
A hands-on practicum on antenna zoning from a radio amateur who has walked the walk ... and won!

So You Want To Put Up a Tower...

BY JOHN LINDHOLM,* W1XX

September 17, 2007, marked the successful conclusion of a year-long battle to validate my 100-foot rotating amateur radio tower. This is the story of that effort.

Most articles dealing with antenna zoning and antenna ordinances are written by attorneys. I'm not a lawyer and I haven't played one on TV (with apologies to Fred Thompson). However, as a layperson, I think I can lend a perspective and practicality—that perhaps a lawyer can't provide—to the average ham who dreams of having an amateur radio tower.

The jubilation of a successful appearance before the town Zoning Board of Review (sometimes called the Zoning Board of Appeals or other similar name) had not subsided before I found myself offering advice to local amateurs contemplating erection of antenna towers. Some were going to make what I considered the wrong moves from the outset. Thus, the need for this article presented itself. Why not share my experiences, which might help others in similar circumstances?

Some Starting Assumptions

First of all, let's assume that you probably either intend to put up a tower or already have (see fig. 1). Also, that it is (or will be) perfectly safe in every respect. Its distance from any power lines is greater than its height. It will be erected by hams who really know what they're doing, or better yet, by professionals. Its configuration can be documented by a professional engineer if required (more on that later). Your property does not come under any restrictive covenants that clearly prohibit ama-



Fig. 1— The author's 100-ft. rotating tower, the subject of this article. Majestic, isn't it? (Photo by KB1LN)

teur radio towers. If you live in a CC&R (covenants, conditions, and restrictions) environment, I don't think this article can help you. Should you be seeking the perfect ham radio QTH, I'm sure you already know to beware of any such restrictions. I went through that process a few short years ago and did find what I considered the near perfect location to

build a new home with amateur radio a prime consideration (fig. 2).

Do I Need a Permit?

The obvious technical answer is: "Of course you do, knucklehead!" Any lawyer will tell you that. But don't you know hams who simply have put up an

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Fig. 2— W1XX's new home was built with ham radio in mind and his tower is well-shielded from view by the neighbors ... except from another hilltop a half-mile away in the next town. (Photo by N1CX)

antenna tower without any repercussions? I know several. My guess is that 50% of amateur towers are, let's say, not quite legal.

If you contemplate putting up an amateur radio tower, that's probably the first question you will have to answer: Do I get a building permit? You can't press the "easy button" on this one. The answer will depend on a lot of factors. Every case is different. Here are a couple of examples that may guide you.

Scenario #1: You live (or contemplate buying) in a housing development or neighborhood of houses built on quarter-, half-, or even acre-size lots. You can see some of the other houses. Decision: You had better contemplate getting a permit prior to tower installation.

Scenario #2: The property in question is high on a hill hidden in the woods on a private drive leading to your ham radio heaven of 5-plus acres. You can barely see other residences through the trees. This aptly describes the property my wife and I purchased on which to build a retirement home complete with a beautiful amateur radio tower with HF

and VHF antennas. After consultation with knowledgeable hams in the area (we were relocating from a different state), we adopted the "erect first and (if necessary) apologize later" approach. In most cases, I believe it would have worked. Unfortunately, things backfired for us. More on that later.

Know the Regulations

Regardless of which approach you take, knowing your local town ordinances prior to taking any action or making any decisions with regard to towers is a must. Many cities and towns now post ordinances online, which makes your research job somewhat easier. If they don't, put on a disguise (I'm only half joking here), or send someone to the town hall to pick up a complete copy of the building regulations without letting on why you want them. Paranoid? Maybe so, but going to officialdom with all the wrong questions from the outset could shoot you down before you have even started.

You have accessed your town's

Building Code. Here's where you may need some professional help in interpreting the Building Code. I actually did that and still felt safe proceeding to "erect first." You will find copious references to cellular towers. They do not apply. Study every part of the Building Code. The saving grace in my particular situation was tucked away in a section dealing with church steeples and barn silos, the significance of which I did not recognize at the outset. I subsequently learned this from the town's Building Official (in many jurisdictions referred to as the Building Inspector). How cool was that?

You probably will find that there is a height limit to any structure, including ham towers. In my area it's 35 feet. If you can live with that, you should have no further problem. If you have loftier goals, as did I, read on, Macduff.

When Your Tower is Not a Tower

The word *tower* conjures up all the wrong images to the uninitiated. In ham radio, we know it's a beautiful thing. However, say the word *tower* to any city official and images of cellular phone, broadcast radio, and TV and commercial two-way radio behemoths come to mind. "You want to put up a tower in a residential neighborhood in this town? Are you joking?" Delete the offensive word from your vocabulary whenever speaking to officials. Refer to it in all future official dealings as an *antenna support structure*, but we will continue to call it a tower here for purposes of clarity and saving print space.

My Personal Saga Continues: Time to Apologize

My tower went vertical in early June 2006 situated on a pad of five cubic yards of concrete. Each of the guy anchors was secured in a cubic yard of concrete with a rebar cage, as specified in the manufacturer's engineering drawings—i.e., all according to Hoyle. It sat vacant for over a month and drew no attention except from me as I gazed lovingly at it daily. During the lull, I was busy in my garage putting together the tri-band beam, 40-meter 2-element Yagi, and stacked beams for 6 and 2 meters. The antennas were installed in July.

Hours, days, and months of DXing and contesting bliss followed, until one day a certified letter arrived in the mail from the town's Building Official. Uh oh, trouble in River City!

From a veritable precipice over a half-mile away in the next town, my tower was visible and had violated

STATE OF RHODE ISLAND AND
PROVIDENCE PLANTATIONS

TOWN OF SOUTH KINGSTOWN
ZONING BOARD OF REVIEW

SUPPLEMENTAL INFORMATION
IN SUPPORT OF THE FINDING
BY THE
ZONING ENFORCEMENT OFFICER
AND
SUPPLEMENT TO AN APPLICATION
FOR A BUILDING PERMIT UNDER
§502.03

PLAT 78-1, LOT 3



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Fig. 3— The supplement to the application for the tower's building permit. This is the 59-page document that saved the tower.

someone's sense of aesthetics ... a clear case of NIMBY (not in my back yard). Here's the short version of what happened next: The Building Official accepted my tardy apology and application for a building permit and advised the complainers that I was well within my rights; but they appealed to the Zoning Board of Review (ZBR), which scheduled a public hearing. That triggered the realization that a full-scale defense would have to be undertaken.

Back to Your Situation: Do You Wave PRB-1 in Someone's Face?

You have studied and fully understand the local Building Codes. You have found the supporting paragraphs and

are ready to apply for a building permit. Determine the parameters of the potential minefield you now have to negotiate. Try not to ask questions for which you do not already have the answers. Prime objective: getting a building permit from your town's building department. If it's going to be a no-hassle experience, you may need only a minimum of documentation—an engineer's or manufacturer's drawing, copy of your license, plot plan, cost estimate, and whatever your Building Official requires for any construction project.

Let's talk about PRB-1, the FCC limited preemption of local ordinances, mandating a "reasonable accommodation with minimum regulation" with regard to amateur antenna and tower

installations, now ensconced in Section 97.15(b) of the FCC rules. It, along with the 23 states that have adopted similar language (my state had not), is a nice arrow to have in your quiver, but subject to significant interpretation and thus significant litigation if necessary. Go to <http://www.arrl.org> and bone up on PRB-1. You will probably want to provide a copy of the conclusions (short version) of PRB-1 when applying for your building permit. However, waving it in the official's face with impetuous demands is a no-no. Good manners will do much better.

A bureaucrat must, of necessity, cover his or her fanny with whatever documentation is required to justify issuance of a building permit. The Building Official is not really out to give you a hard time (it will only seem that way!). Approving amateur radio antenna tower installations is not an everyday occurrence. It may raise all sorts of red flags at city hall. It's up to you to provide beaucoup documentation to bolster the decision to issue the permit.

At some point it will become obvious that it's either clear sailing for your tower to go legally vertical or that a protracted struggle lies ahead. We always hope for the former. In my case, notification of a formal zoning hearing signaled the latter. What follows will outline steps to be taken when your tower (or potential tower) is under legal attack.

Do I Hire a Lawyer?

Your predicament at this stage is one of the following: (1) The Building Official is balking at issuing the permit for whatever reason, or simply requiring more documentation; (2) The Building Official has already rejected your application for a building permit; (3) There is some citizen outcry blocking permit issuance; (4) A Zoning Board meeting is scheduled to hear the merits of your application. It may be some combination of the above.

Before you proceed further, you must be prepared to go "all the way"—an all-out battle. The legal struggle that may follow could cost you as much as, or more than, the tower installation itself! Never let on to anyone that you are not committed to see this through to victory. Imply that you'll go bankrupt before you surrender! Even if you do not have a large bank account (I will show you how to keep your costs reasonably in check), always project a determined persona.

An all-encompassing treatise in support of your tower application needs to be written. It will be lengthy and cover every issue and potential objection to your tower installation. It will require

many hours to compose. Being essentially a legal document, it will require professional supervision to produce. Who is going to write it?

Before that is determined, you need to do some more research:

Step 1: Purchase from your favorite bookstore (and study), the ARRL publication *Antenna Zoning for the Radio Amateur*, by Fred Hopengarten, K1VR. Fred is a communications law attorney and has written the definitive book on the subject.

Step 2: Contact the closest ARRL Volunteer Counsel (see the ARRL website), who will give you a free initial consultation on your situation; more on this to follow.

Following steps 1 and 2, you may see the task before you appears monumental. Do not despair. All good things come to those who have the right approach, but you will now have to determine if you need to retain a lawyer.

Besides pocketbook issues, the severity of the opposition will play a role. Advice: If you really want a tower to your specifications, don't go cheap! Remember, the objective now is to produce a supplement to your building permit application, or, what I call the "killer document." Here are some probable scenarios.

Scenario #1: Your funds are severely limited. Write the supplement yourself, relying heavily on the Hopengarten book. This is not recommended unless it's your only option. Hopefully, the opposition to your tower is not strong.

Scenario #2: You have good writing skills and retain either the VC or a local attorney to oversee your writing of the supplement. This will save you considerable cost while getting professional direction. This was the approach I took.

Scenario #3: Turn the matter over entirely to an attorney to represent you. Obviously, this will be the costliest approach and—believe it or not—perhaps not the best.

Let's talk a bit more about retaining an attorney. First of all, keep in mind the VC is a ham and understands antenna zoning. He (or she) does it for a living. Thus, beyond the initial consultation, advice is not free. Expect to pay an initial retainer to cover his expenses and time that may run up to \$200 per hour or more. Is it better to hire a local attorney, who may be cheaper? Others in this situation have suggested that bringing in a local attorney not well versed in amateur radio antenna zoning matters can be counterproductive, as it will take time for you to bring him up to speed. On the other hand, a local attorney may



Fig. 4— The author's ferocious dog guarding the tower from intruders. Note that the fence serves as an anti-climbing device. (Photo by KB1LN)

have considerable political sway. Hiring an out-of-town legal expert may be negatively perceived as a "gunslinger." It's a determination you will have to make.

It's Time to Write The "Killer" Document

For both economic reasons and confidence in my own ability to write a cogent sentence, I chose scenario #2: I would write the document (see fig. 3) under the watchful eye (via e-mail) of a paid professional. This would be a full-time job for over two weeks and the most important "term paper" (ham radio-wise) that I had ever authored. Let's outline the format and issues one by one that need to be addressed, referencing supportive exhibits (Exhibit A, etc.).

Title Page: States the area of jurisdiction, controlling ordinance, your name and address, date.

Table of Contents

Executive Summary: In no more than two pages, state the essence of the case and the relief sought.

Zoning Compliance: If applicable, detail the relevant zoning ordinance

with which your application for a tower is compliant.

Reference the Communications Act of 1996: Pray that your opposition fumbles by attempting to shoot you down on the basis of the limited preemption of local zoning contained in the Communications Act of 1996. The term *personal wireless services*, contained therein, refers by definition to commercial services. It does not apply to amateur radio.

Description of the System: Describe the antenna support structure and antennas in detail. Give a simple explanation of the physics of radio propagation that determined the tower height. Provide exhibits from the manufacturer on wind loading and proper installation. Describe visual impact with maps annotated with distances to lot-line setbacks and nearest neighbors.

Safety Issues: Your insurance agent should be able to provide you with a letter that your standard homeowner's policy provides liability coverage due to failure of an amateur radio antenna system structure, without additional premium. In addition, include a photo of a

April 5, 2007

To Whom It May Concern,

RE: 48 Sharnock Road, South Kingstown, RI

The following research has been done to determine if the presence of radio towers in the Sharnock Road neighborhood has had a negative impact on property values. I have researched real estate sales in South Kingstown in the period of January 1, 2004 -April 1, 2007. The year 2004 was selected based on the year the subject property with the tower in question was built. This was to ensure the analysis is a window on the market place for property that could have been affected by the presence of a radio tower at 48 Sharnock Road. The research analyzes two segments of the single family real estate market in South Kingstown. They are:

1. All single family sales in South Kingstown 1/1/04-4/1/07.
1008 sales are recorded
2. All single family sales in the neighborhood of the tall Verizon commercial radio tower and 48 Sharnock Road tower. The streets included are:
Lab Hill Rd, Estampes Ct, Whipposwill Dr, Windwood Valley Rd, Lee Rd, Sharnock Rd, Jacule Dr.
11 sales are recorded

The analysis of the data (1.) above show that the average property sold at 95.5% of the asking price and took 87 days on the market to sell.
The analysis of the data (2) above show that the average property in this group sold at 97.1% of the asking price and took 86 days on the market to sell.

Further research of single family property values in the immediate area of the Verizon and 48 Sharnock Road towers reveals that the South Kingstown Assessor's recent re-valuation completed, 3/16/07, indicate an average 21% increase in assessments.

Based on the data and my knowledge of the market it is my opinion the presence of the radio towers has not had a negative impact on property value. In fact, the market group "2" in the tower's neighborhood experienced a slightly higher selling price and shorter days on market than the general South Kingstown marketplace.

In my professional opinion, in the cases cited, the presence of a radio tower has not affected property values negatively.

I am a broker licensed since 1973, a member of the National Association of Realtors, with GRI and CBR designations.

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Fig. 5- Exhibit X was the real estate broker's market analysis of neighborhood properties. It showed that the presence of an amateur radio tower has no effect on property values. An SASE to the author will get you a copy.

standard "anti-climbing device" to be used to discourage any inquisitive neighborhood children (see fig. 4).

Potential for Radio Interference: The question of potential for RFI has been completely preempted by federal law with exclusive jurisdiction reserved to the FCC. State or local law has no standing in such matters. It is wise, however, to point out that you are the good-guy radio amateur who pledges to cooperate with any affected individual.

Environmental Effects: Contrast amateur intermittent operation of over 50% listening to commercial broadcast. Based on your power output, after feed-line losses, calculate the worst-case scenario power density at your nearest neighbor as a percentage of the American National Standards Institute (ANSI). Mine was a mere 2.975%. Con-

tact Ed Parsons, K1TR, for his PWR_DENS V3.0 calculation program, or use the on-line calculator from Ken Harker, WM5R, found at <<http://n5xu.ae.utexas.edu/rfsafety/>>. Point out that the higher the antenna, the lower the exposure. And finally, point out that on FCC Form 605 used to obtain or renew a license, one must certify the following: "Amateur Applicant certifies that the construction of the station would NOT be an action that is likely to have a significant environmental effect."

Property Values: I requested a professional market analysis by a respected real estate broker in my area, the conclusion of which was that the presence of a radio tower does not negatively affect property values. (See fig. 5, copies available for an SASE.)

Federal Preemption, PRB-1: You will

need some professional guidance here as you point out in detail the significance of PRB-1, citing extensive precedent-setting case law that supports your position. Your objective here is to show that not only is your tower reasonable and permitted by the law, but that any attempt to deny your rights will be met with severe retribution! (Read: "I'll sue the pants off you!") Rely heavily on the Hopengarten book to quote case-law excerpts verbatim.

Conclusion: State the desired action.

Exhibits

Include all the supporting documents of the above points in chronological order, plus the following:

- A copy of your amateur radio license.
- Your amateur radio resume. Make sure this includes membership and credentials in your local Amateur Radio Emergency Service or Emergency Management affiliation.
- TOWAIR Determination Results. Use Google® or another search engine to determine whether FCC or FAA registration is required.
- Press reports on amateur radio in Hurricane Katrina, etc.
- A site plan.
- Letters of support from abutting neighbors. Don't shy away from visiting abutting neighbors with a form letter in hand for their signatures. Point out the positive aspects of your emergency communications capability, an asset to the community. I was pleasantly surprised by the warm reception I received from neighbors, many of whom I had never met.
- Any other documents pertinent to your particular situation.

My killer document weighed in at a total of 59 pages, including exhibits A through Y. Yours might require even more. Take it in CD format to your local printer to make as many plastic-ring bound copies as may be needed. If a zoning hearing is on your calendar, distribute to each commissioner and any ex-officio participants at least a week before the hearing.

Zoning Hearing

A zoning hearing will require a formal presentation either well-rehearsed by you or by your attorney. A PowerPoint® presentation will focus on the key points. Project a friendly but knowledgeable command of the subject and determination in your quest, but keep it short. Enlist support from your local amateur radio community to attend, as

you are a test case for their tower aspirations, but no bizarre hats with blinking lights and rotating miniature antennas in the audience! Exhibit support with reserved decorum. Have a couple of well-spoken amateurs briefly present support on a single issue, such as the value of emergency communications to the community.

The Happy Ending to My Story

After my killer document had been completed and distributed to the members of the Zoning Board well prior to the hearing date, my consulting attorney directed I give a copy to the complainants a day in advance of the hearing. "No, I don't want to do that!" Case in point: Listen to professional advice. Reluctantly complying, the evening of the hearing came with a full audience of supportive hams from all over the state. It seemed like a hamfest, except no funny hats! We were number two on the agenda.

Número uno seemed like a perfectly reasonable request to put up a cellular tower on commercial property. But no ... denied! It was not looking good. Then, however, redemption for all the hard work. Upon reading the strength of the arguments for the tower, the complainants sent word that their objection was withdrawn. Hallelujah! Procedurally, the matter was withdrawn with prejudice, meaning it could not be resurrected. Great rejoicing with ham friends followed outside.

In due course, the building permit was issued, the site inspected and found in compliance, and a final use permit issued. "Hello DX on 20 meters!"

Mega Thanks

This success story could not have been written without the help of many others. They include: my lovely, supportive, wife Carolyn; Fred Hopengarten, Esq., K1VR, who reviewed the draft of my application supplement and this article; the CTRI Contest Group; Rhode Island ARES; Kevin Gallup, Director Charlestown (RI) Emergency Management; Matt Strelow, KC1XX, President XX Towers; Faith LaBossiere, Associate Broker, Randall Realtors, GMAC; my dog Ito, who posed in front of photographs of the tower; Bobby Rogers, KB1LN, photographer; and radio amateurs everywhere who provide emergency radio communications capability.

I hope my experiences help other tower aspirants navigate the sometimes torturous path to their own tower story of success.
