Ike Kerschner, N31K

Three Short Antennas

Last summer at a local hamfest, several other hams and I had a rather lively conversation concerning antennas for the lower frequencies. My feeling was—and is—that anyone who can put up an antenna can operate any band.

The truth is, if you can get a conductor to accept a load (by using a transmatch or other loading method), you absolutely can operate any of the lower ham bands! True, it will be a compromise, and as such you cannot expect to work everything on the band whenever you like. But the important thing is that you will have fun.

For years the largest antenna I could put up was a 40 meter dipole. It did work on 80 and 160; all that had to be done was to tie the coax feed line (i.e., the inner and outer conductors) together and feed it via my transmatch to produce a nice top loaded vertical for the lower bands. In fact, I worked all continents on 80 while running only 50 watts. The ground system was a wire tacked under the rain gutter and run completely around the house.

For some reason, many hams resist using a transmatch—why, I don't know. But for those of you who want to work the lower bands without using a transmatch, here are some antenna ideas. Remember: short antennas have limited bandwidth, so you will need to trim the antenna to the center of the band you are interested in. As an example, the 30 foot long 3.9 MHz dipole will have 2:1 SWR only over about 25 kHz of the band. (This can be increased by use of a transmatch!)

These short antennas do perform very well and will give nearly equal performance, across their given bandwidth, to a full size antenna. Keep power level to 250 watts or so, using the coil information given. If you must run higher power you will need to use larger wire that is space wound (that is, the distance between the wires on the coil will be wider).

All of the antennas in tables 1, 2, 3, and 4 (see next page) will work, but you will need to carefully adjust the length of the end wires to put the resonant point within your desired portion of the band. To prune properly it is important to either measure the SWR at the antenna, or use a multiple of a half wavelength of 50 ohm coax to get an accurate reading at the transmitter end.

Fred N7MQC and his yf KB8QWL stopped by my home on their way to Georgia. The photo is a shot of them, their pickup, home made camper, and chief op and biggest ham of all, Bernie the pup. Fred is a first class homebrew artist, and I hope to show off some of his creations in future issues.

In order to calculate a halfwave of coax, you must take the velocity factor (VF) into account (VF is the speed a signal will travel in a particular conductor). The formula to calculate a half wavelength of coax is 491.8/f x VF. For example, to calculate a half wave of coax at 7.15 MHz using the popular RG8x coax, we would use a VF of .75. (A list of the VF of most popular coax cables is available in the *ARRL Antenna Manual.*) The length of our line would be 491.8/7.15 x .75=51.587, rounded off to 51.5 ft. If this is not enough line to reach the rig, simply multiply by 2 or 3, or whatever it takes.

If you choose to put the antennas up as an inverted vee, remember the frequency will be lower than stated. It is a good idea to add about 5 percent to the end wire length to allow exact pruning. The antennas were designed using the K5QY loaded dipole program and the ARRL single-layer coil winding calculator. Element wire is assumed to be 14 gauge, and coil wire is 18 gauge enamel (close spaced).

These antennas should work fine with rigs up to 250 watts CW. I have given the inductance so you can calculate coils that will accept higher powers by increasing the spacing between turns and using a larger diameter coil and wire. Frequency can be changed by changing the length of the end wire or the number of turns on the coil. Try changing the end wire first.

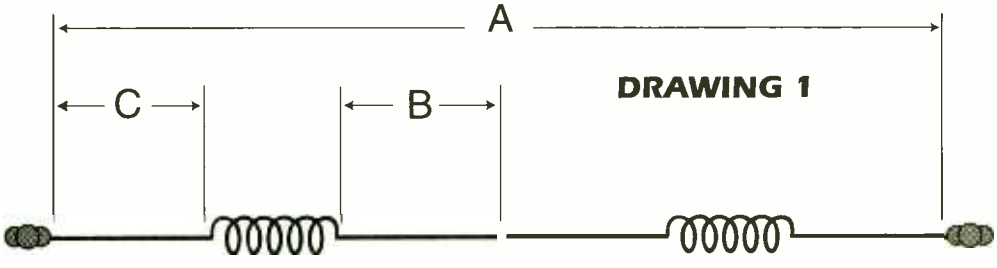
Explanation of tables

Freq is, of course, the frequency of operation; **length** is the overall length "A"; "B" is the distance from the center of the antenna to the coil; and "C" is the distance from the end of the coil to the end of the antenna. **Ind** is the inductance of each coil (two coils are required as shown in dwg. 1), and **turns** is the number of close wound turns of 18 gauge enamel wire required to achieve the necessary inductance. Feed the antenna with 50 ohm coax; if you wish, a 1-to-1 balun may be used at the feed point.

Each table gives several antenna dimensions to allow you to customize an antenna for your particular situation. Use the longest length possible.

As you might expect there is a great deal more that could be said about building a short antenna. But this will get you started and allow you to build a decent loaded dipole.

Yes, you can use loaded dipoles to build yagi and other (for example, phased) gain antennas. How about a two element 40 meter yagi with only 20 foot elements? It is something to experiment with.



DRAWING 1

■ Gadget of the Month

Is there a ham anywhere who does not like gadgets?! At Christmas a co-worker received a neat calculator. No, it does not do all kinds of scientific functions automatically, or turn you into Mr. Wizard; it only adds, subtracts, multiplies, divides, and extracts square roots—which is plenty for the average ham. It does have a clock, though, and that is the neat part.

I like to go on mini-DXpeditions, and keeping time for the log was always a problem. (I hate wrist watches and their funny little buttons you need to mess with to change time, etc). This little calculator has a great clock built in and will display time in 24 hour format—perfect for log keeping. In addition, the unit has a built-in timer, to remind you to change bands, eat, go to sleep, or whatever. The plus for me is the calculator which will let me add up my scores for all those contests I enter in a portable or mobile mode.

Best of all, this handy gadget costs under ten bucks at most discount stores. Look for the Casio Time Face, QA-700. Try it, and I bet you'll like it!

The four tables mentioned earlier in this column follow.

73 de Ike, N3IK

Rob Leonard's Ham DX Tips

This is a month of change. Winter changes into spring, and likewise low band DX changes to openings on the higher frequencies. If you are an SWL, why not change to DXing some of the amateur frequencies? It can be quite rewarding. Here are a few tips to help you and longtime ham band DXers along the way:

DX CONTESTS On March 4th and 5th the ARRL DX Phone contest takes place to open the month, while the month closes with the CQ World Wide Prefix SSB Contest on 25 and 26 March. **NEW DX NETS** A new DX net with many DX stations from around the Pacific (as propagation allows), meets daily on 7230 kHz Lower Side Band at 1100 UTC. **GAZA** An amateur station using the call sign ZC6B has been active from Gaza, the area Israel has negotiated for Palestinian Self Rule. Though the call sign prefix block ZC has been assigned by the International Telecommunications Union to the United Kingdom, amateurs were granted the use of the ZC6 prefix when the UK administered Palestine from the 1920's to 1948. It is believed that this is why the prefix is now being used by an amateur located here. The Palestinian government has requested help in establishing amateur radio operations. Two Japanese amateurs JA1UT and JA3UB should have recently operated from here as JA1UT/GAZA. The two were asked to help establish a government sponsored amateur radio club station and train interested individuals in CW and international amateur radio rules and procedures. Meanwhile, ZC6B has been appearing regularly on 14234 kHz SSB around 1430 to 1600 UTC. The operator has given two QSL routes: either, Dr. Sami Tarazi c/o 7162 E. Kendall Drive, East Syracuse, NY 13057, or direct to, Dr. Sami Tarazi, Box 1008, Gaza, Palestine via Israel. At present, though, Gaza is not recognized as a DXCC official country. The most important thing is to log it, now! **HAWAII** Archie Chatterly, KH6CF, whose address is 1372 Uila St., Honolulu, HI 96818, appears on 3502 to 3504 kHz CW daily at 1045 UTC. **MALI** TZ6VV has been on 21270 kHz SSB daily, when the propagation is good, starting at 1500 UTC. His QSL manager is AA0GL, Marshall Reece, 5831 SE 53rd St., Tecumseh, KS 66542. **ST HELENA ISLAND** Napoleon had to be exiled to travel to this remote South Atlantic Island, but luckily you can travel there via amateur radio! To do so look for ZD7JP on 21340 kHz SSB, when that band is open, starting at 1900 UTC. QSL requests go to QSL manager: N5FTR, William Loe Schman, 717 Milton, Angleton, TX 77515. **SPRATLEY ISLAND** DU9RG and several other Philippine amateurs have been making plans to possibly operate from the Philippine-controlled area of these remote reefs and islands starting around April 10th to 15th. The call sign assigned is DU0UK. If the Philippine military okays the operations from an island they control, check the DX nets for more reports on their plans. **SWEDEN** To promote Sweden's bid to host the 2002 winter Olympics, the Jemtland Amateur Radio Club of Sweden will be operating special events station 7S30WG until June. While the station has operated on all modes and HF bands, when possible, it has been frequenting 14010 to 14030 kHz CW starting at 1300 UTC. QSL requests should be sent to: SM3CVM Lars, Aronsson, Lillfjellv 62, S-81371 Osterdund, Sweden. **USA** Late March is the start of the VHF DXing season, and once again yours truly, N9LAG, will be active on or above 50.125 MHz when six meters propagation is favorable. If we are fortunate enough to make contact please send your QSL requests to PO Box 91, Benton, IL 62812 *ONLY*, no other address! **ZAIRE** Part of the UN relief effort is 9Q5IY whose home call sign is LA9IY. He will be here till the end of March, active on the bands 40 to 10 meters SSB and CW. He also hopes to be active from Rwanda if possible. QSLs would be sent to the Academic Radio Club, LA1K, Studpost 250, N-7034 Trondheim, Norway. 9Q5EXV is on 14083 kHz RTTY starting at 1530 UTC most days. QSL to: F2VX, Gerard Debelle, 4 Le Haut d'yvrac, F-33370 Tresses, France.

Here's a hope that March winds find you and your antenna faring well. 73 de Rob N9OAG.

TABLE 1

Freq.	Length	A	B	C	Ind.	Turns
1.850	120'	120'	35'	25'	108	47
1.850	80'	80'	25'	15'	191	75
1.850	60'	60'	15'	15'	198	81
1.850	40'	40'	10'	10'	288	106

TABLE 2

Freq.	Length	A	B	C	Ind.	Turns
3.9	80'	80'	25'	15'	29	41
3.9	60'	60'	15'	15'	36	47
3.9	30'	30'	8'	7'	85	73

TABLE 3

Freq.	Length	A	B	C	Ind.	Turns
3.6	80'	80'	25'	15'	38	38
3.6	60'	60'	15'	15'	44	44
3.6	30'	30'	8'	7'	100	100

TABLE 4

Freq.	Length	A	B	C	Ind.	Turns
7.15	40'	40'	15'	5'	26	39
7.15	30'	30'	10'	5'	30	42
7.15	20'	20'	5'	5'	32	45

Note: *Table 1 coils wound on 2"I.D. PVC pipe with 18Awg enamel closewound. Tables 2-4 wound on 1"I.D. PVC pipe with 18Awg enamel closewound.*