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By Ruth Stroud, W9BRN, and Dick Stroud, W9SR

# RV Radio

Thousands of hams have found that operating from a motor home is the only way to go—when you're on the go.

Aside from Amateur Radio, our family has always been interested in camping and traveling. This led several years ago to the purchase of a motor home and the desire to carry the radio equipment along on our travels. We quickly met other motoring hams and became aware of several RV ham clubs. We have many lifelong friends who share the two interests.

Information on the three major RV ham clubs can be found at the excellent Web sites hosted by Bill Crockett, KB4OB, at [www.rvweb.net](http://www.rvweb.net). These sites provide contact information, membership lists, rally activities, related links, and much more. Some members belong to more than one club and, in many cases, both the husband and wife are licensed operators.

## Clubs and Conventions

Organized in 1981, the Amateur Radio Chapter of the Family Motor Coach Association ([www.rvweb.net/club/fmcarc/index.html](http://www.rvweb.net/club/fmcarc/index.html)) consists of about 300 motor home owners from the US and Canada. Members meet daily at 14.263 MHz SSB with the women starting at 1830Z and the men taking over at



Figure 1—All within reach: the ergonomic operating position of K4CAV.

1900Z. The ARC chapter also has at least two annual meetings at various locations across the country. They also attend the FMCA National Conventions, held twice a year somewhere in the US. These conventions typically draw 3000 to 7000 motor homes. In August 2000, the FMCA National Convention was held at the Brunswick Naval Air Station in Maine with nearly 7500 motor homes parked on the vacated runways (see photo below). The chapter presents an Amateur Radio

forum at FMCA National Conventions, and members host license exams, sometimes with the help of local clubs.

The RV Radio Network ([www.rvweb.net/club/gsrvnet/index.html](http://www.rvweb.net/club/gsrvnet/index.html)) caters to members with either trailers or motor homes. Their membership numbers about 400 and they also meet twice a year drawing as many as 90 units to a rally. They meet on the air at 7281.5 kHz, Monday through Friday, at 7:30 PM Central time.

The Wally Byam Caravan Club, Inter-

FAMILY MOTOR COACH ASSOCIATION



DICK STROUD, W9SF



Figure 2—The author's operating position is at a desk in his Cruisair III motor home. The 2 meter radio is near the driver's seat.

DICK STROUD, W9SF



Figure 3—The author's manual tilt-over antenna mount. A removable pin locks the PVC antenna base into position, and a weatherproof switch selects the antenna in use.

national (WBCCI) ([www.rvweb.net/club/wbcciarc/index.html](http://www.rvweb.net/club/wbcciarc/index.html)) consists of about 600 members and was formed in 1963. Members own either motor homes or trailers and normally meet in a winter rally at Christmas, Florida. They have a 20 meter net at 1200 and 1700 ET on 14.3075 MHz. A daily 40 meter morning net on 7233.3 kHz from 0730 to 0900 ET attracts members from across the country. The WBCCI club also hosts a daily 2 meter FM "Web-foot" net covering the Rio Grande Valley at 0830 local time using repeater linking. Frequencies are 145.23 MHz (upper valley) and 145.39 MHz (lower valley).

There are many other clubs across the country with similar interests. Each of the three clubs listed publishes a regular newsletter and activities at their rallies are very similar. Aside from lots of food and fellowship, seminars relating to radio and RVs are held and tours are often taken to places of interest in the area. Craft classes are held for the women. A radio related flea market is also normally held. Local clubs are sometimes contacted and invited to the flea market and other get-acquainted activities, such as a cookout. Entertainment is scheduled throughout the rally. Antenna measuring and adjustment is another common activity. Some members with a keen interest in radio-controlled planes and boats often provide entertainment. There are no strangers in the group!

Several members are retired and winter over in the South. They tend to locate in common areas and use the daily nets to keep in touch. We often travel as groups to and from rallies and conventions. When this happens all are in contact via 2 meter FM and moving the group is done with precision. Each unit is sometimes assigned a number to make identification and movement easier. We normally use

146.52 MHz when traveling en route and switch to 146.55 MHz when parked in a campground. In cases of conflict with local frequencies we switch to an alternate. Typical range of the 2 meter units mounted in a motor home is at least 20-25 miles depending on terrain.

RV mobilizing is always interesting. Once traveling on I-55 we gave a short CQ on 2 meter FM and was answered by friends we had not seen in some time who happened to be traveling a few miles ahead of us. We both pulled into the next rest stop and caught up on the latest happenings. After that we shared an enjoyable lunch in one of the coaches. This sort of thing happens often.

At Dayton, many RVers get together each year at the local KOA for a mini-hamfest a few days prior to the start of the Hamvention. On some outings RV operation can be for an extended period with no connection to power lines. This is called "boondocking"; the generator is used intermittently to keep the batteries charged. Solar panels are common.

### Antennas and Gear

Equipment in the RV can range from a simple transceiver sitting on the dash or kitchen table to an elaborate, built-in, multi-radio system with computer and digital equipment. Just about any operating mode used in the home station has been used from the RV. CW, SSB, and the digital modes are common and several use the Winlink system for e-mailing. (See [winlink.org/k4cjsx/](http://winlink.org/k4cjsx/) for information.) Practically all RV hams carry 2 meter FM radios for use between RVs while caravanning, for use with repeaters, and as an intercom when in the campground. The 2 meter transceiver is always located within easy reach of the driver. It is a good idea to monitor the ac voltage supplied

from the campground, as this can vary a lot possibly damaging your equipment. One of the plug-in volt/phase monitors is recommended.

Several problems are unique to RV mobile installations. You have an advantage of antenna height but at the same time there is a road height restriction of 13½ to 14½ feet, depending on the state, so if you exceed that you can expect to be hitting a few obstructions.

Noise, both radiated and conducted, can be a problem in an RV. It is less pronounced on FM than SSB, but can be a nuisance anywhere. Much of the noise can be reduced using filtering and shielding methods described in *The ARRL Handbook* and *Radio Frequency Interference*.<sup>1</sup> Another good source is the ARRL Technical Information Service Web page devoted to RFI, [www.arrl.org/tis/info/rfgen.html](http://www.arrl.org/tis/info/rfgen.html).

### Antennas

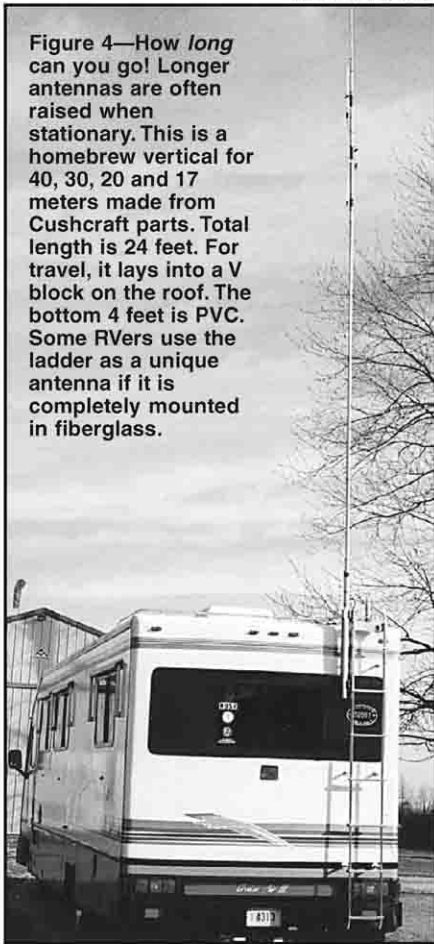
Very few, if any, RV antenna systems are exactly alike. The 2 meter antenna should be vertically mounted as near the top of the RV as possible. Several commercial models are available in ¼, ⅝ and ½ wavelength designs. The ⅝ and ½ wavelength units have slightly more gain

<sup>1</sup>Notes appear on page 54.

DICK STROUD, W9SR

GORDON BENNETT, K7PED

Figure 4—How long can you go! Longer antennas are often raised when stationary. This is a homebrew vertical for 40, 30, 20 and 17 meters made from Cushcraft parts. Total length is 24 feet. For travel, it lays into a V block on the roof. The bottom 4 feet is PVC. Some RVers use the ladder as a unique antenna if it is completely mounted in fiberglass.



but can be a little harder to mount and match. A ground plane is required with the  $\frac{1}{4}$  and  $\frac{5}{8}$  wave models. This can be the metal roof, metal frame members, or three or four 20 inch wires laid out and cemented on a rubber or fiberglass roof and attached to the coax shield at the base of the antenna. We have had great success with a  $\frac{1}{2}$  wavelength through-the-glass antenna mounted on an upper corner of the coach windshield. This requires little effort and no ground plane is required. Do not mount your 2 meter and HF antennas close together as the radiation pattern can be affected and damage to opposite receivers is also possible.

For HF, many RV hams use a relatively short vertical loaded whip while traveling and raise a longer, more efficient antenna upon arriving at a campground. Several methods are used to raise the longer antennas. With the manual approach the antenna is usually mounted on the ladder or near the rear of the RV and lies forward on the roof in the stowed position. A short mast extension behind the pivot point is then pulled down from the ladder or with a rope to raise the antenna, which is then locked into position.

Some operators use a dc motor to drive

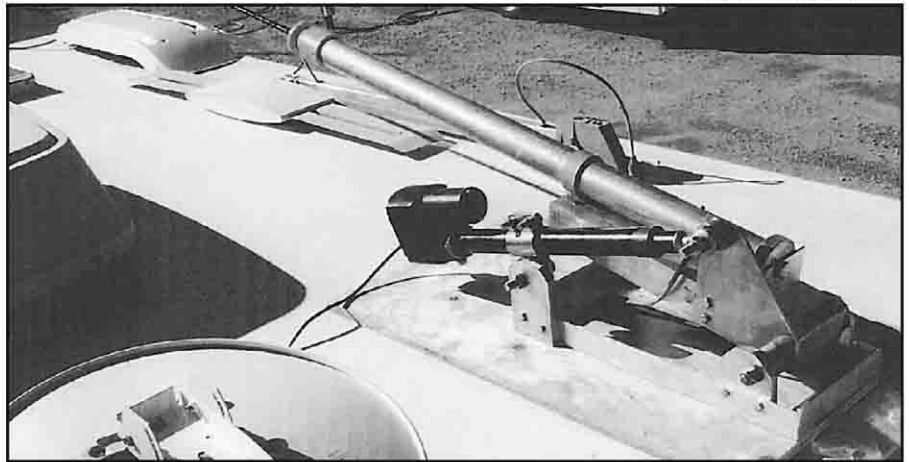


Figure 5—A 12 V antenna lift made of structural aluminum. This unit can raise a large antenna to vertical in about 45 seconds.

a mechanism that raises and holds the antenna. This has an advantage in that the antenna can be stopped at any angle to avoid tree limbs and other obstructions. Also, being able to raise the antenna remotely is a distinct advantage if it happens to be raining! TV satellite dish drives and car window opener motors are sometimes used to raise the antenna, along with the proper gearing and microswitch travel limit controls. One such antenna lift system is designed and marketed by K7PED and shown in Figure 5.<sup>2</sup> Some tie their longer antennas back at an angle behind the motor home and use it while traveling, still clearing obstructions.

Examples of the loaded verticals commonly in use are the Hustler, Bugcatcher and Hamstick. These are normally mounted at the top of the ladder and require some type of ground plane. One HF antenna now commonly used is the screwdriver, so named because it uses a modified screwdriver motor to move shorting contacts, which allow remote band changing. This is basically a  $\frac{1}{4}$  wave antenna with the series inductance varied with the motor and leadscrew assembly.

If you run coax from front to rear under a motor home, be sure to avoid such hot areas as the muffler and tailpipe. If the coax becomes hot it can permanently change impedance or completely short out.

The part of an installation often overlooked is the ground plane, or second half of the antenna. If you use a  $\frac{1}{2}$  wave antenna, no ground plane or counterpoise is needed. With a typical  $\frac{1}{4}$  wave loaded HF system, however, it is very important. With an aluminum roof, the ground plane for your antenna is a snap. Just ground the coax shield to the roof at the base of the antenna using a short braid. Most modern units have a fiberglass or rubber roof and the ground plane is a little more complicated. The ladder and upper railing, if so equipped, can

be bonded together for the ground plane, but this is not the best, especially at the lower bands. Another scheme is to extend a group of wires forward from the ladder mounted antenna base along the roof where they are tacked down with the proper adhesive. The wires should be attached to the coax shield directly at the base of the antenna and fanned out as far as possible and forward on the roof. Wide metallized adhesive backed tape can be used in place of the wires.

Some RV hams use an HF power amplifier to increase the range of their mobile station. These are usually in the 300-800 W range and may be powered directly from the battery or from the ac power lines (generator when traveling). Be sure to include a good low-pass filter following the amplifier, as in a campground many TV viewers are located in a small area and your transmitter harmonics won't be welcome!

### Join Us!

If you're a motor home owner—or you would like to be—get in touch with any of the groups mentioned in this article. You're bound to find a warm welcome into the world of RV hamming.

### Notes

<sup>1</sup>Both are available from your local dealer or from the ARRL Bookstore. Telephone toll-free in the US 888-277-5289, or elsewhere 860-594-0355, fax 860-594-0303; [www.arrl.org/shop/](http://www.arrl.org/shop/); [pubsales@arrl.org](mailto:pubsales@arrl.org).

<sup>2</sup>Gordon B. Bennett, 17201 Fortuna Palms Pl, Yuma, AZ 85367.

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