Antenna Bonanza for 10 —CB is good for something

Modifying your antenna is easy.

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Most CB equipment can be modified, tuned, or used as is to operate on 10 meters. Many excellent articles have been published on the modification of transceivers. I am working on a vfo to work with these modified units. Each CB modification results in the necessity of a good 10 meter antenna.

The CB industry is manufacturing an array of excellent economical antennas that can be easily modified to 10 meters with a near perfect match. If you are looking for a real bargain, don't overlook your local swap meets.

Here is how to modify several types of antennas. The tuning will be covered later. The actual length will vary with each type of antenna.

Mobile—Base-Loaded Steel Whip, 47 Inches

It was necessary to reduce the whip length to 41 inches. The original whip was retained for 11 meters and another whip was cut for 10 meter operation: swr, 1.2 to 1—29 MHz.

Fixed Station—Vertical Half Wave

No modification: swr, 1.8 to 1—29 MHz. This antenna is known as a Starduster. If you don't mind a little swr, use it as is. Cutting it to length would be difficult since the coax is inside the bottom element.

Fixed Station—Quarter-wave Ground Plane

This antenna had three 106-inch radials and one 106-inch vertical driven element. The vertical element was shortened from 106 to 96 inches. The three radials were not modified: swr 1.2 to 1—29MHz.

The above antennas are being used on 10 meters. The measurements are actual. The following is theoretical.

Mobile—Quarter-wave Whip

Reduce length in accordance with the pruning procedure.

Mobile—Fiberglass Wire-wound

These antennas are made by winding wire around a fiberglass rod and then applying shrink tubing over the entire length. The tuning consists of removing turns of wire from the top end. The frequency is determined by the number of turns rather than the overall length of the glass rod. The size of wire determines the power handling capability. 18-gauge wire will handle 200 Watts.

Fixed Station—5/8-wave Vertical

These antennas normally have a loading coil to obtain electrical length without extending the mechanical length. Tuning would consist of reducing the mechanical length. The loading coil is located in the bottom end of the antenna assembly, and is not readily available for modification. If the loading coil is wound with small wire, it will not handle power. This is a good antenna to stay away from!

CB Beam Antennas

For the modification of beams, refer to antenna handbooks. Check swr and, if it is not more than 2 to 1 and it has a front-to-back ratio on receive, try using it as is.

A contact was made with a ham in Michigan who was using a vertical three-element CB Super Scanner beam as is. S9 reports were received on both ends of the contact.

Mobile—Center-Loading Coil

Tuning is accomplished by shortening the whip on the top end of the coil. The actual length will be critical and the bandwidth narrow.

Loading Coils

Antenna loading coils are sealed against moisture. This is normally accomplished by injection molding or potting the coil in epoxy. Do not attempt to remove coil turns unless you have determined a satisfactory method of resealing.

Power Handling Capability

Antennas without

loading coils are usually good for a kW. RG-58 coax is satisfactory up to 200 Watts input. Above this level, use RG-8/U.

Antennas with loading coils have power limitations. The larger the wire in the loading coil, the more power it will handle. Visual inspection of wire size is usually impossible due to moisture seals.

A clue to power capabilities is the outside diameter of the loading coil housing. If it's ½ inch or less, the power handling capability will be low, not more than 25 Watts. Excess power will cause the coil to heat and possible coil destruction. If there is a gradual increase in swr when the transmitter is turned on, the chances are that the loading coil is working up a fever.

Antenna Tuners

Antenna tuners are not required. Do not have one in the line when changing the length of the driven element. There is nothing wrong with trying a tuner with a CB antenna as is.

Pruning Procedure

Regardless of antenna type, the tuning from 27 MHz to 29 MHz requires the reduction of the electrical length of the driven element.

An swr bridge is required. The function switch is first placed in the forward position and adjusted for set level. The switch is then placed in the reflected position and the swr recorded.

Let's assume your modified transceiver has the following transmit frequencies: channel 1—28,965 kHz, channel 13—29,115 kHz, and channel 23—29,255 kHz. The center frequency is 29,115 kHz, so this is where you should adjust for minimum swr.

Minimum swr will not necessarily be a perfect match—1 to 1. It could be 1.3 to 1 or even 1.5 to 1. Do not settle for more than 1.5 to 1. This would indicate there is a problem somewhere.

A base-loaded mobile CB antenna, when operated on 10 meters, will show an swr reading of approximately 4 to 1. A quarter-wave base antenna will show an swr reading of approximately 2.5 to 1. A loading coil narrows antenna bandwidth.

While pruning a mobile antenna whip, cut off 1 inch at a time until the swr drops below 2 to 1. From this point on, cut only ½ inch at a time. The best way to cut a stainless steel whip is to use the edge of a file to notch the whip and then break off the notched piece with pliers. All mobile antennas have an adjustment screw which allows at least a ½-inch adjustment. With this adjustment, it is possible to obtain minimum swr at the center of your operating frequencies.

Pruning Fixed Station Antennas

The procedure is the same but not as critical. Cut off 2 inches at a time until the swr drops below 2 to 1, and then cut only 1 inch at a time until you obtain minimum swr at the center of your operating frequencies.

In the pruning of any antenna, all swr measurements must be made with the antenna in its permanent position. If it's going to be mounted on the roof, that's where you adjust it. If it's a mobile installation on the trunk lid, close the lid and position the car in the clear, away from all obstructions such as trees, buildings, and other automobiles. Close the car doors during swr measurements.■