Choosing a CB Antenna

Choosing a CB antenna can be a bit tricky, but only because there are so many choices. This document describes the various styles of CB antennas.

The first step in choosing an antenna depends on the type of vehicle you have. If you are mounting an antenna to a boat or fiberglass RV, you need a special type of antenna called a "no-ground-plane" antenna. Most CB antennas require a large metal surface (called a "ground plane") in order to work properly. The body of the vehicle typically serves this purpose. Boats and fiberglass vehicles lack a proper ground plane. A no-ground-plane antenna is specially designed for these applications. You can find these antennas at Radio Shack and places that sell boating and RV accessories. Please note that it is important not to modify or change the cable that comes with the antenna. The cable is specially matched to the antenna. There are not many choices of no-ground-plane antennas, so you will have to work with the styles you find available. They typically mount using some kind of bracket, except for the glass-mount type. If you need a no-ground-plane antenna, then you are done with this document (but you can skip below to the glass mount antenna).

The next step in choosing an antenna is to choose a mounting method. Listed below are some popular styles:

BASE STATION

If you are using a CB radio in your home, you will need a base-station antenna mounted on your roof. You do NOT want to use a mobile antenna. Mobile antennas are designed strictly for vehicles and will not work properly for base-station use. And any kind of indoor antenna will get truly lousy range.

Base-station antennas use the same type of mounts as TV antennas. Since the cable run can be rather long, it is best to use RG8 cable which has low loss. Base station antennas are available from a variety of vendors. Try browsing on the internet.

MAGNET MOUNT

A magnet mount antenna means just what it says. A large magnet keeps the antenna on the car. The magnet has a plastic covering so that it does not scratch the paint. The antenna can be mounted on the roof or the trunk lid, but roof mounting provides better performance. The cable is brought inside the car, and the door or trunk lid is closed over the cable. Or the cable can be brought in through the window. Magnet mount antennas are quick to install, easy to remove, and are easily transferred from one vehicle to another.

TRUNK LIP MOUNT

The trunk lip mount clamps on the edge of the trunk lid. It is usually mounted along the front of the trunk lid, just behind the rear window. It can also be mounted along the side edge of the trunk lid. No drilling is required.

BUMPER MOUNT

This is the place to choose if you want to use one of the really long whips. You can also mount a fiberglass antenna to the bumper. It will be necessary to drill a hole for the mount. If you use a fiberglass antenna, choose one that extends at least a foot above the roof of the vehicle. Bumper mounts are more difficult to install on vehicles with plastic bumpers.

FENDER MOUNT

This is accomplished with a ball mount, which lets you swivel the antenna so that it is vertical. It requires drilling a hole in the fender. Either a fiberglass or steel whip antenna can be used.

HOOD MOUNT

An antenna can be mounted at the edge of the hood by using a special bracket that fits between the gap between the hood and fender. A fiberglass antenna is typically used with this mount.

MIRROR MOUNT

Popular on big trucks, the mirror mount antenna clamps onto the mirror bracket. Plastic mirrors won't work, the mirror must have a metal bracket. In addition, it is important that the antenna clamp gets grounded to the vehicle. If the door is fiberglass, it will be necessary to run a ground wire to the antenna clamp. 12 gauge wire is recommended, connected to the nearest ground point on the chassis (the door hinge should be a good spot).

GUTTER MOUNT

A gutter mount antenna clamps onto the rain gutter above the door. Actually, most modern cars have done away with rain gutters to improve aerodynamics. After mounting, the antenna cable is brought inside the vehicle and the door is closed on the antenna. Or the cable can be brought in through the window.

GLASS MOUNT

A glass mount antenna mounts to a window on the vehicle. It is a permanent mount, and should not be mounted to any glass that rolls down or swings open. This type of antenna is short, and looks similar to a cellular phone antenna. The antenna is mounted on the outside with double sided tape, and a small box is mounted in the exact same spot inside the vehicle with double sided tape.

Glass mount antennas should not be mounted over any metallic tint or over defroster lines. Because of the short antenna and some signal loss through the glass, this type of antenna is one of the poorest performers. But it does offer a solution if other mounting methods are not acceptable. The glass mount antenna is a no-ground-plane antenna, and is therefore suitable for fiberglass vehicles and boats.

DUAL ANTANNAS

Dual antennas (also called co-phased antennas) are popular, more for looks than for performance. They are typically mounted using mirror mounts. This type of configuration provides increased range to the front and rear, and reduced range to the sides. For proper co-phasing, the antennas should be mounted approximately 9 feet apart. This limits the application to large trucks; the typical pickup is too narrow to provide 9 foot spacing. Co-phased antennas require 75 ohm RG-59 cable (rather than the 50 ohm RG-58 cable used for single antennas). Actually for overall use, a single antenna works just as well.

COMBINATION ANTENNAS

These are hard to find, but there are AM/FM/CB combination antennas. There is also a splitter device available which allows using your existing AM/FM antenna as a CB antenna, thus achieving the same result. There is no unsightly CB antenna, just the regular AM/FM antenna. But this is one of the worst performers for CB use. Using an AM/FM antenna will compromise CB performance.

JC Whitney carries both a combination antenna and a splitter device:

Combination Antenna: p/n 03NU6857U
Splitter Device: p/n 03NU9294X

Call them at 800-529-4486 or visit www.jcwhitney.com

Your final decision on an antenna may be influenced by the following:

LENGTH

This is THE MOST important characteristic that affects performance. The longer the antenna, the better the performance. A cheap 60 inch antenna will outperform an expensive "top-of-the-line" 30 inch antenna. Go with the longest antenna that is practical. The best performer is a 1/4 wave antenna, which is 108 inches long. That may be too long for you, but just remember that longer length equals better performance. Incidentally, you may see 102 inch whips. The missing 6 inches is made up by the mount.

STEEL OR FIBERGLASS

The only theoretical advantage of a fiberglass antenna over a steel whip is that being stiffer, a fiberglass antenna will stay more vertical at highway speeds. But actually there is not any noticeable difference in performance. Go with the style that you like best.

LOAD

Unless you are going with a 1/4 wave whip (108 inches), your antenna will have a "load". The load is a special wire coil which makes the antenna look (electrically) like it is 108 inches long. The radio cannot tell the difference. The load is located either at the base, the center, or the top. Because of the weight, only the stiff fiberglass antennas can be top loaded. As far as performance, the location of the load is not critical. But here is an example of when it might be important: lets say you have a bumper mount antenna on a minivan, and the antenna extends one foot above the roof. In this case much of the antenna is right next to the body of the vehicle, which will tend to reduce performance. Getting the load above the vehicle will help. So the best choice would be a top loaded antenna.

If you are mounting an antenna on the roof of a vehicle, location of the load is not important.

WEATHER RECEPTION

Some CB radios provide reception of government weather broadcasts, which is a nice feature. But not all CB antennas are compatible with weather reception. Here are the rules:

1. All center loaded and top loaded (fiberglass) antennas are compatible with weather reception.

2. Not all base loaded antennas are compatible with weather reception. If you are buying a base loaded antenna, make sure it says that it is compatible with weather reception.

OK! Now you have finally chosen an antenna and installed it and are happy. The last thing you need to do is adjust (tune) the antenna for proper operation in the CB band. This is accomplished by checking the "SWR" of the antenna. Most CB antennas are adjustable, which should be described in the instructions that came with the antenna (you did save the instructions, didn't you?).

A separate document is available which discusses SWR.