CHAPTER 14

Low Band DXing From a Small Garden

The story to follow is undoubtedly the story of many, and it could be the story of even more people, provided they tried. If you don't have a large garden or a farm, read it. It's the story on 160 meters of a very good friend of mine, George Oliva, K2UO.

"*Having been an avid DXer for many years and having achieved "Number One" Honor Roll status on CW, SSB and MIXED, 5BDXCC, etc, I was in search of a new challenge. Some of the locals had started on 160 meters but I assumed that I didn't have the space for the antennas needed to work Topband on a half-acre lot. My amplifier didn't cover 160 and my tower was a crank-up type so a shunt feed wouldn't work very well. Eventually in 1985, I grew bored of the WARC bands and took on the challenge! I put up what has since become known as my 'stealth' dipole, a full quarter wave on 160, not in a straight line and not very high in the air. I worked 75 countries over the next 36 months with 100 watts and no special receiving antennas. Although most were relatively non- exciting, however, I did manage to snag 3B8CF, D44BC and even VK7BC.*

I next picked up a linear which did cover 160 meters. Now I began to see the need for special receiving antennas, I could now work everything I could hear but knew from the locals and packet clusters that I was not hearing a lot. I asked my 'friendly' neighbor if I could run a wire up the back end of his property line and I was now in business with a 550+ foot single wire, terminated Beverage antenna pointed to about 65 degrees. This antenna is truly amazing. I could now hear stations that I couldn't even imagine hearing on the 'stealth' dipole.

Although I am not the first to get through, I usually make it in the pileups. I have worked Bouvet, Peter I, Heard Island, South Sandwich, and now have 230 countries worked on 160 meters, almost all on CW of course.

When other hams visit my station and look at my Topband antennas, they are amazed at the results I have achieved. The bottom line of all this is that you do not need a super station to work a lot of DX on Topband. What you do need is a little imagination, ingenuity and perseverance to succeed and have a lot of fun."

What better introduction could I have than the above testimony of a dedicated Topband DXer, who's not frustrated living in a (beautiful I must say) but fairly typical suburban house on a 1/2-acre lot? George did not use his QTH handicap as an excuse. No, for him it was just another challenge, another hurdle to take.

Fig 14-1—Showing a stealth antenna is easy—you show the sky. Rather than just the sky, here's the view at K2UO's QTH showing his low-profile 10/15/20-meter quad and his beautiful home in a wooded residential area in New Jersey. With his invisible 160-meter stealth dipole, George has worked 200+ countries on Topband.

So don't lament if you don't have a one Million $ QTH. You can work DX on the low bands as well. Maybe you won't be the first in the pileups, but you will get even more satisfaction from succeeding, since you did have to take the extra hurdle!

My good Friend George Oliva, K2UO, holds BSEE and MSEE degrees and is an Associate Director at the US Army's Communications and Electronics Command's Research, Development and Engineering Center at Fort Monmouth, NJ. He is responsible for Research and Development programs involving Information Technology. He got his first amateur license in 1961 and has operated from a few exotic locations such as Lord Howe Island, Guernsey, Turkey and even Belgium. He is a Senior Member of the IEEE and holds several patents

George not only volunteered the above striking testimony, he also volunteered to godfather this section of the book, for which I am very grateful.

1. THE PROBLEM

If you have decided to read on, this is not going to be news for you. But let me nevertheless describe the typical suburban antenna syndrome.

You have this wonderful house, in this wonderful-looking neighborhood, at the right driving distance from your work. A dream, however, may not be a ham's dream. There really isn't enough space for the three towers and the Four-Square you would like to put up, and the neighbors would rather see trees growing than antennas. And your spouse won't really tell it to your face, but thinks one multiband vertical is more than enough. At the very best, one tower is what you can obtain your spouse's permission for.

If you really want to compete with the big guns on the HF bands, you need Yagis. Not a simple tribander, but monoband Yagis. On the low bands though, you can be relatively competitive with rather simple antennas. This is good news! Read on.

2. SET YOURSELF A GOAL

Maybe you should set yourself a goal that is realistic for your circumstances. You can get satisfaction that way as well. Compete with your equals.

But there are nevertheless "fantastic" stories from average suburban QTHs. Here is another testimony of perseverance (or maybe addiction): "*I was a young engineer working for IBM, just emigrated from Europe and lived until 1986 in a Toronto suburb, on a 46 by120-foot city lot surrounded by houses, TVI, power line noise and nasty neighbors. First I had a home-brewed 65-foot TV tiltover tower with used TH6 and 402BA and inverted Vs ($350). Later I thought I struck gold when I found a second-hand Telrex Big Bertha monopole with the antennas for $1200. I designed and built my own antennas (about $200 in material from junkyards). The rig was a used Drake B-line + R4C (about $500). All the rest of the station, the amplifier and the gadgets were home-brewed. I realized that I had a hard time beating the M/M stations in the contests, so I specialized in single-band operation. This netted me about 16 world records and all Canadian monoband records from 160 through 10 meters in CQWW and WPX contests...*"

All that from a 14 by 36-meter city lot! Wow! This was Yuri Blanarovich, VE3BMV, ex-OK3BU, now K3BU. But you are not that addicted? Keep on reading.

This book has explained propagation and focused on various types of antenna configurations for both receiving and transmitting. Factors such as gain, polarization, radiation angle, incoming signal direction and angle, soil conductivity and the many other factors affecting receive and transmit performance. It is up to you as an individual to assess your own situation, set your own goals and use the information in this book in conjunction with basic engineering judgment to experiment in the true amateur spirit.

Every QTH has its own limitations, and you must apply your own skills to optimize your station based on your individual goals. Let's have a look at some simple but very effective antennas that might help overcome some of the limitations.

3. THE FLAGPOLE VERTICAL ANTENNA

A $\lambda/4$ vertical for 7 MHz measures 10 meters, about the size of a really good patriot's flagpole. There you have a wonderful full-size 40-meter vertical. If the pole is a metal pole, make sure there is a good electrical contact between the different sections. If you are using a wooden flagpole, you will have to run a wire along the pole. It is best to use small stand-off insulators, so that the wire does not make contact with the wood. If your neighbor is curious about the wire, tell him it's part of a lightning protection system. Being a vertical antenna, the flagpole requires radials, but you can hide these in the ground, so nobody should object. You should of course insulate the flagpole from the ground. If the flagpole is exactly resonant on 40 meters, you can probably feed it directly with a 50-Ω feed line. Chances are the flagpole may be a little shorter, so you can load it at the bottom with a coil.

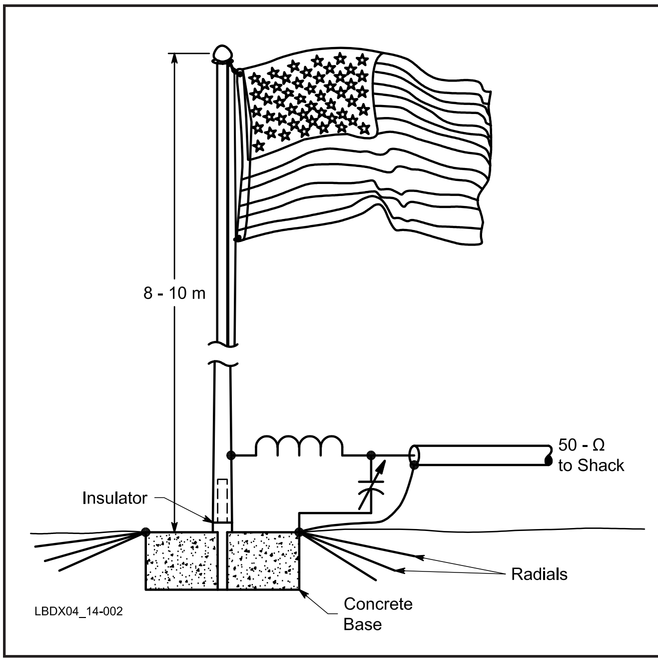
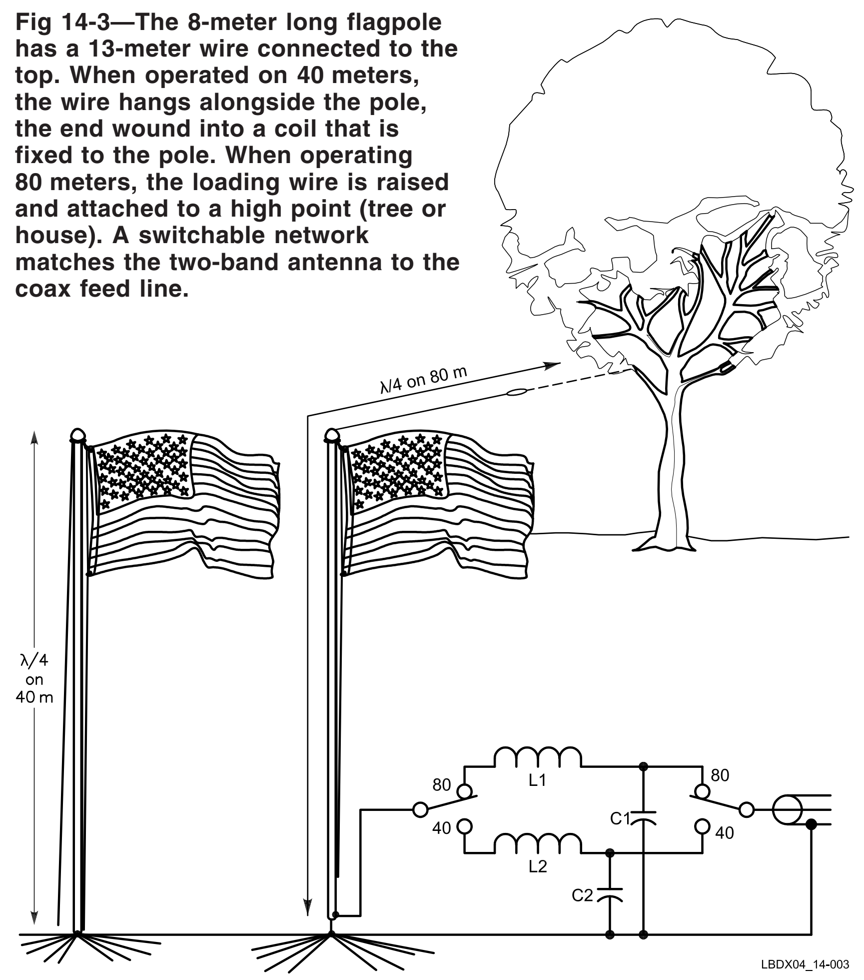


Fig 14-2—Forty-meter flagpole antenna. Any metal flagpole between 8 and 10 meters will do. Use an L-network to match to the 50-Ω feed line.

An L network, as shown in **Fig 14-2** will load and match the antenna at the same time. For a flagpole measuring 8 meters, typical component values (assuming a 5-Ω equivalent ground loss resistance) are: C = 500 pF and L = 2.8 µH. With a 10-meter long flagpole, no matching network will be required on 40 meters.

How about 80 meters? You can transform the 8 to 10-meter tall 40-meter vertical into an efficient inverted L at night, if it has to be a super stealth antenna. See **Fig 14-3**. Connect the top loading wire to the top of the metal flagpole. When you operate 40 meters, or during daytime, hang the top wire along the flagpole (coil up the bottom end so that it does not touch the ground). When you want to operate 80, raise the wire with an invisible nylon fishing line and stretch it toward the house or a tree. The top loading wire can be any thin wire, as it hardly carries any current (all the current is at the base of the flagpole). Now you're all set on 80 meters. For this 40/80-meter flagpole antenna (using an 8-meter long flagpole) the typical L-network component value for 80 meters is: L1 = 1.1 µH and C1 = 1100 pF.

Fig 14-3—The 8-meter long flagpole has a 13-meter wire connected to the top. When operated on 40 meters, the wire hangs alongside the pole, the end wound into a coil that is fixed to the pole. When operating 80 meters, the loading wire is raised and attached to a high point (tree or house). A switchable network matches the two-band antenna to the coax feed line.



If your spouse or the neighbors won't object to a permanent tiny wire running from the top of the flagpole (maybe they haven't even seen it), install an 40-meter trap at the top of the flagpole. Disguise it using your imagination. See **Fig 14-4**. Appropriate traps are described in Chapter 9.

For an efficient 160-meter vertical antenna you need at least 15 meters of vertical conductor. Have you looked at the trees in that corner of your lot? They should do as supports. Maybe you need to exercise a bit with a bow and arrow, but if you can shoot a nylon wire over the trees, you're probably set for a good 160-meter antenna. If you use an inverted L or T antenna, you can use the tree-supported vertical on 40, 80 and 160 meters. And your neighbors will hardly see it! Don't forget that this antenna requires a good radial system. But you can put those down during the night.

Don't forget that the open ends of an antenna are always at very high voltage. If you run the outer ends of these wire antennas through the foliage toward a tree, it's a good idea to use Teflon-insulated wire. This will help prevent setting your tree on fire. And, by the way, all these wires don't have to be perfectly horizontal or perfectly vertical. Slopes of up to 20° will not noticeably upset the antenna performance.

You could of course also buy a commercial antenna, and spend lots of money for lots of loss. Use your imagination instead, and put your brains to work instead of your wallet!

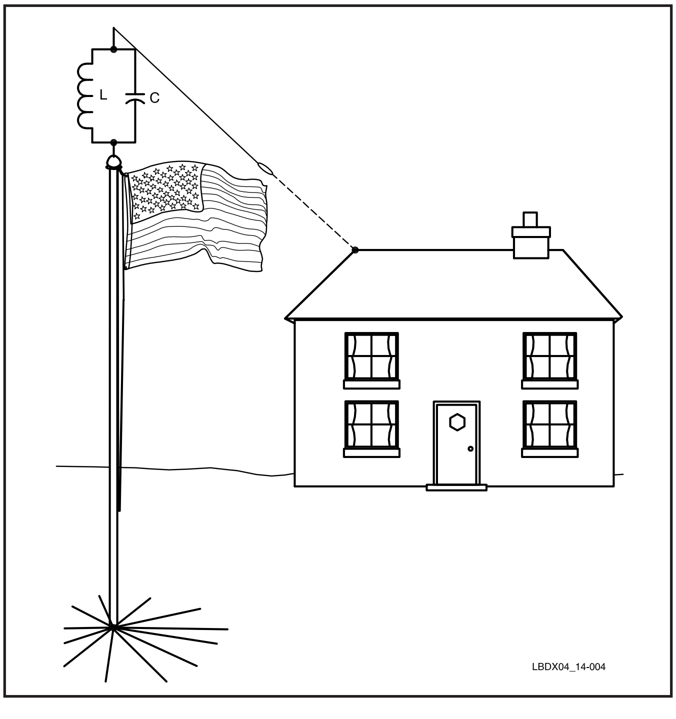


Fig 14-4—With a 40-meter trap installed at the top of the flagpole you can get the 80-meter top-loading wire permanently connected. It can be directed to a tree, the house or any other available support.

4. LOADING YOUR EXISTING TOWER WITH THE HF ANTENNAS ON 80 OR 160 METERS

If you have a tower with one or more HF or VHF Yagis, you can probably turn it into an efficient vertical on 80 or 160 meters. A tower of about 15 meters with a simple tribander will give you the right amount of loading to turn it into an excellent 80-meter vertical.

For 160 meters you will need a little higher tower, but starting about 18 meters with a reasonably sized tribander antenna will get you about 70° electrical length on 160. See Chapter 9 for details on how to shunt-feed these antennas.

If the tower is guyed, make sure the guy wires are broken up in short sections. Short means about λ/4. Better still, use dielectric guy rope, such as Phillystran (Kevlar) or glass-epoxy rods (Fiberglass Reinforced Plastic or FRP).

If you use a crankup tower, you will do better running a solid copper cable along the sections (an old coaxial cable will be fine), as the electrical contact between sections may not be all that good. In case of doubt, climb your tower and measure the resistance.

It is imperative that you run the cables inside the tower all the way down to ground level, and run them underground to the house; otherwise it will be extremely difficult to decouple these cables. It is a good idea to coil all the cables at ground level, to provide enough inductance to form a good common-mode RF choke.

Don't forget that shunt-fed towers do require a good ground system. Run as many radials as you can in as many directions. Don't overly worry if the tower is next to the house—you may lose a couple of dBs in that direction but that's all.

5. HALF SLOPERS

Half slopers are covered in Chapter 10, Section 6. These antennas are popular with those who have a tower with a rotary antenna, and who want to get it working on 80 meters. A minimum height of about 13 meters (depending on the loading on top of the tower) is required to make a good vertical radiator on 80 meters. For a 160-meter sloper to work well, you would need a tower about twice that high. Don't forget that it is not the sloping wire that does most of the radiating, it is the vertical tower. The sloping wire merely serves as a kind of resonating counterpoise for the feed line to push against. As with all vertical antennas the efficiency of a half sloper will depend primarily on the radial system used.

Don't feel tempted to use sloping wires in various (switchable) directions. As the sloping wire only radiates a small part of the total field, this effort would be in vain. As with shunt-fed towers, all cables that run to the top of the tower should run inside the tower, and run underground to the shack to maximize RF decoupling.

6. HALF LOOPS

Half loops are covered in Chapter 10, Section 5. Fed at the bottom of the sloping wire, this antenna is attractive where space is limited. A 15-meter high tree could support the vertical wire, and from the top a slant wire can run to the shack or any other convenient place. If you use a 26-meter long sloping wire, the antenna will be resonant around 3.5 MHz, and have a feed-point impedance of 60 to 75 Ω, good for a direct feed to the transmitter. To make it work on 3.8 MHz, shorten the total length of the antenna by approx 3 meters, or simply feed it through an antenna tuner or L network. This antenna will also work quite well on 160. Its feed impedance will be very high, however. The best feed system is to use a parallel-tuned circuit as shown in Chapter 12, Fig 12-20. Needless to say, the feed point is at very high RF voltage, and the necessary precautions should be taken to prevent accidental touching of the antenna at this high voltage point. **Fig 14-5** shows the radiation patterns for this half-loop for 80 and 160 meters. On 80 meters the antenna shows some directivity, about 4 dB in favor of the direction of the sloping wire. Again, a good ground system is required for this antenna, at both ground connection points.

7. VERY LOW TOPBAND DIPOLES

The saying is that very low dipoles (10 meters up) are only good as receiving antennas. Is that so? **Fig 14-6** shows the layout of K2UO's *Zig-Zag dipole* for 160. When you walk around his lot, you can hardly see the wire. It really is a stealth antenna, but it has given George 230+ countries on Topband. And that's not only "heard" countries, but those worked and confirmed!

In this book I have described high dipoles as efficient

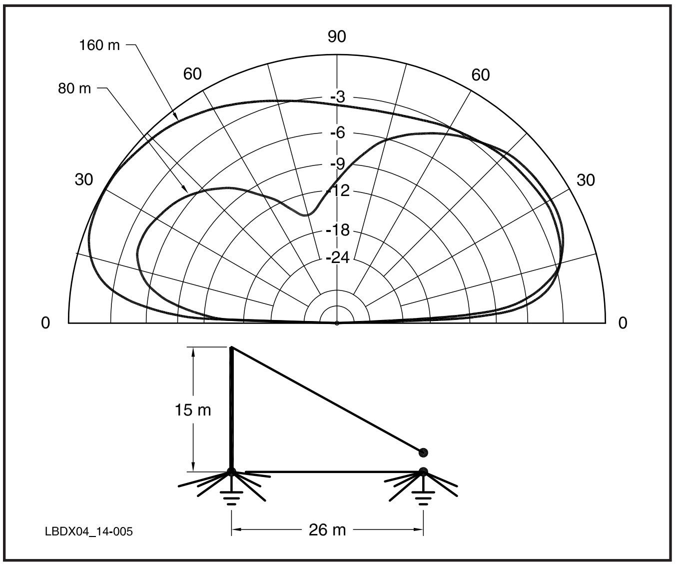


Fig 14-5—Vertical radiation pattern for the Half-Sloper on 80 and 160 meters. See text for details.

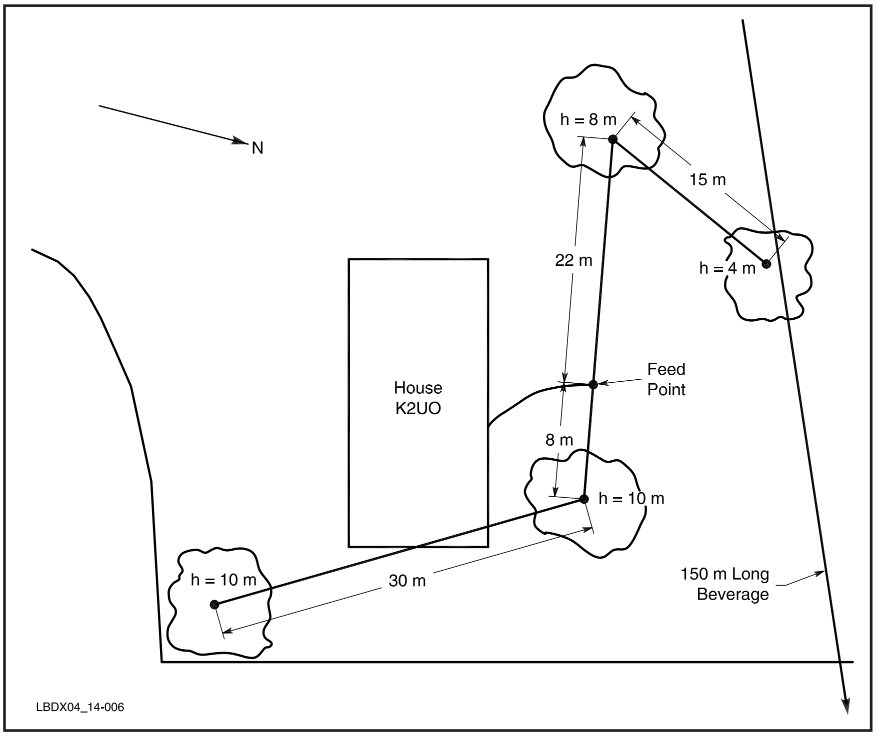


Fig 14-6—Top view of K2UO's 160-meter stealth dipole, which is supported by trees and which is at no point higher than 10 meters!

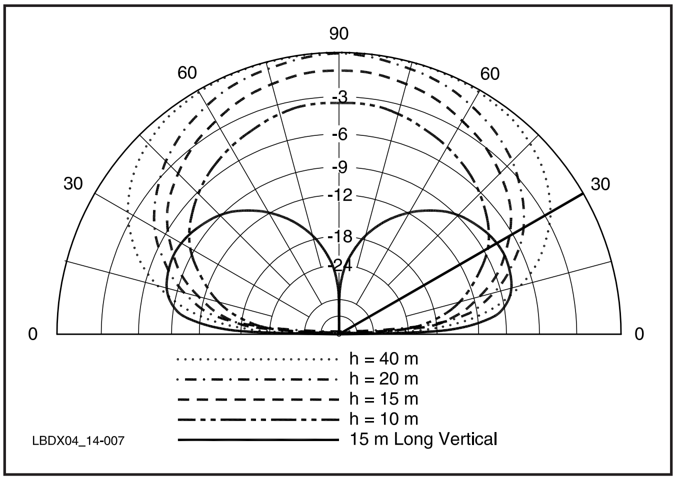


Fig 14-7—Vertical radiation pattern of dipoles at various heights, compared to a short 15-meter long vertical with 5 Ω equivalent ground-loss resistance.

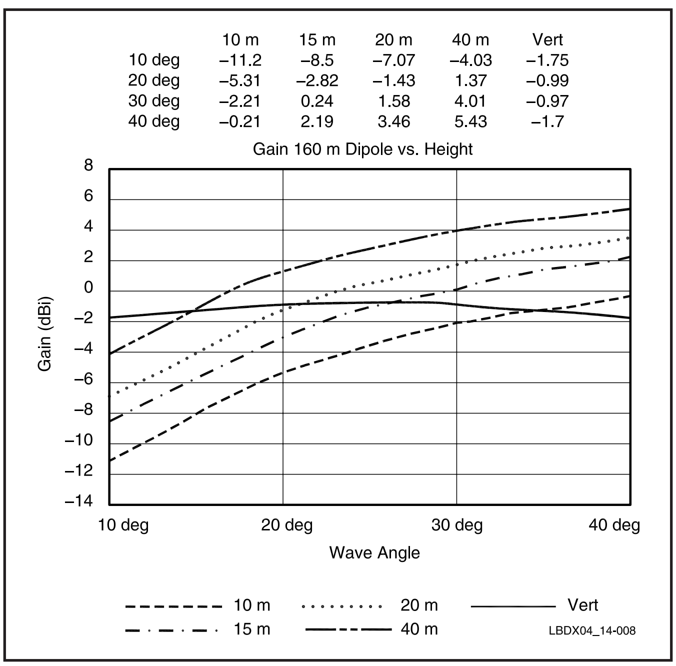


Fig 14-8—Gain of low dipoles compared to a reference 15-meter long vertical.

low-angle radiators. In order to be competitive with vertical antennas at really low angles, a dipole must be at least λ/2 high. I think we will hardly ever find such high antennas on a typical suburban lot though! But low dipoles can still function quite well on the low bands. The antenna at K2UO is a outstanding testimony for such low dipoles.

Fig 14-7 shows the vertical radiation patterns of low λ/2 dipoles, compared to a 15-meter long vertical (R_{rad} = 17 Ω) using a fairly decent radial system (R_{loss} = 5 Ω). A 160-meter dipole between 10 and 15 meters high produces the same signal as our reference vertical (±1 dB) at a wave angle of 30°, which may come as a surprise to some. At very low angles, (10°), the vertical will be 13 dB better than the 10-meter high dipole. **Fig 14-8** shows the gain of the various antennas for wave angles of 10°, 20°, 30° and 40°.

Looking at the patterns in Fig 14-7 we see that the big difference is in the high angles. The low dipole will be much better than the vertical for local coverage, but that means also that the signals from local stations will be much stronger than they would be on a vertical. Although the dipole may have the big advantage of reducing man-made noise (which is generally vertically polarized), it has the disadvantage of producing very strong signals received at high elevation angles.

What may come as an even bigger surprise is that we have learned that not all (though most) of the DX on Topband comes in at very low angles. Especially on 160 meters, however, we know that gray-line enhancement at sunrise or sunset often coincides with an optimum angle of radiation that is rather high, and that definitely gives the advantage to the low dipole. So, you might even beat the big gun with his super low-angle antenna, using a K2UO-style dipole!

As a rule I'd like to stress that it is important that you keep the center of the antenna as clear and as high as possible. The ends are just "capacitance hats"—they don't really radiate a lot, so you can bend and hide them as appropriate without hurting the antenna's performance a lot. If you don't have room for a straight 80-meter long dipole (who has?), rather than loading it with coils, or using a W3DZZ-type dipole, just bend the ends. That's much better, and will introduce less loss than the usual lossy coils. What holds for 160 meters is of course applicable to 80 as well.

K2UO is certainly not the only one who's been successful with low dipoles. Recently I read a similar testimony from Ivo, 5B4ADA (ex-HH2AW): "*My 160-meter antenna is 1/10-λ high (apex of inverted V is 16.5 meters above ground, wire ends are 1.5 meters above ground). Theoretically, it radiates up most of the RF, but I still have fun working USA, JA, VK, breaking XW3Ø pileup, etc. I had 57-meter long wire in Haiti on a bamboo pole 10 meters above around. Worked many USA and EU stations on 160. Don't be scared with too much theory, get on the air...*"

I would not necessarily agree with the "theory" part of Ivo's statement, since the theory does predict that low dipoles are a viable alternative... to nothing at all.

8. WHY NOT A GAIN ANTENNA FROM YOUR SMALL LOT?

8.1. An Almost Invisible 40-Meter Half-Square Array

I am convinced that on 40 meters you can get up this almost invisible gain antenna. You need to be able to run a horizontal wire about 10 meters up, and 20 meters long. Perhaps from the chimney of the house to a tree in the corner of the lot. **Fig 14-9** shows a 40-meter half-square array that can be squeezed in many small lots. Gain is approx 3.4 dB over a single full-size λ/4 vertical. The ends of the vertical wires are also at very high RF potential, and precautions should be taken to prevent accidental touching. The Half-Square is fed via a parallel-tuned circuit as shown in Chapter 12, Fig 12-20.

You can also feed the Half-Square in one of the top-corners. This may be a good idea if one element is close to the house as shown in Fig 14-9B. When fed in the corner, the feed impedance is about 52 Ω, a perfect match for a 50-Ω feed line. Do not forget to install a current balun on the coaxial feed line. **Fig 14-10** shows the radiation pattern for the 40-meter Half-Square.

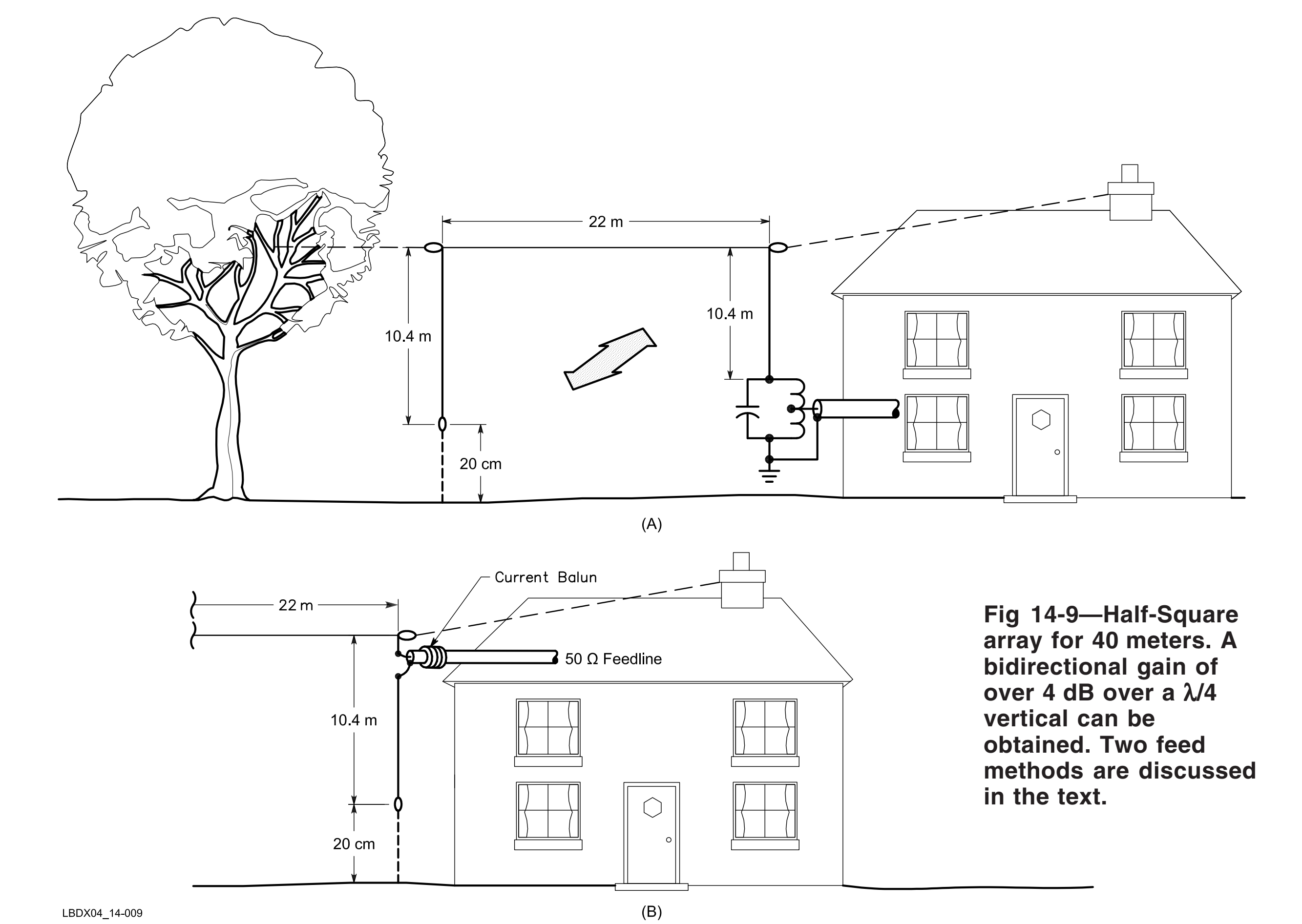


Fig 14-9—Half-Square array for 40 meters. A bidirectional gain of over 4 dB over a λ/4 vertical can be obtained. Two feed methods are discussed in the text.

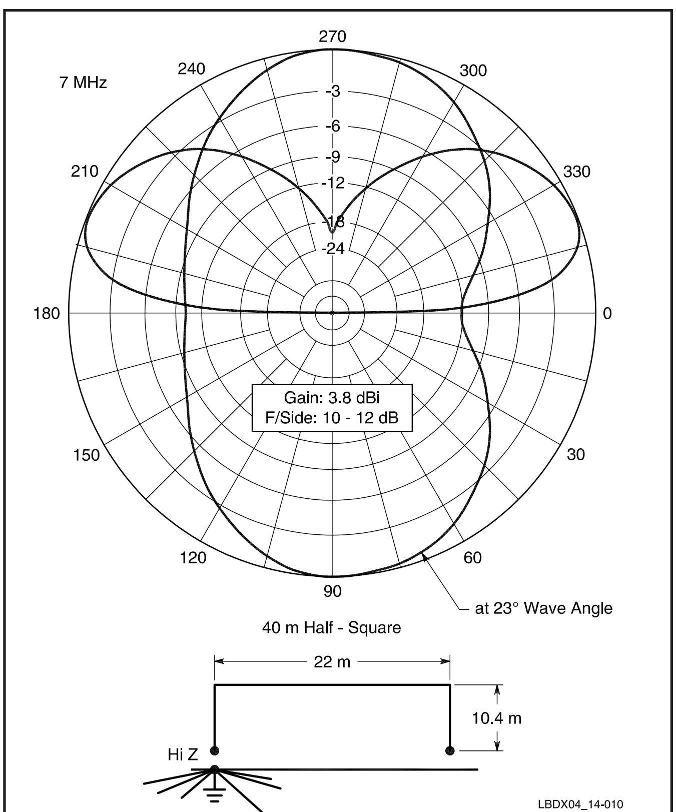


Fig 14-10—Radiation pattern for the 40-meter Half-Square.

8.2. Using the 40-Meter Half-Square on 80 Meters

What about using the 40-meter half-square on 80 meters? A bit of magic turns the antenna into two close-spaced in-phase fed end-fire arrays with top loading. The only thing you need is to short the base of the second element to ground, and feed the array at the other element at ground level (**Fig 14-11**). This 2-element array has a gain of 1.6 dB over a single full-size (20-meter high) vertical and provides excellent low-angle radiation. The antenna has about 4 dB front-to-side ratio. Its feed-point impedance is about 70 Ω excluding ground-loss resistance at each vertical element. This antenna requires a good ground radial system at the base of both elements.

With some ingenuity you could homebrew a switching system that grounds/ungrounds one element, and either feed the other element directly with coax on 80 meters, or feed it via a parallel-tuned network on 40 meters.

8.3. 40-Meter Wire-Type End-Fire Array

Maybe the Half-Square doesn't suit your most wanted direction. You can also turn this into a 2-element parasitic array as shown in **Fig 14-12**. I worked out the example of an array where a maximum height of 8 meters was available as the catenary wire. The elements were top-loaded as shown in Fig 14-12 and **14-13**. The array has a very good F/B and gain, and a feed-point impedance of about 25 Ω. See Fig 14-13. Matching can be done through a λ/4, 35-Ω line, consisting of two parallel 75-Ω coaxial cables (each measuring 7.03 meters

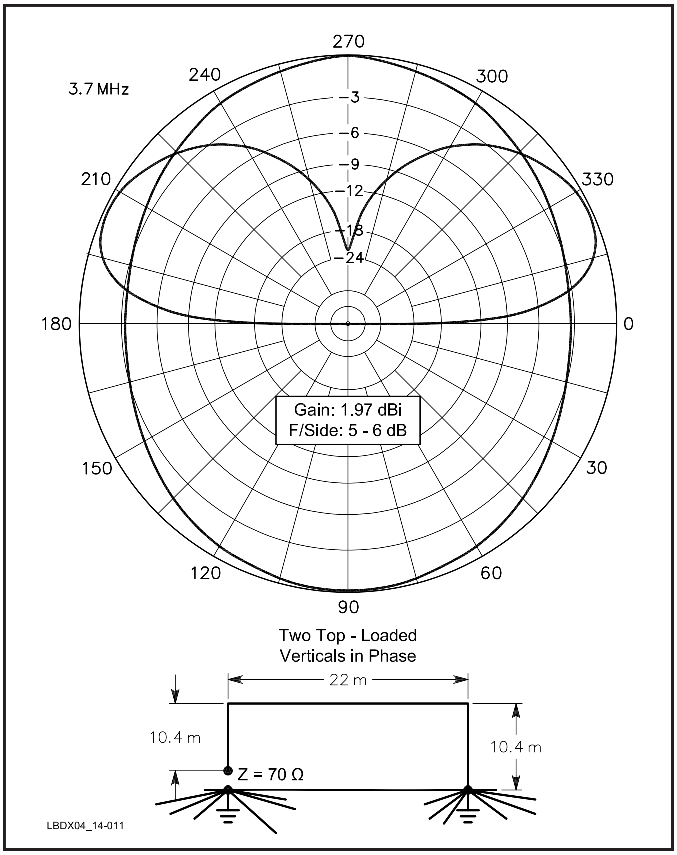


Fig 14-11—The 40-Meter Half-Square can be turned into a 2-element close-spaced top-loaded array for 80 meters, where both elements are also fed in phase. Both vertical and horizontal patterns (at 30° elevation) are shown.

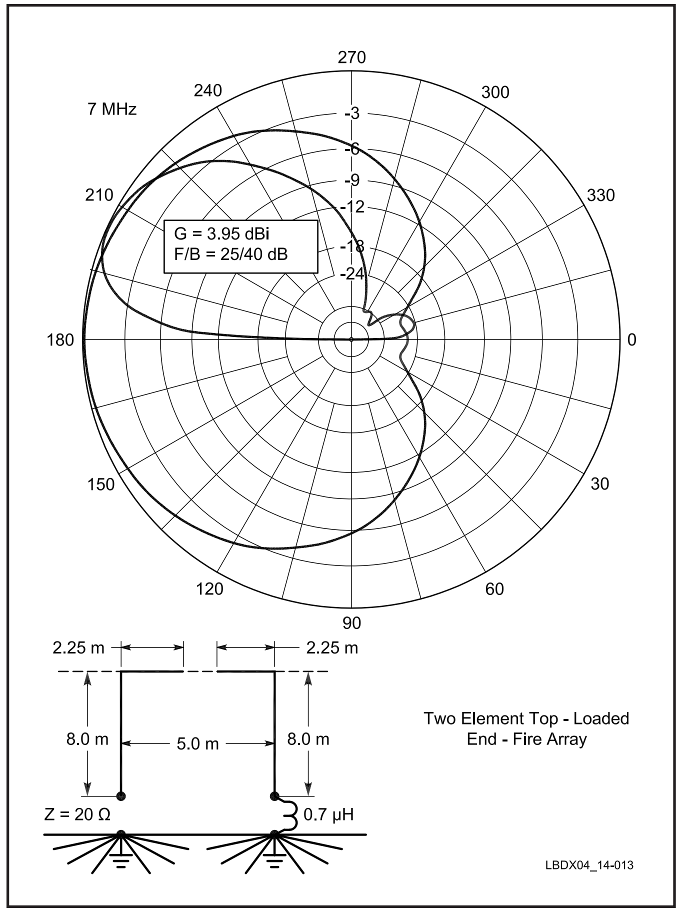


Fig 14-13—Horizontal radiation patterns for the 2-element parasitic array of Fig 14-12. The gain is 3.95 dB, and the F/B is an impressive 25 to 40 dB.

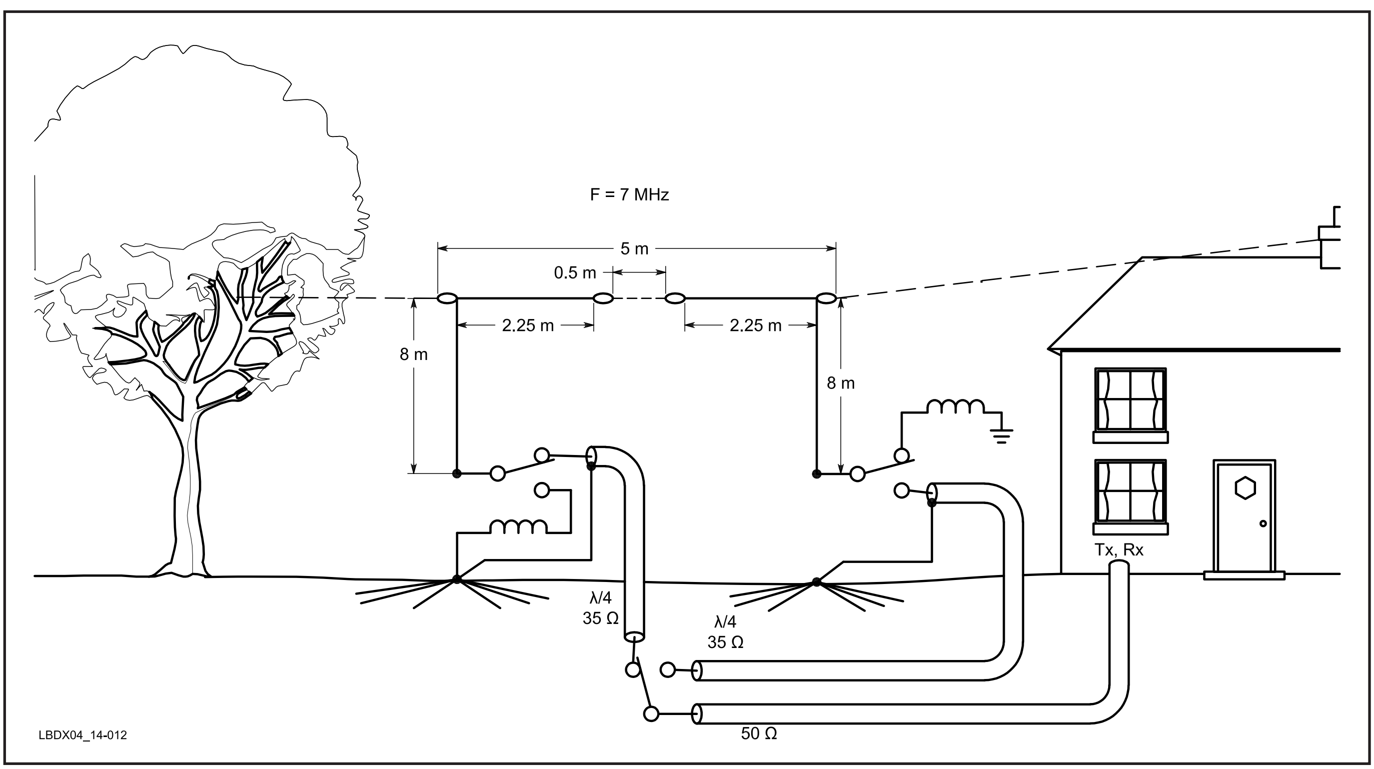


Fig 14-12—Switchable 2-element parasitic array for 40 meters. The antenna has a gain of 3.08 dB over a single vertical.

for RG-11 or RG-59 (solid PE insulated coax with VF = 0.66).

It is important to install as good a radial system as possible on this array. Where radials from the two elements meet they can be connected to a bus wire, as shown in Chapter 11.

8.4. And an 80-Meter End-Fire Array

Maybe you have two high trees in the back that could help you support a 2-element array for 80 meters. I would recommend a minimum height of the elements of approximately 13 meters; the remainder can be top loaded if necessary. **Fig 14-14** shows two T-loaded 13-meter high verticals, suspended from a single catenary rope, for example between two tall trees.

This array has an excellent F/B ratio and gain, and will certainly put you in the front seat in a pileup if you take care to install a good ground system. When properly adjusted, the array impedance, assuming about 5 Ω equivalent ground loss resistance, is about 20 Ω. The array can be fed via a 37.5-Ω, λ/4 transformer (two parallel 75-Ω cables) as shown in Fig 14-12, or via an unun transformer (20 to 50 Ω).

It is important that the top-loading wires are as shown (points facing one another). If you are forced to try another configuration, I would advise you to model the array exactly as in reality. Needless to say, if you have some really tall trees on your property, this antenna can be scaled up for 160 meters.

8.5. The Half-Diamond Array

Maybe you don't have the two supports required to put up the box-shaped arrays I described above. With just one support, a few good arrays can be created as well. You will require one high support (15 meters); eg, a tree. In **Fig 14-15** I've reshaped the Half-Square to become a Half-Diamond. You lose about 1 dB gain, but the pattern remains unchanged.

8.6. The Half-Diamond Array on 80 Meters

The same inverted-V-shaped Half-Diamond 40-meter array can be used on 80 meters as well. As with the Half-Square (see Section 8.2) all you must do is ground the bottom end of the array at the side opposite to the feed point. The array has an impedance of about 75 Ω. The exact resonant frequency can be tuned by simply changing the total length of the antenna. For use on 40 meters the exact length is not so critical, since the array can easily be tuned for low SWR anywhere in the band using the resonant tuning circuit.

8.7. Capacitively Loaded Diamond Array for 80 Meters

Maybe you can't quite get a height of 15 meters. One solution is to top load the two sloping verticals with a common capacity wire, hanging right down as shown in **Fig 14-16**. Two wires are connected to the apex of the V. Their length and

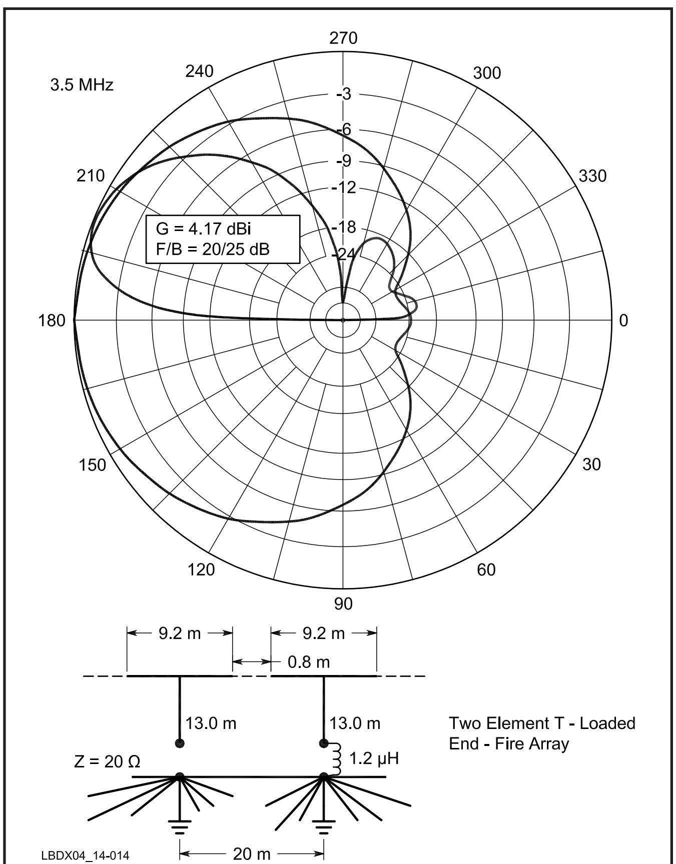


Fig 14-14—Horizontal radiation patterns for the 2-element T-loaded parasitic array for 80 meters. The gain is over 4 dBi and the F/B is 20 to 25 dB.

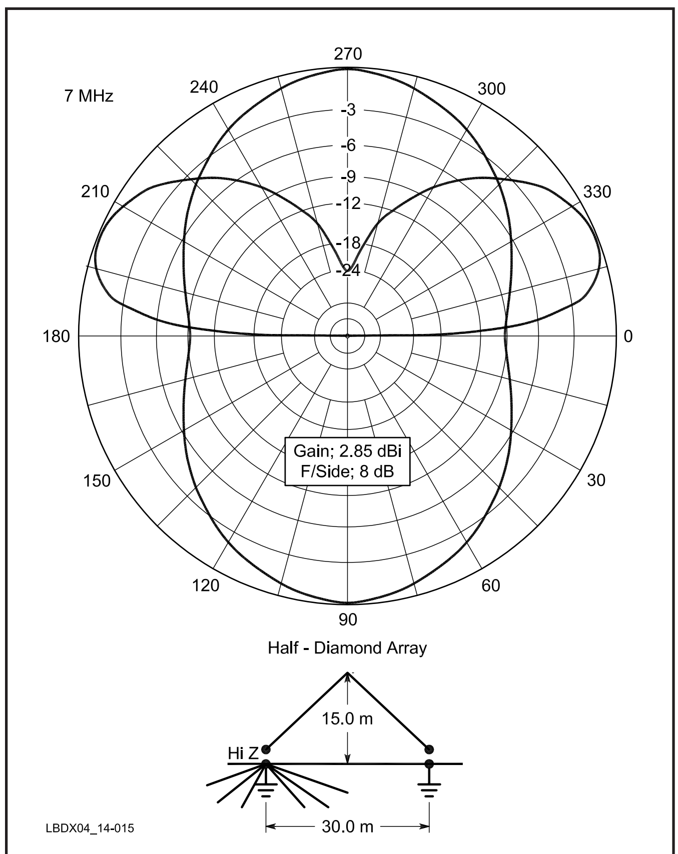


Fig 14-15—Using a single support, you can turn the Half-Square array into a Half-Diamond array, at the sacrifice of about 1 dB of gain.

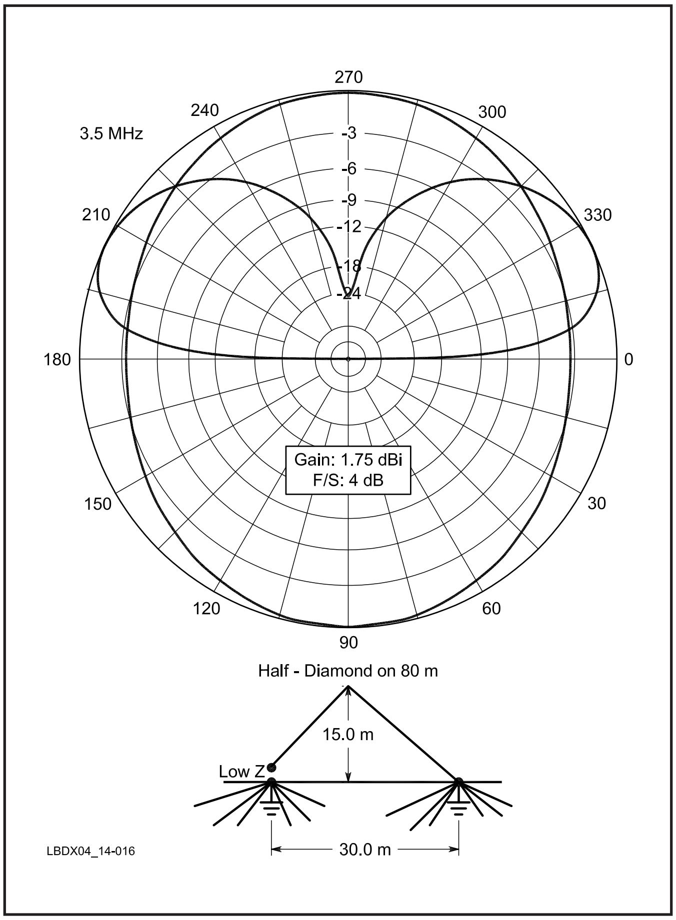


Fig 14-16—This 80-meter array requires only 12 meters of height. The array is capacitively loaded at the top, using two wires in a V shape.

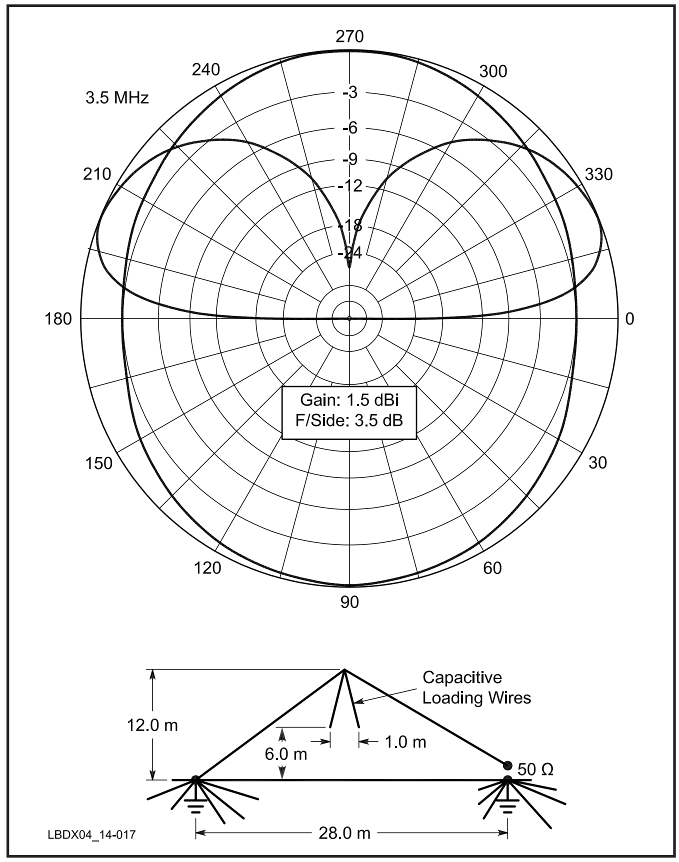


Fig 14-17—This 80-meter capacitively loaded midget Delta-Loop array requires only a 16-meter high support. With one 14-meter support, and sloping the antenna about 30°, the radiation pattern will not be overly affected.

the angle between the wires is varied to tune the antenna to the required frequency. The gain of this antenna is still about 1.5 dBi, which is more than 1 dB better than a single full-size (20 meter high) vertical over typical ground. The feed-point impedance, including about 10-Ω loss resistance, is about 50 Ω!

8.8. A Midget Capacitively Loaded Delta Loop for 80 Meters

The Half-Diamond antennas look very much like a Delta Loop with its bottom wire laying on the ground. Let us raise the wire, and turn it into a real Delta Loop. The model shown in **Fig 14-17** has similar dimensions to the antenna in Fig 14-16, and yields the same gain, the same front-to-side ratio, and even the same feed-point impedance. Needless to say, this is once more proof that the Delta Loop is nothing else than two sloping verticals, fed in phase (see Chapter 10, Section 2).

In this example I used capacitive loading in a little different way. This Delta Loop can be tuned anywhere from 3.8 to 3.5 MHz by just changing the length of the bottom capacity wire. L1 is 11.0 meters, and L2 is 6 meters for f = 3.5 MHz. For f = 3.8 MHz the bottom loading wire can be eliminated altogether.

There is nothing magical about these dimensions. Just keep in mind that the capacitive loading wires should be attached at the high-voltage points, and that they carry very high voltage indeed. Where crossing each other, the loading wires should be kept about 20 cm from each other.

Do not fool yourself into thinking that this antenna does not require radials. The radiation is affected just as much by near-field absorption losses under the antenna as in the case of the grounded verticals. In other words, Delta Loops require a ground screen, just as is the case with all antennas that do have radiating elements close to ground!

9. Special Receiving Antennas

Typical suburban QTHs mean rather dense housing, which in turn means a lot of man-made noise. Now that you have used your imagination, and squeezed an efficient vertical—or even a couple—onto your lot, you're faced with a very high noise level. There are basically four ways to tackle this problem:

- Use a horizontally polarized receiving antenna
- Use a directive receiving antenna so that you can null out the main noise source
- Use a noise-reduction system based on phased antennas
- Locate the offending noise sources and kill them (the noise sources, that is!)

Jim McCook, W6YA, swears by his very short rotatable dipole on top of his tower (see **Fig 14-18**). Such a small dipole would fit almost every lot. You can actually rotate it as it has excellent rejection when its ends are turned toward the direc-

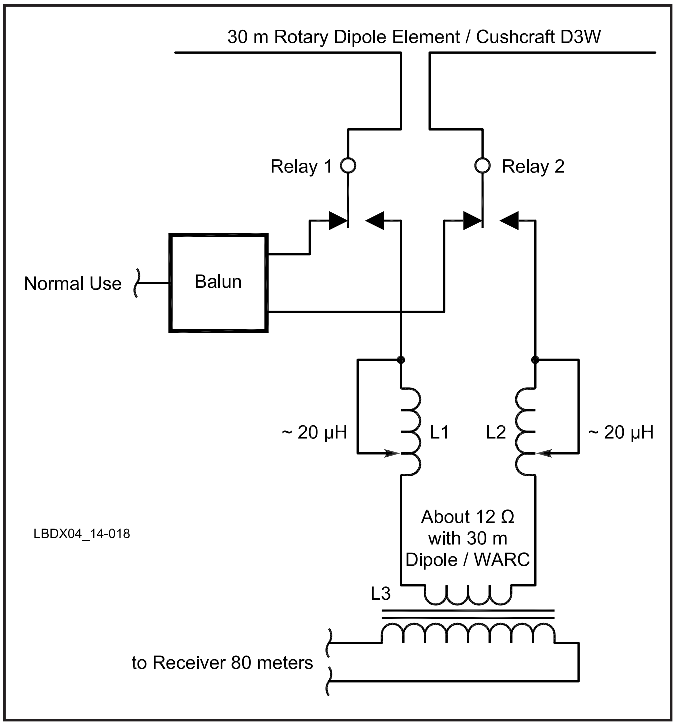


Fig 14-18—W6YA uses a 30-meter rotary dipole, which he resonates on 80 meters with loading coils. The same could be done for 160 meters. As losses are quite irrelevant in a receiving antenna, the Q of the loading coil is not so important.

tions of the noise source. But any low horizontal wire will probably be better than your vertical for receiving.

How about a Beverage? I know your property is not quite like a Texas ranch, but maybe you can run one or even two short ones along the property line. Maybe you can talk your good neighbor into a concession. George, K2UO, has room for only one (150-meter long) Beverage, which partly runs along the property lines of his neighbors. But he says this antenna really was an eye-opener. Even λ/2 long Beverages are better than nothing! If you're after best F/B, tune them for a cone-of-silence length. This means you will need a complex impedance to terminate them (see Chapter 7, Section 2.5). If your neighbor does not care to see the Beverage wire along his property line, maybe you should try a Beverage on Ground (BOG) antenna, as described in Chapter 7, Section 2.11.

How about EWEs, Flags, K9AYs and the like? They are quite popular where space is limited. Don't forget that these antennas should be clear from any transmitting antennas. I would recommend λ/4 as the minimum distance between a special receiving antenna and your transmit antenna. If you cannot achieve that, you can always detune the transmit antenna on receiving (see Chapter 7, Section 3.10).

I have been extremely successful in eliminating man-made noise from a particular source (a chemical plant 10 km away) by using a so-called *noise eliminator*. This is nothing but a circuit in which you combine the inputs from two antennas, the main receiving antenna and a noise-pickup antenna) in such a way that they are added out-of-phase, resulting in complete cancellation of the noise (see Chapter 7, Section 1.35). The MFJ-1206 unit has been a very valuable asset for me when dealing with noises from one particular source.

10. POWER AND MODE

Power and mode both factor into the results you will receive in terms of working DX as well as "working" your neighbor's TV/telephone/radio, etc! The more power you radiate, the more signal will be available at the DX station's antenna. However, look at the goals you have set for yourself. Do you really need to be the first one to get through the pileup? If the answer is yes, you need power; otherwise, you may not. Again, the question is not how much power is coming out of your amplifier; it's how much power are you radiating and are you radiating it in the right direction at the right angle? You must also remember that it is much easier to work DX on CW than on SSB, especially on the low bands. With few exceptions, DX on Topband is on CW.

It is obvious that the more power you run the easier it will be for you to work DX. That does not mean you will get the most satisfaction from your results though. Also, the more power you run, the more chances there are of creating some kind of TVI, BCI or telephone interference problem in the neighborhood. The first and easiest way to avoid similar problems is not to run high power. But, if you are already handicapped with your pocket-size lot, some power may be one of the few available means to get that evasive DX on the low bands after all. CW as a mode also creates fewer audible interference problems than phone (unless your neighbors copy CW).

11. ACHIEVEMENTS

You have read about K2UO's 200+ countries worked on 160 meters with a Zig-Zag Stealth dipole that's nowhere higher than 10 meters. In Chapter 13 (Section 4.5) I described W6YA's 21-meter tower, on a typical suburban lot, which carries antennas for all nine bands! Don't let space restrictions scare you away from the low bands. Be sure that, if you work the evasive 3B7 on Topband from your small lot QTH, you will get triple the satisfaction of the big gun who maybe got through a couple minutes earlier.

Some time ago I read a very applicable statement: *"…I was always complaining about my shoes, until I saw a man without legs."* Let's have fun with what we have and do our best under the circumstances. Be convinced you're not the only one who's not living in ham's paradise. There are many others in the same boat.

12. THE ULTIMATE ALTERNATIVE

Don't put up any antennas, don't get on the air from your pocket-sized QTH, but save your money and energy, and go on a DXpedition once or even twice a year, and provide us hard-core Low Banders with the new countries we need to be able to prove we're the best!

Of course, there's another solution, if you can afford it. Set up a remote station. I have seen wonders of ingenuity and engineering when visiting some of the top remote-controlled stations on the low band in the US: K9DX, W6RJ and N7JW/K7CA come to mind. (See Chapter 11). While that solution is out of reach for all but a very few, it shows what can be done. The sky is the limit!