Here's a good weekend project that will get you up and running on 30 meters.

How To Build a 80 And 30 Meter Trapped Dipole

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A few weeks ago I picked up my soldering pencil and went to work on my rig to add the 10 MHz, 30 meter band to it. The conversion was a success, but now an antenna was needed to go with it. I tried running it on my 80 meter dipole, using a tuner, but the results left a great deal to be desired. So, out came the reference texts and a calculator and within a few minutes a trap was designed which, if it worked, would permit operation on both 80 and 30 meters without a tuner. From the calculations it appeared that a good trap could be fabricated by building a tank circuit that would resonate on 10 MHz. This called for an 80 pf capacitor and a 3.2 uh coil. With these figures in mind an expedition was launched into the archaelogical junk heap which is made up of old parts and items one buys at hamfests, then can't figure out what to do with them later. Armed now with a fist full of parts, and the plan, a simple prototype trap was fabricated and installed on the 80 meter dipole. The results were good and after a few trial runs the SWR readings were around 1.5-1 on both 30 and 80 meters. The unit was then encapsulated in plastic tubing and installed permanently on the dipole. The total cost ran under $7.00 and actual fabrication time ran around two hours. Even if you had to buy everything the entire project could be completed for under $15.00.

The steps needed to build the traps are simple and can be altered to meet the parts you have on hand. Start off by laying out the pattern on the ¼" plexiglass. The ½" radius cuts are added only to make treading the coil onto the form easier. Care should be taken to get the grooves even and safety glasses should be worn when doing the actual cutting. I made the slots on a table saw with a blade that was ⅛" wide. The coil is fabricated by wrapping the wire tightly around a 1 ⅝" cyclinder. The wire was obtained by stripping some 14 gauge Romex house-wire and the winding form was a bedpost in my daughters room. It is suggested that you get the wire as straight and as smooth as possible, as the coil will be hard to form if the wire is kinked. One way to get it smooth is to pull it over a slightly round edge several times. once you have made about 15 turns let the wire go and it should spring open just a bit. If the coil has about a 1 ¾" inside diameter then you're in the ball park.

The coil can be easily threaded onto the plexiglass-form by simply turning it. If it doesn't go on easily, try winding the coil in the opposite direction. Once it is in

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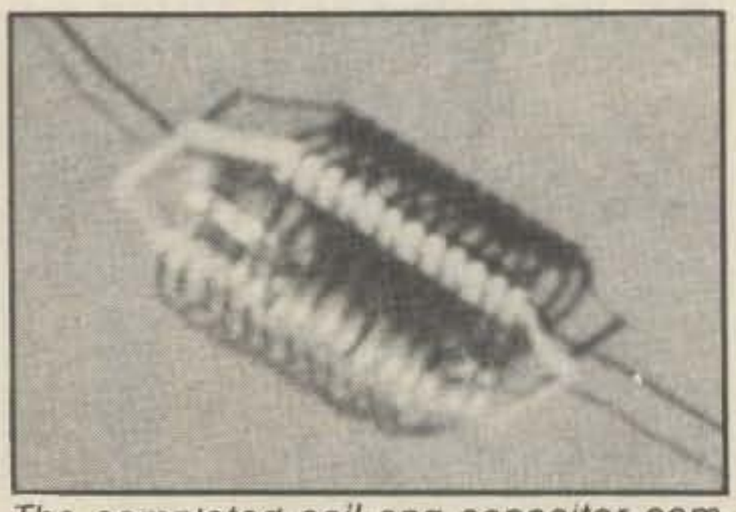
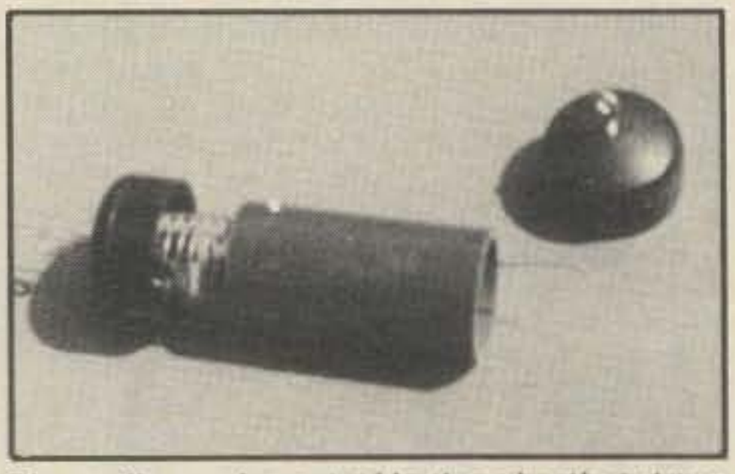
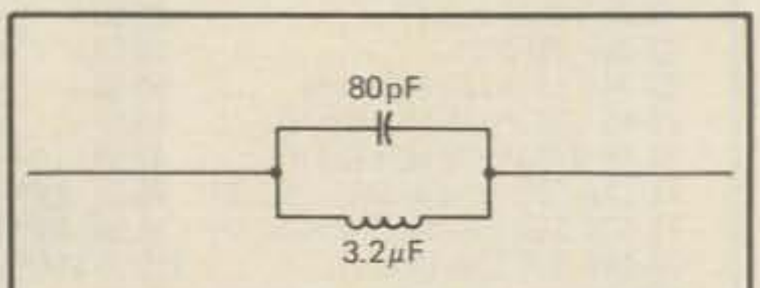


The completed coil and capacitor combination.



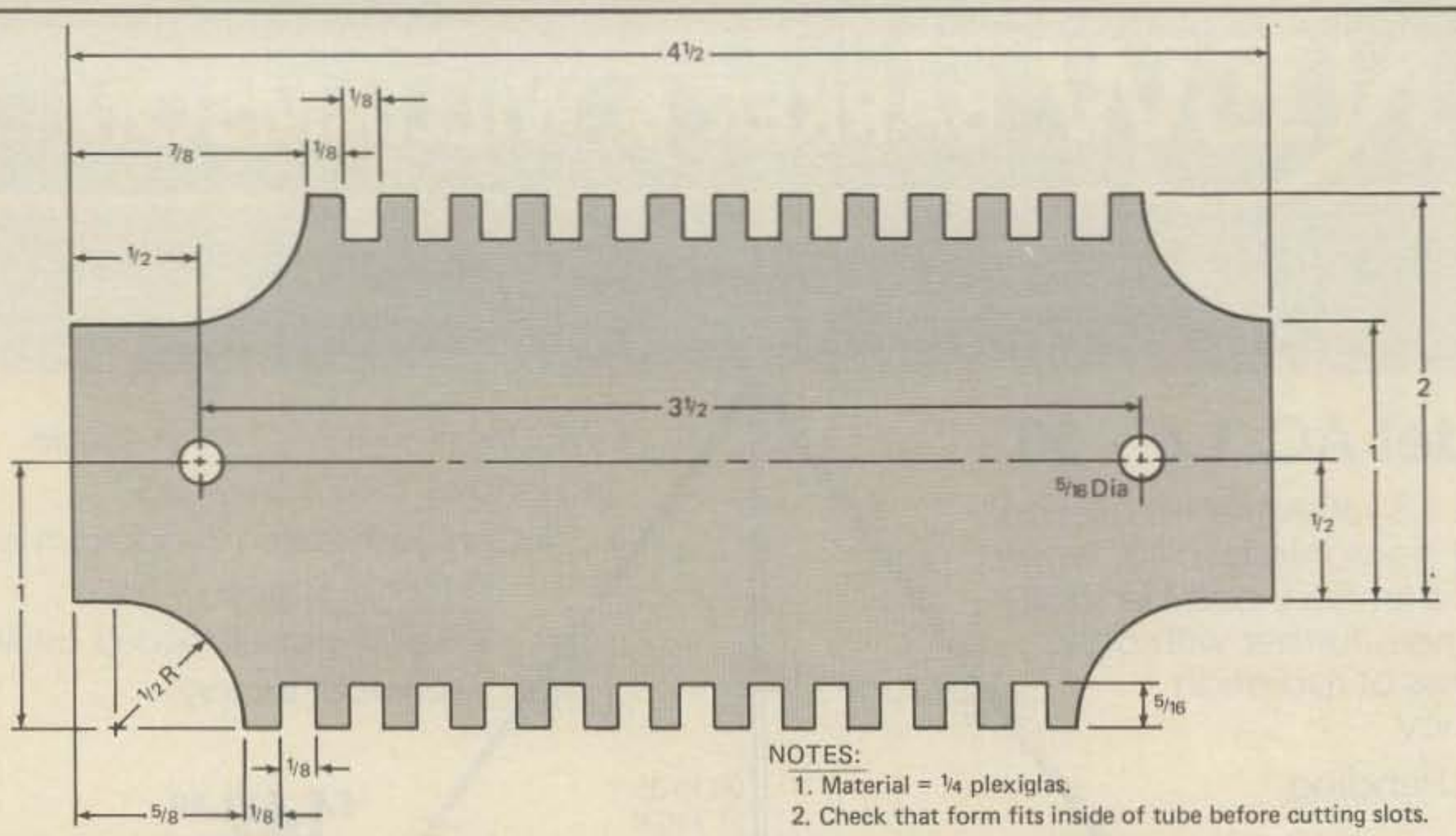
The coils are inserted in the plastic tubing as shown.



BILL OF MATERIALS

2–¼" × 4½" × 2" plexiglass
2–80 pf, 1.5 KV or higher transmitting capacitors (in the unit I built I used a 200 pf and a 150 pf capacitor in series to get approximately 80 pf. This is why two are seen in the picture.)
2–4½' lengths of 14 gauge copper wire, solid.
4–#6-32 × 1" round or pan head screws
4–#6-32 nuts
4– #6 flat washers
4–6" lengths of wire about the same gauge as your antenna wire
2–4" length of 2" ID plastic pipe
4–End caps for 2" plastic pipe AR-Pipe cement
4–#8 eye bolts and nuts

Fig. 1– Schematic diagram for the antenna trap. Two traps are required.



NOTES:
1. Material = ¼ plexiglas.
2. Check that form fits inside of tube before cutting slots.

Fig. 2– Mechanical drawing of the coil form. Two forms are required.

place, bend the ends down flat and turn a loop in the end. This loop will be wrapped around the machine screw used to fasten all of the parts together. It should be noted that both ends came out on the same side of the plastic so if they don't, check to make sure you have 11½ turns. Now insert the capacitor and tie the ends to each end of the coil using the #6-32 machine screws, nuts, and washers. At this point the tank circuit is complete but you might want to check it out with a grid-dip meter to see just where it is tuned to. Remember, if the circuit is tuned too low, you can increase the resonant frequency by making the coil shorter. So you might want to fine tune it by adjusting the coils length. If you don't have a grid-dip meter but follow the directions carefully, you should be close enough to get good results. Before tightening up the screws you should add a 6" piece of wire to the screws. These will be used to attach the trap to the actual antenna wire.

The unit should be tested on the antenna and if it is working, you can then proceed to encapsulate it. to check it out, measure about 26 feet down from the feed point on your dipole. Install the trap and begin testing it at that point. you will probably find that you will have to adjust it to a shorter length, but it is better to start out too long and cut off any excess once you find the correct length for you. With the help of my daughter, Lori, KA2SHN, the process took about 20 minutes to get the SWR reading to about 1.5 to 1. The length of the 80 meter portion can be cut down since the coil in the trap will electrically add length to the antenna. This will mean you not only have a dipole for both 30 as well as 80 meters but the whole thing will be a few feet shorter.

When you have the antenna tuned-up, the traps can be encapsulated to prevent the elements from attacking the components. This is done by cutting a 4 ½" length of 2" ID plastic pipe and sliding the trap inside of it. The holes are drilled into the end-caps and the eye-bolts attached. The caps are then pushed onto the pipe and the wire fed through the smaller holes on each end. If the fit looks good, add the cement and press both caps into place. By adding a drop of sealant such as GE silicon around the wire hole the unit should n ow be water tight. At this point you should be able to complete the installation by soldering the antenna wires to the trap wire. For a good mechanical fit the antenna wires should be looped and tied to the eye bolts. CQ

The completed traps.

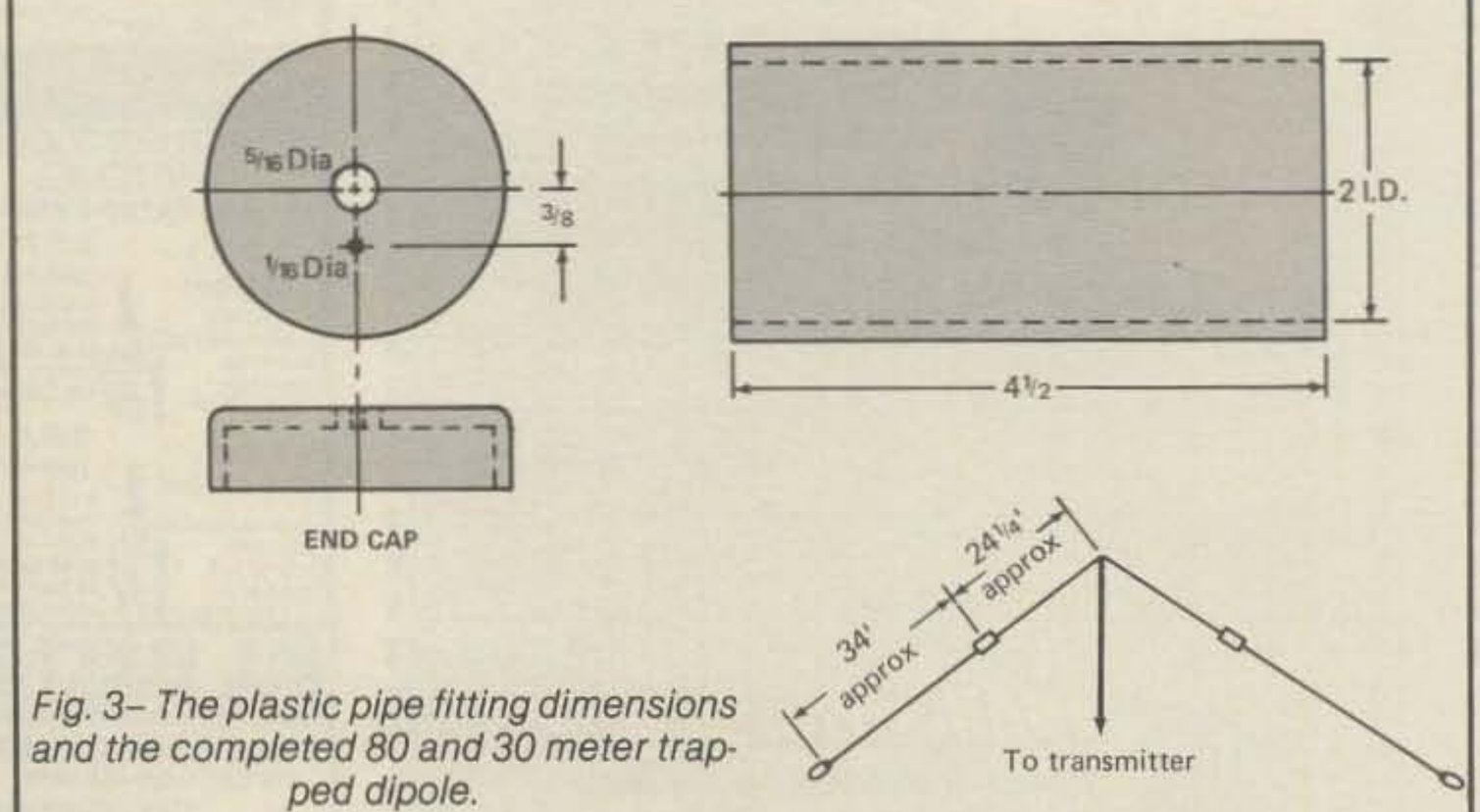


Fig. 3– The plastic pipe fitting dimensions and the completed 80 and 30 meter trapped dipole.