

CQ REVIEWS:

The Create CLP 5130-1 Log Periodic Antenna

BY JOE LYNCH*, N6CL

Log periodic antennas are popular with amateur radio operators because of their broad frequency coverage. They have been around in amateur radio use in some form or another since the 1960s. Over the years amateur radio publications have contained in excess of 40 articles on their construction and theory of operation. In addition, *The ARRL Antenna Book* devotes a chapter (27 pages) to the design and construction of these antennas.

While they represent a compromise in gain, they make up for it in versatility. Additionally, the low overall SWR and good front-to-back and front-to-side patterns are pluses for log periodic antennas.

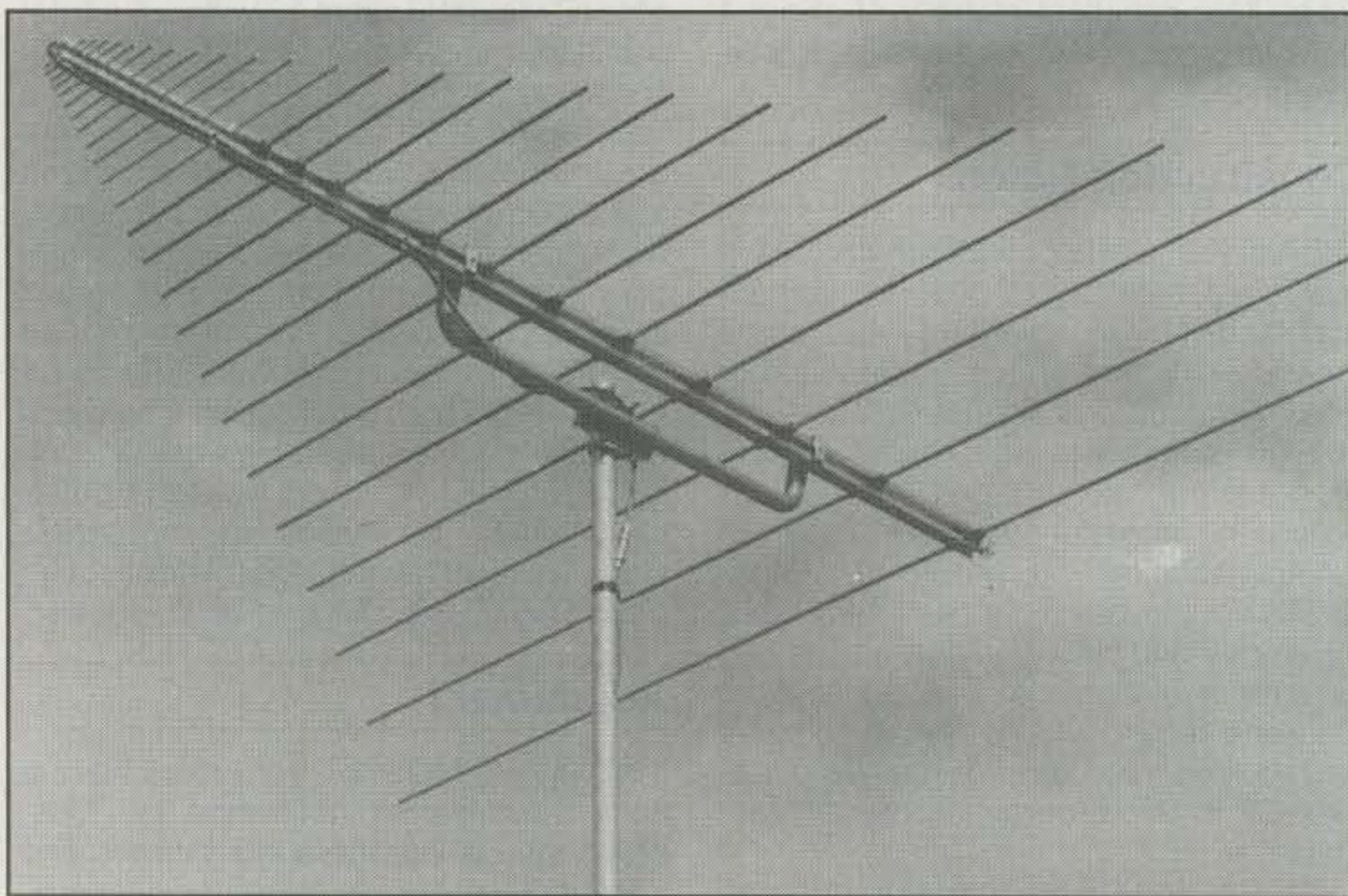
Typically, insofar as gain, the log periodic operates similar to a 3-element Yagi antenna over a given frequency range. The gain you can expect, however, is a bit lower than that of a 3-element antenna. It is, at the most, around 6-7 dB over a dipole antenna.

Because of the broad frequency coverage in one antenna, log periodics have become popular with the VHF+ amateur and SWL. In fact, most people's exposure to the log periodic antenna is by way of their TV antenna.

Enter a log periodic for amateur radio VHF+ use. For more than a year the Create CLP 5130 series VHF/UHF log periodic antennas have been available to U.S. buyers. There are two models that are imported by Electronic Distributors Co. They are the 5130-1, which covers 50-1300 MHz, and the 5130-2, which covers 105-1300 MHz.

After hearing that a growing number of my fellow VHF+ operators had obtained the 5130-1 model, particularly for their Rover operations, I decided that I also had to have one. I ordered mine, and it came on a cold winter's day here in Oklahoma. Not wanting to venture outside to assemble it, I took a chance that it would not be too large, fully assembled, to fit into the living room.

Upon opening the box, I found that everything was packed in a logical, organized manner. The hardware was packed inside various sealed plastic bags. I unpacked everything and laid out the parts on the carpet. I then emptied the hardware into separate bowls that I previous-



If you can have only one antenna for VHF/UHF operating, you should consider buying the Create CLP 5130-1 log periodic.

ly had obtained from the kitchen. So far, so good.

Next I read the manual. I found it to be adequate. It was skimpy on detailed instructions, which left a bit of the construction to my imagination. And I caught a few grammatical errors and misspellings. However, it was full of cautions concerning the installation of the antenna, and I was quite pleased to see that. It also had one curious sentence, and I have not been able to figure out where this information came from. It states: "Height limitations are placed on antenna installations by the FCC, normally at 20 meters above ground or 10 meters above a building for amateurs." This is the only bit of misinformation that I found. Nevertheless, after reading the manual I forged ahead.

The first item to construct was the front boom section. This part comes in two sections, with each containing 12 of the elements (elements 2-13) folded back onto each boom section for shipping. My job was to fan out these elements to a 90° position and lock them into place with the appropriate screws and nuts.

After assembling the front boom, I bolted the two sections of it together at the appropriate place using the appropriate

screw, lock washer, nut, rubber spacers, and plastic sleeve and temporarily set it aside.

The next section to construct was the rear boom section. It is composed of two rails that are held together by rubberized insulators that also hold the elements. This section comes bolted together at each end. You must position and then bolt in place the remaining ten insulators using the same type of spacers, screws, washers, and nuts as applied in the front boom section. *Note:* Perform this assembly before you start inserting the elements. I forgot and found it a bit challenging to reach around or between the elements in order to hold the nut in place while turning the screw.

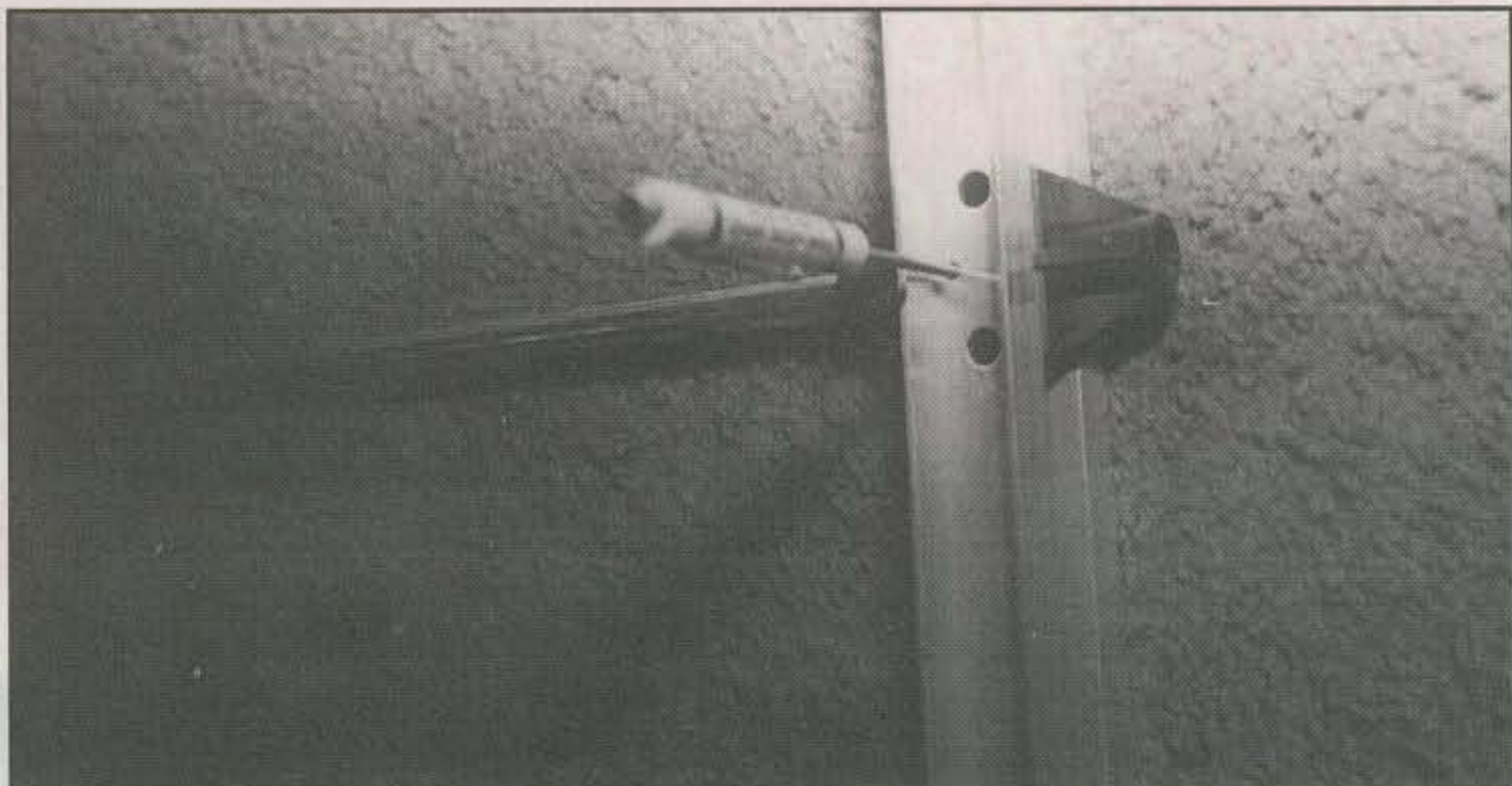
Next comes the assembly of the elements. They are slid into the holes of the rubber insulators and attached to the rails with a self-tapping screw. They go in fairly smoothly. However, after inserting the element, I found that I needed to use a small Phillips-type screwdriver blade or awl poked into the hole on the rail and into the insulator in order to align the hole on the element prior to driving in the self-tapping screw.

The next assembly was the joining of

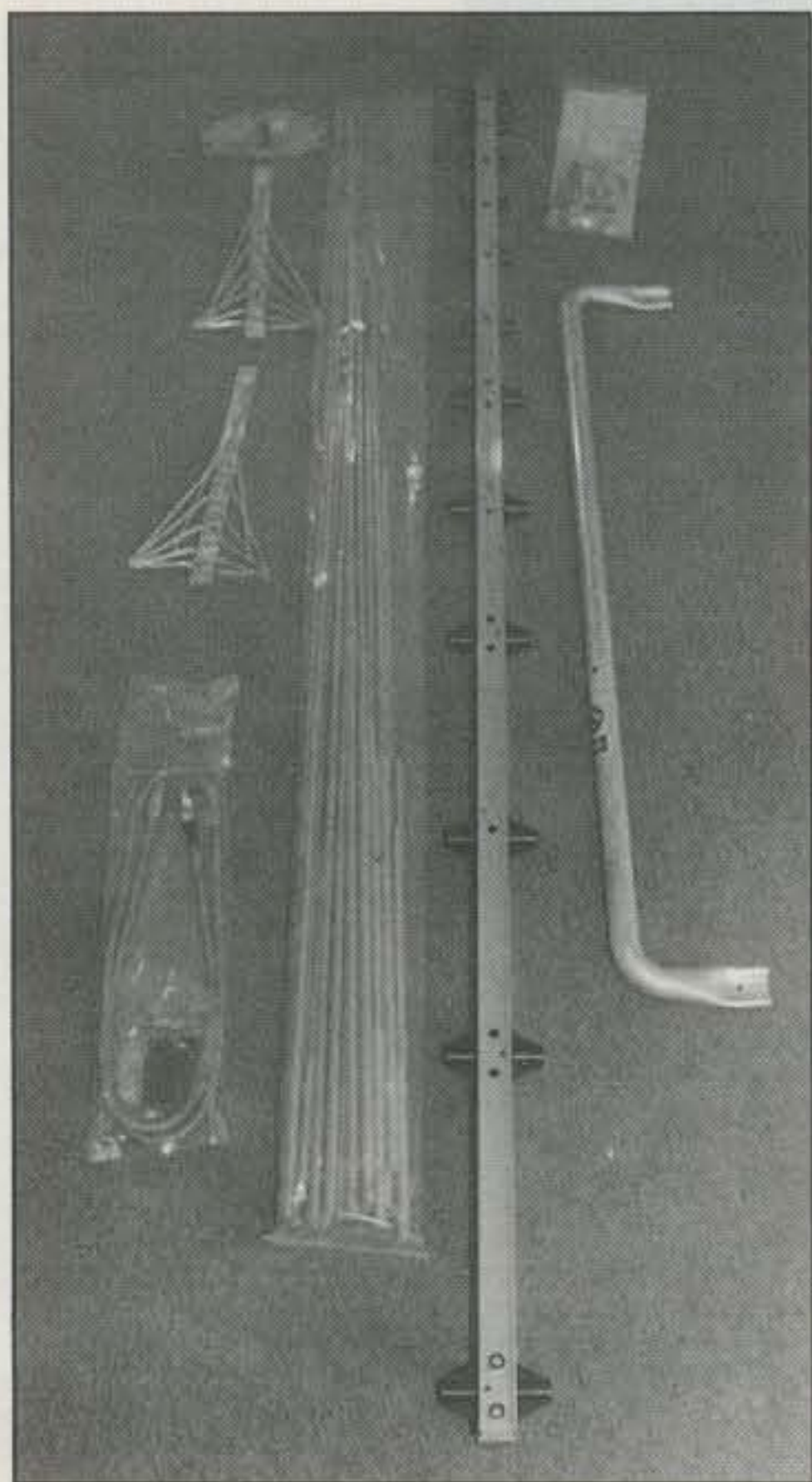
*P.O. Box 73, Oklahoma City, OK 73101

Frequency	50–1300 MHz
Number of elements	25
Polarization	Horizontal (vertical possible)
Forward Gain	10–12 dBi (claimed)
F/B Ratio	15 dB
Impedance	50 ohms
Half Power Point	70–60 degrees
VSWR	2.0:1 or less
Power Rating	500W PEP
Boom Length	6'8" (2.0 m)
Element Length	Max. 9'10" (3 m)
Mast Size	1 1/2–2" (38–50 mm)
Weight	11 lbs. (5 kg)
Wind Survival	90 mph (40 m/sec.)

Table 1—Manufacturer's specifications for the Create log periodic CLP 5130-1.



I used a small Phillips-type screwdriver to align the holes of the element, insulator, and boom before driving in the self-tapping screw.



All the parts for the Create CLP 5130-1 log periodic antenna were neatly boxed. Here they are placed on the living room floor ready for assembly.

the two booms. This is done simply by sliding the front boom into the grooves on the front of the rear boom and attaching the front boom to the rear boom with two lock washers and screws. There are nuts welded to the under side of each of the front boom sections, so there is no necessity to fumble around and hold a nut in place while driving in the screw.

The antenna is fed from the very front of the boom. It uses a specially designed section of coax that contains feeder plates on one end and a type-N female connector on the other. The feeder plates are held in place by two screws each

which pass through the feeder plate and then attach to the first elements of the antenna. Again, there is no need to fumble with holding nuts between the rails of the front boom while driving the screws, because the holes in the elements are threaded.

Once attached to the front of the boom, the coax is then routed toward the center of the boom and held in place by three plastic clamps. The design of the rails of the boom is such that no matter to which side you attach feeder plates, there are corresponding holes along the rails for the screws and nuts to attach the plastic clamps. *Note:* While the illustration shows the nut on the outside of the rail, I found that it was easier to secure the screw and nut by having the screw on the outside.

The next assembly was that of the boom clamp. There are four rubberized spacers that go on each side of the rails. The boom clamp is attached so that it is on the same side of the antenna as the coax cable.

On one side of the rails and the spacers you attach the boom clamp. On the other side you attach the plates. The boom is situated just in front of the eighteenth element (called E-17 in the illustration) and about 2 1/2 inches behind the twenty-third element (called E-22 in the illustration).

Once the boom clamp is attached, the boom-to-mast plate is installed. There are four "U" clamps, two of each size supplied. For convenience and reference (see further on in this article for orientation of the plate for polarization of the antenna) I attached the larger "U" clamps at this time. Next I attached the plate to the boom clamp using the two smaller "U" clamps and the nuts and lock washers.

Here is where you determine the polarization orientation of the antenna. Before you tighten the nuts, determine whether you will orient the antenna horizontally or vertically. For my installation I chose hor-

izontally.

If your choice is horizontally, swing the plate around so that the larger "U" clamps are directly underneath the boom. If you choose a vertical orientation, swing the plate around so that the larger "U" clamps are perpendicular to the antenna elements. *Note:* If you choose a vertical orientation, once the plate is secured, notice which side of the antenna elements are pointing upward when the antenna will be installed. Then plug the ends of these elements with the supplied rubber plugs.

The last item to be attached is the arrestor coil. It is secured to the rear of the boom through two holes. However, this is an item that you may want to wait to attach until you are just about ready to install the antenna. If you are like me, you may want to lean the antenna against something (like the back of a van or the side of the house). If you do so with the arrestor coil in place, you can very easily crush it. So wait to install it, but don't forget it because it provides an electrical short of the two rails of the boom and is necessary for the proper operation of the antenna.

Every time I write a review of an antenna I caution you about installing it. This review is no exception. **Warning: High voltage lines can kill you.** The minimum clearance between an antenna and an overhead power line is 10 feet. This antenna is small and light enough so that you can install it almost anywhere—even in your attic. If you cannot find a safe place outdoors, then put it in your attic. Even then, avoid poking the elements into power lines running through the attic.

If you are installing the antenna on the outside, then make sure that the mast is clear of power lines and power company service drops into your house should the mast fall to the ground. Above all, in your antenna installation play it safe.

What about the practicality of this antenna? With its frequency range you can cover 6 and 2 meters, as well as 135, 70,

33, and 23 cm. As mentioned above, friends of mine are already using it for Rover operations.

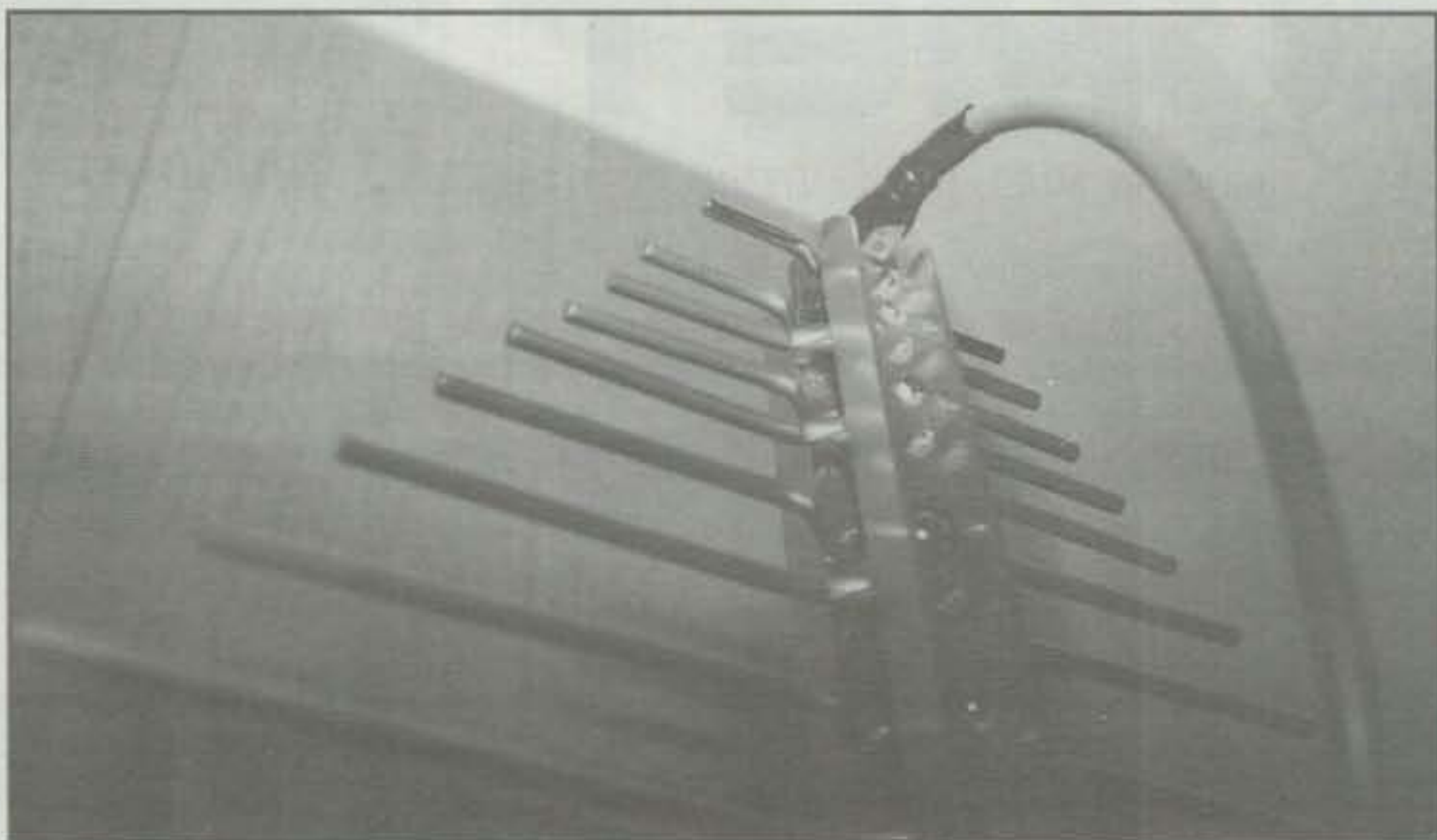
You can use it in the vertically polarized position to work into a local split repeater. For example, with my TM 742 and the Diamond MX-72H duplexer, which combines the two outputs for the separate bands, I can work crossband through a 70 cm input/2 meter output repeater.

Keep in mind, however, that should you orient the antenna vertically, the top portion of the mast must be made from non-conductive material in order to keep the mast "out of the plane" of the antenna. Additionally, the coax should be routed in such a manner that it is also kept "out of the pattern" of the vertically polarized antenna.

I solved this problem by using a piece of PVC-type electrical conduit that was reinforced with a wooden dowel rod inside of it for the mast section. Next I created a loop from the coax by taping the top of the loop to the top of the mast and the bottom of the loop around 5 feet down from the top of the mast. The size of the loop is not critical, just so that there is about a foot at the center of the loop and the loop is facing perpendicularly away from the antenna.

You can also use this antenna for your packet station.

You might want to put up one of these antennas and tell your neighbors that it is a TV antenna, because it can also double as a TV antenna since it covers all the



The specially designed coaxial cable is attached to the front of the log periodic by four screws and the front two (self threaded) elements.

channels, both VHF and UHF.

Speaking of TV, this antenna can be used for ATV. Whether you are working simplex or through an in-band repeater or a crossband repeater, the versatility of its frequency coverage makes it practical for any ATV operation on the three most popular ATV bands.

Are you an SWL who likes to monitor scanner frequencies on the VHF/UHF bands? This antenna covers them.


Overall, I found the construction laborious (which is to be expected, considering its complexity). However, the layout of the construction was well organized.

It is important to note that when designing such a complicated multi-element (25 in all) antenna, one must keep in mind the

ultimate assembly of it by an amateur builder. For this model I can say that the engineers at Creative Design Company live up to their name.

Incidentally, I was right about my antenna fitting into the living room fully assembled, because fully assembled it fit on the floor just fine and it just slid underneath the door frame as I took it out the front door.

As mentioned above, the antenna is imported by Electronic Distributors Co., P.O. Box 1936, Vienna, VA 22180. You can call 703-938-8105 or FAX 703-938-6911 to find out the name of the dealer nearest you. The suggested retail price of the CLP 5130-1 is \$299.95, and the 5130-2 is \$199.95.



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The Arrestor coil is the last item to be installed. You might want to wait to install it just prior to installing the antenna in order to keep from accidentally crushing it.