference.

Television Interference

Television interference is probably the most common problem caused by CB radio. TV channels 2, 5 and 9 are multiples of the 27 MHz CB radio frequencies. If, after checking your CB station as men-

tioned above, you still have TVI, there are some additional steps you can take to solve the problem. If most of the problem is on TV channel/s 2, 5 and 9, this is due to harmonics of the 27 MHz signal. Install a good quality low-pass filter at the output of the CB as close to the radio as possible. A low-pass filter allows the 27 MHz CB signal to pass through while blocking higher harmonics such as the TV channel frequencies (54 MHz and up). There is no real measurable power "loss" at CB frequencies with a good filter, so it should be left in-line. Also, install a high-pass filter at the TV set antenna terminal. This does the reverse of the low-pass filter; it allows only the higher TV frequencies to enter the TV and rejects the lower CB frequencies. Use only good quality filters, preferably those that have a shielded metal enclosure for additional RF rejection.

The snap-on type of ferrite RF chokes can be placed on the CB coax near the low-pass filter and on the TV cable near the high-pass filter for extra help on stubborn problems.

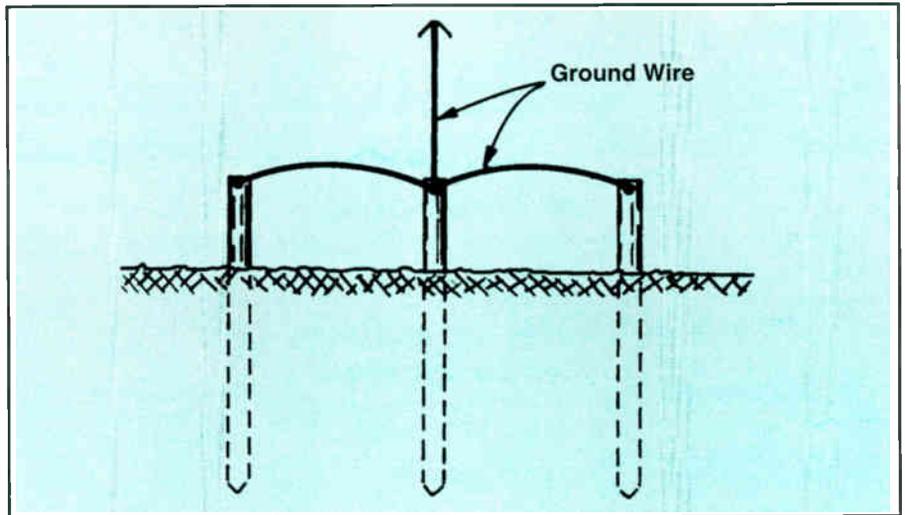
At the TV set, again make sure all fittings are tight and use 100 percent shielded RG6 or RG11 75 ohm cable. Disconnect all accessories and switches and run the TV direct to see if the problem is in one of the accessory components. It's amazing to see how many people are using long nine-foot or so video accessory cables when a two-footer would do! Nine feet is a resonant quarter wave antenna at CB frequencies, so use the shortest possible cable. Loop and tie any long AC or other cables that cannot be shortened.

Audio and video lines should be well-shielded, too. They can be run through ferrite chokes if necessary.

Your CB can also be radiating interference through the AC house wiring. This can be minimized by installing an AC line interference filter at the AC cord of the CB or power supply, and at the TV set or item receiving the interference. I also recommend a ferrite choke wrapped in the line cord of each for extra rejection. These filtering techniques can also be used on other audio/video components such as VCRs, stereos, video games, disk players, etc. if they are prone to interference. Sometimes it may take all of the above filters and steps to cure certain tough RFI/TVI problems.

Telephones and Other Devices

Imagine being in the middle of a phone conversation and hearing "Breaker 32, how 'bout it Slime Foot, You Out There?"—WITH an echo that sounds like Cousin Brucie on the Oldies Station along with a multi-tone Roger Beep to finish it all off!



A well grounded antenna is important for RFI/TVI reduction..

Telephone interference can be a funny addition to your phone conversation at times, but like TVI, it should not be there, and you CAN get rid of it.

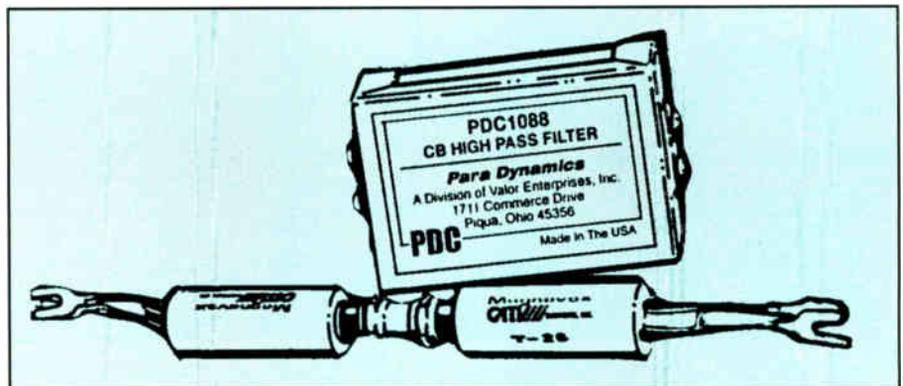
After you check and correct any problems on the CB end as I mentioned earlier, you can also take additional steps at the telephone set to reduce the interference. There are many good quality "clip in" filters available that work wonders at reducing telephone interference (see the box accompanying this article). They should be plugged in as close to the phone as possible.

Phone lines can also be wound around ferrite RF chokes to reduce interference. Make sure the telephone system ground is adequate. An old ground connected to a cold water pipe may be loose or rusty, or somewhere down the line a section of PVC plastic pipe was added which would break the ground connection entirely. Many phone companies will correct a phone ground problem at no charge. Check with your phone company if you need help with the telephone ground.

Answering machines and other telephone devices can be helped with the same methods of RF chokes, etc.

Computer equipment can also be affected by RFI. Again, many times a thorough check of the CB and antenna system may eliminate the problem, so do that first. If the problem persists, check all computer cables, ensuring they are shielded and as short as possible. Make sure all connectors are in tight. Plug the computer, the monitor and all peripherals into an EMI/RFI AC line filter, an item available at any computer store. Ferrite RF chokes can be put on any or all cables, if necessary. Even the modem line can be plugged into a telephone interference filter. An AC line interference filter/ferrite choke combo should also be used on the CB radio's line cord to prevent RF from entering through the AC power.

Remember that there are also other devices that can cause interference to TV, radio and telephones. If your neighbor points to your antenna and claims an interference problem, run a test and make



This Para Dynamics PDC 1088 high-pass TV filter for 75 and 300 ohm cable suppresses TV interference at the TV. (Courtesy Para Dynamics)



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sure your CB station is indeed the culprit. Other nearby radio transmitters, garage door openers, ham and business band transceivers, computers and AC power tools have all been known to interfere with other electronic items. You should also know that there are some poorly made and designed TV sets, telephones and other devices that have little or no shielding or interference rejection. They may not be able to be used in close proximity to a CB or other radio transmitter.

Remember, a little detective work and troubleshooting will go a long way toward making everyone happy. ■

Where to Find Interference Filters

Advanced Specialties, Inc.,

114 Essex Street
Lodi, NJ 07644.
Phone 201-843-2067.

Carries a large variety of antenna tuners and RFI filters for TV, telephone, CB and ham transceivers.

Oak Bay Technologies,

P.O. Box 65494,
Ludlow, WA 98365.

Manufactures high-power commercial grade low-pass filters for CB and ham radio.

Amidon, Inc.

3122 Alpine Avenue
Santa Ana, CA 92704.
Phone 714-850-4660.

Carries ferrite cores and rods to wind around line cords and cables for RFI reduction.

MFJ Enterprises

P.O. Box 494,
Mississippi State, MS 39762
Phone 601-323-5869.

Manufactures high and low-pass filters and antenna tuners. Call for name of nearest dealer.

Vectronics Corp., Inc.

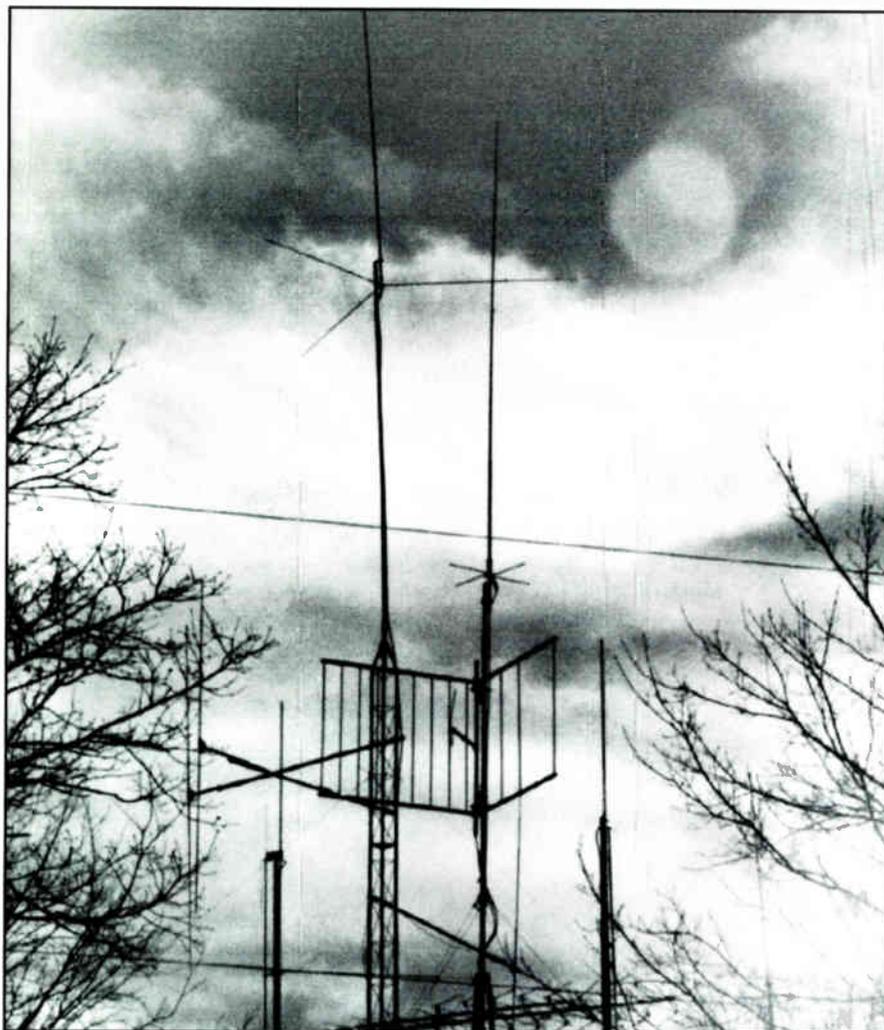
1711 Commerce Drive
Piqua, OH 45356
Phone 513-778-0074.

Manufactures heavy duty high and low-pass filters and antenna tuners.

Radio Shack

Over 6,000 stores and dealers nationwide.

Carries snap-on ferrite chokes, AC line interference filter and RG6 100 percent shielded TV cable.



It's not always the CBer's fault. There are many neighbors, who, after noticing your CB and scanner antennas will be quick to point the TVI finger at you. Be neighborly (remember, you BOTH have to live there!) and try to resolve the problem. Sometimes business band, taxi, public service and other transmitters interfere with TV reception

Solving Telephone RF Interference

Some Helpful Hints and Suggestions

BY INDUSTRIAL COMMUNICATION ENGINEERS, LTD.

With the increasing popularity of complex and computer-aided home telephone units manufactured by numerous companies worldwide comes a corresponding increase in both the quantity and severity of telephone interference caused by local radio broadcast transmitters. The new telephones are the most susceptible and delicate ever built, and few manufacturers of the devices have given much consideration or effort to designs which include resistance to RFI and other forms of electromagnetic interference.

The thing that makes matters worse is that ground terminal connections for telephones are rarely available at the location of an extension telephone. Another problem is with telephone wiring that is all unshielded and also exposed.

Telephone interference is caused by radio signals produced in the immediate vicinity that are intercepted by the mass of telephone wiring in the home and outside on the telephone company wiring. Signals enter the phone on different conductors, working their way through phone circuits and causing current flow, resulting in voice distortion or noise.

Most telephone interference can be remedied by the simple installation of a telephone filter that plugs simply into the rear of the phone. These devices are designed to insert a choking effect, or loss at radio frequencies, into the phone wiring. They have no effect on the telephone operation. About the only realistic way to resolve phone interference short of making internal circuitry changes to the phone is by choking the RF signals before they enter.

There are two ports of entry where interfering signals can enter a phone unit. The first, and most common, is through the house wiring and into the telephone set directly as mentioned above. The second is through the handset cord (cord attaching the handset to the phone body). In nearly all cases a telephone line filter will be part of the solution to eliminate the interference. But in cases where the line filter is not completely effective, another small filter device in the handset lead may be needed to bring back quiet enjoyment of the unit. An easy way to judge for yourself if the handset cord is suspect is to make a short handset cord about 6-12

inches long with the cord and tools available at most radio parts stores. If the interference is not present when the short cord is used to connect the handset with the phone body, then the handset cord will probably have to have its own filter installed. If the phone has a speaker, then simply disconnect the handset cord and run the test with the internal speaker (and a line filter installed).

If a line filter and handset filter are both installed and interference persists, then it's time to recognize that the telephone itself is inherently hyper-sensitive to external electromagnetic fields. Possible cures are replacement of the phone with a different type or brand, or internal circuitry modifications done by a local technician. Generally in our experience the

worst offenders of telephone interference susceptibility are AT&T and Panasonic manufactured units. The best performers are built by RadioShack/Tandy.

If you go shopping for phone filters, always obtain a unit with at least 30 dB measured attenuation in the HF range (3 to 30 MHz.). If the filter manufacturer doesn't publish his figures, shop elsewhere. And get one that is designed to prevent BOTH common mode and differential mode interference.

For the most part, telephone interference is the easiest type of interference to deal with, but sometimes it can be insidious. Don't be afraid to experiment with different combinations of filters, phone locations, or lead lengths to seek a final solution to your problem. ■



That Darned Noise Just Won't Go Away!

It isn't always *easy*, and no one said it was fun, but tracking down RFI is certainly a challenge . . .

BY HAROLD ORT, N2RLL

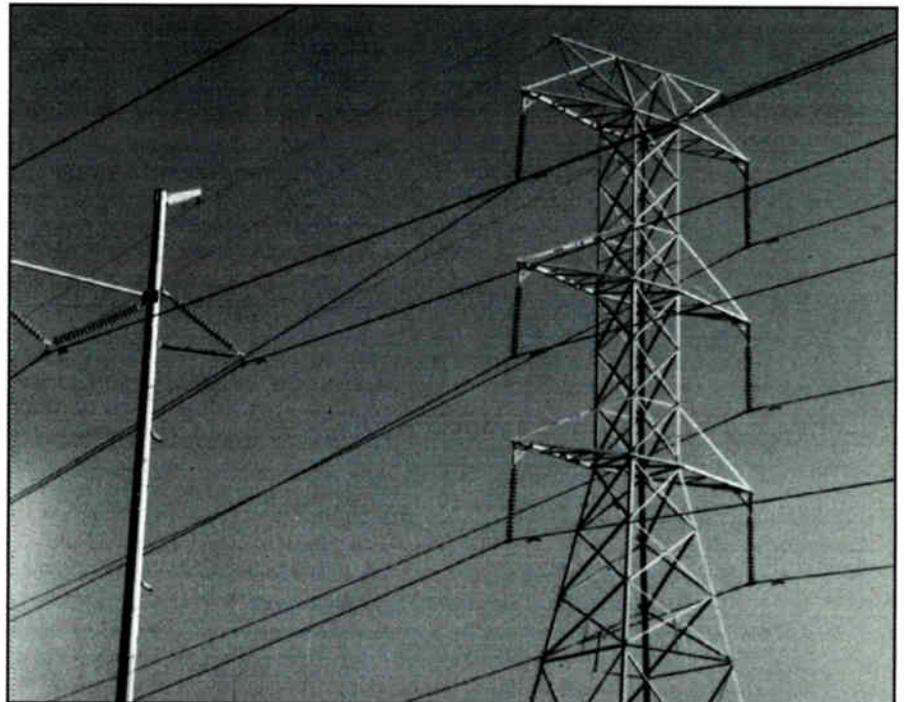
During a recent radio talk show about CB and scanning, we received a call from an unlucky fellow who was experiencing a serious RFI (radio interference) problem. To his dismay, he was hearing his local AM radio station without a radio—even in his clothes hamper! The host asked me what the caller could do to eliminate the problem. Laughing (it is funny isn't it?) I said that moving to the next town might not be a bad idea, but then I offered a couple of possible remedies. While I'm not sure if this fellow ever moved or found a better solution to his problem, I learned that sometimes RFI isn't so funny, especially when it happens to you.

In My Ears, Everywhere!

There it was, right on 810 kHz and at various intervals up through 11 meters—that blasted oscillator-type hum. For weeks now it's become a part of my life. I turn on the radio at 6 a.m., it's there. It's there at noon. It's there 24-hours-a-day! Just before turning down our street, there it is—the noise begins, and it's there all up and down the street.

Finding and curing RFI isn't rocket science, but it certainly is an art that requires a bit of ingenuity, diplomacy and skill. There's a rule of thumb when tracking down RFI: the higher the frequency you're hearing the racket on your radio, the closer you are to the actual source. So, armed with my portable AM radio tuned to 810 kHz, I diligently walked around the house systematically sniffing out possible sources of the interference: thermostats, the doorbell transformer, the computer, TV, recharging razor, light fixtures, the garage door opener and the list goes on and on. This isn't really fun and it's certainly not fun to look at, especially when the investigation moves outside. Your family probably won't understand and your neighbors definitely won't!

There comes a point though, like listening to a politician's promises, when



Those mega-watt power lines can wreak havoc with CB and scanner users. Patience usually pays off when tracking down interference. (Photo by Harold Ort)

enough is enough! One by one we turned off the circuit breakers; the worst was yet to come—re-setting all the clocks. With all the circuit breakers “off” it was still there. Zap, I flicked the main breaker. It was still there!

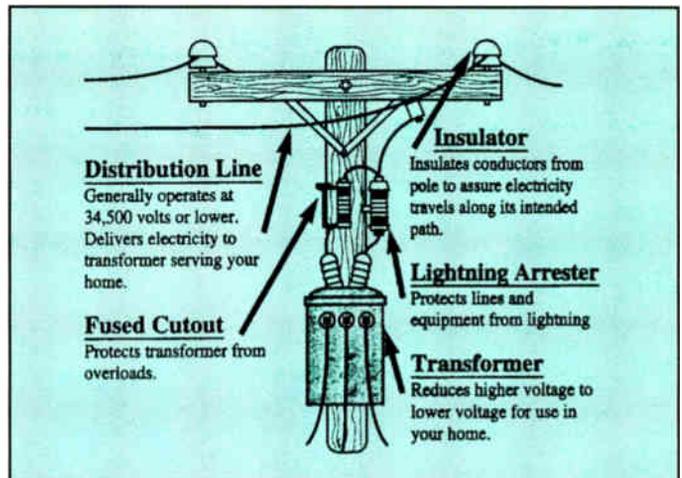
This can't be happening, I thought. Maybe I'll wake up and it'll be gone. No such luck. Okay, I'll admit it: walking around my neighborhood in 30 degree weather with a small portable radio at waist-level looks rather odd. Let's face it, if you were out there, I'd think your piano wasn't tuned! So I waited 'till dusk and went from pole to pole. It was much the same up and down both sides of the street. But at this point I was convinced it was the power company's problem. I had done my part, now the rest was in their hands, or so I thought.

It took less than a week and only a couple of phone calls for the Jersey Central Power and Light RFI investigator to check it out. Chris had narrowed the possible source down to a couple of poles. He decided the company would replace a couple of lightning arresters. He reminded me that doing so might fix the problem, and of course, it might not. A few days after the initial visit, the big day came. I was ready to be RFI-free! After all, that isn't so much to ask, is it?

I was in radio heaven. They were supposed to be at our place between 9 a.m. and noon. That morning the utility truck arrived right on time. Good-bye RFI! Chris and Ed talked some power company talk for a couple of minutes, then the bucket went up. After the second pole was inspected and fixtures were replaced and



Use a small portable radio such as the Sangean SG-621 tuned to a vacant spot on the dial to locate the source of the RFI. (Photo Courtesy Sangean America, Inc.)



Did you ever wonder what all that stuff is at the top of a utility pole? That "stuff" is what delivers electricity efficiently to your home; lines, insulators, transformers and more. Since electricity has to be used as soon as it's generated, it must be sent from one area to another through networks of wires, poles and equipment known as transmission and distribution lines. Let's take a closer look: (Courtesy Jersey Central Power and Light Company)

others were tightened, it was still there. This was going to be a real bad day, I thought. We were all cold. And the racket was still there.

All the hardware had been checked, except the transformer. It just loomed there looking at me. Chris agreed that since they weren't really thrilled about the prospect of returning, they'd cut the power to the transformer that serves most of the street. As the crew cut the power I envisioned hundreds of digital clocks blinking 12:00. Chris exclaimed, "it's gone!" Everyone was delighted, but the thrill was only temporary. So, the power was off, the noise was gone, but all it really meant was the electrical noise was coming from *somewhere* in the neighborhood. But where. Which house? It was almost noon, but Chris and I went to a couple of homes and convinced them to shut off their main circuit breaker. Holding the portable AM radio near the power meter confirmed our nightmare. It was still there! "We've done all we can," he told me. It sounded like a terminal illness. Who checks the rest of the neighborhood? You guessed it.

At this point it didn't matter if I looked like part of a Star Trek "Away Team" scouring the neighborhood with a tricorder. All that mattered was finding the source of the racket, period. It's fascinating how understanding (thankfully!) folks can be, especially when they really don't fully understand RFI headaches. After all, how often does someone knock on your door in the middle of the afternoon, holding a small buzzing portable radio asking you to turn off your circuit breaker? Well,

they did—and without hesitation, too.

The closer I got to the red house, the louder the buzzing became. As I rang the doorbell, I felt like an Army recruiter; if I can only keep smiling and talking at the same time . . .

I put the radio on the coffee table and turned up the volume. It was very obvious these folks didn't use their radio. The noise was unbearable; something like being inside a massive generator.

One by one we shut off the circuit breakers. The noise disappeared. Looking a bit puzzled, Bob went into what I would call their "music room." Just standing in the open doorway, I could see row upon row of records and tape decks and gizmos I couldn't even recognize. He was down on the floor now caught up in this maze of wire and cables. "I think I've got it," he exclaimed. Just give it to me, I thought, I'll fix it for eternity! This gizmo had been radiating RF energy for two blocks or more and he was promising not to use it again. Obviously something had gone haywire with the device which turned out to be a carrier-current transmitter that plugs into an outlet and sends stereo audio signals to speakers in another room. At this point I was willing to buy him five miles of the best speaker wire in the country, and help him install the wire, if necessary. Anything, but don't plug that thing in the wall, please.

Interestingly, he explained how they were interested in shortwave radio, but recently returned one to Radio Shack because "we couldn't hear anything." Hmm, I wonder . . .

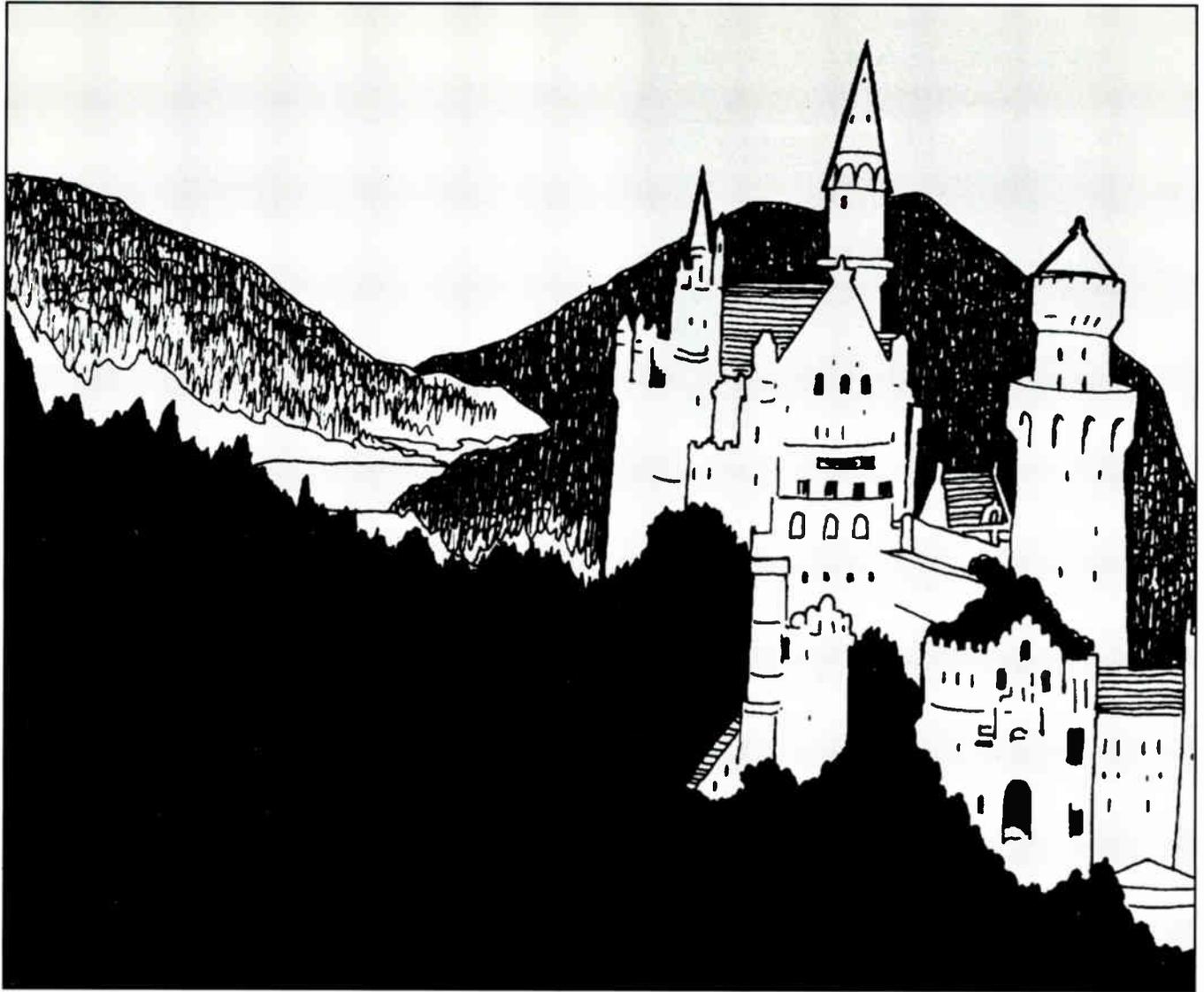
Not all cases of RFI are this easy to

solve. That's right, this easy. Sometimes it's weeks or months before you get close to solving the mystery. My advice is to be polite, yet persistent. Check the neighborhood with your small portable AM radio tuned to a vacant spot on the dial. Remember, RFI on the AM broadcast band can travel power or phone lines from a mile away. You might even have to drive some distance to locate the noise source.

It's a good idea to check you own home first. If you're able to hear the noise on your scanner, in the VHF aircraft band, for example, you're darned close to the source. Check the obvious; constantly-running computers, light dimmers, fax machines, TV's, radios, thermostats, to name just a few.

If it's coming from a power pole, leave the repairs to the professionals. Jot down the pole number and report it. Call the power company a few days later; remember, locating RFI isn't a priority repair order, and repairs cost money. But, be persistent. It may be necessary to take detailed notes of precisely where and when you're experiencing RFI—what frequencies are involved, when is it heard, does the noise vary in strength/intensity, is it a problem only when it rains? The more questions you can answer *before* contacting the power company, the more likely you'll get the problem resolved. Remember, power company investigators and repair crews are interested in solving the problem, up to a point. There comes a time where their responsibility ends, and yours begins.

Now only if I could find what's causing those white speckled lines on the TV. ■



Citizens Band in Europe

CB Across the Mersey

BY JOHN PHILLIPS, N2IUJ

CB radio is booming in most of Europe right now. Most countries there have legalized a "CB" band over the last 15 years causing widespread use of CB all over the continent. This has led to a push toward a "Pan-European" standard of frequencies, channels and operating modes. Let's now take a look at what is going on in the realm of Euro-CB.

CB in Great Britain

Our friends over in Great Britain have been hooked on CB radio for quite a while

now. It all started in the 1970's when the big CB "craze" was on in the USA. "American" CB sets found their way over to England and Europe, and although they were illegal to use, they nevertheless became very popular. This led to the legalization of the British CB band in 1981. The British authorities created a new set of 40 CB channels much higher in the 27 MHz frequency band than the American 40 channels. They also outlawed the use of any CB with AM or SSB modes, only FM transmission mode is allowed on the U.K. CB band. Other CB regulations in the U.K. prohibit the use of directional "beam" type antennas, and

limit the power output to 4 watts. Also, until very recently, large omnidirectional 18 foot "Big Stick" type antennas could not be used in Britain, only small base antennas of 4-5 feet tall were legal. Receive boosters also can not be used on CB radios there.

Unlike CB radio in the US, England and most European countries still require a license for CB use. Also, as in the US, the use of linear amplifiers on CB radio is not permitted, yet most European countries allow them to be sold. CB shops and catalogs in the U.K. are loaded with CB transmit boosters of all wattage values, usually with a small note stating "not for



European Countries CB Standards

Austria	40 FM
Belgium	40 FM, 22 AM/FM/SSB
Czech Repl.	40 FM, 12 AM (ch. 4-15)
Denmark	40 FM
Estonia	40 FM
England	40 FM, additional 40 U.K. FM
Finland	40 FM, 23 AM
France	40 FM/AM/SSB
Germany	40 FM, 12 AM/SSB, + new 40 FM between 26.565-26.965 MHz
Hungary	40 FM/AM/SSB
Iceland	40 FM/AM (2.5W AM)
Ireland	40 FM
Italy	40 FM, 34 AM/FM/SSB
Latvia	40 FM
Lithuania	40 FM
Luxembourg	40 FM, 22 AM/FM/SSB
Malta	CB is ILLEGAL
Netherlands	40 FM
Norway	40 FM, 22 AM/FM
Poland	40 AM/FM
Portugal	40 FM/AM/SSB (AM/SSB thru 1999)
Romania	40 AM/FM (license allows use of 1 or 2 channels only)
San Marino	40 AM/FM/SSB
Slovakia	40 FM, 12 AM (ch. 4-15)
Spain	40 FM/AM/SSB (AM/SSB thru 1999)
Sweden	40 FM, 23 AM, 1 SSB
Switzerland	40 FM, 22 AM/FM/SSB + 80 ch. CB at 933-934 MHz
Turkey	40 AM

Figure 1

British FM 40 CB Channels and Their Corresponding Frequency

1	27.60125
2	27.61125
3	27.62125
4	27.63125
5	27.64125
6	27.65125
7	27.66125
8	27.67125
9	27.68125
10	27.69125
11	27.70125
12	27.71125
13	27.72125
14	27.73125
15	27.74125
16	27.75125
17	27.76125
18	27.77125
19	27.78125
20	27.79125
21	27.80125
22	27.81125
23	27.82125
24	27.83125
25	27.84125
26	27.85125
27	27.86125
28	27.87125
29	27.88125
30	27.89125
31	27.90125
32	27.91125
33	27.92125
34	27.93125
35	27.94125
36	27.95125
37	27.96125
38	27.97125
39	27.98125
40	27.99125

Figure 2.

use on the U.K. CB system"—Yeah sure! Europeans also do not have the DXing restriction we have here in the US (US CBers *may not communicate to stations more than 155 miles away except in an emergency as per FCC rules*). They are legally using their CB hobby to communicate and exchange QSL cards with other CBers all over the world.

The Pan-European Frequency Standard

In the 1980s there was a push to standardize the CB channels and modes

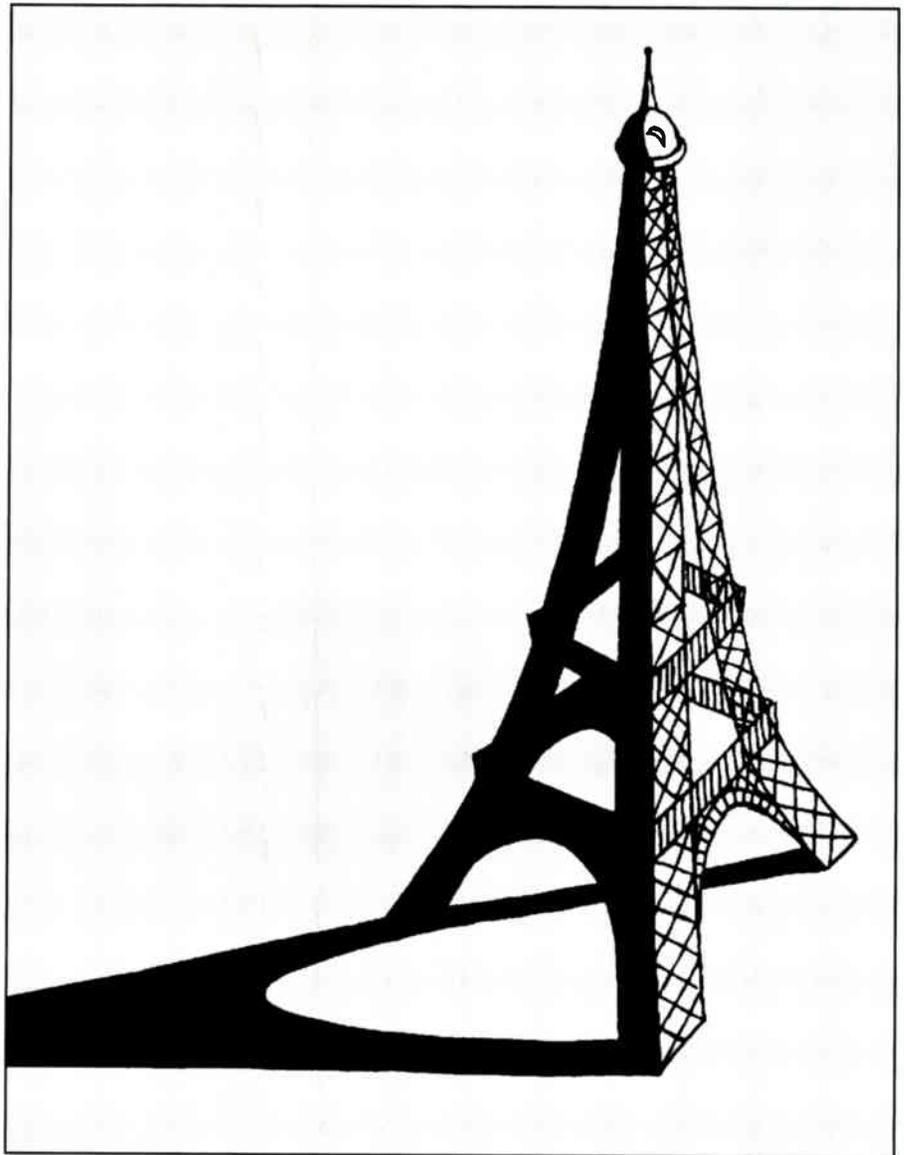
among the various European countries. Some countries, like Great Britain, had created their "own" CB channel band while many others were following the US FCC channels. There was also AM, FM, and SSB modes being used in the various countries. Truckers and motorists were crossing borders with illegal and/or incompatible CB radios. This led to the C.E.P.T. (Conference of European Posts and Telecommunications) 40 channel FM Pan-European standard. The C.E.P.T. 40 channels are the same frequencies as the FCC 40 channels here in the US, but use an FM mode of transmission, not currently allowed here. Most countries in Europe now allow the use of the C.E.P.T. FM 40, and many also still allow the use of their original CB bands and/or modes. In The United Kingdom the "original" U.K. 40 channels remain more popular, although both sets of 40 channels can now be used. Rules in the U.K. currently prohibit CB sets with both bands (80 channels) in one radio. This rule forces British CB enthusiasts to purchase two separate CB transceivers in order to enjoy using both CB bands. CB sets with weatherband or AM/FM broadcast also do not currently need approval in the U.K..

Helpful Hints:

If you want increased range from your CB walkie-talkie, consider buying one that accepts a full-size telescoping antenna. The flexible rubber duck antenna is fine for close-in communications. It won't get snapped off by low-hanging tree branches or backyard obstacles, but you compromise longer range communications for the convenience of a short antenna.

Treat your new CB purchase with care. Remember, it's a delicate piece of electronic gear; dropping, knocking or abusing it can cause intermittent operation and void your warranty if you've subjected the radio to obvious abuse.

Got a cellular phone? Maybe you've just bought a new ham radio, too. Very often cell phones have dead spots, and even though you've programmed all the latest repeater frequencies in that new ham radio, you still can't get assistance on the highway. It won't hurt to get a small mobile CB. Tuck it in the glove compartment. When you need it, it's there.



Citizens Band and the Rest of Europe

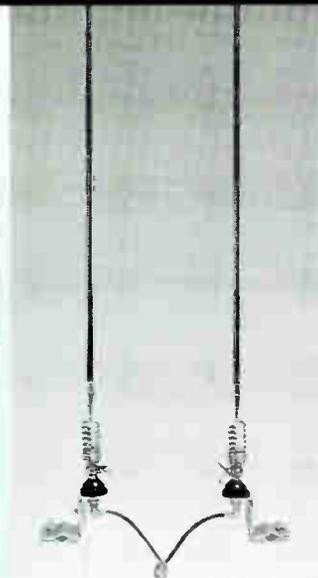
The Germans have just added a new set of 40 channels from 26.565–26.965 FM. These channels are located just below our channel 1. In addition they also use the C.E.P.T. 40 and have 12 channels for AM/SSB as well. Eighty channel sets will be allowed. Spain and Portugal are set to phase out their old AM/SSB modes at the end of 1999 leaving them with just the FM C.E.P.T. radios. In Italy they are allowed both AM and FM modes on the 40 channels as well as SSB on their original 34 channel CB radios. France allows all modes, AM/FM and SSB on the 40 channels. For a breakdown of channels and modes see Figures 1 and 2. By the way, if anyone out there has information or updates on CB channels, modes, rules

and power regarding countries in Asia, South America, Europe and elsewhere, please send it to me in care of CB Radio magazine and I will try to put it all together for a possible future article.

CB and the Future

In Great Britain, there is a big push right now to legalize AM and SSB, and it looks as though it is going to happen. Additional rules in the U.K. may also be revised such as the 'No 80 channel sets' rule. As has happened in Germany, other countries in Europe are feeling pressure from a growing CB population to legalize more modes and channels. All of this may have a spillover effect on the US, where there is a growing number of people who would like to see an additional amount of channels and the clearer FM mode be made available. Only time will tell. ■

SIRIO



Truck 27 Log CB 27MHz Vehicular Twin Antenna

5/8 wave twin vehicular antennas with large band. The whips are made of glass fibre with logarithmic charge and supplied with steel mirror mount which makes the installation easy on the vehicle. Tuning can be made by adjusting the special sleeve placed at the bottom. They are particularly suitable for fitting on trucks and caravans.

HI-Power 3000 PL CB 27MHz Vehicular Antenna

7/8 wave vehicular antenna base loaded, specially conceived for hi-powers, from 1500 Watts continuous to 3000 Watts. The coil, made of big section copper wire, works as an impedance transformer and the conic whip is made of 17/7 PH stainless steel to get the best performance. Its strong mount is of black chromed brass supplied with a big washer for a perfect waterproofing. It's available in the 2000mm length version as HI-POWER 4000 and with "Clear Coil" also.



Tornado 27 5/8 CB 27MHz Base Station Antenna

5/8 wave antenna for base station made of anti-corrodal aluminum tubes and supplied with jointing sleeves of polythene to guarantee a perfect waterproofing. Strong and easy to install, it allows very good links.



MINI MAG 27 CB 27MHz

1/4 wave magnetic antenna with central charge coil. It has been manufactured with first quality materials to keep its good technical characteristics unchanged for a long time. Its pleasant design coupled with its easy installation, make it suitable for fitting on every vehicle. It is recommended for installation on the centre car-roof.



Space Shuttle 27 PL CB 27MHz Vehicular Antenna

5/8 wave vehicular antenna specially conceived to support hi-powers. The coil, made of big section copper wire, is protected by a polycarbonate clear cover completely water-proof. New in design and technology, it is supplied with 8 ground plane radials to get the best resonance. The conic whip is of black chromed stainless steel and the base, made of chromed brass, is very strong and complete with a big rubber washer.

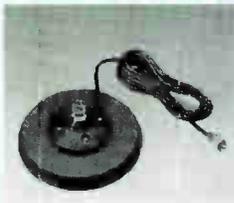


Cobra 27 Black Mini Cobra 27 Vehicular Antennas

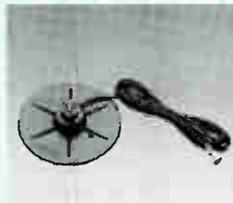
The Cobra 27 Black is a 1/4 wave antenna based. The conic whip is made of black chromed stainless steel, and can be tilted for 180° angles. Fine tuning can be made by acting on the special rings.



Magnetic Mounts



MAG 145 PL



MAG 160 PL

MAG 145 PL - Overall dimension of 6.3" and comes with 1/2' of coaxial cable.

MAG 160 PL - Ultra Flat. Overall dimension of 6.3" and comes with 1 1/2' of coaxial cable.

The Mini Cobra 27 is a 1/4 wave antenna as well with a reduced version of of the Cobra 27 whip of 530mm. This antenna is available complete with magnetic mount and rubber washer for a quick installation.



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Emergency Backup Power—There When You Need It

Maybe not today or tomorrow, but sooner or later you'll need backup power for your radios . . .

BY LARRY MILLER

Where you are sitting, the sun may be shining. The temperatures could be hovering in the 80s and the only thing that obstructs your view of the beach are palm trees and great-looking people splashing in the surf.

Here, however, it's winter. The temperature outside is somewhere around 20 and a thick coating of ice has brought down everything from six-inch thick branches to power lines. Route 10, a busy, hilly road, is like the proverbial skat-

ing rink, and Channel 9 is alive with calls for assistance. The scanners in the radio room seem to run endlessly, spitting out dispatches for the state police.

A truck filled with 50-gallon drums has flipped over and spilled its contents. The

drums, someone says, may be leaking. Frantic calls go out to the truck line to find out what's in the drums. This time, the news is good; it's only molasses.

Just down the road from here, the news is not so good. A neighbor has found a man lying unconscious in his driveway. It could be a heart attack; the elderly man was seen shoveling snow from his walkway earlier in the morning.

Car Accidents

There are literally too many to count. The local REACT team is assisting; those without injuries are kept warm and told to wait while more serious cases are attended to. This is a motorists nightmare, but a monitor's dream.

You may not have thought about it, but there's something amazing about this scene. I am able to be a part of all of this, listening on my radios—four scanners, two CBs and rotor, even a shortwave—and the power is out. If the wires survived the icy coating, then skidding cars clipping down telephone poles did them in. The long and the short of it is that there's not a drop of electricity to be found anywhere in this part of the county. But here we're still on the air, full power and full time. How? Big-time preparation—backup power.

I've got to admit that perhaps we overdid it a bit. Out in the garage, a 4,000 watt propane-fueled Onan generator is humming away. On the roof are 16 Hoxan H-200SQ solar panels hooked to an Ananda Load Center and Trace Inverter. About 5,000 pounds of industrial NiCd batteries sit in a shed. Short of nuclear war, we'll be cozy, warm and on the air. Even if nuclear war happens, there's a good chance that my last QSO will be with the Strategic Air Command bombers as they head out of the country on their way to Russia. My only regret will be that I probably won't live to get the QSL!

I've been a CBer since the mid-1960s, adding to my radio room with scanners, shortwaves, even GMRS and assorted "goodies" over the years. I've got a lot tied up in this, in terms of both time and money. And for a while I felt pretty smug about it all. If a gnat sneezed in Iraq, chances are that I could hear it, contact it and QSL it. One winter though, a storm passed through the area, knocking out the power. The house was dark. Because we live in a rural area and get our water from a well, we were also dry. As time went on, we also got cold. All of this I could live with until, just across the street, I saw flashing red and blues. Odd, I hadn't heard anything on the scanner. Come to think of it, I hadn't heard anything on the scanner in a while. I stumbled down the stairs, flashlight in my hand, to find my



The Portable Power Station; enough to power a CB walkie-talkie and rig (in this case, though, a couple of ham radios on low power).

worst fears had come true. The power was out and the batteries on the handheld had drained. As I stood looking at my radio room, I had a sinking feeling. Here I was, equipped to the teeth and at the same time, totally, completely, dead in the water. All of this radio gear, I quickly realized, was useless—just at the time when I needed it the most—unless I had a reliable source of backup power. The next day, after chipping the ice off of my wife and kids, I got to work on the problem. This would never happen again!

Inexpensive Power

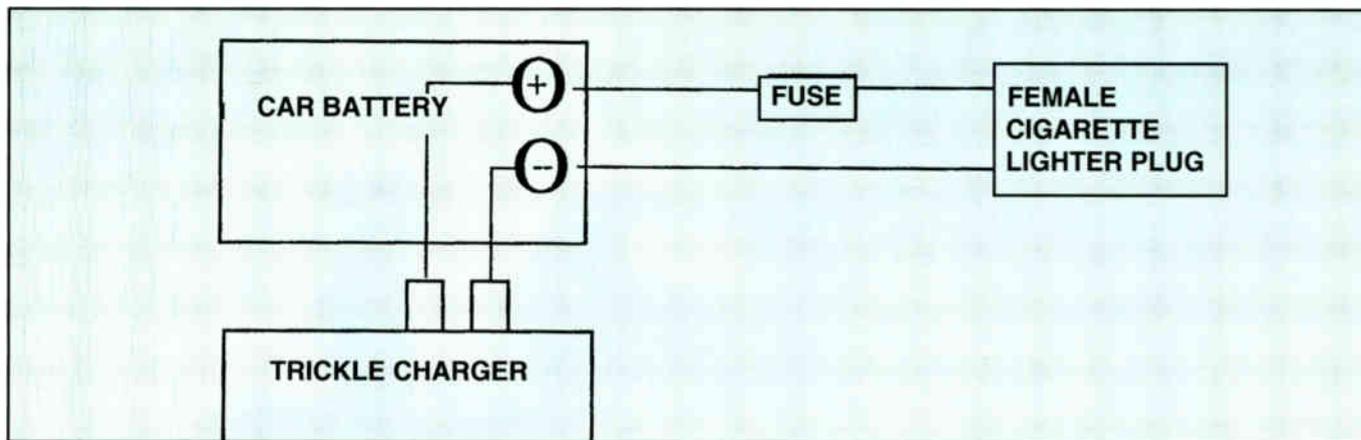
My first attempt at backup power worked great and it's something you can do yourself. Best of all, it doesn't cost that much, although it is a little clunky. You'll need the following parts: a car battery, a standard trickle charger, a fuse, some wire, and if you want to get fancy, a female cigarette plug socket. Essentially, you're setting up a replica car electrical system—without the car. As long as you're not going to try and set this up in the bedroom, it should go over okay with the spouse although I can almost guarantee at least a little discussion about bringing a car battery into the house.

The good part about the car battery scheme is that it's affordable, easy to do, and best of all, the average car battery has enough power to keep you going for days, depending on usage. A word of

warning: when setting up a car battery power backup, remember that you MUST fuse it. Also remember that batteries contain acid, which is dangerous, and that batteries give off potentially explosive gas when charging. Always vent a charging battery.

The easiest way to keep yourself on the air and at full power is to make sure you've got some battery-powered handhelds around, and that the batteries are fully charged. Some go the extra mile, get extra batteries or battery packs and buy a charger. You can get battery chargers for standard "AAs", "Cs", "Ds", and 9-volts just about anywhere. In the case of scanners, your best bet is to contact a company called MetroWest. MetroWest specializes in long-life batteries and chargers for scanners. A call to 800-657-1475 will bring you a copy of their free catalog. Their address is 822 North Spring, LaGrange Park, IL 60526. Tell Pat and Mike that Larry Miller at *CB Radio* magazine sent you.

The next step up, certainly among the most versatile, is something called the Power Station. The power station is a multi-function, portable rechargeable power source. At its heart is a 7.0 amp-hour sealed gel cell battery. (By comparison, the NiCd in the average handheld is about 500ah). The output is switchable from 12 volts to 6 volts to 3 volts; 3, 6, and 9 come from a 3.5mm coaxial jack and the 12 from a female cigarette lighter socket at the end of an eight-foot cord.



This diagram shows how to connect a car battery and female cigarette lighter plug, with in-line fuse to a trickle charger for emergency power use.

Not only can it run your radios, but its powerful enough to jump start your car! It's available from DX Radio Supply for \$59.95 plus \$6.50 UPS. Call them at 610-273-7823 or write Box 360, Wagontown, PA 19376.

Generators and More . . .

Generators are the first string in the big leagues of backup power. Regardless of what's happening, if you have fuel, you can produce electricity. Generators are widely available, too, and the prices aren't all that bad. Virtually every hardware store carries several models, most with Tecumseh or Briggs and Stratton engines. These are fine for light duty, but if you plan extended use of a generator, look for a slow-speed generator with a cast iron sleeve. Now you're talking money, though. Look under "generators" in your yellow pages for more information in this area. Our Onan was somewhere around \$3,500, weighs about 650 pounds and is about 1/4 the size of a Dodge Neon—definitely not appropriate for apartment dwellers.

We did discover an interesting generator from a firm called ATI (Active Technologies, Inc.). ATI used to make power supplies for the military, but in the post-Cold War climate, have turned their attention to the civilian sector. Their Lightning Emergency Power generator is 115 VDC and 12/24 volt DC unit that's about the size and weight of a bowling ball. The entire unit is powered by a 2 HP Tecumseh engine. It rings in at \$489.95. You can get one of ATI's brochures free by calling 800-545-5348.

Finally, don't forget the possibility of alternative power sources. Solar power is now somewhat reasonably priced and very exciting for those inclined to experiment. With solar power, you get your

electricity free from the sun and as of yet, the government hasn't found a way to tax or regulate it. (They are, no doubt, beginning to work on that, though).

You can buy a tiny 9-volt panel that's about the size of a matchbook, attach it to the front of your handheld and wire it in to the battery. Then, every time the sun's out, you're feeding power into the battery. Edmund Scientific at 609-573-6879, sells one (part #E52, 169) for \$12. You can contact them at 101 East Gloucester Pike, Barrington, NY 08007-1380.

Larger solar arrays, along with such exotic fare as wind turbines, hydroelectric generators and the like are sold by a growing number of companies. The one we chose is called the Backwood Solar Electric. Our system allows us to operate

independently of the electric company. There are no wires going into this house, and as a result, no electric bills coming in, either. You can call Steve and Elizabeth Wiley at 208-263-4290 or write 8530 Rapid Lightning Creek Road, Sandpoint, ID 83864. Their catalog is worth reading even if you're unable to buy anything right now.

Even if you're not able to set up an elaborate backup system, you should at least start thinking. If you take your radio operating seriously, there will—I guarantee this—come a day when there will be something you need to hear, a contact you desperately want to make and you too will find yourself well-equipped, but absolutely useless. It happened to me. It'll happen to you. ■



Protection to Keep You Communicating

Time spent now making a good ground system will pay big dividends if there's a lightning strike . . .

Editor's note: The following article was adapted from an article written by Roger R. Block, PolyPhaser Corporation President and Chief Engineer. It was co-authored by Ron Block, Roger's brother and owner of W.R. Block and Associates, a company representing PolyPhaser products in Clarksboro, New Jersey. PolyPhaser Corp. designs and manufactures lightning/electromagnetic protectors and grounding solutions for the communications industry.



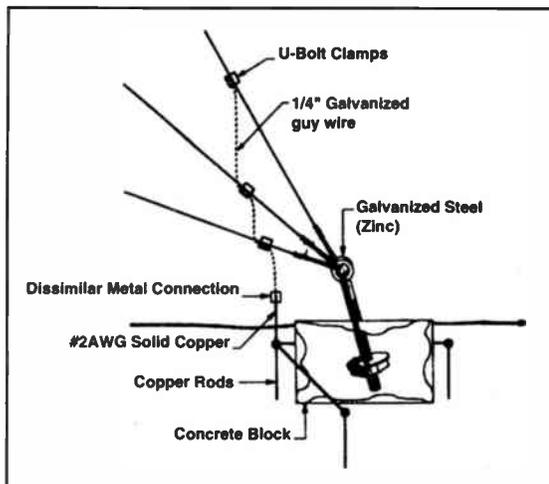
The primary rule for protecting your radio equipment against damage from a lightning strike is connection of all elements to a single, low impedance ground system. This includes the antenna, the antenna support (pole, tower, etc.), and the station's input and output protectors (antenna, power, telephone, rotor, etc.).

Antenna location is critical and dictates the size and location of the earth system needed to disperse the strike's energy. The faster the ground system is able to absorb and disperse the energy, the better the chance of preventing any energy from reaching the equipment. Nearly 90 percent of lightning strikes will unleash electrons which, because of like charge, will repel and disperse. An antenna ground system comprised of a set of ground rods interconnected below grade with bare radials will provide a path for dispersing the energy.

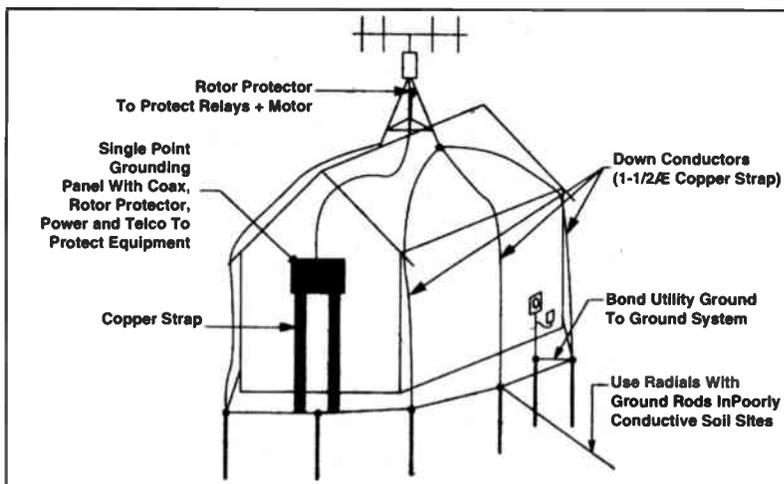
A good protection plan also includes the creation of a single point ground within the radio shack itself. This interior single point ground is connected with a low impedance copper strap to an external ground system composed of radials with ground rods. The tower ground system and the single point ground system must be interconnected. The interconnection should be below grade with a bare low inductance conductor. A coax shield must *not* be the only interconnection between these ground systems.

Three Techniques to Improve Conductivity

If the soil at your grounding location is not very conductive, three techniques will improve the situation. First, increase the surface area of the surrounding conductors. Second, dope the soil to increase its conductivity. Third, install bare radial lines with ground rods. In some locations it may be necessary to use all three techniques for best results.



A properly grounded guy anchor. Note the downward ground wire dress which prevents surge currents from welding the turnbuckles. (Courtesy PolyPhaser Corporation)



A typical roof-mounted antenna with wide copper strap down conductors to a perimeter ground system. Note the utility ground connection. (Courtesy PolyPhaser Corporation)

Conductor Surface Area

The most effective material for a ground system is copper strap. Since lightning has a large portion of its energy in the VHF range, it will behave like an RF signal. Energy (surge current) will only be conducted on the surface of a conductor. Therefore, the use of a round surface conductor isn't nearly as effective as using a 1 1/2 inch or larger flat strap of at least 26 gauge. Both surfaces will conduct the surge.

Soil Doping

Water, in its purest form, is an insulator. Due to the number of ionic salts present in our soil, the earth is a conductor. Conductivity can be improved by adding more ions to the soil.

Soil doping is accomplished by either adding water or a saline solution to the soil around the grounding system. Salts such as Epsom or rock salt can be added to the soil to increase conductivity. Depending on the amount of rainfall, doping the ground system radials with four pounds of salt per linear foot and 20 pounds per rod may last up to two years.

Ground Radials

Radials are the most cost effective grounding technique when considering system impedance, material cost and installation labor. As a general rule of thumb, all radials should be at least 50 feet long and no longer than 75 feet. Ground rods should be placed along the

entire length of each radial. The most cost effective spacing between rods for normal (grassy) soil is two times the length of a rod into the ground. If 8-foot rods are used, they should be placed on 16-foot centers. If the soil is not a good conductor (very dry or sandy) the separation may be reduced.

Tower Considerations

Do NOT use a nonconductive structure for an antenna support. Conductive towers or metal poles should be used for mounting antennas high into the air. If the tower or pole has sliding contacts (crank-up or push-up), the joints should be jumpered using short sections of copper strap attached with PolyPhaser TK clamps. Normal self support and guyed towers do not require jumpers.

Guyed towers are better from a lightning protection perspective if the guy anchors are grounded properly. Because the anchors are located away from the tower base, some of the strike energy will traverse the guy wire to the ground. The more the strike energy is divided, the less energy the equipment may see.

Antenna Location

A ground-mounted vertical antenna is similar to a ground-mounted tower. Both have a substantial and low impedance connection to the ground system. However, if the antenna or tower is mounted on a roof, the inductance inherent in the conductors to the ground system is significant. Voltages of several hundred thousand volts could be present. To

reduce the inductance in the ground conductors, increase the surface area of the conductor (a wider copper strap) as well as the number of conductors.

For the roof-mounted antennas and towers, the multiple down conductors can be spread over the roof and brought down to ground in multiple locations. This will require the ground system to encircle the building (a perimeter ground).

Coax Grounding

Since the tower is a conductor and is well grounded, all coax lines should be grounded (using grounding kits) at the top of the tower close to the antenna, and at the base of the tower before they go toward the equipment.

During a strike, the tower and coax lines will mutually share the strike energy. If your coax lines are not grounded as they leave the tower, or they are completely isolated from the tower, more energy could traverse the coax toward the equipment than is conducted to the ground system by the tower. Such a large inductive voltage drop may cause arcing between the coax lines and tower which could cause coax deterioration (pin holes in the coax for moisture to enter) or complete destruction of the coax lines.

Since all towers have some inductance, leaving the tower at a point above ground will allow some of the strike current to continue on the coax line (both the center conductor and shield) toward the equipment. If this current is delivered to the equipment, it will follow the chassis to the safety ground raising the voltage levels in the cabinets to deadly magnitudes.

Coax lines leaving the tower MUST remain at right angles to the magnetic field surrounding the tower.

Rotor Control and Coax Line Protection

Rotor control lines should be protected using a suitable protector at both the top of the tower where the lines enter the control motor and inside the shack at the single point grounding panel. If it is not practical to protect the lines at the single point grounding panel, protect them at the base of the tower by placing them inside electrical metal tubing conduit, grounded only at the tower base. Coax lines can also be protected from induced energy by using the conduit grounded at the tower base.

In The Shack

In your shack, each piece of equipment must be bonded to the single point grounding panel with a low inductance strap. This will maintain all chassis at the same potential during a strike event and minimize chassis-to-chassis current flow. The power, telephone and coax line protectors on each of the input/outputs must be mounted on the single point panel. This will minimize input/output to input/output current flow.

No Sharp Bends

Route all ground straps and grounding conductors to form a gentle bending radius. Bends sharper than an 8-inch radius will add unwanted inductance to the desired ground path. Sharp bends are not recommended, even for conductors buried underground.

Coaxial Protection

Coax protectors should have DC blocking on the center pin. This serves as high pass filtering which prevents the low frequency energy of lightning from continuing to the equipment. The strike energy is diverted into the ground system in a controlled fashion. The DC blocking ensures the operation of the protector regardless of the input circuitry of the equipment.

The best protectors DC block the center pin energy and the shield energy from continuing to the equipment chassis.

Shack Location and Protection

A basement is an ideal location for your

radio shack. It is close to ground and has the lowest inductance connection to a grounding system. Because it is below grade, magnetic shielding may occur. Many basements have concrete floors. Since concrete is a conductor, the equipment must not sit directly on the concrete.

In the event of a strike, surge energy could enter the shack and find a ground path through the equipment to the floor. Insulate your equipment with material that does not absorb water. Polypropylene is a desirable choice.

The first floor of a building is the next best location for equipment placement. Magnetic shielding is less and the inductance to ground is higher than the basement. If a tower is located close to the building, the recommended grounding strap, running down the building's outside, many inductively couple some energy from the tower. This is also true for coax, tower lights and rotor lines. The longer a parallel run, the more energy will be coupled. Protect lines at the tower base utilizing an EMT steel conduit. It should be grounded to the tower base ground. Do not run unprotected lines in the EMT. Protectors must be grounded to each other and to the tower ground. Place the protectors inside a weatherized NEMA type box, such as a NEMA 3R or 4X. Make sure the weatherized box and inside mounting plate are grounded, removing the paint from the box's outside and inside surfaces at the ground point using the proper joint compounds to weatherize connections.

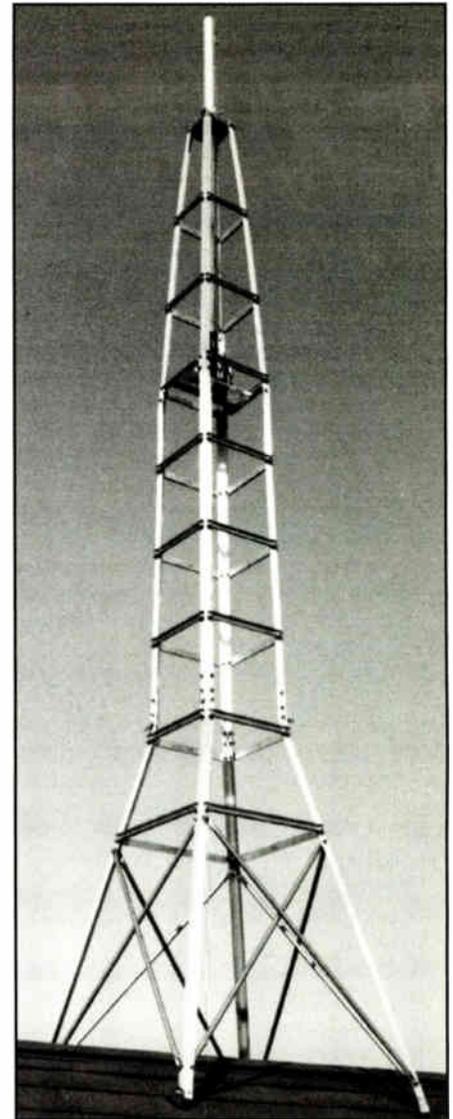
Antenna Support

Ground-mounted vertical antennas require the same type earthing for lightning protection. A good ground plane is critical. The better the ground plane for RF, the better the earthing for lightning assuming that the RF ground plane is in the ground.

Do NOT use trees or wooden poles to support antennas. If one of these supports is already in place, install two copper straps from the top to ground. By using two straps, the inductance is further reduced. Place the straps on opposite sides of the pole to reduce mutual inductance. The coax line should run down between and clear of the straps.

You're In Control

The concept of lightning protection can be summed up in a few words: You have control over the lightning strike's energy, not Mother Nature. This means that you are providing a path to earth and not allowing it to choose a random path. It is



Here's the Create CR45 Roof Tower. Proper grounding is absolutely essential to divert strike energy without property damage.

NOT possible to stop a strike, nor is it possible to prevent a strike from occurring. Therefore, you must be prepared to divert the strike energy to earth via a deliberate and controlled path to avoid any damage. Building or structure protection is more forgiving than protection of electronics. While a building can handle 100,000 volts, electronics will be damaged with just a few volts.

In case you're thinking that there's considerable cost and blood, sweat and tears associated with doing the job right the first time, you're right. True, a proper grounding system is going to cost you a few bucks, but think of the possible loss if you DON'T have a good system! It just might save you some heartache. ■

CB: The Cell Phone Alternative

Teens and young adults are finding CB fun and less expensive than cell phones . . .

BY BILL SIMPSON

“Dad, can I please, please get a cell phone? Everyone else I know has one!”

More and more in today's world, we discover the need for communication, for staying in touch with family, business and friends. Immediately after the first bill arrives for the cell phone, there is usually a brief scream, followed by several hours of lecture about “telephonitis”, the value of money, wasteful spending and the customs in use when Dad was much younger. Young adults might hear a portion of the lecture, the eyes glaze over and the rest of the dissertation follows the direct path through the ears. In the case of the young adult who is employed while in school, the monthly greetings from the cell phone provider is a sudden slap into the reality of growing up.

Young adults in many areas are discovering that CB radio IS a very viable option for communications. Networks are springing up to keep the group in touch in a much less expensive way than cellular. In some cases, both a base station

AND a mobile can be operational for about the cost of three months of cell phone. Now the group is accessible all the time.

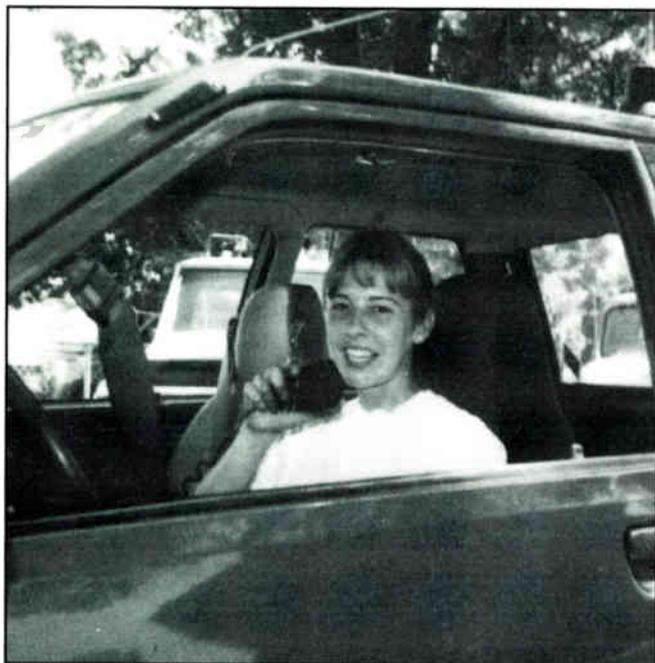
Many of the young ladies have discovered that CB radio and “power shopping” mesh well. No, this doesn't mean talking on the CB while watching the Home Shopping Club on cable, and waiting until “that” particular article appears. CB power shopping is using the group to simultaneously descend on several shopping malls with a wish list, check prices, return to the mobile radios at a specific time, and use the CBs to compare prices at the different malls. Guys are using the same idea to find auto parts or cheap gas. Saves time and money!

Another exciting new idea has the ladies check into the network at specific times, or time intervals, confirming that they don't have any problems, such as an overly amorous date, or car trouble. Current locations may or may not be revealed, depending on the situation. I heard about one instance concerning a

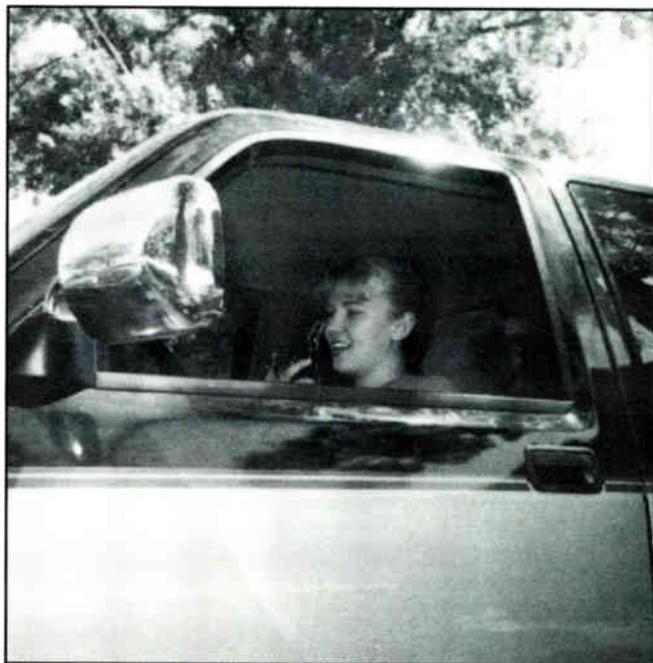
young lady who was supposed to check into the net, but was having so much fun that she simply forgot. Imagine the look on the date's face when eight other young ladies popped into the teen dance, asking if she was ok!?

Since many of the YLs (Young Ladies) have installed CB base stations, they are able to monitor the progress of, or lack of progress of, their boyfriends. Parents can contact the young adults or vice versa and even though neither parent or child would admit it to the other for fear of creating some embarrassing moments, the little edge of security adds to the peace of mind. In our society—during the days of terrorists, mass murderers and all kinds of weirdos, every edge we can get on the creeps is a plus.

A generation ago, CBers would meet at a designated restaurant, (pronounced “bar”) to actually meet the person they had been chatting with on the way home. If a person were really active on the CB, it was possible to attend a different “eyeball” every night, and meet radio users



Tracy “Speedracer” of Chatham, Illinois.



Kerrie “Racer X” of Hoffman Estates, Illinois.



CB allows young adults, their friends and even parents to stay in touch when traveling the interstate near home.

from various channels. Sideband users were notorious for having meetings, usually on a Sunday morning—the only chance to sleep late! Many romances were begun as a result of an eyeball, and

several have continued over the years. While the young adults of the 90's don't necessarily have "eyeballs", they tend to use the mall as a meeting place, putting faces with the "handles" and perhaps

beginning some form of relationship. The common denominator, bridging the generation gap, is CB radio. More and more, today's young adults are realizing that close-range communication, such as within a town, is CB friendly. After the initial cost to purchase and install the radio, there simply is no more cost.

Parent's Perspective—300 Minutes Buys a CB!

From the parent's perspective, it's much less expensive to purchase a base station and several mobiles than to continue to feed the ravenous maw that is cellular telephone. The usual 300 minutes on a cell phone, at a quarter per minute is a quick \$75. That buys a mobile radio! The young people are able to use CB to save money, as a shopping tool, a recreation device, even a tutor, in the case of some who slept through the "Intro to Calculus". If things go wrong, the car develops a problem, the CB can be used to call for help on either the local channel or Emergency Channel 9.

Give CB radio a try, you'll be glad you did. Next month, the *Teen Guide to Power Shopping*.

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Mobile Radio Installation— A Reader's Idea

A Possible Solution to Mounting Mobile Radios in Newer Cars.

BY ROBIN W. HARTFORD



Robin's '95 Crown Vic with his Black Rack, Uniden BC 760 XLT 100 channel scanner, Cobra 29LTD WX Classic CB, Cadet Dash Light, Radio Shack extension speaker, and Gall's three-hole outlet box. You can't see it, but Robin uses an Austin "Spectra" scanner antenna and Larsen NMO 27 low band CB antenna. (Photo by Robin W. Hartford)

As an Associate Editor for *Stock Car Racing* and *Open Wheel* magazines, I spend a lot of weekends traveling to various motorsport events. Subsequently, I have outfitted my car accordingly. However, due to current automobile construction design and airbag installations, I encountered a great deal of difficulty in obtaining a solution for mounting my CB, scanner and other equipment. Police supply catalogs are based on the premise that a vehicle has no console and bucket seats. While I had no console, I had bench seats. I thought you and your readers might be interested in my solution and the suppliers who provided it.

The "Black Rack" provided the mount

within a '95 Ford Crown Victoria LX with a slight modification. A portion was sliced off to accommodate the side-mounted microphone on the Cobra 29LTD WX CB unit. While I found the Uniden BC 760 XLT's volume more than ample, the CB needed a boost and that was provided by a RadioShack extension speaker "hook and loop" mounted to the base. Since I lost my lighter and the ashtray due to the mounts location, I then installed a three-hole outbox which powers my map light. I also have "hook and loop"-mounted my sunglasses case to the top of the CB for easy access.

In an effort to help gas mileage, Ford has lightened the Crown Vic by stamping the hood and trunk lid out of aluminum.

With my old magnet mounts now useless, I hooked the scanner up to a permanent mount black Austin "Spectra" scanner antenna which has outstanding performance. Although not known for CB antennas, I was impressed by the mount and workmanship of the Larsen antennas on the area's law enforcement vehicles. Inquiries lead to a permanent mount low key matte black Larsen antenna which works superbly with my CB unit. Having always used low end CBs and antennas, I never realized how much could be gained in clarity and range by utilizing first class equipment. It is truly amazing.

Although I have subscribed to *Popular Communications* for a number of years and recently purchased your special CB

issue, I found specific solutions to CB and scanner mounting in vehicles largely lacking in specifics and detail. Now that I found my own solution I would like to offer it to your readers. I hope it is useful.

Editor's note: Our sincere thanks to Robin for providing this article and photo. If you've got any specific CB/scanner mobile mounting ideas and photos, send them along.

The Black Rack
available from
D. Wall Sales, Inc.
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Gall's Three-Hole Outlet Box
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RadioShack 4-inch Extension
Speaker, catalog number 21-549.

Cadet Dash Light #SHMAP
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Larsen NMO 27 Low Band (CB)
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(Cobra CBs and Uniden scanners
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WANTED — WANTED

Maybe it's out there and we've just missed it somehow. We'd like to find a mobile radio mount that: 1. Doesn't require screwing, gluing or bolting anything to a vehicle, and 2. That "somehow" attaches, with some sort of easy-to-clip on mechanism, to the underside lip of a vehicle's front seat and holds the mobile radio/s in a similar fashion to easily-tipped-over hump mounts.

It seems this would solve lots of installation problems, especially on newer vehicles where drilling holes in the floorboard and under the dash can be a problem. If anyone has an idea, please let us know!



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GLOSSARY

A

AC: Alternating current.

ACARS: Aircraft Communications Addressing and Reporting System. VHF radioteletype used to transmit data and messages between commercial aircraft and ground stations.

AFC: Automatic frequency control.

AGC: Automatic gain control. Used to lessen strong signals while a user attempts to hear a weaker station.

AM: Amplitude (envelope) modulation.

AVC: Automatic volume control.

B

Back door: In CB terminology, typically the last vehicle in a long line of vehicles. This CBer/driver keeps a lookout for "smokies" (state troopers/police).

Bandpass filter: A filter that allows only a select band of frequencies to pass.

Bandwidth: Frequency space occupied by a signal.

Bank: A specific grouping of channels/frequencies in a receiver/scanner. Many scanner users will place like frequencies/services into specific banks. For example, bank 1 (channels 1–100) could be local fire or police frequencies. Bank 2 (channels 101–200) could be aircraft frequencies, etc.

Bleedover: Interference to user's operating channel by an operator on another channel. Very often caused by high power operation or misaligned CB transmitter. Often called "splash" or "splashover."

Broadcast communications: Communications intended to be received by the general public with no restrictions.

C

CATVI: Cable television interference.

CB: Citizens Band radio. By FCC definition it's a short distance voice communications service for personal or business activities. Use requires no license, registration or call letters.

Channel 9: The only emergency frequency (27.065 MHz) in the United States available to the general public for emergency and traveler's assistance. In many areas of the country it is actively monitored by REACT teams and other non-profit volunteer groups. Many CB radios manufactured today have an "instant channel 9" control that allows the user to

quickly get to the emergency channel.

Clarifier: Tuning control that fine tunes sideband signals to give the most normal sounding pitch. Does not change the transmitter's frequency.

Coaxial cable: Commonly referred to as "coax." A feedline with one conductor completely surrounding the other.

Copy: In CB terminology, means to listen for/to another CBer. As in "How do you copy (my signal)?"

CTCSS: Continuous tone-coded squelch system; sometimes called a sub-audible tone (commonly known by Motorola's trademark Private Line or PL).

D

D-layer: Lowest layer of the ionosphere that has little effect on shortwave radio propagation.

DC: Direct current. Power supplies used at base stations are DC power supplies; they convert standard household AC to DC to allow use of mobile/portable radios from the home.

Dipole: Antenna often used as a standard for calculating gain. A half-wavelength wire cut to a specific band of frequencies.

Direct wave: Often referred to as line-of-sight propagation, these signals travel from antenna to antenna in a straight line.

Discone: A type of antenna used for receiving and transmitting that is shaped in the form of an inverted cone, with a top disk element. A discone antenna exhibits no "gain", but offers scanner users wide-band receiving ability.

DTMF: Dual-tone multi-frequency; telephone-type keypad signaling system that uses 2-of-7 or 2-of-8 tones; often referred to by Bell's trademark Touchtone.

Dummy load: A device that connects to a transceiver that allows a user to test a radio without actually transmitting a signal.

Duplex: In radio communications, to receive on one frequency and transmit on another.

DX: Distant and/or rare station.

DXer: A person who actively specializes in tuning distant stations.

E

ECPA: Electronic Communications Privacy Act of 1986; Public law 99-508 that forbids listening to certain communications, including cellular phone communications, scrambled signals, voice

paging, remote broadcast links and paid subsidiary carrier authorization (SCA).

E-layer: Layer of the ionosphere that is present only during the day.

EMF: Electromotive force; voltage.

EMS: Emergency Medical Service.

F

F-layer: There are two F layers in the ionosphere; the F1 and F2. The F layer is responsible for reflecting radio waves to earth. Amount of reflection depends upon several factors including time of day, year, and amount of sunspot activity.

FCC: Federal Communications Commission. The regulatory federal agency that governs our nation's airwaves. Often referred to as Charlie or Uncle Charlie.

Feedline: Typically a lead-in wire or cable connecting an antenna and receiver/transceiver.

FEMA: Federal Emergency Management Agency. Agency charged with writing and implementing emergency preparedness and recovery plans for disasters.

Flat Side: Term used by CB sidebanders that means a horizontally-polarized signal vs. the standard vertically-polarized signal used on CB.

FM: Frequency modulation.

Freeband: Portions of the 26–27 MHz band that is above and below authorized CB frequencies. Freeband operation, although illegal, has gained popularity in recent years.

Frequency counter: A device that reads out the exact frequency (not channel) the radio is operating on.

Front door: In CB terminology, typically the first vehicle in a long line of other vehicles; not necessarily an organized group of vehicles traveling down the interstate. Typically the "front door" driver will report "smokey" or "bear" (state trooper/police) sightings.

G

Gain: The measure of an antenna's directivity.

GMRS: General Mobile Radio Service; organized public safety teams using frequencies in the 462.55–462.725 MHz spectrum.

GMT: See UTC.

Gray line: Often called the "terminator", this is the area around the earth which separates the areas of daylight and dark-

ness. "Gray line propagation" is an excellent method of DXing on the shortwave bands.

Ground: Common zero-voltage reference point; e.g. chassis ground or earth ground.

Ground wave: Radio waves that follow the curvature of the earth. Lower frequencies, such as the lower end of the standard AM broadcast band can be heard at greater distances than even those at the upper end of the AM broadcast band during daylight hours.

H

Handle: Used on AM CB channels, an operator's nickname that typically reflects the Cbers job, hobby interests or some other facet of their life.

Harmonics: Signals from a transmitter occurring at multiples of the basic frequency.

Hertz (Hz): Basic unit of frequency measurement equal to 1 complete cycle in one second.

HF: High-frequency (3–30 MHz). Also known as shortwave.

High-pass filter: A filter that attenuates signals below a certain cutoff frequency. Signals above the cutoff frequency pass through.

I

ID: Identification, as in station ID.

Ionosphere: Layers of charged particles above the earth's atmosphere that are responsible for reflecting (refracting) radio waves back to earth.

IRC: International Reply Coupon. Available at U.S. post offices and typically sent with a reception report to overseas radio stations when writing for a QSL.

Itinerant businesses: Businesses that typically move from one location to another, never remaining in one location for more than a year. Such businesses can be licensed on: 27.49, 35.04, 151.625, 464.500, 464.550, 469.500 and 469.550 MHz.

ITU: International Telecommunications Union; worldwide organization affiliated with the UN that deals with telecommunications matters.

J

Jamboree: A large organized gathering of CB operators, often in the form of a picnic or weekend convention.

Jamming: Deliberate transmission of

radio signals with the intent of rendering another signal ineffective.

K

kHz: Kilohertz (1000 Hz). 1,000 kilohertz is the same as 1 megahertz.

kW: Kilowatt (1000 W).

L

LCD: Liquid crystal display.

LED: Light-emitting diode.

Lid: Poor radio operator. A term typically used by sidebanders meaning rude.

Linear: Short for linear amplifier. An illegal RF power booster.

Low-pass filter: A filter that attenuates signals above a certain cutoff frequency. Signals below the cutoff frequency pass through. Common cure for TV interference (TVI) problems. Unwanted signals above about 30 MHz are filtered out, often eliminating unwanted harmonics, especially on TV channel 2.

LSB: Lower sideband.

LSB/USB switch: Allows CB user to select either the upper or lower sideband.

M

Ma: Milliampere (1/1000 A).

Mag-Mount: Short for magnetic-mount antenna. Today many Cbers, scanner users and hams use magnetic-mount antennas simply because the user doesn't have to drill holes in their vehicle, and because the mag-mount antenna is easily removable to prevent theft.

MF: Medium frequency (300–3000 KHz).

MHz: Megahertz (1,000,000 Hz or 1000 kHz). Scanner frequencies are usually expressed in MHz, such as 162.550 MHz.

Mic gain: A control on some CB radios that varies the amount of audio sent to the radio's transmitter.

MUF: Maximum usable frequency; highest frequency at which the ionosphere supports propagation at any given time; usually best DX openings occur just below the MUF.

mV: Millivolt (1/1000 V).

mW: Milliwatt (1/1000 W).

N

Net: An organized gathering of radio operators on a specific frequency. Typically, nets are organized to deliver information or messages.

NiCd: Nickel cadmium; refers to rechargeable battery packs.

NOAA: National Oceanic and Atmospheric Administration.

O

Ohm: A unit of resistance.

OM: Commonly refers to a husband or male radio operator.

Omnidirectional: When referring to an antenna, one that radiates (or receives) equally in all directions. A disccone antenna is omnidirectional. A vertically polarized CB base antenna is omnidirectional.

P

PA: Public address. A function on most CB radios that allows for the hookup of an external PA speaker. Used primarily by emergency teams and volunteers active in public safety.

Packet communications: High-speed data communications.

PEP: Peak envelope power.

Picture taker: In CB terminology, a police radar set-up.

Pirate station: Illegal broadcasting stations usually operated by radio hobbyists. They are also operated by well-financed corporate organizations that ignore international broadcasting regulations.

PLL: Phase-lock loop; used as one section of a digital frequency oscillator.

PL-259: Male connector that typically terminates the end of radio coaxial cable. It mates with the SO-239 connector on the radio.

PTT: Push-to-talk; a switch on the microphone that activates the station transmitter.

Q

QSL: A verification of a listener's reception report. A card sent from one radio operator to another to confirm contact.

QRM: Interference on the channel, usually refers to interference caused by other stations. Usually used by sideband operators.

QRN: Interference on the channel, refers to electrical type noise, such as static or power line interference. Usually used by sideband operators.

QRP: Low power operation, usually 5 W or less.

QRZ: Literally means "Who is calling?" Usually used by sideband operators.

QSK: In CB sideband use its meaning is similar to "break" that's used on the AM channels. On SSB it typically means "Would anyone like to talk with me?"

QTH: Means location. Usually an operator's city and state.

R

Radio check: Frequently-heard CB transmission that typically means, "Hey, is anyone out there? I'm here and just turned my CB on for a moment and have this burning need to know if it works."

REACT International, Inc.: Radio Emergency Associated Communications Teams; non-profit public service organization with headquarters in Wichita, KS, whose many volunteer teams of radio operators provide assistance/information to the public. REACT teams are typically found on CB Channel 9.

Reception report: Information, usually in the form of a letter or cassette tape recording sent to a radio station in an attempt to obtain a QSL. The report contains some pertinent information such as date, time and frequency of reception, along with other items to prove reception.

Repeater: Automatic relay station.

RF gain control: Variable control found on some CB radios that allows the user to adjust (maximum to minimum) the amount of received signals. Most users keep it set to maximum.

RFI: Radio Frequency Interference. Can be caused to or by communications equipment.

Rig: A radio/CB transceiver. Sometimes referred to as a unit, whether base or mobile.

RIT: Receiver Incremental Tuning—on a transceiver, a control sometimes called a clarifier, that gives the operator the ability to slightly change the receiver frequency. The transmitter frequency is not affected.

RTTY: Radioteletype.

S

SASE: Self-addressed stamped envelope. Sent as a courtesy to radio stations, other hobbyists, clubs, publications when requesting information.

S-meter: An indicator on communications equipment that shows the relative strength of a received signal. From S1 to S9 the meter is calibrated in S-units. From S9 and above it is calibrated in decibels.

Search mode: On a receiver/scanner, a control that allows the user to program an upper and lower frequency limit and command the radio to detect signals within that limit.

Selectivity: Ability of a receiver to reject signals adjacent to the tuned signal. The

higher this number, the better the receiver's selectivity.

Sensitivity: A receiver's ability to receive weak signals. Expressed in microvolts (μV). A lower number means greater sensitivity.

Seventy three: Typically means best regards, used when terminating a contact.

Sidebander: In CB terminology, an operator who uses SSB communications, typically on CB channels 36 to 40. The FCC has traditionally not officially set aside any CB channels for sideband use, however most users adhere to the unofficial channels 36–40 plan.

Simplex: In radio communications, transmitting and receiving on the same frequency.

Sky wave: Radio waves that use the ionosphere's refraction capabilities (skip).

Squawk: A transponder setting used to inform controllers on the ground of an aircraft situation. Information is translated to give information on the controller's radar display indicating the aircraft, its type, altitude and speed.

Squawk 7700: Announcement indicating a declared emergency on-board an aircraft.

SSB: Single sideband; efficient form of voice transmission with one sideband and carrier frequency removed before transmission. SSB radios are more expensive than AM-only CBs, however, the increased legal power and range is considered by many users to be worth the extra cost.

SSB Network: An organization that issues special unique callsigns for sideband CB users. An inscribed membership certificate is also sent to members. Open to anyone interested in CB SSB use. Located at P.O. Box 908, Smithtown, NY 11787.

SWR: Standing wave ratio; figure of merit indicating degree of match for antenna and feedline at some particular frequency.

T

Traffic: Radio communications passed from one transmitting station to another. Usually heard in amateur (ham) communications.

Trunk-mount: Term for an antenna that mounts on a trunk or hatchback using small set screws. It is a permanent antenna installation.

TVI: Television interference.

Twenty: Term used on CB meaning an operator's location. Also said as "10-20." Common usage is often, "What's your twenty?"

U

UHF: Ultra-High frequency (300 MHz–3 GHz).

UHF Band: Typically frequencies from 406–520 MHz. Technically can mean all frequencies from 300 to 3,000 MHz.

USB: Upper sideband.

UTC: Universal coordinated time; formerly Greenwich Mean Time; world time. Also Coordinated Universal Time.

Utility stations: Stations other than broadcast, amateur or CB stations; these stations are not intended to be heard by the public. They include aircraft communications, radiotelephone, marine, embassy and military communications.

V

V: Volt (unit of electrical force).

VFO: Variable frequency oscillator.

VHF: Very-high frequency (30–300 MHz).

VHF High: A specific band of frequencies, typically 137–174 MHz.

VHF Low: A specific band of frequencies, typically 30–50 MHz.

VLF: Very-low frequency (3–30 kHz).

VOX: Voice-operated switch.

W

W: Watt (unit of electrical power).

WARC: World Administrative Radio Conference; international ITU meeting that apportions radio spectrum and determines usage.

X

XCVR: Transceiver. A transmitter/receiver in one unit.

XYL: Wife.

Y

Yagi antenna: A directional beam antenna used by radio operators (rhymes with foggy).

AND ..

800 MHz: Frequencies between 800 and 900 MHz, typically the 851 to 869 MHz business and public safety channels and the 869 to 894 MHz cellular band.

900 MHz: Frequencies between 900 and 1,000 MHz (or 1 gigahertz), but typically the 902 to 928 MHz amateur band, the 929 to 930 and 931 to 932 MHz paging, and 935 to 940 MHz business band.

ANSWERS TO YOUR MOST FREQUENTLY ASKED CB QUESTIONS

By Bill Price

Imagine that—the second issue already! I feel as if we've known each other for a while now. It'll still be a few months 'til we overcome the initial lead time between typewriter and press, but by the time you read these words, I will have the first of your questions on my desk, frantically looking up information, calling my engineer friends or wondering how to bluff my way through yet another issue. Meanwhile, we've still got a pile of questions that have been waiting for a place to answer them, so here are a couple of the better ones:

Hey, Bill—what's a "positive ground?" Isn't the negative terminal of a car's battery always connected to the chassis?

E.B.W., Machias, ME

You're almost right, E.B., and frankly, I wish you were. With the exception of a few forgettable years in the history of automotive electrical engineering, all cars and light trucks have had negative ground. That is, the negative terminal of the battery is connected to the chassis. There was a period of time, however—I believe it was during the late sixties and early seventies (do any of you readers remember?) when one of the electrical engineers at a "Big Three" factory in Detroit thought he'd play just one more practical joke on the weekend mechanic.

He had just finished a plan whereby home mechanics would need to remove their engines to change the spark plugs when he got this really devious idea—reversing the polarity of the car's electrical system! Late one night he revised the wiring drawings to initiate his change, and it was several years until management found out. This was the same company, by the way, which used left-hand threads on the left-side wheel-lugs and right-hand threads on the right side, and never realized until about the time we put a man into space that folly was completely unnecessary too.

Seriously, though, these bassackwards cars are dangerous to anyone who doesn't know the polarity is reversed. If you suspect you have a car with positive ground, ask a mechanic, an electrician, or a skilled radio installer to check it for you. If you'd like to learn how to determine polarity yourself (and a lot of other things) this would be a good time to find a budget-priced *multimeter* for measuring volts, ohms, and milliamperes at your favorite radio store, or at most stores with names ending in "mart." They all come with directions, and that favorite radio

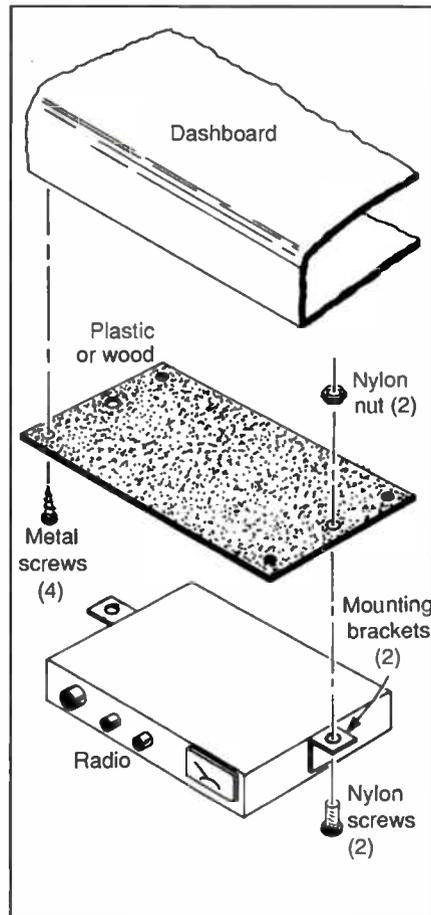
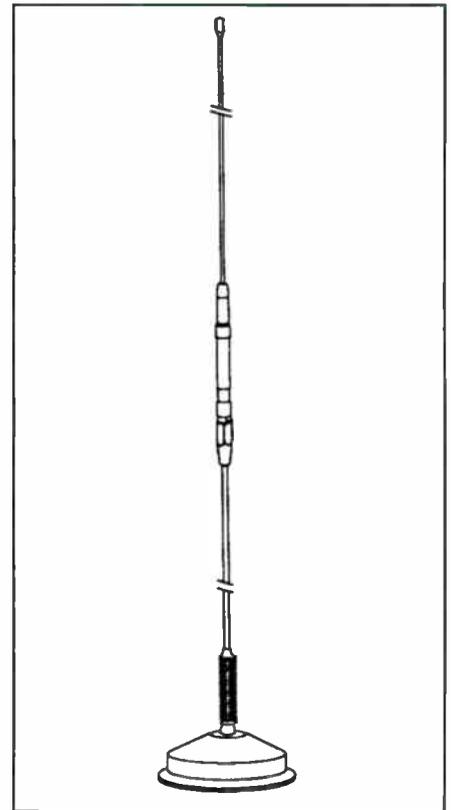


Figure 1: For folks with positive-ground vehicles, the CB radio can be mounted to a plastic part of the car, or you can attach a piece of non-conductive material (plastic or wood) where you want to install your radio, then connect the radio's positive terminal to the car's chassis, and the radio's metal case, or ground screw (-) of the radio to one of the car's fuse blocks.

store of yours will most likely have a detailed book devoted to the care and feeding of your new gadget. They range from about \$10 (bare-bones analog) to over \$100 (highly accurate, some with computer interface). The \$10 version will do you just fine 'til you become sophisticated in its use. It'll also do for most household and automotive applications.

If you find that you have an old positive ground system you'll need to either:

- Find a radio which is switchable between negative and positive ground, or
- Mount your radio to a non-conductive



CB antennas, such as this Hustler model RTM magnetic-mount are "cut" for CB frequencies; reception of CB (27 MHz shortwave) signals will typically be better than on your base station shortwave receiver using a random length longwire antenna. (Courtesy Hustler, Inc.)

(plastic) (See Figure 1) part of the car, or attach a piece of non-conductive (plastic or wood) material where you want to install your radio, then connect the positive (+) terminal of the radio to the car's chassis (isn't that the most ridiculous thing you've ever heard?) and connect the radio's metal case, or the ground screw (-) of the radio to one of the car's fuse blocks (you don't know how it pains me to write these convoluted instructions). In other words, you must wire the radio incorrectly, or

- Give the car to someone you really hate.

P.S. If you have a positive ground car, it would be a good idea to paint the words "POSITIVE GROUND" on the inside of the hood in six-inch red letters

Dear Bill—I have a pretty good shortwave receiver (it cost over \$400) with a 100-foot longwire antenna. It doesn't

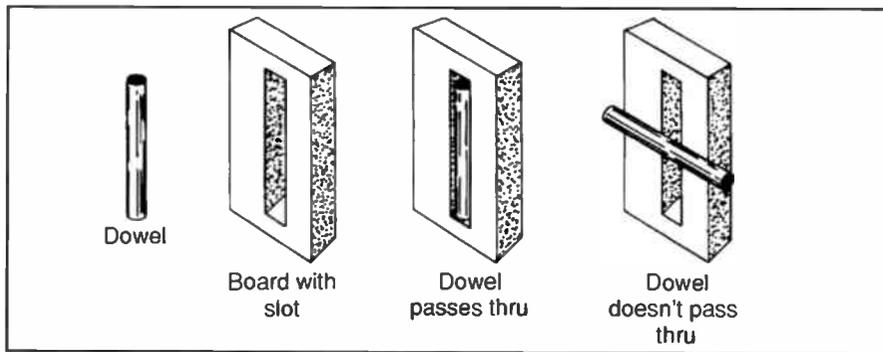


Figure 2:

receive CB signals as well as my \$49 transceiver. How come?

F.S.K., Baltimore, MD

How come, indeed, F.S. You would think your expensive shortwave receiver is better than the receiver in your CB, wouldn't you? Well, it is. It's your antenna that's not up to par here. Don't get me wrong—a 100 foot longwire antenna is fine for general shortwave listening—it's an antenna whose overall performance is pretty high based on the antenna's cost (about five bucks) and the time it takes to put one up (anywhere from ten minutes to an hour). Now think about your CB antenna. It probably cost you between \$30 and \$100, and took you most of a long afternoon to install. It's designed specifically for a tiny slice of the shortwave spectrum, and it's vertically polarized (that means it sticks up in the air rather than laying on its side). Almost all CB signals are transmitted using antennas that are vertically polarized, which means that local signals (non-skip signals) are vertically polarized when they arrive at your antenna (which is horizontal).

Imagine that you have a horizontal slot cut in a board, (See Figure 2) say a foot long and a quarter inch wide. Now you have a 12" by 1/4" dowel coming toward the board, but it's perpendicular to the slot. It won't get through, will it? Now rotate either the board or the dowel, and voila! it gets through. That's the general concept of how a receiving antenna's polarization should match the way the incoming signal is polarized.

Remember how I said that local, non-skip signals are vertically polarized when they arrive at your antenna? That's because skip signals bounce off the ionosphere (charged, reflective layers in the earth's atmosphere) and when they bounce, their polarity is no longer what it was when it left its transmitting antenna, so the polarity of a skip signal is completely random. Try listening to CB signals on your shortwave receiver with the longwire antenna, and on your CB with the CB antenna, then swap antennas and see what a difference it makes.

Bilious—I have a 1-watt CB walkie-talkie, and I can usually get about 1 mile of useful range out of it when I'm out on the lake. I'd like to double my range—will doubling my power—getting a 2-watt unit—do the trick?

J.M., Erie, PA

J.M., this is a topic where the math is almost simple enough to talk about, so I'll throw out a formula. Then, after we play with the math, I'll offer another solution.

First of all, there's Doug's Rule of Inverse Square, which is something my friend Doug taught me with regard to photographic lighting (light propagates pretty much the same as radio waves, but it doesn't reflect off the ionosphere very well). The law states that:

Light (or in your case, your radio signal) diminishes in inverse proportion to the square of the distance from the source.

If you measure 10 lumens (units of light) at a distance of 1 foot from your light source, you'll measure 2.5 lumens at 2 feet. Same with a received radio signal. (When applying this rule to radio waves, this should be stated in decibels, but I'll use plain ol' numbers for clarity). If you measure 1 milliwatt at a distance of 10 feet from your transmitter, you'll measure .25 milliwatt at 20 feet. With light waves or radio waves, twice the distance leaves you with only 1/4 the power.

So what happens if you double the power? You only get the square root of your transmitter power increase once you get out to your receive site, and this is true whether you're one foot away from the transmitter or 100 miles. Let's say you had a one-watt transmitter, and at 10 feet away you measured one milliwatt with a given measuring device. Now you double the transmitter power (to two watts). You go back to your receive site, which is still 10 feet away, and what do you measure? 2 milliwatts? Nope—you'll only see 1.4 milliwatts. Remember 1.4 is the (approximate) square root of 2. Using a couple of easy, whole-number square roots in that same situation, if you'd have increased the transmitter power to 9 watts, you'd measure 3 milliwatts at your receive site (3 is the

square root of 9). Increase transmitter power to 100 watts? The receive site would see a 10X increase—it would now show 10 milliwatts.

Any time you need twice the given power at some point, you'll need to increase the transmitter power (that's just like increasing the wattage of the light) by a factor of *four*! You must *square* the increase you want at a receive site to determine how much of a power increase you need at the transmit site. If you want a 3X increase in power at some receive site, you need a *9X* increase in transmitter power.

If, as you said, you have a usable signal at 1 mile and you want a usable signal at two miles, the magic number is still a 4X increase in transmitter power, so you'd have to run the full legal limit of 4W.

If you're on the lake, I can only assume you're in a boat. If that's the case, I'd suggest raising your antenna as high as is practical (that increases your range dramatically) and switch to a mobile (or marine) SSB (single-sideband) rig instead of the portable. You get a lot more effective range when you use SSB because none of your power is wasted creating an AM "carrier," and SSB rigs operate with a higher legal limit than AM anyway. The net result is that you get more watts to use, and each watt in an SSB rig will take your signal farther than it will with an AM rig; the trade-off is that you'll sound like a duck. Now the only missing part of the equation is whether the folks you want to talk to also have an SSB rig.

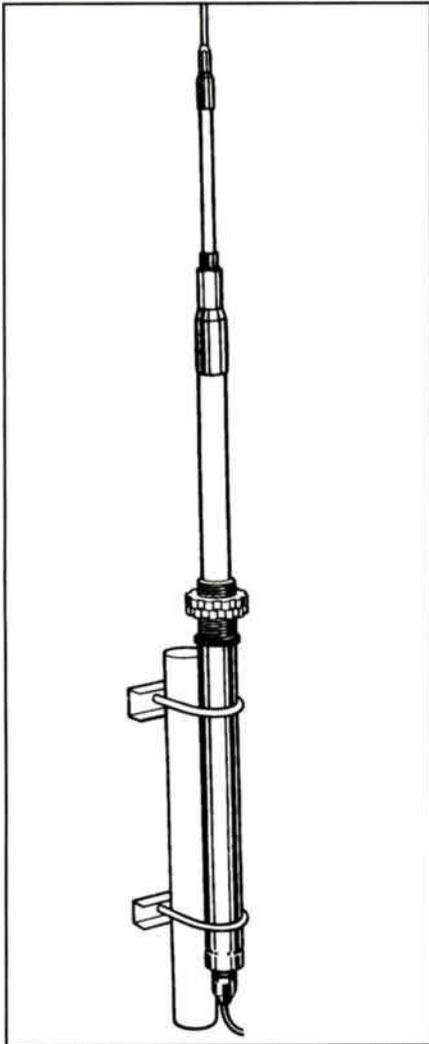
Okay, Big Guy—I've heard that old tube-type radios put out more power than new solid state (transistor) rigs—any truth to that?

J.D., Cottonwood, AZ

An astute point, my learned colleague. It's another of those "yes-and-no" answers. The "no" part is that by law, the tube-type rigs were not to be adjusted to put out more than the 4 Watt legal output—just like today's solid-state (transistor) rigs. Also like today's radios, when those tube-type rigs came from the factory, they too were properly adjusted to 4 Watts output. Now on to the "yes" part of the answer.

Because those tube type circuits had plenty of headroom (they were capable of more output than they used) they were loafing along with respect to both modulation and RF output power. Because they were not being "pushed to the limit," their modulation and RF output were usually "cleaner" (more linear, with less distortion) than today's solid state rigs.

Although it was just as illegal in 1958 as it is today, there were those who would adjust their radios to "peak" the RF out-



If you're using a vertical CB antenna such as this Solarcon A99 (without bottom radials), you can always mount it above your CB beam, on the same mast; just get it six to 10 feet above the beam's elements. (Courtesy Solarcon Antenna Research)

put to more than the 4 Watt factory setting—and many of the tube-type rigs had enough headroom to allow a person to double or even triple the output power. I doubt that the best-engineered of today's solid state rigs have sufficient headroom to allow more than about 6 Watts output before the signal quality would be reduced to rubbish. Before you rush to see if you can achieve that "whopping 50% increase" (and mis-align your transceiver) take a look at what it'll buy you by reading the previous question and answer.

Somehow too, the clicking of hefty relays and the hum of AC transformers gave an early CB operator the feeling—the perception of "more power." It's a natural reaction. Remember, too, that with all

the size of those early behemoths, there was plenty of room for a hefty audio amplifier and large speaker, so our forefathers usually had a much louder and cleaner audio signal than we get from the tiny audio sections of today's rigs. That big sound also fed into the perception of the big old rigs being more powerful.

If you like the smell of cooking dust and the scratchy sound of dirty tube sockets, by all means use an old tube-type transceiver if you can find one. They didn't have nearly the frequency stability of today's rigs, but they had enough to stay legal. Most of them didn't have the adja-

cent-channel rejection, automatic noise limiting or noise blanking circuits found in a modestly priced solid state rig, but they had a clean, powerful audio section (in both transmit and receive) and a good linear output that's hard to match today—but if you're going to use one in your car, be sure you keep the engine running whenever you're transmitting—it'd be embarrassing if your battery ran down so low that you couldn't call someone on your CB radio to ask for a jump-start.

Hey Bill—I'm using a 3-element 10-meter "ham" beam that I've tuned to

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Helpful Hints

When installing your mobile CB always be sure the controls are easily accessible and don't interfere with the driver's ability to control the vehicle.

When installing a trunk-lip mount (or hatchback mount) antenna, be sure to scrape away the paint on the underside of the trunk lid for the best possible contact. Tighten the set screws securely and then apply a coating of Coax Seal or silicone type sealant to protect the connection from corrosion.

If you use a magnetic-mount antenna, periodically lift the magnet and gently clean off the underside of the magnet and your vehicle. Dirt and dampness have a way of getting under the magnet, eventually deteriorating your signal and dulling the car's finish.

use on the CB frequencies. I'd like to put up an omni-directional (vertical) CB antenna too, but the roof is small—how close can I put them?

C.J.F., Washington, DC

That depends on what kind of vertical you've got, C.J. If it's a ground-plane with radial "whiskers" hanging out from the bottom, the tip of the whiskers should stay about 15 feet away from the nearest part of the beam when you turn it. If you have one of those fiberglass vertical antennas with no radials (or very short radials), you can mount that on the same mast as the beam—sticking straight up above your beam—just make sure the bottom of the vertical antenna is about six feet above the elements of the beam—10 feet would be better, if your mast is strong enough.

By the way, congratulations on using both an omni-directional and a directional antenna—it lets you listen for signals from all directions, then zero in on the ones that are important to you. Having a vertical and a horizontal antenna can be an advantage, too—there will be some signals (vertically polarized) that you'll hardly hear at all on the horizontally polarized beam, even though the beam has far more gain than the omni-directional vertical.

Can I connect my fax machine to my CB transceiver so that I can send and receive fax messages to my office across town?

T.A.E., Menlo Park, NJ

It's another "yes and no" for T.A. Yes, it's electrically possible, but no, the FCC wouldn't want you to do it. After you tried it, you wouldn't want to do it either, because the static and man-made interference on CB frequencies would reduce your effective baud-rate to about two. It would be quicker and more accurate to use a wingless carrier pigeon who hitched rides atop bicycle messengers' helmets. Technically easier, too, because while making the input and output connections between fax and radio might not be that hard, there would be some switching circuitry required so that the two fax machines could "shake hands." The system would need so many relays it'd sound like a pinball machine, making the unflappable rock dove even more of a bargain. Seriously, though, if you must send and receive fax messages or computer data via modem and either one or both of your locations has no phone service (car, remote cabin, etc.) there are fax and modem connections available for cell-phones and radio based fax/modem systems on the market right now, though they're a bit more costly than a good CB, and you'll have to pay something like cell-phone rates to use them. ■



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CIRCLE 65 ON READER SERVICE CARD

State of the Month



OUR SALUTE TO THE STATE WHERE SERVICE IS TOPS

By Ron McCracken

Way To Go Florida!

Why bother with a REACT Council? Some jurisdictions don't, for a variety of reasons. You can't say that about Florida.

For a while, Florida REACT Teams had two Councils! After a few years, the value of having a single Council to represent all the REACT Teams within the Sunshine State became apparent, and the two Councils merged.

Just as well. There has been a lot of action in Florida recently and member Teams are proud of the Council they forged. It has served them and the people of Florida well for the past decade amid some pretty severe tests you've all read about.

information to benefit their Teams. A healthy dose of fun and good fellowship encourages strong turnouts at their meetings. That's certainly the way it was at the recent Council meeting we attended in Apollo Beach, near Tampa. Extra seats were needed to accommodate those who came from near and far.

The Council's Board meets quarterly. Teams re-elected their officers at Apollo Beach to another two-year term, indicating their pleasure with them under the chairmanship of Mike Chuven, Daytona Beach. Two posts were contested and the candidates gave lively presentations of their platforms. This is a strong, spirited Council.



Florida

Battling The Weather

The weatherman seems to have it in for Florida REACT Teams. No doubt Hurricane Andrew will immediately pop into your mind. He was the most destructive, of course. Andrew actually helped REACT in Florida in a perverse way, however. He drove home to Teams just how valuable their Council was to them as they mustered to assist one another. He also prompted the formation of new REACT Teams in his wake as people realized just how vital communications are in disaster situations of any type.

Last hurricane season four major tropical storms tested Florida's REACT Teams. Some Teams were activated repeatedly by their Emergency Management offices to help cope with the series of severe storms.

When it isn't hurricanes, it may be floods along Florida's southwest coast after a torrential summer rainstorm. They certainly tax REACT communications skills. Even good weather can create problems. Wildfires endangered life and property from Ocala to Ormond Beach a few years ago, putting REACTers to work once again.

Good Hosts

Twice Florida has hosted REACT International conventions—in 1984 and 1991. Both were highly successful credits to the Council and the host Teams. Already the Council has its sights set on hosting the millennial convention in 2000.

Florida's contributions at the International level are not limited to hosting conventions either. Barbara Chuven, now

in Atlanta, Georgia, served on the Board of Directors for REACT International. Other Florida REACTers have also served capably on various International committees over the years.

Clearly, to have achieved as much as it has in a fairly short life span, Council secretary Paul Jones hits the nail on the head when he says its Teams "have worked in harmony". Florida Council of REACT Teams, it shows! ■

Fun Too

Much of the time things are quiet and pleasant for Florida's REACT Teams. Then Teams get together for their semi-annual Council meetings. Along with business, they pick up new and useful



Florida REACTers get updates from Council officers Jerry Rowton, Mike Chuven and Paul Jones at a packed meeting in Apollo Beach.



Getting Ready to Hike the Appalachians

The Citizens Band is now a few decades old. It was created so everyone could use a chunk of the radio spectrum for local two-way communications. However, they allocated the band to the top of the shortwave spectrum, just below the amateur radio 10-meter band. Because the frequencies are in shortwave, the signals often skip out much further than five or 10 miles; often signals can be heard 1,000 miles away. To make matters worse, because the Citizens Band is so close to the 10-meter amateur band, some amateur transceivers can easily be modified to operate here. Some equipment, such as the 1950's-era Heath VFOs even cover right across the CB frequencies. With no modifications, a Heath VF-1 VFO and a Heath DX-100 can put out about 100 watts of AM across the CB band.

Before you get the wrong idea, this is NOT a primer on excessively high-powered or out-of-band operation. But, just imagine when the guy with DX-100 or a Yaesu FT-101E (150 watts out SSB) and a beam antenna fires up. Boom! The frequency is his—for hundreds or even thousands of miles. Toss a handful of these guys on the air (from most anywhere in the world) and it can be very difficult to work a local channel. With all of this interference, you might start to wonder if there is a point in using the CB band for local two-way communications.

That's what the FCC evidently thought when they established the low-power band in the 49 MHz range. This range is popular for cordless telephones, baby monitors and low-power walkie-talkies. So what's to stop someone from using a set of walkie-talkies in the 49 MHz band for two-way communications? Nothing really, but the range can be restrictive, even if you want to talk with anyone in the outside world, forget it. In last month's column on ski-B'ing, 49 MHz walkie-talkies could have been used. But if someone would get lost or injured, CB handheld sets could be a lifesaver—the skiers could call emergency search parties or typical CB users for help.

So, although the 49 MHz walkie-talkies are handy for a number of short-distance communications applications, there are also a number of shortcomings (besides waking up all of the children in the neighborhood via their baby 49 MHz monitors).

Another activity where both local two-



Here's a look at a high-powered transceiver like the one mentioned in our column.

way radio communications are important is hiking. Now that we're in the middle of Spring, now is the time to start planning hiking trips. Most people don't equate the radio hobby with hiking or exercise (usually an easy chair and some junk food come to mind first), but hey, we're adventurous!

Speaking of Adventure

Why limit yourself to just a little hike in the woods? Instead, this column and the one next month will take a very brief cursory glance at CB radio while on the mother of all U.S. hiking trails, the Appalachian Trail (A.T.). The A.T. doesn't get as much press as Cindy Crawford's shoes, so you might not have heard of it. As can be expected, the Appalachian trail covers the Appalachian Mountains. In fact, the whole trail covers 2,100 miles, running from Springer Mountain, Georgia to Mount Katahdin, Maine.

Needless to say the trip is LONG. And the trail runs through the mountains. The mountainous aspects means rocks everywhere, steep climbs, high wind, and cold weather. Over the years, at least 99 people have frozen to death on Mt. Washington in New Hampshire, although

most of these deaths weren't related to hiking the A.T.

Whoa! That's scary! But don't get the impression that hiking the A.T. is like those clips between videos on MTV, where some guy wearing spandex is hanging upside down from an ice ledge while the camera flips at contorted angles and instrumental heavy metal squeals on. No, the A.T. is more like a slow, weaving treadmill with obstacles. The A.T. is much more likely to be featured on PBS than MTV and most hikers seem to be patient and determined, not thrill-seeking.

So now I've convinced you that the A.T. is 1. painful and deadly—2,100 miles of sheer Hell and 2. more boring and tedious than reciting the names and numbers in a phone book backwards. That wasn't my purpose, but the point is that you must be tremendously dedicated if you want to hike the entire Appalachian Trail: it's not a little jaunt in the woods.

Why Do It?

I can't speak for everyone else, but I would like to hike the trail to get to know America a bit better. I know, "Just drive or catch the plane." That's okay, but you end up missing much of what you're



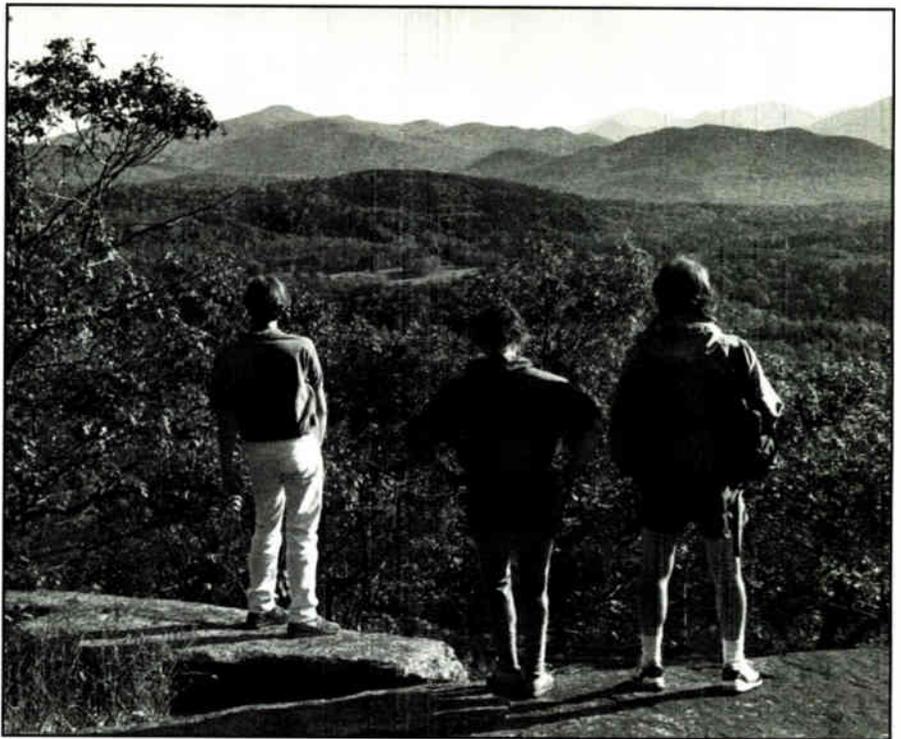
This photo of part of the Appalachian trail shows a crossing bridge at Harpers Ferry, West Virginia.

crossing. Also, it's an education about the natural wildlife in the mountains. In addition to seeing bears, I could also get a chance to expand that fungus photo collection. Finally, after years of reading about these adventures in books like *Walk Across America*, *The Walk West*, and *Home is the Sailor*, I would love to try it for myself. Because of commitments (such as writing this column) and my family, I won't be hiking the trail myself this year. Otherwise, you would get seven months of columns in this magazine with me begging for meals at Taco Bell and a room at Motel 6. I'll spare you this year.

Right now it's April. A perfect month to begin planning that big hike (so you don't finish the hike in the Winter) or to schedule a smaller hike, such as a weekend on the trail or walking across a state.

If you are seriously interested in making such a hike, here is your homework assignment:

1. Go to the library and check out a few books on the subject, such as *Hiking the Appalachian Trail*. Read these to get an idea about the A.T. Do you REALLY want to do this?



This view could be yours—take a hiking trip, but remember to bring your CB walkie-talkie along. It's fun and could be a lifesaver! (Photo courtesy New York State Department of Economic Development).

2. Go to the doctor for a checkup and make sure your physical condition is up for this type of abuse.
3. Pick up a copy of the 1996 *CB Radio Buyer's Guide* from 1-800-853-9797. Compare the different types of equipment and features, and then pick a CB radio that best suits your needs.
4. Contact the Appalachian Trail Conference in Harper's Ferry, West Virginia for information about the trail and about the local A.T. groups that maintain it. They will also be able to provide you with information about the hike and about the gear you'll need to take on your journey.

Write: Appalachian Trail Conference, P.O. Box 807, Harpers Ferry, WV 25425 or call 304-535-6331 or on the Internet: appalachiantrail@charities.usa.com

Last month's article mentioned using headsets with an earphone and a microphone, and a VOX switch for hands-free operation. I was reading an amateur radio magazine. It contained an advertisement for EARTALK—an earphone that doubles as a microphone—you talk and the sound is picked up by the earphone and carried back to the transceiver. Of course, these are intended for amateur radio transceivers, but I'm sure that would either work as-is or with slight modifications for at least some handheld CBs. I've never

tried one of these, so I can't comment on their sound quality or convenience, but it seems like a great idea! For more information write to: Electro Automatic Corporation, 599 Canal Street, Lawrence MA 01840 or call 508-687-6411 or fax them at 508-687-6493.

A voice-activated headset that's on the market is the model VX-33, which is what I described in last month's column. It costs \$130. For more information write to: RF Limited/Clear Channel Corporation, P.O. Box 1124, Issaquah, WA 98027 or call 206-222-4295 or fax 206-222-4294. Tell them you read about them in the *CB Radio* magazine!

To contact me via this column, just write to: CB Applications, c/o *CB Radio* Magazine, 76 North Broadway, Hicksville, NY 11801, USA or if you have an idea you'd like to see covered in this column and you are on-line, you can send an e-mail to ayoder@delphi.com. I can't promise a response to any questions, but I will try. If you send questions via the U.S. Postal Service, please enclose an SASE or two International Reply Coupons (IRCs) so I can write back. I also check into the alt.radio.cbc Usenet group on the Internet from time to time, so I might see your ideas posted there as well.

Until next month, happy planning and reading, and do your homework! ■

How Channel 9 Became an Emergency Channel

One of the first things everyone learns about CB radio is that Channel 9 is for emergencies. Sounds so logical and clever that it's the reason many people went out and purchased CB radios. You can even read about Channel 9's special status in the FCC regulations. It's reassuring to know you can usually scare up a REACT monitor on Channel 9 to help in case of an accident, car problem, or if you get lost on an unfamiliar road.

Channel 9 didn't become something special overnight. It fought the good fight to become designated CB's emergency channel. There were fits and starts. Here's a concept that's got a truly strange past with a story to tell. Actually, the idea had been floating around in one form or another since CB opened up in 1959.

The first time I learned of it was when Roy Freeland, President of International Crystal Mfg. Co., came to speak to me. In 1959, I had started writing a monthly CB column in a national electronics magazine, and Roy wanted some publicity on an idea he had. It was for Channel 9 to be used by travelers for emergencies. Here's why.

Those Early Days

Back then, CB was rather leisurely and simple. Few stations were on the air. Though some operators felt CB would grow, nobody foresaw the boom era that was to take place 15 years into the future.

Manufacturers were producing single channel transceivers, with most better grade sets having from two to five channels. You really didn't need any more channels than that for hooking up with the handful of locals in any area. CBers knew the most popular local channel or two, and popped those crystals into their transmitters. In those pre-PLL days, you had to decide which channels you wanted, then plug in two crystals per channel to operate; one for transmit, one for receive.

So, if you were located in Goose Hump County, for instance, and all four of the other area CBers had crystals for only channels 3 and 8, and you also had those channels, you were all set. Of course, if they used channels 17 and 20 in the next county, you'd have to get those channels, too. Hopefully your rig would be able to accept a sufficient number of crystals to allow you to chat on the channels for your local and surrounding areas.



Locally preferred monitoring channels made it difficult nationally to get help in the days when CB rigs had only a couple of channels.

No problem, except if you were going on a trip and found that anywhere you went you had to know which of the 23 channels were in use locally, and you had to actually have a set of those crystals with you. We used to keep extra crystals in a Dixie cup, with a dab of nail polish to separate the transmit ones from the receive crystals. Crystals weren't cheap, and few people were fully set to go on all 23 channels.

In the event of an emergency, you had to start unplugging and plugging in crystals, hit and miss (at two per channel), shouting all over the place for help. Hopefully you had a channel used by the locals so that you could summon the police, ambulance, or tow truck. With so few CBers on the air, it was usually easier to hike down the road to a house where they would let you make a landline call for help.

Roy Freeland had in mind that CB should be more useful than a novelty gizmo for yakking with one's own mobile



We made up and distributed tens of thousands of "Monitor 9" decals over the years to help publicize the national channel concept.

units and local pals. He realized that the lack of being able to inter-communicate with others nationally was a barrier that needed to be removed. He wanted to establish a national channel that was common to all areas which could be used by itinerant and traveling CBers. To ensure its availability and use on a national basis, Roy suggested that all manufacturers deliver their CB equipment ready to operate on this channel. He suggested the channel to be Channel 9, since it was near the center of the band.

Roy visualized Channel 9 as a calling frequency that would be voluntarily monitored for calls by all CB stations not engaged in communications on other channels. In this manner, it would be useful for emergency purposes. I thought this was an excellent idea and began pushing Channel 9 in my column. In those days, Roy's company was publishing CB callbooks, and the 1960 edition carried a feature story seeking voluntary support for the Channel 9 concept. We dubbed it NATCH-9, meaning NATIONAL Channel 9.

Support Grows

REACT was formed in 1961, sponsored by Hallicrafters. Soon after, several other national travelers monitoring groups and teams such as H.A.M., ALERT, and PACER were formed. Only REACT had any staying power, thanks to its organizational structure and a succession of



Every local area had its own channel. If your radio didn't have those crystals, you were out of luck.

several commercial sponsors in its early years. There were also many independent regional and local groups. Oddly enough, while all groups and teams liked the emergency monitoring idea, most still preferred to rely upon their long-established local area CB calling channels instead of NATCH-9.

I kept plugging the channel 9 idea when I became the first editor of the CB

magazine, S9, in 1961. It was a perfect forum to encourage readers to suggest that the FCC designate Channel 9 as the voluntary national calling and emergency channel. We made up, and over the years distributed, thousands of "Monitor 9" decals. Another idea was to suggest that CBers who monitored NATCH-9 in their mobiles paint the top six inches of their whip with Day-Glo orange to publicize the

channel. A number of manufacturers soon began shipping radios with Channel 9 crystals. Still, as of 1962, the FCC remained indifferent to designating Channel 9 as special. This made it difficult to give it the needed push.

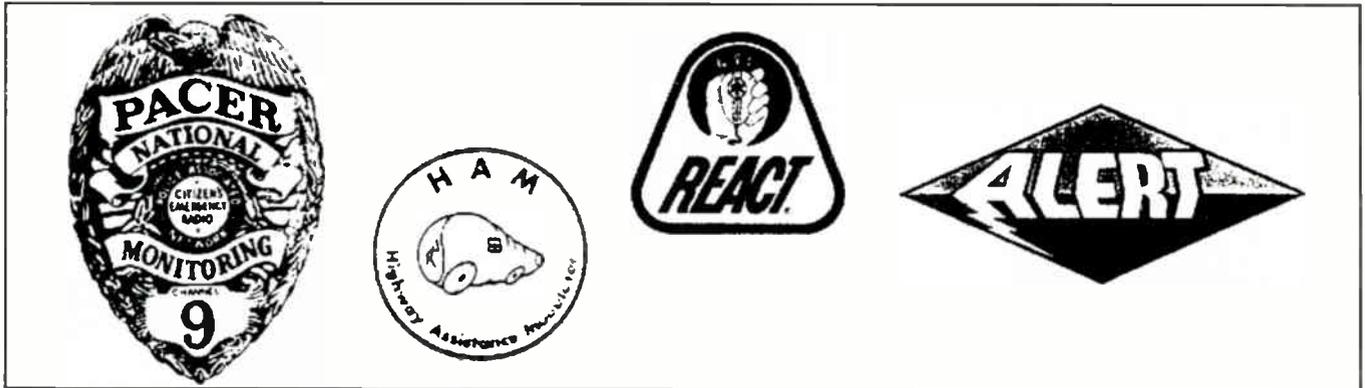
In 1964, the FCC finally commented on the Channel 9 idea. The agency expressed very little interest, stating that while they didn't object to Channel 9 being voluntarily regarded this way by operators, they certainly did not feel it would ever be possible to maintain or self-police Channel 9 for proper use. Basically they were saying, "It's not a bad idea, but you people are going to have to do it all by yourselves." Thanks, but we had already been doing just that for five years.

In early 1965, REACT endorsed and adopted Channel 9 as the group's official monitoring channel. This was a big help. In mid-1967, further significance was provided to Channel 9 when the Electronic Industries Association (EIA) decided to throw its support behind the idea. The FCC still was not buying, however. All CB was looking for was one measly line in Part 95 stating that if you had an emergency, or needed information or wanted to contact another station, try Channel 9 first because it had a lot of CBers with their ears on.

In January of 1965, the Automobile



CBers eventually got used to the Channel 9 idea, and joined in the effort to get it designated.



REACT was started in 1961, and a number of other national CB emergency groups followed. REACT seemed to be the only one with long-term staying power.

Manufacturers Association, Inc. formally outlined to the FCC how stranded motorists on superhighways could have a CB Channel 9 system to permit calls for assistance. They called their idea the Highway Emergency Locating Plan (HELP). This proposal included the idea that as CB continued to expand, 27.235, and 27.245 MHz should eventually be dedicated as protected clear channels for mobile emergency use. Those two frequencies are present-day channels 24 and 25, then not allocated to CB but illegally used by many CB DXers as unoffi-



In 1965, REACT adopted Channel 9 as its official emergency monitoring channel, advising affiliated local teams to give up any other channels they had been monitoring.

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cial "Channels" 22A and 22B. More than a year later, the FCC stated they had thought over HELP and decided it needed more study. HELP was never again heard from or about.

The FCC's HELP study had included the 1966 Detroit CB Driver Aid Network. That was a motorist assistance project on the Lodge Freeway sponsored by General Motors Research Laboratories, and operated by the City of Detroit, Department of Streets and Traffic. The FCC issued special license KUY3173 for the base station. Special GM-made mobile CB radios were provided to 20 city and 80 GM employees. The base was staffed weekdays from 6 a.m. to 8 p.m. Thank goodness, GM decided the experiment had been a spectacular success.

Soon after this, GM took over sponsor-



Independent monitoring teams had all shifted over to Channel 9 by 1965. This is The AID, Inc. van in Rhode Island.



HELP was a 1965 Channel 9 proposal submitted to the FCC by the Automobile Manufacturers Association, Inc. So far as anyone has ever heard, the FCC is still thinking it over!

ship of REACT. In early 1969, GM's REACT petitioned the FCC to make Channel 9 the national emergency channel. GM's prestige and clout was exactly what Channel 9 needed to get the message through Washington. In October, the FCC adopted a Notice of Proposed Rule Making looking towards this. On April 27, 1970, the official approval was

given in Docket 18705. The idea was that Channel 9 should be turned into a mandatory emergency channel.

The FCC made no mention that all of this had grown out of Roy Freeland's original 1959 NATCH-9 idea. They somehow also forgot to note the CB service's 10 years of voluntary CB monitoring of Channel 9, or repeatedly ignored grass-

roots efforts to get the channel specially FCC designated.

CBers had dared to hope for only voluntary status. Yet, GM had gotten it made mandatory! Maybe it was 10 years late, and came from somewhere in the agency's Twilight Zone, but finally a designated Channel 9 had become a reality. Go figure. Well, that's our Uncle Charlie. So typical of why you've got to find it in your heart to love the big fella. He means well, but sometimes he's slow on the uptake and needs some bullying to get off the dime.

Send Your Comments

Sure, you could write to this column. What would you like to know about the early days of CB radio? About a particular CB radio, maybe? Or are you an old timer who would like to share some memories, QSLs or photos of CB between 1959 and 1980. Send them in. In the meantime, we'll be on the side till next time. Seventy-threes, and over to you!

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This month: Snowbirds Head South

Joyce and Red Ervin of Lethbridge, Alberta, Canada could hardly wait to start their first snowbird run back in February, 1992. When they both retired from work on the same day, friends and family threw a surprise party for the popular couple that evening, and by eight o'clock the next morning, Joyce and Red were on the road heading for the United States. They enjoyed snow-birding in Arizona so much, they've been heading south on October 30th each year since.

The Ervins are a part of the over one million Canadian snowbirds flocking to the warmer climate of various U.S. states every year. Statistics of the Canadian government show the number of Canadians traveling into the U.S. by car, for a stay of one or more nights, doubled between 1984 and 1994. Figures also show Canadians spent nearly seven billion dollars while traveling in the U.S. in 1993.

Why Do They Do It?

Many of these travelers are snowbirds, who, like the Ervins, may invest over \$45,000 for a 35-foot fifth-wheel trailer, complete with slide-outs to increase living space, and another \$30,000 for a one-ton dually 460 Ford to tow their home-away-from-home. When you consider the additional expense from the difference resulting from the 30 percent exchange on the Canadian and American currency, you may begin wondering just what attracts all those travelers to winter in the U.S.

"It's the social life," said Joyce, as she and Red prepared for another stay at the Blue Water RV Park in Parker, Arizona. "People staying at Parker come from all over the Northwestern U.S. and Canada. When you first get to your parking spot, you've got half a dozen people standing around, some with a drink in their hand, to show you how to back in the trailer.

"Besides, there aren't any high-rollers where we stay. They're just ordinary people. We do crafts, play cards, and of course there's Happy Hour every day," Joyce says with a laugh.

"Everybody's on a holiday," Red says with a shrug. "And that's the way they act. They're all just having a good time."

While traveling, the Ervins keep their TRC 479 CB on channel 16. With a smile, Red says, "Except around Wells and Jackpot. Sometimes I switch to 19 and lis-



Photos by Brynly Roberts

Joyce Ervin of Lethbridge, Alberta, Canada at the controls prior to heading out for Parker, Arizona. Red and Joyce Ervin spend up to five months snowbirding in the U.S. every winter.



Here's the Ervin's winter home when in Arizona. They are part of the over one million snowbirds annually escaping Canadian winters by heading for U.S. southern states every winter.

ten to the girls doing their advertising. They don't get too specific, but don't leave any doubts about what they're doing either." But for Joyce, she says she gets a little tired hearing some of the stuff on the CB, and tries to concentrate on a book or the scenery.

Before retiring from work, Red was with the Canadian Pacific Railroad, beginning as a wiper in the roundhouse, he became a locomotive engineer, and finished his 40-year career training other engineers. Joyce worked for over 25 years in various capacities with the same company in the claims and customer service division, taking time off to raise their four children. Now the Ervins stay in Parker until mid-December, then make a quick trip back to Canada by sharing a vehicle with friends. After their traditional family gathering over the Christmas holidays, they return to Parker until the first of April.

Joyce fills her days and nights with visiting, playing cards, and bingo, while Red golfs nearly every day. "Coffee and cards start by six a.m. in the clubhouse," Joyce says. "There's always some social activity going on there."

The Ervins don't go in for boon-dogging—parking the RV in some remote area, which is a popular activity for many snowbirds. According to a local RV specialist, equipment for such outings (solar panels, electrical generators, and batteries) are selling well. "It seems some of them want all the bells and whistles, including CBs," he said with a chuckle. "But I don't mind. It means sales for me."

The Andersons from Edmonton, the capital of Alberta, are another pair of snowbirds preparing for the trip south. A retired city fireman with the city of Edmonton, Bill can hardly wait to get his 30-foot motor home on the road for their 15th trip. "We spend from January to April around the Phoenix or Palm Springs area. We don't often go back to the same place every year.

"We usually travel with two or three trailers or motor homes. They call me the "Wagon Master", since I know all the good places to pull over for a coffee or a rest.

We don't bunch up when traveling, so the CB is great to keep in touch, relaying messages if we have to. We use channel 17 to stay away from the traffic on 19. It's a great way to keep in touch, and let the others know what's coming up ahead." Bill says he uses President CBs, and went on to explain how the social contacts made while traveling and at the RV parks, are a major attraction of their yearly jaunts down south.

RCMP's in Mesa

An even more cohesive group, although they may not spend the whole



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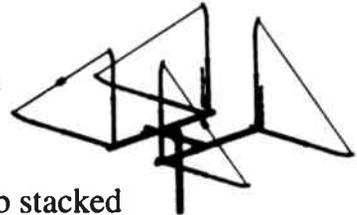
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Bill and Cecilia pause in Lethbridge on their trip south. The couple rely on their CB and cell phone for travel communications.

winter down south, are the Royal Canadian Mounted Police veterans, who attend an annual reunion in Mesa, Arizona. Each year the event attracts 55 regulars, and last year there was a total of 188 retired RCMP members from across Canada.

Be Prepared

If you're just popping down for a few days, or are part of the snowbirds spending the winter in the U.S., get proper medical insurance coverage while planning your trip. Medical coverage in Canada,

either through the various provincial governments, or through extended health care offered by company plans, are relatively inexpensive. For around \$1,500 per year, Canadians are offered coverage from cradle to grave, lulling many of them into a sense of security when they travel abroad. However, they may find they are not fully covered while visiting outside the country; an accident or illness may result in loss of retirement savings or their home.

All travelers should shop around for the best medical plan before leaving on their trip. Many snowbirds are able to save money on their medical expenses by slip-

ping across the border into Mexico for medicines, eye glasses and even dental work. As a group, they are experts at finding bargains while enjoying their winter-time nirvana.

This includes shopping at flea markets, such as the one Red Ervin called, Quartz site, in Arizona. "I don't think it's even on any maps," Red said. "But it's unbelievable the number of people parking their RVs around there. It's like a five mile-long main street with one traffic light. Over a million people stop by every winter."

"Snowbirds spend half their time in flea markets," Joyce says with a laugh. "You can always see them lining up at restaurants around 4:30 p.m. when the senior specials come on." According to Joyce, food prices in Arizona are reasonable by Canadian standards, and she mentions one couple who always go to a restaurant for every meal. "When I retired, my wife retired as well," he told Joyce proudly.

For many retirees who have spent their life working, the retirement years can be boring. The snowbird life offers a challenge and an opportunity to meet new friends, or the chance to just get away from the rest of the family for a change. Whatever their reasons, heading out for their favorite winter stomping grounds appears to be almost a religious experience as they talk trailers, trucks, mileage, and about favorite sights.

For the Ervins, they've managed to push aside the memory of their first trip when the trailer heater didn't work, and a vent cap blew off the trailer while they were still in snow country, and the gas gauge needle fell faster than the stock market in '29, and the CB wouldn't work. Now they're confirmed snowbirds, and naturally, they love their CB. ■



Custom combining crew from Manitoba stops over in Lethbridge, Alberta after working their way north from Texas. Following the harvest, from May 22 to November 2, owner Art Weibe relies on CBs to coordinate operations.

REACTer of the Month ■ ■ ■ ■ ■ ■ ■ ■

OUR SALUTE TO THOSE WHO VOLUNTEER

By Ron McCracken

How did Sue Baumann become a REACTer? She heard some REACT people on her CB. They were with North Brevard REACT, based in Titusville, Florida near Kennedy Space Center. They struck up a conversation and Sue soon decided she wanted to be part of their organization. She later interested her late husband in joining REACT too. That was 1976.

Twenty years later, Sue Baumann still finds REACT an excellent fit for her physical disability. "I can serve my community right here in the convenience of my own home as a REACT monitor," Sue explained. "That's the wonderful part about REACT service. I can do much of it right here where I have everything arranged to be handy when I need it."

Not that her disability slows Sue down very much; she has some mobility, as well as a trusty wheelchair, so she helps at every Team event. Her husband, Ray, ensures that she is where the action is. Is he a REACTer too? You bet!

Actually, Sue can thank REACT for introducing her to Ray. They met at a March of Dimes walk-a-thon where REACT was providing safety communications for the event. Ray was also involved in helping out. A mutual friend introduced the two, and the rest is a happy ending.

Every Office Held?

In her two decades with North Brevard REACT, Sue has held about every post the Team has. She is on her second time around as Team president. She served the Team in that post 10 years ago and now they've asked her to lead them again.

Along the way Sue also served as secretary for 10 years, as treasurer and as monitor controller. Did we forget Safety Break chair? Her Team is a strong supporter of the Florida Council of REACT Teams too, and she served as Council secretary for a brief period.

It's Never Dull

Like most REACT Teams, North Brevard "REACTS" to a variety of emergencies. It is fortunate that the director of the Emergency Management Office is a member of a neighboring REACT Team and knows firsthand the capabilities of REACT Teams in the area.

Sue recalls the Team being called out late at night to support authorities in the search for a victim of a parachuting tragedy. In the mid-summer Florida heat, searchers could only work in the marshy area for 15 minutes at a time. REACT members provided them with a steady supply of cool drinks and snacks during the 24-hour effort that finally located the body.

Last year, a chemical spill closed major roads and forced evacuation of a nearby subdivision. Sue and other REACT members assisted authorities in securing the area overnight until the threat was removed the following day.

Some Storms!

Severe weather can keep Sue and her Teammates hopping. During Hurricane Andrew she acted as net control while her Team, Space Coast REACT and Brevard CARES REACT combined forces to deliver food to Red Cross shelters filled with evacuees from the Miami area.

Last year Hurricane Erin threatened to pay Sue's area a visit. Again she rose to the challenge and filled the role of net control



Sue Baumann, North Brevard (Florida) REACT overcomes her disability to help her community from the comfort of her home. (Photo by Ron McCracken)

for REACTers and hams located at three shelters. "Erin changed her mind, but she gave REACT a chance to demonstrate to authorities that the Team was ready, willing and able to assist," Sue commented with a note of pride.

Humorous situations brighten REACTers' days and offset the heavy-duty stuff they sometimes have to handle. Sue tells of the accident report she took on Emergency Channel 9 not too long ago. The accident on I-95 involved two identical red mini-vans. When she got it straight, she had to convince state troopers that it was for real.

Fortunately it was a minor accident, but it kept Sue busy for a while making calls to employers and families to explain lateness and calm fears. "One of the men called me back later to thank me," Sue noted. "Every once in a while that happens, and it reminds you of just why you are a REACT monitor."

Several others with disabilities serve on North Brevard REACT, thanks to Sue Baumann's leadership and encouragement. Watch them in action at a Team meeting or at an event, however and your definition of "disabled" will quickly change.

Sue Baumann's enthusiasm is infectious. It has benefited REACT. It has benefited her community. We salute her! ■



For More Information about forming a REACT Team, you can connect with REACT several ways:
Telephone 316-263-2100
Fax 316-263-2118
Internet "react@wichita.fn.net"
Mail: REACT International, Inc., Box 998, Wichita, KS 67201

REACTing With Radio



NEWS AND INFORMATION ABOUT PUBLIC SERVICE VOLUNTEERS

By Ron McCracken

This month: Lives Depend on YOU!

Your interest in this column indicates you value CB and emergency Channel 9 for the role they can play in travel safety.

Perhaps personal experience where emergency Channel 9 made a difference is your reason. A good number of REACT members are members because channel 9 helped them in a time of need. They wanted to repay the favor REACTers did them and "be there" for someone else.

Maybe you haven't needed a REACT monitor yourself, but these reports make you feel better knowing monitors are out there. Good, but it takes more than monitors to make channel 9 work effectively.

You Matter

You, the caller on emergency Channel 9 are by far the most important person in any emergency. REACT or police monitors must rely entirely on your skill in using your CB radio.

Consider for a moment that at least half of the calls REACTers or police monitor, fail. At least half! One west coast Team recorded a staggering 95 percent failure rate!

Now consider that every one of the calls that failed was heard. It had to be in order to be recorded. You are wondering how all those calls could be heard and still fail, right?

The reason is starkly simple. The callers could not hear the monitor/s answering and pleading for critical details they needed to have. Without the details, monitors could only listen in vain.

Learn by their mistake. Train yourself to use your CB with lifesaving skill in an emergency. It's so easy.

Get It Right

Air all the information you have about the emergency. Do it over and over. Take a moment to list the items. Air them in the same order each time. This helps monitors. They may be having great difficulty hearing you. They need the details in the same order, over and over, in order to piece together the message. Include the road, mile marker, nearby town and state. State is important since roads cross state lines.

It works. Most REACTers can recount a rescue they helped with from a great distance. They could do it only because



Entire Mexican towns will be safer when their fire departments, etc. receive these donated radios. Crest REACT and other Southern California REACT Teams launched the drive to gather radios for neighboring Mexican communities' emergency services.

a caller knew how to use a CB correctly in an emergency.

Your CB emergency call is almost certain to be heard by someone, some-

where. Whether it brings help will depend on how skillfully you use that wonderful radio. Teach yourself now. REACTers and police want to help. That's why they



FCC Field and Regional office closings prompted much discussion and concern at this recent Florida Council of REACT Teams conference. Every responsible radio operator should be concerned. Contact your congressional representative or senator to object to the cutbacks!

monitor. But, they often must rely entirely on your skill. Don't disappoint them. It could cost lives.

Safety Info Too

Whether it's at Team Safety Breaks or in malls, Empire Central REACT, NY strives to inform CBers about correct CB emergency use so every call will succeed. The Team has hosted Safety Breaks for 15 years, thanks to businesses that donate all the needed supplies. At the last one they brewed over 1,300 cups of coffee and went through 65 dozen donuts. The Team also welcomed the Upstate NY REACT Council for its Fall meeting. Council meetings give Teams opportunities to Share ideas and plan together for the benefit of all.

Deserved Honors

Three REACT Augusta, GA Team members were awarded their 23-year pins recently. Two others received 17-year pins. They represent over 100 years of REACT monitoring for the safety of their area. Several more Team members earned awards for one to 11 years of service. REACT does grow on you, for sure.

REACT Augusta formed in 1969. In addition to communications, the Team boasts an underwater rescue unit that has carried out searches for the sheriff's department. Special units like this make a Team all the more valuable to authorities.

Fund-Raising Help

REACT Prince William, VA was recently approved to participate in the DC area Combined Federal Campaign of the United Way. With so many federal employees living and working nearby, the Team expects to benefit from the designation in its fund-raising efforts.

Virginia REACT Teams enjoy a close working relationship with Commonwealth of Virginia officials state-wide and with FEMA authorities. They willingly share the keys to their success with other REACT Councils seeking closer links with their states. Such sharing among Teams and Councils strengthens all.

Border Incident

Mexican fire departments, ambulance services, Red Cross branches and others were the welcome beneficiaries of a happy border incident recently. Crest REACT, CA and Southwestern REACT, CA mounted a drive to gather radio gear for Mexican communities.

Riverside, Orange County and South-

gate REACT Teams responded to the challenge, as did a local amateur club. The result was donations of over 50 radios of various types. They will be put to life-saving use by Mexican emergency services in small towns. REACT saves lives in a variety of ways.

Wrong Turn?

It makes you wonder. REACT McLennan County, TX reports that among the 2,300 visitors to its last Safety Break on I-35 were: 4 Brits, 2 Irish, 1 Italian and a Venezuelan!

Obviously, the Team keeps a guest book. Smart idea that garners some nice compliments too. The Safety Break is a real community effort with supplies donated by area businesses. Help to serve visitors came from REACT Bell County and students at two area high schools. Terrific work, everyone!

Learning How

Training is a vital component of many REACT Teams' meetings, and an important one, too because it prepares Team leaders of the future. Some of those will later serve REACT at the Council and International levels.

REACT Houston, TX recently got some tips on effective fund-raising from speaker Peggy Matthews, a Houston fund-raiser with 40 years experience. Choosing your project carefully, starting early and using saturation publicity were among the ideas she shared.

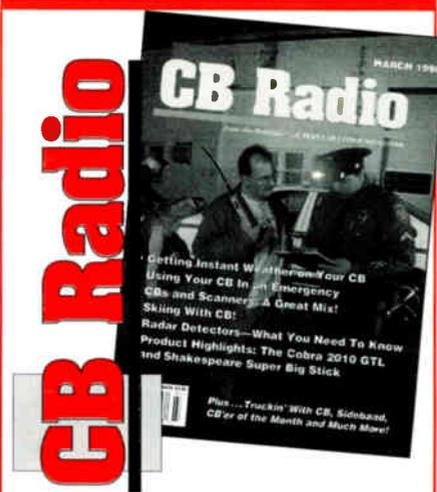
Interesting, informative speakers are available in every community. Not only do Teams learn, but they have an opportunity to acquaint speakers with the Team's roles in serving the community. Now they have a new ally as the speaker goes to address other groups. It's a form of networking, and every Team can benefit from all its advantages. Invite someone soon!

Goodbye Uncle Charlie?

FCC offices across the U.S. seem doomed to extinction. Regional offices will be cut from six to three, with Boston, Atlanta and Seattle to go. Only Chicago, Kansas City, MO and San Francisco will remain to deal with compliance matters.

Then there are FCC Field Offices to be scuttled too. Among them are Buffalo, Houston, Miami, Norfolk, St. Paul, Vero Beach, FL; Portland, OR; San Juan and Anchorage, AK.

More good news for those who really value the FCC's work. The FCC will no longer investigate CB violations of any type. Wonderful!



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REACT Safety Breaks at hundreds of spots along highways will refresh tired travelers next month. The Canadian Victoria Day (May 24) and U.S. Memorial Day (May 31) holiday weekends begin another summer of road travel. REACT Fayette County, West Virginia is all rested up and ready to greet their Safety Break visitors.

REACT Florida, at its recent Council meeting, appointed a committee to pursue the closure plans with congressional representatives and U.S. Senators from Florida. Hopefully other REACT Teams and Councils are doing exactly the same.

Can you just imagine in your wildest nightmares the anarchy that is likely to descend upon the radio community if these closures materialize? Scary, isn't it? Thanks to those fighting the insanity.

A Happier Note

More and more REACTers are taking advantage of opportunities to qualify as amateur operators, adding to their value to their Teams and communities. There is now a thriving amateur club at the International level, chaired by Steve Gobat, KA3PDQ.

REACT Oakland County, MI reports that the Team now has three amateurs among its ranks, at least one with his Technician Class license. This capability just makes the Team that much more useful in emergencies. It has volunteers qualified to operate in one more band as the need arises. Great foresight!

Be Prepared

LEMA/REACT, PA helps Boy Scouts do exactly that. It sponsors Emergency Service Explorer Post 99 in Allentown.

Recently, the Post received the highest

honor in the Boy Scouts of America Explorer Post program; The William H. Spurgeon Award. The Post also captured three of five other awards in competition with neighboring Posts.

The Scouts assist LEMA/REACT to develop their skills in emergency services. It's another of those win-win situations where all concerned merit congratulations.

Exam Time Jitters?

Few of us relish exams. We do enjoy the satisfaction of scoring well, however.

REACT International has launched a series of training modules to help members develop particular skills. They are

designed for independent study, but some Teams work through them at Team meetings. HQ has issued four modules so far.

Eventually exam time comes. It's when you decide you are ready. Papers are submitted to HQ for scoring by computer. Successful candidates receive certificates suitable for framing and display.

Teams with recent graduates are: REACT Tobacco Valley, CT; REACT Kauai, HI; REACT Hagerstown, MD; REACT Somerset County, NJ; REACT Long Island, NY; REACT Southern Tier, NY; REACT Hagerstown, PA; Life REACT, GA; Richmond Metro REACT, VA; REACT Lake Washington, WA; and REACT Services Diversified, WI. Matthew Medlen, Sr., a REACT Affiliate in Illinois completes the list.

Clearly, REACTers want to be the best they can in various areas of their work. These and others have taken their time to improve their abilities in CB Monitoring, Search and Rescue, GMRS Operation and Team Money Matters. Their Teams will be the winners for their dedication.

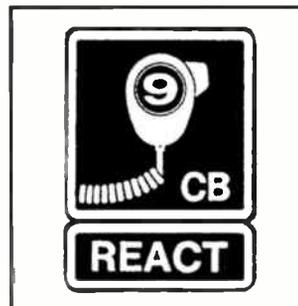
Heading Their Way?

If you'll be traveling U.S. 19, the shortcut between I-77 and I-79 in West Virginia on Memorial Day weekend, watch for REACT Fayette County's Safety Break near Oak Hill.

Their latest Safety Break attracted folks from 16 states, Canada and the U.K. Again, donations from local business supporters made it all possible. What community spirit!

The 20-member Team, between Safety Breaks, provides communications for parades, cancer walk-a-thons, Red Cross Bloodmobile drives and other community events.

There will be hundreds of similar Safety Breaks across the nation and in Canada over the May holiday weekends. Watch for them and enjoy a little REACT hospitality as you journey. ■



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Sounding Like a Pro Right From the Start . . .

Oh, the excitement. The crackle of cellophane. The squeak of Styrofoam. And the pleasing aroma of new electronics, fresh out of the box. At last, you have acquired that new sideband CB. Gosh, it's pretty. Just look at the way it glistens as the light catches the trim and controls. It even feels good to the touch. Congratulations! On behalf of the SSB community, may I say welcome aboard, glad to have you with us.

In a few minutes you'll have it up and running. Understandably you are anxious to find someone to talk to and make your first (of many!) new SSB contacts, if only to be sure that the radio really works. Before you do, though, there are a few things you should know.

Rules of the Road

Packed among the owner's manual, warranty card and miscellaneous material accompanying your new radio are the official rules of the Federal Communications Commission (FCC) for operating your CB. You did find them, right? Read and keep them. You'd be amazed how many CB operators, even SSB operators, haven't read them. That is not as surprising as it may at first sound. Fact is, no matter how good or bad an operator you are, your chances of seeing or hearing from an official of the FCC are very slim. If current trends at the Commission continue, their enforcement activities of the 27 MHz CB band, as well as others, will continue to decline. Soon it might take an act of Congress, or at least a letter from a congressional representative to get the Commission to move against a rogue radio operator. This does not, however, mean that you are free to do as you please, without regard to your fellow operators and neighbors. Quite the contrary.

The CB community has long been left to its own devices. As a result, we have learned to police ourselves, if for no other reason than to prevent a permanent state of chaos from dominating the band. Nowhere is the desire for good radio practice and the ability to maintain some semblance of order more pronounced than among sidebanders. Sidebanders have developed a code of operating practices and procedures that go above, beyond and occasionally contrary to the "Official" rules of the FCC. We call this code the "Gentleman's Agreement." The



A view of I-87, the Northway and the Thaddeus Kosciuszko Bridge over the Mohawk River/New York State Barge Canal between Colonie and Halfmoon. Locals and truckers call it the Twin Bridges or Dolly Parton. It's used by many CB operators, including SSBers on the daily commute to and from Albany.



Here's a Realistic SSB rig, the TRC-459 microprocessor controlled base station. It's capable of "scanning" channels, something more radios should be capable of doing. This radio is used every day, including during the morning and afternoon commute across the "Dolly Parton" by a couple of SSBers that I'll be writing about in the near future.

procedures and practices that this "Agreement" detail allow the most people to get the most from their radios most of the time. They are built on one simple and basic truth: good radio is a matter of mutual respect and cooperation. And GOOD radio is what sideband is all about.

The most popular method of enforcing this agreement is the "snub." It is very effective. Sidebanders have found that, given enough time, even the most blithering of idiots will eventually get tired of talking to themselves, and disappear. So, folks operating contrary to the agreement are frequently ignored. Unfortunately, new SSB operators often unknowingly violate these "rules" and get ostracized right along with the bad guys. So before you hit the air, take a few minutes to become familiar with what is expected of you. It is well worth the time you have to invest. Mastery of these techniques and practices will ensure your smooth entry to the world of SSB. They will also serve you well whenever you radio—be it SSB, AM, amateur or wherever. So, here are a few tips to help you sound like a pro right from the start.

Ladies and Gentlemen

Good radio technique is the primary responsibility of every radio operator. We have no control over radio conditions, little over other radio operators, occasionally some over our equipment, but must continually exercise control over ourselves. Only when we individually, consistently practice the utmost in operating technique, are we collectively able to enjoy all the best that radio has to offer. Good radio has its roots within us. It's basis is our attitude—the manner with which we approach our daily radio activity. In short, on radio as in life, there is no substitute for, and few things appreciated as much as manners. Mind yours.

Technical Requirements

Nix the noise. Now that we have a grip on ourselves, it's time to grab hold of the radio. Before turning it on, make sure that all echoes, beepers, sound effects and power boosters are OFF. If you are using an amplified mic, turn it DOWN. While "noise makers" may be popular among bed wetters and degenerates, they won't make you many friends on SSB. Sure, we like to think that everybody is welcome to join the SSB community, however, over-powered loud mouth blowhards and bullies need not apply.

Squelch vs. Gain

Once the radio is on, the first thing to do is turn the squelch off, all the way to

the left. Squelch does *not* work well on SSB. It should not be used, especially when you are actively involved in an on-air conversation. Instead of squelch, SSB operators use a combination of volume and RF (receiver) gain to reduce background noise and increase listening comfort. Start with the gain all the way up, to the right, so you can hear it all. As you become an experienced SSB listener, you will probably find a setting somewhere between a little above, to a little below half is sufficient for most occasions. Ideally, strive to find a combination of gain and volume that reduce background noise (hiss) to a minimum, yet allows you to dependably hear the weakest signals.

Choice of Channels

As you will soon discover, if you haven't already, SSB and AM operations do not mix well when used simultaneously on the same channel. SSB signals tend to overpower and disrupt AM traffic. Further, SSB signals are generally unintelligible growls and grumbles when heard by AM listeners. AM signals, on the other hand, are usually quite understandable when listened to in the SSB mode. Their accompanying carrier, however, adds a whistling sound to their signal. Surprisingly, FCC regulations allow SSB and AM operations on ALL channels. Nevertheless, sidebanders, out of consideration for their AM bandmates, have voluntarily agreed to restrict their operations to channels 16 and 36 through 40. Channel 36 is generally regarded as the Call Channel. It's the best place to find or meet someone and then move to another channel to chat. In some areas, channels 30 through 35 are also used for SSB. But, you should not use SSB there until you have firmly established, not just on the word of a few renegade agitators, that it is permitted by local custom. Conversely, of course, you should not operate in the AM mode on any of the sideband channels.

Choosing Sides

One of the two controls that are unique to SSB radios is the "mode selector". It has three settings: AM, USB and LSB. For standard CB operation you would choose the AM (amplitude modulation) setting. For sideband, select either USB (upper sideband) or LSB (lower sideband). Start on the lower side. The sidebands of each channel are close together, frequency wise. Neighboring stations operating on different sides of the same channels can interfere with each other. Therefore, it is common practice for operators in any particular area to use only one

side or the other of any particular channel. There was a time, in the not too distant past, when CB, SSB included, was so overcrowded, that in heavily-populated areas it was necessary to use *both* upper and lower sidebands. Those days, at least for the time being, in most areas, are gone. Lower side, which is said to be less susceptible to AM interference, is the most widely accepted mode to use. There are exceptions, but again be very careful before operating upper sideband, particularly on channels 36 through 40, especially on the Call Channel, 36.

Center Slot—12 O'clock

The other control that is unique to SSB radios is the "clarifier." Sometimes called the "voice lock", it's used to fine tune signals and makes them more understandable. Of all the controls on your SSB radio, this is the hardest to use. Using it will take a little practice. Start by setting it to the center position, about 12 O'clock, straight up. When you hear a signal, tune it slightly to the right or left until it sounds best. Most of the time you will find the ideal setting somewhere between 11 O'clock (just left of center) to 1 O'clock (just right of center).

Listen

It's always a good idea to listen to a channel a while before keying up and starting to talk. Just because it is quiet doesn't necessarily mean that there isn't anybody there. It could be that there are several stations listening for a scheduled contact or net to come on the air. At other times there could be folks at home listening for a loved one who is in a mobile. On occasion there might even be a public service communication project in progress that just happens to have a lull in the action. Listening can also help you locate and identify the better operators on the band. These are the folks who are most likely to make you feel welcome. They are also the ones who are best suited to guide and support you as you explore sideband. Scan through the SSB channels and find a channel that is active. Look for one where the signals are clear and strong. Find operators who call each other by name, that leave little spaces or pauses between transmissions and use a minimum of slang or codes.

Plain English

Perhaps the most remarkable, and certainly most enjoyable characteristic of SSB operation is the use of plain English. This makes communicating on sideband very much like talking on the telephone.

Cutesy slang and technical jargon are actively discouraged. The "10Codes" are rarely, if ever, used. And while some SSB operators try, often incorrectly, to use amateur radio's "Q Codes", their use is in sharp decline. Today, the use of "Q Codes" is usually a dead giveaway that you are listening to a hotshot AMer in disguise. It's someone who is trying to fool others into thinking that they are an "Old Pro" at SSBing. Don't let them fool you.

Operating Terms

Some "Q Codes" and a few technical terms, however, seem to be here to stay, mainly because they work so well. Their skillful use can enhance everyone's communications. Here are a few you should be familiar with:

- **CQ**—the literal translation means calling any station.
- **Listening**—means just that. You are listening for any station to call you.
- **Comment**—tells people you are listening to, and that you have something to add to their conversation.
- **Question**—tells them you have one.
- **Break**—when you want the use of the channel.
- **Short break**—if you just want to call your party and move to another channel without disrupting the on-going conversation.
- **Acknowledged**—lets you know your request has been heard and will soon be granted.

Technique—The Pause That Refreshes

The hallmark of SSB operation is the pause between transmissions. It's the length of silence from the time one participant lets go of their mic key and the next presses theirs. This is called "pausing on the key" and this is where you are expected to "break", "comment", inject "listening" and so on; instead of talking or keying over someone's conversation. By listening to the length, or lack, of this pause, you can tell a lot about the operators. No pause, or at best very short pauses, can indicate an urgent conversation, perhaps an emergency communication. In this case your participation, unless very relevant to the situation at hand, is probably inappropriate and unwelcome. Stay out of it. More than likely, however, the lack of a pause indicates that you are listening to new or careless operators. Whichever they are, they should be avoided. Chances are they are not interested in hearing from you. Further, and what is more important, to

get their attention, you will have to key over at least one of them. Doing that is *definitely* not good form. Don't do it. Short pauses of one to three seconds are used by experienced operators involved in active conversation. "Break" and "CQ" may be inappropriate here because the channel is already in use. "Short break", "Listening", "Comment" and "Question" are perfectly acceptable. Longer pauses, three to five seconds, say that you are on an active channel that is waiting for you to join in. Even longer pauses, five seconds or longer, usually mean "somebody say something . . . PLEASE!"

ID

One final tidbit of information you'll need to get on the air and sounding like a real sidebender is something to call yourself; an ID. In keeping with the Plain English motif of SSB operation, the use of "handles" or nicknames is discouraged. Instead, SSB operators identify themselves with their first names. Call signs or "numbers" are also popular. If you don't already have a call sign you can just make

one up; at least at first. Two, three or four digit numbers seem most common. Augment them with your state or city; something like New Jersey 101 or Chicago 29. This, of course, can lead to a problem of duplicate call signs. Eventually, you should find a local sideband club and let them assign you a call sign that is yours alone.

Enough Already!

Gee, look at the time. I've kept you away from that radio long enough. Why don't we quit here? Go ahead. Enjoy that new rig and the exciting world of SSB. If you have understood most of what we have been over, I know we will enjoy your company, too. Take notes on any problem you run into or questions that come up. Send them to me at the magazine or via the internet (edbarnat@global1.net) and I'll try to help you solve or answer them. And, if you can, get a couple of snapshots of you with that new radio and send it along. I know I'd sure like to see them and I'll bet some of the other folks would also.

73's, Ed

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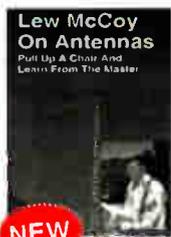
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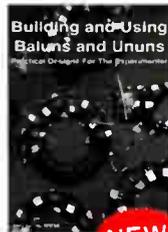
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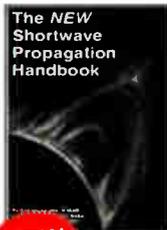
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This Month: Mobile Noise Elimination—3 to 500 MHz

How is your mobile CB and scanner reception? Can you only receive distant signals when the engine is turned off? And what about your transmit quality? Do fellow radio operators complain that they can hear your alternator every time you key down?

It's relatively easy to cure transmit alternator noise. Receive noise elimination is a 50/50 proposition; 50 percent of the noise is simple to reduce, yet the other 50 percent of the noise can be a real challenge to identify and destroy. Let's take a look and see how we seek and destroy mobile noise.

Noise—What Is It?

Noise on both receive as well as transmit may be an amplitude modulation (AM) undesired phantom signal that rides in with recovered communication signals out of your loudspeaker, or may sometimes ride in and onto your transmitted modulation output. Most good-quality CB and scanner radio receivers offer sensitivity of 1 microvolt or better. A strong amount of undesired noise would actually equal incoming desired communication signals. When equal amounts of noise and desired signals mix, it's up to you to try and figure out what the other operator is saying among the noise. When noise is actually stronger than the incoming signal, you might not hear any information coming from your speaker system at all.

White Noise

White noise is generated within your CB radio or scanner receiver mixer circuit and is the common hissing sound you can hear when the squelch is turned off, the volume is turned up and the antenna is removed. The more expensive the CB transceiver you purchase, the more stages of "white noise" filtering, to the point it is almost inaudible when there is no antenna connected. Don't be concerned about white noise.

Atmospheric Noise

Atmospheric noise is generated by the earth's environments; distant lightning, ionospheric disturbances and the crackling of random electron discharges on a windy, dry afternoon. Atmospheric noise



Noise filters are placed next to the interference source in order to stop the racket.

Photos by Gordon West

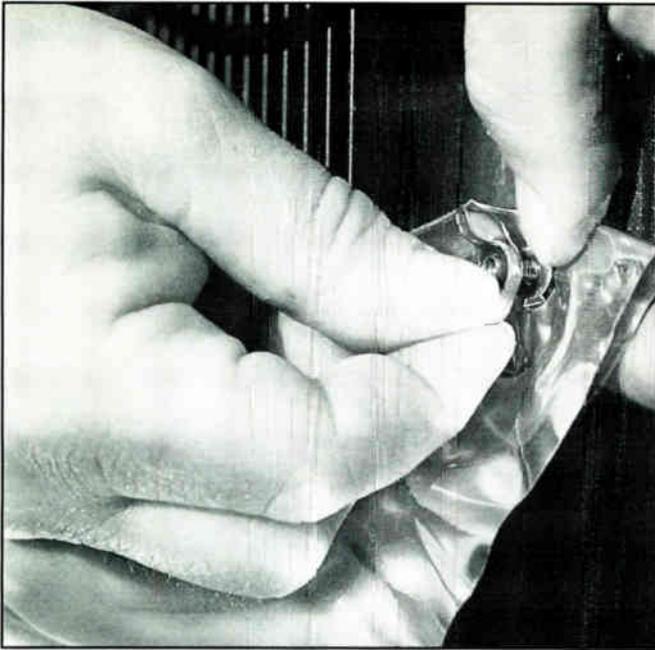
is greatest on the lower shortwave bands, but can still be easily heard up on 11 meters on a CB transceiver. Scanners at very high frequencies and ultra high frequencies are normally immune to atmospheric noise.

Atmospheric noise may help you judge the performance of your receiver and

antenna system by registering signal strength of one or two when you plug in the outside antenna on your CB transceiver where no one is talking on a specific channel where you're listening. Static bursts associated with nearby thunderstorms are most likely the sounds of lightning. Lightning reception at great

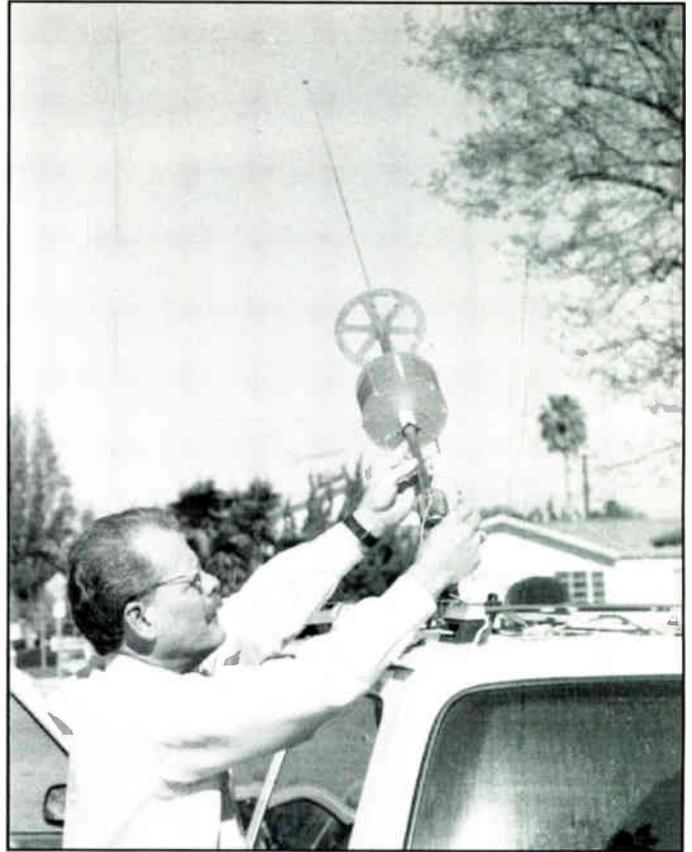


A CB radio (next to the steering wheel) on a boat also needs noise elimination procedures.



Copper foil bonding metal hoods and trunks will help isolate CB noise.

This CB antenna was repositioned away from the engine compartment for lower noise results.



distances is another good test for a properly operating CB radio system, either base or mobile.

Signal Interference

This is NOT considered noise. When you tune into a CB channel and hear the roar of thousands and thousands of heterodyne signal tones, this is normal channel occupancy. If your set is not pulling in these tones, groundwave and skywave, your receiver is probably dead! It's also possible your antenna isn't connected. This type of reception is absolutely normal.

Car Noise

Here is your greatest source of noise interference to incoming signals. If the car noise is strong enough, it could also affect your transmit capabilities, too. There are many types of amplitude-modulated noise spikes that can enter your CB radio or receiver. These spikes of noise are also rich in noise harmonics because of their almost instantaneous rise and fall times. Anything under your hood that creates an electrical spark yields thousands of noise impulses that can create common "static" from 1 through 500 MHz and higher.

This automobile-generated static can drive the S-meter well beyond 20 over S9 in particularly bad cases. Any signal less than 20 dB over S9 is simply covered up by your automobile's generated static.

The worst noise comes from your high voltage ignition system. The noise pulses increase in pulse repetition rate as you increase your engine speed, driving your spark plug noise floor well above S9 in some cases. Spark plug noise and noise associated with your distributor account for 75 percent of receive noise problems from a CB radio in a vehicle. Switching to resistor spark plugs and resistor ignition cables will help suppress the instantaneous rise and fall of the noise impulse, dramatically reducing the popping sound found on your CB radio. Also double check to ensure that all plug wires are tight, and that your vehicle's hood has a ground strap to ensure it acts as a "Faraday Shield" to the internal spark plug clatter. Most of the noise from your engine ignition system comes directly out of the engine compartment and to your antenna. The better your antenna, the higher your noise floor!

Check with your vehicle's service center to see whether or not they have any service bulletins on how to minimize the impulse noise coming out of your engine compartment. Coil filters work well.

If the noise you hear on receive sounds like a musical tone that increases in pitch (the tone gets higher) when you step on the gas, this is classic alternator noise. This one is relatively easy to cure. Alternator noise is also the culprit if people tell you your transmit audio sounds like it has a whistle in it, and that the whistle changes as you speed up and slow down in heavy traffic.

Get a Filter, or Two or Three!

Alternator noise filters are commercially available. They're usually found at RV or marine electronic stores. These filters go right on the alternator output and bypass the AC pulse-width-modulated signal to ground. Sometimes a series coil within this filter will help increase the reactance of the filter network, adding further reduction of the AC signal going to the battery. Make sure you choose only a commercially-built filter on the alternator because an improper series reactance could cause your alternator to actually "run away" without regulation.

In-line series filters containing both inductance and capacitance are also available to install right at the power input connection to your CB radio. This filter must also be well grounded in order to fil-



This CB antenna is mounted too close to the engine. It will almost certainly pick up noise.

ter the AC out of the DC line. My favorite 20-amp series filter comes from convenient Radio Shack, product #270-055. It does triple duty on my CB and HF transceiver, my scanner as well as my AM/FM stereo system.

If alternator whine is still screaming out of your CB, stereo, and scanner systems, and you have noticed that your battery is tough to keep charged, chances are you have blown a diode or two in your alternator. You'll need to get it repaired or replaced as soon as possible.

All Those Tiny Motors

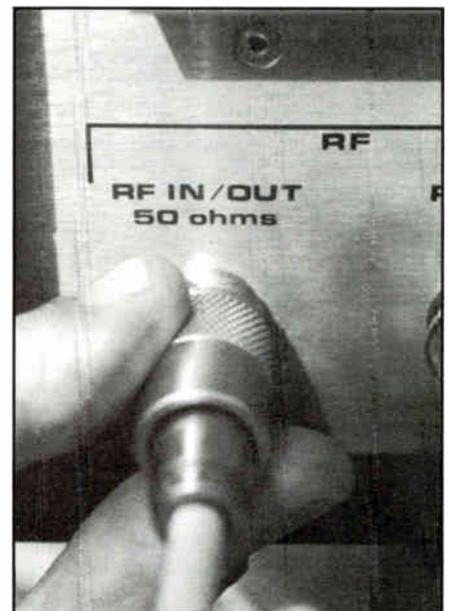
Another form of noise comes from all of those tiny motors inside your vehicle that drive windshield wipers, the fuel pump, air conditioning, fluid levels, and Lord knows what else. The noise over your receiver has no specific pitch; it's just broad banded "hash" noise that increases by several S-units as soon as you fire up your vehicle.

Electronic fuel pumps and other obvious motors can sometimes be cleaned up

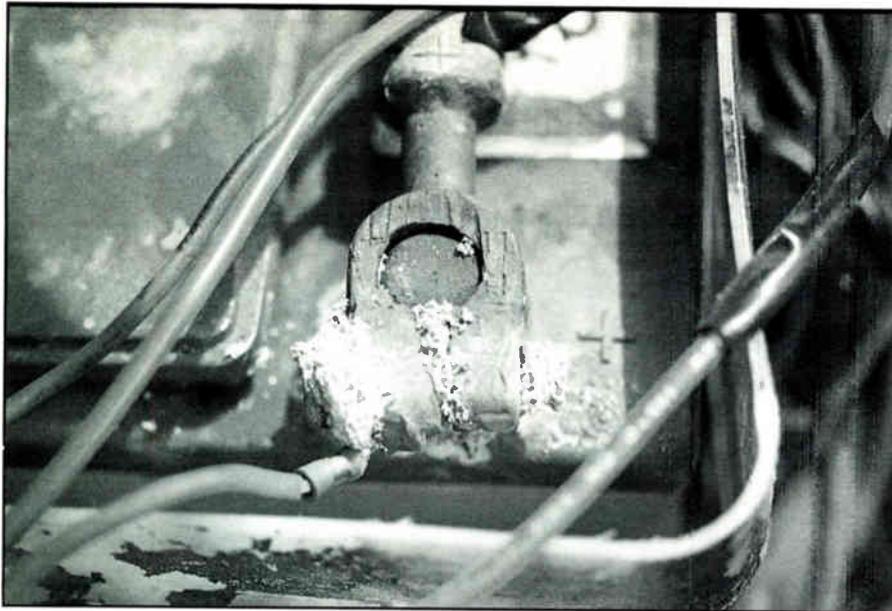
with feed-through filter capacitors. These are usually .05 microfarad at 40 amps, and only run about \$7 each at Radio Shack or marine electronic stores. Sometimes that automobile service center will have a factory bulletin on how to knock down pump noise from specific vehicles. You will need to contact your auto service manager and stay persistent to the point of beginning to look through the service bulletins for a cure. Many times the service department will attempt to brush you off saying that there is no factory modification, but if you hang tough, you can usually find the bulletin that tells all!

Phantom Signals

If you hear a "phantom signal" on only a couple of CB channels that comes and goes when you turn your key on and off, and that noise also appears on many VHF and UHF scanner channels, this is instrument cluster microprocessor harmonics. They are most noticeable on a sensitive CB SSB transceiver. Use a little portable



Reduce receiver noise by tightening all antenna connections on your CB or scanner.



Loose or dirty battery contacts can make noise even worse.

FM receiver to locate where the noise is coming from. Once you have identified the computer within the dashboard or near the fire wall of your vehicle emitting this noise, contact your vehicle dealer and seek a cure.

Other Noise

An irregular noise that only occurs when you are at driving speeds could be from wheel static. Apply the brakes and see whether or not the noise disappears. If it does, chances are it's from the front wheels where someone forgot to re-install the static eliminators. Find a tire specialist that will pull your wheels and re-install the little spring assemblies.

Noise in vehicles can be dramatically reduced by killing the noise at its source with capacitors, inductors and a combination of both. Wiring your CB transceiver directly to your battery also dramatically lowers noise coming in from the DC power feed. While going to your battery with the red and black wires is a nuisance, it will assure a much quieter operating set on both receive and transmit. Be sure to fuse both the red and black leads right at the battery posts for safety.

The Antenna Location

Mounting your CB antenna as far away as possible from your engine compartment will also help reduce direct noise. Making sure your vehicle frame is well bonded with flexible braid will also help capture and reduce ignition noise. Going

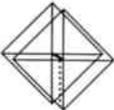
to a larger CB antenna may also help pull in more signal strength than the surrounding noise floor. But keep in mind that a small CB antenna may sound like it's reducing the amount of noise, where it's actually reducing everything to a point that you hear almost nothing!

Finally, the noise limiter and noise blanker circuits on higher-priced CB transceivers are your last choice for cutting the clatter. You don't really reduce the noise within your vehicle, but rather mask your receiver to certain types of vehicle-generated noise. The noise limiter simply reduces the amplitude of all static peaks. The noise blanker is more effective on constant repetitious noise like spark plug clatter by fractionally timing an almost instant lockout of the receiver at the same time of the incoming noise pulse. While this indeed works on certain types of recurring noise pulses, it could lead to a noticeably distorted incoming signal that is literally torn up by the blanker action. If your CB noise blanker is variable, run it only as high as midway. If the noise still comes in, better get under the hood and take a look to see what you can do to quiet things down.

Your CB radio range is only as good as an extremely low noise level. So find out how much noise YOU have in your mobile system. Wait until skywave conditions drop off at dusk, and then see what your S-meter reads with no one using the channel locally. Now turn off the engine. If your S-meter is staying about the same or maybe only rising one S-unit, then you have done a good job in cutting out nuisance mobile noise. ■

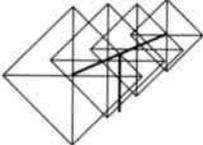
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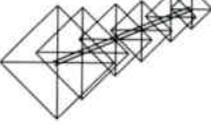
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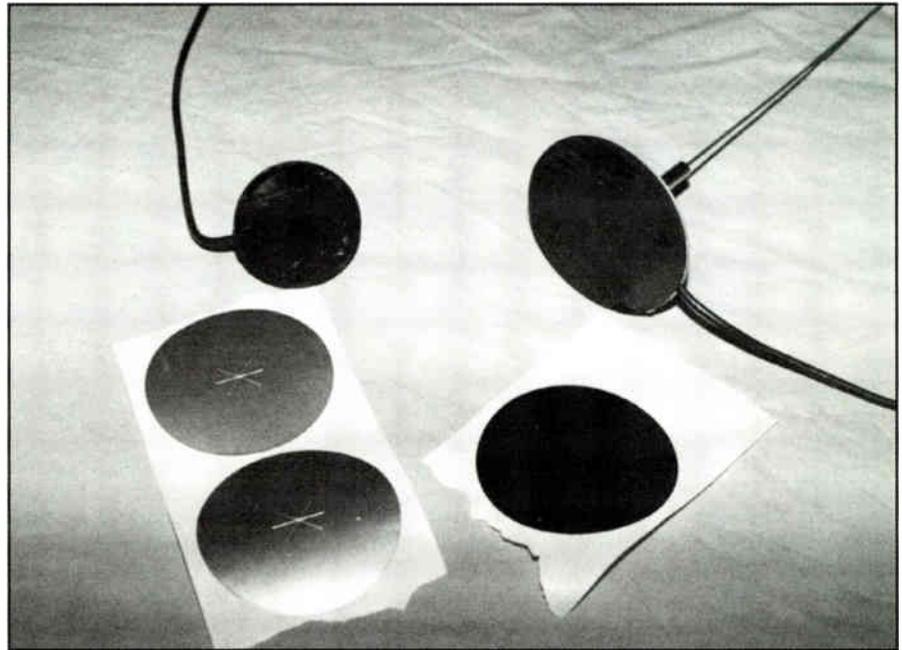
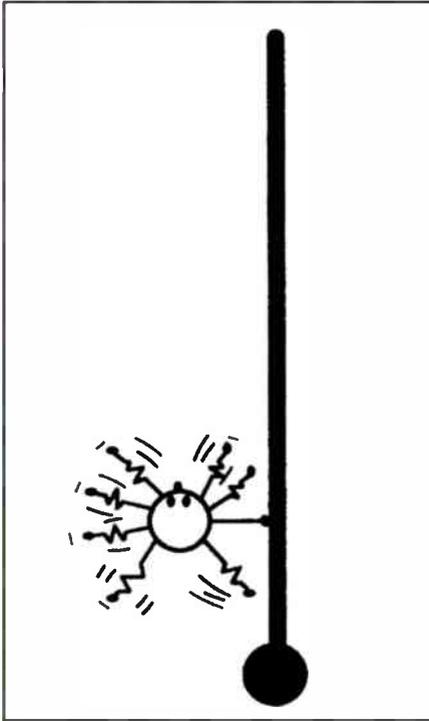
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WHAT YOU NEED TO KNOW TO PUT OUT A GREAT SIGNAL

Care and Feeding of SWRs and A Look at Magnetic-Mount Antennas



Antenna designers try to get a layer of foil as close to the car's body as possible. The vinyl plastic protection layer comes in contact with your vehicle. (Photo by Kent Britain)

The SWR is a finicky little pet, and a difficult critter to study. We contacted an SWR expert to try to explain the different SWR readings we were getting. Our BIG question was "Do SWRs have six legs or eight legs?" Well, it seems that SWRs have eight legs like other arachnids, and this is a big point: But they don't necessarily put *all* of them on the ground at the same time! This is why you get SWR readings of three or six or whatever. The trick is to get the waves really going in the antenna.

Now the electrons tickle the SWR's feet—kind of like walking barefoot across hot asphalt. SO the little SWRs start lifting their feet off the hot steel. One foot, then another, and another. The SWR goes from 4 to 3 to 2. Get it tuned just right and all of them SWRs are standing on one foot with the other seven sticking out in the air. Those seven legs sticking out in the air makes the antenna radiate best—the SWR count is now 1. Please refer to our April 1 artist's rendition to get the full picture.

This month I'm going to talk a bit about magnetic-mount antennas. When you've tuned the hundreds of mag-mount anten-

nas I have, you soon notice they tune differently on different cars.

Ground plane antennas and many mirror-mounts are built without tuning adjustments. *They* just don't need them. On the other hand, I've never seen a mag-mount that didn't have an adjusting screw. (They really DO need them!)

Base-Loaded

Most mag-mounts are a base loaded

1/4 wave vertical using the car body as its ground plane. That's the problem—the ground plane. Trunk-lip and mirror-mounts have screws that bite into the metal of the car giving them a good ground connection. But not the mag-mount. A layer of metal foil is built into the base of the magnet. This foil forms a capacitor between the antenna and car body. The value of the capacitor depends on how close together the plates are to one another. In this case, the capacitor is formed by a sheet of vinyl on the bottom

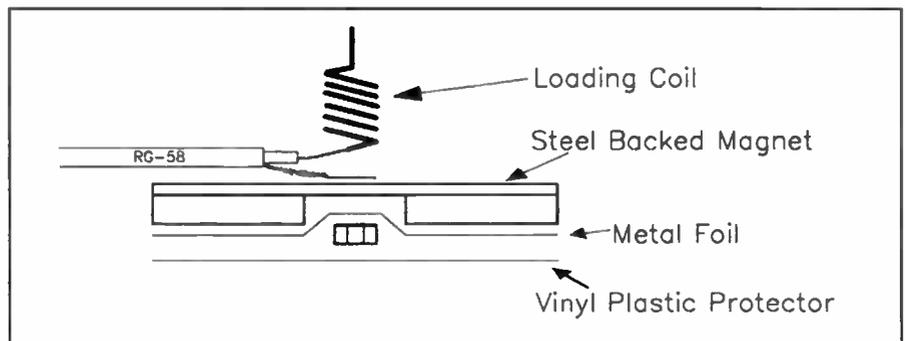


Figure 1.

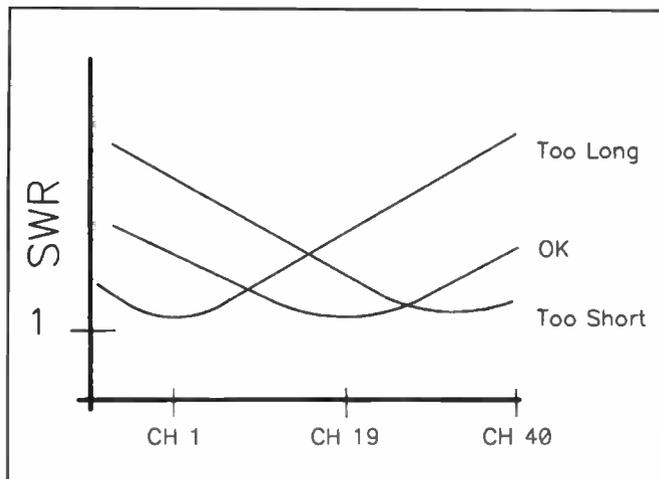


Figure 2.

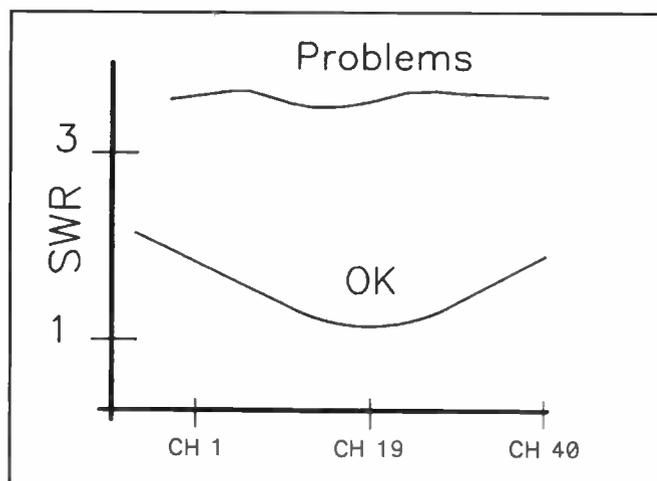


Figure 3.

of the base, the car's paint, the car body and the metal foil.

As the photo and Figure 1 show, the antenna designers try to get a layer of metal foil as close as possible to the car's metal. So what you're really doing is tuning the antenna to the thickness of your car's paint. If you've ever tried tuning a mag-mount on an older car that's got several coats of paint, you know what I mean.

If you'd like to try this out for yourself, here's an easy test you can do. Check the SWR of your magnet-mount antenna. Now slip a piece of paper under the base, between the magnet and the car. Now check your SWR. Went way up, didn't it? Care to try some cardboard?

Don't ever use a mag mount antenna on a vinyl-roofed car. At least not on the vinyl itself. The magnet won't stick very well and at highway speeds, it can blow right off. The extra spacing between the magnet and ground gives the antenna a lousy SWR. So, if it doesn't blow off, and the bad SWR doesn't blow your final, it's not going to talk very far. Stick the mag-mount back on the trunk where it will work a lot better.

Big and Little Ones

You tend to see two sizes of bases on magnet-mounts. The larger ones are about four inches across; smaller ones about two inches across. The larger base has four times the area, or capacitance to the car body as the small base. Last month we covered how the efficiency of an antenna is affected by the antenna's length. Remember that the longer the whip, the better the antenna's efficiency. A long whip needs a bigger magnet just to keep it stuck to the car.

So a really short mag-mount has two strikes against it. The small one can't use the car's ground plane with good effi-

ciency, and the short whip isn't going to radiate much of what's left. Those little 18-inch high mag-mounts are cheap to make, very convenient to use, fit nicely in the garage, and talk about as far as you can throw them.

A Neat Trick

There's a simple trick for tuning the SWR of your antenna to the center of the band. Citizens band is called the 11 meter band because the radio waves are 11 meters long. To be a bit more precise, CB channel 1 is 11.125 meters and CB channel 40 is 10.947 meters. So the radio waves on channel 1 are longer than channel 40. Just remember that channel 1 has the longest radio waves. Quickly check your SWR at channel 1, then a middle channel such as 19, then on channel 40. If your SWR is best on channel 1, then your antenna likes long waves best. It's

too long. If your SWR is best on channel 40, then your antenna likes short waves best. It's too short. When you have your antenna properly tuned, the SWR should look like the "OK" line in Figure 2.

Sometimes the SWR looks more like the "problems" line in Figure 3. This antenna has more problems than just trimming the whip an inch or two. Look for a bad connection at the coax connector or where the coax enters the antenna BEFORE you cut anything. Remember, it's much easier to make a whip shorter, than it is to make it longer! Don't get caught in that old radio saying: I've cut it off twice, and it's still too short!"

Next month we'll talk about the different ways to design and build antenna loading coils. We do enjoy answering your antenna questions. Send your letter to: Antennas, Etc., *CB Radio Magazine*, 76 North Broadway, Hicksville, NY 11801. The better questions will be answered in this column. ■

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Frequency Fastrack

GENERAL MOBILE AND FAMILY RADIO SERVICE NEWS By Judith Simpson, N9NSI, KAD-9669

Answering Your Questions

After the GMRS article appeared in the *CB Radio Buyer's Guide*, we received several letters asking for information concerning the General Mobile Radio Service, or telling us of experience with GMRS. We don't claim to have ALL the answers to your questions, especially the really technical stuff, but we have access to technical folks who WILL supply answers, and perhaps we can use the information in a later column. We especially like to hear from other users with their experiences.

What's a Repeater?

One of the questions we had received was "What's a repeater?" so this seems like a good place to answer. Thanks to reader Rich Winkleman of Chicago for the idea. Remember, this is a non-technical column . . .

GMRS radio uses FM (Frequency Modulation) to carry the signal from the transmitter of one radio to the receiver of another. FM depends primarily on "line-of-sight" . . . in other words, if I can see you, I can talk to you. That's one of the reasons that commercial FM radio fades as rapidly as it does, and the commercial AM stations can still be heard on your car radio. For two walkie-talkies, that means ranges of about three-quarters of a mile, with the little rubber antennas they use. However, if the same radios are connected to a mobile antenna, the range increases dramatically, yet the only change has been in the antenna height. Keep this thought in mind—the height of the antenna directly affects the distance an FM radio transmission can be received.

Distance can also be affected by the power transmitted from the radio. Without becoming involved with ERP (effective radiated power) or PEP (peak envelope power), let's logically adopt the idea that the 3 watt hand held radio connected to a mobile antenna will not be as effective as the 35 watt mobile radio connected to the same antenna. Sound reasonable? Here's an example: The three watt HT and the mobile antenna could be heard about three miles, from another mobile. The 35 watt mobile should be heard at about eight miles. This is a significant difference, and is the second consideration when dealing with radio transmissions.

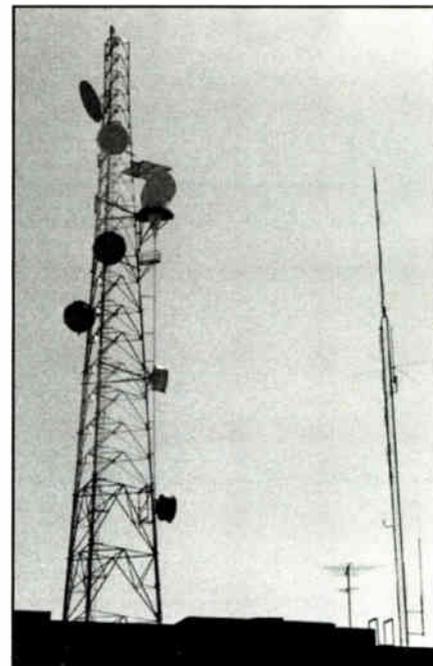
There's a guy over in the corner jumping up and down, yelling about terrain,

and yes, he is right. Radio transmission and reception is very dependent on terrain, including both natural terrain and the manmade variety; buildings, for instance. As we transmit toward a hill or a building, we can talk to someone on our side of the terrain, or even on top. Anyone on the other side would be "blocked" from our signals by the terrain. That's our third consideration in using FM radio.

Now, if we were on TOP of the hill or in a tall building, we know that we could see further, simply because we increase our height above the curvature of the earth. The same thing happens to radio waves—the higher we go, the further we can talk, AND be heard.

Now, let's put all these ideas together; a radio and antenna on a tall hill or building, using the 50 watts of power allowed by the FCC for GMRS. We ARE dependent on the height, but let's decide that we can now talk for 20 miles, which would be rather on the low side for GMRS, but after all, not everyone has access to the Sears Tower or the Empire State Building, or any of the other high buildings.

One problem—we can't stay on this tall place forever. Regardless of how much we want to talk on the radio, there's the odd husband or wife that simply won't understand about being able to talk two counties over. One solution is to leave a radio on that high spot and let *it* talk. Simple enough, but the radio can't work without someone to act as operator. Wrongo again, wattbreath . . . it's called a repeater, and that's what we've been leading up to all along. You CAN talk on your five watt radio from your house and let the 50 watt radio hear you and automatically retransmit your message from this high spot above the terrain, to the person you are trying to locate. Obviously there is one conflict: if both your radio and this repeater are transmitting on the same frequency, the result will be a noise that resembles four cats, two dogs and a pig in a 50 gallon drum at the same time. The solution is to transmit on one frequency to the repeater and set the repeater to hear your message on that frequency and simultaneously retransmit your voice on another preset frequency to the person with whom you wish to speak. As that person responds, the process remains the same . . . they transmit on one frequency, you hear on the other. The FCC has decided that the distance or separation between the two frequencies should be

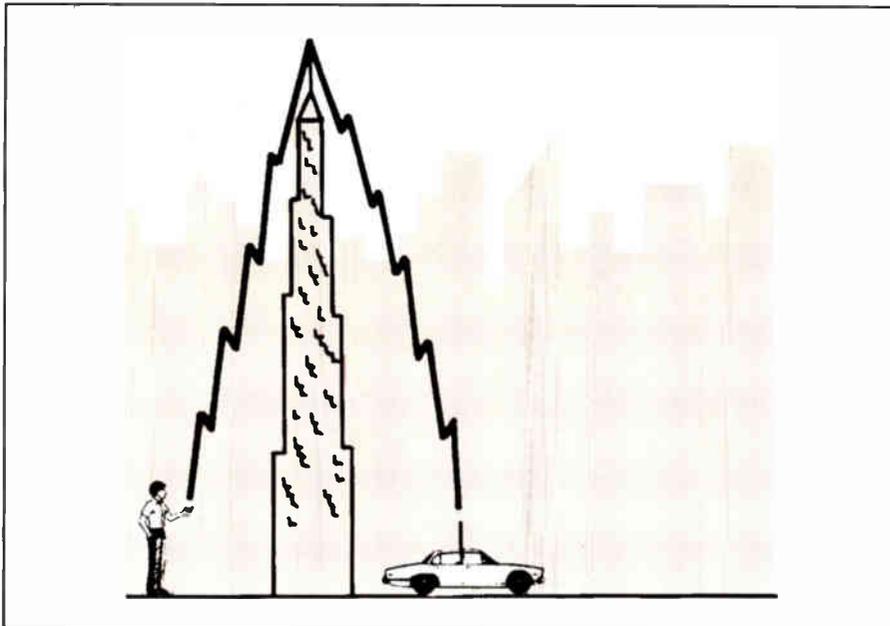


Here's a view of various telephone microwave and public service antennas. Similarly, GMRS antennas placed high and in the clear allows GMRS users of the radio spectrum to benefit from repeater operation.

5 MHz in the UHF bands, which includes GMRS, business band, and amateur 70 cm band.

Checking It Out

Ok, so now you have the concept, but there's obviously going to be some catch. You simply can't make this marvelous setup to enable you to talk for 40 or 50 miles without Murphy popping in to spoil your fun. In most areas, repeaters are already in place for GMRS in the tall spots. The best thing to do is to monitor the GMRS frequencies in your area to see which ones are busy. Perhaps you may be able to contact a repeater operator who might be willing to let you use an existing machine. That's the simplest solution. You will be required to follow the FCC rules regarding the operation of your radios, AND will most certainly have a financial responsibility to the operator. After all, the operator has probably used personal funds to set up the machine, and there is a certain amount of money



Using low-power handheld GMRS radios to communicate in dense urban areas would be nearly impossible if it weren't for repeaters and antennas placed on high buildings or hills.

required each month to pay for the location on the tall spot. These expenses MUST be shared equally by the users of the repeater, and NO profit is realized by the repeater licensee.

If there are no repeaters on the GMRS frequency you are considering, you may purchase a repeater from any licensed two-way communications dealer. Obviously, you must also apply for a license from the FCC to operate the machine. Cost of the license: \$60 for five years, which includes the \$45 license fee and \$3 per year (or \$15) user fee. Cost of the repeater could start at about \$600 for a small used machine and finish at \$3,000 or more for a new top-of-the-line repeater. Antennas start at \$75 and really go up, especially if you need directional effects. Coax depends a great deal on the height of the antenna; under 50 feet you could use RG-8 at 25 cents per foot, or you could use

"gas fet" (a gas-pressurized coax) for very long coax runs at \$5 per foot.

Simply then, a repeater is another radio, physically placed very high, and at much higher power (50 watts allowable GMRS) which hears the signals of a lower-powered radio transmitter and rebroadcasts or "repeats" the signals at higher power and on a different frequency to another radio.

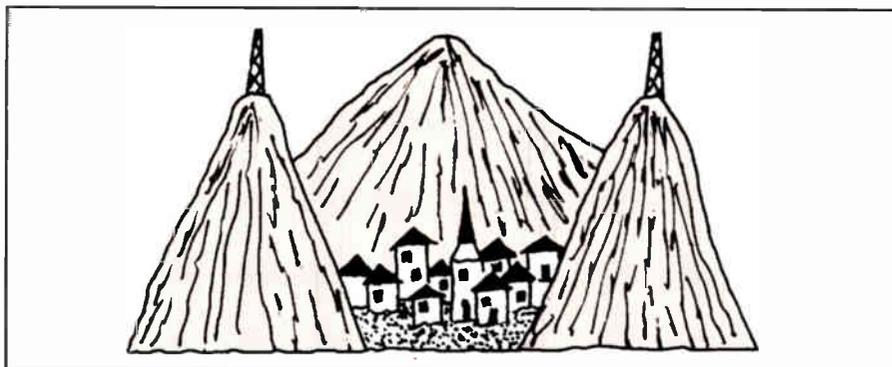
For more information on GMRS radio contact me at the *CB Radio* magazine, 76 North Broadway, Hicksville, NY 11801, or write to:

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GMRS users in this village in the valley could be out of touch without the aid of repeater systems.

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CIRCLE 51 ON READER SERVICE CARD



Just Passin' Through

"Don't even think about 10-22ing me," warned CBer John Smith. "Farmer, this place would blow your mind." Probably. John and I have very little in common. He lives on the 32nd floor of a drug and roach infested housing project somewhere in New York; I live in the rolling Amish farmlands of Lancaster County, Pennsylvania. Where John lives, you can actually see where bullets have chipped the concrete walls of his building. Here, we worry about moths in the apple trees.

It was through the CB that I first met John one hot summer night while I was caught in a three hour-long traffic jam on the Cross Bronx Expressway. I was on my way to a family vacation in Maine; John was in his sweltering apartment, monitoring Channel 9 like he does every night, high above the beeping horns and auto fumes at ground level. We spoke for quite a long time, almost continually hopping frequencies to get away from the jeering and cursing that threatened to interrupt our conversation. From time to time when I listened to John, I heard a second CB in the background. "I use one (CB) to talk, but the other constantly monitors 9 in case someone needs help," he explained.

The airwaves in this particular part of New York are flooded with voices, chattering in a variety of dialects and languages. I felt like a foreigner in a strange land. "Welcome to hell," said John. Hell seemed perhaps a little tame for what I saw from my car window. The police, he told me, have all but abandoned the area. Vicious, angry bands of armed men wander the

bombed-out buildings, taking, killing, raping, almost at will. The decent people who are left, live not in fear, but terror. Few leave their homes because nearly every trip outside brings the sound of gunfire and a reminder that life here can hang on by only the tiniest thread. People mean nothing. Violence is king in this forsaken place.

John, like others in his building, compete for airtime on the CB with prostitutes, drug dealers, and people conducting business in a variety of languages and codes. John's people, however, use their radios to bring some sort of order to the chaos in which they live. Theirs is a sort of "town watch" used to warn each other of particularly dangerous areas, such as disputed gang "turf" and as a sort of crime "party line." "We call ourselves the 10-44 club which means 'I have a message for you.' Whenever something happens, we're on the radio, letting everybody know." But the 10-44s use their CBs carefully. "Radios are not welcome here," says John. "Gang members who see hand-holds think cops and that could cost you your life."

As traffic started to move, slowly at first, John began to fade. "Before you go, let me ask you one more question," he said. "What kind of street lights do you have in Wagontown?" "Streetlights? We don't have street lights in the country," I told him. "No street lights?" he said incredulously. "I don't think I could live in a place with no street lights," he replied. "Too dark. Too scary."

To each his own.

On the Road

CBers who monitor Channel 9 will soon have another tool in their roadway rescue arsenal. The Ford Motor Company recently announced the Lincoln Remote Emergency Satellite Cellular Unit, conveniently called Lincoln RESCU. The system uses GPS to compute the location of cellular callers who are in need of help on the roadways. A driver simply activates a two-button device in the vehicle's overhead console, which takes control of the cellular phone and automatically dials the Westinghouse Emergency Response Center in Irving, Texas.

Information transmitted includes type of assistance needed (emergency or roadside), VIN number, location, and call-back phone number. The operator confirms the request and the location of the call, contacts the local PSAP (Public Safety Answering Point) and directs them to the caller. The Lincoln RESCU will be manufactured for Ford by Motorola and has reportedly already begun shipping. The new system is an option on 1996 Lincoln Continentals.

Please call me when it's ready for 1992 Dodge Shadows.

Silent Key

Sidney Shure, chairman and founder of Shure Brothers, Inc., has died at the age of 93. S.N. Sure, as he was known, started the Shure Radio company in 1925 as

a wholesale parts supplier for home radio set builders. Today, 70 years later, you may know his business as the world's largest manufacturer of microphones.

Southern Radio Action II

Not too far to the south, the Fredericksburg, Virginia Free-Lance Star reports that "a call from an alert scanner listener led to the arrests of two men accused of breaking into two homes yesterday in Spotsylvania County."

Police responded to a burglar alarm and saw three men coming out of the houses. While they were able to grab one of the men, the two others took off. Using dogs, a search was unable to locate the two. Some time later, they were seen at a payphone by someone who heard their descriptions over the scanner. Police stopped their car a short time later and made the arrests.

Squeal Like A Piggy

CB old-timers still remember the days when FCC enforcement in the U.S. was tough as nails and the very name of "Uncle Charlie" brought waves of terrified nausea to the hearts of grown men and women. In Australia, things are apparently still tough. A man in Launceston was fined \$2,000 for quacking like a duck on his radio. No kidding. According to the Reuters News Agency, Don Desmond Davey was convicted for "broadcasting something that was not speech, was not understandable, and could cause confusion." Davey pled guilty and was ordered to turn in his radio. Think about it the next time you monitor one of the wild channels in your area.

Radio In Action

It's not unusual to read newspaper articles in which the heroes are radio hobbyists. Take, for example, a situation in Westminster, Maryland. A man walked into the bank, "acted suspiciously," and left as soon as another customer walked in. The police were called and a description of the man and his vehicle was broadcast over the police radio.

According to police spokesman Greg Shipley, it wasn't long before area radio enthusiasts pitched in to help. Police received several calls from residents who heard the transmission and helped police pinpoint the vehicle's location. When the man was stopped by police, they found a pipe bomb, a fake bomb, several guns and newspaper clippings on the Oklahoma City bombing. He was arrested and charged with attempted robbery, handgun possession, manufacturing and possessing a pipe bomb and other charges including possessing a device that resembles a bomb.

Hurricane Alert

When Hurricane Marilyn swept through the U.S. Virgin Islands, it was two guys in an old Spanish fort that kept local and federal officials informed of what was happening. "When everything went down, our radios were still working," contends Steve Siddons who, with Carlos Rodriguez, bunkered in the Puerto Rico Civil Defense Headquarters. The two relayed faint radio signals from the islands, signals that told of the hurricane's destruction. Siddons said, "We lost the signal from St. Croix at one point, but we knew well before it went down that the U.S. Virgin Islands were in big trouble." Siddons and Rodriguez belong to the UN Radio Readiness Network which goes to full alert during natural disasters.

This Month's Give-Away

This month we've rolled out an all-new 1996 version of our handy *Pocket Frequency Guide*. It's perfect for anyone who has ever gotten lost on the scanner bands. A handy, laminated wallet-size card, it's designed for any radio hobbyist who wants to keep in touch with what's going on around him or her. Arranged by service (Police, fire, emergency medical, search-and-rescue, etc.), every major range of frequencies is covered for easy access. To get yours,

send \$3.00 to Larry Miller, Box 360, Wagontown, PA 19376.

By the way, we also have some of the APCO 10-code cards left from last time. We'll send you both for \$5.00.

Remember, you can be part of the *CB Radio* magazine's Communications Monitoring Team. If you see an article on radio in the news, clip it out and send it in! Be sure to tell us your name and where you got the information.

Product Spotlight

THE STUFF THAT'S OUT THERE—AND HOW IT WORKS

By Harold ort, N2RLL, SSB-596

Midland 77-285 Power Max II Mobile CB

SPECIFICATIONS: Mobile CB transceiver operates on 40 channels with multi-function black matrix LCD readout, four memory channels, dual-watch, instant channel 9 and 19, last channel recall and local/DX receiver switch and noise blanker control. Includes four-pin screw-on microphone, power cable, mounting bracket and manual. Operates on 13.8 Vdc negative ground.

DIMENSIONS: (HWD) approx. 1 7/8" x 6 1/4" x 8". Weight approx. 2 1/2 lbs.

Midland pulls no punches about their Power Max II in the advertising brochure saying "If a trucker could design his own CB, this would be it."—Frankly, on several counts, we'd be inclined to agree. Let's take a look at this rig that's loaded with neat features any CBER would appreciate.

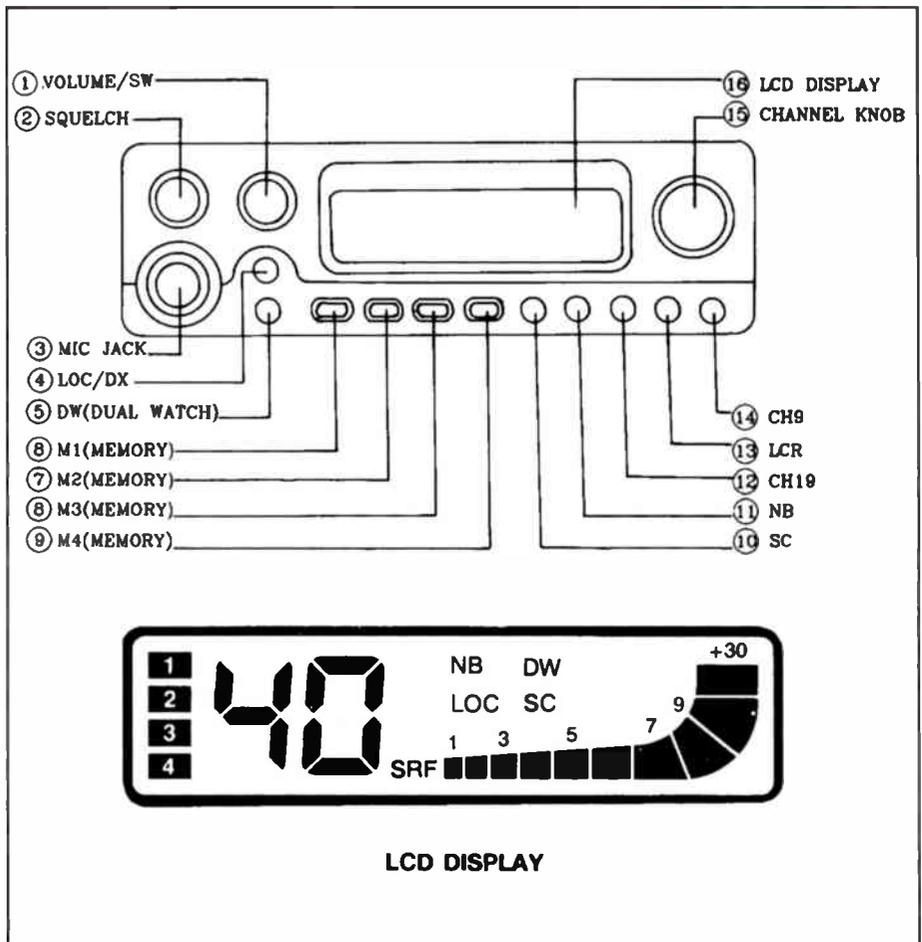
While many people still unfortunately think all CBs are created equal, we know it just isn't true! Take for example the brightly-lighted display with its 5/8-inch high channel numbers. Here's a CB rig that really resembles a quality ham transceiver. ALL controls—push button and rotary—are thoughtfully backlit for easy access when traveling at night. "Bright and impressive" accurately describes the front panel's appearance.

Using The 77-285's Controls

Using the Midland 77-285 is basically straight forward, but there are aspects that might take some getting used to. First, the manual, while well written, has a few glitches. You'll easily find them, so we won't waste your time pointing them out. It's a minor criticism, but something you should know about beforehand.

The front panel is well organized; squelch, volume and channel selectors are all rotary-controlled and easily accessed on the highway without taking your eyes off the road. For most users, that's all that counts; can you see and "feel" the volume control in the dark without messing up other controls? Can you easily find the larger channel selector? Yes, to both questions!

What I especially like about this radio is the large bright channel display and the red-segmented bargraph signal strength meter. It's accurate—at least as accurate as any other bargraph I've recently seen. It's also easy to see; there's no question about a meter reading—it's upward swing at S9 level clearly indicates a super strong signal.



The Midland 77-285's operating controls and LCD display.

Along the bottom of the front panel is a series of 10 push buttons. Actually there are 11 if you include the small push button just under the volume control. It's labeled LOC for LOCAL. It's a push button RF gain control that really does what its supposed to do—greatly reduce the strength of incoming signals (receiver gain)—particularly useful if you're operating in close proximity to another station. Personally, like many other operators, I'll never use it. I suppose it's useful if there's a CBER living down the street running a kilowatt; push the LOC button and you'll cut his signal drastically, but in doing so you also reduce other signals. Here's an example: There are several stations in my area that hang out on channel 25. For the most part they all hit me at just above S9. Hit the LOC button and they all disappear.

Then there's the fellow with the linear. Of course his signal sends the meter to the top. Push the LOC and he's knocked down to S5. Sure, I've succeeded in eliminating a headache, but everybody else on the channel has been completely eliminated from my receiver. So, what's the point? Maybe if you're on the interstate communicating between your vehicle and another close vehicle during a long trip, it might be useful to reduce other radio signals. But then again, I don't know about you, but it's important to me to hear ALL the smokey and accident reports. Just remember to check the display from time to time to make sure you haven't accidentally pushed the LOC control!

Let's get back to the other push button controls. They're easy to find and use; each one confirms entry by sounding a



The Midland 77-285. (Courtesy Midland Communications)

Channel 9 to instant Channel 19 without again first pushing the Channel 9 button, then the Channel 19 button (or using the rotary tuning control after pushing the Channel 9 button a second time). When in either Channel 9 or 19 modes, the channel number flashes continually alerting you to your radio's status.

The remaining push button control, located between the Channel 9 and 19 buttons, is the LCR or "last channel recall" button. It's a handy feature to get you instantly back to the last channel you used, regardless of the mode your radio was operating.

On The Air

First, using the rotary tuning knob, I tuned to channel 25. After calling a couple of friends there—they reported my signal strength and audio to be outstanding. I moved to channel 19 and heard one driver exclaim that my signal was, in his words, "choice." A great compliment, indeed.

The front-mounted microphone does an excellent job of delivering fine audio—"just right" as one driver told me. Being the clumsy operator I always have been, I accidentally dropped the plastic mic a couple of times. Thankfully it still works!

What about the transmitted signal? Everyone I talked to in my car and at home (using a Big Stick antenna and power supply), reported a solid signal and great-sounding audio. Speaking of audio, the receive audio was superb on the 77-285; with the volume cranked up less than half way I was nearly blasted out of the car! Cranking it up further produced even louder audio with little distortion. The advertised specs indicate 4.5 watts audio. Believe me, it's sure sounds great! No external speaker needed, folks. There is a rear jack for an optional external speaker, though.

Using the Dual-Watch Function

The "Dual-Watch" mode allows the user to automatically switch between two selected channels; it's like having two receivers in one.

The radio's manual tells the user to first adjust the volume and squelch and then using the rotary tuning knob, select the MAIN channel. However, in reality, you must first OPEN the squelch, set the main and SUB channels, THEN adjust the squelch to eliminate the background noise. Follow the manual's instructions in this case and you'll be forever wondering what's going on.

The manual states that "The unit will transmit on the MAIN or SUB channel ONLY if a signal was received on that

momentary "beep". Remember I said earlier the 77-285 has four memories? It really doesn't. It actually has five. Well, it really has SEVEN! There are four standard memories. Tune to one of your favorite channels with the rotary control, push and hold in one of the four buttons (labeled 1-4) for three seconds, and you've just programmed a memory channel. Easy as 1-2-3-4. The display shows you the memory number, too.

Right next to memory button number

four is one labeled SC. The manual calls this a "special call" channel. It's programmed the same way as the other four memory channels. Use it like you would any other memory channel.

Then there are the CH19 and CH9 buttons. They give you instant access to either channel. The Channel 9 button is on the bottom right of the panel. Push it and you're instantly on Channel 9. Pushing it again returns you to your previous channel. You can't go from instant



Getting ready to install the CB; included and well-packaged is the mounting bracket, mic bracket and hardware and power cord. (Photo by Harold Ort)

channel." I think what they meant to say was, "the unit will RECEIVE (or STOP) on the main or sub channel ONLY if a signal was received on that channel." It's similar to how a scanner operates—the difference being the 77-285 continues to switch between the two channels even if a signal pops up. It'll pause briefly during the received transmission, then resume switching between the two set channels. To a newcomer, this misprint and operation could be confusing. It isn't the end of the world, but still somewhat confusing, just the same.

It doesn't mention that if you choose to transmit on the MAIN channel when NO received signal is present, the dual-watch function is disabled; not so if you do so on the SUB channel! Furthermore, if you

decide to transmit on the MAIN (first set) dual-watch channel, whether a signal is present or not, the dual-watch function is also disabled. The dual-watch function can be disabled by pressing the "DW" button again.

Keeping the dual-watch function activated, if you inadvertently decide to use the rotary tuning control, the unit will change channels. The display will still show your initially-set MAIN dual-watch channel, while another channel (possibly above or below) the MAIN channel will be displayed. Our recommendation: The Midland's 77-285 dual-watch function is a welcome addition to CB; it allows the user to listen for activity on two channels. Use it, but know its quirks. If you're a Channel 9 volunteer monitor, it can be invaluable.

Let's suppose you're expecting a call from your daughter coming home from school on channel 14; set Channel 9 as the MAIN channel, and 14 as the SUB channel. You'd still be able to effectively listen to Channel 9 for emergencies and automatically hear Channel 14 for her call. You won't miss important calls with this radio!

Overall, the Midland Power Max II 77-285 is an outstanding AM CB transceiver. Aside from a couple of minor idiosyncrasies, it's a mobile CB that really has a lot going for it; easy to see and operate controls and bright display window, punchy transmit and receive audio and enough useful features to give it an "A" in our books!

The Midland 77-285 retails for \$250.

CIRCLE 101 ON CARD FOR MORE INFORMATION

The Goldenrod 45 Spyder A Plus Mobile CB Antenna

The Golden Rod 45 Spyder A Plus is a top-loaded mobile CB (and 10 meter amateur) antenna. It's total height is 4 feet, 3 inches and it requires a 3/8 x 24 stud mount.

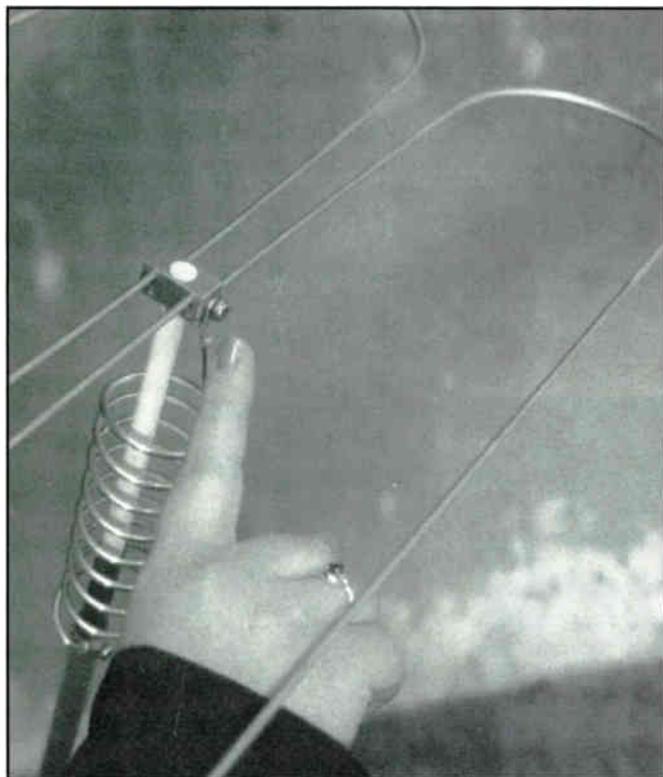
Some things in life that work well can't always be explained, at least by most of us mortals. Such is the case with the Goldenrod 45 antenna by Signal Engineering. Here's a superior-perform-

ing mobile antenna that simply screws into a standard stud mount; mirror, trunk lip, magnetic or ball-mount.

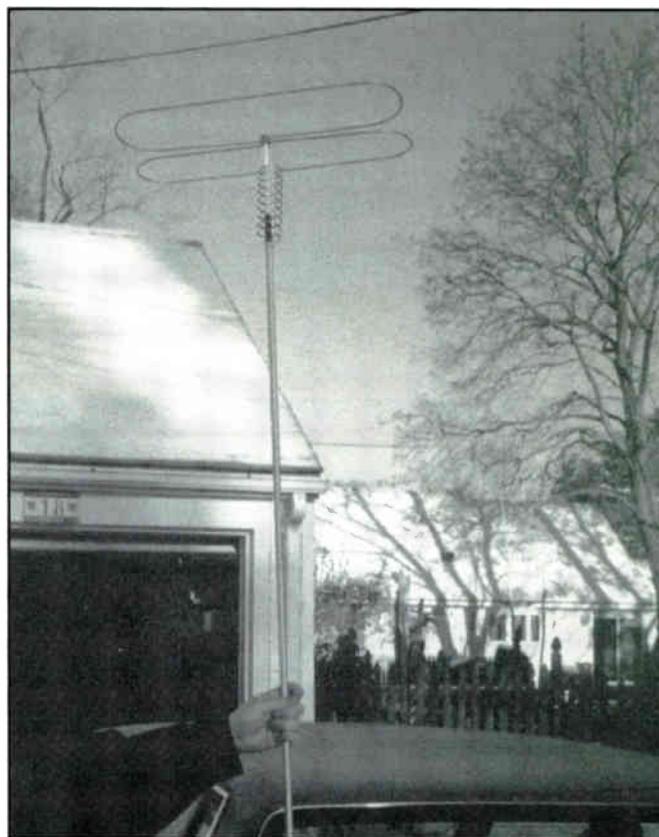
Arriving on our doorstep well-packaged to protect from the rigors of transit, the antenna comes nearly ready-to-use. It took only about five minutes to insert and tighten the two 19-inch formed oval loops into the nut assembly at the top of the whip. It might look a little strange; a

lot like a four-foot mobile TV antenna with a loading coil at the top, along with the two loops.

Constructed of aircraft alloy aluminum with a gold-alodine finish and a tightly-fitting rubberized cover near the screw mount, the Goldenrod antenna looks like it would last for years—it may well indeed. And if it proves as durable as it looks, it certainly will!



The Goldenrod 45 Spyder A Plus mobile CB antenna features two identical 19-inch formed loops that fit snugly into a nut assembly. Simply insert the ends of each loop into the nut, tighten and fire up the rig!



Installing the 45 A Plus onto a standard 3/8 inch x 24 stud magnetic-mount was quick and easy.

Advertised gain is 4.5dB with a frequency range of 26.5 to 28.5 MHz. Also claimed is a 1.5:1 max VSWR. Guess what? They're right. In checking the SWR on channel 40, it was just above 1.5:1 progressively getting lower on the other 39 CB channels. My first thought was that this couldn't be; or more accurately, how could this be, especially considering the fact that the two loops can each be individually adjusted for best SWR? Our test model was near perfect without further adjustment. So like they say, if the darned thing works, leave it alone.

How It Performs

I've got to admit, I was a bit skeptical at first, simply given past problems I've had with obtaining a good SWR and performance with different mobile antennas, and even digesting claims made by some antenna folks. The Signal Engineering brochure for the Golden Rod 45 A Plus claims a "One to two S-unit increase in signal strength over base and top-loaded antennas . . . (it) responds to horizontally-polarized signals unlike any standard vertical whip, thus extending the useful range of a mobile station enormously."

We don't use any sophisticated test equipment other than what a typical CB operator would use; an off-the-shelf legal mobile CB radio. What I found with the Goldenrod 45 Spyder A Plus was a substantial increase in range over a half-wave

fiberglass whip on a magnetic mount from my base to my mobile. We all know CB range depends on lots of things, but there typically comes a point when driving away from the base that it gets downright difficult, if not impossible to hear your base (or even be heard). When I used the Goldenrod antenna on the same magnetic mount, located in the same place on my vehicle, I was able to keep driving almost another full mile! I couldn't believe my ears. But I had to prove to myself that I wasn't somehow dreaming, so I had brought along my 1/2 wave fiberglass whip, and changed antennas. At that location in the pizza parking lot my base could not be heard with the basic fiberglass antenna, period. I called and called, but it was useless, so I drove to the point where I normally begin to lose my base—about a mile back down the road—and there it was.

On the Highway

If you've ever been to a CB jamboree, hamfest (especially a larger event, like Dayton) you'll see mobile antennas that make the Goldenrod 45 look like a rubber duck! Most of the vehicles look more like porcupines than vehicles. So, driving the highway with this antenna will get you a few strange looks, but let's face it, it's worth the stares! Signal reports on channel 19 were as good as any other antenna I've used. And at least one of the few bases I normally work reported my mobile

signal with the Goldenrod 45 Spyder A to be, ". . . really good . . . better than many other mobiles on channel 19." (Except of course those fearless souls running a kilowatt into co-phased antennas!)

I like this antenna a lot. It's not the sort of antenna you'd leave permanently attached to your vehicle. It's certainly eye-catching to Arthur the Antenna Ripoff Artist who just might want to relieve you of your new antenna or CB. The solution is simple; a sturdy trunk or magnetic-mount assembly for a few bucks that's easily removed or an assembly that tilts inside the trunk when you're away from the vehicle. Be prepared to hear some wind noise at highway speeds; not loud, but noticeable; (of course that too depends on the antenna placement and style of your vehicle—a 102-inch whip can give the same wind noise). Also be prepared for better signal reports and extended range—"Enormously" as the Goldenrod 45 Spyder A brochure states? You be the judge; an extra mile or so where I was able to effectively test the antenna just might be more than a mile in the open country. "Greatly" or "significantly" increased range might be more the case, but regardless, I'm certain you'll be pleased at the ease of assembly, great SWR and solid construction of the Goldenrod 45 Spyder A antenna. It retails for \$53 from Signal Engineering, 155 San Lazaro Avenue, Sunnyvale, CA 94086, phone 408-733-1580.

CIRCLE 102 ON CARD FOR MORE INFORMATION

The RadioShack PRO-2038: a 50-channel Home/Mobile Programmable Scanner

ITEM: RadioShack PRO-2038

SPECIFICATIONS: Preprogrammed base or mobile scanner features auto search of police, fire, air, marine and weather frequencies. Auto-scan delay, individual lockout and memory backup. Also stores 50 additional frequencies. Includes AC adapter. Suggested retail price: \$199.99.

Welcome to the world of an out-of-the-box preprogrammed scanner. The title, "programmable" is also accurate; besides utilizing the PRE-programmed features of this compact gem, you can transfer your finds to up to 50 vacant channels! But first, let's look at the basic features of the PRO-2038.

This unit comes complete, ready to operate in your home using the supplied wall adapter and telescoping antenna. With the optional 270-1533 cigarette power cable you can use the scanner (subject to local laws) in your vehicle. You'll also need an optional 20-0028 mounting bracket. You can also use an

outdoor or vehicle-mounted antenna that terminates with a BNC connector for better reception.

The PRO-2038 is really easy to operate, making it ideal for newcomers. All you do is plug it in, turn it on, adjust the squelch and press a button! When the scanner finds activity, it stops and even holds the frequency for two seconds. This gives you time to listen for a reply. But wait, there's much more!

The PRO-2038 receives the following frequencies: 29-29.7, 30-50, 50-54, 108-137, 137-144, 144-148, 148-174, 406-420, 420-450, 450-470, 470-512, 806-824, 849-902, 902-928, and 929-956 MHz. That's quite a chunk of the radio spectrum in a small package. The on/off/volume and squelch controls are mounted on the right side of the front panel. The easy-to-read backlit display is large enough to be read in all kinds of lighting conditions. Below the display are four buttons, "search," "I/out," "band," and "prog." Turn the unit on, and with

each push of the "band" button you're treated to a simple display of the band search segments; "29-30," "30-50," etc. the scanner will search for you. In this mode you see the frequencies either increasing or decreasing through the specific band.

On the left front panel are nine more buttons; the top three are "hold," and up/down keys. The remaining six are labeled, "private," "fire/emg," "air," "police," "wx," and "marine." Pushing any of these service search buttons puts the scanner into an ultra-fast (called Hyperscan by RadioShack) 100-step-per-second search through all FCC-assigned frequencies for that service. In this mode you see the word "scan" moving across the display from right to left. When the PRO-2038 finds activity, it displays that frequency for the duration of the activity and holds for an additional two seconds. You can also push the "hold" button once to manually hold that frequency in memory as long as you wish to

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check for activity. You can also store it in one of the 50 vacant channels.

The unique feature of this scanner is that once the scanner stops on an active frequency, you have the option of simply listening to determine if it's a keeper, or if you want to let the unit continue to search other frequencies in that segment. If you do want to keep the frequency, you have a couple of options. By pushing a couple of other buttons (a two-second operation) you can program the frequency into the "police" bank, for example. That particular "bank" has 20 available slots (channels) for your use. Frequencies you assign to "police" channels become part of the police service scan bank. Later you can also check these individual channels for activity, too.

Then there's the "private" bank. It also holds a total of 20 channels. So, for example, you're searching one of the bands and the scanner stops on an active frequency. A couple of key presses and you've stored it permanently in the "private" bank. The fire/emg bank has 10 vacant channels where you can store similar frequencies you may find. Add it all up and the PRO-2038 allows you to store up to 50 of your new finds, plus it will search at the push of a button or two, fire/emg, aircraft (civilian), police, weather and marine frequencies.

What I think is great about the PRO-2038 is it's overall performance and it's compact size. It weighs just over a pound and measures (HWD) approx. 2 x 5 x 7 inches. Finding a mounting location in most vehicles should be easy, indeed. The folding front feet angle the unit up for easy viewing. The back of the unit includes a jack for an optional external speaker. The bottom-mounted speaker provides adequate audio (rated at 1.8 watts, typically though 1.5 watts, but you'll get much better audio using an external

8 ohm speaker or even headphones (at home, please!) with an 1/8 inch plug.

Using only the supplied telescoping antenna I was able to hear police agencies from all around, and frankly some I didn't know I could hear! I'm not very interested in monitoring activity in New York City or even south Jersey. I'm an aircraft and public service band fanatic who rarely gets excited about hearing the more distant police/fire stations. But in checking out the PRO-2038 I was able to jot down a few frequencies that aren't listed in the directories and now they're part of my listening fare. Here's a scanner that's sensitive enough to pick up the distant stations (even some mobiles) and yet selective enough the discriminate between what you want to hear and the other signals out there.

That doesn't mean this or any other scanner is free from receiving image frequencies. On the down side, there were image frequencies (the manual explains this further) in the upper parts of the spectrum and in parts of the aircraft band. But remember, images (stations being received on a frequency they really don't belong on) are common in some scanners. This isn't a major drawback, just something you should be aware know about.

The overall performance of the PRO-2038 is very good. I think it's a bit odd for the squelch control to operate in a counter-clockwise direction, but I also found the squelch itself to be excellent, not needing a lot of adjustment from band to band. All-in-all, the PRO-2038 would be a welcome addition to your monitoring shack. Use if for finding those often-elusive frequencies and mobile monitoring when you don't want to unplug and disconnect your other programmed scanner.

CIRCLE 103 ON CARD FOR MORE INFORMATION

Truckin' With CB



THE PROFESSIONAL DRIVER'S CB RADIO PLACE TO BE

By Bill Simpson, "Highlander"

Voices in the Night (and the day)

Ever stop to realize just how unique this "Truckin'" thing really is? How many other jobs actually PAY for a vacation? We get to see most of our wonderful country, and they pay us for the privilege! Doctors, lawyers, accountants and steel workers work a 40, 50 or 60 hour week, go home, and do it all over again the next week. We could go to sleep in Minneapolis on Monday, Chicago on Tuesday, Nashville on Wednesday, and Mobile on Thursday, Chattanooga on Friday, and Richmond on Saturday. Where else could we get paid for traveling? The rain and snow and the scales and smokies are simply the penalty we pay for being able to run as we want during the good times.

Friends Along the Highway

During our years on the road, I would bet that each one of us remembers at least one particular guardian angel we could always depend on. NO! I do NOT mean the little guy who sits on your shoulder and keeps you from running over the idiot four-wheeler that just cut you off, OR the not-so-bright young lady trying to talk to her boyfriend on the cell phone as she puts on makeup at 60 mph!

I mean the base stations we depend on in a particular area to provide instructions to our destination, without having to



Those new style mirrors on KWs create slight problems for mirror-mounts.

chase off for a map, while we sit on a ramp, waiting for instructions. . . that might require another exit. Over the past years, I've met four guardian angels around the northeast Illinois area: Nice 'n Easy, Raintree, Mirage and Indigo.

"Nice 'n Easy" was a base station along I-94 near Racine, Wisconsin with a voice

that was so unbelievably sexy that when she keyed the radio, the hair on the back of the neck stood on end! Her husband was a trucker, and after she had traveled with him a few times, and met a few of the road drivers, she could feel closer to him by helping give directions while she was at home. Rumor says that Nice 'n easy

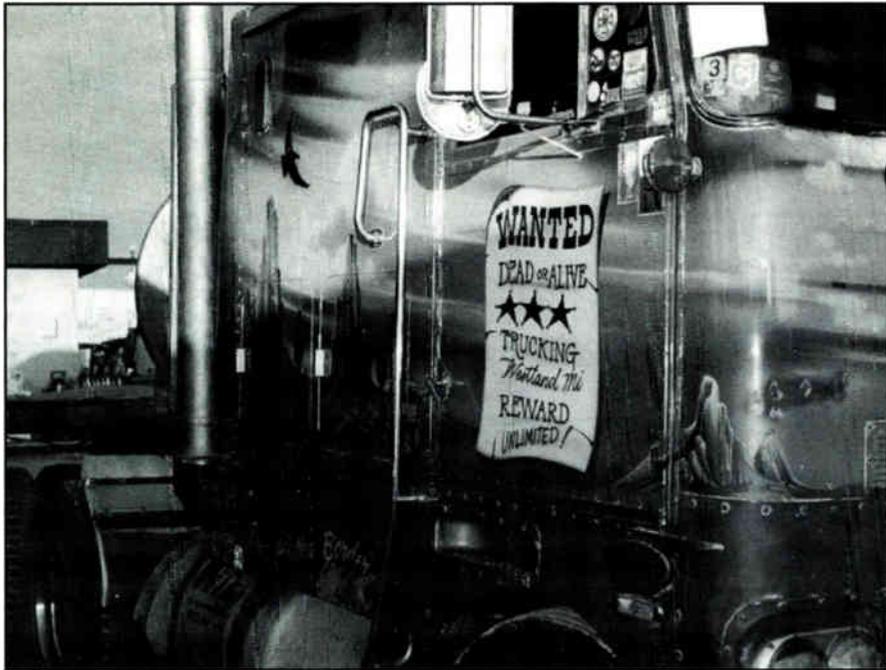


"Tomcat" uses this Cobra 25 LTD Classic out of Minnesota. (See, TK, there really IS another "Tomcat."



"Mr. Pibb" a Trans National driver.

Photos by Bill Simpson



A Trans National lessee, "Wanted Dead or Alive Truckin" sign.



Is this your truck? Tell us your handle, along with the truck line and we'll give you a one year subscription to the CB Radio magazine. Send your handle, name and address to: Trucker, CB Radio magazine, 76 North Broadway, Hicksville, NY 11801.

moved from the area. I don't know where.

"Mirage", another station along the Wisconsin border, is usually found on channel 9. Mirage is a 'Nam vet who now works from his home and does wonders with CB radios and other electronics that most techs won't touch. Mirage is well traveled between Milwaukee and Chicago

and can usually help with directions along that corridor or anywhere in the Kenosha, Wisconsin or Lake County, Illinois areas.

Speaking of angels, many of us received directions for Evanston or Skokie, Illinois from "Raintree" for years. Perhaps we talked often enough to be able to ask about his wife, Liz, or to learn about

the kids or to ask about other CB stations in the area or to even leave messages for those stations. We haven't heard from our favorite Scot for many years, even though we've been by the house, we have not been able to find Scott. (Yes, that IS a play on words . . . Scott is a Scot, and very proud of his heritage.) The only solution is that "Raintree" is a SILENT KEY. So long, Raintree, we'll miss you.

On a much happier note, "Indigo" is still very active, and on the air morning, noon and night from northern Illinois along I-94 between the 39 and 35 mile sticks. A little background—Indigo's husband, "Termite", was a trucker for many years. She, too, felt that by helping other drivers, she could be closer to Termite, and feel that someone else was helping him. Indigo spent many happy hours on her two-way, chatting with drivers or with Raintree, or any number of other locals, to pass the time while Termite was away. After he retired and lost his bout with the big C, she still feels that she has her friends on the airwaves, AND the truckin' family she found with Termite. She's still giving directions, and is still very active in her church. She's still as sharp and as caring as ever. As we roll by the area, give her a shout and tell her you read about her in the *CB Radio* magazine. Say hello and wish her well. She'll be happy to hear from any and all.

There's one other base that I must mention because she is very special to me. "Crazyleggs", formerly of the Skokie, Illinois area, and now closer to the Wisconsin border. I met my bride over the airwaves 14 years ago while she was recuperating from an operation. I know that many drivers chatted with her over the years, and possibly wondered what happened to her. Yep, I stole her away from ALL you guys. Seriously, by the time you read this, we should have our base station totally operational. We've had our ups and downs, trying to get back on the air with all our equipment, but should have the problem solved soon. In some areas, there are legal problems that take a while to unravel.

Have a Highway Friend?

If YOU have a favorite base station along your travels, please tell us about them. We can't promise to do a complete story about each one, but send us the info . . . with pictures if possible (no Polaroids, please), and we'll try to mention them so other drivers can meet them through the magic of radio.

Until then, keep 'em rollin'.

73's,

Highlander

Trucker of the Month



OUR SPECIAL RECOGNITION OF PROFESSIONAL DRIVERS

By Bill Simpson, "Highlander"

It's safe to say that all Knights of the Road admire the nice looking rigs; and even envy the drivers for maintaining the pristine condition.

For many years, the Montford Truck Line was the epitome of the prestigious carrier—nice trucks, and clean (even in the winter), fast (always hurrying toward the East Coast or back toward Denver). We even named the left lane the Montford Lane in their honor!

While there are obviously many companies with big, beautiful trucks, not too many can consistently compete with the Steelcase Company of Grand Rapids, Michigan. We caught Rick, AKA "Radar" in a Chicago suburb, and made him our Trucker of the Month.

Radar has been driving over the road for eight years, strictly for Steelcase. He loves both the "road" and his company. "It's simply a great company to work for," he says. "They'll give you the miles to make a buck, but they'll also get you back home if needed. My daughter has a recital tomorrow in Grand Rapids. I'll be back for it!"

One other attaboy for Steelcase . . . along with Amway, Steelcase has placed a great deal of money into the improvement and upgrade portion of the Grand Rapids area. Quite honestly, according to Radar, it's refreshing to find a trucking company/manufacture that is willing to spend the kind of money necessary for such a project.

Most of the complaints Radar hears from other drivers concern the rate of pay, or the available miles from a company. "I ran with a new driver who grossed \$600 his first week with HIS company, and had never been over \$300 since that time. If your company is treating you like that,



Rick "Radar" is our "Trucker of the Month." (Photo by Bill Simpson)

perhaps it's time to look at another company. Nearly every company is searching for professional drivers. . . just make sure that you are being a professional. If you can't make a buck with a company, go somewhere else!" he added.

After talking with Radar for a short time we realized that he WAS indeed a professional and a family man. He was proud of his Peterbilt, and proud of his company, and the way they maintained his truck. His hometown means a great deal to him, and he obviously enjoys, and is proud of, his family.

When we caught up with him and asked if he had a few minutes to spare for a chat, explaining on the radio that we would not

take more than five minutes of his time, Radar would not even take the time to chat until his delivery was off the truck! He closed the trailer doors, and relaxed. "I have to be in Zion (about 30 minutes north) at 10 a.m. for a pickup . . . we have a few minutes," he said.

That's the sign of a true professional; the customer comes first. The truck looks professional, the driver looks and acts like a professional.

Do YOU know a driver that should be nominated for "Trucker of the Month"? Send us a couple of pictures along with as much information as possible. Who knows, maybe the next "T.O.T.M." could be YOU! We're watching. . .



Scanners: User Friendly

HOW TO GET THE MOST OUT OF SCANNING VHF/UHF

By Steve Adams

How Scanners Work

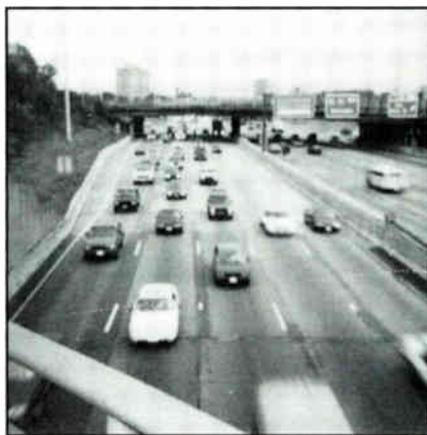
It's true. You don't need to know how scanners work to use them effectively, however a little knowledge will help you understand their capabilities and limitations, shop for accessories wisely, and increase their performance and your enjoyment. Some people want to know how they work, so here are some basics.

Transmitter to Your Antenna

A radio transmitter sends an alternating electric current through an antenna which produces an electromagnetic field around that antenna. Some of this energy (radio waves) radiates out into space and induces a tiny signal in receiving antennas. The strength of this received signal is dependent upon the distance from the transmitter, the power of the transmitter, the frequency the antennas are tuned for, the height of both antennas and various atmospheric conditions. The rate of this alternating current is called its *frequency*, measured in Hertz (Hz) or cycles per second.

Radio waves behave differently by frequency. All radio waves tend to follow the surface of the earth to some extent and these ground waves may have a range of a hundred miles or more. Radio waves also radiate into space. These sky waves reflect off the ionosphere and return to earth in varying degrees. Lower frequencies tend to reflect best while some higher frequencies pass straight through and are considered line-of-sight, meaning the receive antenna must be in a direct line with the transmitting antenna to receive any signal. Sunlight, sunspots, solar flares, weather and other celestial influences can greatly affect the reflectivity of radio waves. In perfect conditions, CB radio transmissions can be heard thousands of miles, while VHF public safety broadcasts can be heard over a wide area.

The tiny signal induced in your scanner antenna and sent to the receiver is the signal your scanner works with. At any given moment, there are thousands of signals reaching your scanner, but only specific frequencies you have told your scanner to look for (programmed in) will be seen and processed. Intelligence is added to radio waves at the transmitter by varying the amplitude of the signal (AM or amplitude modulation) or by varying the frequency (FM or frequency modula-



How about a National Traveler's Guide? Send us your frequencies and information, but give us time to get it into the CB Radio magazine. Highway patrol, sheriff, fire, military, federal and other agencies all use radio. You're the key to letting others know the frequencies! (Photo by Bill Simpson)

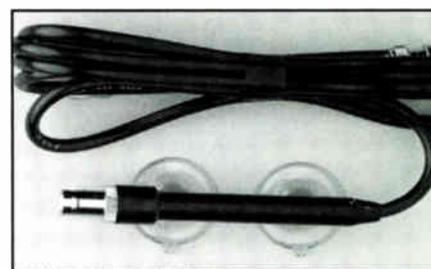
tion). Radio receivers including scanners reverse this process and extra the intelligence or audio portion of the signal, sending it through your speaker. AM radio waves are more susceptible to static from lightning, sparks from nearby motors, etc.

Some Basic Scanner Functions

A CHANNEL is a memory cell which stores a frequency you have entered. A scanner looks sequentially through each channel, tunes the receiver to the frequency stored in the channel and looks for a signal. If a signal is present, the scanner receives that signal until the transmission has ended, looks at the frequency stored in the next channel and starts scanning again. The more channels, the more frequencies you can store and receive.

The SCAN MODE starts the receiver looking through channels for active signals. The scanner will normally stop and remain on an active channel and resume scanning once the transmission ends.

MANUAL MODE allows you to stop scanning and step through each channel. You can normally go to any channel by pushing MANUAL, entering the chan-



This Radio Shack suction-mount BNC antenna holding device is great for getting your vehicle's (or even indoor) scanner to perform better. Simply connect your rubber duck antenna to the top, and mount the device on a window. (Courtesy Radio Shack)

nel number and pushing MANUAL again. PROGRAM MODE is used to enter frequencies into channels.

KEY PAD LOCK disables all keys except manual and scan to prevent inadvertent loss or changing of data.

SEARCH MODE looks at signals within a given frequency range. You set the search LIMITS and the scanner will see everything within those limits, allowing you to find many frequencies that are not listed in guides.

DELAY FUNCTION provides a two-second (or so) delay between the end of a transmission and the resumption of scanning. This allows both sides of a conversation to be heard. It also compensates for the built-in delays of repeaters (amplifiers located on tall buildings or mountains to extend the range of signals).

LOCKOUT lets you bypass channels without having to clear the contents (frequency). LOCKOUT is used when the scanner hangs up on a signal (open carrier or open microphone) or when you want to listen to specific channels in a bank and bypass the rest.

LOCKOUT REVIEW (if available) allows you to see which channels are locked out without having to manually cycle through several hundred channels. This is a very useful function.

The Frequency Spectrum

The frequency spectrum includes all radiated energy. Rules, regulations and treaties have created order in the trans-

Interstate 680 from Benicia to San Jose, CA (North to south)

Solano County/Benicia Area

Solano Co. Sheriff	155.490
California Highway Patrol (CHIPS)	42.600 Solano County
CHP Blue channel	42.340 statewide/emergency
CHP extenders (short range)	154.905 statewide
Benicia Police	155.775
California Dept. of Forestry (for wildland fires)	151.445 regionwide

Martinez/Concord/Walnut Creek/Danville/San Ramon Area

Martinez Police	460.475
California Highway Patrol	42.920 Contra Costa County
CHP Blue Channel	42.340 statewide/emergency
CHP extenders	154.905 statewide
Contra Costa Co. Sheriff	155.310
Contra Costa Co. Sheriff	155.640
Contra Costa Co. Fire	46.320
Concord Police	460.150
Pleasant Hill Police	460.500
Walnut Creek Police	460.425
Transit Police (B.A.R.T.)	453.150 regionwide
San Ramon Valley Fire	460.575

Dublin/Livermore/Pleasanton Area

California Highway Patrol	42.62 Alameda County-East
CHP Blue Channel	42.340 statewide/emergency
CHP extenders (short range)	154.905 statewide
Alameda County Sheriff	155.250
San Ramon Valley Fire	460.575

San Jose Area

California Highway Patrol	42.500 Santa Clara County
CHP Blue Channel	42.340 statewide/emergency
CHP extenders (short range)	154.905 statewide
California Dept. of Forestry (for wildland fires)	151.445 regionwide

mission of radio waves. Specific bands of frequencies have been assigned for specific uses. Public safety, aircraft, government, military, business and industry, FM radio and television broadcasts are among the uses for the VHF (Very High Frequency) and UHF (Ultra High Frequency) bands. These are the bands normally associated with scanning; the frequencies are in MegaHertz (MHz) or millions of cycles per second.

Would a National Traveler's Guide Be Useful?

If you think so, let's start one. We'd like to hear from truckers, travelers and all enthusiasts who use scanners. Send us key frequencies along major routes and metropolitan areas you use. Give us primary dispatch frequencies of federal,

state and local public safety agencies along major routes, including interstate and highway numbers, nearby cities, mile markers or landmarks. You can use maps and write the frequencies on them. We will try to develop a national monitoring map for you. We'll need your inputs and patience, since this will take time to develop. We can print it in this column by geographical areas or (maybe in time) produce a pull-out national map for you. The object is for you to be able to program your scanner by banks ahead of time and simply lock and unlock banks as you travel. Please don't send in data from frequency guides as we don't want copyright problems. Please do send active frequencies you regularly monitor, with specifics about agencies that will help unfamiliar travelers.

I'll start with a few. I live in eastern San Francisco Bay area. Interstate 680 pass-

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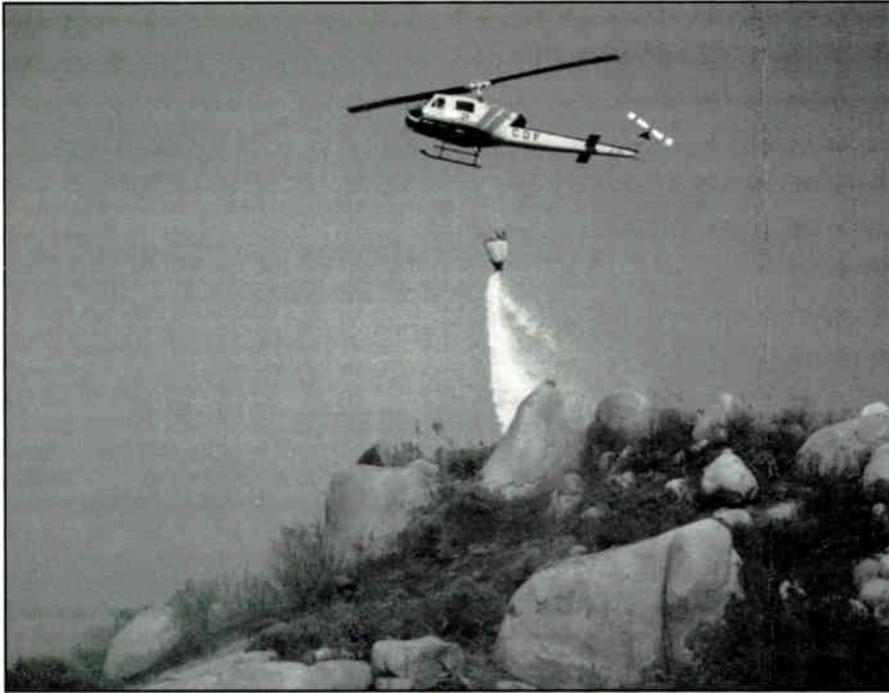
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CIRCLE 3 ON READER SERVICE CARD



The California Department of Forestry battles a brush fire near San Diego. (Photo by Steve Adams)

able for a few dollars at all Radio Shacks (part no. 274-396) or other scanner and electronics outlets.

- A length of bell wire and an alligator clip attached to your metal whip antenna can sometimes do wonders for reception. Longer and higher is better.

- Those suction cup devices for car window antennas work well inside too. They can move your antenna away from noise sources such as fluorescent lighting, computers, etc. Make sure it has a BNC connector and a long enough high quality coax cable. As always, safety is paramount. NEVER run wires or antennas near power lines. Never work near power lines. When in doubt, ask your full service scanner dealer for advice.

Coming Up

In coming months we'll talk about disaster preparedness, the state of public safety communications, scanning and the law, product reviews and more.

This Column is Interactive!

Send your technical tips, anecdotes, questions, comments, photos (no Polaroids, please) schedules of events and anything unusual and of interest about scanning to: Scanners: User Friendly, CB Radio magazine, 76 North Broadway, Hicksville, NY 11801-2953. There will be a three month lead time in publishing your letters and photos, so please be patient.

Be sure to pick up a copy of the 1996 *CB Radio Buyers Guide* and 1996 *Popular Communications Guide*, both available from 1-800-853-9797. Talk to you next month . . . ■

Helpful Hints:

It's always a good idea to listen before you talk, so why not take some time to tune across the CB channels, listening for local activity. Then, when you learn the ropes, you'll be surprised the friends you'll make who share your same interests.

Always remember to observe safety precautions and common sense when putting up ANY antenna. Keep it away from power lines! ALWAYS do a basic site survey first to ensure, among other things, if the antenna falls, it won't touch power lines. While you're putting up that new antenna, keep your coax cable runs as short as possible to cut down on loss.

Are you after increased range and more "talk power" on the CB band? Why not consider buying a beam antenna and rotor assembly? It's legal, and it's lots of fun talking to another CBer with your legal CB radio, knowing you're pumping out the equivalent of big watts in a pinpoint signal. Another excellent way of getting more "talk power" is to invest (it really isn't THAT much more money) in a SSB CB.

es near my home. Here are some frequencies I regularly monitor near the I-680 corridor that would be of interest to a traveler.

Technical Tips

- To have sound in both earphones or speakers, use a 1/8-inch monaural-to-stereo adapter between your scanner and headphones or speakers. The signal will still be monaural. Adapters are avail-



Inside view of communications gear in a police cruiser. (Photo by R.D. Baker)



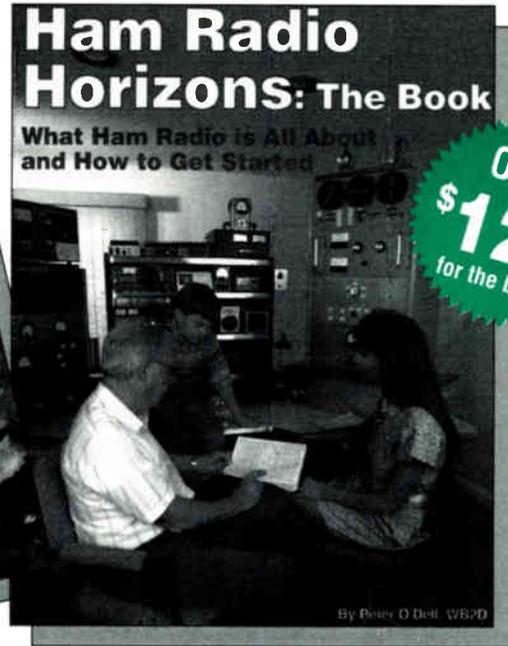
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Outband activity can be dangerous!

Hi folks! As promised, I have some interesting news from Algeria, but also the story of Max, President of the Belgian DX Club, "BRC". Max got caught by the Belgian police a few months ago and tells us his story here. As usual, we'll end with some very interesting DX information from around the world.

The Story of Max, 16BRC001

A few months ago, "Belgian Radio Contact" President, Max, **16BRC001**, got caught by the Belgian police for illegal transmissions on 27 MHz. "It was a

Friday, just after 12 o'clock, when I heard two cars outside. I glanced through the window and saw four guys approaching the front door. I understood straightaway that it was the local police," says Max. "When I opened the door, one of the cops held a search warrant in front of my face!" From then on, Max thought he was wandering in the middle of a nightmare. "They first headed towards the shack where they found my Kenwood TS-450S and kilowatt linear amplifier. They also looked at the computer, searching for packet radio software. They were interested in almost everything, including logbooks, QSL cards . . . dollars!" All the envelopes and QSL cards received at the BRC QSL

Service have been taken away by the Belgian police. For this reason, four BRC DXpeditions are concerned with QSL card problems, including , **16BRC/BW**, **137BRC0** (Isle of Man) and **32BRC0** (Chile).

On top of searching for radio equipment the police also looked in Max's freezer. "I felt as a criminal" continues Max. "Then I was arrested and questioned at the police department."

Max will probably be fined 6 million Belgian Francs. He has lost around 150000 BF of radio equipment. But the BRC club is still there! Max is back on the air again and BRC members are still activating rare countries for the benefit of all



DXers worldwide. To contact the club write to Belgian Radio Contact, P.O. Box 33, 3271 Zichem, Belgium.

Island Hunting on 27 MHz

Most DXers look for new countries, but when propagation conditions are not at their best, island hunting can be a nice way to continue your DXing activities. Radio amateurs have a program called "IOTA" meaning Islands on the Air. This award scheme was founded more than 30 years ago by a British shortwave listener, Geoff Watts.

A similar program is being used by 27 MHz enthusiasts, especially in Europe. The name is the same, the list of referenced islands is too. If you're interested in such a program, why not get your copy of the "European Island List." There are only 100 copies of the book around, so order your copy promptly. The price is \$16 including shipping and handling. The data in the book includes the island name, division number (country), geographical position, region or province, of course the ham IOTA reference and whether the island has been on the air on 27 MHz. The list contains over 3,500 references. It's a nice little booklet, professionally bound with a color front cover. All your orders may be sent to Groundwave, "European Island List", P.O. Box 17, Kenilworth, Warwickshire, CV8 1SF, UK. Most island activity takes place during the summer (until autumn). Although many clubs are trying to use specific frequencies for island expeditions, you can find them almost anywhere on the band. Look out for "/XX" format callsigns, or "/amateur prefix" calls.

Algeria

Robert, **146AT102**, transmits from Algiers, the capital city of Algeria and takes a lot of risks. But as he says, "My passion has no price!" For security reasons, Robert uses a mailbox manager in Italy: **1AT614** Antonio, P.O. Box 5, 41040 Corlo (MO), Italy. Once your progressive number and \$1 contribution has been verified and received, Robert will send you a very nice full-color flag QSL card from Algeria.

Robert uses a homemade dipole antenna and like most foreign operators, he usually calls outband.

European DX

49BC0/DX will be around this month calling from Balearic Islands. The activity should take place for a while. QSL is



via: Breaker Club, P.O. Box 123, Hamburg 22321, Germany.

Guernsey Island, in the English Channel will be on the air between May 15 and 20. The station will be operated by Jeff, WH107. QSL is via the radio operator at P.O. Box 7123, 69302 Lyon cedex 7, France.

171AT/DX on Svalbard Island is still very active. The operator hopes to be there until July. QSL is via: 161AT065 Adam, P.O. Box 79, Wladyslawowo 84120, Poland.

304SD0 is still on the air from Estonia until December next year. QSL via John 30SD014, P.O. Box 136, 12080 Castellon, Spain.

African DX

A rare one from Botswana is **105BR0**. This special event station is operated by some local fellows. They'll be on the air with this callsign until they reach 2,000 contacts. The QSL card is via the club's HQ, BR HQ, P.O. Box 20676, Maun, Botswana.

Canary Islands are also located in Africa, although this very touristic place is Spanish. There are quite a few DXers on the main island—Gran Canaria—who are very active. Nevertheless, many European DXers like operating from this division, such as **34RC0**, a French expedition. The dates haven't been released, but the activity is supposed to take place during the first six months of this year. In any case, if you ever contact this station, send your QSL via Romeo Charlie HQ, P.O. Box 2032, 18026 Bourges Cedex, France. Contribution is welcome. The same group has planned activity from South America and the West Indies, oper-

ating from Netherland Antillies, Suriname, Barbados and Saint Vincent. You'll also have to wait for confirmation of the following expeditions: **79RC0** (Philippines), **94RC0** (United Arab Emirates) and **115RC0** (Qatar).

Back to Africa, 44CA/DX will be operated very soon by an Italian operator who will be in South Africa for a while. No QSL information is available for the time being.

The German Breaker Club is on the air from Mauritius signing **168BC0/DX**. The expedition will be around until the end of April. The operator asks for two International Reply Coupons (IRCs) instead of the usual dollar bill) with your QSL card. The address is: Breaker Club, P.O. Box 123, 22321 Hamburg, Germany.

Chad will be on the air sometime this year thanks to the Belgian BRC Group from Zichem. The callsign used is supposed to be **175BRC0** and QSL is via the BRC QSL Service, P.O. Box 33, 3271 Zichem, Belgium. Contribution, of course, is always welcome.

Closing Comments

As you can see, most of the DX stations ask for some sort of contribution when QSLing. The usual contribution is a one dollar bill, but you're free to send a pair of IRCs. Beware of fake stations! Also avoid sending contribution to countries where the postal service opens almost all the foreign mail and steals everything that's interesting. We'll take a close look at some of these countries in our upcoming issues.

Until then, take care and have a lot of fun on the air.
73/51,

Alex



How Joe Became Known as “The Cheese Grater”

I met Joe Bilinsky back about 1970, when he didn't even *have* a CB. This would be a nice story if I had given him his first rig and gotten him started in CB radio, but the way it really happened is much better.

Joe always had a natural instinct for things mechanical and electronic, and that prompted him to spend a few years in the vo-tech electronics shop instead of devoting his teen years to dangling participles, congruent triangles, and covalent bonding. It was Joe's frugality though, (the editor told me not to call him a cheapskate) that really makes the story play so well. If the truth be known, Joe found his first rig alongside a muddy trail leading from a favorite fishing spot in Pennsylvania's Pocono mountains. Joe was walking back to his car with his fishing buddy, Chomper (which is not such an unusual name once you know that Chomper was a German shepherd) when he spotted the mud-caked rig where someone had probably thrown it in a fit of rage. Because Joe had been dealing with a back injury and repeated surgery, he was not able to carry much weight, so Chomper was outfitted much the same as a burro, with a pack that let him carry all of Joe's fishing gear except the rod, and two lunches, which the pair had eaten hours before. Chomper willingly carried the new-found treasure where the lunches had been. Even the microphone was caked in mud. "I knew when I picked it up," Joe said, "I could clean it up and have it working in a few hours—and the price was right, too!"

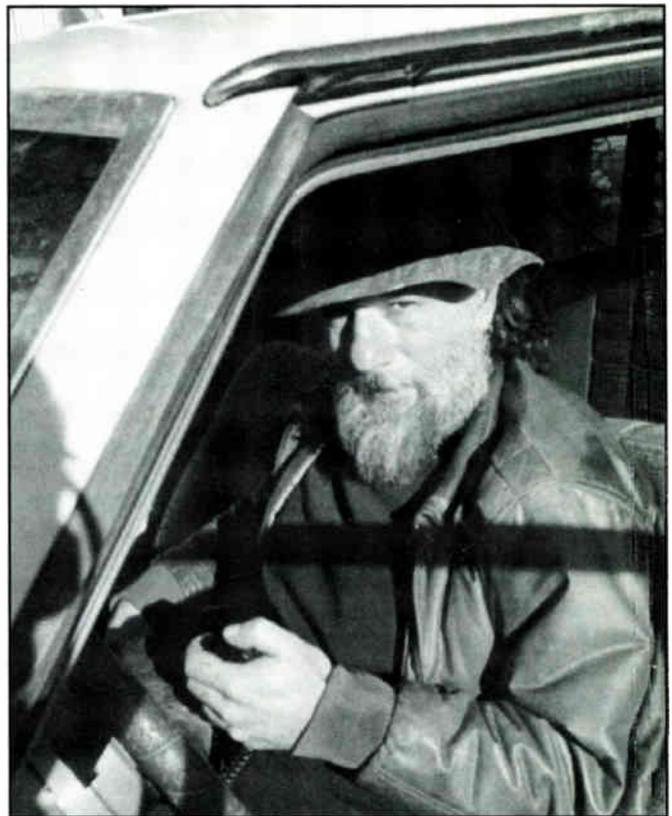
When Joe called me and told me about the rig, my experience told me it would either be a loose wire or a complete disaster. I wished him luck and reminded him not to transmit without attaching an antenna to the set.

Some folks might laugh at Joe's restoration method, but I learned a long time ago that his ways of doing things usually worked. He soaked the mud-caked radio in a bucket of fresh water and shook it around for about five minutes, then changed the water. He repeated this process about ten times, until the water remained clear, then took the innards out of the case, immersed them, and cleaned them under water with a soft brush.

Rags and cotton swabs removed most of the water, then Joe dried the rig patiently with a pistol-type hair drier set on low. The only additional task was to remove the clear plastic cover over the transmit relay and clean that out with cotton swabs. During this last process, he called me to borrow an antenna. I just had to see if he could make the thing work, so I took an extra mag-mount mobile antenna to his house and waited to see the results. Joe's wife Terry was convinced that we'd both lost our marbles. "Who ever heard of washing a radio in a bucket of water?" she asked. "Just name *one person* who's ever washed a radio in a bucket of water," she said. She had us there.

When we powered the thing up it received well right off the bat, but it wouldn't transmit—the relay didn't even click.

We pulled the plastic cover from the T/R relay, closed the contacts with a plastic rod, and the set gave us a fine carrier, leading our attention to the microphone cable, which turned out to have a broken lead right at the plug. Joe soldered the wire before I could say, "That looks like the problem," and when he asked for a radio check he got an immediate reply, which he really wasn't ready for.



Joe Bilinsky at the controls of his CB. Known as the “Cheese Grater,” Joe and his wife, Terry live in Pennsylvania. (Photo by Bill Price)

When a guy across town told Joe his signal was “just like next door—what's your handle?” Joe said, “Geeze—great,” which the guy must have mistaken for “Cheese Grater,” because that's what he called Joe for the rest of the QSO, ignoring Joe's protests. After he signed off with that guy, Joe must have had a dozen more contacts over the next hour, all of whom continued calling him “Cheese Grater.” When he finally shut down the radio for the night, he had given up and decided to call himself “Cheese Grater,” since everyone he'd ever spoken to on the radio now knew him by that handle. “It was just too damn hard to explain it,” he told me, “and besides—I hadn't thought of another handle anyway.” When people asked him about the handle, he told them he worked in a pizzeria.

That evening, Joe reached up through the trap door in his roof and snapped the mag-mount antenna on the metal cover of the hatch. The house is two-and-a-half stories high in Pennsylvania's highest city, and the antenna has served him well to this day.

I asked Joe about his favorite things, so readers could know a bit more about this month's CBer. Steak is his favorite meal, and all things being equal, he'd prefer to wash it down with a

good beer. The exotic snack that appeals to him most is a big plate of fried Jalapeño peppers and eggs. Joe lives in Hazleton with his wife, Terry, who doesn't understand why he'd rather use a "found" radio than spend a few bucks on a new one, but she's used to him and says it'd be such a lot of work breaking in a new husband, so she'll keep Joe and his mud-bucket radio.

Joe and Terry are loyal supporters of the Hazleton Animal Shelter, and of a fair number of unattached critters who come by their place looking for a hot meal and end up staying the night—or sometimes longer.

Asked where he would live if he could live anywhere, Joe said, "Just a little closer to some of the good fishing places out in the Pocono Mountains—but the drive isn't so bad." When I asked who he'd like to be if he could be anyone, he told me without hesitation, "Me. I'd like to be me, but about twenty years younger."

"And if you could do any one thing—something really wild—what would it be?" I asked. "Fly a fighter jet," he answered, without skipping a beat. "An F-16." Yeah—me too.

So far as other radio interests, Joe always has the scanner turned on, "There's always something goin' on," he says, but he isn't much interested in shortwave ("too many weird signals") or amateur radio ("with CB, there aren't many rules to worry about breaking").

Asked if he had a message for the FCC, Joe said, "Next time you guys decide to create something like the Citizens Band, you might want to spend more than five minutes planning it... I can't argue with that logic.

Joe's message to all of our readers: "Support your local animal shelter, and be kind to animals—they're a lot nicer than some people."

I asked Joe if he'd ever upgrade to an SSB base station. "Sure," he said, "just as soon as I find one alongside the road."

Since the "Cheese Grater" incident, Joe has gradually convinced folks in his town to call him "The Fisherman," but every once in a while, someone forgets.

This being only our second issue, the lead-time between typewriter and finished magazine still hasn't allowed for readers to nominate anyone for the coveted office of *CB Radio* magazine's CBer of the Month. It'll still be a couple more issues until information sent by readers can find its way into print, so until then, I'll be writing about people who I've run into in my travels.

If you know someone worthy of the honor, try to get a couple good clear B&W or color pictures (slides don't work too well) and tell us what makes this person so special. Give us a whole shipload of information about the person so we can maintain our high standards of journalistic craftsmanship as exemplified by the profile you've just read. If, like several of us here at the editorial offices, you are a student or graduate of the National CB Writer's Institute of the Air (heard Monday and Wednesday evenings at 7 p.m. channel 32 USB), you might like to interview your candidate and write a highly polished piece yourself, which would make you the envy of your peers. Remember—clear photos, no mixed metaphors, and try to avoid saying "Breaker-Breaker."

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Over and Out

CB HUMOR

By Bill Price

My friend Norm had a special talent for getting into trouble, and such is how it was when Norm came home Tuesday night and remembered to check his oil before walking the dog and retiring for the evening.

Champ was inside doing the ritual Cocker Spaniel wee-wee dance while Norm fumbled with the key. Norm had found it easier to leave the dog's leash attached than to find it four times a day and chase a dog whose aunt and uncle were also its mother and father; Champ had learned to treat the leash like a second tail.

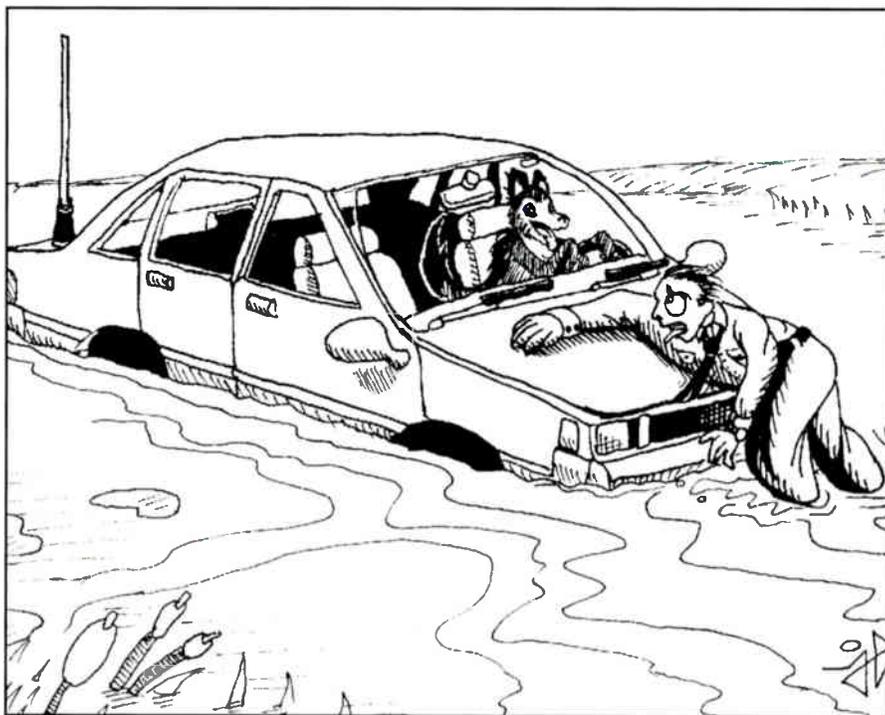
As Norm stepped on the leash and bent to grab the end, he felt a cool breeze as his pants split from zipper to beltloop. No matter, he thought—it was dark out and he still wore his sport coat. As Champ took off, Norm grabbed his flashlight and they set out to walk the perimeter of the apartment complex, then head to Norm's '78 station wagon.

When Norm opened the driver's door, Champ climbed into the passenger seat and Norm pulled his leash under the steering column, then up and over the top to slip the loop over the gearshift lever. Norm knew if Champ pulled on the leash, it would only pull the lever up and more firmly into "park."

Norm released the hood latch, then propped up the wagon's massive hood with a red broomstick he'd carried ever since the hood spring broke. A black drop on the bottom of the dipstick told Norm to add two quarts. A case of cheap oil every month beat a big car payment, Norm thought, so he didn't mind the inconvenience. He thought he'd check the transmission fluid as well, but he had to get the owner's manual because the process involved several steps which he could never remember.

Norm started the car, and with his foot on the brake, moved the shift lever, stopping for a moment in each position before returning the lever to the neutral position. He then went to the front of the car and leaned under the hood to find the transmission dipstick.

He never noticed the black Labrador Retriever wandering around the lot until the dog decided Norm needed a good sniffing, which he gave him, greeting him in a manner usually reserved for other dogs. The next few seconds are still a bit hazy, but the key points involve Norm standing up very quickly, the hood falling, and Champ's leash pulling the lever into reverse while trying to leap through the windshield to get at the Lab. The incident



could have ended right there if the hood latch hadn't punctured Norm's tie as it slammed shut, or if Norm had set the parking brake, which is probably moot since it had never worked anyway, though he sincerely intended to have it fixed.

Norm cursed himself for not wearing a clip-on tie that day, but was relieved that he had just that morning slowed the car's idle speed from a dangerously high race. As Norm tried to figure how Champ had pulled the car into gear, he obediently followed it across the lawn between the parking lot and the road in front of his apartment, wishing that instead of stopping to fill the tank on the way home, he would have tried to make it home on fumes. Champ stood with his front paws on the steering wheel as if he was driving; Norm walked along, bent like Groucho Marx over the car's hood. He tried to remove his tie, but found that the hood had caught both ends, and it was then that Norm began to wonder who would get all his radios when he was gone.

Norm became increasingly aware of the lake across the road from his apartment, and increasingly hopeful that it would be shallow—particularly in the area where Champ was heading. With his limited range of motion, Norm tried to influence Champ to move to one side or another so that he would pull the car's shift lever into park, or at least "steer" the car into a tree or a rock, but Champ

appeared to maneuver deftly between every hazard, past the only witness to the whole episode—a four-year-old boy who had been looking out his window as Norm and Champ passed through their yard on the way to the lake. Norm yelled and waved frantically at the boy; the boy waved back with equal fervor.

Sunrise found the car waist-deep in the lake with Norm and Champ shivering—Norm laying across the hood like a deer and Champ squeezed onto the dashboard against Norm's radio, which ran all night despite the car's electrical system being submerged. Some fishermen had guided their boat within thirty feet of them just before dawn, their outboard masking feeble cries and barks for help. Champ had gone hoarse barking at some nearby ducks, and Norm wore out his voice begging Champ to "key the mike, dammit!" As the sun rose, the ducks came in for a closer look, followed by the fishermen, who cut Norm's tie and Champ's leash so they could both splash to shore.

Norm now pays a slightly higher insurance rate, and Champ isn't quite so anxious to ride in the car, but they are otherwise none the worse for wear. Norm is at least now his neighbors know his name, though everyone's taken to calling him "Captain Titanic," and Champ wears a special ski-mask with ear-holes when they go out for a walk. ■



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