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12 January 1999

Office of the Secretary
Federal Communications Commission
1919 M Street NW - Room 222
Washington, DC 20554

Re: WTB 98-143 Reply to Comments

Enclosed is an original and nine copies of my Reply to Comments about Wireless Telecommunications Bureau Docket 98-143 in regard to the 1998 Biennial Regulatory Review on Amendment of Part 97 of the Commission's Amateur Radio Service Regulations. Also enclosed is a 3.5 inch floppy disk containing a WordPerfect 8.0 format file of this Reply to Comments. I wish this Reply to Comments be a Formal reply and copies forwarded to all Commissioners.

Three attempts were made to forward this Reply to Comments via the FCC's ECFS but problems with my service provider, America On Line, prevented full upload. I ask the Commission's forgiveness if this partial upload disturbed or damaged the ECFS.

Yours sincerely,

Leonard H. Anderson

Leonard H. Anderson
10048 Lanark Street
Sun Valley, CA 91352-4236

e-mail: Lenof21@aol.com

Enclosures: Original and 9 paper copies, one 3.5 inch floppy disk

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**Before the**
**Federal Communications Commission**
**Washington, DC 20554**

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| IN THE MATTER OF: | ) | WTB Docket 98-143 |
| | ) | |
| 1998 Biennial Regulatory Review | ) | RM-9146 |
| Amendment of Part 97 of the Commission's | ) | RM-9150 |
| Amateur Radio Service Regulations | ) | RM-9196 |

January 12, 1999

To: Office of the Secretary
Federal Communications commission
1919 M Street NW - Room 222
Washington, DC 20554

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**REPLY** to Comments of Michael P. Deignan (28 November 1998), et al
by
Leonard H. Anderson, 10048 Lanark Street, Sun Valley, California 91352-4236

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## INTRODUCTION

This reply concerns itself with several Comments received by the FCC in response to WTB Docket 98-143 on the restructuring of the Amateur Radio Service; it uses the 28 November 1998 Comment of Mr. Deignan as a base point for replies with other Commenters indicated in text .

I am a retired electronics engineer who has had a career in electronics, radio, and communications plus a great interest in the hobby aspects of radio and electronics (please see short biography at end of text). As such I have no pecuniary interest in amateur radio nor am I bound by any long-held traditions common to many licensed radio amateurs. I am concerned that a retention of the old, traditional rules and regulations will have a stultifying effect on the future of amateur radio in the next century. I feel that restructuring of the amateur radio service rules and regulations is necessary to maintain the amateur radio service of the future for all United States citizens, including those yet unborn.

The reply commentary is made from an "outside" point-of-view; i.e., from the standpoint of those who may wish to be granted an amateur radio license but are not now licensed in that radio service. It is felt that the restructuring plan in WTB 98-143 affects those citizens much more than currently licensed individuals.

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## MORSE CODE EXAMINATION FOR AN AMATEUR RADIO LICENSE

### Historical Overview

Early radio technology can be considered primitive. The only practical means to communicate using early radio was by means of on-off switching of the transmitter. Such switching codes were invariably variants of the "Morse code" devised by Samuel F. B. Morse prior to the Morse-Vail Telegraphic Relay

Patent award of 1840.[1] With six decades of telegraphic communications practice, the morse codes were a practical means to adapt for use with early radio.

Predecessor U.S. radio regulatory agencies instituted morse code testing for amateur radio licenses in early days of radio. This was eminently practical since other radio services also used morse codes. With all radio communications service users able to send and receive telegraphy, emergency communications was possible and various radio services could use morse to mitigate interference.

The advent of the vacuum tube prior to World War I enabled a conversion from the damped-wave, wide bandwidth "spark" transmitters to on-off keyed continuous wave transmitters having a relatively narrow bandwidth. Practical vacuum tubes required electronics and radio equipment to have one tube carry out one function. A vacuum tube based OOK CW (On-Off Keyed Continuous Wave) transmitter was simpler and of lower cost than a transmitter of any other modulation type.[2]

Invention of the transistor in 1947 and subsequent development of the integrated circuit of the late 1950s and refinement of integrated circuit processes and the number of transistor junctions per chip beginning in the 1960s meant that old vacuum tube based electronic architectures were rendered obsolete. Single integrated circuit radio receivers were possible in the 1970s. In addition, the post World War 2 research (begun just prior to WW2) in new modulation techniques and communications coding theory enabled many, many more modulations in radio and wired communications.[3]

At the turn of the century, landline telegraphy was changing over from the mature manual telegraphic means to teleprinting. That was essentially complete by 1930. Teleprinters did not require morse code specialists at each end of a communications link. Teleprinter messages could be entered by anyone familiar with a typewriter keyboard and read directly at the receiving end by anyone capable of reading. In addition, a paper "hard copy" was automatically generated at each end. This was a period of telegraphers finding themselves out of work, displaced by new technology. Many telegraphers took jobs as early radio operators, once again able to use their telegraphic skills. Since radio was new in the first three decades of the 20th century, many myths and legends on the "magic" of code on radio were generated. The skill of early radio operators was in their manual telegraphic ability, hardly changed from the six decades prior to the turn of the century.

Meanwhile, radio teleprinting by frequency-shift-keying and audio-frequency-shift-keying in multiple-voice-channel Single Sideband (SSB) was begun in the 1930s by commercial and military radio users. At the end of World War 2, the U.S. military used teleprinting as the major written communications method over long-distance HF radio circuits; manual telegraphy was still used on some military ships until that was converted to teleprinter and data in the 1960s.

Amateur radio continued to champion telegraphy as the hallmark of amateur radio operator skills well past the end of WW2. This is evident by the content of U.S. amateur radio publications QST, CQ, and 73 over that period. By the end of the 1980s, the only radio service regularly using morse code was

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[1] The term "Morse code" is colloquial. This is due mainly to the general public's recognition of landline telegraphy in the latter half of the 1800s. The Morse-Vail land telegraphy system was adopted around the world, including codings for western alphabets and some syllabic-based languages. This is somewhat simplified to "morse code" or "morse" in the remaining parts of this reply.

[2] The "simplicity" of OOK CW transmitters is often used as a "reason" for the alleged superiority of on-off keying modes. While this had validity in the vacuum tube era, that ceased with semiconductor-based radios of the last three decades.

[3] "Phasing method" SSB modulation and demodulation is one such development over the classical bandpass filter SSB method used in telephony and radio prior to WW2.

maritime mobile radio service and allied shore stations.[4] The reasoning behind such a long retention of a singular operator skill may lie in the following:[5]

1. Morse code was the only available mode or method possible in very early radio.

2. Vacuum tube based OOK CW transmitters were simpler, less costly than for any other mode, well into the post-WW2 period until the 1960s..

3. Many early amateurs were professional telegraphists who enjoyed the new radio medium. They put forth morse code skill as the foremost attribute for radio amateurs and this was reflected in pre-WW2 amateur radio publications. Higher-rate morse skill was considered a final goal in amateur radio operation.

4. Post-WW2 era saw the influence of returning military radio operator war veterans championing morse code skill as the highest attribute of a radio amateur...a case of military skills education carried over to a civilian avocational pursuit.[6] Again, immediate post-WW2 amateur radio publications stressed morse skill as the highest attribute of radio amateurs.

5. The morse code test has never been removed from U.S. amateur radio licensing examinations for privileges of operating below 30 MHz. The code test has "always existed" in U.S. amateur radio licensing, therefore many think it "must always be so."[7]

**Corrections and Counter-arguments to Mr. Deignan's Comments on Morse Test Reductions**

Contrary to Mr. Deignan's insistence that there are "pro-code" and "anti-code" proponents, there has been no evidence presented that "anti-code" proponents are against morse code use in amateur radio. The only advocacy has been a *morse code test rate reduction* or an outright *elimination of the morse test.* As an example, both are a goal of the No-Code International organization and so stated on the No-Code International web site.

Mr. Deignan infers that all humans are capable of learning morse code. This is only partially true since humans vary in morse rate capability. The United States military began a "morse aptitude" screening test of all incoming recruits during WW2 and continued that test for about two decades. Those that showed morse aptitude were considered for radio operators' military occupation specialties. Humans have many different aptitudes that have nothing to do with intellectual learning capability. Retention of maximum radio operator license class privileges based on a high-rate aural recognition aptitude can only be considered as discriminatory.

Mr. Deignan also infers that (in the amateur radio service) "SSB is almost as old as morse code as a

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[4] Discounting the automatically-sent morse identifiers required in other radio services.

[5] This is supposition by the writer based on the published history of amateur radio. Obviously, a thorough research study would be required to ascertain all these suppositions as real reasons.

[6] An Amateur Extra class license with 20 Words per Minute code test did exist prior to the Incentive License Plan of 30 years ago which put the Amateur Extra class back into U.S. amateur radio.

[7] ITU-R Article S25.5 requires all signatories to have an International Morse Code test "received by ear and sent by hand." There is more commentary on Article S25.5 later in this Reply.

mode." This is incorrect. Morse code was the first mode in radio communications in 1896.[8] The first U.S. radio amateurs were licensed in 1912. While commercial and military users were communicating via single sideband beginning in the 1930s, U.S. amateur radio operators did not adopt that AM mode until the 1950s.[9] That is a difference of almost four decades.

Mr. Deignan mentions "several sources of surveys" and the "latest survey" (indicating percentage of morse use). There seems to be only a singular survey in regards to modes in use by amateurs, that done by the ARRL in 1997, a mail-out/mail-in survey of less than 2000 participants. If there has been more than one survey done in the last decade, the details and results have not been made public.

Mr. Deignan claims that subpart 97.1 (c) requires a minimum level of morse code proficiency to "advance the radio art." That is an incorrect quote. 97.1 (c) states:

> *Encouragement and improvement of the amateur service through rules which provide for advancing skills in both the communication and technical phases of the art.*

Morse code, as a method of communication, is 159 years old. It is a difficult stretch of the imagination to assume that manual telegraphy can be improved by anyone after such a long period of use by many communicators. There exist ways to improve the non-manual ways to send and receive morse code but those involve technical and intellectual skills which have nothing to do with manual telegraphy or a license test requiring "receive by ear and send by hand."

Mr. Deignan seems to discount technical ability as an attribute of radio amateurs (first paragraph, third page) when he says that that the elimination of other radio services' morse code use is not an applicable comparison to amateur radio. He states: "We are amateurs, with people from all walks of life, from janitors to cardiac surgeons - oh, and the occasional RF engineer here and there." Mr. Deignan should realize that all radio amateurs, regardless of occupation, meet all Part 97 regulations including technical standards, not just the operator and operating standards in Subpart A.. One cannot advance skills in the technical phases of the art by ignoring them and concentrating solely on communication skills.

This *deus ex machina* complex is evident in comments on amateur "traffic handling" systems (paragraphs 7, 8 on page 4) where he states "this reliance on technology means a greater probability of failure in catastrophic disaster situations" without outlining the nature of the catastrophe. In disaster communications the purpose is to handle communications in a clear and expeditious manner. Computer assisted packet message relays do this routinely.[10] The equipment failure rate of modern electronics used in and with radio is very, very low, far lower than older vacuum tube based manual telegraphic radio circuits. Non-morse communications has the further advantage of eliminating the need for morse code specialist operators at each end of an emergency circuit; senders and recipients can be in better liaison with amateur radio operators and have fewer errors using clear text transmission.

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[8] Guglielmo Marconi is considered the first radio communicator, sending a signal one way over a 2.5 KM circuit near Bologna, Italy in 1896. That same year Aleksandr Stepanovich Popov sent the name "Heinrich Hertz" over a 300 yard circuit in St. Petersburg, Russia.

[9] It is recognized that a very few U.S. radio amateurs were experimenting with single sideband before the U.S. entry into WW2, but that is an insignificant number compared to the veritable flood of amateur SSB voice use beginning in the 1950s. While the first AM transmission was made in 1906 using a water-cooled microphone modulating an Alexanderson alternator, that was a test transmission and AM did not become practical until higher power vacuum tubes were perfected a decade later.

[10] The U.S. military employs digital message exchanges on the battlefield. A battlefield can be (loosely) defined as existing in a "catastrophic" environment, certainly as severe as in any civilian catastrophe.

**Suggestions on Morse Code Testing Elements**

I will disagree with Mr. Deignan's recommendations only partially. I would suggest a change from the existing three-rate morse test to a single rate. They could be implemented in two phases:

First Phase, Implement Now

1. Keep element 1 (a). It would become element 1 and apply to all license classes having privileges below 30 MHz.

2. Eliminate elements 1 (b) and 1 (c). This is in line with the National Conference of VECs' recommendation for CEPT harmonization of 5 WPM for a Class 1 license allowing full privileges.[11]

Second Phase, Subsequent Biennial Reviews

1. Have the United States take action at a future World Radio Conference to reword Article S25.5 to void the requirement of a code test entirely. S25.5 could be reworded to simply state that the on-off keying code for international use is the International Morse Code. This would allow each nation to decide individually on code testing.

2. Eliminate all morse code test elements in U.S. amateur radio license examinations.

3. Retain the band planning below 30 MHz in relatively the same divisions of morse-only and other modes. Those that wish to continue using morse code mode can do so in relative privacy.

4. Encourage U.S. amateur radio organizations to sponsor their own morse code proficiency testing with appropriate awards as they see fit. I envision the FCC as a radio regulatory agency, not as a federal agency that awards merit badges for a singular radio operations ability.

5. Increase the bandwidth of existing HF amateur bands or add new amateur bands.[12]

**Some General Comments About the Morse Code Test**

There is only one diplomatic requirement for an amateur morse code test: ITU-R Article S25.5. There is also no reason why the United States cannot initiate changing S25.5. It is a carry-over from the old CCIR amateur radio articles, voted in by administrative members. It can also be changed or deleted by those same administrative members.

Nothing in Part 97 requires that any radio amateur *use* morse code on any band. Part 97 as it currently exists is quite flexible on modes; any amateur radio class can use any allocated mode. Technician class

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[11] CEPT is Conference of European Postal and Telecommunications administrations, 41 nations. This is explained more in the WTB 98-143 Comment of 1 October 1998 from the National Conference of Volunteer Examination Coordinators.

[12] National Technical and Information Agency special publication 96-332 indicates that at least 900 KHz of additional HF spectrum should be available for radio amateurs by 2006. It is a mystery to this writer why there hasn't been more stated on this possible band increase in amateur radio publications over the last three years.

licensees can use morse code above 30 MHz even though they are not tested for morse code ability.[13]

The morse code test has never been eliminated from the amateur radio license test for a license having privileges below 30 MHz. Although a number of other modes and modulations are available for amateurs, there has never been an operator's proficiency test element in the license examination for any of those other modes or modulations. This indicates that the FCC may have "favored" morse code for amateurs without explaining the need for that singular operator test.

The original reasons for instituting a morse code test were: Emergency communications and communications regarding mitigation of interference. Those are no longer applicable. Other radio services do not use morse code modes and are nearly all on different frequency bands. Actual radio amateur emergency communications employed over the last decade indicate that morse code mode is seldom used or never used.

Widespread, economical communications for the general public have obviated the need for the old-time "telegram surrogate" service through morse code mode done by radio amateurs prior to 1940.[14]

A morse code test, whether given as "perfect copy" or in multiple-choice answers on content, does not give the government any information on the license examinee's ability to operate other modes or be sufficiently learned in technical matters to operate their transmitter within regulations. On the other hand, written test elements can contain questions regarding technical matters and *all* modes; there could be morse code written test questions sufficient to show that an examinee can recognize and understand dot-dash patterns of the International Morse Code.

If the single ARRL survey of 1997 showed that as many as 40 percent of HF-privilege licensees used morse code however much or however little, that in itself is no logical reason to retain the morse code test. Those would be in the minority of HF amateur band users.

## ON THE WRITTEN TEST ELEMENTS

### Some Questions About and Corrections Of Mr. Deignan's General Comments

In general, Mr. Deignan's proposals for written test element improvements would seem to be increasing the complexity of the testing and increase the VE's workload in addition to increasing the Commission's overhead in amateur radio licensing to requalify those already licensed.

There is also considerable disagreement on license requirements "gradually eased" (over the last two decades). Privatization of license testing was an effective, budget-conscious means with the FCC having final review and approval of questions and answers. The COLEM and VEC organizations have been operating for about 15 years with minor controversy regarding question-answer content. Apparently this "gradually eased" licensing requirement suddenly surfaced as some sort of strawman issue over the advocacy to eliminate the morse code test.

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[13] There is some lack of clarity in 97.305. 97.305(a) states that "An amateur station may transmit a CW emission on any frequency authorized to the control operator." The table associated with 97.305(c) indicates that the 219 to 220 MHz band is Data only. 97.305(a) and 97.305(c) seem to be in conflict.

[14] The American Radio Relay League (ARRL) was originally formed as a local organization in the New England area to provide such a "telegram surrogate" service. The word "Relay" in the organization's name refers to that. Direct-dial telephones and facsimile machine service available at various store chains have become better, more effective substitutes of quick communications for the general public.

Mr. Deignan has some validity in his concerns on publicly-available exact answers to all written test elements. However, I feel he is over-reacting in his Comments. First of all, Question-and-Answer books on both commercial and amateur FCC licenses have existed since the early 1950s. While these "Q & A" books did not contain *exact* answers, the given answers and questions were extremely close to FCC administered tests.[15] There is also a human tendency to look back on earlier tests and consider them "hard" but that is largely one of self-perception. *At a previous time* in one's experience those questions would *seem* "hard" since the examinee had not learned as much as they know now.

**1. Grading System Changes**

I must disagree with Mr. Deignan on the necessity to reorganize the questions into "sub-elements" within elements, increase their number, then change the grading for an increased passing score.[16] This appears to increase the difficulties for the VECs and VEs, suggesting computerized test administration. There are no details given as how this proposed system is better or worse than the existing system. Without details or examples there is no way to judge that a passing examinee would have a "better-than-fundamental understanding of *some* of the material in the knowledge-base" under the proposed system.

The purpose of a license test is to assure the government that an examinee is considered qualified to be granted a license for which they are being tested. To create a suitable test requires considerable study of the rules and regulations and existing radio-applicable electronic theory and how that would best apply to a licensee's demonstration of qualification. That mechanism is already in effect and has been in effect for over a dozen years: the VEC and their Question Pool Committee.

**2. Question Count Increase**

This appears to have some merit, but I would defer to the National Conference of VECs Comment of 1 October 1998 as to the number of questions and a reduction to three total license classes. In that Comment the three proposed classes are Technician, General, and Extra. The number of questions per class are:

| | |
|---|---|
| Technician | 50 |
| General | 50 + 50 given to Technician class |
| Extra | 100 + 100 given to General and Technician classes |

Given that 97.523 would still require 10 times the number of questions administered for each class, the VECs would require question pool sizes of:

| | | |
|---|---|---|
| Technician | 500 | 2000 answers in question pool, total |
| General | 1000 (total) | 4000 answers in question pool, total |
| Extra | 2000 (total) | 8000 answers in question pool, total |

It would seem reasonable that the number of questions in a question pool preclude the average

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[15] This writer used one such book in March, 1956, to assist in passing the First Class Radiotelephone Commercial license. That test, administered in an FCC field office, required some written (essay) answers plus drawn schematics in addition to multiple-choice questions.

[16] Such "sub-elements" already exist in 97.503 (c) where specific question types are indicated for each written test element.

examinee from "memorizing" the questions and correct answers in any class' pool.[17]

The National Conference of VEC's plan would reduce the number of written test elements to 3. This is a lighter workload on test preparation and proctoring than Mr. Deignan's additional "sub-element" generation and grading. The VEC's Conference Comment proposes fewer written test elements than the current five.

**3. Syllabus Overhaul**

Mr. Deignan's proposals seem to have little merit from the standpoint of the government's assurance that an examinee has been proven worthy of a license grant. The VECs already review and revise the existing five written test element question pools periodically for final approval by the FCC. With only three classes as proposed by the VEC Conference, their task and the FCC's question-answer approval task is reduced even with an increase in the number of questions per written test element.

**4. Public Question Pool Elimination**

Again, there is disagreement with Mr. Deignan's insistence that a public question-and-answer pool is invalid for "learning" regulations and theory. In the first place, a license test is not some classroom test covering past-taught subjects. It is not within the charter of the FCC to "teach" radio and electronics, merely to test for, and grant if passed, an operator's license.[18] The government is only interested in whether or not a prospective licensee is sufficiently versed in regulations and theory to effectively and legally operate an amateur radio station.

In the second place, prospective licensees must be *already knowledgeable* to the extent required by regulations. Licensees must still follow technical standards on power output, emission, modulation content, harmonic output level, etc., even though a particular examination question selection does not cover all such topics in detail. There exist plentiful publications on theory in the amateur radio marketplace sufficient for self-teaching on theory and the copyright-free rules and regulations are available in the Internet and in the amateur marketplace. It is not the task of the Commission to teach radio regulations or theory.

Thirdly, Mr. Deignan's idea that a revised, non-public question-and-answer pool be "copyrighted" fails U.S. law.[19] Even if 17 USC 105 did not exist, having the VECs hold a copyright on the Q & A pool would require the VECs to jointly hold a copyright even though they are disparate organizations. This would increase their own administrative tasks and possibly require additional test monies due to such overhead.

Fourthly, it is a good idea for VECs to utilize computers in random question selection and test

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[17] There exist individuals with high eidetic aptitudes who have a "photographic memory" but those are rare in the population, perhaps more rare than those with high-rate morse code recognition aptitudes. A curious observation is that the allegations of "being able to memorize a question and answer pool" always seem to come from those who have already passed a test.

[18] This includes commercial radio operator licenses. The amateur radio license is unique in that it covers both the operator and the station itself (called the "control point").

[19] 17 USC 105. Subject matter of copyright: United States Government works. The U.S. government cannot copyright specific government works although it can hold transferred copyrights by assignment, bequest, or otherwise.

preparation for examinations. However, it is not prudent to mandate that all VE proctored examinations use computers. At present, and even with increased questions suggested by the National Conference of VECs' Comment, test papers can be prepared by whatever means are available to VE groups.

Fifth, the present question-and-answer pool dissemination by computer means already allows sample question-and-answer practice examinations. All such publicly-available question-and-answer pools are in text file format. It is not a difficult task for any competent computer programmer to write a program that reads the question-and-answer database file, selects an appropriate sub-element question at random for presentation to the practicing individual.

### 6. Periodic Re-Certification of Existing Licensees

While this seems a worthwhile suggestion, it places an undue burden on the VEC system as well as adding to the FCC in maintaining records of those already licensed who pass or fail. In the case of failing a re-certification, the FCC must add new regulations regarding license class changes as well as updating the licensee database.[20]

Second, the VEC and VE workload would be increased. As of the end of December 1998 the total U.S. amateur radio licensees numbered 673,823.[21] If that number were to remain static, the VEC and FCC would have to process an additional 67 thousand re-certification tests per year. As an example of workload increase, based on the Speroni Web site tabulations for 1998, the total number of FCC aplications processed 118,489. Adding 67,382 renewal tests would bring the necessary processing to 185,871, an increase of about 57 percent over the current processing.

Third, to repeat, the FCC is not chartered to "teach" new radio-electronic theory or regulations that have come to pass during a licensees' license term. It is the responsibility of each licensee to keep abreast of the technical art and regulatory changes just as much as they are required to responsibly operate and maintain their amateur station under existing regulations. Amateur radio organizations and general electronic-radio publications already exist to teach licensees all that is new in radio.

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## LICENSE CLASS REDUCTIONS

### General

The five-tiered HF-privilege U.S. amateur radio license system has existed for almost three decades. A sixth license class, Technician, was added nearly 8 years ago. Administration and regulation of six different license classes is burdensome to the government and unique to the United States in the international radio amateur community. Existence to six classes, or even five, promotes a literal "class distinction" among U.S. radio amateurs and encourages a "ranking" and attendant snobbery within the

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[20] This would be in addition to the existing licensee administrative task of handling license class or callsign changes that occur before the ten-year license term is over.

[21] Value from Internet Web site of Joe Speroni, AH0A at http://www.speroni.com. Mr. Speroni periodically downloads the U.S. amateur radio licensee databases from the FCC, processes that data into several forms, displays the result in easy-to-read format.

U.S. amateur community.[22]

A number of different license class structures have been proposed in the Comments to WTB 98-143. Mr. Deignan and Mr. Philip M. Kane propose only two classes, one having "VHF and above" privileges and the other having all privileges. The National Conference of VECs proposes three classes, those two plus an Extra class. The ARRL Comment proposal and several others have four classes, all of the preceding plus the Advanced class. Most seem to favor the elimination of the Novice class. Indeed, the Novice class has shown a continuing drop in total class numbers for years and does not have the popularity it once had in the 1950s and 1960s. From the Speroni Web site tabulations, the Novice class license total dropped from 64,169 at the end of December, 1997, to 57,617 at the end of December, 1998. This loss of 6,552 is reflected approximately in the losses for 1997 and 1996, showing a consistent decline in the number of Novice class licenses.

Any reduction in the number of license classes should consider the number of total licensees that exist now. From the Speroni Web site, the totals per class are:

| | At End of Dec., 1998 | At End of Dec., 1997 | Gain or Loss In 1998 | Percentage of Total, End of Dec., 1998 |
|---|---|---|---|---|
| Extra | 74,669 | 73,949 | + 720 | 11.1 |
| Advanced | 103,592 | 105,835 | - 2,243 | 15.4 |
| General | 111,513 | 114,877 | - 3,364 | 16.6 |
| Technician + | 134,857 | 137,688 | - 2,831 | 20.0 |
| Technician | 191,575 | 179,988 | + 11,587 | 28.4 |
| Novice | 57,617 | 64,169 | - 6,552 | 8.5 |

Any realignment of license classes in a reduced-class structure requires class reassignment to a "next higher" class. The reason for that is largely emotional: Existing licensees will feel denigrated if they are reassigned to a "lesser" class. Conversely, existing "higher" classes will feel outraged if "lesser" existing classes are reassigned to "their" level; many feel that all who reach "their" level should have taken the same test elements as "they" did. Reduction of the number of types of license classes is bound to cause dissension among those already licensed regardless of the proposed system. A prudent course of action would seem to be a phased-in reduction of the number of license classes. While a two-class license structure seems the most logical, the hue and cry for blood on the part of those already "awarded" a merit of a "higher" class license would be great. Rather than Mr. Kane's or Mr. Deignan's two-class structure, a four-level class license system is possible. This is in line with the ARRL's own proposed structure and several other Commenters.

**A Four-Level License Class Structure**

This suggested structure assumes that a 5 WPM morse code test will exist for all classes except Technician. In order of descending "level" these are:

1. **Extra**. The superfluous "Amateur" could be dropped from the title. Existing Amateur Extras would transfer to the new Extra. New Extras would be required to take a 200-question total written test, as in the suggestion of the National Conference of VECs' Comment.

[22] This writer considers the so-called Incentive Plan system to be likened to a "merit-badge" rank and privilege. Philip M. Kane, K2ASP, in his 30 November 1998 Comment described it as "essentially a prize-awarding system, where personal status is conferred by the grade of license."

**2. Advanced.** Existing Advanced class licensees would remain the same. New Advanced class licensees would have to take a 150-question total written test. This is a compromise of the National Conference of VECs' suggestion of 200 questions for Extra and 100 questions for General.

**3. General.** Existing General class licensees would remain the same. New General class licensees would take a 100-question total written test as suggested by the National Conference of VECs.. Existing Technician Plus and Novice class licensees would be transferred to this new General class license without further testing.

**4. Technician.** Essential unchanged from the existing Technician class license. No code test.

Given the December 1998 amateur radio license class totals at the Speroni Web site as an example, the totals per new class and percentage of grand total of licensees would be:

| | Class total | Percentage |
|---|---|---|
| Extra | 74,669 | 11.1 |
| Advanced | 103,592 | 15.4 |
| General | 303,987 | 45.1 |
| Technician | 191,575 | 28.4 |

The declining Novice class would be given a decided boost in status, perhaps halting their decreasing numbers. Existing Technician Plus licensees would receive all the privileges of a General class and remove the status barrier that separates them from General.

**An Alternate Three-Level License Class Structure**

This is essentially that proposed by the National Conference of VECs' Comment. The morse code test would be at 5 WPM for Extra and General, no code test for Technician class. In so doing, existing Advanced class licensees would be transferred to the new Extra class; existing Technician Plus and Novice class licensees would be transferred to the new General class. Technician class would be essentially the same as now. Total number of written test questions per class would be as given in the National Conference of VECs' suggestion.

Again, using the previously-used December 1998 class totals, the new three-level license class structure would be:

| | Class Total | Percentage |
|---|---|---|
| Extra | 178,261 | 26.5% |
| General | 383,987 | 45.1% |
| Technician | 191,575 | 28.4% |

It is this writer's thought that the alternate three-class structure would best suit the amateur radio service for at least the next ten years. An Extra class remains for those who feel the necessity of having higher status certified by the United States government. It is assumed that the United States will take little or no action on changing ITU-R article S25.5 so the above-30-MHz privilege Technician remains separated from those that have or are code-tested.[23]

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[23] It is this writer's unverifiable prediction that, if such a proposed structure is adopted, the General and Technician class totals would reverse before ten years elapses. The Technician class license has shown a

**A Final License Class Structure**

One license. No code test at all. The United States, by the end of a ten year period, has finally taken international action to remove the necessity of a code test for an amateur radio license. Morse code mode remains one of the many optional allocated modes available to all radio amateurs. There are no "band plans" that separate one class' use of amateur bands from another class.

If there remains a need among existing licensees for status, such personal perquisites can be awarded by private amateur radio organizations. There should be no need for government-certified "awards" through multiple, near-Byzantine-structure license class grants. The FCC is a radio regulatory agency chartered by the United States Congress, not the Boy Scouts of America.

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**A COMMENT CONCERNING THE MINIMUM AGE OF A LICENSEE**

The ARRL Letter, a feature of the ARRL Web site, carried a news story about the "two youngest hams" who were licensed at age four.[24] There is nothing in the existing Part 97 regarding age of a licensee or a prospective amateur. It is this writer's opinion that there should be a minimum age.

Anyone taking an amateur radio test should be literate. Further, examinees and licensed amateurs should possess sufficient reasoning of regulations that they will operate responsibly. It leaves this writer in a state of incredulity to suppose that *four year olds* have sufficient reading capability, sufficient understanding and responsibility to be granted a radio license in any radio service. Regardless of familial claims of abilities, it should be clear to any adult that four year olds do not possess enough maturity to operate radio transmitters sending signals internationally or with possibility of interference to communications in other radio services. It cannot be excused that these *children* will be operating under "parental supervision." Nothing in the existing Part 97 regulations covers "parental supervision" of very young amateurs. *Children* are simply too young, too immature to be entrusted with the responsibility of lawful operation of radio transmitters.

It is suggested that a minimum age of amateur radio license examinees be limited to at least age 14 or older, any license class.[25] Proof of meeting minimum age limit would be shown to the examining VE team. Exact age would not be required to be submitted to the FCC; responsibility would be put on the VE test team to state to the FCC that an examinee met the minimum age requirement.

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continuous positive growth over the last eight and a half years and there is no sign of any reduction in the rate of growth. There is little interest in using or being tested for morse code skills and there is more apparent interest in new modes, modulations, and hardware for the frequencies above 30 MHz.

[24] ARRL Letter of March 20, 1998, Volume 17, Number 12. The two "youngest hams" were licensed as KB9RYP (Samuel Lewis, Technician Plus) and KB9SEG (Sarah Bruno, Novice) in late February 1998. The ARRL Letter text indicated that their siblings and parents were all licensed in various amateur radio classes.

[25] Most states have a minimum vehicle driving license age limit of 16, usually as a "Learner's Permit" or similar. Vehicle driving has a direct possibility of causing injury to others. Radio transmitters do not have such a direct effect on public safety but, irresponsibly operated, a transmitter could cause interference to radio navigation aids or emergency radio signalling devices. Federal Air Regulations allow children to pilot certain aircraft types but only under the direct supervision of an adult at the controls.

## REMARKS ABOUT THE AMERICAN RADIO RELAY LEAGUE

Many commenters have praised the ARRL. The ARRL provides an effective service to its members. However, ARRL members comprise only a quarter of all amateur radio licensees.[26] The ARRL has never claimed to represent those who not licensed in amateur radio service.[27] It is the feeling of this writer that the FCC has, in the past, given too much credence to ARRL statements of position regarding the amateur community. ARRL membership is a minority in regards to opinions, statements, polls, or issues of policy concerning *all* radio amateurs.

Given that the ARRL has no representation of non-licensed individuals, their opinions and statements before the FCC do not necessarily reflect the U.S. citizenry.[28] With the advent of the Internet and improved communications with the entire population, it is hoped that the FCC can now effectively consider and judge the opinions of all citizens, not just minority membership organizations.

## A SHORT BIOGRAPHY

Leonard H. Anderson is a retired electronics engineer who has been active in radio communications, radio and electronics design, test, application since 1952. He is a U.S. Army veteran, having been a Signal Corps fixed station radio and microwave radio relay supervisor at Army station ADA in Tokyo, Japan, 1953 to 1956. He was granted a First Class Radiotelephone (Commercial) license in 1956. He has worked for Hughes Aircraft Company, Ramo-Wooldridge division of TRW, Electro-Optical Systems division of Xerox Corporation, RCA Corporation, Teledyne Electronics, and Rockwell International. He has a radio-related patent granted in 1974, assigned to RCA Corporation. He has written for the electronics trade, popular electronics, and amateur radio publications since 1968. He was a frequent contributor to Ham Radio Magazine, later serving as an Associate Editor there for two years.

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[26] From the previously-mention Speroni Web site, the total number of U.S. radio amateur licensees at the end of March, 1998, was 674,767. According to the ARRL Web site (QST magazine page), the ARRL membership at the end of March, 1998, was 169,295. Membership represents only 25.1 percent of all U.S. amateur radio licensees.

[27] The ARRL Web site and QST (membership magazine) both claim to "represent more than 600,000 U.S. radio amateurs" but that is just a claim. Non-members cannot vote in ARRL affairs and therefore have little say in ARRL statements and actions of their legal counsel before the FCC. Unlicensed citizens cannot become voting members in the ARRL.

[28] Given an estimated 260 million population of the United States, the ARRL membership is only 0.06 percent of the total population, 1 in every 1554 citizens. That is a decided minority.

**SUMMARY OF REPLY COMMENTS**

1. The general comments of the National Conference of VECs should be adopted.
2. The morse code test for under-30-MHz license privileges should be reduced to a single 5 WPM rate.
3. The United States should strive for a rewording of ITU-R Article S25.5 to eliminate any morse code tests and simply make the International Morse Code the standard on-off keying CW coding.
4. Amateur license classes should be no more than three: Technician, General, Extra.
5. A suggested goal for the future is a single license, no classes, no morse code test.
5. Written test element question quantity should be as recommended by the National Conference of VECs.
6. Privatized license testing and public question-and-answer pools should be maintained.
7. A minimum license examination age should be instituted, to be checked by the examining VE but not required to be forwarded in detail to the FCC.
8. The ARRL is an effective organization for a quarter of the U.S. radio amateurs but does not speak for all those citizens not yet licensed.

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**CONCLUSION**

This writer has given opinions and statements based on the observation of United States amateur radio over the last 51 years, given in good faith, and respectfully brought before the Commission for the betterment of U.S. amateur radio in the future. I wish to thank the Commission for this chance to be heard on radio regulatory matters that affect all U.S. radio amateurs and the many more yet to come in the future.

Respectfully submitted this 12th day of January, 1999,

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Attachment A

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