Before the
Federal Communications Commission
Washington, D.C. 20054

In the Matter of	)	
	)	
The Amateur Radio Service:	)	
Proposed Changes to the Morse Code (CW)	)	**RM-10811**
Proficiency Requirement for Operator	)	
Access to the Amateur Radio Bands	)	
Below 30 MHz	)	
	)	

To: The Commission

Reply Comments in Rebuttal to Comments of James M. Talens Made on 28 October 2003 On The Above Petition

I, Leonard H. Anderson, respectfully wish to make some general Comments to Mr. Talens' comment statements. I make these as a private citizen, as a professional electronics design engineer retired from regular hours, as a U. S. Army Signal Corps veteran who began in HF radio communication in 1953, and as a long-time radio and electronic hobbyist who has never had any amateur radio license or ever tested for same, nor has any affiliation with amateur radio organizations or businesses or publishers.

Allegation That Removal Of Morse Code Testing Is Akin To Personal Laziness

> On page 2, first paragraph, Mr. Talens writes: "*The Commission has been besieged of late by petitions to eliminate Morse testing as a licensing criterion in the Amateur Radio Service. It is variously argued that each testing is antiquated or that it is too much of a burden for people today to learn Morse code. Neither of these arguments can be seriously justified other than for reasons of personal laziness by those having no patience for learning the most fundamental of radio communications skills as a prerequisite for obtaining spectrum utilization privileges."*

Other than a broad-spectrum personal insult to hundreds of thousands of radio communicators, both professional and amateur, who have never been required to use Morse Code in communications, even in emergency situations, he has committed several descriptive errors.

Firstly, "the most fundamental of radio communications skills" has been placed on an emotional pedestal which is not appropriate to its status. Early primitive radio transmitters could only be used for communications through some means of on-off switching. Landline telegraphy employed such a method of communications. In the year of the first radio communications demonstrations, 1896, landline telegraphy had already been in service for 52 years.[1] Manual telegraphy had matured sufficiently to insure that communications professionals were in sufficient supply to serve as radio operators. The very sparse technical nature of early radio required minimal additional intellectual skills of landline telegraphers. It was a happenstance of an available technology (primitive though it was) that on-off keying telegraphy became the first mode of communications in early radio.

To expound that telegraphy is "the most fundamental of radio communications skills" is pure sophistry. That would be akin to stating that the most fundamental radio transmitters were of the spark-induced oscillators or that the most fundamental radio receivers were solid-state types.[2] Nearly all early

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[1] Guglielmo Marconi in Italy and Alexandre Popov in Russia both demonstrated radio to the public in 1896. The first Morse-Vail Telegraph System was installed and operating between Baltimore, MD, and Washington, DC, in 1844. In the following 52 years of manual landline telegraphy, the Morse-Vail Telegraph method spread throughout the world and the representations of written language characters resulted in many and various versions of the "code."

[2] The "galena crystal" detector is a form of point-contact semiconductor diode in a very crude form. The "coherer" detector relied on iron or alloy filings in a container and could be described as solid state only by an extreme stretch of the imagination. Absolutely none of the early radio receivers had any active devices for amplification of either radio or audio frequencies.

amateur radio stations used "spark" transmitters and unamplified detectors along with on-off keying telegraphy. The technology of such "fundamental radio" stations was absurdly primitive by the standards of what developed in all of radio by the time of the onset of World War 2. "Spark" transmitters had been outlawed by then, replaced with the VLF spectral region rotary alternators, then vacuum tube types having truly pure Continuous Wave radio frequency generation.[3]

However technically primitive early radio was, it must have seemed as a form of "magic" to everyone who had never heard or seen of that form of communications that could reach over the visible horizon, work at all hours of the day, and do it without interconnecting wires! Thus developed many a legend about radio in the early days, some of which propagate to the mythology spread in today's much more technically-advanced communications-oriented society.

[3] An electric arc induced damped oscillation in a passive tuned circuit will produce a remarkable and varied combination of amplitude, frequency, and phase modulation, using a very broad relative bandwidth with little control over quality. For early primitive unamplified detectors, the buzz of the "spark" transmitters' arc was an advantage in discerning a signal from random atmospheric noise.

It is interesting to note that "the most fundamental of radio communications skills" might well have been **voice**! Reginald Fessenden and others had already been experimenting with wireless voice communications by the year 1900. The first publicly-witnessed voice transmission over radio was on Christmas Eve, 1906, from Brant Rock, MA, Fessenden speaking into a microphone connected in series with a rotary alternator radio frequency generator and the antenna.[4] Obviously, this advance in technology was still in the primitive stage and true modulation modes would have to wait until vacuum tubes were invented and improved. However, this first voice transmission was only a decade after the first demonstrations of radio communications in 1896. Had there been an early breakthrough in radio or electronics technology, the "most fundamental skill" might have become voice. What then of the mystique and legends of early radiotelegraphy?

Speculation aside, telegraphy over early radio was the **only practical means of using radio as any form of communications medium.** It was first only because it could adapt to early, primitive radio. It is no more "fundamental" to communications than using "spark" transmitters as the first radio frequency transmitters.

Morse Code Testing Must Continue As A Last Resort For Emergencies

> On page 2 Talens writes: "*As has been noted by any number of commenters in all of those related proceedings, Morse code remains a technically advantageous mode that has been used and continues to serve as a last resort in times of local or national need. Loss of that skill at a national level, which would follow its removal as a mandatory adjunct to testing in the Amateur Radio Service, represents a regressive step in national emergency preparedness that should not be taken by the Commission."*

This is preposterous and outdated. First, this is the year 2003, not 1913 and a year past the disastrous sinking of the Titanic which led to the adoption of the 500 KHz international maritime distress frequency

[4] Details and photographs are available at the Thomas H. White radio history site at http://earlyradiohistory.us/index.html.

and need for morse trained operators on maritime vessels to use that special frequency. The Global Maritime Distress and Safety Service was endorsed by the maritime community as a successor to that old system to provide instant transmission and notification of distress situations by any trained ship's officer, not just a radio operator. If Talens thinks that Morse Code skill of such inestimable value in emergencies, then he should **demand** that the Commission make Morse Code mandatory for emergency and distress situations **in every other radio service!** Of particular interest would be the Private Land Mobile Radio Service (PLMRS) which includes Public Safety Radio such as police, fire, and medical mobile radio. Those public safety agencies have never considered adopting any Morse Code mode in modern times. The United States Coast Guard no longer monitors the 500 KHz international maritime distress frequency. The United States military, including the National Guards, do not use any Morse Code modes in tactical radio communications today. Such reductions or denials of Morse Code mode use by acknowledged public safety agencies and the military were done **prior** to the terrorist attacks in the United States on September 11, 2001.

All those other agencies, directly involved with the public safety and national defense at all times do not consider any Morse Code proficiency as valuable for their purposes on public safety maintenance.. Why should the Commission expect a voluntary, avocational, recreational activity be federally tested in Morse Code proficiency...but not federally mandated in any emergency training whatsoever...for some supposed communications "last resort?" Talens' remarks on code as a last resort should be ignored by the Commission as the outdated and preposterous claims.

Morse Code testing for a voluntary, avocational, recreational activity continues a **regressive** trend in all of amateur radio, one of holding back progress, indeed holding back time to a century ago. No one can rightfully claim that testing in communications skills needed 159 years ago represents **any** advancement of the state of the radio art today.

Allegation That Young People Are Engaged In Mind-Numbing Attractions

In the first and second paragraphs of page 3, Talens writes: "*Today, young people find greater attraction in computer games and mind-numbing attractions that have potentially more limited benefits for them and for society.*"

"*Yet there is a mystique that has attracted many thousands throughout the last century in the magic of radio. Increasingly, through efforts of the American Radio Relay League and myriad clubs throughout the United States, more young people are now learning the Morse code, and many are finding radio at least as compelling as the Internet. Whether such new trends can or will overcome the broader attrction of computer games remains a matter of speculation, but doubtless there continues to be an enduring interest in Amateur Radio and in learning and utilizing Morse code for communications."*

The first paragraph statement is puzzling, considering that the alleged "mind-numbing attractions" not computer games would be both the vast resources of information on the Internet as well as all major Internet Service Providers have some form of wide and diversified **communications** through chat rooms, newsgroups by the hundreds, hobby groups of many kinds, private e-mail services, instant messaging, and so forth. The Internet has been public for only a dozen years yet, as of the end of 2002, one in five United States households had some form of Internet access.[5] Internet-specific terms have become commonplace in American English, from "spam" to "blog" to "dot-com" appearing in national newspapers and periodicals as well as in spoken English.[6] All that happening in a short 12 years. Radio as a communications medium has been in existence for 107 years yet only mass media broadcasting has made any specific impact on modern language use...including what some might term "mind-numbing" entertainment shows.[7]

"Mind-numbing" is a highly subjective description. The same description could be applied to a Morse Code practice session, listening for many minutes at a time to monotonic tone patterns, lacking the

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[5] National Technical Information Service (NTIS) advertisement of new publications from the U. S. Census Bureau in early 2003, quoting "items of interest" from the Census Bureau.

[6] "Spam" is colloquial net-speak for unsolicited advertisements and mass-e-mailings. "Blog" is more colloquialism, a contraction of "web log" or a private page expressing thoughts of politics or national policy. "Dot-com" is a general slang word for a new web site, particularly one of a business which has failed to profit, phrase taken from the spoken form of the ending of an Internet address.

[7] The term "mind-numbing" is highly subjective, especially so in entertainment vehicles. Despite that, terms such as "Beam me up, Scotty" (Star Trek, the original series) or "Book 'em, Danno" (Hawaii 5-0), and a host

more entertaining beat of drums or rhythm instruments in music.

The use of "enduring interest" seems exaggeration. Radio is only 107 years old. Mass media audio broadcasting is approximately as old as the Commission (since 1934, or 69 years) and television did not begin as part of American culture until the late 1940s. If there is any "enduring interest" in "learning and utilizing Morse code for communications," then it would be among the minority of amateurs who have the aptitude for cognition of arrhythmic monotonic sound patterns. With the exception of maritime radio service, all other United States radio services have either dropped Morse Code modes or never considered it when that service was begun.

Talens does not cite any sources for the alleged nationwide "interest of young people" in Morse Code. Obviously there are some according to amateur radio license databases, but the United States population is also continuing to increase with a total of approximately 300 million citizens as of 2002. In the dozen years of existence of the no-code-test Technician Class amateur license, about 200 thousand became licensed amateurs without exhibiting any "enduring interest" in Morse Code.

Allegation That Morse Code Skill Will Disappear Without Federal Testing

On paragraph 2 of page 4 Talens writes: "*Although some percentage of Amateurs, even in a no-code testing environment, will continue to possess Morse skills, elimination of the Morse requirement will hasten an inexorable trend for Morse to decline and skill to diminish on a nationwide basis and, ultimately, to disappear.*"

That is pure speculation, impossible to prove but it is in direct opposition to Talen's claim that "enduring interest" [of young people] will take them away from "mind-numbing attractions."

Firstly, the Commission's lawful task does not involve maintenance of early radio's skills nor mandate that those must be used over and above other allocated modes. Second, if Morse Code as a communications mode possesses such attractions and positive attributes to young people, then they would

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of other phrases are quite familiar to the majority of U. S. citizens who watch television.

be eager to become involved on a large scale. Third, the Commission is not obliged to cater just to the young in American society; it is obliged to serve **all** American citizens.

If Morse Code possesses such positive attributes as claimed by its favorites, then it would be logical to expect that Morse Code will **survive without federal testing of any kind.** Ergo, survival would be guaranteed without testing.

Allegation That Dropping Morse Code Testing Is Not In The Public Interest

Talens states in the close of second paragraph of page 4, "*Such a result [of dropping code testing] is plainly not in the public interest, yet this will happen if Morse is not maintained as a mandatory testing element in Amateur Radio licensing."*

Talens seems confused on what constitutes "public interest." "Public interest" should be manifest in the number of new amateur licenses granted in the no-code-test Technician Class category, an amount greater than the total off all new licenses in all other classes in the same past 12 year period. "Public interest" should be evident in all the other radio services which have either dropped Morse Code use or never considered it in their beginning. "Public interest" is not in the maintenance of the status quo when the state of the art of **all radio** is changing, evolving with new technology and new methods of operation. "Public interest" is for the future as well as the present. "Public interest" is **not plainly evident** in the retention of Morse Code testing as can be judged by the responses against petitions for such retention.

Allegation That Morse Code Testing Retention Modernizes Amateur Radio And Returns Integrity To Its Standards To Be Capable Of Operating Under The Most Adverse Of Emergency Conditions

Talens states the above in paragraph 3 on page 4, adding that the Amateur Extra class Morse test rate be increased from 5 to 12 words per minute as part of that alleged modernization. Report and Order 99-412 issued in late 1999 placed a limit of 5 words per minute equivalent Morse Code cognition rate on all new license classes of Amateur Extra and General licenses. "Modern" would certainly include

changes from the older rates of 13 and 20 words per minute established only four years ago. "Modernization" is not established by returning to older standards of multiple Morse Code rates.

The "return of integrity" is puzzling. The Commission shows no sign of removal or castigation of licensees who obtained amateur radio licenses under older regulations provided they continue to uphold Commission regulations of the present. Removal of a Morse Code test does **not** mean a cessation of Morse Code operation on the amateur bands.

A "most adverse of emergency conditions" would be akin to armed combat, such as in warfare. The United States military is tasked to defend the nation by means of armed combat and the United States military does **not** use Morse Code modes for any tactical communications. PLMRS, in particular Public Safety Radio, does not rely on Morse Code modes for radio communications in any environment. The United States Coast Guard no longer monitors the 500 KHz international distress frequency for Morse Code distress messages. No group of firefighting units in the recent southern California firestorms has used Morse Code modes for any radio communications.[8] A raging firestorm covering tens of thousands of acres would certainly be in the "adverse conditions" category.

Radio communications by Morse Code requires proficient operators at both ends of a radio circuit. Under the "most adverse of emergency conditions" there is **no guarantee** that Morse Code proficient operators would survive an onslaught of such conditions. There is **no guarantee** that any amateur radio stations or equipment would survive; amateur radio equipment is not designed nor manufactured to military radio standards which are the most severe of all environmental radio operation

[8] These firestorms occurred in the last week of October, 2003, and are continuing as of 1 November 2003. While the destruction continues and no positive containment is stated, the losses as of 1 November 2003 are 20 dead, over 3330 structures destroyed, over 730,000 acres burned out, an area larger than the entire state of Rhode Island. Approximately 14,500 firefighting personnel were deployed at about 8 separate fire locations in five California counties along a curving line of about 160 miles in length. Source: Los Angeles Times morning edition of 1 November 2003.

specifications.[9]

Implication That "CW" Gets Through When Nothing Else Will[10]

At the top of page 4 Talens states: "*In the event of a national emergency, whether natural or man-made, we know that cellular and wireline telecommunications can be instantly overwhelmed. Data and voice radio systems, even within Amateur Radio, can also become overridden by interference, undermined by poor propagation of noise conditions or limited by lack of available emergency power.*"

"Lack of available emergency power" **includes** Morse Code mode radio equipment. **All radio equipment operates by electrical power**, regardless of mode. While batteries supply electrical power, so-called "dry" batteries of the Leclanche cell construction (carbon-zinc electrodes) are primary cells of one use only. Rechargeable cells require some source of other electrical power for recharging.

[9] This will include old military surplus military radio equipment converted to amateur radio use. Older military equipment from the pre-1950 era had less severe environmental specifications than military equipment of modern times. U.S. land and air forces have successfully met the conditions of warfare in the Middle East, Afghanistan, and the former Yugoslavia within the last 13 years.

[10] From an old phrase probably originating in amateur radio about the 1930s in reference to AM voice mode being inferior to on-off keyed CW.

Telephone circuits that are routed through telephone switching centers can easily be made inoperative by too many subscribers accessing the systems; for reasons of normal operating economy, telephone switching centers operate on past statistical data of only a fraction of all subscribers using the system at any one time. Telephone companies also provide fixed wireline circuits which are **not** routed through switching centers. Those are not rendered inoperative. Telephone companies also have on-line, floating battery power to supply electrical power to all central office equipment to maintain communications.[11]

All radio circuits are susceptible to noise and changes in propagation effects, regardless of mode of operation. Line-of-sight radio paths have very minimal propagation changes, any band from MF to

[11] During the Northridge Earthquake in Los Angeles on 17 January 1994, the entire area of about 10 million population was without all primary electrical power for a half day and slightly more, beginning shortly after 4:30 AM Pacific Standard Time. Local telephone service continued. While there were periods of telephone activity exceeding the capacity of switching centers, incoming long-distance calls were routed through. This commenter received long-distance calls from Florida in the late morning hours, no problem getting into the area code. All public safety agencies were operating and their radios operating through emergency electric power generators or mobile vehicle electrical systems. The Los Angeles Fire Department uses fixed wirelines for alarms and notices to all fire stations; those all continued to function.

microwaves and most, if not all, “adverse conditions” or emergency extremes occur within relatively small areas of no more than 4 lines of sight.[12] Near Vertical Incidence Skywave (NVIS) single-ionospheric-reflection paths are commonly used by U. S. military land forces in tactical communications from HF to VHF using a maximum station-to-station distance of about 300 miles.[13] NVIS path techniques are useable by any HF to VHF radio service.

[12] The farthest fire zones in the end week of October, 2003, in southern California are separated by about 150 statute miles, “Piru fire” at the northwest end to the “Otay fire” at the southeast end. The 11 September 2001 terrorist attacks on the United States were confined to the immediate area of the World Trade Center in New York City and the Pentagon in Washington, D.C. Recent western state wildfires have occurred over a 300 mile distance in relatively uninhabited areas. The damaged areas in the Northridge Earthquake of 17 January 1994 extended no more than 50 statute miles. The wildfires in southern California of 1993 approximated the areas in the 2003 firestorms. The earlier Loma Prieta earthquake in middle California was confined over a maximum distance of about 300 miles. Hurricanes along the eastern seaboard and Gulf of Mexico coastline, tornadoes in the midwestern states had actual damage contained within 400 statute mile distances. A “line-of-sight” distance is taken as 30 to 40 miles depending on terrain along a radio path and elevations at each radio path end.

[13] SINCGARS 30 to 88 MHz land-air radio sets use voice and data modulation with optional frequency hopping. Military AN/GRC-213, AN/PRC-104 HF radios have voice and data modulation.

While some have argued that the ionosphere will be temporarily made unuseable by a high-altitude electromagnetic-impulse nuclear bomb and thus destroy all radio circuits which require ionospheric "bounce," such will affect on-off keyed CW radio modes equally as well as voice and data mode use. This scenario is far-fetched and imaginative. Actual historic data of adverse-condition emergencies in and around the United States over the last eight decades involves distances within the NVIS maximum radius.[14]

All emergency communications conditions cannot be fully anticipated but professional public safety agencies have planning and organization and interdepartmental teamwork for the most-likely adverse conditions, are adequately equipped, and, most importantly, train and drill on a continuing basis so that all involved have some first-hand knowledge of what may be expected.[15] True adverse-conditions cannot be met by amateurs' day-dreams and imaginations saving their communities by their favorite radio mode and not coordinating, drilling, or training with local public service agencies. True adverse-conditions require flexibility and adaption to whatever condition occurs, including the possibility that no Morse Code proficient radio operators survive.

A Summary And Conclusion

[14] Radio communication of the Titanic sinking of 1912 involved on-off keyed spark transmitters operating at frequencies below 300 KHz. There are presently no below-MF allocated amateur radio bands in the United States amateur radio service.

[15] This was done in the Greater Los Angeles area and served all well in the 1994 Northridge Earthquake and again in the firestorms of 2003, tying together and directing utility service radios as well as all public service radio systems. The California Auxiliary Communications System (ACS) is a part of that and several states have planning modeled on the California ACS.

There is no valid reason for retention of the Morse Code test in United States amateur radio for either technical or legal reasons. Retention of the Morse Code test only serves as emotional sustenance of those already licensed in the amateur radio service who will never again be expected to take any test in their lifetimes.[16] Retention of the Morse Code test provides a barrier to uncounted numbers of future Americans who are interested in the communications and technical aspects of amateur radio, not in becoming members of a living museum of old radio skills.

The Commission must continue to look towards and prepare for the future for **all** Americans, not to satisfy a minority of amateur old-timers. The future is full of promise for Americans as we are a nation of innovators, of pioneers in technology, especially those of radio and electronics. Change is inevitable. The Morse Code test has proved its worth in the past. We no longer live in that past. Those who have become proficient in Morse Code should feel secure that they have accomplished a personal task and met test requirements of older times. However, such individual personal accomplishments have no basis for demands that all emulate them in testing in the future, nor subscribe to their personal desires or imaginations. I urge the Commission to discontinue the Morse Code test for any amateur radio license for the benefit of all, present and future. It is time for that change.

Respectfully submitted electronically this 1st day of November, 2003.

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

Life Member, Institute of Electrical and Electronic Engineers
Veteran, United States Army, Signal Corps, 1952 to 1960
retired (from regular hours) electronic engineer person

[16] Provided they renew within the regulatory grace period.