

I credit Citizen Band (CB) radios with saving my life a couple of times on the road. Being able to access information like my vehicle's immediate proximity to a speeding eighteen-wheeler on a one-lane logging road or an approaching tornado enabled me to make decisions that without this timely information could easily have resulted in a fatal crash. Likewise, CBs can bring peace of mind when you're "trapped" on a highway in a traffic jam of unknown cause. On a lighter note, they can also provide conversation on long solo journeys. It's easy to think that cellular telephones have turned CB radios into dinosaurs, but in fact, nothing could be further from the truth.

These relatively low-tech devices are enjoying a resurgence of popularity among professional truck drivers and road trip enthusiasts for some very good reasons. They're relatively inexpensive to buy and free to use. They work well, and they provide communication under circumstances where other forms of technology still don't do a very reliable job.

What follows is a short overview of the types of radios and a general discussion about the "4-watt rule." I have owned and used Cobra Electronics radio products for nearly thirty years, and since the company is very generous with the use of photographs, I have included examples of Cobra radios in this article. Keep in mind that there are many excellent CB manufacturers, and I'm not endorsing any one in particular.

Although CB radios have been available since 1959, the first time I used a CB was in 1976, when I worked as a fire lookout on a remote mountain peak in Arizona. During my off-hours I used the radio to alleviate the occasional boredom that such a job can engender. Since I was sitting on an 8000-foot peak with an unobstructed, several-hundred-mile view, I was able to reach and talk to other radio operators an amazing distance away from my location. That first radio featured 23 crystal-controlled channels and required a registration from the Federal Communications Commission (FCC). Today, neither registration nor license is required to operate a two-way "Citizen's Band" radio, and the basic radio has been expanded to 40 channels.

The world of CB radiotelephony has enough jargon to arouse self-doubt in any normal human. It is easy to start feeling a little lost when someone starts talking about "bird" watts, LSBs, 10-meter radios, Standing Wave Ratios, skip, swing, and slide. Fortunately you don't need to know most of this to own and use a CB perfectly competently.

Citizen's Band refers to a range of radio frequencies that lie between the short-wave broadcast signals and the 10-meter Amateur radio bands. The wavelength of a particular radio frequency is distance commonly measured in meters. Wavelength is calculated by dividing the speed of light by the radio frequency. For example, the CB band is also known as the 11-Meter band, which is the result of dividing 300,000,000 meters per second (approximately the speed of light) by 27MHz (which is roughly the middle frequency available in this band, which is 27,000,000 hertz). These frequencies are further divided into 40 channels starting at 26.065 MHz and going to 27.405 MHz in 10 KHz (kilohertz) steps.

CBs are part of what the FCC has designated "Personal Radio Services." They are characterized as being "short-range, low power radios for personal communications." The three most well known of these are CBs, Family Radio Service (FRS), and General Mobile Radio Service (GMRS). FRS radios are supposed to be limited to a one-mile range, have a maximum 1/2 watt effective radiated power and have non-detachable antennas. These radios are sold just about everywhere and are frequently seen being used by "family members" at sporting events or even being used by spouses when backing large RVs into parking spots.

GMRS radios, which look a lot like FRS radios, can transmit at higher power levels (up to five watts). They often have detachable antennas, and although they are often sold at the same sales counters as FRS radios -- which don't require licenses -- users of GMRS radios are supposed to obtain licenses from the FCC to operate them. Currently these cost about \$80.00, but many retailers fail to mention this legal requirement.

CB radios, on the other hand, are limited by FCC regulation to "4 watts of carrier power" and operate on the AM radio band. Many folks believe that this means that this type of radio is limited to a "maximum output of four watts" but according to Mark Pili, owner of Karl's C-B Shop in Las Vegas, Nevada, this is really a misstatement of what the standard is. He suggests that this four-watt standard actually applies to the output of a radio's "dead key" (that is the power that emanates from the radio when the mike button is depressed - with no voice modulation. The actual potential output from a 100% legal, stock, out-of-the-box CB radio at full modulation is much closer to 7 watts. By adjusting the potentiometer "pot" setting inside a CB radio, a technician can adjust this potential output upward to nearly 11 watts, and the "4-watt" radio will still be legal.

Here's a further clarification about the wattage issue. By definition, any two-way radio with a dead key output of 5 watts or more is supposed to be operated by an FCC-licensed amateur radio operator. These amateur radio operators are also known as HAMS. HAM radio operators have to pass a written and practical application test, and their radios may employ the use a variety of power amplifiers that extend the reach of their radios. Under the law, no CBer may use any form of an amplifier, also known as linear amplifiers or "linears" when transmitting on the CB band.

However, any 10-meter amateur radio can be easily modified to work on the CB channels and the majority of professional truck drivers are using these higher power radios when they are on the road. Initially these radios were used to just reach the 40 channels below and the 40 channels above the common 40 CB channels. This is what is referred to Single Side Band (SSB). These radios have switches for Lower Side Band (LSB) and Upper Side Band (USB). But most of these radios can be fine-tuned to find little-used frequencies between these larger channels. Many of these radios can be used to access nearly 300 AM frequencies.

One curious thing about CB radios -- or for that matter any radio -- is the nature of "ground plane." Ground plane is the area under the reflective area of an antenna -- imagine that the antenna is the pole in an invisible patio umbrella. Because of ground plane, an entire vehicle, with all of its electrical components, can act as transmitter, and a CB radio will attempt to "play" those sounds. It is common to hear the sound of alternators and power window motors through CBs. This irritating "whine sound" can be reduced or eliminated by using extra capacitors, using a better ground for the radio, properly tuning the antenna with the vehicle, or a combination of all three.

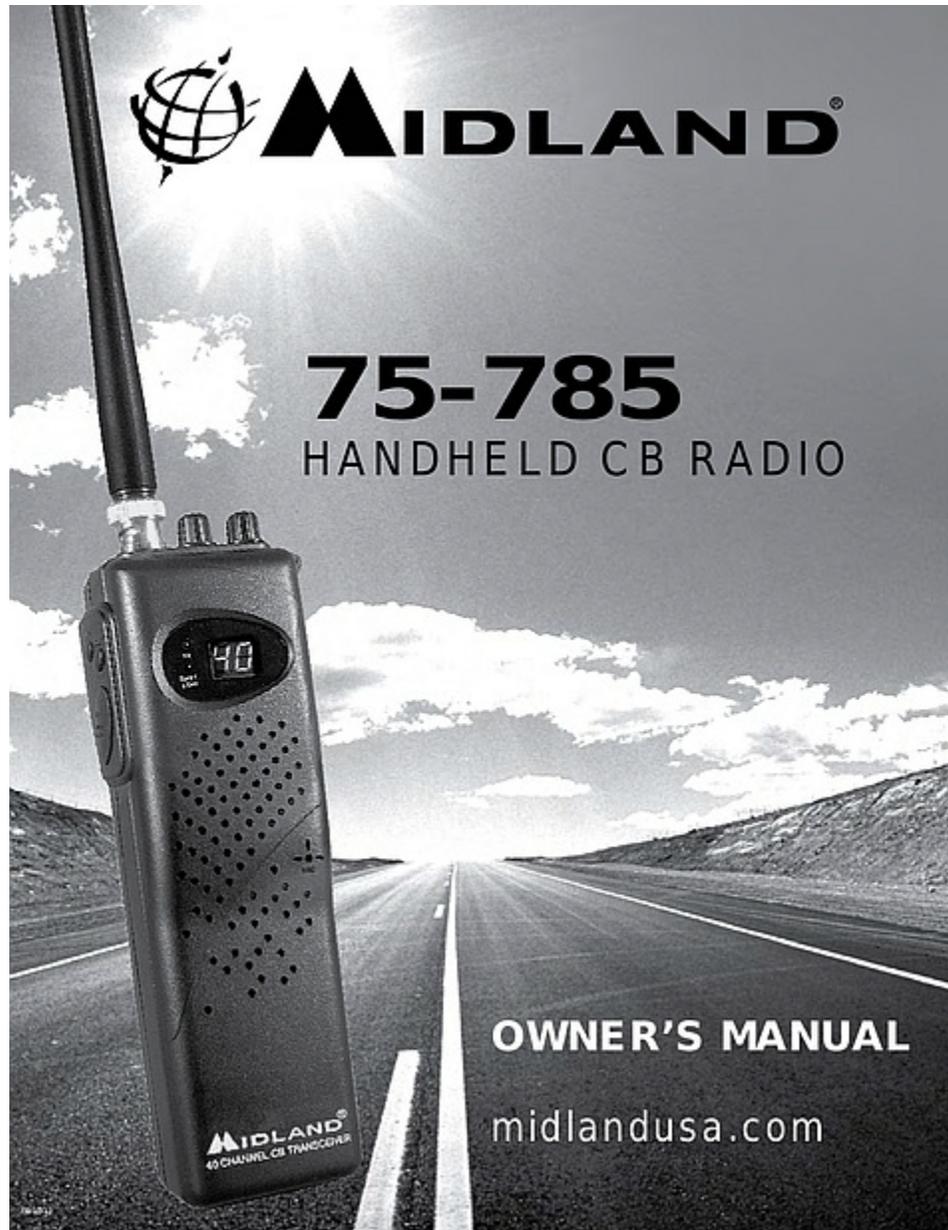
A good CB shop can tune your CB and antenna to your vehicle in about 30 minutes, and the cost should be around \$35.00. A decent quality CB costs \$100 to \$150, and a reasonable antenna costs between \$35 and \$75. Although our primary road trip vehicle has a permanently mounted antenna, we also use a handheld radio (which looks like an oversized walkie-talkie) and a magnet-mounted short antenna in our other vehicles. We find that it works fine, although there is an extra level of wear and tear on the coax cable over time since the door closes around it. Another option is to install a hand-held CB where the controls are all built into the microphone. We have had mixed results with this radio setup, and generally I recommend getting a standard format (box-like) transceiver if it will fit in your vehicle.

Generally, a properly tuned CB has a range of 10-20 miles, but it is "line of sight" transmission, and mountainous terrain can reduce this range to less than a mile. One of the things you might notice when using a CB is a slight, squeal-like harmonic which is an indicator of an atmospheric condition known as "skip". Basically, the radio signals are bouncing off the ionosphere, allowing you to hear conversations that are occurring hundreds, sometimes even thousands of miles away. Near my office in Las Vegas, Nevada, I can usually hear a CB shop that is transmitting from a location near Chicago, IL. The easiest channels to hear skip on are channels 1 to 5.

With the advent of better cellular phones, some folks rely on them when communicating with other cars on road trips, but we find that CBs actually work much better and often provide a much cleaner quality of sound. In addition, virtually all CB radios include weather channels which can be very helpful for obtaining quick and accurate weather conditions on unfamiliar roads.



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