

STATE OF NEVADA

STOREY COUNTY BUILDING DEPARTMENT

SUPPLEMENTAL INFORMATION  
FOR AN AMATEUR RADIO FACILITY  
ACCOMPANYING APPLICATIONS  
FOR BUILDING PERMITS

APN: 003-431-18, AREA VR, LOT/BLK 37



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**TABLE OF CONTENTS**


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Table of Contents.....	2
Preamble .....	5
The Telecommunications Act of 1996 (47 USC §332 <i>et seq.</i> ) Does Not Apply .....	6
Covenants, Conditions and Restrictions Do Not Apply .....	7
Amateur Radio is Not a Commercial Use .....	8
All Structures Comply with the Storey County Code.....	8
<i>The Proposed Antenna System May Be Permitted as a Matter of Right</i> .....	8
<b>Chapter 17.40 E ESTATES ZONE Section No (17.40.020) Permitted uses.....</b>	<b>8</b>
<i>No Special Use Permit Required.....</i>	<i>9</i>
<b>Chapter 17.62 SPECIAL USES Section No (17.62.020) Special use permits.....</b>	<b>9</b>
<b>Chapter 17.40 E ESTATES ZONE Section No (17.40.025) Uses subject to permit .....</b>	<b>9</b>
<i>No Variance Required .....</i>	<i>10</i>
<i>If §1712.62.020 (“Special Use Permits”), §17.40.025 (“Uses Subject to Permit”), and §17.60.010 (“Variances”) Do Not Apply, What Does?.....</i>	<i>10</i>
<i>Building Permits May Be Issued Without Action by the Board of County Commissioners.....</i>	<i>10</i>
Intended Use Consistent with Needs Analysis.....	11
<i>A Maximum Height of 45’ Does Not Satisfy the Need .....</i>	<i>11</i>
Description of the Proposed System .....	12
<i>The Antenna Support Structures.....</i>	<i>12</i>
“Height Above Grade Level” Must Be Defined.....	13
<i>No Effect on Microclimate .....</i>	<i>19</i>
<i>Effective Visual Impact is Minimal .....</i>	<i>19</i>
<i>Wind-loading Consistent with Standards.....</i>	<i>19</i>
Site Carefully Selected.....	20
<i>Every Structure is Distant from Nearby Homes .....</i>	<i>20</i>
<i>Every antenna structure meets E-10-HR zone setbacks – 30’ (front); 40’ (rear); 15 (side).....</i>	<i>20</i>
Why this Height? “Effective Communications” .....	22
Local Terrain Requires Height .....	24
Environmental Effects Insignificant.....	25

Good Engineering Practices Employed .....	26
Insurance Covers Losses.....	26
Radio Frequency Interference Preempted.....	26
Property Values Unaffected.....	29
Legal: Preemption & Case Law Support The Application .....	29
<i>Firm, Fixed, Unvarying Height Restrictions are Void</i> .....	32
<i>Multiple Towers are Permissible</i> .....	34
<i>Amateur Radio is an Ordinary Accessory Use</i> .....	37
<i>The County Must Accommodate This Individual Radio Amateur</i> .....	37
<i>No Additional Balancing By the County Permitted</i> .....	38
Support From Neighbors.....	39
Remote Control is Not an Option .....	39
Conclusion.....	39
Exhibit A: APPLICANTS' AMATEUR RADIO LICENSES .....	40
Exhibit B: ANNOTATED PLOT PLAN OF APPLICANT'S LAND PARCEL.....	41
Exhibit C: LOCAL ROAD MAP .....	43
Exhibit D: AREA ZONING .....	44
Exhibit E: USGS TOPO MAP OF PROPOSED SITE.....	45
Exhibit F: PHOTOS/DRAWINGS OF EXISTING & PROPOSED STRUCTURES .....	46
Exhibit G: EMERGENCY POWER GENERATOR .....	50
Exhibit H-1: RED CROSS SUPPORT FOR AMATEUR RADIO ANTENNAS .....	51
Exhibit H-2: LOCAL SUPPORT FOR THIS APPLICANT .....	52
Exhibit I: FAA TOWAIR STUDY.....	54
Exhibit J: THE IMPORTANCE OF AMATEUR RADIO IN EMERGENCIES.....	55
Exhibit J-2: PRESIDENTIAL RECOGNITION .....	65
Exhibit J-3: ARRL-FEMA AFFILIATION .....	66
Exhibit K: EMERGENCY COMMUNICATIONS SERVICES IN STOREY COUNTY .....	67
Exhibit L: VIEWS TOWARD NEIGHBORING PROPERTIES .....	70
Exhibit M: INSURANCE LETTER .....	71
Exhibit N: POWER DENSITY CALCULATION .....	72

Exhibit O: VISUAL IMPACT AT NEIGHBORING PROPERTIES.....73

Exhibit P: VCHR POA MEMO RE CC&Rs .....76

Exhibit Q: BUILDING PERMIT NO. 8354 .....77

Exhibit R: PE LETTER FOR STRUCTURES IN BUILDING PERMIT NO. 8354.....78

Exhibit S: NEVADA PE OPINION.....79

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**PREAMBLE**

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This accompanies applications under §15.12.010 of the Storey County Code for building permits for the erection and maintenance of private, non-commercial amateur radio antenna support structures for personal use by the Applicants, individuals licensed by the Federal Communications Commission (FCC) since 1959 (Tom Taormina) and 1991 (Midge Taormina). See **Exhibit A** for their present licenses, which qualifies them for the protections of the amateur radio preemption by federal law contained in 47 CFR §97.15(b), and the amateur radio preemption contained in NRS 278.02085.

An amateur radio antenna system is normally carried above the roof-line; and amateur radio, inherently non-commercial, is an ordinary accessory use of a residence. The proposed antenna system will not cause substantial detriment to the public good; in fact, the proposed system will serve the public good due to the findings of the Congress, the FCC, the Courts, and, most particularly as displayed in this application, the availability of this station to serve in time of emergency – including power and cell phone blackouts. A permit for the proposed system would be consistent with public policies, both Federal and State, protecting the rights of licensed radio amateurs to construct and use amateur radio facilities, and the granting of this application will be in harmony with the general purposes and intent of the regulations of the Storey County Code.<sup>1</sup>

Antenna systems, as mentioned above, are normally above the roof-line. They have been a part of American popular culture since the invention of radio.



*Figure 1- Marconi Wireless Telegraph Station, South Wellfleet, Mass. Source: The National Park Service.*

Among the very first stations for international communications, this postcard shows the antenna system constructed by Marconi, in South Wellfleet, Massachusetts, *in 1901*, which included a series of towers 200' tall.

Norman Rockwell made a TV antenna famous, by putting it on the cover of the Saturday Evening Post for November 5, 1949. This oil on canvas is presently in the Los Angeles County Museum of Art.

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<sup>1</sup> The General Purpose of the Ordinance is expressed at §17.02.020: “to serve the public health, safety, comfort, convenience and general welfare . . . “ The Applicant’s amateur radio use promotes each of those goals.



Figure 2 - Source: [http://www.artchive.com/artchive/r/rockwell/thumb/rockwell\\_antenna.jpg](http://www.artchive.com/artchive/r/rockwell/thumb/rockwell_antenna.jpg)

Putting antennas up in the sky is engrained in American culture.

The position of a radio amateur in the permitting process is uniquely enhanced by a Congressional finding that "reasonable accommodation should be made for the effective operation of amateur radio from residences, private vehicles and public areas, and that regulation at all levels of government should facilitate and encourage amateur radio operation as **a public benefit.**" Public Law 103-408, § 1 (3), October 22, 1994 (*emphasis added*). While defining "effective operation" may be challenging, the Applicant is confident that, by comparison, no one would accept as "effective operation" a cell phone or TV station that was only useful three or four days a week. Nonetheless, the Applicant has used that highly compromised standard as his threshold.

The Applicant and his wife own the property, which was acquired on May 1, 1997. The land is designated Lot 37, as shown on a Division of Land Map, recorded August 1, 1978 as Document 42925, Official records of Storey County, Nevada, of what is commonly referred to as Highland Ranches. The property, approximately 10 acres in size, is in the E-10 HR district.

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**THE TELECOMMUNICATIONS ACT OF 1996 (47 USC §332 ET SEQ.) DOES NOT APPLY**

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An opponent to this project may wish to emphasize the limitations of the preemption of local zoning contained in The Telecommunications Act of 1996 (especially §704), the contents of which are now found at 47 USC §332 *et seq.*, and cases related to the PCS and cellular mobile industry (together, Commercial Mobile Radio Services, or CMRS, also "personal wireless services"). Nonetheless, 47 USC §332 is unrelated to the matter at hand. It does not apply.

In particular, an opponent may be well pleased with, and cite, 47 USC §332(c)(7)(A):

**(7) Preservation of local zoning authority**

**(A) General authority**

Except as provided in this paragraph, nothing in this chapter shall limit or affect the authority of a State or local government or instrumentality thereof over decisions regarding the placement, construction, and modification of **personal wireless service facilities.** (*Emphasis added.*)

An opponent might also cite (in part) 47 USC §332(c)(7)(B):

(B) Limitations

- (i) The regulation of the placement, construction, and modification of **personal wireless service facilities** by any State or local government or instrumentality thereof -  
 (I) shall not unreasonably discriminate among providers of functionally equivalent services; and  
 (II) shall not prohibit or have the effect of prohibiting the provision of personal wireless services. (*Emphasis added.*)

**Unfortunately, an opponent is likely to overlook the definitions, which answer the question: “To whom does this apply?”**

Please refer to 47 USC §332(c)(7)(C):

(C) Definitions

**For purposes of this paragraph -**

**(i) the term "personal wireless services" means commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services;**

**(ii) the term "personal wireless service facilities" means facilities for the provision of personal wireless services (*Emphasis added.*)**

The Applicants are neither a commercial mobile service, nor an unlicensed wireless service, nor a common carrier.

The Applicants are non-commercial, FCC-licensed, radio amateurs, in a wholly different service and subject to a wholly different set of regulations (47 CFR §97), and the beneficiary of a wholly different preemption (47 CFR §97.15(b)). A discussion of the law that does apply is found later in this document, in the section entitled “Preemption.”

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**COVENANTS, CONDITIONS AND RESTRICTIONS DO NOT APPLY**

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Highland Ranches is a very rural 40,000 acre subdivision. It has, historically, appealed to residents who value their privacy and their ability to engage in non-prohibited activities such as owning and raising horses and other livestock. Many have moved from suburban areas solely for the purpose of being able to engage in activities and avocations that are not permitted in subdivisions. The CC&R’s (<http://hrpoa.org/HRPOACCnRs2003.pdf>) have no prohibition against amateur radio support structures. Further, the Highland Ranches Property Owner’s Association has gone on record with their acknowledgement that the CC&R’s do not apply in this case.

I spoke with Bill Lewis earlier today about [permission of the Architectural Committee as necessary for the antennae] and he assured me that the Committee does not consider that it has authority over the radio antennae.

Memorandum from Laura Grant, Deputy District Attorney, July 1, 2008, at 2.

See also an undated memorandum from Howard H. Depew, P.E., Chairman Architectural Committee, Virginia City Highlands Ranches Property Owners Association, included as **Exhibit P**, which states: “I have reviewed the existing association CC&Rs and find nothing which prevents erection, limits tower size, or the quantity of these structures on a member’s property.”

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**AMATEUR RADIO IS NOT A COMMERCIAL USE**

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This particular use, and the structures involved, may be controversial, be it is important to point out what this is NOT. All amateur radio uses are inherently non-commercial, under the terms of the license. See especially 47 CFR §97.1 (a):

**PART 97--AMATEUR RADIO SERVICE****Subpart A--General Provisions****Sec. 97.1 Basis and purpose.**

The rules and regulations in this part are designed to provide an amateur radio service having a fundamental purpose as expressed in the following principles:

- (a) Recognition and enhancement of the value of the amateur service to the public as a **voluntary noncommercial communication service, particularly with respect to providing emergency communications.**
- (b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.
- (c) Encouragement and improvement of the amateur service through rules which provide for advancing skills in both the communication and technical phases of the art.
- (d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.
- (e) Continuation and extension of the amateur's unique ability to enhance international goodwill. (*Emphasis supplied.*)

These structures will be used exclusively for amateur radio, not cellular telephone, broadcasting, or any other commercial purpose. The Applicant will accept a permit condition to the following effect: "The structure shall not be used to support common-carrier cellular telephone or any other commercial purpose antennas."

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**ALL STRUCTURES COMPLY WITH THE STOREY COUNTY CODE**

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**THE PROPOSED ANTENNA SYSTEM MAY BE PERMITTED AS A MATTER OF RIGHT**

Amateur radio is a permitted use in all districts of the County because amateur radio cannot be forbidden. "State and local regulation of a station antenna structure must not preclude amateur service communications." 47 C.F.R. §97.15(b). "A governing body shall not adopt an ordinance, regulation or plan or take any other action that precludes amateur service communications . . ." NRS 278.02085.1.

The amateur radio antenna structures at this property are, together, an accessory use, located on the same lot or parcel and customarily incident to a single-family dwelling. They are **permitted as a matter of right.** Storey County Ordinance §17.40.020:

**CHAPTER 17.40 E ESTATES ZONE  
SECTION NO (17.40.020)  
PERMITTED USES.**

The following uses are permitted in the E estates zone:

. . . B. Accessory uses customarily incident to the above uses and located on the same lot or parcel, including but not limited to, a private garage with a capacity of not more than four automobiles; private stables, garden houses, playhouses, greenhouses, enclosed swimming pools, tool-houses, well-houses, woodsheds, storage sheds and hobby shops. Any accessory use structure over forty-eight feet wide or over sixty feet long shall require a special use permit.

None of the towers involved is more than three feet wide, or more than three feet long. This being the only plausible correlation to amateur radio support structures, they are a permitted use. For more on amateur radio as an ordinary accessory use, see the subsequent section on Preemption, and Amateur Radio as an Ordinary Accessory Use, with many cases cited.

#### NO SPECIAL USE PERMIT REQUIRED

It may be argued that SCC §17.62.020 requires a special use permit for these amateur radio antenna systems, under §17.62.020 I, because they are radio transmitters and towers. But that is not what §17.62.020 says. It reads:

#### CHAPTER 17.62 SPECIAL USES SECTION NO (17.62.020) SPECIAL USE PERMITS.

The following uses may be permitted only in zones that allow said usage per the granting of a special use permit. This excludes the I-S special industrial zone and PUD planned unit development or subdivision zone: A. City, county, state and federal enterprises, including buildings, facilities and uses; B. Educational institutions, including elementary, middle and high schools whether public, private or parochial; C. Establishments or enterprises involving large assemblages of people or automobiles, including amusement parks, circuses, carnivals, expositions, fairgrounds, race tracks, recreational and sports centers, whether temporary or permanent; D. Golf courses, golf driving ranges and country clubs; E. Hospitals, sanitariums and rest homes; F. Libraries, museums and private clubs; G. Parks, playgrounds and community facilities; H. Public utility or public service buildings, structures and uses; I. Radio, television and other communication transmitters and towers; J. Sewer plants or sewage disposal facilities; K. Wild animal maintenance. (Ord. 159 § 2(part), 1999)

A closer reading of §17.62.020 is required. It says that a special use permit is required ONLY if the use IN THAT ZONE requires a special use permit. This requires us to look at the uses which require a special use permit in the E Estates zone. To find out what those uses may be, we look to §17.40.025.

#### CHAPTER 17.40 E ESTATES ZONE SECTION NO (17.40.025) USES SUBJECT TO PERMIT.

The following additional uses may be permitted subject to securing a special use permit [from the BOCC] as provided for in Chapter 17.62 of this title: A. Public buildings, . . . ; B. Licensed child care facilities . . . C. One detached family guest home . . .

Radio, television and other communication transmitters and towers are not listed. **As ordinary accessory uses to a residential dwelling, the Applicants' antenna systems do not require a special use permit.**

## NO VARIANCE REQUIRED

A variance under §17.60.010 is also not appropriate, because this section was designed to vary restrictions that would otherwise forbid the construction proposed. It allows a grant of relief from the strict application of the regulations of this title. It would be appropriate if amateur radio antenna systems were forbidden by the SCC, but amateur radio antenna systems are permitted as a matter of right, and the 45 foot height limit is void as a matter of both federal and state law. As a result, no variance is required.

IF §1712.62.020 (“SPECIAL USE PERMITS”), §17.40.025 (“USES SUBJECT TO PERMIT”), AND §17.60.010 (“VARIANCES”) DO NOT APPLY, WHAT DOES?

**Response: The proposed antenna system is governed by §17.40.020 (Permitted Uses in the E-10 Estates Zone) and 47 CFR §97.15(b) and N.R.S. NRS 278.02085.** The County should accept that §17.12.044, which purports to limit accessory structures to “forty-five (45) feet in height” **is illegal, as a firm, fixed, maximum height, inherently incapable of meeting both the state and federal requirements that the municipality must reasonably accommodate amateur radio** (see case law cited in the subsequent section on preemption), and issue a building permit. Section 17.12.044, which purports to limit all amateur radio antenna systems to 45 feet at most, is preempted. The County should abide by the state and federal preemptions. **The proposed antenna systems should receive permits as a matter of right.**

Simply granting the necessary permit is an extremely common approach throughout the United States. It is exactly the approach taken in any number of un-litigated cases (Applicant’s counsel is familiar with Prescott, AZ, Ames, IA, Polk County, GA, Citrus County, FL, and Putnam Twp., MI as examples of such situations within the last few years), and exactly the approach taken in two cases where the decision of the building inspector was appealed and upheld by the courts. *Snook v. Missouri City, Texas*, No. 03-cv-243, 2003 U.S. Dist. LEXIS 27256, 2003 WL 25258302 (S.D. Tex. Aug. 26, 2003, Hittner, J.) (the Order, Slip Opinion, 63 pp.), see also the Final Judgment, Slip Opinion, 2 pp. PACER citation: [https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L\\_238\\_0-14:03-cv-00243\\_Snook v.\\_City\\_of\\_Missouri](https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L_238_0-14:03-cv-00243_Snook_v._City_of_Missouri), (S.D. Tex. 2003), but more readily found at

[http://www.arrl.org/FandES/field/regulations/PRB-1\\_Pkg/Snook%20KB5F%20Decision%20&%20Order%2034.pdf](http://www.arrl.org/FandES/field/regulations/PRB-1_Pkg/Snook%20KB5F%20Decision%20&%20Order%2034.pdf) (USDC, SDTX, 2003, Hittner, J.) (the Order, 63 pp.) (Building Inspector realized that 35’ maximum height for amateur radio antenna systems violated 47 CFR §97.15(b). Court affirmed decision of the Building Inspector.); *Chedester v. Town of Whately*, <http://www.qth.com/antennazoning/ham/chedester-decision.pdf> (Superior Court, MA 2004) (Building Inspector realized that 35’ maximum height for amateur radio antenna systems violated 47 CFR §97.15(b), Superior Court affirmed Building inspector, finding height limit of 35’ to be “an absolute and unvarying height restriction” and preempted. “A 35’ height restriction would effectively mean that no radio communications would be able to be transmitted.” Building permit reinstated.)

BUILDING PERMITS MAY BE ISSUED WITHOUT ACTION BY THE BOARD OF COUNTY COMMISSIONERS

This path has the following advantages:

1. It avoids a finding that the maximum height provisions of the code are preempted as an illegal firm, fixed maximum height (leaving, one might point out, Storey County with no regulation of amateur radio antenna support structures whatsoever).
2. It preserves the SCC as written, because no challenge will be brought.
3. It saves all parties the cost of litigation. (As to the County’s likelihood of success in the courts, please review the plethora of court cases cited in the preemption section of this filing, which cases find a firm, fixed height to be preempted.)

**The Applicant strongly urges the adoption of this strategy.**

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**INTENDED USE CONSISTENT WITH NEEDS ANALYSIS**

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The intended use of the support structures and antenna arrays is not a matter of whim or unfounded desire for quantity or size of towers. The applicant moved to Highland Ranches with a carefully engineered strategic plan to build a “world class” amateur radio installation that would reach its ultimate capability by 2011<sup>2</sup>. Since Mr. Taormina built his first antenna support in 1959, he has designed and built successively more effective “antenna farms” and the planned system is the culmination of nearly 50 years of pioneering work in antenna design and radio wave propagation experimentation. **When the parcel at 370 Panamint Road was purchased in 1997, there were no County Ordinances or HRPOA CC&R’s that prohibited this plan.**

The Needs Assessment prepared by R. Dean Straw, B.S.E.E.<sup>3</sup>, discusses the intended purpose (reliable communications over routine paths to Europe at 1.8, 3.5, 7, 14 and 21 MHz), and the differences between performance of an antenna system at a lower height, as opposed to a really useful height, and finally the height that the Applicant is willing to accept. Straw also examines current and planned needs for VHF and UHF antennas in furtherance of the Storey County Emergency Communications Plan (See **Exhibit J**).

**A MAXIMUM HEIGHT OF 45’ DOES NOT SATISFY THE NEED**

At lower height, the performance does not meet the need. In the amateur radio cases, **the need is specific and defined by the individual radio amateur.** This concept has recently been confirmed by the Court in *Snook v. Missouri City (TX)*, No. 03-cv-243, 2003 U.S. Dist. LEXIS 27256, 2003 WL 25258302 (S.D. Tex. Aug. 26, 2003, Hittner, J.) (the Order, Slip Opinion, 63 pp.), see also the Final Judgment, Slip Opinion, 2 pp. PACER citation: [https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L\\_238\\_0-14:03-cv-00243\\_Snook v. \\_City\\_of\\_Missouri](https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L_238_0-14:03-cv-00243_Snook_v._City_of_Missouri), (S.D. Tex. 2003), more readily found at [http://www.arrl.org/FandES/field/regulations/PRB-1\\_Pkg/Snook%20KB5F%20Decision%20&%20Order%2034.pdf](http://www.arrl.org/FandES/field/regulations/PRB-1_Pkg/Snook%20KB5F%20Decision%20&%20Order%2034.pdf) (USDC, SDTX, 2003, Hittner, J.), wherein the Court stated:

To conduct effective emergency communications, Snook must be able to achieve at least a 75 to 90 percent successful signal under the changing variables that impact emergency or other amateur radio communications. *Snook Findings of Fact ¶9*

Based on his emergency and amateur radio experience, he estimated that an antenna array of 180 to 185 feet would be optimal. *Snook Findings of Fact §15*. [Note that Snook’s requirements were for Texas, where hills – which impact propagation needs -- are rare.]

The key test is: What communications does the amateur desire? That is what must be accommodated by the municipality. Here is the way the test was originally stated by the FCC in 1985.

Amateur station communications are only as effective as the antennas employed, antenna height restrictions directly affect the effectiveness of amateur communications. **Some amateur antenna configurations require more substantial installations than others if they are to provide the amateur operator with the communications that he/she desires to engage in.** For example, an

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<sup>2</sup> The 11 year solar sunspot cycle is predicted to reach its maximum benefit for HF radio communications in 2011.

<sup>3</sup> Mr. Straw is currently considered one of the preeminent authorities on amateur radio wave propagation and antenna design

antenna array for International amateur communications will differ from an antenna used to contact other amateur operators at shorter distances. **Federal Preemption of State and Local Regulations Pertaining to Amateur Radio Facilities** (FCC 85-506) (known as "PRB-1"), 9/16/85, ¶ 25. (*Emphasis added.*) Source: <http://wireless.fcc.gov/services/amateur/prb/index.html>

As some courts and municipalities were to later misread the FCC's rule, the FCC found it necessary to clarify its ruling in 1999, by recognizing that there might be differences between "heavily-populated urban or suburban locales" and the rural situation involved here, wherein the Applicant resides on 10 acres of rural land, stating:

We believe that the effectiveness of these guidelines or standards can be gauged by the fact that a local zoning authority would recognize at the outset, when crafting zoning regulations, the potential impact that high antenna towers in heavily-populated urban or suburban locales could have and, thus, would draft their regulations accordingly. In addition, we believe that PRB-1's guidelines brings to a local zoning board's awareness that **the very least regulation necessary for the welfare of the community must be the aim of its regulations so that such regulations will not impinge on the needs of amateur operators to engage in amateur communications.** <http://wireless.fcc.gov/services/amateur/prb/prb1999.html> at ¶9 (*emphasis supplied*).

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## DESCRIPTION OF THE PROPOSED SYSTEM

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### THE ANTENNA SUPPORT STRUCTURES

The antenna support structures were installed starting in 1997 and have been continually modified ever since, according to the Applicant's plans and resulting from experimentation. In the last year, there have been eight support structures, and the planned number is still eight – because the two structures approved in Building Permit No. 8354 are replacements for two existing structures (removed).

1. 40 Meter Rohn 45G -- 140'  
This structure was installed in 1997. It has had successive iterations of antenna arrays installed on it. This tower is guyed in four places to concrete guy anchors. It meets the manufacturer's specifications and drawings. Since there has never been a building permit required<sup>4</sup>, this structure was raised from 70' to 140' in July, 2008. Three antennas are planned to be erected on this structure when the Stop Work Order is rescinded.
2. 20 Meter Rohn 25G -- 85'  
This structure was installed in 1998. It has had successive iterations of antenna arrays installed on it. This tower is guyed at four levels. It meets the manufacturer's specifications and drawings. This structure is scheduled for guy wire maintenance, replacement of one antenna, addition of another antenna and repair of the rotator. This maintenance will be completed when the Stop Work Order is rescinded.

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<sup>4</sup> From 1997 until July, 2008, the Applicant has been repeatedly verbally informed by the Storey County Building Department that his towers "did not need permitting," and were "grandfathered" into the 1999 Building Code revisions.

3. Rohn HBX-32 – 32'

This structure was installed in 1999. As with other structures, it has had successive iterations of antenna arrays installed on it. This structure is self-supporting by design, but is also guyed and bracketed to the pump house building. It meets the manufacturer's specifications and drawings. This structure is scheduled for installation of one antenna and repair of the rotator. This structure is below the 45' limit currently imposed by the SCC. Work on this structure will commence upon the issuance of permits requested by Building Permit application of July 25, 2008.
4. 160 Meter Rohn 25G – 110'

This structure was installed in 2007. The entire structure is a radiating antenna. This antenna is guyed at three levels to concrete anchors. It meets the manufacturer's specifications and drawings. This structure will be moved approximately 40' to alleviate an unintentional encroachment of a guy anchor on Lot 36. This work will be completed when the Stop Work Order is rescinded
5. VHF Trylon 1245 – 40'

This structure was installed in 2003. It has had successive iterations of antenna arrays installed on it. This structure is guyed at two levels. It meets the intent of the manufacturer's specifications and drawings. This structure is scheduled for periodic maintenance. It is below the 45' limit currently imposed by the SCC. Maintenance on this structure will commence when the Building Permit application of July 25, 2008 is granted.
6. 20 Meter Rohn 45G – 140'

This structure was installed in 2007. It is guyed at three levels to concrete anchors. It meets the manufacturer's specifications and drawings. This structure is scheduled for guy wire maintenance, replacement of one antenna, and repair of the rotator. Maintenance will be completed as soon as the Stop Work Order is rescinded.
7. 15 Meter Monopole (proposed) – 120'

This support is under construction. It is scheduled to hold four 15 Meter antennas. This structure has been approved under Building Permit No. 8354 and will be completed when the Stop Work order rescinded. A wet-stamped PE package was supplied to the County with the original application.
8. 80 Meter Monopole (proposed) – 195'

This support is under construction. It is scheduled to hold two 80 Meter antennas, four 10 Meter antennas, and a 440 MHz vertical antenna for the emergency communications repeater. This structure has been approved under Building Permit No. 8354 when the Stop Work order rescinded. A wet-stamped PE package was supplied to the County with the original application.

Every structure in the antenna systems at this site was designed for wind-loading of 21 lbs per square foot, equivalent to a wind-speed of 70 miles per hour per the State Building Code and industry standard EIA-222. These structures have an abundance of safety margin, as the building code itself has safety margins within it.

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**“HEIGHT ABOVE GRADE LEVEL” MUST BE DEFINED**

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The arbitrary “45' height above grade level” in §17.12.044 begs for “grade level” to be more precisely defined. On the flat open desert of central Nevada, height above grade level can be accurately reckoned as height above the dirt you are standing on. In mountainous Storey County, height above grade level is not so

clearly measured. For instance, on the Taormina ten-acre parcel, the lowest elevation is 6,323' and the highest is 6,456', a difference of 133'. How does one measure "height above grade level?" Is it from the lowest point? Is it from the highest point? Is it from the grade at the house? Is it from the base of each support structure?

Since safety issues (the possibility that a structure might fall on a neighbor's house) are not a factor – the nearest house to any antenna support structure is 610 feet away, and the Highlands is not close to any airport, height above grade should not be arbitrarily determined. Using the highest point of the highest structure currently on the property<sup>5</sup>, from the bottom of the driveway of the Taormina property<sup>6</sup>, and 1,045' from the base of the structure, the 40 Meter tower would appear to an observer to be 6,591 - 6,323 or 268' above grade. But measured from the bottom of the driveway, it would be 268' above that ground.

There is a neighbor's house 2,721' to the South-Southeast of the base of that particular tower (See Figure 1). Their driveway is at 6,650' elevation. Do the math. As  $6,650 - 6,591 = -59'$ , the highest point of the highest structure currently on the Taormina property is BELOW their "grade" vantage point -- and invisible.

Another example is the HBX-32 support, which is 32' above the dirt at its footing<sup>7</sup>. At the bottom of the driveway, it appears to be 123' tall. From the highest point on the property, that structure appears to be  $(6,456 - 6,446)$  or  $-10'$  tall. What is the actual height of the HBX-32 tower?  $-10'$ ? 32'? 123'?

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<sup>5</sup> 40 Meter Tower, 6,451 at the base, +140' = 6,591' AMSL

<sup>6</sup> 6,323' AMSL

<sup>7</sup> 6,446' AMSL to the top of the structure

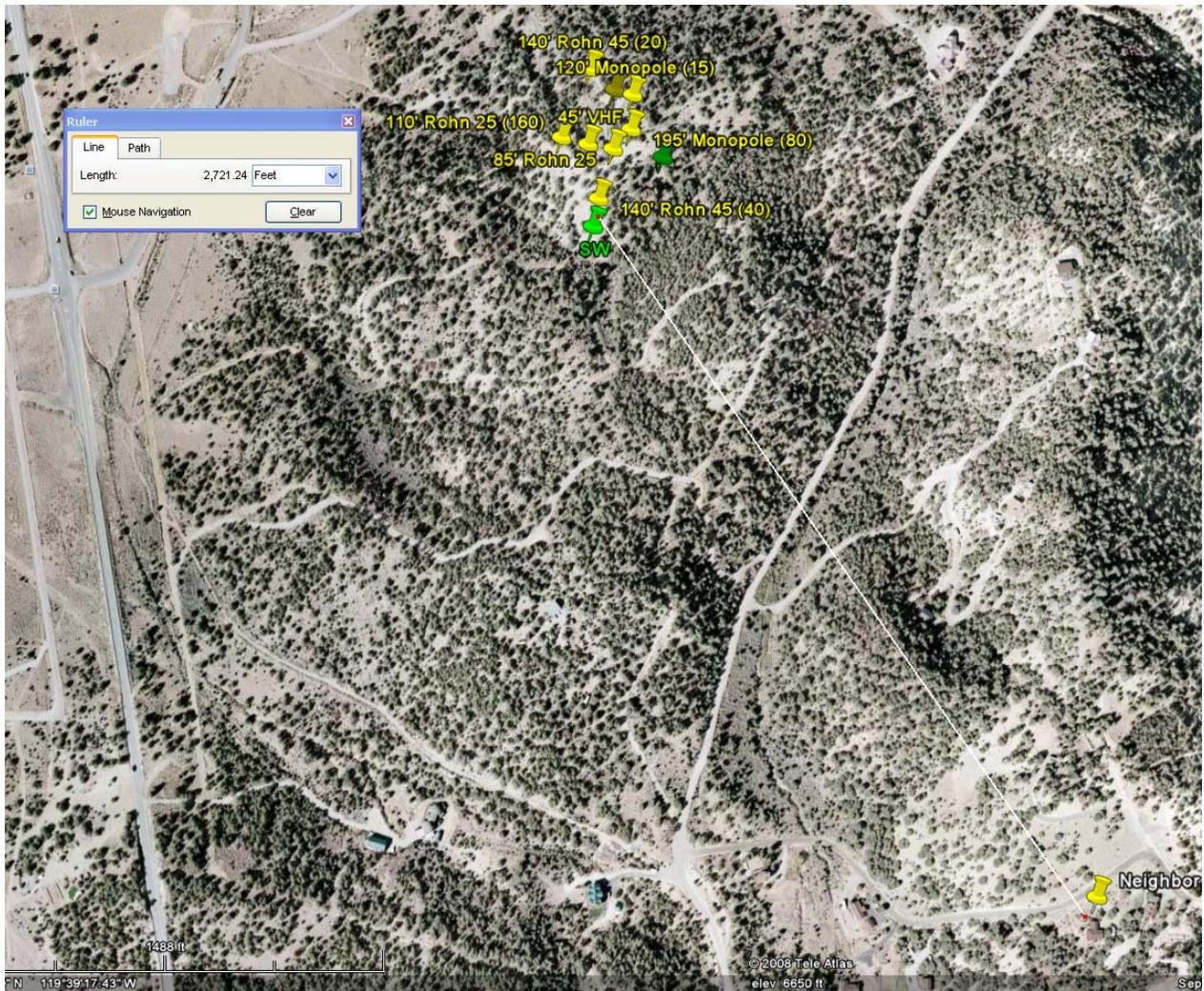


Figure 3- Ground Reference

The FCC and FAA have been dealing with the “height above ground” issue for many years. The FCC because they need to determine effective height of FM, VHF-TV or UHF-TV broadcast stations to determine potential interference with stations nearby. The FAA cares about flight safety. Their term for height is “Height Above Average Terrain” (or HAAT). The FCC web site has a calculator used to determine these numbers<sup>8</sup>. Average HAAT (measured at the top of the antenna structure) is an average of the height above mean sea level (AMSL) for 360 degrees of terrain about the precise latitude and longitude of the subject structure, when calculated over a ten-mile radius of the structure. The radial heights in the charts in Figures 2 and 3 are the effective height at each compass bearing from true north at the subject site. Therefore, from Figure 2, the “height” of the monopole that is permitted by the County to be 195’ above the dirt it rests on, is actually 218 meters or 715’ HAAT. At azimuth 310 degrees, it is 457 meters or 1,499’ HAAT. At azimuth 200 degrees, it is **-159 meters** or **-522’ HAAT**, which is 522’ below so-called “ground” level.

<sup>8</sup> See [http://www.fcc.gov/mb/audio/bickel/haat\\_calculator.html](http://www.fcc.gov/mb/audio/bickel/haat_calculator.html)

FCC Height Above Average Terrain Calculator

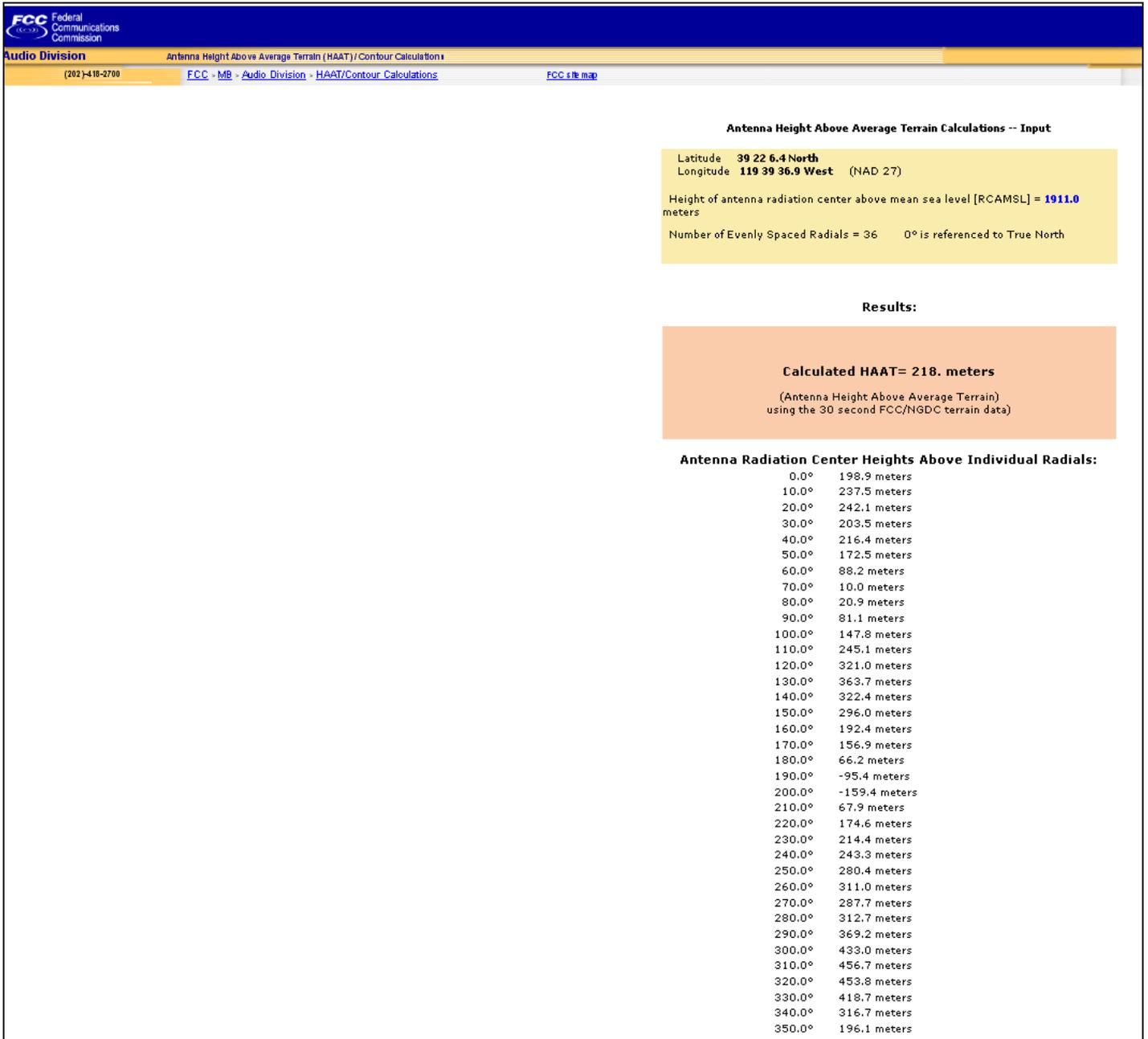


Figure 4 – HAAT Calculations for the 195' Monopole in Building Permit 8354

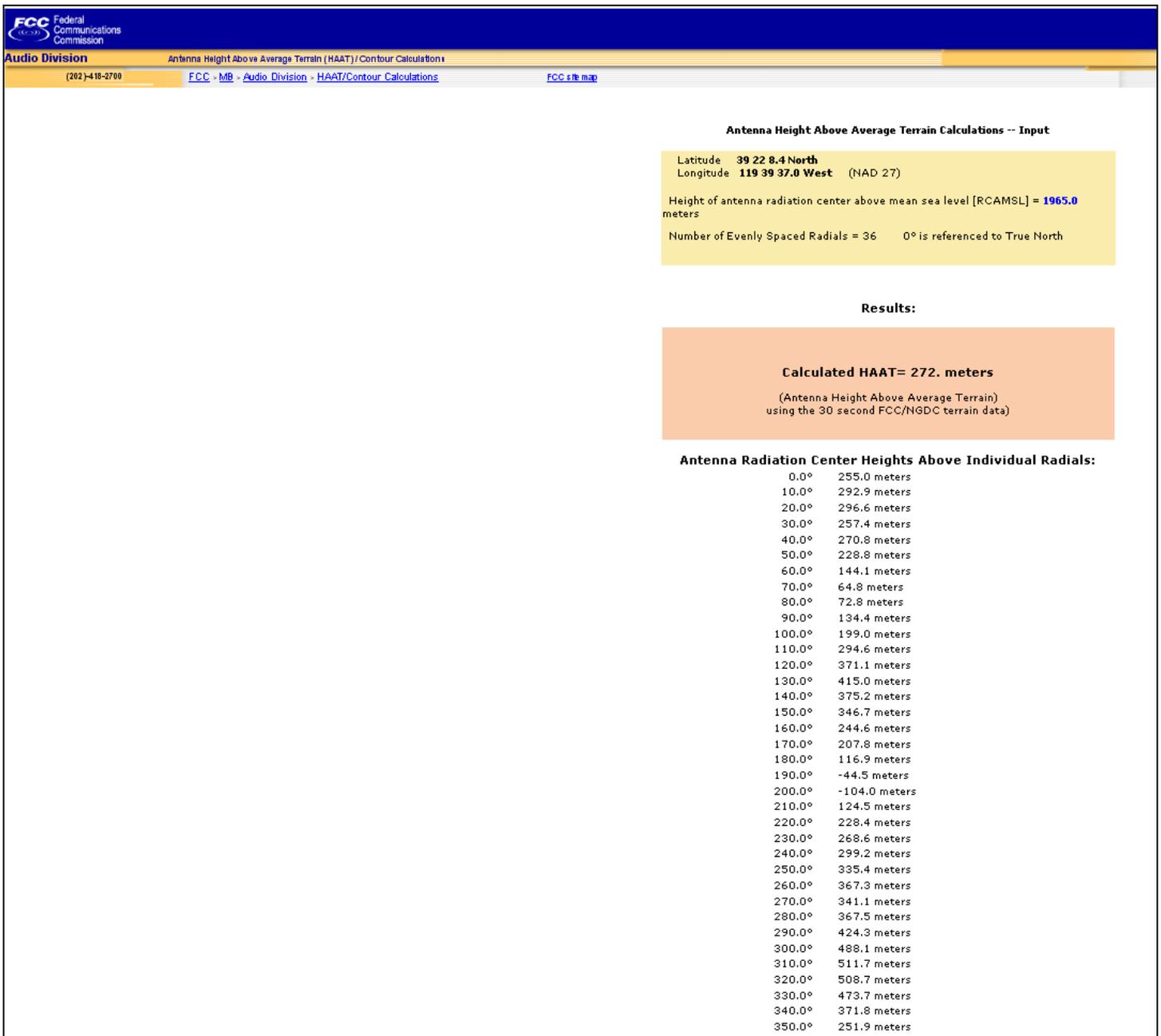


Figure 5 - HAAT Calculations for the HBX-32 32' Tower<sup>9</sup>

Continuing these comparisons from Figure 3, for the HBX Tower 32' above the dirt it sits on, the FCC calculator places its HAAT at 272 meters or 892'. **Under FCC and FAA rules, the 32' HBX Tower is 177' HIGHER than the 195' monopole, which is physically only 142' to the Southeast on the same Taormina property!**

<sup>9</sup> This structure is below the 45' arbitrary height limit in the SCC.

Height above grade is, therefore, a three-dimensional issue and is relative to one’s point of vantage or measurement.

		Highest Point on Property	Lowest Point on Property	Highest FCC HAAT	Lowest FCC HAAT	FCC Average HAAT
<b>Rohn HBX-32</b>						<b>892</b>
Elevation at Base of Support	6414					
Height of Support	32					
Total Height AMSL	6446	6456	6323	8126	6105	
<b>Difference</b>		<b>(10)</b>	<b>123</b>	<b>1680</b>	<b>(341)</b>	
<b>80 Meter Monopole</b>						<b>715</b>
Elevation at Base of Support	6434					
Height of Support	195					
Total Height AMSL	6629	6456	6323	8128	6107	
<b>Difference</b>		<b>173</b>	<b>306</b>	<b>1499</b>	<b>(522)</b>	

Figure 6 – Representative Height Calculations

The table in Figure 4 brings the issue of “height above grade” into sharp focus. **In this case, a 32’ support is defined by the FCC as being effectively 177’ higher than a 195’ support.** This assertion is as obtuse and illogical as establishing 45’ height above grade for all towers as a County ordinance.

The question might then be then asked, why can’t the 32’ support, at its current location, be the support for the larger antenna arrays? The answer is that effective antenna height **IS** determined by physical height above the surrounding dirt (ground). Radio waves propagate in direct correlation to the real and electrical “ground” surrounding the antenna. A 3.5 MHz antenna simply will not radiate at 100% efficiency below its required minimum “electrical” height, which is 280’ above physical ground. The 195’ monopole is already a compromise height, but it was selected to stay below 200’<sup>10</sup>.

Finally, the HAAT calculation does have a very compelling meaning in relationship to flight safety. HAAT in mountainous areas is the basis for establishing minimum flight levels for commercial and private aircraft. Because of the mountainous terrain, no air traffic controller or responsible pilot would consider a flight level that is even close to the elevation of the Taormina structures. In fact, when CareFlight established the landing pad on Cartwright Road, ½ mile from the subject property, the antennas were in place. No

<sup>10</sup> At 200’, a filing must be made with the FAA and an ensuing study of hazards to air navigation conducted. As a result of the study, the FAA may require obstruction lighting to be placed on the supports. The applicant has no desire to have flashing red lights above the Highlands’ skies at night.

concern was expressed or implied about the safety of their helicopter landings or take-offs. **From the helicopter landing site, the Taormina antennas are considerably lower than the surrounding terrain. There is no hazard to flight safety.**

The 45' maximum height code section is, at the very least, arbitrary and capricious, as it fails to consider local terrain. (In addition, as a firm, fixed, unvarying maximum height, it is void.) It should be removed from the SCC, unless a valid calculation scheme can be devised to include the effect of the surrounding terrain to establish the datum point from which to measure.

#### NO EFFECT ON MICROCLIMATE

The proposed installation will not emit heat, vapor or fumes. As it is unlighted, there will be no impact on dark skies. It will not impact air or water resources. It will not generate noise, nor change any temperatures. No additional traffic will be associated with this installation. It is not a hazard to air traffic. The wild animal population of stray horses, deer, cougars, bobcats and coyotes are not threatened by this installation.

#### EFFECTIVE VISUAL IMPACT IS MINIMAL

A Rohn 25G antenna support structure, with a 12-inch triangular lattice-style face, has an effective visual impact equivalent to that of a 2" diameter round flagpole. Put another way, the footprint of Rohn 25 is 0.433 sq. ft., or 62.354 sq. inches. One square foot is 144 square inches.

A Rohn 45G antenna support structure, with an 18-inch triangular lattice-style face, has an effective visual impact of only 0.296 square feet of gray steel. This design dramatically reduces visibility and is comparable to the mass of a 3.5" diameter round flagpole. Put another way, the footprint of Rohn 45G is 0.974 sq. ft., or 140.296 sq. inches. One square foot is 144 square inches.

The galvanized steel weathers quickly to a non-reflective, dull-gray finish, further diminishing its visibility. The rest is open air. Recall that haze-gray (as in "haze gray and under way") is the color chosen by the U.S. Navy and Air Force to make things less visible at sea and in the air.

The monopole antenna support structures, with an average 10-inch circular face, have an effective visual impact equivalent to that of a 10-inch diameter round flagpole. These structures are painted "Nevada Sand," a color employed by Sierra Pacific Power Company to blend with the surrounding landscape.

To keep things in perspective, an ordinary telephone pole is about 12 inches in diameter. It is tar-brown in color, which is much more noticeable against blue or gray skies than a dull-gray galvanized steel lattice tower, or a "Nevada Sand" monopole — and few people pay much attention to telephone poles.

See **Exhibit L** for photographs showing the visibility of the proposed structure from several vantage points around the neighborhood.

#### WIND-LOADING CONSISTENT WITH STANDARDS

Amateur radio is, by design promoted in Federal law, an experimental service. It is natural and expected that amateurs will change their antenna systems as interests change, and as propagation changes with the season and the 11-year sunspot cycle. In addition, the Applicant wishes to perform experiments in radio signal propagation, communications effectiveness, and antenna design and configuration needed to advance

his knowledge and ability in the field of radio communications. Nonetheless, the antenna system shall not exceed the building code requirements of 21 psf. of wind-load, well within the manufacturer’s specifications for this antenna support structure. Total wind-load of the proposed system is commensurate with the capacity of each structure, with a safety factor: of 2.5.

Wind-load is the equivalent horizontal force that will act on the structure. It is directly related to the surface area of the antenna. Safety factor describes the ratio between the maximum resistance load and the normal load. For example, if the wind-load is 10 square feet, and the structure can hold a wind-load equivalent to 20 square feet, the safety factor is 20/10 or 2.

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**SITE CAREFULLY SELECTED**

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EVERY STRUCTURE IS DISTANT FROM NEARBY HOMES

The Applicant’s property is a 10 acre site. The closest proposed or existing antenna support structure to the home of any neighbor (380 Panamint Road) is 610 feet.

**Distance Schedule: Nearest Home**

<b>Tower Identifier</b>	<b>Distance to Nearest Home</b>
40 Meter Rohn 45G	960'
20 Meter Rohn 25G	802'
Rohn HBX-32	646'
160 Meter Rohn 25G	873'
VHF Trylon 1245	848'
20 Meter Rohn 45G	670'
15 Meter Monopole (proposed)	610'
80M Monopole (proposed)	721'

*Figure 7*

EVERY ANTENNA STRUCTURE MEETS E-10-HR ZONE SETBACKS – 30’ (FRONT); 40’ (REAR); 15 (SIDE)

Each antenna support structure erected on site, or proposed under Building Permit No.8354, meets the setback requirements for this zone, as expressed in SCC §17.40.050.

**Distance Schedule: Setbacks**

Tower Identifier	Height of Structure	Erected	Nearest Property Line	Setback	Setback OK ?
40 Meter Rohn 45G	140'	1997	76'	Side	Yes
20 Meter Rohn 25G	85'	1998	145'	Side	Yes
Rohn HBX-32	32'	1999	106'	Side	Yes
160 Meter Rohn 25G	110'	2007	34'	Side	Yes
VHF Trylon 1245	40'	2003	81'	Side	Yes
20 Meter Rohn 45G	140'	2007	170'	Side	Yes
15 Meter Monopole (proposed)	120'	Base installed 7/08	38'	Side	Yes
80 Meter Monopole (proposed)	195'	Base installed 7/08	72'	Side	Yes

*Permissible setbacks for E-10-HR Zoning, as per SCC §17.40.050: Front – 30'; Back – 40'; Side – 15'*

*Figure 8*

Accidents involving such structures are rare. They are so rare, in fact, that ARRL Volunteer Counsel Fred Hopengarten, of Lincoln, Massachusetts, reviewing 20 years of literature in amateur radio was able to discover only a few published photographs, out of thousands of antenna photographs, showing how an antenna structure fails. In conjunction with these several photos, further discussions with mechanical engineers have yielded a better understanding of the failure modes of antenna structures.

A typical failure mode, which may occur when an antenna system is completely out in the open, involves a tower twisting and buckling. In effect, the structure corkscrews onto the ground. Towers do not fall the full length of their height, like a pencil. Instead, a failure occurs at the location of the highest combined stress ratio, as if there is a “mechanical fuse.” This phenomenon is well known in physics, and is usually demonstrated in physics textbooks with a photograph of a falling chimney. As an example, see *Fundamentals of Physics*, 2nd Edition, by Halliday and Resnick, page 174, published by John Wiley & Sons:

When a tall chimney is toppled by means of an explosive charge at its base, it will often break near its middle, the rupture starting at the leading edge. The top part will then reach the ground later than the bottom part.

We note that as the chimney topples, it has at any instant an angular acceleration  $[A]$  about an axis through its base. The tangential acceleration  $[A_t]$  of its top is given by  $[A_t = A_r]$ .

As the chimney leans more and more, the vertical component of  $A_t$  comes to exceed  $g$  [gravity, or  $9.8 \text{ m/s}^2$ ], so that the bricks at the top are accelerating downward more than they would in free fall. This can happen only as long as the chimney is a rigid body. As the chimney continues to fall, internal tension stresses develop along its leading edge. In nearly all cases rupture occurs, thus relieving those stresses.

Instances of damage caused by a falling antenna system are so rare that the presence of an amateur radio antenna system has no impact on the cost or availability of insurance for the homeowner. See **Exhibit M**.

Although the casual observer might think that a greater setback to lessen visual impact is always better, this would be wrong. Take the example of a self-supporting tower placed one foot from a rear lot line. If the lot to the rear has four square miles of woods, then the least visible siting for the antenna system would be the site closest to a lot line. As a result, rigid application of standard setback rules least serves the purposes of

the county code.

An aerial view of the site reveals the heavily forested nature of the entire area and distances to near neighbors (**Exhibit Q**).

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#### WHY THIS HEIGHT? “EFFECTIVE COMMUNICATIONS”

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There are 12 commonly used amateur radio bands between 7 MHz and 440 MHz. The choice of which band to use depends on the distance between communicating stations, time of day, time of year, position in the 11-year sunspot cycle, as well as daily propagation conditions. At any given point in time, only one or two of these bands may be useful for communication to a particular location. To have a reasonably high probability of effective communications with a given location, at any given point in time, it is therefore necessary to have high performance antennas on all or most of these bands.

High performance is obtained by using directional antennas. (Recall, before cable and satellite TV, the need to aim television antennas in the correct direction for best reception, or in some outlying areas, a tower and rotator were necessary to receive signals from more than one direction.) Directivity not only strengthens signals being received, but also is also extremely important because it can also be used to “null out” interfering stations.

High performance antennas can be particularly important under emergency conditions, when operating under auxiliary power sources, when operation may require communications with only low power output or communications with other stations operating under adverse conditions. In addition, doubling the height of the antenna is considered to be approximately equivalent to doubling the power output (permitting lower power, consistent with emergency batteries as power sources).

For communications at frequencies below 30 MHz (the “HF bands”), the height of an antenna above ground is the major controlling factor on the angle at which signals are transmitted (“take-off angle”), which in turn directly affects the reliability and dependability of worldwide signal paths. Besides height above ground, the local terrain in the vicinity of the structure can also affect takeoff, as it can reflect and diffract the signal in the near field. If the antenna is not of sufficient height above ground, signal reliability is compromised; in other words, communications to certain parts of the world can be strictly limited, or nonexistent.

Significant height is also required so that antennas can be separated by a distance sufficient to mitigate the potential of interaction between different antennas. Typically, in the HF bands, a separation of 8 to 12 feet is needed between the individual antennas. The exact distance is a complicated function of the individual antenna configuration and orientation, but can be predicted by computer modeling

“High enough” is commonly accepted to be, *at a minimum*,  $\frac{1}{2}$  wavelength high at the lowest frequency used. A height of 1 to  $1\frac{1}{2}$  wavelengths at this lowest frequency is preferable. The proposed antenna support structure will support antennas for 3.5 MHz and above. At 3.5 MHz,  $\frac{1}{2}$  wavelength is approximately 140 feet, and 1 wavelength is approximately 280 feet. Thus, the proposed structure (195’) represents a significant, but acceptable, compromise<sup>11</sup> by the Applicant.

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<sup>11</sup> A “no-compromise” amateur radio installation would require at least 12 support structures, one being at least 280’ in height.

Communications at frequencies above 30 MHz (known as VHF for Very High Frequencies, or UHF for Ultra High Frequencies -- examples: FM radio, TV, police and fire departments) can be dependent on 'line of sight'. Most *local* emergency communications are conducted above 30 MHz. Here, topography, trees and buildings all cause significant signal loss. Thus, antennas that are above, free and clear of such obstructions permit the amateur to communicate more effectively, over greater distances and using lower power levels. These are the frequencies at which most local emergency communications are conducted. Doubling the height of the antenna is considered to be approximately equivalent to doubling the power output. Considered together, these two factors are strong arguments for higher antennas.

A Needs Analysis, for HF and for VHF, is attached as a separate document. It shows that the heights of the proposed structures represent a significant compromise, but one that is acceptable to the Applicant. Despite additional advantages which might be obtained, the Applicant has no intention of going over 200' in height, as that might then require lighting and painting under FAA regulations. An FAA study of hazards to aircraft is required, speaking generally, only for heights above 200 feet and in very close proximity to an airport. At the heights of structures for this amateur radio station, at this location, **no lighting or painting is required.** 47 CFR §17.7 See **Exhibit I.**

The proposed total height of 195' for the tallest structure satisfies both of these concerns by:

- 1) Placing the antennas high enough to allow reliable VHF/UHF communication, free from obstruction by intervening terrain, and
- 2) Satisfying the minimum reliability requirements for HF communication at 3.5 MHz and above.

It is a well-recognized phenomenon that communications effectiveness is often a function of height. This was suggested by the American Red Cross when it encouraged the FCC to adopt its limited preemption for amateur radio antenna systems. See **Exhibit H.** The concept is also plainly stated by the FCC in PRB-1, and has been reiterated by the courts numerous times.

Both Tom and Midge Taormina, each a licensed radio amateur, have been trained in emergency communications. Their participation may be documented by contacting Don Carlson, KQ6FM, of Reno, the Emergency Coordinator for Nevada.

Mr. Taormina's ARES identification badge is included below. His ongoing membership and participation in the Storey County Local Emergency Planning Commission can be documented by contacting Joe Curtis, the County Emergency Officer.



*Figure 9*

For the purpose of providing emergency communications, a 5 KW Troy-Bilt generator, has been installed at the residence. See **Exhibit G.**

When complete, the amateur radio station, with its antenna systems, will be a substantial addition to the emergency communications capabilities of the community, and the County, thus aligning it with the very basis and purpose of the FCC's amateur radio service.

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### LOCAL TERRAIN REQUIRES HEIGHT

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This Applicant's need for the height proposed is greatly influenced by intervening local terrain. This topographic map shows that the terrain rises in all from the proposed site in the directions of desired communications.

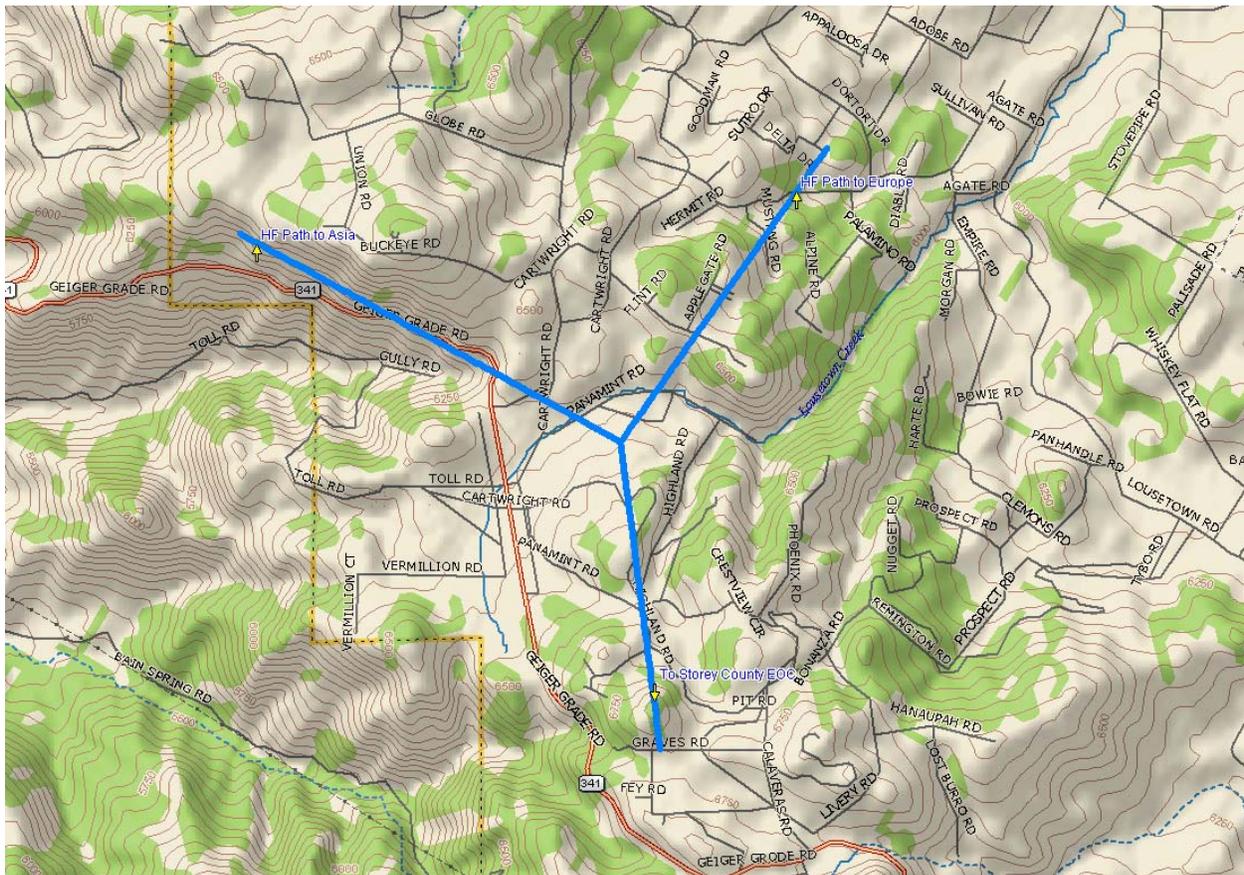


Figure 10 - Topo map showing that terrain rises in the desired directions of communication.

As the Court noted in *Bodony v. Sands Point*, 681 F. Supp. 1009 (E.D. NY 1987), may be found at: [www.qsl.net/k3qk/bodony.html](http://www.qsl.net/k3qk/bodony.html) (preempting a 25' height limit, permitting an 86' antenna support structure):

**One factor in determining the range and effectiveness of radio communication is the height of the antenna. Measurement from the ground tells us little. A 25 foot antenna in a valley surrounded by hills might be useless, while that equipment on a mountain top might give optimum results. An antenna rising above the obstacles that interfere with radio signals obviously gives a greater range and better reception than an antenna of a lesser height.**

To the extent any decision fails to account for local terrain, it would fail to be a reasonable accommodation.

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#### ENVIRONMENTAL EFFECTS INSIGNIFICANT

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The maximum legal limit for transmitter output power is 1500 watts. As an amateur radio station, and a hobby of the Applicant, the transmitter will be in limited service. Even when an amateur is active, transmissions occupy less than 50% of the time of activity, as amateurs listen for other signals more than half the time.

By contrast, typical FM broadcast or AM broadcast stations use from 5,000 to 50,000 watts, continuous duty. Think of it another way—the energy of a ham radio station, at maximum power output, is about the same as a kitchen toaster. Nonetheless, in accordance with 47 CFR §97.13(c)(1), as the proposed power output exceeds 50 watts at 10 meters (28 MHz), the Applicant has performed the required “routine RF environmental evaluation prescribed by 47 CFR §1.1307(b),” see [http://edocket.access.gpo.gov/cfr\\_2006/octqtr/pdf/47cfr97.13.pdf](http://edocket.access.gpo.gov/cfr_2006/octqtr/pdf/47cfr97.13.pdf).

Using the output power at the antenna, after feed-line losses, and calculating the energy per square centimeter, the standard units of measurement in these matters are expressed in mW/cm<sup>2</sup>, this amateur station, in a worst-case scenario, will produce only 0.00301 milliwatts per square centimeter of power, or 1.3% percent of the American National Standards Institute (ANSI) safety standard at that frequency (the worst case frequency), as measured at 721 feet away from the antenna support structure, at the nearest home line. **Exhibit N** contains the computations for the engineering calculations supporting the statements above.

In this case, if the Applicant were to put up the antenna at a lower height, the power required for the same reliability of the outbound communications would increase significantly (but received communications would be reduced significantly and cannot be overcome with greater power at the Applicant’s end). Thus, a lower antenna would be closer to a neighbor and increase exposure (although exposure would still remain well below the regulatory threshold).

Under the Environmental Policy Act of 1969 (NEPA), 42 USC §4321 *et seq.* (1976) at §4332 (2)(c), and as allowed by regulations of the Council on Environmental Quality (CEQ), 40 CFR. §1508.4, the FCC has ordered categorical exclusion of amateur radio stations from the need to do Environmental Assessments. FCC Gen. Docket No. 79-144, adopted February 12, 1987.

Furthermore, a search of the literature fails to find a single example in the history of radio in which an amateur radio station has caused injury or death to a neighbor from exposure to amateur radio signals at any power level.

When amateurs complete FCC Form 605, to obtain or renew a license, they must understand and certify by signature the following statement: “Amateur Applicant certifies that the construction of the station would NOT be an action that is likely to have a significant environmental effect” (see FCC Rules 47 CFR §§1.1301-1.1319 and §97.13(a)). The only amateurs who may be required to file an Environmental Assessment (EA) under the National Environmental Policy Act of 1969 are those whose stations will be located in an officially designated wildlife area; areas that are significant in American history, architecture, archeology, engineering or culture; areas that are listed, or are eligible for listing, in the National Register of Historic Places; where the facility may affect Indian religious sites; facilities located in a flood plain; facilities whose construction will

involve significant change in surface features (e.g., wetland fill, deforestation or water diversion), those which require tower lighting; and stations that exceed the maximum permitted RF exposure limits. 47 CFR §1.1307 (a)-(b).

The Applicant's location for the antenna system does not involve any such concerns. No environmental assessment need be filed.

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#### GOOD ENGINEERING PRACTICES EMPLOYED

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The design criteria included the assumption of ½ inch of ice loading on both the support and all antennas, at a wind velocity of 70 miles per hour (Basic Wind Speed for Storey County, Nevada under the EIA/TIA code is 70 miles per hour (EIA/TIA-222 code, page 44), the antenna support structures at the site are overbuilt.

P.E. certificates and manufacturer's drawings accompany the various applications for building permits.

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#### INSURANCE COVERS LOSSES

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If a tree falls in a forest and no one is around to hear it, does it make a sound? This popular philosophical riddle may not have any practical application to the matter at hand, but it does beg the question: What if the antenna support structure falls?

The Applicant's standard Nevada homeowner's policy provides coverage for personal liability and medical payments due to failure of an amateur radio antenna structure, without additional premium. See **Exhibit M**, from the Applicants' American Family insurance agent. From an actuarial point of view, this means that these structures are considerably safer than allowing a teenage boy to drive.

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#### RADIO FREQUENCY INTERFERENCE PREEMPTED

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The question of the potential for radio-frequency interference (RFI) has been completely preempted by Federal law on the matter. In amending the Communications Act of 1934 in 1982, the Congress clearly expressed its opinion:

The Conference Substitute is further intended to clarify the reservation of exclusive jurisdiction to the Federal Communications Commission over matters involving RFI [radio frequency interference]. Such matters shall not be regulated by local or state law, nor shall radio transmitting apparatus be subject to local or state regulation as part of any effort to resolve an RFI complaint. [T]he Conferees intend that regulation of RFI phenomena shall be imposed only by the Commission.

H.R. Report No. 765, 97th Cong., 2d Sess. 33 (1982), reprinted in 1982 U.S. Code Cong. & Ad. News 2277, referring to amendments to Section 302(a) of the Communications Act.

In a private letter opinion to the American Radio Relay League, Inc., dated February 14, 1990, Robert L. Pettit, General Counsel of the Federal Communications Commission (FCC) adopts the position of the Congress as the position of the FCC, writing:

State laws that require amateurs to cease operations or incur penalties as a

consequence of radio interference thus have been entirely preempted by Congress.

These opinions have been confirmed repeatedly by the courts. See, for example, *Broyde v. Gotham Tower*, 13 F.3d 994 (6th Cir., 1994). For an excellent discussion, and a wealth of cases, see *Southwestern Bell Wireless, Inc. v. Johnson County Board of County Commissioners*, No. 98-3264 (10th Cir. Dec. 27, 1999) <http://www.kscourts.org/ca10/cases/1999/12/98-3264.htm>

Another well-written and thorough discussion states plainly: “We conclude that allowing local zoning authorities to condition construction and use permits on any requirement to eliminate or remedy RF interference ‘stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress.’” *Freeman v. Burlington Broadcasters, Inc.*, 204 F. 3d 311 (2d Cir. 2000), cert. denied, 531 U.S. 917 (2000) <http://www.tourolaw.edu/2ndCircuit/February00/97-9141.html>

Late in the second term of President Clinton, the Congress passed, and the President signed, P.L. 106-521 which further clarified, if there was room for doubt, that municipalities have no authority to act with respect to interference. The Communications Act, at 47 USC §302a, now reads, in relevant part:

#### **47 USC § 302a. Devices which interfere with radio reception**

##### **SUBCHAPTER III - SPECIAL PROVISIONS RELATING TO RADIO**

**...(f)(2) A station that is licensed by the Commission pursuant to section 301 of this title in any radio service for the operation at issue shall not be subject to action by a State or local government under this subsection. A State or local government statute or ordinance enacted for purposes of this subsection shall identify the exemption available under this paragraph.**

(3) The Commission shall, to the extent practicable, provide technical guidance to State and local governments regarding the detection and determination of violations of the regulations specified in paragraph (1).

(4) (A) In addition to any other remedy authorized by law, a person affected by the decision of a State or local government agency enforcing a statute or ordinance under paragraph (1) may submit to the Commission an appeal of the decision on the grounds that the State or local government, as the case may be, enacted a statute or ordinance outside the authority provided in this subsection.

(B) A person shall submit an appeal on a decision of a State or local government agency to the Commission under this paragraph, if at all, not later than 30 days after the date on which the decision by the State or local government agency becomes final, but prior to seeking judicial review of such decision.

(C) The Commission shall make a determination on an appeal submitted under subparagraph (B) not later than 180 days after its submittal.

(D) If the Commission determines under subparagraph (C) that a State or local government agency has acted outside its authority in enforcing a statute or ordinance, the Commission shall preempt the decision enforcing the statute or ordinance.

(5) The enforcement of statute or ordinance that prohibits a violation of a regulation by a State or local government under paragraph (1) in a particular case shall not preclude the Commission from enforcing the regulation in that case concurrently.

(6) Nothing in this subsection shall be construed to diminish or otherwise affect the jurisdiction of the Commission under this section over devices capable of interfering with radio communications.

Finally, we call the attention of this Board to a ruling of the United States District Court for the Northern District of New York in *Palmer v. City of Saratoga Springs*, 180 F. Supp. 2d 379 (N.D.N.Y. 2001), [http://www.arrl.org/FandES/field/regulations/PRB-1\\_Pkg/Palmer-v-Saratoga-Springs.pdf](http://www.arrl.org/FandES/field/regulations/PRB-1_Pkg/Palmer-v-Saratoga-Springs.pdf) Slip Opinion at 18:

The few planning Board requests that Palmer refused to agree to were unreasonable on their face. . . . Palmer refused to give the Planning Board any additional information on the issue of interference for the simple reason that the issue of possible interference was beyond the Board's purview.

...

Normally, the Court would simply instruct the Planning Board to comply with [the preemption]. However, given that the Planning Board was already fully apprised of its duties under [the preemption] when it reconsidered Palmer's application, such action would likely be futile. The Court thus enjoins the Planning Board from taking further action interfering with Palmer's special use permit application and orders the Planning Board to grant the application with the conditions already agreed to by Palmer.

Nonetheless, amateurs generally, and this Applicant in particular, are prepared to offer aid beyond the requirements of law. Should it be necessary, the Applicant pledges to cooperate with any individual, whether or not an abutter, who owns equipment that might be affected.

At least one study by the FCC Field Operations Bureau has shown that amateurs are responsible for less than 1% of all interference complaints (400 of 42,000 complaints during a fiscal year in the early 1970's) filed with the Commission. (Source: FCC data, as reported in *QST*, July 1974, p. 10). Part of the preparation for licensing involves studying how to minimize and correct such problems, if they should ever occur.

Furthermore, many home entertainment electronic devices, including portable telephones, bear the following required label, in accordance with 47 CFR §15.19(a)(3):

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Actually, the erection of this antenna system will have a tendency to *decrease*, not increase, the likelihood of television interference, as higher antenna systems (with directional arrays) are farther away from neighboring television sets and transmit over nearby homes. Lower antennas, erected in trees, or on shorter antenna support structures, for example, have a greater likelihood of interference, since they would direct more energy toward a neighboring TV set.

This is exactly the position that was taken by the FCC's Chief of the Private Radio in a letter to the Board of Zoning Appeals of Hempstead, NY (October 25, 1994):

Antenna height is inversely related to the strength, in the horizontal plane, of the radio signal that serves as a catalyst for interference in susceptible home electronic equipment. It is a matter of technical fact that the higher an amateur antenna, the less likely it is that radio frequency interference will appear in home electronic equipment.

For a review of the field of radio frequency interference (RFI), see "The Ghost in the Computer: Radio Frequency Interference and the Doctrine of Federal Preemption", Brock, *Computer Law Review and Technology Journal* (1999), pp. 17-36. <http://www.smu.edu/csr/articles/1999/spring/Brock.pdf>

For information on resolving problems, the FCC's Interference Handbook is available on the Internet. The 22-page booklet, available from the Compliance and Information Bureau via the FCC World Wide Web home page, includes the same information and illustrations contained in the recently published Interference to Home Electronic Entertainment Equipment Handbook. It includes information about equipment installation, identifying interference sources, curing interference problems, and filters. It also contains a list of home electronic equipment manufacturers and telephone numbers. Pictures illustrate different TV interference problems, including ham or CB transmitter interference.

[http://www.fcc.gov/ftp/Bureaus/Mass\\_Media/Databases/documents\\_collection/1993InterferenceHandbook.pdf](http://www.fcc.gov/ftp/Bureaus/Mass_Media/Databases/documents_collection/1993InterferenceHandbook.pdf)

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#### PROPERTY VALUES UNAFFECTED

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Research by the American Radio Relay League, the National Organization for Amateur Radio, has failed to find any evidence in the appraisal literature, or anywhere else, that home values are harmed by the presence of amateur radio antenna systems. The only study found concluded:

In the course of this study, I have looked at seven different locations. I have considered thirty three matched pairs. As I indicated in the introduction, this has covered a variety of types, styles locations, time periods, and lot sizes. In no instance have I been able to discover any measurable, uniform decline in value that can be attributed to the presence of a radio antenna. This is verified by my general real estate experience in over 35 years of selling various kinds of residential properties throughout the Denver Metropolitan Area. The presence of a radio antenna has not only failed to make a measurable difference in value, it has not affected the sales time for the properties involved. Therefore, I have concluded that it is not a measurable factor in value.

Russ Wehner, Jr., MAI, SRPA (Appraiser), evidence in *Evans v. Boulder*, 994 F2d 755 (10th Cir., 1993) (decided on other grounds).

Finally, the Applicant assures the County that should he no longer reside at the property, assuming no other person residing there wishes to continue using the structure, he will remove the antenna-support structures and the antennas. He has every intention of taking the structures and antennas to his next home.

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#### LEGAL: PREEMPTION & CASE LAW SUPPORT THE APPLICATION

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Zoning for amateur radio antenna systems is one of those rare areas of law where an application must be considered against the background of a federal preemption of local zoning law. The Congress of the United States has weighed in on the subject.

#### SENSE OF CONGRESS

##### Sec. 10

(a) The Congress finds that —

(1) more than four hundred thirty-five thousand four hundred radio amateurs in the United States are licensed by the Federal Communications Commission upon examination in radio regulations, technical principles, and the international Morse code;

(2) by international treaty and the Federal Communications Commission regulation, the amateur is authorized to operate his or her station in a radio service

of intercommunications and technical investigations solely with a personal aim and without pecuniary interest;

(3) **among the basic purposes for the Amateur Radio Service is the provision of voluntary, noncommercial radio service, particularly emergency communications;** and

(4) volunteer amateur radio emergency communications services have consistently and reliably been provided **before, during, and after floods, tornadoes, forest fires, earthquakes, blizzards, train wrecks, chemical spills, and other disasters.**

(b) It is the sense of Congress that —

(1) it strongly encourages and supports the Amateur Radio Service and its emergency communications efforts; and

(2) Government agencies shall take into account the valuable contributions made by amateur radio operators when considering actions affecting the Amateur Radio Service.

Federal Communications Commission Authorization Act of 1988. Pub. L. No. 100-594, 102 Stat. 3021, 3025 (November 3, 1988); *see also* Joint Explanatory Statement of the Committee of Conference on H.R. Conf. Rep. No. 386. 101st Cong., 1st Sess. 415, 433 (November 21, 1989), *reprinted in 1990 U.S. Code Cong. & Admin. News* 3018, 3037 (amateur licensees exempted from new Commission-wide fees program because “[t]he Conferees recognize that amateur licensees do not operate for profit and can play an important public safety role in times of disaster or emergency”). Joint Explanatory Statement of the Committee of Conference on H.R. Conf. Rep. No. 765, 97th Cong., 2d Sess. 18-19 (August 19, 1982), *reprinted in 1982 U.S. Code Cong. & Admin. News* 2261, 2262-63.

PUBLIC LAW 103-408—OCT. 22, 1994

103d Congress  
Joint Resolution

**To recognize the achievements of radio amateurs, and to establish support for such amateurs as national policy.**

Whereas Congress has expressed its determination in section 1 of the Communications Act of 1934 (47 U.S.C. 151) to promote safety of life and property through the use of radio communication;

Whereas Congress, in section 7 of the Communications Act of 1934 (47 U.S.C. 157), established a policy to encourage the provision of new technologies and services;

Whereas Congress, in section 3 of the Communications Act of 1934, defined radio stations to include amateur stations operated by persons interested in radio technique without pecuniary interest;

Whereas the Federal Communications Commission has created an effective regulatory framework through which the amateur radio service has been able to achieve the goals of the service;

Whereas these regulations, set forth in Part 97 of title 47 of the Code of Federal Regulations clarify and extend the purposes of the amateur radio service as a—

(1) voluntary noncommercial communication service, particularly with respect to providing emergency communications;

(2) contributing service to the advancement of the telecommunications infrastructure;

(3) service which encourages improvement of an individual's technical and operating skills;

(4) service providing a national reservoir of trained operators, technicians and electronics experts; and

(5) service enhancing international good will;

Whereas Congress finds that members of the amateur radio service community has provided invaluable emergency communications services following such disasters as

Hurricanes Hugo, Andrew, and Iniki, the Mt. St. Helens Eruption, the Loma Prieta earthquake, tornadoes, floods, wild fires, and industrial accidents in great number and variety across the Nation; and

Whereas Congress finds that the amateur radio service has made a contribution to our Nation's communications by its crafting, in 1961, of the first Earth satellite licensed by the Federal Communications Commission, by its proof-of-concept for search rescue satellites, by its continued exploration of the low Earth orbit in particular pointing the way to commercial use thereof in the 1990s, by its pioneering of communications using reflections from meteor trails, a technique now used for certain government and commercial communications, and by its leading role in development of low-cost, practical data transmission by radio which increasingly is being put to extensive use in, for instance, the land mobile service: Now, therefore, be it

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,*

## SECTION 1. FINDINGS AND DECLARATIONS OF CONGRESS

Congress finds and declares that—

(1) radio amateurs are hereby commended for their contributions to technical progress in electronics, and for their emergency radio communications in times of disaster;

(2) the Federal Communications Commission is urged to continue and enhance the development of the amateur radio service as a public benefit by adopting rules and regulations which encourage the use of new technologies within the amateur radio service; and

(3) reasonable accommodation should be made for the effective operation of amateur radio from residences, private vehicles and public areas, and that **regulation at all levels of government should facilitate and encourage amateur radio operation as a public benefit.**

Approved October 22, 1994.

Sources:

(text) <http://thomas.loc.gov/cgi-bin/query/z?c103:S.J.RES.90.ENR>;

(PDF) [http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=103\\_cong\\_bills&docid=f:sj90enr.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=103_cong_bills&docid=f:sj90enr.pdf)

The Applicant wishes to call attention to Federal law that preempts certain elements of regulation by a municipality. Federal Communications Commission Order PRB-1, 101 FCC 2d 952, 50 Fed. Reg. 38813 (September 25, 1985), declares in pertinent part:

Local regulations which involve placement, screening, or height of antennas based on health, safety or aesthetic considerations must be crafted to accommodate reasonably amateur communications, and to represent the **minimum** practicable regulation to accomplish the local authority's legitimate purpose. (*Emphasis added.*)

Source: <http://wireless.fcc.gov/services/amateur/prb/index.html>

The above order has subsequently become part of the Code of Federal Regulations, as 47 C.F.R. §97.15 (b):

Except as otherwise provided, a station antenna structure may be erected at heights and dimensions sufficient to accommodate amateur service communications. State and **local regulation of a station antenna structure** must not preclude amateur service communications. Rather, it **must reasonably accommodate** such communications **and**

**must constitute the minimum practicable regulation** to accomplish the state or local authority's legitimate purpose. (*Emphasis added.*)

Source:

<http://frwebgate.access.gpo.gov/cgi-bin/get-cfr.cgi?TITLE=47&PART=97&SECTION=15&YEAR=1999&TYPE=TEXT>

In 1999, the FCC amplified the restrictions on the powers of this Board when it issued a further Order, holding that:

**. . . the very least regulation necessary for the welfare of the community must be the aim of its regulations so that such regulations will not impinge on the needs of amateur operators to engage in amateur communications.** (*Emphasis added.*)

*In the Matter of* Modification and Clarification of Policies and Procedures Governing Siting and Maintenance of Amateur Radio Antennas and Support Structures, etc.

<http://www.fcc.gov/Bureaus/Wireless/Orders/1999/da992569.txt>, at ¶9.

The Courts have routinely enforced these FCC rulings, which have the power of Federal law.

FIRM, FIXED, UNVARYING HEIGHT RESTRICTIONS ARE VOID

The Courts have been very kind to radio amateurs when the local entity (town, city, or county) seeks to enforce a fixed maximum height. See:

***Bodony v. Sands Point, NY***, 681 F. Supp. 1009 (E.D.N.Y. 1987), [www.qsl.net/k3qk/bodony.html](http://www.qsl.net/k3qk/bodony.html). Ordinance with a firm 25' height limit. Proposed antenna support structure: 86'. Summary judgment for ham; settled with permit granted and \$60,000 in legal fees to ham on §1983 claim, because town was seeking ways to deny his rights (soliciting opinion of counsel on how to deny, without regard to merits).

***Izzo v. River Edge, NJ***, 843 F.2d 765 (3d Cir. 1988). Upholds preemptive effect of PRB-1 on 35' height limitation. "The effectiveness of radio communication depends on the height of antennas." *Id.* at 768. The court need not abstain. Court awarded fees of \$10,000.

***Brower v. Indian River County Code Enforcement Board, FL***, No. 91-0456 CA-25 (June 23, 1993), 1993 WL 228785 (Fla.Cir.Ct.). Support structure of 68.88 feet, plus antenna to total of 95.6 feet; 72.4 feet from neighbor's property line. By-law had an absolute prohibition on towers over 70'. Ham erected without first attempting to obtain a permit. Court held that any application for a permit would have been futile ("a circular dead-end"). Ordinance facially void as an unvarying maximum height: "We agree with the Evans court's adoption of prior rulings in that case which concluded that flat prohibitions of this nature are not permitted, Evans, at 976." [Refers to *Evans I*]

***Pentel v. Mendota Heights, MN***, 13 F3d 1261 (8th Cir. 1994) <http://www.qsl.net/k3qk/pentel.html>. Ham applied for 68' antenna (crank-up 30-68' and two Yagis). Absolute 25' height limit in ordinance preempted. Rejects balancing test, as the FCC did the balancing. Accepts 56.5' height as ineffective.

***Palmer v. Saratoga Springs, NY***, 180 F. Supp. 2d 379 (N.D.N.Y. 2001), <http://www.nysd.uscourts.gov/courtweb/pdf/D02NYNC/01-12259.pdf> or [http://www.arrl.org/FandES/field/regulations/PRB-1\\_Pkg/Palmer-v-Saratoga-Springs.pdf](http://www.arrl.org/FandES/field/regulations/PRB-1_Pkg/Palmer-v-Saratoga-Springs.pdf)

Absolute height limit of 20' in ordinance preempted. "(A)n unvarying height restriction on amateur radio antennas would be facially invalid in light of PRB-1." (Citing *Pentel, Evans and Bulchis.*)

Commentary on bad faith of town. Request for information on Radio Frequency Interference “unreasonable on (its) face.” Grant of permit as applied for, at 47’, without further proceedings. This, and Snook, are only cases that ever went to trial in a Federal District Court on PRB-1.

***Marchand v. Town of Hudson, NH***, 788 A.2d 250, 147 N.H. 380 (N.H. 2001), <http://www.courts.state.nh.us/supreme/opinions/2001/march221.htm>. Three, 100’ tall antenna systems. Ruling that balancing is not appropriate. “(T)o "reasonably accommodate" amateur radio communications . . . the ZBA may consider whether the particular height and number of towers are necessary to accommodate the particular ham operator’s communication objectives. Remand to determine if three towers is a customary accessory use under NH law. [On remand, Hudson, NH Board held that three towers qualifies as a customary use. [http://www.arrl.org/FandES/field/regulations/PRB-1\\_Pkg/hudson.pdf](http://www.arrl.org/FandES/field/regulations/PRB-1_Pkg/hudson.pdf) or <http://www.qth.com/antennazoning/ham/marchand-decision.pdf>]

***Snook v. Missouri City, TX***, No. 03-cv-243, 2003 U.S. Dist. LEXIS 27256, 2003 WL 25258302 (S.D. Tex. Aug. 26, 2003, Hittner, J.) (the Order, Slip Opinion, 63 pp.), see also the Final Judgment, Slip Opinion, 2 pp. PACER citation: [https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L\\_238\\_0-14:03-cv-00243\\_Snook v.\\_City\\_of\\_Missouri](https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L_238_0-14:03-cv-00243_Snook_v._City_of_Missouri), (S.D. Tex. 2003), more readily found at [http://www.arrl.org/FandES/field/regulations/PRB-1\\_Pkg/Snook%20KB5F%20Decision%20&%20Order%2034.pdf](http://www.arrl.org/FandES/field/regulations/PRB-1_Pkg/Snook%20KB5F%20Decision%20&%20Order%2034.pdf) (the Order, Slip Opinion, 63 pp.), see also the Final Judgment, Slip Opinion, 2 pp. PACER citation: [https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L\\_238\\_0-14:03-cv-00243\\_Snook v.\\_City\\_of\\_Missouri](https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L_238_0-14:03-cv-00243_Snook_v._City_of_Missouri), (S.D. Tex. 2003).

Original bylaw permitted only 35’, second bylaw permitted more by specific use permit. After grant of building permit under first bylaw (B/I recognized 35’ was not legal), Ham built 114’. City cited Ham for repeated violations of second bylaw for failure to have specific use permit, which it declined to grant. City expert recommended 50-60’ for 20 meter antenna, and just above tree tops (60-80’) for VHF/UHF, but ignored 40 and 80 meter antenna argument. For no special reason, City decided 65’ as acceptable. “To conduct effective emergency communications, Snook must be able to achieve at least a 75 to 90 percent successful signal under the changing variables that impact emergency or other amateur radio communications.” Findings of Fact ¶9. City Ordinance preempted. Order for City to issue permit (no remand) consistent with existing structure. Citing *Younger v. Harris*, Court declined to enjoin City, but received assurances City would not further prosecute. “PRB-1 requires a site-specific, antenna-specific, array-specific, operations-specific, ordinance-specific, and city action-specific analysis. PRB-1 at p. 7.” [Referring to PRB-1 paragraphs 24 and 25.]

***Chedester v. Town of Whately, MA***, <http://www.qth.com/antennazoning/ham/chedester-decision.pdf> (2004). Bylaw permitted no more than 35’. Ham granted permit for 140’ on 10 acres in agriculture/residential zone when Building Inspector decided bylaw was preempted. Planning Board appeals to ZBA. ZBA revokes permit. Superior Court ruled that town misinterprets both state and federal preemption in holding that while the ordinance may permit antennas over 35’, restrictions on antenna support structures are not similarly affected. Height limit of 35’ found to be “an absolute and unvarying height restriction” and preempted. “A 35’ height restriction would effectively mean that no radio communications would be able to be transmitted.” Building permit reinstated.

In addition to the above matters of Federal law, Nevada law limits local action. **NRS 278.02085 Amateur radio** has been enacted to read:

Limitations on restrictions on amateur service communications; limitations on regulation of station antenna structures; exception.

1. A governing body shall not adopt an ordinance, regulation or plan or take any other action that precludes amateur service communications or that in any other manner does not conform to the provisions of 47 C.F.R. § 97.15 and the limited preemption entitled "Amateur Radio Preemption, 101 F.C.C. 2d 952 (1985)" as issued by the Federal Communications Commission.

2. If a governing body adopts an ordinance, regulation or plan or takes any other action that regulates the placement, screening or height of a station antenna structure based on health, safety or aesthetic considerations, the ordinance, regulation, plan or action must:

(a) Reasonably accommodate amateur service communications; and

(b) Constitute the minimum level of regulation practicable to carry out the legitimate purpose of the governing body.

3. The provisions of this section do not apply to any district organized pursuant to federal, state or local law for the purpose of historic or architectural preservation.

4. Any ordinance, regulation or plan adopted by or other action taken by a governing body in violation of the provisions of this section is void.

5. As used in this section:

(a) "Amateur radio services" has the meaning ascribed to it in 47 C.F.R. § 97.3.

(b) "Amateur service communications" means communications carried out by one or more of the amateur radio services.

(c) "Amateur station" has the meaning ascribed to it in 47 C.F.R. § 97.3.

(d) "Station antenna structure" means the antenna that serves an amateur station, including such appurtenances and other structures as may be necessary to support, stabilize, raise, lower or otherwise adjust the antenna.

(Added to NRS by 2001, 596)

*(Emphasis added.)*

**Why is it important for this Board to know about all of this legal background? Because this Board has an obligation to accommodate the radio amateur in the communications that he or she desires to realize, because the Town may only impose "the minimum practicable regulation," and the Board may not balance the amateur's needs with the needs of the municipality. The FCC has already done the balancing.**

MULTIPLE TOWERS ARE PERMISSIBLE

If an opponent to this project should argue that perhaps one amateur radio antenna support structure may be permissible, but multiple antenna systems are not, the response would be first, that the Applicant is entitled to use all of the amateur frequency bands, which may require wholly separate antennas, at varying heights, for effective communications in accordance with the needs of the radio amateur. Second, no limitation on the number of antenna support structures or antennas themselves can be found in the County

Code, nor state or federal law. Third, there is substantial case law supporting the concept of multiple antennas.

First, as to the radio amateur's need for different antennas at differing heights, this is well addressed elsewhere in the Applicant's submission, including the Needs Analysis.

Second, as to the lack of limit on number, the County has demonstrated fully that it can draft an ordinance specifically, to deal with single and plural uses. For example:

- §17.40.020 permits "a private garage," but all other enumerated uses are plural.
- §17.40.025 permits "one detached family guest home," but all other enumerated uses are plural.
- §17.62.020 permits "towers" (plural).

Furthermore, NRS 278.02085 requires that regulation by the County shall "constitute the minimum level of regulation practicable . . ." Attempting to limit an applicant to one antenna system would be more than "the minimum level of regulation practicable." The County Code contains no indication whatsoever that multiple amateur radio antenna systems accessory to a single family residence are forbidden.

Third, there are many cases where multiple antenna systems were found allowable, despite claims to the contrary.

***Bay v. ZBA of New Canaan (CT)*** 1993 Conn. Super. LEXIS 2345 (Super. Court of Stamford-Norwalk, Sept. 9, 1993). Ham had lawful existing retractable 72-foot structure and proposed to add one antenna to it, as well as to install a new 57-foot vertical. Court finds that an amateur radio antenna is a customary accessory use, and disregards *Presnell v. Leslie*. Good discussion of why Court adopts the majority view. Court finds that additional antenna may be placed 10 feet above present antenna (total 82') due to interaction. **Court finds multiple antennas are customary and accessory.** Court finds that the height is necessary. Ham's appeal sustained.

***Baskin v. Bath Twp. ZBA (OH)***

Baskin I: 15 F.3d 569 (6th Cir. 1994), <http://pacer.ca6.uscourts.gov/cgi-bin/getopn.pl?OPINION=94a0030p.06> Abstention not appropriate despite a somewhat parallel state court action.

Baskin II: 101 F.3d 702 (6th Cir. 1996), 1996 WL 678228 (6th Cir. Ohio). **Four towers** plus one antenna without a tower. Bylaw required special approval from BZA for structures >50'. Drop zone imposed – not invidious discrimination as "similarly situated" class for equal protection purposes is amateurs with towers of similar height. Section 1983 claim denied on grounds that PRB-1 not intended to benefit Baskin. Court declined to exercise pendant jurisdiction and Cir.Ct. found this was not an abuse of discretion. However, Cir. Ct. affirmed Dist. Ct. declaratory judgment that the height/location was not a reasonable accommodation and therefore void and unenforceable.

***Marchand v. Town of Hudson (NH)*** 147 N.H. 380, 788 A.2d 250 (N.H. 2001), <http://www.courts.state.nh.us/supreme/opinions/2001/march221.htm>

Bylaw had no regulation on number or height of towers. **Three, 100' tall antenna systems** on 6.04 acres of forest in an R-2 zone. Ruling that balancing not appropriate. "(T)o "reasonably accommodate" amateur radio communications . . . the ZBA may consider whether the particular height and number of towers are necessary to accommodate the particular ham operator's

communication objectives.” Remand to determine if three towers is a customary accessory use under NH law. [On remand, Hudson, NH Board held that three towers qualifies as a customary use. [http://www.arrl.org/FandES/field/regulations/PRB-1\\_Pkg/hudson.pdf](http://www.arrl.org/FandES/field/regulations/PRB-1_Pkg/hudson.pdf) or <http://www.antennazoning.com/ham/marchand-decision.pdf>]

***Smith v. Bernalillo County (NM)*** New Mexico Supreme Court Slip Opinion at <http://www.supremecourt.nm.org/opinions/VIEW/05sc-012.html>, (last visited June 12, 2005), 2005 WL 791994. This is not a PRB-1 case. The case involves **two 130-foot towers** with ten-foot masts (a total height of 140 feet each) on five acres in the A-2 (rural residential) in the East Mountain area. On the subject of customary accessory use, the Court found:

{25} Our review of cases from other states supports Plaintiff's belief that amateur radio antennas are generally considered customarily incidental to residential use without adding a reasonableness inquiry. See, e.g., *Town of Paradise Valley v. Lindberg*, 551 P.2d 60, 61-62 (Ariz. Ct. App. 1976) (holding that the erection of a ninety-foot amateur radio tower in conjunction with a homeowner's hobby as a ham radio operator is a permissible accessory or incidental use); *Skinner v. Zoning Bd. of Adjustment*, 193 A.2d 861, 863-64 (N.J. Super. Ct. App. Div. 1963) (upholding a 100-foot radio antenna tower used as a hobby as an accessory use customarily incidental to the enjoyment of a residential property); *Dettmar v. County Bd. of Zoning Appeals*, 273 N.E.2d 921, 922 (Ohio Ct. Com. Pl. 1971) (finding that **even an unusual customarily incidental use is permissible unless specifically excluded by a zoning restriction**).

{37} The results of this case may be unfortunate for the neighbors who understandably regard Plaintiff's radio towers as an eyesore. But Plaintiff fairly relied on the express language of the ordinance and the assurances of the county zoning officials in buying his property. After the County granted Plaintiff a permit, he complied with its terms in the construction of his radio antenna towers. If the County wanted to prevent towers on this scale, the problem could easily have been avoided by doing exactly what has been done since: expressly amending the ordinance with specific height limitations. See *Bernalillo County, N.M., Ordinance 2004-1* (adopted Jan. 27, 2004) (amending the zoning ordinance to provide for amateur radio towers as permissive uses up to sixty-five feet or conditional uses up to 100 feet). The County has every right and responsibility to regulate structures such as amateur radio towers, but it did not do so explicitly and in fact exempted such antenna towers from height restrictions. **The County cannot after the fact come up with a new legal rationale to block an unpopular activity, which was previously permitted**, to the detriment of a property owner who did everything in his power to follow the rules.

{38} . . . We hold that Plaintiff is entitled to a declaratory judgment that the building permit for his antenna towers was properly issued and that the County's stop work notices are invalid.

***Evans v. Burruss (MD)*** <http://www.courts.state.md.us/opinions/coa/2007/1a07.pdf> (MD Court of Appeals, 2007), last visited October 22, 2007. Ham applied for building permit (not special permit, not variance) for **four 190' towers**, which was granted as a matter of right under the old ordinance. Began construction. Over a year later, new bylaw passes. Court holds his rights have vested. Held, the grant of a building permit is a ministerial act. No notice to neighbors is required.

Note: Neighbors subsequently filed a suit claiming “private nuisance.” When the ham filed a fully briefed Motion for Summary Judgment, Plaintiffs withdrew with prejudice – ending the litigation.

#### AMATEUR RADIO IS AN ORDINARY ACCESSORY USE

Amateur radio antennas are generally considered customarily incidental to residential use. *See, e.g., Town of Paradise Valley v. Lindberg*, 551 P.2d 60, 61-62 (Ariz. Ct. App. 1976) (holding that the erection of a ninety-foot amateur radio tower in conjunction with a homeowner’s hobby as a ham radio operator is a permissible accessory or incidental use); *Skinner v. Zoning Bd. of Adjustment*, 193 A.2d 861, (N.J. Super Ct. App. Div 1963) (upholding a 100-foot radio antenna tower used as a hobby as an accessory use customarily incidental to the enjoyment of a residential property); (*Dettmar v. County Bd. of Zoning Appeals*, 273 N.E. 2d 921, 922 (Ohio Ct. Com Pl. 1971) (finding that even an unusual customarily incidental use is permissible unless specifically excluded by a zoning restriction). Another common thread in these cases is that neighbors do not determine what is customarily incidental to a particular homeowner’s use of his property. *Lindberg*, 551 P.2d at 62; *Dettmar*, 273 N.E.2d at 922 (use customarily incidental “does not limit the use to the incidental activity chosen by the neighbors”).

#### THE COUNTY MUST ACCOMMODATE THIS INDIVIDUAL RADIO AMATEUR

The New Hampshire Supreme Court has decided:

In light of the FCC's requirement, a zoning board's fact-finding and analysis should focus, first, on whether the three towers are permitted under local zoning regulations. If, as we have determined here, they are not, the zoning board should then consider what steps must be taken to "reasonably accommodate" amateur radio communications. In making this determination, the ZBA may consider whether the particular height and number of towers are necessary to **accommodate the particular ham operator's communication objectives**.

There was some evidence presented to the ZBA that the tower and antenna operation "was not the typical installation, but rather was something that every ham who was interested in reliable international communication on a regular basis aspired to own." The ZBA, however, did not make any factual findings regarding whether Muller even requires the proposed three radio towers **to facilitate his international ham radio operations**. Therefore, we vacate the superior court's decision and remand with instructions to remand to the ZBA for proceedings consistent with this opinion. (*Emphasis added*.)

*Marchand v. Town of Hudson*, 788 A.2d 250 (N.H. 2001).

So the question is not whether some other amateur might be satisfied, or some communications would be effective. The question relates to "the particular ham."

As the Federal District Court said in the *Snook* case:

PRB-1 requires a site-specific, antenna-specific, array-specific, operations-specific, ordinance-specific, and city action-specific analysis. PRB-1 at p. 7.

*Snook v. Missouri City, TX* No. 03-cv-243, 2003 U.S. Dist. LEXIS 27256, 2003 WL 25258302 (S.D. Tex. Aug. 26, 2003, Hittner, J.) (the Order, Slip Opinion, 63 pp.), see also the Final Judgment, Slip Opinion, 2 pp. PACER citation: [https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L\\_238\\_0-14:03-cv-00243\\_Snook\\_v.\\_City\\_of\\_Missouri](https://ecf.txsd.uscourts.gov/cgi-bin/login.pl?387442335892775-L_238_0-14:03-cv-00243_Snook_v._City_of_Missouri), (S.D. Tex. 2003), more readily found at

[http://www.arrl.org/FandES/field/regulations/PRB-1\\_Pkg/Snook%20KB5F%20Decision%20&%20Order%2034.pdf](http://www.arrl.org/FandES/field/regulations/PRB-1_Pkg/Snook%20KB5F%20Decision%20&%20Order%2034.pdf)

The reference to “PRB-1 at p.7” by the *Snook* Court is to PRB-1 ¶ 25, which reads:

25. Because amateur station communications are only as effective as the antennas employed, antenna height restrictions directly affect the effectiveness of amateur communications. Some amateur antenna configurations require more substantial installations than others if they are to provide the amateur operator with the communications that he/she desires to engage in.

FCC Order PRB-1, 101 FCC 2d 952, 50 Fed. Reg. 38813 (September 25, 1985, (“PRB-1”), <http://wireless.fcc.gov/services/amateur/prb/index.html> (last visited May 3, 2005).

Again, the test is NOT what would satisfy some ham. Under PRB-1, the test is whether or not the municipality will reasonably accommodate a proposed installation "to provide the amateur operator with the communications that he/she desires to engage in."

If another radio ham were to come along and say: “I’m perfectly happy with a dipole at 18 feet,” that would not, in any way, address the PRB-1 requirement "to provide the amateur operator with the communications that he/she desires to engage in."

This Board should note that this not a “Reasonable Man” test, and it is not a “Reasonable Ham” test. Re-read the FCC Preemption (PRB-1) at ¶25:

Some amateur antenna configurations require more substantial installations than others if they are to provide the amateur operator with the **communications that he/she desires to engage in.**

It is very important to understand that this is a subjective test. The amateur determines the communications desired. After the amateur operator has determined that, regulation “must constitute the **minimum practicable regulation**” 47 CFR Sec. 97.15(b). Furthermore, the law requires that such regulation “will **not impinge on the needs** of amateur operators to engage in amateur communications.” FCC DA 99-2569, at ¶9. <http://wireless.fcc.gov/services/amateur/prb/prb1999.html> (*Emphasis supplied.*)

#### NO ADDITIONAL BALANCING BY THE COUNTY PERMITTED

It may be common in other areas of zoning law to balance the needs of the community with the needs of an applicant for a permit. But this is not one of those areas. Balancing local interests against the Federal government's interest in promoting amateur communications is not permitted. The FCC has already done the balancing. The municipality must reasonably accommodate the radio amateur. *Pentel v. Mendota Heights*, 13 F.3d 1261 (8th Cir. 1994), <http://www.qsl.net/k3qk/pentel.html>.

This “no balancing” approach was affirmed by the FCC in 1999, in an order known as DA 99-2569, which is very helpful to amateurs (it again rejects balancing tests, and includes the must “not impinge” language in ¶9, last sentence). The FCC ruling may be found at <http://wireless.fcc.gov/services/amateur/prb/prb1999.html>

7. . . . PRB-1 decision precisely stated the principle of "reasonable accommodation". In PRB-1, the Commission stated: "Nevertheless, local regulations which involve placement, screening, or height of antennas based on health, safety, or aesthetic considerations must be crafted to accommodate reasonably amateur communications, and to represent

the minimum practicable regulation to accomplish the local authority's legitimate purpose." **Given this express Commission language, it is clear that a "balancing of interests" approach is not appropriate** in this context.

*(Emphasis added.)*

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**SUPPORT FROM NEIGHBORS**

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Letters supporting this application may be found in **Exhibit H-2**.

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**REMOTE CONTROL IS NOT AN OPTION**

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Recall that amateur radio is an ordinary accessory use of a residential property. In addition, under 47 CFR §97.15(b), local regulation must not preclude amateur radio communications. Put those two concepts together and the conclusion is that local regulation cannot preclude antennas on the radio amateur's property. A requirement that a radio amateur's antennas must be located at a remote site would be a requirement that precludes communications from the amateur's home site. A requirement that antennas be located off-site would also frustrate the requirement of the law that regulation must be "the minimum practicable,"<sup>12</sup> and must be regulation that "will not impinge on the needs of amateur operators to engage in amateur communications."<sup>13</sup> Furthermore, a remote-site requirement would frustrate one of the purposes of amateur radio, which is to have stations ready from residences<sup>14</sup> in time of emergency. An amateur radio station designed to be available when telephone and internet communications systems go down would be useless when needed most.

---

**CONCLUSION**

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For the reasons set forth above, the Applicant requests that this application be granted for the antenna support systems at the proposed sites as submitted.

Respectfully submitted,



Fred Hopengarten, Esq.  
Six Willarch Road  
Lincoln, MA 01773-5105  
(781)259-0088  
Maine Bar #1660, D.C. Bar # 114124

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<sup>12</sup> 47 C.F.R. §97.15(b)

<sup>13</sup> FCC DA 99-2569., at ¶9. <http://wireless.fcc.gov/services/amateur/prb/prb1999.html>

<sup>14</sup> Public Law 103-408 (J.Res., 103d Congress, 1994)§1(3),  
<http://thomas.loc.gov/cgi-bin/query/D?c103:1:./temp/~c103axha51:> ,  
or [http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=103\\_cong\\_bills&docid=f:sj90enr.txt.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=103_cong_bills&docid=f:sj90enr.txt.pdf)

**EXHIBITS**

**EXHIBIT A: APPLICANTS' AMATEUR RADIO LICENSES**

Call Sign/Number	Grant Date	Expiration Date	File Number	Print Date	Effective Date
K5RC	11-14-2001	12-10-2011	0002316542	09-16-2005	09-16-2005
Operator Privileges Amateur Extra		Station Privileges PRIMARY		THIS LICENSE IS NOT TRANSFERABLE. SPECIAL CONDITIONS/ENDORSEMENTS: NONE	
TAORMINA, THOMAS S 370 PANAMINT RD V C HIGHLANDS NV 89521					
<b>AMATEUR RADIO LICENSE</b> FCC Registration Number (FRN) 0004025581 FCC 660 April 2002					
				 (Licensee's Signature) FEDERAL COMMUNICATIONS COMMISSION	

Call Sign / Number	Grant Date	Expiration Date	File Number	Print Date	Effective Date
K7AFO	01-24-2008	01-24-2018	0003299044	01-24-2008	01-24-2008
Operator Privileges Technician		Station Privileges PRIMARY		THIS LICENSE IS NOT TRANSFERABLE Special Conditions / Endorsements: NONE	
TAORMINA, MIDGE A 370 PANAMINT RD V C HIGHLANDS, NV 89521					
<b>AMATEUR RADIO LICENSE</b> FCC Registration Number (FRN): 0003913290 FCC 660 - May 2007					
				 (Licensee's Signature) FEDERAL COMMUNICATIONS COMMISSION	

EXHIBIT B: ANNOTATED PLOT PLAN OF APPLICANT'S LAND PARCEL



Plat Plan Drawn  
7/30/2008  
Map - 9/2004  
Taormina

The plot plan shows the Applicant’s residence. The following map shows surrounding home sites.

Neighborhood Drawn 7/30/2008  
 Map – 9/2004 Taormina

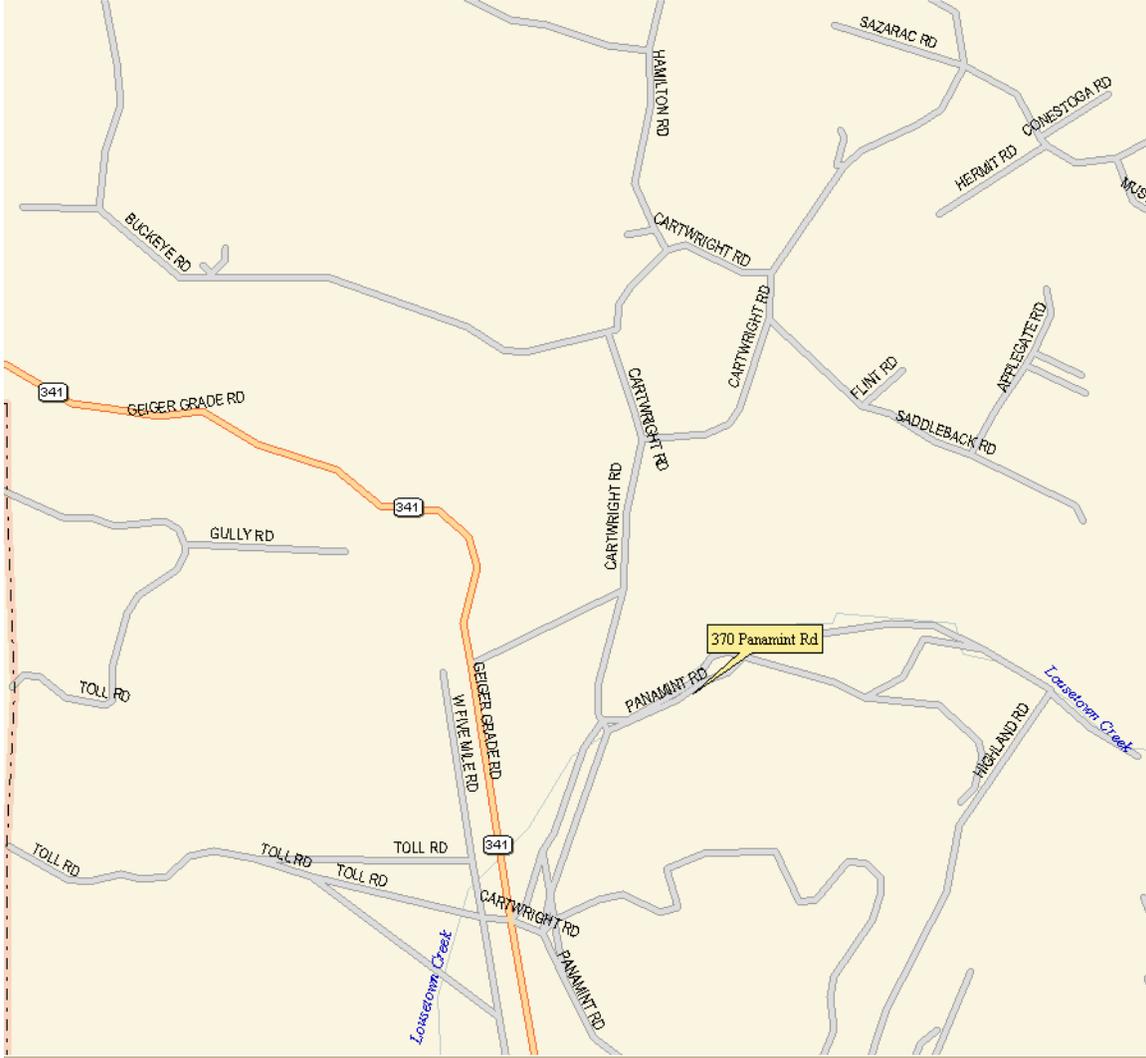


### Chart of Distances

From Nearest Antenna Support Structure to	Distance (in feet)
Future Home Site <sup>15</sup> , Blake Property – 360 Panamint	348
Home of Meade – 380 Panamint	702
Home of Adkins – 390 Panamint	620

<sup>15</sup> Assumed by cleared area, visible well head and rough road bed.

EXHIBIT C: LOCAL ROAD MAP



**EXHIBIT D: AREA ZONING**

# STOREY COUNTY CODE

## **Chapter 17.08 ZONES GENERALLY SectionNo( 17.08.010) Zones designated.**

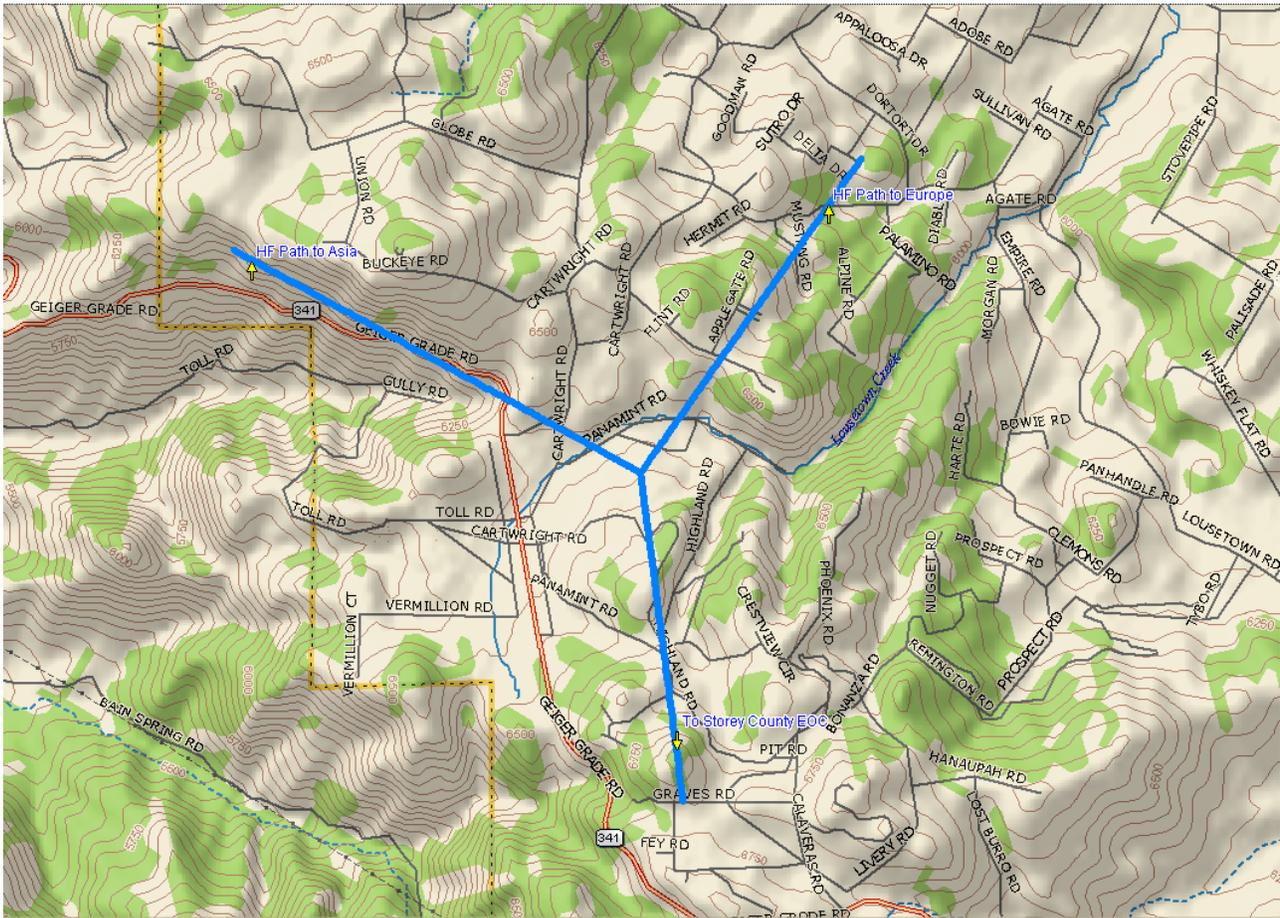
The county is divided into the following land use zones: A Agricultural C Commercial CR Commercial/Residential E Estates (1, 2.5, 5, 10 and 40 acre parcels) E-1-VCH Estates 1 acre-- Virginia City Highlands E-10-HR Estates 10 acres--Highland Ranches E-40-VR Estates 40 acres-- Virginia Ranches F Forestry H-O Historic Overlay I-1 Light Industrial I-2 Heavy Industrial I-S Special Industrial MHO Manufactured/Mobile Home Overlay MHP Manufactured/Mobile Home Park NR Natural Resources P Public PUD Planned Unit Development and Subdivisions R-1 Residential R-2 Multiple Residential SPR Special Planning Review Zone (Ord. 159 § 2(part), 1999)

# STOREY COUNTY CODE

## **Chapter 17.40 E ESTATES ZONE SectionNo( 17.40.050) Setbacks.**

The following minimum setbacks shall apply to all structures over six feet in height in the E estates zones. Percentages are a percentage of the average lot width; where a percentage and a dimension are indicated, the larger shall apply: Estates Zone Front Setback Rear Setback Side Setback E-1 20 ft. 12 ft. 12 ft. E-2,5 30 ft. 50 ft. 30 ft. E-5 30 ft. 50 ft. 30 ft. E-10 50 ft. 80 ft. 50 ft. E-40 80 ft. 150 ft. 80 ft. E-I-VCH 30 ft. 40 ft. 15 ft. E-10-HR 30 ft. 40 ft. 15 ft. E-40-VR 30 ft. 40 ft. 15 ft.

**EXHIBIT E: USGS TOPO MAP OF PROPOSED SITE**



The land parcel and site are again shown at the intersection of the three lines. Radial lines indicate the several compass directions for which terrain profiles were calculated. These terrain profiles were used in the HF Radio Propagation Analysis described in detail in the Needs Assessment Exhibit P.

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**EXHIBIT F: PHOTOS/DRAWINGS OF EXISTING & PROPOSED STRUCTURES**

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1. 40 Meter Rohn 45G – 140'



2. 20 Meter Rohn 25G – 85'



3. Rohn HBX-32 Tower – 32’



4. 160 Meter Rohn 25G – 110’ (Note: The structure is a vertical antenna.)



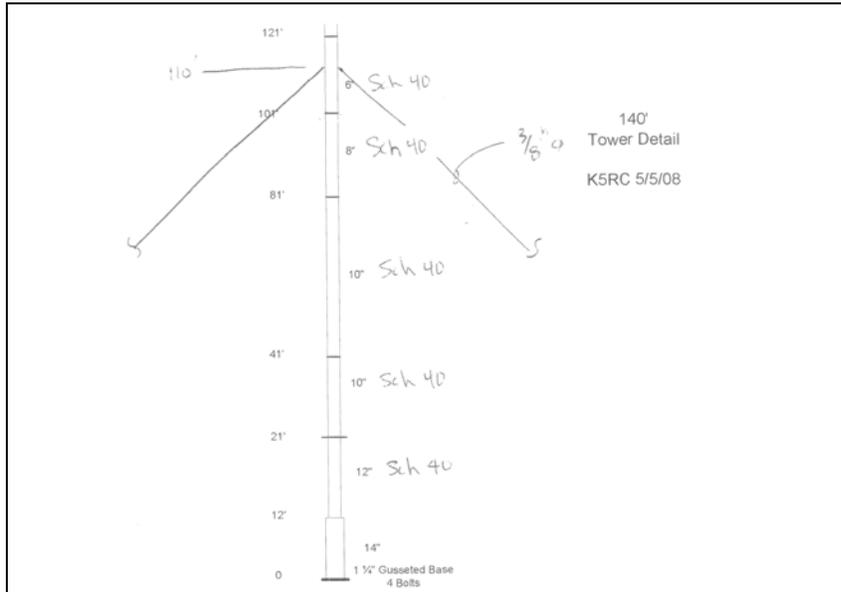
5. VHF Trylon 1245 – 40'



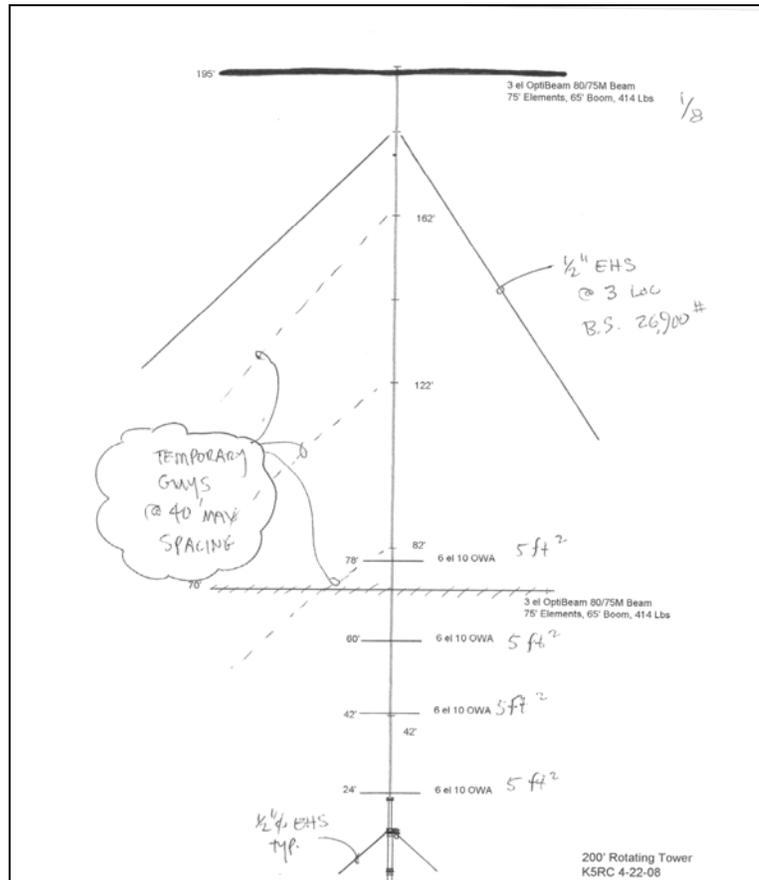
6. 20 Meter Rohn 45G – 140'



7. 15 Meter Monopole (proposed) – 120' (PE Rendering)



8. 80 Meter Monopole (proposed) – 195' (PE Rendering)



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**EXHIBIT G: EMERGENCY POWER GENERATOR**

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*Exhibit G. Troy-Bilt 5KW Generator.*

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**EXHIBIT H-1: RED CROSS SUPPORT FOR AMATEUR RADIO ANTENNAS**

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National Headquarters  
8111 Gatehouse Road  
Falls Church, VA 22042

September 11, 2002

President Jim Haynie  
The American Radio Relay League  
225 Main Street  
Newington, CT 06111-1494

Dear President Jim Haynie:

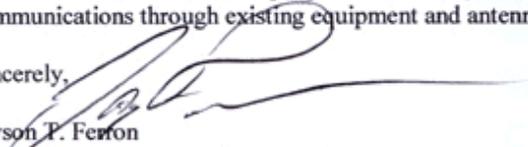
Each year, on average, the American Red Cross provides services in over 62,000 emergencies in various places around the United States. Whether flood, fires, earthquakes, hurricanes, or man made disasters, the American Red Cross is there to respond. As our corporate slogan states "Together, we can save a life". When the Red Cross asks for help from America's radio hams we get it. Every time we ask, radio hams volunteer the use of their stations, including antennas, and they volunteer their time. For this, and for the results they achieve for victims of tragedies, we are grateful. Your membership helps us at the disaster scene or from their home running emergency communications.

Even in an era of cell phones and satellite communications, amateur radio continues to provide crucial links in disaster stricken areas. When the emergency arises, it is too late to build or transport communications systems equivalent to those available in the existing stock of amateur radio stations.

We understand that in emergency communications the one of the key issues is to have trained emergency communicators who have equipment and antennas set up for fast response. For this reason, we supported the American Radio Relay League when it sought preemption of zoning and other local regulations that, either as written or as applied, act to inhibit effective communications. We applauded when the Federal Communications Commission recognized an obvious fact of physics – that effective communications is often a function of height.

For these reasons, the American Red Cross strongly supports amateur radio, and the construction of station antenna systems to provide effective local and long distance communications. We have done so through Memoranda of Understanding with the American Radio Relay League dating back before World War II, and still current today. We encourage municipalities and Home Owner Associations to employ their regulations so they will not impinge on the needs of amateur radio operators. In emergencies, the American Red Cross, and the people we serve in your area, need what radio amateurs provide – effective communications through existing equipment and antenna systems.

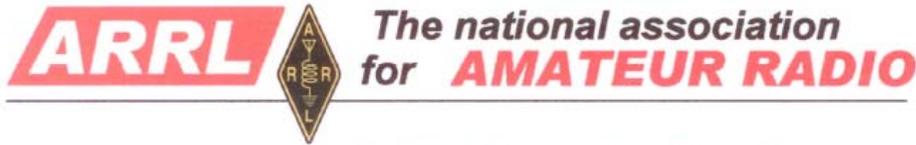
Sincerely,



Jayson P. Fenon  
Disaster Telecommunications Partner  
Disaster Services

***Together, we can save a life***

## EXHIBIT H-2: LOCAL SUPPORT FOR THIS APPLICANT

**Public Information Coordinator  
Section Emergency Coordinator**

Storey County Building Department  
PO Box 526  
Virginia City, NV 89440

July 23, 2008

Dear Building Department:

I would like to extend my appreciation to Tom Taormina for his ongoing role as Storey County Emergency Coordinator and County RACES Officer, as officially appointed. Tom (K5RC) and his wife Midge (K7AFO) are the only viable amateur link we have between the State Department of Emergency Management in Carson City and the Reno Emergency Operations Center for emergency communications.

His long service on the Storey County Local Emergency Planning Commission has been our only intra-county coordination link and his organizational skills are critical to the future of increasing RACES and ARES participation in Storey County.

I understand that he now contemplates the installation of replacement amateur radio antenna support structures with appropriate antennas for UHF, VHF and HF (High Frequency) operations. This proposed installation would benefit emergency communications for your community, Storey County, and would add critical missing intra-county and inter-county coverage. His planned High Frequency upgrades could be the main conduit for the area to Homeland Security in the event of a catastrophic disaster that disrupts normal power, radio and telephone communications.

On behalf of the American Radio Relay League and the Radio Amateur Civil Emergency Service, I urge you to rule favorably on Tom's applications.

Sincerely,

A handwritten signature in blue ink, appearing to read "Don Carlson", is written over a light blue horizontal line.

G.L. "Don" Carlson - KQ6FM  
NV Section Emergency Coordinator / State R.A.C.E.S. Officer  
Public Information coordinator/  
ARRL National PR Committee

Don Carlson • [kq6fm@arrl.net](mailto:kq6fm@arrl.net)  
5591 Barcelona Court, Sparks, NV 89436 • (775) 354-2788 • Fax (775) 354-2636

August 3, 2007

To Whom It May Concern:

As a Storey County resident living in the Highland Ranches, I have known Tom Taormina for approximately 4 years. Our acquaintance came during my service on the Storey County School Board and Tom's volunteer efforts to assist us with a bond roll-over initiative for the District.

The ultimate success of that initiative has made significant contributions to the education of our students and the quality of our school district. We are grateful to Tom for his efforts.

I have always found Tom to be a man of considerable substance and one who has genuine regard for his community and neighborhood. The recent controversy over his amateur radio equipment is unfortunate, and while some have expressed concerns over the visual impact of his antennae towers, I have not personally found that to be an issue despite passing by them most days.

Instead, I find the sight of the antennae towers to be a reminder of the role amateur radio operators continue to play in our country. Their investment in equipment and knowledge for a private hobby provides a valuable resource to their community in times of emergency and need.

I am pleased to have Tom as a member of my local community and I am hopeful a reasonable solution can be reached that still allows the pursuit of his amateur radio passion and his service to our community.

Sincerely,



Curt Chapman  
2560 Musket Road  
VC Highlands, NV 89521  
(775) 847-7771

## EXHIBIT I:

## FAA TOWAIR STUDY

**Antenna Structure Registration Not Required**

TOWAIR Search Results

<http://wireless2.fcc.gov/UlsApp/AsrSearch/towairResult.jsp?printable>**TOWAIR Determination Results****\*\*\* NOTICE \*\*\***

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

**DETERMINATION Results**

**Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.**

**Your Specifications****NAD83 Coordinates**

Latitude	39-22-07.0 north
Longitude	119-39-36.0 west

**Measurements (Meters)**

Overall Structure Height (AGL)	59.4
Support Structure Height (AGL)	59.4
Site Elevation (AMSL)	1961.1

**Structure Type**

TOWER - Free standing or Guyed Structure used for Communications Purposes

**Tower Construction Notification**

Notify Tribes and Historic Preservation Officers of your plans to build a tower.  
Note: Notification does NOT replace [Section 106 Consultation](#).

**CLOSE WINDOW**

Source: <http://wireless2.fcc.gov/UlsApp/AsrSearch/towairSearch.jsp>

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EXHIBIT J: THE IMPORTANCE OF AMATEUR RADIO IN EMERGENCIES

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from the September 15, 2005 edition - <http://www.csmonitor.com/2005/0915/p12s02-stss.html>



**HELLO?** Joe Garcia, station manager of the American Radio Relay League in Newington, Conn., is one of many hams helping to coordinate disaster relief until land lines and cellphone service is fully restored.

LAUREN TAGLIATELA/THE HERALD/AP

### Ham radio operators tune in hurricane help

By **Barbara W. Carlson** | Contributor to The Christian Science Monitor

**NEWINGTON, CONN.** - Richard Webb, an amateur radio operator, was asleep on his air mattress at University Hospital in New Orleans during the aftermath of hurricane Katrina when he was awakened at 5 a.m. by a hospital administrator.

As Mr. Webb tells it, "He told me we had a lady who was in labor, who had swum five blocks in that dirty, nasty water to the hospital because she saw lights there - people with flashlights moving around." Medical personnel said the baby needed to be delivered by caesarean section. But the hospital had limited power, no running water, no way to sterilize instruments, no way to perform such surgery. "We figured we had two hours to get her medevacked out of there" before the lives of mother and child would be in danger. "So I got on the radio and was talking to a fellow who was with the Coast Guard auxiliary in Cleveland, Ohio. I was working with him to arrange a medevac."

Choppers did arrive in time, Webb says. The woman and another patient in need were evacuated successfully. Because the hospital had no landing pad, the two had to be lifted out in baskets lowered from the helicopters.

Webb, who lived in nearby Slidell, La., had been summoned to his hurricane post by the hospital's head of emergency management. He's one of about 750 amateur radio operators, or "hams," who have been in and out of the five hurricane states since day one: Louisiana, Mississippi, Alabama, and parts of northern Florida and Texas, where evacuees are taking shelter. At least a thousand other hams throughout the nation have been involved in some way, relaying messages or assigning hams to various locations. They're all volunteers, all unpaid, and they do what they do because they want to. They train for disaster work; their FCC radio licenses mandate public service.

In typical disaster conditions, agencies like the Red Cross, Salvation Army, the Federal Emergency Management Administration (FEMA), and local government bodies call on a state ham leader for volunteers when usual channels of communication are down or jammed.

Katrina was different: It was far more vast. For the first time, the nonprofit American Radio Relay League (ARRL) set up a website and database to facilitate assigning hams.

Pamela Taylor, who works as an events manager in Hampton Beach, N.H., got a call from FEMA and

headed south on Sept. 9. She was deployed to a shelter in Ocean Springs, Miss., near Gulfport, before moving to New Orleans. The shelter was a church, well-supplied and maintained, with an abundance of volunteers. Her job was to radio for special needs, anything from a doctor to paper plates. Nights sometimes brought an emergency or two when a resident had to be removed, usually for alcohol or drug problems.

Hams worked with the National Weather Service before and during the hurricane. They still are receiving and transmitting messages in shelters and other locations, alerting emergency agencies that a community needs water, that an elderly woman needs an ambulance, or that sanitary conditions are in crisis.

An estimated 600,000 FCC-licensed amateur radio operators live in the United States; about 162,000 are members of the ARRL, which was founded in 1904 and is located here in Newington, Conn. Nearby Hartford is where Hiram Percy Maxim, the father of amateur radio, experimented at sending messages across the city and then relaying them across the country. Long before e-mail, there was amateur radio. It evolved over the last century so that today, ham operators communicate with one another around the world. Allen Pitts, for example, the ARRL's media-relations manager, says he has spoken to fellow hams in 213 foreign countries or "political entities."

That's the hobby part of hamdom. The serious and vital part is seen in the Amateur Radio Emergency Service (ARES). Trained ham operators are ready with their "go kits" of equipment, batteries, and energy bars. ARRL coordinates the work of the emergency operators. Hams were at ground zero in New York within hours, they were in Florida for the multiple hurricanes last year, and they handled communications in the Northeast blackout of 2003.

Hams are volunteers. When they set sail for disasters, they pay their own way. Sometimes employers give them a paid leave or reimburse expenses. Hams' sacrifices are real, but the rewards are often intangible.

Mark Conklin of Tulsa got time off as a sales manager for an appliance company to relay messages. At first he handled communications between the state department of emergency management and the highway patrol.

Next he was assigned to the 1,200 evacuees transplanted to an Oklahoma National Guard camp. At the camp, he talked to an elderly woman who was crying because she was happy - "communications" had been able to get a pair of glasses for her. "For the first time in a week," she said, "I can see."

[Full HTML version of this story which may include photos, graphics, and related links](#)

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# Ham radio operators to the rescue after Katrina

## Amateur radio networks help victims of the hurricane

By Gary Krakow

Columnist

MSNBC

updated 6:12 p.m. ET, Tues., Sept. 6, 2005



With telephones down and wireless service disrupted, at least one group of people did manage last week to use technology to come to the rescue of those in need.



**Gary Krakow**  
Columnist

Often unsung, amateur radio operators regularly assist in emergency situations. Hurricane Katrina was no exception. For the past week, operators of amateur, or ham, radio have been instrumental in helping residents in the hardest hit areas, including saving stranded flood victims in Louisiana and Mississippi.

Public service has always been a large part of being an amateur radio operator. All operators, who use two-way radios on special frequencies set aside for amateur use, must be tested and licensed by the federal government, which then issues them a unique call sign. (Mine is W2GSK.)

Ham operators communicate using voice, computers, televisions and Morse code (the original digital communication mode.) Some hams bounce their signals off the upper regions of the atmosphere, so they can talk with hams on the other side of the world; others use satellites. Many use short-range, handheld radios that fit in their pockets.

When disaster strikes, ham networks spring into action. The Amateur Radio Emergency Service (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service.

In this disaster a number of ham emergency stations and networks have been involved in providing information about this disaster – from [WX4NHC](#), the amateur radio station at the National Hurricane Center to the [Hurricane Watch Net](#), the [Waterway Net](#), [Skywarn](#) and the Salvation Army Team Emergency Radio Network ([SATERN](#)).

On Monday, Aug. 29, a call for help involving a combination of cell [telephone calls](#) and amateur radio led to the rescue of 15 people stranded by floodwaters on the roof of a house in New Orleans. Unable to get through an overloaded 911 system, one of those stranded called a relative in Baton Rouge. That person called another relative, who called the local American Red Cross.

Using that Red Cross chapter's amateur radio station, Ben Joplin, WB5VST, was able to relay a request for help on the SATERN network via Russ Fillinger, W7LXR, in Oregon, and Rick Cain, W7KB, in Utah back to Louisiana, where emergency [personnel](#) were alerted. They rescued the 15 people and got them to a shelter.

Such rescues were repeated over and over again. Another ham was part of the mix that same Monday when he heard over the same Salvation Army emergency network of a family of five

trapped in an attic in Diamond Head, La. The family used a [cell phone](#) to call out. Bob Rathbone, AG4ZG, in Tampa, says he checked the address on a map and determined it was in an area struck by a storm surge.

He called the Coast Guard search-and-rescue station in Clearwater, explained the situation and relayed the information. At this point, the Coast Guard office in New Orleans was out of commission. An hour later he received a return call from the South Haven Sheriff's Department in Louisiana, which informed him a rescue operation was under way.

Another search-and-rescue operation involved two adults and a child stuck on a roof. The person was able to send a text message from a cell phone to a family member in Michigan. Once again, the Coast Guard handled the call.

Relief work is not just relegated to monitoring radios for distress calls. The organization representing amateur radio operators, The American Radio Relay League or ARRL, now is seeking emergency volunteers to help supplement communication for American Red Cross feeding and sheltering operations in Mississippi, Alabama and the Florida Panhandle — as many as 200 locations in all.

Hams who wish to volunteer their time and services should contact the Hurricane Katrina volunteer registration and message traffic [database](#).

And, for the first time, the federal government will help hams help others. The Corporation for National and Community Service ([CNCS](#)) will provide a \$100,000 grant supplement to ARRL to support its emergency communication operators in states affected by Hurricane Katrina. The grant will help to fund what is being termed "Ham Aid," a new program to support amateur radio volunteers deployed in the field in disaster-stricken areas.

One last note for ham operators in the stricken area: The FCC has announced that it's extending amateur license renewal deadlines until October 31, 2005.

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URL: <http://msnbc.msn.com/id/9228945/>



You may retrieve this story by entering QuickLink# 56636

## Ham radio volunteers help re-establish communications after Katrina

Some 700 operators are already at work, with more on the way

Todd R. Weiss



**September 6, 2005** ([Computerworld](#)) Volunteer ham radio operators are coming to the aid of relief agencies and emergency officials to help with badly needed communications in areas of Louisiana, Alabama and Mississippi ravaged early last week by Hurricane Katrina.

With power still out in much of the region and telephone service restored in limited areas (see ["Cell operators restore some network service in New Orleans"](#)) of New Orleans, the Mississippi cities of Biloxi and Gulfport, and other hard-hit areas, ham radio operators have been [asked](#) by the American Red Cross and other agencies to supplement communications at more than 200 storm shelters in Mississippi, Alabama and the Florida panhandle.

Some 700 ham radio volunteers from around the nation are already at work helping in the efforts, with more on the way, said Allen Pitts, a spokesman for the 157,000-member American Radio Relay League Inc. (ARRL), a nationwide amateur radio organization based in Newington, Conn. "This is going to be a marathon, not a sprint," Pitts said. "We have people there; we have more people coming."

On Sunday, the American Red Cross asked for about 500 more radio operators to assist at shelters and food kitchens set up to aid evacuees, he said. The volunteers are driving to needed areas and meeting with officials at staging areas in Montgomery, Ala., and in Oklahoma and Texas, where they are being dispatched to disaster shelters, Pitts said. The ham radio operators travel to the disaster areas using their own vehicles and pay their own way, he said.

Many of the volunteers sprung into action even before the storm struck the Gulf Coast, broadcasting as part of a "Hurricane Watch-Net" three days before deadly Hurricane Katrina slammed into the coast on Aug. 29, Pitts said.

Ham radio equipment can be used in disaster areas even when power is out and phone lines, relays and other communications systems are down because the radios run on their own battery or generator power, Pitts said. "Each one is a complete transmission and reception center unto itself," he said. "It works when other stuff is broken. You give an amateur radio operator a battery, a radio and a piece of a coat hanger and they'll find a way to make it work."

The volunteers carry their own fuel for their generators and bring all the equipment they need. Used ham radio systems can be bought for as little as \$100, while newer, state-of-the-art hardware can run as high as \$5,000, he said.

Ham radio operators can also use their equipment with laptop-based computer software to help re-establish e-mail access over the Internet to further assist with communications, Pitts said.

Other disaster assistance agencies, including the Salvation Army, the Federal Emergency Management Agency, the U.S. Coast Guard and the Department of Homeland Security, have also sought help from ham radio operators, Pitts said.

Late last week, the Washington-based Corporation for National and Community Service, a federal agency for volunteer service, [announced](#) a supplemental \$100,000 grant to help ARRL volunteers with their expenses as they travel to and stay in the areas where hurricane victims are receiving assistance.

"With the breakdown of regular communication channels caused by the storm, the services provided by volunteer ham radio operators [are] vitally important, both to organizations and to individuals seeking to connect with loved ones," agency CEO David Eisner said in a statement. "We're pleased to be able to provide this extra assistance at this critical time."

The money will be used as part of the ARRL's "Ham Aid" program, established with a grant from the Corporation in 2002 to increase emergency certification training for ham radio operators.

Mary Hobart, chief development officer at the ARRL, said in a [statement](#) that this marks the first time in the ARRL's 90-year history that it will be able to reimburse some of the expenses incurred by members responding to disasters.

Volunteer radio operators will be at various sites for the duration of this disaster response, which could run into several weeks or months, according to the group.

Several ARRL members have already played key roles in the rescue efforts by connecting storm victims with emergency responders. In one such incident, a radio operator helped organize the rescue of 15 people stranded by floodwaters on the roof of a house in New Orleans, according to an ARRL [statement](#).

URL: <http://www.computerworld.com/printthis/2005/0,4814,104418,00.html>

# THE WALL STREET JOURNAL.

In Katrina's Wake

## Power Outages Hamstring Most Emergency Communications

By CHRISTOPHER RHOADS and AMY SCHATZ  
Staff Reporters of THE WALL STREET JOURNAL  
September 1, 2005; Page A7

Millions of dollars have been spent to upgrade emergency phone and radio communications systems since the Sept. 11 attacks, but Hurricane Katrina exposed a simple but nagging vulnerability: power.

In Katrina's aftermath, communication between different emergency-response agencies has been nearly impossible in places. Cell towers, emergency communications equipment and 911 centers in many locations are inoperable because they are underwater.

Federal agencies have churned out several reports detailing standards for first-responder phone and radio equipment and formed countless working groups. But this week officials in Washington have had trouble gathering information about the situation in hurricane-ravaged areas because communications are so sporadic.

States received about \$830 million for interoperable telecom equipment in fiscal year 2004 alone, according to the Department of Homeland Security. But many communities have been slow to upgrade equipment so that it operates on the same radio frequency. The Federal Communications Commission has set aside some frequencies for use by emergency responders, but much of it isn't available yet because it's still being used by television broadcasters. In many smaller communities, emergency responders still use equipment that operates on different frequencies, making it difficult to talk to one another.

In New Orleans and other Gulf Coast areas, the biggest problem, however, has been far simpler: There's just not enough power.

The problem worsened yesterday, as radio and phone equipment batteries began to die. "Field personnel are beginning to lose power on the radios because they don't have any way to recharge them. It's not looking good," says Courtney McCarron, spokeswoman for the Association of Public-Safety Communications Officials.

Emergency generators powering some cell towers and underground phone switches, which route traditional phone calls, may also soon begin to go dark. "The issue is a power issue at its core," one FCC official said.

For customers, phone service will take even longer to restore because phone companies are mostly concentrating on getting emergency services operational.

Sprint Nextel Corp., the wireless carrier that has a large business with governments and emergency personnel, said that a long-distance switch in the area reported flooding and had to be turned off, affecting long-distance calling. Wireless towers, which require electrical power, are running on battery backups and in many cases are about to expire, if they haven't already.

In Plaquemines Parish, near New Orleans, the 911 center was beneath six feet of water and had to be abandoned, according to a spokesman from Motorola Inc., the company that supplies gear to the parish and many other agencies in the affected area. After the walls to the center collapsed, the remaining workers floated out using life jackets. "Due to the catastrophic effects of Hurricane Katrina, many of our customers' emergency equipment remains inaccessible or underwater," said Jeffrey Madsen, a Motorola spokesman.

Motorola, based in Schaumburg, Ill., said it has shipped more than 2,300 pieces of communications equipment -- including portable radios, fully charged batteries and chargers -- to the affected areas. To cope with the lack of working transmitters in the area, Motorola has also deployed three emergency communication trailers to the region.

Sprint Nextel is sending five satellite trucks to the region to help restore some communication for emergency services, the company said. An emergency team is also being sent with 3,000 walkie-talkie handsets. The response team, which includes hundreds of engineers and technicians, will move into the area once it is declared safe, the company said.

In the meantime, the communication gap is being filled by a low-tech solution: ham-radio operators. A number of those stranded, or friends and relatives of those missing, are contacting ham-radio enthusiasts, who in turn are telling local emergency personnel about the location of those in need.

“Obviously, the communications system is not working because people are contacting us, even to dispatch police calls,” said Allen Pitts, spokesman for the American Radio Relay League, a ham-radio association located in Newington, Conn. Earlier this week, after a New Orleans police officer was shot while attempting to prevent looting, a witness was unable to reach 911 emergency dispatchers but contacted a ham-radio operator, who in turn reached local police to respond to the fallen officer, Mr. Pitts said.

Write to Christopher Rhoads at [christopher.rhoads@wsj.com](mailto:christopher.rhoads@wsj.com) and Amy Schatz at [Amy.Schatz@wsj.com](mailto:Amy.Schatz@wsj.com)

Source: "Power Outages Hamstring Most Emergency Communications," THE WALL STREET JOURNAL, [http://online.wsj.com/article/0,,SB112553304837128550,00.html?mod=rss\\_whats\\_news\\_technology](http://online.wsj.com/article/0,,SB112553304837128550,00.html?mod=rss_whats_news_technology) (subscription only)

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PC Magazine

November 8, 2005 Tuesday

OPINIONS

876 words

Inside Track v24n19;

John C. Dvorak

The most overlooked participants in Katrina relief were the ham radio folks. Bush should give them all medals.

Two weeks after Hurricane Katrina, it was reported that over 100 Internet networks were still down in Louisiana, as well as another dozen elsewhere that had been in the path of the hurricane. So much for the notion that the Web is impossible to kill. Hard to have an Internet with no power! WiMAX and other solutions are useless, too, though I suppose a generator would be useful for WiMAX. Whatever the case, the most overlooked participants in the Katrina relief effort were the ham radio folks, who were doing whatever they could as ad hoc emergency dispatchers, creating their own network within the system. These dedicated persons pride themselves on their ability to do worldwide communications under adverse conditions, and the ARRL (Amateur Radio Relay League) and its members, as well as others, were a big part of the aid effort. Of course, since amateur radio is anything but trendy in today's Xbox, gene-splicing world, there was zero coverage of its contribution in the mainstream press, and these people are not the world's greatest self-promoters. At least some of us are paying attention. Good work, guys! Bush should be giving medals to you all.

Source:

<http://www6.lexisnexis.com/publisher/EndUser?Action=UserDisplayFullDocument&orgId=574&toPicId=100017534&docId=1317616881&start=1> as retrieved on Oct 13, 2005 13:09:10 GMT.

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**EXHIBIT J-2: PRESIDENTIAL RECOGNITION**

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**THE WHITE HOUSE**

WASHINGTON

January 8, 2007

I send greetings to all those celebrating 100 years of voices over the airwaves.

Radio plays an important role in informing, entertaining, and protecting people everywhere. At the turn of the last century, Reginald Fessenden pioneered wireless communications and opened the door for technological advances that have improved the lives of Americans and individuals around the world. This occasion is an opportunity to remember Fessenden's broadcast of voice and music over the air a century ago and a chance to celebrate the many ways radio has enriched our lives and our Nation.

I appreciate all who work in radio, and I am grateful to the amateur radio operators who provide emergency communications that help make our country safer and more secure. Your good work strengthens our society and represents the American spirit.

Laura and I send our best wishes. May God bless you.

A handwritten signature in black ink, appearing to read "George W. Bush".

Source: <http://www.arrl.org/news/stories/2007/01/17/102/PresBush-VoiceOverRadio-large.jpg>

EXHIBIT J-3: ARRL-FEMA AFFILIATION



STATEMENT OF AFFILIATION
BETWEEN
THE FEDERAL EMERGENCY MANAGEMENT AGENCY
AND THE AMERICAN RADIO RELAY LEAGUE

The Department of Homeland Security (DHS) and the American Radio Relay League (ARRL) view community disaster preparedness and response as top priorities for their respective organizations and for the American people.

Under the direction of DHS, Citizen Corps is a community-based initiative to engage all citizens in homeland security and community and family preparedness through public education and outreach, training opportunities, and volunteer programs.

ARRL is a non-commercial membership association of radio amateurs organized for the promotion of interest in Amateur Radio communication and experimentation, for the establishment of networks to provide communications in the event of disasters or other emergencies, for the advancement of the public welfare, and for the representation of the Radio Amateur in legislative and regulatory matters.

Together DHS and the ARRL agree to work collaboratively to:

- Raise public awareness about the use of Amateur Radio as a public safety resource;
Provide training and accreditation for Amateur Radio Emergency Communications;
Promote the formation of local Citizen Corps Councils and assist these Councils with providing public education, training and volunteer service opportunities that support first responders, disaster relief organizations, and community safety efforts;
Publicly acknowledge the affiliation of Citizen Corps and the ARRL, which may include website links, co-logos on publications, and references in printed materials, including articles and news releases;
Coordinate their respective activities to further their shared mission; and
Keep each other informed of activities conducted in support of Citizen Corps and to provide an annual report summarizing those activities.

On this 21st day of June 2003, both parties enter into this agreement in good faith and agree to pursue the shared mission as stated.



Signature of Michael D. Brown

MICHAEL D. BROWN
UNDER SECRETARY
DEPARTMENT OF HOMELAND SECURITY
EMERGENCY PREPAREDNESS AND RESPONSE

Signature of Jim Haynie

JIM HAYNIE
PRESIDENT
AMERICAN RADIO RELAY LEAGUE, INCORPORATED

Source: http://www.arrl.org/FandES/field/mou/FEMA-ARRL-SOA1.pdf

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**EXHIBIT K: EMERGENCY COMMUNICATIONS SERVICES IN STOREY COUNTY**


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Tom Taormina is a long-standing member of the Storey County Local Emergency Planning Committee (LEPC), and the duly-appointed Amateur Radio Emergency (ARES) and Radio Amateur Civil Emergency Service (RACES) Emergency Communications Officer for Storey County. Midge Taormina is a licensed amateur radio operator and has training and experience in emergency communications. While she has no formal title or designation, she is typical of amateur radio operators volunteering in time of need. The following describes how ARES and RACES support LEPC and, in particular, how we “fit in” to SCC §8.34.060.F.

**SCC §8.34.060.F. Emergency Communications Services.**

1. During any emergency or disaster, reliable communications are absolutely essential. All public and **private communications capabilities** available to Storey County will be used, as needed, during an emergency. The EOC is the county's primary communications center during an emergency, and it has both telephone and radio communications equipment, as described [below].
2. The telephone will be the primary means of communication between the EOC and county, state, federal and private agencies at fixed, permanent locations. **Radio communications are reserved for contact with field operation units unless required for other uses in the event of failure or overloading of the telephone system.**
3. Storey County is in the telephone service area of **Nevada Bell**, which serves Northern Nevada. Any service requirement at the EOC or which point critical to effective emergency response will be provided on a priority basis by contacting Nevada Bell at 811.
4. **Eight radio frequencies** are available for local police, fire and public works agencies, as well as the Nevada Highway Patrol and Department of Transportation frequencies, plus Radio Amateur Civil Emergency Services (RACES) volunteers, whose support will be coordinated by the emergency management director.

*(Emphasis supplied.)*

**Explanation**

¶ 1. The “private communications capabilities” referred to are the personal assets of those who support the first-responders. Amateur radio operators are the vast majority of this “private” resource pool. Tom Taormina was a licensed RACES operator (K2BGP Unit 51) at age 15. By age 16, he was the Deputy Town Radio Officer of Huntington Township (New York). Since 1960, he has been actively involved in emergency communications and has a wealth of experience in providing emergency communications services in circumstances where traditional communications (landline, police radios, or fire radios) were interrupted. In 1979, he was a member of the Pasadena (Texas) ARES communications system during Tropical Storm Claudette<sup>16</sup>. While his neighborhood was in the process of receiving a 42” rainfall in 24 hours, he stayed in his home and coordinated the emergency evacuation of his neighborhood via amateur radio. He was the last one to leave his home after the evacuation was complete. He carried his seven year old son a mile through shoulder-deep water to an awaiting rescue boat. During the three decades he lived in South Texas, he was also involved in providing emergency communications during many floods, tornados and hurricanes. Today he is the communications liaison for the Storey County LEPC.

¶ 2. The ordinance provides: “Radio communications are reserved for contact with field operation units unless required for other uses in the event of failure or overloading of the telephone system.” This paragraph

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<sup>16</sup> [http://en.wikipedia.org/wiki/Tropical\\_Storm\\_Claudette\\_\(1979\)](http://en.wikipedia.org/wiki/Tropical_Storm_Claudette_(1979))

recognizes that, in emergencies, the conventional landline system may be overloaded. Since the World Trade Center attack in 1991, it has also been widely recognized that cellular telephones are more vulnerable to overload than conventional landlines, rendering them virtually useless in a wide-spread disaster. Here, ARES and RACES become the backup link to essential communications services. What is less well known, unless a citizen has had the experience, is that the amateur radio operators are the public's conduit for "health and welfare" messages for families and loved-ones – because hams can communicate to virtually any place on the globe. There are volunteer "traffic" handling networks in operation daily on the amateur bands that pass messages of a routine, but significant, nature from citizens who are unable to afford global communications, or are trying to get messages to remote locations (for instance, to missionaries) where amateur radio is the ONLY form of communications. Even today, with the proliferation of cell phones and satellite communications, US soldiers serving in remote regions of the world still receive health and welfare messages by amateur radio as their ONLY communications conduit. These networks are pressed into service immediately when disasters are declared in virtually any corner of the world.

Mr. Taormina's installation provides four critical resources to the County:

- VHF and UHF communications, with emergency power backup, via amateur radio, to the Storey County Emergency Operations Center (EOC), and to surrounding county EOC's.
- A UHF repeater, with emergency power backup, to allow ARES volunteers to communicate within the County and with surrounding areas. This is especially useful should the need for "search and rescue" operations be initiated. When necessary, this repeater can be linked with a backbone system covering the entire West Coast, via VHF and UHF mobile and hand-held radio communications
- A High Frequency amateur radio system that is capable of communication with virtually any location on the globe, for sending and receiving health and welfare traffic for the citizens of the County. "*When All Else Fails,*" County Officials can use these capabilities to communicate with governmental agencies such as the Department of Homeland Security.

The phrase "When All Else Fails" is commonly associated with amateur radio operators because they have the skills and training to effect radio communications when conventional communications are disrupted or ineffective. In the July 2008 LEPC meeting, Storey County Emergency Officer, Joe Curtis, said that he was amazed that the amateur radio operator on duty for Operation Vigilant Guard at the EOC in June was providing critical communications with a home-made antenna fashioned from copper tubing and PVC pipe. With the Taormina amateur radio station, emergency communications during non-catastrophic emergencies will greatly enhance the capability of the County EOC. In the event of a catastrophic emergency, even if the Taormina antenna farm suffers major damage, his proficiency in the International Morse Code, and "can do" spirit, combined with decades of experience in constructing and repairing his own equipment, will permit him to establish critical communications links using the most modest of equipment and makeshift antennas. In 1995, while residing in Austin County, Texas, Tom and Midge Taormina continued providing emergency communication using improvised communications equipment after their 440 MHz repeater tower was destroyed and their home damaged by a tornado.

¶ 3. As a side note, Storey County should consider revising this paragraph, as Nevada Bell is now AT&T Communications.

¶ 4. While the County has only eight available frequencies, amateur radio operators have a host of frequency "bands," some with thousands of frequencies on which to establish communication. Taormina operates on those bands of frequencies from 1.8 MHz to 440 MHz, allowing selection of the appropriate frequency and mode<sup>17</sup> for

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<sup>17</sup> County communications is conducted on FM. Amateurs have the option to use a variety of modes including AM, FM, Single Side Band (SSB), International Morse Code (CW) and a number of digital modes of communication, each of which has special characteristics allowing the most reliable mode to be selected freely as conditions warrant.

the particular communications path needed or desired at any given time of the day or night. Bands and modes are continually changed, on the basis of experience, to allow for atmospheric, tropospheric and ionospheric conditions, which change from hour to hour and day to day. The key to this flexibility and reliability lies in the ability to select the appropriate frequency and mode, but also to have access to various antennas at various heights that can be selected by the experienced amateur to overcome adverse radio wave propagation conditions. Hence, a well equipped station, with multiple antennas for each frequency band is highly desirable for the maintenance of critical emergency communication. Lesser antennas would greatly hurt Storey County's ability to execute this ordinance.

There is a formal relationship between the County and amateur radio. As Tom Taormina is the appointed liaison from ARES and RACES and a member of LEPC, the best interests of the County will be served by granting the required building permits.

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**EXHIBIT L: VIEWS TOWARD NEIGHBORING PROPERTIES**

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Views are provided only from the two proposed structures in Building Permit No. 8354. These are representative of all views.

View from 80M Monopole base toward Meade and Adkins properties:



View from the 15M Monopole base toward Meade and Adkins properties:



EXHIBIT M: INSURANCE LETTER



"An Outstanding Customer Experience"



PATRICK O'DAY
PATRICK O'DAY AGENCY
6430 SOUTH VIRGINIA STREET, SUITE B
RENO, NEVADA 89511-1150
PHONE: OFF: (775) 829-6822
FAX: (775) 853-0482
E-MAIL: poday@amfam.com



07/25/2008
Patrick O'Day
American Family Insurance
6430 South Virginia St
Suite B
Reno, NV 89511

Regarding coverage for:
Tom Taormina
PO Box 1126
Virginia City NV 89440

To whom this may concern:

American family would not provide coverage for amateur radio antenna during the construction phase. A licensed contractor would be able to present evidence of business liability insurance during construction.

Once construction is completed American Family would include the tower or antenna as part of the structure of the home. It would be covered under the same liability protection as the home in the amount of \$300,000.

Sincerely,

Handwritten signature of Patrick O'Day.

Patrick O'Day
American Family Agent

REGISTERED REPRESENTATIVE AMERICAN FAMILY SECURITIES, LLC
6000 AMERICAN PARKWAY, MADISON, WI 53783 1-888-428-5433

\*SECURITIES OFFERED THROUGH AMERICAN FAMILY SECURITIES, LLC

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**EXHIBIT N: POWER DENSITY CALCULATION**

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**FAR FIELD POWER DENSITY CALCULATION  
FROM PWR\_DENS V3.0 BY E. S. PARSONS, B.S.E.E., KITR**  
-----**SITE:**

**VC\_HLDS\_NV. 10MSTACK\_ON\_80M\_MONOPOLE\_TO\_NEAREST\_HOUSE**

**INPUTS:**

**POWER AT TRANSMITTER (FCC METHOD) IS 495 WATTS.  
ANTENNA GAIN OVER A DIPOLE IS 14.0 DBD.  
FREQUENCY OF OPERATION IS 28.0 MHZ.  
FEEDLINE LOSS IS 0.5 DB.  
DISTANCE TO ANTENNA IS 723 FEET.**

**OUTPUTS:**

**POWER AT ANTENNA FEEDPOINT IS 446.0 WATTS.  
EFFECTIVE RADIATED POWER IS 18373 WATTS.  
ANSI C95.1-1991 MAXIMUM LIMIT IS 0.230 MW/SQ CM.**

**COMPUTED POWER DENSITY IS 0.00301 MW/SQ CM (0.03010 W/SQ METER).  
(POWER DENSITY CALCULATED ALONG ANTENNA BORESIGHT;  
NO ASSUMPTIONS MADE ABOUT ANTENNA PATTERN.)**

**HENCE:**

- 1. THE COMPUTED POWER DENSITY IS 1.3110% OF THE ANSI LIMIT.**
- 2. THE COMPUTED POWER DENSITY IS -18.82 DB FROM THE ANSI LIMIT.**
- 3. TRANSMITTER OUTPUT POWER MUST BE INCREASED BY AT LEAST A FACTOR OF 76 TO EXCEED THE ANSI LIMIT.**

Note: All calculations conform to [FCC OET Bulletin 65 Supplement B](http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet65/oet65b.pdf),  
[http://www.fcc.gov/Bureaus/Engineering\\_Technology/Documents/bulletins/oet65/oet65b.pdf](http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet65/oet65b.pdf)

Far field power density is a measure, in units of milliwatts per square centimeter (mW/cm<sup>2</sup>), of the radio frequency power to which a human or animal is exposed. To put this in context and add meaning, the power density at the point specified (usually the home closest to the amateur's antenna) is compared to the Maximum Permissible Exposure (MPE) for uncontrolled environments set forth by the FCC in their Report and Order No. 96-326,  
[http://www.fcc.gov/Bureaus/Engineering\\_Technology/Orders/1996/fcc96326.pdf](http://www.fcc.gov/Bureaus/Engineering_Technology/Orders/1996/fcc96326.pdf).

An uncontrolled environment is an area where people would not normally be aware of potential RF exposure. A neighbor's home is an example of an uncontrolled RF environment. The FCC 96-326 Report and Order adopted the standards set forth in IEEE C95.1-1991 for uncontrolled RF environments.

This analysis assumes that the antenna is pointed at the nearest dwelling. For rotary antenna systems, the antenna is often pointed in other directions, resulting in much lower power densities at the nearest dwelling.

The FCC method for measuring exposure in uncontrolled RF environments requires compliance with MPE standards for the average power density computed over a 30 minute period of RF emissions (10 minutes of transmitting, 10 minutes of listening, 10 minutes of transmitting). The power density for the station (computed above) uses the FCC assumption of a duty cycle for the CW mode of 50%.

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**EXHIBIT O: VISUAL IMPACT AT NEIGHBORING PROPERTIES**

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**360 Panamint (Blake)**



**380 Panamint (Meade)**



**390 Panamint (Adkins)**



**630 Panamint**



**660 Panamint**



**Community Mailboxes (Cartwright Road) 1,140' from closest tower**



Note: All photos taken from street to avoid trespass issues. Actual 90 degree view from 380 and 390 Panamint homes and 360 Panamint home site affords a much more limited view (if any) of the antennas<sup>18</sup>.

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<sup>18</sup> The residents of 360, 380 and 390 Panamint are the only ones known to have complained to the Building Department. All three purchased their home sites long after the antennas were initially installed. These individuals were able to incite others who cannot see the antennas from their homes because the structures are visible from the community mailboxes where every resident stops on a daily basis.

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**EXHIBIT P: VCHR POA MEMO RE CC&RS**

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**Virginia City Highland Ranches Property Owners Association**

To: Storey County Board of Commissioners

Subject: Amateur radio towers

A concern has been raised by some association members over the erection of amateur radio towers in the Virginia City Highlands. I have reviewed the existing association CC&Rs and find nothing which prevents erection, limits tower size, or the quantity of these structures on a member's property.

The issue does raise some questions which the association members have requested the property owner's board to ask the Commissioners.

- 1) Will the county require and review, tower and component fabrication design drawings prepared and wet stamped by a structural engineer, licensed by the state of Nevada?
- 2) Will the county require and review, tower and support component foundation design and installation drawings prepared and wet stamped by a structural engineer, licensed by the state of Nevada?
- 3) Will the county issue building permits and perform inspections on these structures, verify compliance with the design drawings, and all applicable codes and mandatory county set backs.

The Commissioners consideration and subsequent specific ruling to these questions posed by the Virginia City Highlands Ranches Property Owners Association would be appreciated.

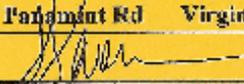
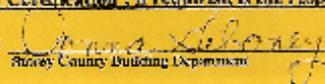
Sincerely,



Howard H. Depew, P.E.  
Chairman Architectural Committee  
Virginia City Highlands Ranches Property Owners Association

Cc Dean Haymore

EXHIBIT Q: BUILDING PERMIT NO. 8354

Permit No. <b>8354</b>	<b>Storey County Building Dept.</b> P O Box 526 Virginia City Nevada 89440 ~ (775) 847-0966	Date <b>6/27/08</b>
<b>RESIDENTIAL</b>		
WORK DESCRIPTION: <b>Erection of two Ham Radio Towers</b>		
WORK LOCATION ADDRESS: <b>370 Panamint Rd</b>		AREA: <b>VR</b>
APN: <b>003-431-18</b>	ZONE:	FLOOR:
LOT/BLK: <b>37</b>		
OCCUPANCY or INTENDED USE:		
ESTIMATED WORK COMMENCEMENT DATE: <b>6/27/08</b>		ESTIMATED COMPLETION DATE: <b>6/27/09</b>
MOBILE HOME / TRAVEL TRAILER:	MAKE:	MODEL:
	YEAR:	SIZE:
		SERIAL #:
SCHOOL TAX RESERTI #: <i>If you require, per 2598 to Storey County Clerk at Courthouse</i>	SPECIAL CONDITIONS:	
CONTRACTOR: <b>Owner Builder</b>	PHONE:	
ADDRESS:	MV LIC #:	Exp
	Exp	Limit: \$
	SO LIC #:	Exp
<b>ALL MATERIALS USED FOR THIS PROJECT SHOULD BE RECEIVED IN STOREY COUNTY AND THE VALUE REPORTED AS 'COUNTY-OF-DELIVERY' ON THE NEVADA DEPARTMENT OF TAXATION FORM TXR-01.01 'SALES/USE TAX RETURN'.</b> <i>If you require further information, please call (775) 847-0966.</i>		
OWNER / Permittee (Print): <b>Tom Taormina</b>	PHONE: <b>847-7929</b>	
ADDRESS (Mailing): <b>370 Panamint Rd Virginia City Highlands, NV 89521</b>		
OWNER SIGNATURE: 	AUTHORIZED BUILDER / AGENT:	
LIVING AREA: Sq Ft @ \$81.10 = \$	BLDG FEE: \$111.25	PLOT PLAN: \$
CONCRETE SLAB: Sq Ft @ \$16.10 = \$	PLAN REV FEE: \$72.31	SIGNS: \$
STD T FOUNDATION: Lin Ft @ \$26.00 = \$	ELECTRICAL: \$	SPEC INSP: \$
GARAGE: Sq Ft @ \$19.40 = \$	MECHANICAL: \$	Temp TRAILER: \$
FINISHED GARAGE: Sq Ft @ \$23.21 = \$	PLUMBING: \$	STOVE / Fireplace: \$
WOOD DECKS: Sq Ft @ \$6.62 = \$	: \$	: \$
SYNCOMP DECKS: Sq Ft @ \$9.96 = \$	: \$	: \$
WOOD DECK: Sq Ft @ \$12.00 = \$	PARK TAX: \$	: \$
BASEMENT: Sq Ft @ \$15.84 = \$	<b>TOTAL PERMIT FEE: \$183.51</b>	
TOTAL VALUATION: <b>\$5,000.00</b>	<input type="checkbox"/> PLAN REVIEW ONLY	Check #: <b>6566</b>
<input type="checkbox"/> Est. Cost <input type="checkbox"/> Actual Contract	<input type="checkbox"/> FULL PERMIT	Receipt #: <b>16337</b>
<small>Permittees to be notified in the work described in this application and ONLY in accordance with the Rules, Regulations, and Ordinances of the County of Storey. Inspection MUST be called for within 180 days of issuance of permit or permit is void. Permit may be renewed for 50% of the original "Permit Fee".</small> <b>State "Health Certification", if required, is the responsibility of the "Permittee".</b>		
By:  Donna Seloney Storey County Building Department		
Assessor Dept	Fire Dept	Sheriff Dept

## EXHIBIT R: PE LETTER FOR STRUCTURES IN BUILDING PERMIT NO. 8354

**ARTISAN ENGINEERING, LLC**

325 West 13<sup>th</sup> Avenue  
 Eugene, Oregon 97401-3402  
 Phone: 541-338-9488 Fax: 541-338-9483  
 www.artisanengineering.com

June 2, 2008

Mr. Paul Nyland  
 Custom Metalworks  
 PO Box 1959  
 Sandy, OR 97055

Re: Structural Calculations and Foundation Design for Guyed Rotating Antenna Poles  
 to be Erected in Virginia City, Nevada for K5RC

Dear Paul:

Artisan Engineering, LLC has completed a structural analysis and have designed the guy anchors and pole foundation for the 140-foot and 200-foot rotating guyed monopoles that you plan to erect for your Client K5RC in Virginia City, Nevada. The pole will support a variety of directional yagi antenna arrays. I completed the work per your request earlier this month.

Each of the poles will be made of varying diameter steel pipes stacked on top of each other and guyed near the base and near the top below the large top mounted antenna array. I based the design on the preliminary drawings that you mailed to us on May 8<sup>th</sup>. I checked the previous analysis completed by a local Engineer, who had specified the expected tension in the top guy wires and subsequent pole down-loading, pole sizes, and guy anchor uplift forces. I used a wind loading of 80 mph at an Exposure C to check the earlier design. I found that the design was fairly conservative and probably more like a 90 mph wind loading which I retained and applied to the design for the 140-foot monopole.

I have supplied you with concrete guy anchors and monopole base footings using your approximated conceptual sketch. I have noted the necessary rebar, footing dimensions, anchor hardware, and guy wire sizes. I have also detailed an embedded spread footing or a drilled pier footing for support the pipe mast and antennas against the wind loading. Please refer to the attached calculations and use the attached S1 drawing to anchor the rotating guyed monopoles.

We have enjoyed assisting you with this project. If you have any additional questions, comments, or concerns please feel free to call.

Sincerely,



Timothy A. Wolden, PE  
 Principal, Artisan Engineering, LLC

File: Letter to Paul N for WGuyed Rotating Poles in Nevada.doc



Note: The referenced 140' Monopole was subsequently lowered to a height of 120'.

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**EXHIBIT S: NEVADA PE OPINION**

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**Lawrence M. Prater, PE, Ltd.  
235 W. Pueblo Street  
Reno, NV 89509  
(775) 829-9819**

July 24, 2008

To: Whom it may concern

Re: Antenna Support Structures  
370 Panamint Road  
Virginia City Highlands, Storey County, NV

At the request of Mr. Tom Taormina I have conducted a post-construction inspection of a Rohn HBX-32 (32 ft. high) and a U.S. Military (40 ft. high) antenna support structure located on his property at 370 Panamint Road, Virginia City Highlands, NV. I have also examined the available information from the structure manufacturers. I was not present at the time of installation, but a physical inspection conducted on July 24, 2008 showed all components of the structures (towers, bases, anchors and guys) to be in viable condition with no apparent signs of deterioration. The 32 ft. structure has been in service for 9 years and the 40 ft. structure for 5 years, and both have survived the harsh winters in the Highlands with no apparent damage.

I could find no apparent structural issues, and in my professional opinion the structures are adequate for their intended purposes.

Please call if you have any questions or need any additional information.



Lawrence M. Prater, P.E.  
NV Lic. No. 3935

Mr. Prater is a Civil Engineer, not a Structural Engineer. As a Civil Engineer, he declines to “officially” opine on structures over 45'. However, on July 24, 2008, he inspected all structures at the site and rendered the same opinion -- that they were adequate for their intended purposes. He is willing to discuss his inspection with the County. As a long-time resident of the Highlands and a member of the Storey County Planning Commission, his observations and opinions should be treated with the respect due his experience and training. In addition, the Applicant welcomes an inspection by the Building Inspector.