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VC Highlands, NV 89521-7430
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Storey County Planning Commission
Storey County, NV

To All,

The following comments are directed to Tom Taormina's application for a Special Use Permit to install additional towers at 370 Panamint Rd., listed on the agenda for the March 3, 2011 meeting of the Planning Commission as:

2011-010 SPECIAL USE PERMIT: By Taormina, Thomas (Highland Ranches) Request for Special Use Permit to maintain existing amateur ham radio antenna towers and to install two additional amateur ham radio antenna towers, all of which will exceed the 45 foot height limitation established by Title 17 of the County Code. Project is located at 370 Panamint Road (APN 003-431-18), Highland Ranches.

If you do not have time to read the whole thing, please go directly to [page 14](#):

J. Why does Tom need a 198 foot tower?

K. What this is really about.

I will start with Tom's *SUPPLEMENTAL INFORMATION FOR AN AMATEUR RADIO FACILITY ACCOMPANYING AN APPLICATION FOR A SPECIAL USE PERMIT* ("Supp. Info.") dated December 30, 2010.

A. Standard of Review

Tom has applied for a special use permit under Section 17.12.044 of the County Code because (Supp. Info. page 4, para. 1):

A special use permit is necessary because Section 17.12.044 requires such a permit where a radio mast extends more than forty five feet above grade level. In *Taormina v. Storey County*, the United States District Court for the District of Nevada ruled that the Applicants "may apply for a special use permit pursuant to section 17.62.010." Slip opinion at 7. Section 17.62.010 is the applicable section for Applicants' application. Id. at n.7.

As Tom notes (Supp. Info. page 4, para. 2):

The standard, or test, for whether an applicant may receive a special use permit pursuant to section 17.62.010 is whether the use is "deemed essential or desirable for the public convenience or welfare."

Thus, Tom's application stands or falls solely on section 17.62.010 .

B. Tom Mis-States Communications Law

In order to get an amateur radio license you have to take and pass a test given by a volunteer examiner. The test comprises technical questions and questions about the rules. Passing the test does not constitute a Finding by the FCC that the “public interest, convenience or necessity” is being served. Once you get an amateur radio license you have to follow the rules. An amateur radio license is not a license to do whatever you want by asserting that what you want is in the “public interest, convenience or necessity.”

Tom mis-states and/or twists Communications Law when he asserts (Supp. Info. page 4, para. 3)

Federal law is unequivocal in defining Amateur Radio as an activity that is "in the public interest, convenience or necessity." The Communications Act, under which Part 97 of the FCC's rules governing Amateur Radio are promulgated, explicitly states in 47 U.S.C. § 303 that radio licenses are issued only where the public interest, convenience or necessity require. Possession of an Amateur Radio license, therefore, demonstrates a finding by the FCC that the public convenience is being served. Indeed, the United States Supreme Court has expounded in any number of cases that granting a radio license constitutes a finding in favor of the public interest. *See, e.g., Red Lion Broadcasting Co. v. FCC*, 395 US 367, 379-380 (1969). Therefore, by Congressional action, FCC rules and case law from the United States Supreme Court, the licensing and operation of amateur radio stations is in the “public convenience, interest, or necessity.” The standard of section 17.62.010 is satisfied.

Let's start with 47 U.S.C. § 303.

47 U.S.C. § 303 does not explicitly state that “radio licenses are issued only where the public interest, convenience or necessity require.” 47 U.S.C. § 303 is about the Powers and Duties of [the] Commission and requires that the Commission act “from time to time, as public convenience, interest, or necessity requires, ...” 47 U.S.C. § 303 (from the Cornell University Web site) is reproduced herein as Exhibit 1.

Part 97 refers to the Code of Federal Regulations (47 CFR Part 97 Amateur Radio Service).

The requirements for getting an amateur radio license are in § 97.9 .

From <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=f7ba89728031c12732435f6b2f5ceeea;rgn=div8;view=text;node=47%3A5.0.1.1.6.1.157.5;idno=47;cc=ecfr>

Title 47: Telecommunication
PART 97—AMATEUR RADIO SERVICE
Subpart A—General Provisions

§ 97.9 Operator license grant.

(a) The classes of amateur operator license grants are: Novice, Technician, General, Advanced, and Amateur Extra. The person named in the operator license grant is authorized to be the control operator of an amateur station with the privileges authorized to the operator class specified on the license grant.

(b) The person named in an operator license grant of Novice, Technician, General or Advanced Class, who has properly submitted to the administering VEs a FCC Form 605 document requesting examination for an operator license grant of a higher class, and who holds a CSCE indicating that the person has completed the necessary examinations within the previous 365 days, is authorized to exercise

the rights and privileges of the higher operator class until final disposition of the application or until 365 days following the passing of the examination, whichever comes first.

[75 FR 78169, Dec. 15, 2010]

To get an amateur radio license you take written tests administered by a volunteer examiner.

The application process is detailed in § 97.17 (from <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=f7ba89728031c12732435f6b2f5ceeea;rgn=div8;view=text;node=47%3A5.0.1.1.6.1.157.9;idno=47;cc=ecfr>)

§ 97.17 Application for new license grant.

(a) Any qualified person is eligible to apply for a new operator/primary station, club station or military recreation station license grant. No new license grant will be issued for a Novice or Advanced Class operator/primary station.

(b) Each application for a new amateur service license grant must be filed with the FCC as follows:

(1) Each candidate for an amateur radio operator license which requires the applicant to pass one or more examination elements must present the administering VEs with all information required by the rules prior to the examination. The VEs may collect all necessary information in any manner of their choosing, including creating their own forms.

(2) For a new club or military recreation station license grant, each applicant must present all information required by the rules to an amateur radio organization having tax-exempt status under section 501(c)(3) of the Internal Revenue Code of 1986 that provides voluntary, uncompensated and unreimbursed services in providing club and military recreation station call signs (“ Club Station Call Sign Administrator ”) who must submit the information to the FCC in an electronic batch file. The Club Station Call Sign Administrator may collect the information required by these rules in any manner of their choosing, including creating their own forms. The Club Station Call Sign Administrator must retain the applicants information for at least 15 months and make it available to the FCC upon request. The FCC will issue public announcements listing the qualified organizations that have completed a pilot autogrant batch filing project and are authorized to serve as a Club Station Call Sign Administrator.

(c) No person shall obtain or attempt to obtain, or assist another person to obtain or attempt to obtain, an amateur service license grant by fraudulent means.

(d) One unique call sign will be shown on the license grant of each new primary, club and military recreation station. The call sign will be selected by the sequential call sign system. Effective February 14, 2011, no club station license grants will be issued to a licensee who is shown as the license trustee on an existing club station license grant.

[63 FR 68978, Dec. 14, 1998. as amended at 64 FR 53242, Oct. 1, 1999; 65 FR 6549, Feb. 10, 2000; 75 FR 78170, Dec. 15, 2010]

The examinations are as follows (from <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=f7ba89728031c12732435f6b2f5ceeea;rgn=div5;view=text;node=47%3A5.0.1.1.6;idno=47;cc=ecfr#47:5.0.1.1.6.6.157.1>)

§ 97.501 **Qualifying for an amateur operator license.**

Each applicant must pass an examination for a new amateur operator license grant and for each change in operator class. Each applicant for the class of operator license grant specified below must pass, or otherwise receive examination credit for, the following examination elements:

- (a) Amateur Extra Class operator: Elements 2, 3, and 4;
- (b) General Class operator: Elements 2 and 3;
- (c) Technician Class operator: Element 2.

[65 FR 6550, Feb. 10, 2000, as amended at 72 FR 3082, Jan. 24, 2007]

§ 97.503 Element standards.

A written examination must be such as to prove that the examinee possesses the operational and technical qualifications required to perform properly the duties of an amateur service licensee. Each written examination must be comprised of a question set as follows:

- (a) Element 2: 35 questions concerning the privileges of a Technician Class operator license. The minimum passing score is 26 questions answered correctly.
- (b) Element 3: 35 questions concerning the privileges of a General Class operator license. The minimum passing score is 26 questions answered correctly.
- (c) Element 4: 50 questions concerning the privileges of an Amateur Extra Class operator license. The minimum passing score is 37 questions answered correctly.

[54 FR 25857, June 20, 1989, as amended at 61 FR 41019, Aug. 7, 1996; 65 FR 6550, Feb. 10, 2000; 72 FR 3082, Jan. 24, 2007]

After you pass the test you are required to follow the rules in Subpart B, Subpart C, Subpart D, and Subpart E.

Subpart B—Station Operation Standards

- § 97.101 General standards.
- § 97.103 Station licensee responsibilities.
- § 97.105 Control operator duties.
- § 97.107 Reciprocal operating authority.
- § 97.109 Station control.
- § 97.111 Authorized transmissions.
- § 97.113 Prohibited transmissions.
- § 97.115 Third party communications.
- § 97.117 International communications.
- § 97.119 Station identification.
- § 97.121 Restricted operation.

Subpart C—Special Operations

- § 97.201 Auxiliary station.
- § 97.203 Beacon station.
- § 97.205 Repeater station.
- § 97.207 Space station.
- § 97.209 Earth station.
- § 97.211 Space telecommand station.
- § 97.213 Telecommand of an amateur station.
- § 97.215 Telecommand of model craft.
- § 97.217 Telemetry.
- § 97.219 Message forwarding system.
- § 97.221 Automatically controlled digital station.

Subpart D—Technical Standards

- § 97.301 Authorized frequency bands.
- § 97.303 Frequency sharing requirements.
- § 97.305 Authorized emission types.
- § 97.307 Emission standards.
- § 97.309 RTTY and data emission codes.
- § 97.311 SS emission types.
- § 97.313 Transmitter power standards.
- § 97.315 Certification of external RF power amplifiers.
- § 97.317 Standards for certification of external RF power amplifiers.

Subpart E—Providing Emergency Communications

- § 97.401 Operation during a disaster.
- § 97.403 Safety of life and protection of property.
- § 97.405 Station in distress.
- § 97.407 Radio amateur civil emergency service.

For the details of the rules see <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=f7ba89728031c12732435f6b2f5cceeaa;rgn=div5;view=text;node=47%3A5.0.1.1.6;idno=47;cc=ecfr>

Thus, you get an amateur radio license by taking and passing a test given by a volunteer examiner. The test comprises technical questions and questions about the rules. Passing the test does not constitute a Finding by the FCC that the “public interest, convenience or necessity” is being served. And once you get an amateur radio you have to follow the rules. An amateur radio license is not a license to do whatever you want by asserting that what you want is in the “public interest, convenience or necessity.”

Tom’s assertion that “radio licenses are issued only where the public interest, convenience or necessity require” comes from the case he cited: *Red Lion Broadcasting Co. v. FCC*, 395 US 367, 379-380 (1969).

Red Lion was a SCOTUS case involving a **Broadcaster** (Red Lion Broadcasting) and the Fairness Doctrine (now deceased).

Starting at Page 395 U. S. 371 (from <http://supreme.justia.com/us/395/367/case.html>):

A

The Red Lion Broadcasting Company is licensed to operate a Pennsylvania radio station, WGCB. On November 27, 1964, WGCB carried a 15-minute broadcast by the Reverend Billy James Hargis as part of a "Christian Crusade" series. A book by Fred J. Cook entitled "Goldwater -- Extremist on the Right" was discussed by Hargis, who said that Cook had been fired by a newspaper for making false charges against city officials; that Cook had then worked for a Communist-affiliated publication; that he had defended Alger Hiss and attacked J. Edgar Hoover and the Central Intelligence Agency, and that he had now written a "book to smear and destroy Barry Goldwater." [Footnote 2] When Cook heard of the broadcast, he

Page 395 U. S. 372

concluded that he had been personally attacked and demanded free reply time, which the station refused. After an exchange of letters among Cook, Red Lion, and the FCC, the FCC declared that the Hargis broadcast constituted a personal attack on Cook; that Red Lion had failed to meet its obligation under the fairness doctrine as expressed in *Times-Mirror Broadcasting Co.*, 24 P & F Radio Reg. 404 (1962), to send a tape, transcript, or summary of the broadcast to Cook and offer him reply time, and that the station must provide reply time whether or not Cook would pay for it. On review in the Court of Appeals for the District of Columbia Circuit, [Footnote 3] the

Page 395 U. S. 373

FCC's position was upheld as constitutional and otherwise proper. 127 U.S.App.D.C. 129, [381 F.2d 908](#) (1967).

SCOTUS ruled that:

1. The history of the fairness doctrine and of related legislation shows that the FCC's action in the *Red Lion* case did not exceed its authority, and that, in adopting the new regulations, the FCC was implementing congressional policy. Pp. [395 U. S. 375](#)-386.
2. The fairness doctrine and its specific manifestations in the personal attack and political editorial rules do not violate the First Amendment. Pp. [395 U. S. 386](#)-401.

The Court explained:

Page 395 U. S. 394

It does not violate the First Amendment to treat licensees given the privilege of using scarce radio frequencies as proxies for the entire community, obligated to give suitable time and attention to matters of great public concern. To condition the granting or renewal of licenses on a willingness to present representative community views on controversial issues is consistent with the ends and purposes of those constitutional provisions forbidding the abridgment of freedom of speech and freedom of the press. Congress need not stand idly by and permit those with licenses to ignore the problems which beset

the people or to exclude from the airways anything but their own views of fundamental questions. The statute, long administrative practice, and cases are to this effect.

Licenses to broadcast do not confer ownership of designated frequencies, but only the temporary privilege of using them. 47 U.S.C. § 301. Unless renewed, they expire within three years. 47 U.S.C. § 307(d). The statute mandates the issuance of licenses if the "public convenience, interest, or necessity will be served thereby." 47 U.S.C. § 307(a). In applying this standard, the Commission for 40 years has been choosing licensees based in part on their program proposals. In *FRC v. Nelson Bros. Bond & Mortgage Co.*, [289 U. S. 266](#), [289 U. S. 279](#) (1933), the Court noted that, in "view of the limited number of available broadcasting frequencies, the Congress has authorized allocation and licenses." In determining how best to allocate frequencies, the Federal Radio Commission considered the needs of competing communities and the programs offered by competing stations to meet those needs; moreover, if needs or programs shifted, the Commission could alter its allocations to reflect those shifts. *Id.* at [289 U. S. 285](#). In the same vein, in *FCC v. Pottsville Broadcasting Co.*, [309 U. S. 134](#), [309 U. S. 137-138](#) (1940), the Court noted that

Page 395 U. S. 395

the statutory standard was a supple instrument to effect congressional desires "to maintain . . . a grip on the dynamic aspects of radio transmission" and allay fears that, "in the absence of governmental control, the public interest might be subordinated to monopolistic domination in the broadcasting field." Three years later, the Court considered the validity of the Commission's chain broadcasting regulations, which, among other things, forbade stations from devoting too much time to network programs in order that there be suitable opportunity for local programs serving local needs. The Court upheld the regulations, unequivocally recognizing that the Commission was more than a traffic policeman concerned with the technical aspects of broadcasting and that it neither exceeded its powers under the statute nor transgressed the First Amendment in interesting itself in general program format and the kinds of programs broadcast by licensees. *National Broadcasting Co. v. United States*, [319 U. S. 190](#) (1943).

{Emphasis added}

Red Lion is about Broadcast stations, not Amateur Radio stations.

See the case for the complete ruling.

And, BTW, The Fairness Doctrine and the Equal Time provision of 47 USC § 315 have never applied to amateur radio. A radio amateur is subject only to the FCC obscenity rules and the general rules regarding slander, libel, and defamation.

Tom is using *Red Lion* as a red herring.

C. Tom's achievements as a radio amateur.

Tom states (Supp. Info. page 5, first full paragraph):

In 2007, Taormina was inducted into an amateur radio Hall of Fame for his contributions and innovations to ham radio over nearly five decades. 3

The amateur radio Hall of Fame that Tom was inducted into was the CQ Contest Hall of Fame. It was for contesting. See Exhibit 2 for the page at the link that Tom provided: http://www.contestdinner.com/page_hall_of_fame.html Tom is #50, where he was inducted in 2007 along with three other contesters.

D. Straw Men Down

Tom sets up a number of Straw Men so he can knock them down.

1. Amateur Radio is not a Commercial Use (Supp. Info. Page 9)

No one said it was.

2. No Covenant, Condition, or Restriction Applies (Supp. Info. Page 9)

Even if there were, they could not supersede the County Code by allowing actions prohibited by the County Code.

3. All Structures Will Comply with the Storey County Code. (Supp. Info. Page 10)

But only if you let Tom decide what the Storey County Code is and which codes apply to him.

Besides, he has already said that his amateur radio license, bestowed upon him by an Act of Congress, gives him the right to do whatever he wants. All he has to do is assert that it is essential or desirable for the public convenience or welfare.

E. SECTION 17.62.010 IS THE ONLY APPLICABLE ORDINANCE

From Supp. Info. Middle of page 11:

The U.S. District Court has declared that the applicable law “specifies that an individual seeking to build a radio antenna over forty-five feet may obtain a special use permit [and] may apply for such a permit under section 17.62.010.” Slip Opinion at 8. For the purposes of this application, the Court’s ruling settles the matter as to what standard the County must apply to this application.

The test for a special use permit in this case was stated by the Court, and appears in section 17.62.010:

Certain uses may be permitted by the board of county commissioners in zones in which they are not permitted by this title where such uses are deemed essential or desirable for the public convenience or welfare.

(Emphasis supplied.)

The only legal question is whether the proposed Amateur Radio use is "deemed essential or desirable for the public convenience or welfare."

Ok so far.

But then he says: "Federal law answers that question for us, as shown below." Then he offers various quotes to make the illogical argument that, since the FCC is required to act in the public interest, and since the FCC granted him an amateur radio license, everything Tom does is, therefore, in the public interest.

Then he repeats his discussion of 47 U.S.C. § 303, Part 97, and *Red Lion*.

His arguments were misleading the first time, and have not improved in the intervening pages.

Even if a radio amateur were explicitly required to act in the public convenience or welfare, that does not mean that everything a radio amateur **does** is, by definition, **in** the public convenience or welfare.

Amateur Radio licenses are good for ten years. Then they have to be renewed. It requires filing a form, either on paper or online. The form does **not** ask, "What have you done that is in the public convenience or welfare?" No bureaucrat then decides whether what you have done merits renewing your license.

See Exhibit 3 for Form 605 Renewal. Note that Form 605 is also used for ship and aircraft radio operator licenses.

F. Tom's pictures of his antenna farm and other people's structures are misleading (Exhibits v7.pdf).

1. The pictures of his antenna farm from different locations are taken at long range. The pictures of other people's structures are taken at shorter range, making the structures appear to be very tall.
2. No graphics illustrations were provided to show how his proposed 198 foot tower will appear from his selected locations.
3. The pictures taken from the mail shed place the mail shed directly between the viewer and the antenna farm and close to the mail shed. This makes the antenna farm look small.

G. Tower Lighting

Tom states that his towers will be unlighted. (Supp. Info. bottom of page 17)

The FAA standards for tower marking are contained in a document labeled as an Advisory. However the FCC mandates that for radio and television towers, the FAA Advisory is mandatory. (47 C.F.R 17.23 available at http://edocket.access.gpo.gov/cfr_2004/octqtr/47cfr17.23.htm)

TITLE 47--TELECOMMUNICATION

CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION

PART 17_CONSTRUCTION, MARKING, AND LIGHTING OF ANTENNA STRUCTURES--Table of Contents

Subpart C_ Specifications for Obstruction Marking and Lighting of Antenna Structures

Sec. 17.23 Specifications for painting and lighting antenna structures.

Unless otherwise specified by the Commission, each new or altered antenna structure to be registered on or after January 1, 1996, must conform to the FAA's painting and lighting recommendations set forth on the structure's FAA determination of ``no hazard," as referenced in the following FAA Advisory Circulars: AC 70/7460-1J, "Obstruction Marking and Lighting," effective January 1, 1996, and AC 150/5345-43E, "Specification for Obstruction Lighting Equipment," dated October 19, 1995. These documents are incorporated by reference in accordance with 5 U.S.C. 552(a). The documents contain FAA recommendations for painting and lighting structures which pose a potential hazard to air navigation. For purposes of this part, the specifications, standards, and general requirements stated in these documents are mandatory.

47 C.F.R. 17.23 refers to FAA Advisory circulars AC 70/7460-1J, "Obstruction Marking and Lighting," effective January 1, 1996, and AC 150/5345-43E, "Specification for Obstruction Lighting Equipment," dated October 19, 1995.

AC 70/7460-1J was updated, effective 2/1/2007. Does Congress intend for the marking and lighting standards for new and modified radio and television towers to be frozen with the FAA's 1996 Advisory or have they simply been too busy to update the Code of Federal Regulations to note the new edition of the FAA Advisory?

This is important because the standards in the FAA's Advisory Circular AC 70/7460-1K (effective 2/1/07) are different than the ones in the 1996 Advisory.

The FAA's Advisory Circular AC 70/7460-1K (effective 2/1/07), Section 53 says:

53. POLES, TOWERS, AND SIMILAR SKELETAL STRUCTURES

The following standards apply to radio and television towers, supporting structures for overhead transmission lines, and similar structures.

a. Top Mounted Obstruction Light.

1. Structures 150 Feet (46m) AGL or Less. Two or more steady burning (L-810) lights should be installed in a manner to ensure an unobstructed view of one or more lights by a pilot.
2. Structures Exceeding 150 Feet (46m) AGL. At least one red flashing (L-864) beacon should be installed in a manner to ensure an unobstructed view of one or more lights by a pilot.

3. Appurtenances 40 Feet (12m) or Less. If a rod, antenna, or other appurtenance 40 feet (12m) or less in height is incapable of supporting a red flashing beacon, then it may be placed at the base of the appurtenance. If the mounting location does not allow unobstructed viewing of the beacon by a pilot, then additional beacons should be added.

4. Appurtenances Exceeding 40 Feet (12m). If a rod, antenna, or other appurtenance exceeding 40 feet (12m) in height is incapable of supporting a red flashing beacon, a supporting mast with one or more beacons should be installed adjacent to the appurtenance. Adjacent installations should not exceed the height of the appurtenance and be within 40 feet (12m) of the tip to allow the pilot an unobstructed view of at least one beacon.

b. Mounting Intermediate Levels. The number of light levels is determined by the height of the structure, including all appurtenances, and is detailed in Appendix 1. The number of lights on each level is determined by the shape and height of the structure. These lights should be mounted so as to ensure an unobstructed view of at least one light by a pilot.

1. Steady Burning Lights (L-810).

(a) Structures 350 Feet (107m) AGL or Less. Two or more steady burning (L-810) lights should be installed on diagonally or diametrically opposite positions.

(b) Structures Exceeding 350 Feet (107m) AGL. Install steady burning (L-810) lights on each outside corner of each level.

2. Flashing Beacons (L-864).

(a) Structures 350 Feet (107m) AGL or Less. These structures do not require flashing (L-864) beacons at intermediate levels.

(b) Structure Exceeding 350 Feet (107m) AGL. At intermediate levels, two beacons (L-864) should be mounted outside at diagonally opposite positions of intermediate levels.

FAA Advisory Circular AC 70/7460-1K (2007) is available at:

[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/B993DCDFC37FCDC486257251005C4E21/\\$FILE/AC70_7460_1K.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/B993DCDFC37FCDC486257251005C4E21/$FILE/AC70_7460_1K.pdf)

I have reproduced the cover page and Section 53 in Exhibit 4.

The County should get a definitive statement from the FAA about tower lighting before taking any action on Tom's application.

H. The Operative Federal statute is 47 C.F.R. § 97.15.

Here is what 47 C.F.R. § 97.15 says (http://edocket.access.gpo.gov/cfr_2002/octqtr/47cfr97.15.htm):

[Code of Federal Regulations]
[Title 47, Volume 5]
[Revised as of October 1, 2002]

From the U.S. Government Printing Office via GPO Access
[CITE: 47CFR97.15]

[Page 568-569]

TITLE 47--TELECOMMUNICATION

COMMISSION (CONTINUED)

PART 97--AMATEUR RADIO SERVICE--Table of Contents

Subpart A--General Provisions

Sec. 97.15 Station antenna structures.

(a) Owners of certain antenna structures more than 60.96 meters (200 feet) above ground level at the site or located near or at a public use airport must notify the Federal Aviation Administration and register with the Commission as required by part 17 of this chapter.

(b) Except as otherwise provided herein, 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.

[[Page 569]]

See PRB-1, 101 FCC 2d 952 (1985) for details.)

[64 FR 53242, Oct. 1, 1999]

{Emphasis added}

Here is the “Amateur Radio Preemption, 101 F.C.C. 2d 952 (1985)” as issued by the Federal Communications Commission. [<http://www.arrl.org/prb-1>]

This is the important part:

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. For example, an antenna array for international amateur communications will differ from an antenna used to contact other amateur operators at shorter distances. We will not, however, specify any particular height limitation below which a local government may not regulate, nor will we suggest the precise language that must be contained in local ordinances, such as mechanisms for special exceptions, variances, or conditional use permits. 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. \fn 6/

It doesn't say that Tom can do whatever he wants. It says that local regulations cannot prohibit ham antennas but that local regulations are permissible which involve placement, screening, or height of antennas based on health, safety, or aesthetic considerations as long as they are crafted to accommodate reasonably amateur communications, and to represent the minimum practicable regulation to accomplish the local authority's legitimate purpose.

I. The Operative Nevada statute is NRS 278.02085

(<http://www.leg.state.nv.us/Nrs/NRS-278.html>)

NRS 278.02085 Amateur radio: 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}

J. Why does Tom need a 198 foot tower?

This question is addressed in *Showing of Need for Height of Amateur Radio Antenna Support Structure*, dated August 12, 2008, by R. Dean Straw.

My analysis of this document is lengthy and will be attached to my present comments.

The short version is that:

1. Tom needs to have direct communications with China in the event of an emergency.
2. The technical quality of the communications must be comparable to what the Voice of America strives for in their Short Wave Broadcasts.

What possible kind of emergency could Storey County have that would require direct communications between the County and either Europe or Asia?

The assumptions underlying this need are:

1. Communications with the rest of North America is no longer possible.
2. There has been a catastrophe, everyone else is dead, and there is no one to operate the satellite networks or the undersea fiberoptic cables linking the continents.
3. Europe and Asia have escaped the catastrophe that has befallen all of North America (except for Storey County).

What kind of emergency aid does Tom think Europe and Asia will be able and willing to provide to Storey County?

The only emergency I can think of is that Tom and his friends need to contact more stations in Europe and Asia so they can win the Contests they are so passionate about participating in.

One of the events that could destroy the North American Infrastructure would be a nuclear war. If there were a war it would probably be with China. In such a war China would destroy our GPS satellites and we would destroy their GNSS (Global Navigation Satellite System). China could use Tom's communications signals with them as a beacon to send a nuclear-armed missile our way.

K. What this is really about.

Tom wrote an article titled *The Next 3dB*. The article is dated July/August 2008.

It is available at www.ncjweb.com/julaug08feat.pdf

The Web site www.ncjweb.com belongs to the National Contest Journal.

From <http://www.ncjweb.com/welcome.php>

The *National Contest Journal* is published six times per year (Jan/Feb, Mar/Apr, May/Jun, Jul/Aug, Sep/Oct and Nov/Dec) and is dedicated to covering the competitive contesting aspects of amateur radio. Each issue is loaded with information of interest to contesters (and DXers, too!); from casual observer to hardcore competitor, from *little pistol* to *big gun*.

The following are excerpts from the article. The complete article is reproduced in Exhibit 5.

The Next 3 dB Tom Taormina, K5RC

I am a pragmatist by nature. Long ago I developed and validated a theorem stipulating that regardless of where you are in contesting, your next 3 dB of signal improvement will be expensive. Electronics 101 tells us that doubling the transmitter's power effectively improves the signal by 3 dB. Properly stacking two five-element 20 meter beams theoretically yields a 3 dB improvement over a single antenna. Before buying an amplifier or stacking Yagis, we apply cost/effort and return-on-investment calculations, either consciously or due to limited resources, time or importance to you (and to your family).

Let's analyze these two scenarios. If you're S8 with 750 W and a five-element Yagi, you'll be S8.5 by plugging either of the above variables into the equation. At first blush, that 3 dB increase is hardly audible, and going forward with the improvement may not make practical sense. If you're 449 in a pileup, however, that extra 3 dB may make the difference between working the station or not. One-half S unit in the ARRL November Sweepstakes won't help much when signals typically are very strong, but it may be of particular consequence in a DX contest.

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The “Operator Enhancement Corollary”

This is where the “Operator Enhancement Corollary” (OEC) enters the next 3 dB equation. The OEC assumes I have the talent and drive to be a really competitive operator but need a station to match my abilities. I'm willing to make the commitment of time and resources to achieve the goals I've set. My business and family life can be prioritized to accommodate this indulgence. The OEC allows us to make more emotional judgments about spending \$5000 for a transceiver or \$900 for an SO2R box. These types of enhancements do not fit into the 3 dB improvement analysis so easily, because you can't measure their effect with a field strength meter. You probably won't double your contest scores by spending \$300 for headphones when your \$30 set has worked satisfactorily for years. So, the OEC places a subjective burden on each of us, assuming we have to justify our station enhancements to ourselves or a “higher power” (eg, spouse?).

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The “I-Want-It Factor”

Serendipitously, about the time the K5RC/K5GA station was peaking in its potential, NA5R came on the scene and wanted to build a “no-compromises” multiop contest station. The design called for 200-foot towers and stacked Yagis on every band from 80 through 10 meters. The 3 dB and OEC factors were no longer statistically viable measures as we embarked on that project. A third and more powerful

corollary had to kick in. This is called the “I Want It Factor.” While the motivation for the NA5R/K5RC station was to provide an extremely competitive environment for a cadre of up-and-coming operators, the rationale to expend what some might consider an obscene amount of money can only be explained by the I-Want-It Factor.

-
-
-

Tom Taormina, K5RC, has been building contest stations for more than 35 years. In 2007 he was among those inducted into the CQ Contest Hall of Fame. He lives in Virginia City Highlands, Nevada. A complete set of inside and outside N5JJ/K5LZO Memorial Station photos is available on his Web site, <http://k5rc.cc> .

The reason Tom wants the 198 foot towers has nothing to do with public convenience or welfare. He wants them simply because of the **“I-Want-It Factor”**.

Tom has agreed (with the help of the Court, See Supp. Info. page 4, paragraphs 1 and 2) that his application stands or falls solely on:

The standard, or test, for whether an applicant may receive a special use permit pursuant to section 17.62.010 is whether the use is “deemed essential or desirable for the public convenience or welfare.”

There is no sane way that Tom’s **“I-Want-It Factor”** can be twisted into **“deemed essential or desirable for the public convenience or welfare.”**

No doubt the County wants to avoid another costly lawsuit with Tom.

However, the County has a history of refusing to give in to bullies.

The County should do that now and deny Tom’s application for a Special Use Permit.

If the County fails to do so, what will Tom’s **“I-Want-It Factor”** make him do next?

/Jed Margolin/

Exhibit 1

Exhibit 1

U.S. Code

[main page](#) [faq](#) [index](#) [search](#)



[TITLE 47](#) > [CHAPTER 5](#) > [SUBCHAPTER III](#) > [Part I](#) > § 303

§ 303. Powers and duties of Commission

Except as otherwise provided in this chapter, the Commission from time to time, as public convenience, interest, or necessity requires, shall—

- (a) Classify radio stations;
- (b) Prescribe the nature of the service to be rendered by each class of licensed stations and each station within any class;
- (c) Assign bands of frequencies to the various classes of stations, and assign frequencies for each individual station and determine the power which each station shall use and the time during which it may operate;
- (d) Determine the location of classes of stations or individual stations;
- (e) Regulate the kind of apparatus to be used with respect to its external effects and the purity and sharpness of the emissions from each station and from the apparatus therein;
- (f) Make such regulations not inconsistent with law as it may deem necessary to prevent interference between stations and to carry out the provisions of this chapter: Provided, however, That changes in the frequencies, authorized power, or in the times of operation of any station, shall not be made without the consent of the station licensee unless the Commission shall determine that such changes will promote public convenience or interest or will serve public necessity, or the provisions of this chapter will be more fully complied with;
- (g) Study new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective use of radio in the public interest;
- (h) Have authority to establish areas or zones to be served by any station;
- (i) Have authority to make special regulations applicable to radio stations engaged in chain broadcasting;
- (j) Have authority to make general rules and regulations requiring stations to keep such records of programs, transmissions of energy, communications, or signals as it may deem desirable;
- (k) Have authority to exclude from the requirements of any regulations in whole or in part any radio station upon railroad rolling stock, or to modify such regulations in its discretion;
- (l)
 - (1) Have authority to prescribe the qualifications of station operators, to classify them according to the duties to be performed, to fix the forms of such licenses, and to issue them to persons who are found to be qualified by the Commission and who otherwise are legally eligible for employment in the United States, except that such requirement relating to eligibility for employment in the United States shall not apply in the case of licenses issued by the Commission to
 - (A) persons holding United States pilot certificates; or
 - (B) persons holding foreign aircraft pilot certificates which are valid in the United States, if the foreign government involved has entered into a reciprocal agreement under which such foreign government does not impose any similar requirement relating to eligibility for employment upon citizens of the United States;

(2) Notwithstanding paragraph (1) of this subsection, an individual to whom a radio station is licensed under the provisions of this chapter may be issued an operator's license to operate that station.

(3) In addition to amateur operator licenses which the Commission may issue to aliens pursuant to paragraph (2) of this subsection, and notwithstanding section 301 of this title and paragraph (1) of this subsection, the Commission may issue authorizations, under such conditions and terms as it may prescribe, to permit an alien licensed by his government as an amateur radio operator to operate his amateur radio station licensed by his government in the United States, its possessions, and the Commonwealth of Puerto Rico provided there is in effect a multilateral or bilateral agreement, to which the United States and the alien's government are parties, for such operation on a reciprocal basis by United States amateur radio operators. Other provisions of this chapter and of subchapter II of chapter 5, and chapter 7, of title 5 shall not be applicable to any request or application for or modification, suspension, or cancellation of any such authorization.

(m)

(1) Have authority to suspend the license of any operator upon proof sufficient to satisfy the Commission that the licensee—

(A) has violated, or caused, aided, or abetted the violation of, any provision of any Act, treaty, or convention binding on the United States, which the Commission is authorized to administer, or any regulation made by the Commission under any such Act, treaty, or convention; or

(B) has failed to carry out a lawful order of the master or person lawfully in charge of the ship or aircraft on which he is employed; or

(C) has willfully damaged or permitted radio apparatus or installations to be damaged; or

(D) has transmitted superfluous radio communications or signals or communications containing profane or obscene words, language, or meaning, or has knowingly transmitted—

(1) false or deceptive signals or communications, or

(2) a call signal or letter which has not been assigned by proper authority to the station he is operating; or

(E) has willfully or maliciously interfered with any other radio communications or signals; or

(F) has obtained or attempted to obtain, or has assisted another to obtain or attempt to obtain, an operator's license by fraudulent means.

(2) No order of suspension of any operator's license shall take effect until fifteen days' notice in writing thereof, stating the cause for the proposed suspension, has been given to the operator licensee who may make written application to the Commission at any time within said fifteen days for a hearing upon such order. The notice to the operator licensee shall not be effective until actually received by him, and from that time he shall have fifteen days in which to mail the said application. In the event that physical conditions prevent mailing of the application at the expiration of the fifteen-day period, the application shall then be mailed as soon as possible thereafter, accompanied by a satisfactory explanation of the delay. Upon receipt by the Commission of such application for hearing, said order of suspension shall be held in abeyance until the conclusion of the hearing which shall be conducted under such rules as the Commission may prescribe. Upon the conclusion of said hearing the Commission may affirm, modify, or revoke said order of suspension.

(n) Have authority to inspect all radio installations associated with stations required to be licensed by any Act, or which the Commission by rule has authorized to operate without a license under section 307 (e)(1) of this title, or which are subject to the provisions of any Act,

treaty, or convention binding on the United States, to ascertain whether in construction, installation, and operation they conform to the requirements of the rules and regulations of the Commission, the provisions of any Act, the terms of any treaty or convention binding on the United States, and the conditions of the license or other instrument of authorization under which they are constructed, installed, or operated.

- (o)** Have authority to designate call letters of all stations;
- (p)** Have authority to cause to be published such call letters and such other announcements and data as in the judgment of the Commission may be required for the efficient operation of radio stations subject to the jurisdiction of the United States and for the proper enforcement of this chapter;
- (q)** Have authority to require the painting and/or illumination of radio towers if and when in its judgment such towers constitute, or there is a reasonable possibility that they may constitute, a menace to air navigation. The permittee or licensee, and the tower owner in any case in which the owner is not the permittee or licensee, shall maintain the painting and/or illumination of the tower as prescribed by the Commission pursuant to this section. In the event that the tower ceases to be licensed by the Commission for the transmission of radio energy, the owner of the tower shall maintain the prescribed painting and/or illumination of such tower until it is dismantled, and the Commission may require the owner to dismantle and remove the tower when the Administrator of the Federal Aviation Agency determines that there is a reasonable possibility that it may constitute a menace to air navigation.
- (r)** Make such rules and regulations and prescribe such restrictions and conditions, not inconsistent with law, as may be necessary to carry out the provisions of this chapter, or any international radio or wire communications treaty or convention, or regulations annexed thereto, including any treaty or convention insofar as it relates to the use of radio, to which the United States is or may hereafter become a party.
- (s)** Have authority to require that apparatus designed to receive television pictures broadcast simultaneously with sound be capable of adequately receiving all frequencies allocated by the Commission to television broadcasting when such apparatus is shipped in interstate commerce, or is imported from any foreign country into the United States, for sale or resale to the public.
- (t)** Notwithstanding the provisions of section 301 (e) of this title, have authority, in any case in which an aircraft registered in the United States is operated (pursuant to a lease, charter, or similar arrangement) by an aircraft operator who is subject to regulation by the government of a foreign nation, to enter into an agreement with such government under which the Commission shall recognize and accept any radio station licenses and radio operator licenses issued by such government with respect to such aircraft.
- (u)** Require that apparatus designed to receive television pictures broadcast simultaneously with sound be equipped with built-in decoder circuitry designed to display closed-captioned television transmissions when such apparatus is manufactured in the United States or imported for use in the United States, and its television picture screen is 13 inches or greater in size.
- (v)** Have exclusive jurisdiction to regulate the provision of direct-to-home satellite services. As used in this subsection, the term "direct-to-home satellite services" means the distribution or broadcasting of programming or services by satellite directly to the subscriber's premises without the use of ground receiving or distribution equipment, except at the subscriber's premises or in the uplink process to the satellite.
- (w)** Omitted.
- (x)** Require, in the case of an apparatus designed to receive television signals that are shipped in interstate commerce or manufactured in the United States and that have a picture screen 13 inches or greater in size (measured diagonally), that such apparatus be equipped with a feature designed to enable viewers to block display of all programs with a common rating, except as otherwise permitted by regulations pursuant to section 330 (c)(4) of this title.
- (y)** Have authority to allocate electromagnetic spectrum so as to provide flexibility of use, if—
 - (1)** such use is consistent with international agreements to which the United States is a

party; and

- (2)** the Commission finds, after notice and an opportunity for public comment, that—
- (A)** such an allocation would be in the public interest;
 - (B)** such use would not deter investment in communications services and systems, or technology development; and
 - (C)** such use would not result in harmful interference among users.

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Exhibit 2

Exhibit 2

Sat. May 21, 2011
 Crowne Plaza
 Hotel
 Dayton, Ohio USA
 Home

Dayton Contest Dinner

- Contact Us
- Get Tickets
- Past Speakers
- Past Programs



CQ Contest Hall of Fame

Hall of Fame



[CLICK HERE](#) for a
 Free Slide Show:

**"Contest Activities
 at Dayton 2010"**
 by Tim K3LR

1. Hazzard "Buz" Reeves, K2GL — Sept. 1986
2. Katashi Nose, KH6IJ — Apr. 1987
3. Al J. Slater, G3FXB — Apr. 1988
4. Martti Laine, OH2BH — Apr. 1989
5. Bernie W. Welch, W8IMZ — June 1989
6. Leonard Chertok, W3GRF — Dec. 1991
7. W. Gerry Mathis, W3GM — Dec. 1991
8. Frank Anzalone, W1WY — Apr. 1993
9. Jim Lawson, W2PV — Apr. 1993
10. Ed Bissell, W3AU — Apr. 1993
11. Fred Laun, K3ZO — Apr. 1993
12. Vic Clark, W4KFC — Apr. 1993
13. Rush Drake, W7RM — Apr. 1993
14. John Thompson, W1BIH/PJ9JT — Apr. 1994
15. Atilano de Oms, PY5EG — Apr. 1994
16. Herb Becker, W6QD — Apr. 1994
17. Ken Wolff, K1EA — Apr. 1995
18. Dick Norton, N6AA — Apr. 1995
19. Jim Neiger, N6TJ — Apr. 1995
20. Tine Brajnik, S52AA — Apr. 1995
21. Ville Hiilesmaa, OH2MM — May 1996
22. Lew Gordon, K4VX — May 1996
23. Bob Cox, K3EST — May 1996
24. Carl Cook, AI6V — May 1997
25. Gordon Marshall, W6RR — May 1997
26. John Devoldere, ON4UN — May 1997
27. Jorge Humberto Bozzo, LU8DQ — May 1997
28. John Dorr, K1AR — May 1997
29. Eugene Walsh, N2AA — May 1998
30. Roger Western, G3SXW — May 1998
31. Glenn Rattmann, K6NA — May 1998
32. Richard Frey, WA2AAU — May 1998
33. Francis Donovan, W3LPL — May 1999
34. John Crovelli, W2GD — May 1999
35. Larry "Tree" Tyree, N6TR — May 2000
36. Walter Skudlarek, DJ6QT — May 2000
37. Algis Kregzde, LY2NK — May 2001
38. Ron Sigismonti, N3RS — May 2001
39. Leif Ottosen, OZ1LO — May 2002
40. Ken Keeler, N6RO — May 2003
41. Dan Street, K1TO — May 2003
42. Steve Bolia, N8BJQ — May 2004
43. Trey Garlough, N5KO — May 2004
44. Jeff Briggs, K1ZM — May 2005
45. Charles "Rusty" Epps, W6OAT — May 2005
46. Tim Duffy, K3LR — May 2006
47. Bill Fisher, W4AN — May 2006
48. Frederick Capossela, K6SSS — May 2007
49. Phil Goetz, N6ZZ — May 2007
50. Tom Taormina, K5RC — May 2007
51. Franc Bogataj, S59AA — May 2007
52. Randy Thompson, K5ZD — May 2008
53. Paulo Cortese, I2UIY — May 2008
54. Rev. Paul Bittner, W0AIH — May 2009
55. Larry Weaver, N6TW — May 2010
56. Don Hill, AA5AU — May 2010





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Created with the [QTH.com SiteBuilder](#).

Exhibit 3

Exhibit 3

1) Radio Service Code:

Application Purpose (Select only one) ()

2) NE – New MD – Modification AM – Amendment	RO – Renewal Only RM – Renewal / Modification CA – Cancellation of License	WD – Withdrawal of Application DU – Duplicate License AU – Administrative Update
3) If this request is for Developmental License or STA (Special Temporary Authorization) enter the appropriate code and attach the required exhibit as described in the instructions. Otherwise enter 'N' (Not Applicable).		() D S N/A
4) If this request is for an Amendment or Withdrawal of Application, enter the file number of the pending application currently on file with the FCC.		File Number
5) If this request is for a Modification, Renewal Only, Renewal / Modification, Cancellation of License, Duplicate License, or Administrative Update, enter the call sign (serial number for Commercial Operator) of the existing FCC license. If this is a request for consolidation of DO & DM Operator Licenses, enter serial number of DO. Also, if filing for a ship exemption, you must provide call sign.		Call Sign/Serial #
6) If this request is for a New, Amendment, Renewal Only, or Renewal Modification, enter the requested expiration date of the authorization (this item is optional).		MM DD
7) Does this filing request a Waiver of the Commission's Rules? If 'Y', attach the required showing as described in the instructions.		() Yes No
8) Are attachments (other than associated schedules) being filed with this application?		() Yes No

Applicant/Licensee Information

9) FCC Registration Number (FRN):

10) Applicant/Licensee legal entity type: (Select One)

Individual Corporation Unincorporated Association Trust Government Entity

Consortium General Partnership Limited Liability Company Limited Liability Partnership

Limited Partnership Other (Description of Legal Entity) _____

11) First Name (if individual):	MI:	Last Name:	Suffix:
---------------------------------	-----	------------	---------

12) Entity Name (if other than individual):

13) If the Licensee name is being updated, is the update a result from the sale (or transfer of control) of the license(s) to another party and for which proper Commission approval has not been received or proper notification not provided? () **Yes No**

14) Attention To:

15) P.O. Box:	And/Or	16) Street Address:	
17) City:	18) State:	19) Zip Code/Postal Code:	20) Country:
21) Telephone Number:		22) FAX Number:	
23) E-Mail Address:			

Ship Applicants/Licensees Only

24) Enter new name of vessel: _____

Aircraft Applicants/Licensees Only

25) Enter the new FAA Registration Number (the N-number): _____
NOTE: Do not enter the leading "N".

Fee Status

26) Is the Applicant/Licensee exempt from FCC application fees?	() <u>Y</u> es <u>N</u> o
27) Is the Applicant/Licensee exempt from FCC regulatory fees?	() <u>Y</u> es <u>N</u> o

General Certification Statements

1) The Applicant/Licensee waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application.
2) The Applicant/Licensee certifies that all statements made in this application and in the exhibits, attachments, or documents incorporated by reference are material, are part of this application, and are true, complete, correct, and made in good faith.
3) Neither the Applicant/Licensee nor any member thereof is a foreign government or a representative thereof.
4) The Applicant/Licensee certifies that neither the Applicant/Licensee nor any other party to the application is subject to a denial of Federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. § 862, because of a conviction for possession or distribution of a controlled substance. This certification does not apply to applications filed in services exempted under Section 1.2002(c) of the rules, 47 CFR § 1.2002(c). See Section 1.2002(b) of the rules, 47 CFR § 1.2002(b), for the definition of "party to the application" as used in this certification.
5) Amateur or GMRS Applicant/Licensee certifies that the construction of the station would NOT be an action which is likely to have a significant environmental effect (see the Commission's Rules 47 CFR Sections 1.1301-1.1319 and Section 97.13(a) rules (available at web site http://wireless.fcc.gov/rules.html)).
6) Amateur Applicant/Licensee certifies that they have READ and WILL COMPLY WITH Section 97.13(c) of the Commission's Rules (available at web site http://wireless.fcc.gov/rules.html) regarding RADIOFREQUENCY (RF) RADIATION SAFETY and the amateur service section of OST/OET Bulletin Number 65 (available at web site http://www.fcc.gov/oet/info/documents/bulletins/).

Certification Statements For GMRS Applicants/Licensees

1) Applicant/Licensee certifies that he or she is claiming eligibility under Rule Section 95.5 of the Commission's Rules.
2) Applicant/Licensee certifies that he or she is at least 18 years of age.
3) Applicant/Licensee certifies that he or she will comply with the requirement that use of frequencies 462.650, 467.650, 462.700 and 467.700 MHz is not permitted near the Canadian border North of Line A and East of Line C. These frequencies are used throughout Canada and harmful interference is anticipated.
4) Non-Individual Applicants/Licensees certify that they have NOT changed frequency or channel pairs, type of emission, antenna height, location of fixed transmitters, number of mobile units, area of mobile operation, or increase in power.

Certification Statements for Ship Applicants/Licensees (Including Ship Exemptions)

1) Applicant/Licensee certifies that they are the owner or operator of the vessel, a subsidiary communications corporation of the owner or operator of the vessel, a state or local government subdivision, or an agency of the US Government subject to Section 301 of the Communications Act.
2) This application is filed with the understanding that any action by the Commission thereon shall be limited to the voyage(s) described herein, and that apart from the provisions of the specific law from which the Applicant/Licensee requests an exemption, the vessel is in full compliance with all applicable statutes, international agreements and regulations.

Signature

28) Typed or Printed Name of Party Authorized to Sign

First Name:	MI:	Last Name:	Suffix:
29) Title:			
Signature:			30) Date:

Failure to Sign This Application May Result in Dismissal Of The Application And Forfeiture Of Any Fees Paid

WILLFUL FALSE STATEMENTS MADE ON THIS FORM OR ANY ATTACHMENTS ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. Code, Title 18, Section 1001) AND / OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. Code, Title 47, Section 312(a)(1)), AND / OR FORFEITURE (U.S. Code, Title 47, Section 503).

**FCC 605
Schedule D**

**Schedule for Additional Data in the
Amateur Radio Service**

Approved by OMB
3060 - 0850
See 605 Main Form Instructions
for public burden estimate

AMATEUR STATION CALL SIGN CHANGE AND VANITY CALL SIGN REQUEST

Systematic Call Sign Change

1) Is this a request to change your station call sign to the next systematically available call sign? () <u>Yes</u> <u>No</u>

If you answered Yes ('Y') to Item 1, do *not* complete Items 2 and 3 on this schedule. If completing Item 2, Item 1 must be answered No ('N').

Vanity Call Sign Change

2) I hereby apply for a vanity call sign under the following eligibility: (make an 'X' in the appropriate box and enter the required information): (Only 1 block may be checked)	
A)	FORMER PRIMARY STATION HOLDER: I request call sign _____ be shown on my primary station license. By checking this box, I <u>certify</u> that the call sign being requested was previously assigned to my station and that I can provide documentation, if requested.
B)	CLOSE RELATIVE OF FORMER HOLDER: I request call sign _____ be shown on my primary station license. By checking this box, I <u>certify</u> that the call sign being requested was shown on the primary station license of my deceased spouse, child, grandchild, stepchild, parent, grandparent, stepparent, brother, sister, stepbrother, stepsister, aunt, uncle, niece, nephew, or in-law within the past 2 years and that I can provide documentation, if requested. Enter the deceased relationship to you: _____.
C)	FORMER CLUB STATION HOLDER: I request call sign _____ be shown on the license for the club station, for which I am the license trustee. By checking this box, I <u>certify</u> that the call sign being requested was shown on the license for this club station within the past 2 years and that I can provide documentation, if requested.
D)	CLUB STATION WITH CONSENT OF FORMER HOLDER OR CLOSE RELATIVE OF FORMER HOLDER: I request that the call sign _____ be shown on the license for the club station, for which I am the license trustee. By checking this box, I <u>certify</u> that the call sign being requested was shown on the primary station license of a person now deceased within the past 2 years. I also <u>certify</u> that I am acting with written consent of the former holder now deceased or of the deceased former holder's spouse, child, grandchild, stepchild, parent, grandparent, stepparent, brother, sister, stepbrother, stepsister, aunt, uncle, niece, nephew, or in-law, and I can provide documentation of that consent, if requested. Enter "self" if deceased licensee gave consent or the relationship of the person giving consent: _____.
E)	PRIMARY STATION PREFERENCE LIST: I request the first assignable call sign from my preference list in item #3 be shown on the license for my primary station.
F)	CLUB STATION PREFERENCE LIST: I request the first assignable call sign from my preference list in item #3 be shown on the license for the club station, for which I am the license trustee.

Vanity Call Sign PREFERENCE LIST

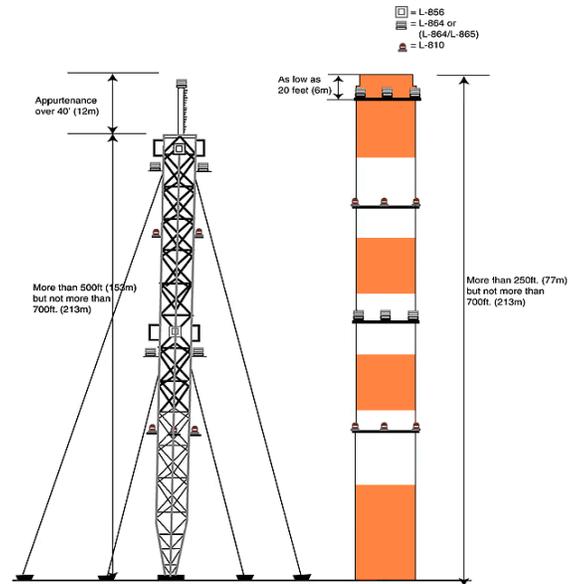
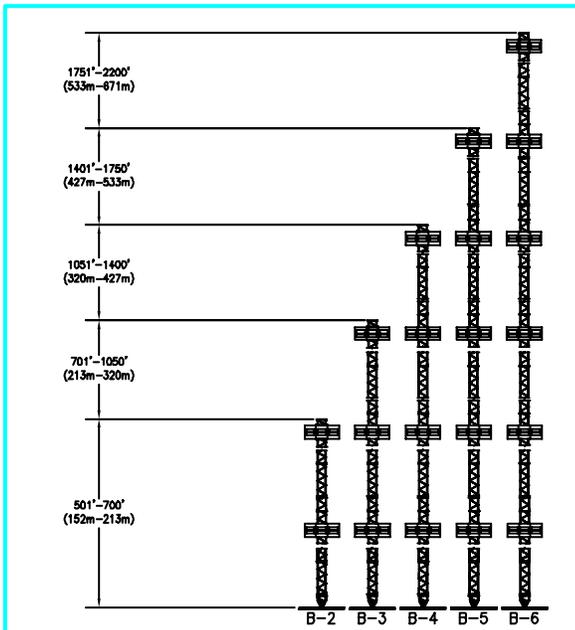
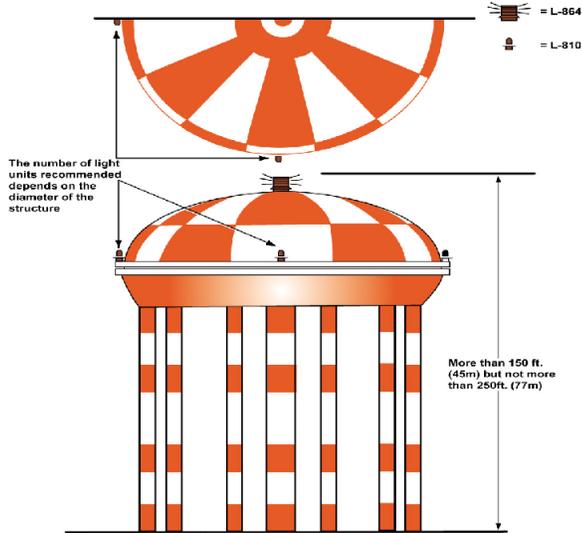
3) Select your preference list of vanity call signs very carefully. Give exact prefix, numeral, and suffix for each call sign.				
1)	6)	11)	16)	21)
2)	7)	12)	17)	22)
3)	8)	13)	18)	23)
4)	9)	14)	19)	24)
5)	10)	15)	20)	25)
Note: If none of the call signs you selected are assignable, you will retain your existing call sign.				

Exhibit 4

Exhibit 4



Obstruction Marking and Lighting



CHAPTER 5. RED OBSTRUCTION LIGHT SYSTEM

50. PURPOSE

Red Obstruction lights are used to increase conspicuity during nighttime. Daytime and twilight marking is required. Recommendations on lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structures and overall layout of design.

51. STANDARDS

The red obstruction lighting system is composed of flashing omnidirectional beacons (L-864) and/or steady burning (L-810) lights. When one or more levels is comprised of flashing beacon lighting, the lights should flash simultaneously.

a. Single Obstruction Light. A single (L-810) light may be used when more than one obstruction light is required either vertically or horizontally or where maintenance can be accomplished within a reasonable time.

1. Top Level. A single light may be used to identify low structures such as airport ILS buildings and long horizontal structures such as perimeter fences and building roof outlines.

2. Intermediate Level. Single lights may be used on skeletal and solid structures when more than one level of lights is installed and there are two or more single lights per level.

b. Double Obstruction Light. A double (L-810) light should be installed when used as a top light, at each end of a row of single obstruction lights, and in areas or locations where the failure of a single unit could cause an obstruction to be totally unlighted.

1. Top Level. Structures 150 feet (46m) AGL or less should have one or more double lights installed at the highest point and operating simultaneously.

2. Intermediate Level. Double lights should be installed at intermediate levels when a malfunction of a single light could create an unsafe condition and in remote areas where maintenance cannot be performed within a reasonable time. Both units may operate simultaneously, or a transfer relay may be used to switch to a spare unit should the active system fail.

3. Lowest Level. The lowest level of light units may be installed at a higher elevation than normal on a structure if the surrounding terrain, trees, or adjacent building(s) would obscure the lights. In certain instances, as determined by an FAA aeronautical study, the lowest level of lights may be eliminated.

52. CONTROL DEVICE

Red obstruction lights should be operated by a satisfactory control device (e.g., photo cell, timer, etc.) adjusted so the lights will be turned on when the northern sky illuminance reaching a vertical surface falls below a level of 60 foot-candles (645.8 lux) but before reaching a level of 35 foot-candles (367.7 lux). The control device should turn the lights off when the northern sky illuminance rises to a level of not more than 60 foot-candles (645.8 lux). The lights may also remain on continuously. The sensing device should, if practical, face the northern sky in the Northern Hemisphere. (See AC 150/5345-43.)

53. POLES, TOWERS, AND SIMILAR SKELETAL STRUCTURES

The following standards apply to radio and television towers, supporting structures for overhead transmission lines, and similar structures.

a. Top Mounted Obstruction Light.

1. Structures 150 Feet (46m) AGL or Less. Two or more steady burning (L-810) lights should be installed in a manner to ensure an unobstructed view of one or more lights by a pilot.

2. Structures Exceeding 150 Feet (46m) AGL. At least one red flashing (L-864) beacon should be installed in a manner to ensure an unobstructed view of one or more lights by a pilot.

3. Appurtenances 40 Feet (12m) or Less. If a rod, antenna, or other appurtenance 40 feet (12m) or less in height is incapable of supporting a red flashing beacon, then it may be placed at the base of the appurtenance. If the mounting location does not allow unobstructed viewing of the beacon by a pilot, then additional beacons should be added.

4. Appurtenances Exceeding 40 Feet (12m). If a rod, antenna, or other appurtenance exceeding 40 feet (12m) in height is incapable of supporting a red flashing beacon, a supporting mast with one or more beacons should be installed adjacent to the appurtenance. Adjacent installations should not exceed the height of the appurtenance and be within 40 feet (12m) of the tip to allow the pilot an unobstructed view of at least one beacon.

b. Mounting Intermediate Levels. The number of light levels is determined by the height of the structure, including all appurtenances, and is detailed in Appendix 1. The number of lights on each level is

determined by the shape and height of the structure. These lights should be mounted so as to ensure an unobstructed view of at least one light by a pilot.

1. *Steady Burning Lights (L-810).*

(a) *Structures 350 Feet (107m) AGL or Less.*

Two or more steady burning (L-810) lights should be installed on diagonally or diametrically opposite positions.

(b) *Structures Exceeding 350 Feet (107m)*

AGL. Install steady burning (L-810) lights on each outside corner of each level.

2. *Flashing Beacons (L-864).*

(a) *Structures 350 Feet (107m) AGL or Less.*

These structures do not require flashing (L-864) beacons at intermediate levels.

(b) *Structure Exceeding 350 Feet (107m)*

AGL. At intermediate levels, two beacons (L-864) should be mounted outside at diagonally opposite positions of intermediate levels.

54. CHIMNEYS, FLARE STACKS, AND SIMILAR SOLID STRUCTURES

a. *Number of Light Units.*

1. The number of units recommended depends on the diameter of the structure at the top. The number of lights recommended below are the minimum.

2. When the structure diameter is:

(a) *20 Feet (6m) or Less.* Three light units per level.

(b) *Exceeding 20 Feet (6m) But Not More Than 100 Feet (31m).* Four light units per level.

(c) *Exceeding 100 Feet (31m) But Not More Than 200 Feet (61m).* Six light units per level.

(d) *Exceeding 200 Feet (61m).* Eight light units per level.

b. *Top Mounted Obstruction Lights.*

1. *Structures 150 Feet (46m) AGL or Less.* L-810 lights should be installed horizontally at regular intervals at or near the top.

2. *Structures Exceeding 150 Feet (46m) AGL.* At least three L-864 beacons should be installed.

3. *Chimneys, Cooling Towers, and Flare Stacks.* Lights may be displayed as low as 20 feet (6m) below the top to avoid the obscuring effect of deposits and heat generally emitted by this type of structure. It is important that these lights be readily accessible for

cleaning and lamp replacement. It is understood that with flare stacks, as well as any other structures associated with the petrol-chemical industry, normal lighting requirements may not be necessary. This could be due to the location of the flare stack/structure within a large well-lighted petrol-chemical plant or the fact that the flare, or working lights surrounding the flare stack/structure, is as conspicuous as obstruction lights.

c. *Mounting Intermediate Levels.* The number of light levels is determined by the height of the structure including all appurtenances. For cooling towers 600 feet (183m) or less, intermediate light levels are not necessary. Structures exceeding 600 feet (183m) AGL should have a second level of light units installed approximately at the midpoint of the structure and in a vertical line with the top level of lights.

1. *Steady Burning (L-810) Lights.* The recommended number of light levels may be obtained from Appendix 1. At least three lights should be installed on each level.

2. *Flashing (L-864) Beacons.* The recommended number of beacon levels may be obtained from Appendix 1. At least three lights should be installed on each level.

(a) *Structures 350 Feet (107m) AGL or Less.* These structures do not need intermediate levels of flashing beacons.

(b) *Structures Exceeding 350 Feet (107m) AGL.* At least three flashing (L-864) beacons should be installed on each level in a manner to allow an unobstructed view of at least one beacon.

55. GROUP OF OBSTRUCTIONS

When individual objects, except wind turbines, within a group of obstructions are not the same height and are spaced a maximum of 150 feet (46m) apart, the prominent objects within the group should be lighted in accordance with the standards for individual obstructions of a corresponding height. If the outer structure is shorter than the prominent, the outer structure should be lighted in accordance with the standards for individual obstructions of a corresponding height. Light units should be placed to ensure that the light is visible to a pilot approaching from **any** direction. In addition, at least one flashing beacon should be installed at the top of a prominent center obstruction or on a special tower located near the center of the group.

Exhibit 5

Exhibit 5

I am a pragmatist by nature. Long ago I developed and validated a theorem stipulating that regardless of where you are in contesting, your *next* 3 dB of signal improvement will be expensive. Electronics 101 tells us that doubling the transmitter's power effectively improves the signal by 3 dB. Properly stacking two five-element 20 meter beams theoretically yields a 3 dB improvement over a single antenna. Before buying an amplifier or stacking Yagis, we apply cost/effort and return-on-investment calculations, either consciously or due to limited resources, time or importance to you (and to your family).

Let's analyze these two scenarios. If you're S8 with 750 W and a five-element Yagi, you'll be S8.5 by plugging either of the above variables into the equation. At first blush, that 3 dB increase is hardly audible, and going forward with the improvement may not make practical sense. If you're 449 in a pileup, however, that extra 3 dB may make the difference between working the station or not. One-half S unit in the ARRL November Sweepstakes won't help much when signals typically are very strong, but it may be of particular consequence in a DX contest.

Increasing power from 750 W to 1500 W is relatively painless. Stacking Yagis is not so simple. You can quickly analyze the benefit of an amp and, if so inclined, add one to your station at modest cost and effort. You may be motivated — and have the resources — to stack two Yagis. On the other hand, you may not have the real estate. Then again, you may be able to do *both* of these things and, in the process, gain 6 dB — one full S unit — of signal improvement! This sort of outcome makes the cost-benefit analysis more compelling.

Gaining 3 dB in a modest station is pretty straightforward. But what if you've worked hard and put together a competitive SO2R station with a couple of towers supporting monobanders? The next 3 dB in *that* scenario is likely to be extremely expensive and time consuming, and it may even require a move to the country. How do you objectively analyze what to do next to gain that 3 dB advantage?

The "Operator Enhancement Corollary"

This is where the "Operator Enhancement Corollary" (OEC) enters the next 3 dB equation. The OEC assumes I have the talent and drive to be a really competitive operator but need a station to match my abilities. I'm willing to make the com-

mitment of time and resources to achieve the goals I've set. My business and family life can be prioritized to accommodate this indulgence. The OEC allows us to make more emotional judgments about spending \$5000 for a transceiver or \$900 for an SO2R box. These types of enhancements do not fit into the 3 dB improvement analysis so easily, because you can't measure their effect with a field strength meter. You probably won't double your contest scores by spending \$300 for headphones when your \$30 set has worked satisfactorily for years. So, the OEC places a *subjective* burden on each of us, assuming we have to justify our station enhancements to ourselves or a "higher power" (eg, spouse?).

I have always been on a tight budget. The original K5RC/K5GA multiop station was built in the late 1970s with an initial outlay of \$1600. Most of the towers were scrounged or donated, and I repaired radios at night to buy cable clamps and coax. The 3 dB rule wasn't a huge factor, because our benchmark was a tribander and a two-element 40 meter Yagi from my first station. To achieve the *next* 3 dB over the seven-tower station was going to require a monumental commitment of time and money, however.

The "I-Want-It Factor"

Serendipitously, about the time the K5RC/K5GA station was peaking in its potential, NA5R came on the scene and wanted to build a "no-compromises" multiop contest station. The design called for 200-foot towers and stacked Yagis on every band from 80 through 10 meters.

The 3 dB and OEC factors were no longer statistically viable measures as we embarked on that project. A third and more powerful corollary had to kick in. This is called the "I Want It Factor." While the motivation for the NA5R/K5RC station was to provide an extremely competitive environment for a cadre of up-and-coming operators, the rationale to expend what some might consider an obscene amount of money can only be explained by the I-Want-It Factor.

Having been part of NASA's Project Apollo team for 14 years, my preferred definition is, "We just made up our minds to go to the moon, and we did it." Since building a multiop contest station is a team effort, "I want it" is, therefore, more accurately defined as, "We just made up our minds and did it."

Unfortunately, Hurricane Alicia paid us a visit in 1983 and took down 13 towers at the old and new stations. That setback was followed by business disasters, divorces and other inconveniences that put plans for a serious multiop station on hiatus for more than 20 years.

In 1997, Midge, K7AFO, and I moved from Texas to Nevada. We found 10 acres on a 6400-foot ridgeline with great takeoffs to Europe and Japan. Since I was still struggling to build a successful consulting practice, we agreed that two or three towers would be all I might erect at the new QTH. That's when I discovered that the Next 3 dB was like malaria. It may go into remission for years, but sooner or later, you will have another outbreak.

With the impetus provided by our both

K5RC



Figure 1—Before: The Phase I station configuration before the 2007 CQ WW CW Contest

becoming members of NCCC and getting caught up in club spirit, the Next 3 dB soon escalated into OEC, as I saw an opportunity to provide a competitive station for club members. Four towers, however, would certainly be enough for my contesting goals to support the NCCC drive for the SS gavel.

Dreams Reawakened

In 2006 we hosted The Great Armadillo Reunion at our home. This gathering of Texas DX Society members and friends commemorated our accomplishment of activating every county in the W5 call area over a three-year period (1983-1986). One unforeseen outcome of that assembly was a renewed interest among graying TDXS members to fix their broken antennas and get back into contesting. Also rekindled was NA5R's ambition to fulfill the plans we'd abandoned in 1983 to build a world-class contest station. The Field Day operation during the Reunion marked the first time NA5R had been on the air in 23 years, and that experience proved to be a big incentive. By this time, the four-tower station had achieved many of the stateside contest objectives with NCCC resulting in several shiny new SS Gavels, so attaining The Next 3 dB was going to present some major challenges.

We kicked around the idea over the ensuing months, but a call from Don, K5AAD, launched us into action. Don's brother David was the former N5JJ (SK). He offered us the antenna farm that N5JJ had been building if we would come to Texas and dig it out of the yaupon bushes. The idea struck me that this would be a viable project to honor the memory of N5JJ and our other good friend and TDXS member "Rowdy," K5LZO (SK). Thus the N5JJ-K5LZO Memorial Station concept was born.

The antennas from Texas became the Next 3 dB, and in short order I had five towers on the property. NA5R (now W5FU) got really pumped when I found two large stations that had been dismantled in NCCC territory, and we acquired the K6ZM and KA6W towers and antennas. At this point OEC had clearly taken over, clouding any Next 3 dB logic. By the fall of 2007 we were up to eight towers and had a five-year strategic plan in place. That plan would take us into "we-just-made-up-our-minds-and-did-it" mode. We have budgeted time and resources to achieve a highly competitive multiop station for up-and-coming contesters and the station to realize their potential by the time the sunspots peak again.

Given that background and with no desire (or insanity) to compete from the West Coast with W3LPL, K3LR and KC1XX, what does the Next 3 dB look like when you already have eight towers and two

well-equipped operating positions in place for 2007 CQ WW CW?

Defining the Requirements

An engineer by training, I felt a requirements document and system design as well as mandatory design reviews were in order. In August, 2007, N5OT operated NAQP CW, and Mark gave me the

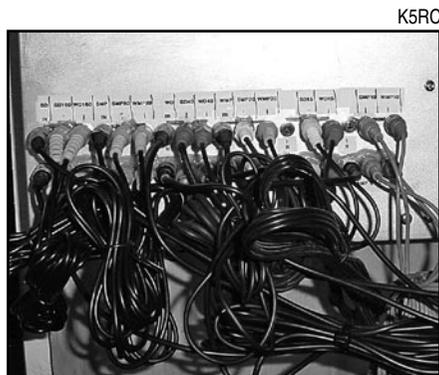


Figure 2 — The patch panel for the amplifier inputs

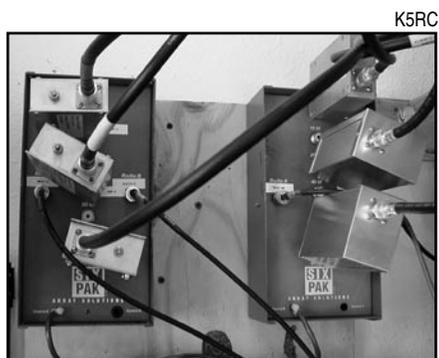


Figure 3 — Amplifier RF input switching: SixPaks with band-pass filters for each band

feedback I needed to make the SO2R setup more competitive. (While I can use the SO2R function, my serial mind cannot adjust to changing bands when I am running three a minute). After consulting with W5FU, I developed the requirements document. The station would have two identical SO2R stations. This way we could continue to support the NCCC Sweepstakes effort and still be able to quickly reconfigure those stations for M/2 DX contests.

Once the concept was clear, the outside work was formulated. Through the wise counsel of Dean, N6BV, and Dave, W6NL, it became apparent that we needed to replace the tribanders and dipoles with stacks of monobanders and Yagis. With Dean's *High Frequency Terrain Analysis (HFTA)* program, a day's worth of computer time yielded precise locations and heights for the antenna farm. Drawing upon the valuable lessons learned at Contest University 2007, we deemed the use of OWA (optimized wideband array) Yagis a must for the station.

Table 1 outlines the *outside* progression from Phase II to Phase III (set for completion by fall 2008). As you gasp at the Phase III plans, refer back to the Next 3 dB calculations. Since anything that can be measured with a field strength meter can be plugged into a simple "Next 3 dB" equation — such as replacing tribanders with monobanders — why the apparent overkill? That answer falls into an even more obscure postulate that says, "While you're at it, why settle for just a 3 dB improvement?" Actually, owing to economies of scale, it doesn't cost much more to gain 6 dB in one fell swoop. According to *HFTA*, going from a 130-foot high dipole to stacked 80 meter beams will yield as

Table 1

Outside the Shack: Phase II and Phase III plans

Band	Phase II (Fall 2007)
160	Quarter-wave vertical, DX Engineering four-square receive antenna
80	Dipoles at 120 feet
40	4 elements at 70 feet and 2 elements at 135 feet
20	6 over 6 on a 140-foot rotating tower, 5 elements at 85 feet
15	6-element OWA, Force 12 C31XR
10	6-element OWA, Force 12 C31XR
Band	New for Phase III (Fall 2008)
80	3 over 3 OptiBeams on a 200-foot rotating tower
40	Raise tower to 140 feet and stack a second 4-element Yagi at 40 feet
20	Add third 6-element Yagi to stack, replace 5-element Yagi with long-boom 6-element Yagu, move 5-element Yagi to 40 meter tower
15	6 over 6 over 6 over 6 on new rotating tower
10	6 over 6 over 6 over 6 on new rotating tower

much as 17 dB gain in one direction! We definitely can justify that using any form of measurement defined so far.

Inside the Shack

What, then, is the metric for the Next 3 dB inside the shack? How do we quantify OEC, and how do we define the ideal equipment configuration? The SO2R design was pretty clear because I had already acquired a MicroHam MK2R box and took N5OT's suggestions for ergonomic improvements relative to equipment placement. Radio choice took on an emotional factor because W5FU had always preferred Yaseu, and Dennis, K7BV, was a regular operator at the station. Without succumbing to the radio debate, we decided on a Yaesu MARK-V FT-1000MP and a FT-2000D for each of the two stations, mostly because any guest operator likely would be familiar with the layout and operation of these radios.

My next challenge was to quantify how to design the most competitive and functional M/2 station. When the crew showed up for the first serious DX contest effort, the 2007 CQ WW CW, the opportunity presented itself to observe human dynamics and to ask what needed to be fixed. Among the first issues tackled in 2007 was "guest-operator proofing" the amplifiers. I was tired of having the Alpha 86 and 87A continually traveling back and forth to Alpha to have pin diodes replaced because KL2A hot-switched antennas in a moment of competitive fury.

Fortunately, we discovered Emtron amplifiers, which are built like the tubes from the Russian military radios they power. They are built for abuse with many integrated safety features, plenty of headroom and forgiveness for poor tuning and hot switching antennas. Having three reliable amps was, I thought, an ideal solution for a multiop station. But *nooooo!* With input from W6EU, KY7M, N6XI, K6KR, and W5FU, I amassed a new checklist of issues aimed at accomplishing the Next 3 dB inside. Operators defined these key issues:

1. The need to be able to immediately select any of the 12 antennas on either station



K5RC

Figure 4—Rotor and antenna controls

Table 2

Reviewing the problem checklist: The week before the ARRL International DX Contest CW, it was time to review how we resolved the issues on our checklist.

Problem	Solution
Select any of 12 antennas from either station	Install a MicroHam switch box and controls into separate amps shared by both stations
Convenient access from either station to the six rotator controls	Intall Green Heron control boxes and <i>Everywhere</i> software, allowing all rotators to be controlled on each computer screen
Simplify band changing and amplifier tuning	Use one amp per band and a install a custom switching system controlled by each radio's band switch
Have wattmeters visible from both stations	Install WaveNode wattmeters that display on the computer screens
Resolve logging software networking problems	Install <i>Win-Test</i> software
Address amplifier noise and heat issues	Install amps in a separate room with noise insulation and a ceiling exhaust fan

2. Convenient access from either station to controls for the six rotators
3. Curing the complexity in changing bands and tuning amplifiers
4. Wattmeters visible from both stations
5. Resolving network problems with the logging software
6. Dealing with noise and heat from the amplifiers

As these issues were folded into a revised requirements document, items 3 and 6 became the drivers for station redesign. Item 3 motivated W5FU to recommend an elegant band-changing solution: an amp for each band. This approach threw down a gauntlet for me to design the controls to allow automatic switching among the six amps with four radios. Further, I had to figure out how to control the antennas into each amplifier. After many hours of design and experimentation, a system approach took form. Having this design

work effectively required making some basic assumptions. First, to make the input logic work the radios had to be assigned specific bands, so each FT-1000MP was assigned 80, 20 and 10 meters, while each FT-2000 was assigned 160, 40 and 15 meters. Next, each of the four radios was assigned to a W9XT band-decoder board. The decoders drive custom-designed relay logic that routes the T/R switching from each radio to the appropriate amplifier. It also switches one of two Array Solutions SixPaks to route the RF input to the correct amp. The RCA patch panel was included in case the amps had to be reconfigured due to an equipment failure.

While waiting for the three Emtron amps to arrive from Australia, we had to resolve other issues on the checklist. The solutions to the heat, noise, rotor access, antenna switching and station layout issues presented themselves in the form of



K5RC

Figure 5—After: The completed remodeling job

a forgotten 6x6 storage room behind the station. Consultation with a local carpenter set off a demolition and construction project that consumed a month of enforced radio silence.

We abandoned the big operating console and the office desk that appears in Figure 1 for a custom wraparound operating console made from very inexpensive laminate plywood. The main (west) station is against an outside wall, but the second (south) station now opens into the old storage room.

Antenna switching was resolved by procuring three MicroHam 4x2 switch boxes and building two controllers. One-half of each RF switch box would be assigned to one amp, giving a total of four antenna selections per band.

Since the two stations now were within reach of each other, we addressed the rotator control issue by acquiring six Great Heron RT-21 rotator control boxes and disposing of the various Create and Hy-Gain boxes. The Great Heron units also provided a convenient location for the various switch and Stack Master boxes.

To deal with network and wattmeter issues, we switched to *Win-Test* logging software because it has its own network. It also requires more display real estate, which precipitated deploying two monitors for each computer. The monitors also show the WaveNode wattmeter displays and the Great Heron *Everywhere* program that controls the rotator boxes. Table 2 reviews how we resolved each problem.

The Next Level?

After a very successful ARRL DX CW, another meeting of operators resulted in another list of issues to resolve. These are *not* Next 3 dB problems but refinements such as being able to see the WaveNode wattmeters on both computers and controlling the antenna switches with a mouse click instead of toggle switches. These issues are being addressed.

What you may want to ask at this point is, "How do you make another 3 dB improvement in the station and/or antennas?" That's part of the magic of evolutionary station design. Outside, the only hint I can give you is that W5FU wants a 3-element rotary 160 meter antenna. Inside, we are working on controlling all antenna switches, stack boxes and rotators on each station's computer screen. *Stay tuned!*

Tom Taormina, K5RC, has been building contest stations for more than 35 years. In 2007 he was among those inducted into the CQ Contest Hall of Fame. He lives in Virginia City Highlands, Nevada. A complete set of inside and outside N5JJ/K5LZO Memorial Station photos is available on his Web site, <http://k5rc.cc>.

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